ETSI TS 186 014-2 V3.2.1 (2015-06)

Core Network and Interoperability Testing (INT);
Communication Diversion (CDIV) using IP Multimedia (IM)
Core Network (CN) subsystem;
3GPP™ Release 10;
Part 2: Test Suite Structure and Test Purposes (TSS&TP)

Reference
RTS/INT-00119-2

Keywords
CDIV, SIP, testing, TSS&TP

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Contents

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Foreword

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

The present document is part 2 of a multi-part deliverable covering Communication Diversion (CDIV), as identified below:

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

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

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

Modal verbs terminology

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

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

Introduction

The Communications Diversion (CDIV) services enables the diverting user, to divert the communications addressed to diverting user to another destination.

1 Scope

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for Communications Diversion (CDIV) services, ETSI TS 124 604 [1].

Further parts of this multi-part deliverable specifies the Protocol Implementation Conformance Statement (PICS), Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on the present document.

The Communications Diversion (CDIV) services enables diverting user, to divert the communications addressed to diverting user to another destination.

2 References

2.1 Normative references

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

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

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

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

[1] ETSI TS 124 604: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Communication Diversion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.604 Release 10)".

[2] ETSI TS 186 014-1: "Core Network and Interoperability Testing (INT); Communication Diversion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem; 3GPPTM Release 10; Part 1: Protocol Implementation Conformance Statement (PICS)".

[3] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[4] IETF RFC 4244: "An Extension to the Session Initiation Protocol (SIP) for Request History Information".

2.2 Informative references

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

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

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

Not applicable.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 124 604 [1] and the following apply:

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [3].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [3].

PICS proforma: Refer to ISO/IEC 9646-1 [3].

Point of control and observation: Refer to ISO/IEC 9646-1 [3].

Protocol Implementation Conformance Statement (PICS): Refer to ISO/IEC 9646-1 [3].

System Under Test (SUT): Refer to ISO/IEC 9646-1 [3].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [3].

3.2 Symbols

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

Gm	Reference Point between a UE and a P-CSCF
Mg	Reference Point between an MGCF and a CSCF
Mw	Reference Point between a CSCF and another CSCF
Mx	Reference Point between a CSCF/BGCF and IBCF

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 124 604 [1] and the following apply:

ISC	IP Multimedia Subsystem Service Control
NDUB	Network Determined User Busy
NNI	Network - Network Interface
TSS	Test Suite Structure
UDUB	User Determined User Busy

4 Test Suite Structure (TSS)

Table 1: Test suite structure

Netw		
	ASdivertingUser/DivProcedures	CDIV_N01_xxx
	ASdivertingUser/NotOrigUser	CDIV_N02_xxx
	ASdivertingUser/NotTermUser	CDIV_N03_xxx
	ASdivertingUser/NotDivUser	CDIV_N04_xxx
	ASdiverted-to	CDIV_N05_xxx
User		
	OrigUE	CDIV_U01_xxx
	Diverted-toUE	CDIV_U02_xxx
	DivertingUE	CDIV_U03_xxx
Interaction		
	TIP	CDIV_N06_xxx
	TIR	CDIV_N07_xxx
	OIR	CDIV_N08_xxx
	ACR-CB	CDIV_N09_xxx
	ECT	CDIV_N10_xxx

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 ETSI TS 124 604 [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 1 points to this.

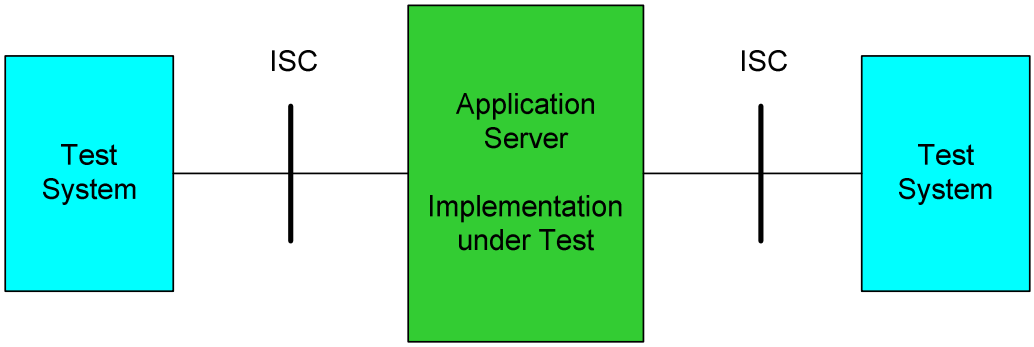

Figure 1: Applicable interface to test AS functionalities

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 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.

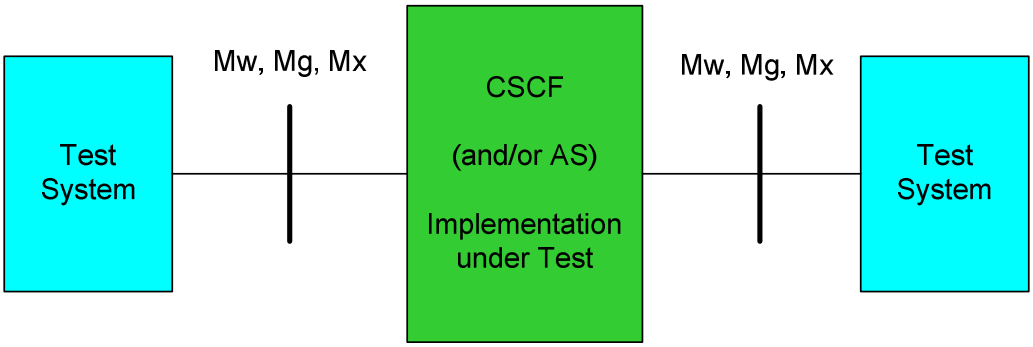

Figure 2: Applicable interfaces to test using the (generic) NNI interface

Figure 3 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.

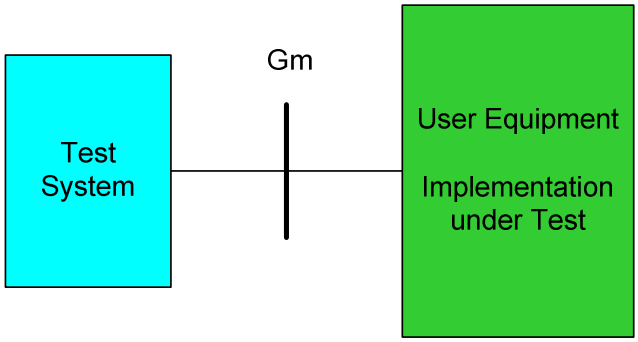

Figure 3: Applicable configuration to test the User Equipment

5 Test Purposes (TP)

5.1 Introduction

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 figure 4).

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

Figure 4: TP identifier naming convention scheme

5.1.2 Test strategy

As the base standard ETSI TS 124 604 [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 ETSI TS 186 014-1 [2].

5.2 Signalling requirements

5.2.1 Actions at the AS of the diverting User

5.2.1.1 Diversion procedures

TSS Netw/ASdivertingUser/DivProcedures	TP CDIV_N01_001	Reference [1], 4.5.2.6.1	Selection expression PICS 1/2

Test purpose

Served user has activated CFB, maximum number of diversion exceeded.

Ensure that the 486 (Busy here) final response with a Warning header is sent to the original user if the served user has activated the CFB simulation service and the served user is busy and if the maximum number of diversions is exceeded.

SIP header values:

INVITE: sip:SIP#n@ example.com SIP/2.0
History-Info: <sip: **non significant uri** value >;index=1,
Build additional entries with **non significant uri** values
<sip:SIP#n; cause=VA_CAUSE>;index=1.n.1
Warning: is present

NOTE: For each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in clause 4.5.2.6.2.3 [1]. In short: each redirection is represented by a "." (dot) in the latest history-entry.

Comments:

SIP#1		**AS**		**SIP#n**	**SIP#n+1**
INVITE 1	→		→	INVITE 1	
			←	486 Busy Here	
486 (Busy here)	←		→	ACK	
ACK	→				

TSS Netw/ASdivertingUser/DivProcedures	TP CDIV_N01_002	Reference [1], 4.5.2.6.1	Selection expression PICS 1/3

Test purpose

Served user has activated CFNR, maximum number of diversion exceeded.

Ensure that the 480 (Temporarily unavailable) final response with a Warning header is sent to the original user if the served user does not answer the communication request and if the maximum number of diversions is exceeded.

SIP header values:

INVITE: sip:SIP#n@ example.com SIP/2.0
History-Info: <sip: non significant uri value>;index=1,
Build additional entries with non significant uri values
<sip:SIP#n; cause=VA_CAUSE>;index=1.n.1
Warning: is present

NOTE: For each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in clause 4.5.2.6.2.3 [1]. In short: each redirection is represented by a "dot" in the latest history-entry.

Comments:

SIP#1		**AS**		**SIP#n**	**SIP#n+1**
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
		No reply timer expires			
480 (Temporarily unavailable)	←		→	CANCEL	
ACK	→		←	200 OK CANCEL	
			←	487 Request Terminated	
			→	ACK	

TSS Netw/ASdivertingUser/DivProcedures	TP CDIV_N01_003	Reference [1], 4.5.2.6.1	Selection expression PICS 1/1

Test purpose

Served user has activated CFU, maximum number of diversion exceeded.

Ensure that the 480 (Temporarily unavailable) final response with a Warning header is sent to the original user if the served user has activated the CFU simulation service and if the maximum number of diversions is exceeded.

SIP header values:

INVITE: sip:SIP#n@ example.com SIP/2.0
History-Info: <sip: **non significant uri value** >;index=1,
Build additional entries with **non significant uri** values
<sip:SIP#n; cause=VA_CAUSE>;index=1.n.1
Warning: is present

NOTE: For each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in clause 4.5.2.6.2.3 [1]. In short: each redirection is represented by a "dot" in the latest history-entry.

Comments:

SIP#1		**AS**	**SIP#n**	**SIP#n+1**
INVITE	→			
480 (Temporarily unavailable)	←			
ACK	→			

TSS Netw/ASdivertingUser/DivProcedures	TP CDIV_N01_004	Reference [1], 4.5.2.6.1	Selection expression PICS 1/4 OR PICS 1/5

Test purpose

Served user has activated CD, maximum number of diversion exceeded.

Ensure that the 480 (Temporarily unavailable) final response with a Warning header is sent to the original user if the served user has activated the CD simulation service and if the maximum number of diversions is exceeded.

SIP header values:

INVITE: sip:SIP#n@ example.com SIP/2.0
History-Info: <sip: non significant uri value >;index=1,
Build additional entries with non significant uri values
<sip:SIP#n; cause=VA_CAUSE>;index=1.n.1
Warning: is present

NOTE: For each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in clause 4.5.2.6.2.3 [1]. In short: each redirection is represented by a "dot" in the latest history-entry.

Comments:

SIP#1		**AS**		**SIP#n**	**SIP#n+1**
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
	←		←	302 Moved Temporarily	
			→	ACK	
480 (Temporarily unavailable)	←				
ACK	→				

5.2.1.2 Notification procedure of the originating terminating and diverting user

5.2.1.2.1 Originating user

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_001	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 1/1 OR PICS1/2 OR PICS 1/6 OR PICS 1/7)

Test purpose
*Communication forwarding using CFU or using CFB NDUB, CFNL or CFNRc with applying diversion condition; originating user is **not** notified.*

When Communication Diversion occurs and if the notification procedures of the originating user is supported then no 181 (Call Is Being Forwarded) response shall be sent towards the originating user if the served users subscription option is set to: *Originating* user receives notification that his communication has been diverted (forwarded or deflected) = no.

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = no

Comments:

SIP#1		AS	SIP#2	SIP#3
INVITE	→			
				→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_002	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND PICS 3/4 AND PICS 3/5 AND (PICS 1/1 OR PICS1/2 OR PICS 1/6 OR PICS 1/7)

Test purpose
Communication forwarding using CFU or using CFB NDUB, CFNL or CFNRc with applying diversion condition; originating user is notified.

When Communication Diversion occurs and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:
a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = CAU_VA and escaped Privacy header set to 'history', index = 1.1

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:
181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2 >;index=1,
<sip:SIP#3;cause=CAU_VA?Privacy=history>;index=1.1

Comments:

SIP#1		AS	SIP#2	SIP#3
INVITE	→			
181 Call is Being Forwarded	←			
				→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_003	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4 AND (PICS 1/1 OR PICS1/2 OR PICS 1/6 OR PICS 1/7)

Test purpose

Communication forwarding using CFU or using CFB NDUB, CFNL or CFNRc with applying diversion condition; originating user is notified.

When Communication Diversion occurs and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

- a P-Asserted-Identity header with the URI of the served user and
- a Privacy header set to "id" and
- a History-Info header
  - including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
  - and
  - including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = CAU_VA, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=CAU_VA?Privacy=history>;index=1.1

Comments:

SIP#1		AS	SIP#2	SIP#3
INVITE	→			
181 Call is Being Forwarded	←			
				→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_004	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4 AND (PICS 1/1 OR PICS1/2 OR PICS 1/6 OR PICS 1/7)

Test purpose

Communication forwarding using CFU or using CFB NDUB, CFNL or CFNRc with applying diversion condition; originating user is notified.

When Communication Diversion occurs and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = CAU_VA and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=CAU_VA?Privacy=history>;index=1.1

Comments:

SIP#1		**AS**	**SIP#2**	**SIP#3**
INVITE	→			
181 Call is Being Forwarded	←			
				→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_005	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4 AND (PICS 1/1 OR PICS1/2 OR PICS 1/6 OR PICS 1/7)

Test purpose
Communication forwarding using CFU or using CFB NDUB, CFNL or CFNRc with applying diversion condition; originating user is notified.

When Communication Diversion occurs and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:
a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = CAU_VA, index = 1.1

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:
181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3;cause=CAU_VA?Privacy=history>;index=1.1

Comments:

SIP#1		AS	SIP#2	SIP#3
INVITE	→			
181 Call is Being Forwarded	←			
				→ INVITE

Table 2: Communication diversion cause, used in CDIV_N02_001-005

CAU_VA	Communication diversion	Value
1	CFU	302
2	CFB NDUB	486
3	CFNL	404
4	CFNRc	503

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_006	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND PICS1/2

Test purpose
*Communication forwarding using CFB UDUB with applying diversion condition; originating user is **not** notified.*

When Communication Diversion occurs (served user sends 486 response) and if the notification procedures of the originating user is supported then no 181 (Call Is Being Forwarded) response shall be sent towards the originating user if the served users subscription option is set to: *Originating* user receives notification that his communication has been diverted (forwarded or deflected) = no.

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = no

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	486 Busy Here	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_007	Reference [1], 4.5.2.6.4	Selection expression PICS 1/2 AND PICS 3/3 AND PICS 3/4 AND PICS 3/5

Test purpose

Communication forwarding using CFB UDUB with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user sends 486 response) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 486 and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2?Reason=SIP%3Bcause%3D486>;index=1,
<sip:SIP#3;cause=486?Privacy=history>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	486 Busy Here	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_008	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4 AND PICS1/2

Test purpose

Communication forwarding using CFB UDUB with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user sends 486 response) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = 486, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history&Reason=SIP%3Bcause%3D486>;index=1,
<sip:SIP#3;cause=486?Privacy=history>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	486 Busy Here	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_009	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4 AND PICS1/2

Test purpose

Communication forwarding using CFB UDUB with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user sends 486 response) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 486 and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history&Reason=SIP%3Bcause%3D486>;index=1,
<sip:SIP#3;cause=486?Privacy=history>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	486 Busy Here	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_010	Reference [1], 4.5.2.6.4	Selection expression PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4 AND PICS1/2

Test purpose

Communication forwarding using CFB UDUB with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user sends 486 response) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

- a P-Asserted-Identity header with the URI of the served user and
- a History-Info header
  - including a first entry with the hi-targeted-to-URI of the served user, index = 1
  - and
  - including a second entry with the hi-targeted-to-URI of the diverted-to user, with a Privacy header set to "history", cause = 486, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2?Reason=SIP%3Bcause%3D486>;index=1,
<sip:SIP#3;cause=486?Privacy=history>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	486 Busy Here	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_011	Reference [1], 4.5.2.6.4	Selection expression PICS 1/3 AND PICS 3/3

Test purpose

*Communication forwarding using CFNR with applying diversion condition; originating user is **not** notified.*

When Communication Diversion occurs (served user does not respond) and if the notification procedures of the originating user is supported then no 181 (Call Is Being Forwarded) response shall be sent towards the originating user if the served users subscription option is set to: *Originating* user receives notification that his communication has been diverted (forwarded or deflected) = no.

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = no

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Alerting	←		←	180 Alerting	
			No reply timer expires		
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_011A	Reference [1], 4.5.2.6.4	Selection expression PICS 1/3 AND PICS 3/3

Test purpose
Communication forwarding using CFNR with applying diversion condition; Reason header in BYE or CANCEL

When Communication Diversion occurs (served user does not respond) the initial communication to the served user is terminated with a CANCEL or a BYE request with a Reason header with protocol set to SIP and the cause set to 408.

SIP header values:
CANCEL/BYE:
Reason: SIP; cause=408

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Alerting	←		←	180 Alerting	
		No reply timer expires			
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_012	Reference [1], 4.5.2.6.4	Selection expression PICS 1/3 AND PICS 3/3 AND PICS 3/4 AND PICS 3/5

Test purpose
Communication forwarding using CFNR with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user does not respond) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing
a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 408 and escaped Privacy header set to 'history', index = 1.1

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:
181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2 >;index=1,
<sip:SIP#3;cause=408?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Alerting	←		←	180 Alerting	
		No reply timer expires			
181 Call is Being Forwarded	←				
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated	
			→	ACK	
					→ INVITE

TSS Netw/ASNotification/Originating user	TP CDIV_N02_013	Reference [1], 4.5.2.6.4	Selection expression PICS 1/3 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CFNR with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user does not respond) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, with a Privacy header set to "history", cause = 408, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=408?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Alerting	←		←	180 Ringing	
				No reply timer expires	
181 Call is Being Forwarded	←				
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated	
			→	ACK	
					→ INVITE

TSS Netw/ASNotification/Originating user	TP CDIV_N02_014	Reference [1], 4.5.2.6.4	Selection expression PICS 1/3 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CFNR with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user does not respond) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

- a P-Asserted-Identity header with the URI of the served user and
- a Privacy header set to "id" and
- a History-Info header
  - including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
  - and
  - including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 408 and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=408?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Alerting	←		←	180 Ringing	
				No reply timer expires	
181 Call is Being Forwarded	←				
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated	
			→	ACK	
					→ INVITE

TSS Netw/ASNotification/Originating user	TP CDIV_N02_015	Reference [1], 4.5.2.6.4	Selection expression PICS 1/3 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CFNR with applying diversion condition; originating user is notified.

When Communication Diversion occurs (served user does not respond) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, with a Privacy header set to "history", cause = 408, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3;cause=408?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Alerting	←		←	180 Ringing	
				No reply timer expires	
181 Call is Being Forwarded	←				
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_016	Reference [1], 4.5.2.6.4	Selection expression PICS 1/4 AND PICS 3/3

Test purpose

*Communication forwarding using CD (immediate response); originating user is **not** notified.*

When Communication Diversion occurs (served user deflects call immediately) and if the notification procedures of the originating user is supported then no 181 (Call Is Being Forwarded) response shall be sent towards the originating user if the served users subscription option is set to: *Originating* user receives notification that his communication has been diverted (forwarded or deflected) = no.

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = no

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_017	Reference [1], 4.5.2.6.4	Selection expression PICS 1/4 AND PICS 3/3 AND PICS 3/4 AND PICS 3/5

Test purpose

Communication forwarding using CD (immediate response); originating user is notified.

When Communication Diversion occurs (served user deflects call immediately) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 480 and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2?Reason=SIP%3Bcause%3D302>;index=1,
<sip:SIP#3;cause=480?Privacy=history>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_018	Reference [1], 4.5.2.6.4	Selection expression PICS 1/4 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CD (immediate response); originating user is notified.

When Communication Diversion occurs (served user deflects call immediately) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = 480, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history&Reason=SIP%3Bcause%3D302>;index=1,
<sip:SIP#3;cause=480?Privacy=history>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_019	Reference [1], 4.5.2.6.4	Selection expression PICS 1/4 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CD (immediate response); originating user is notified.

When Communication Diversion occurs (served user deflects call immediately) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

- a P-Asserted-Identity header with the URI of the served user and
- a Privacy header set to "id" and
- a History-Info header
  - including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
  - and
  - including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = 480, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3 ;cause=480?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_020	Reference [1], 4.5.2.6.4	Selection expression PICS 1/4 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose
Communication forwarding using CD (immediate response); originating user is notified.

When Communication Diversion occurs (served user deflects call immediately) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:
a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = 480, index = 1.1

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:
181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#;cause=4803?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_021	Reference [1], 4.5.2.6.4	Selection expression PICS 1/5 AND PICS 3/3

Test purpose
Communication forwarding using CD during alerting; originating user is not notified.

When Communication Diversion occurs (served user deflects call during alerting) and if the notification procedures of the originating user is supported then no 181 (Call Is Being Forwarded) response shall be sent towards the originating user if the served users subscription option is set to: *Originating* user receives notification that his communication has been diverted (forwarded or deflected) = no.

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = no

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_022	Reference [1], 4.5.2.6.4	Selection expression PICS 1/5 AND PICS 3/3 AND PICS 3/4 AND PICS 3/5

Test purpose

Communication forwarding using CD during alerting; originating user is notified.

When Communication Diversion occurs (served user deflects call during alerting) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 487 and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=487?Privacy=history>;index=1.1

Comments:

SIP#1		**AS**		**SIP#2**	**SIP#3**
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_023	Reference [1], 4.5.2.6.4	Selection expression PICS 1/5 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CD during alerting; originating user is notified.

When Communication Diversion occurs (served user deflects call during alerting) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = 487, index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=487?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_024	Reference [1], 4.5.2.6.4	Selection expression PICS 1/5 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose

Communication forwarding using CD during alerting; originating user is notified.

When Communication Diversion occurs (served user deflects call during alerting) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:

a P-Asserted-Identity header with the URI of the served user and
a Privacy header set to "id" and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 487 and escaped Privacy header set to 'history', index = 1.1

Subscription options:

Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
Served user allows the presentation of his/her URI to *originating* user in diversion notification = no OR
Served user has subscribed to TIR in permanent mode

SIP header values:

181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
Privacy: id
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=487?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

TSS Netw/ASdivertingUser/NotOrigUser	TP CDIV_N02_025	Reference [1], 4.5.2.6.4	Selection expression PICS 1/5 AND PICS 3/3 AND (PICS 3/5 OR PICS 4/3) AND PICS 3/4

Test purpose
Communication forwarding using CD during alerting; originating user is notified.

When Communication Diversion occurs (served user deflects call during alerting) and if the notification procedures of the originating user is supported then a 181 (Call Is Being Forwarded) response shall be sent towards the originating user containing:
a P-Asserted-Identity header with the URI of the served user and
a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user with a Privacy header set to "history", cause = 487, index = 1.1

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = no
Served user allows the presentation of his/her URI to *originating* user in diversion notification = yes OR
Served user has subscribed to TIR in permanent mode

SIP header values:
181 Call is Being Forwarded:
P-Asserted-Identity: SIP#2
History-Info: <sip:SIP#>;index=1,
<sip:SIP#3;cause=487?Privacy=history>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
181 Call is Being Forwarded	←				
					→ INVITE

5.2.1.2.2 Diverted-to user

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_001	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/1 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFU.

The served user subscribes to the CFU service. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes".**

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "302" in the Request URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 302, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 302 SIP/2.0
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=302>;index=1.1

Comments:

SIP#1		AS	SIP#2	SIP#3
INVITE	→			
				→ INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_002	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/2 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFB NDUB.

The served user subscribes to the CFB service and is in NDUB condition. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is NDUB (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "486" in the Request URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 486, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 486 SIP/2.0
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=486>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS	SIP#2		SIP#3
INVITE	→				
				→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_003	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/6 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFNL.

The served user subscribes to the CFNL service and has not logged in. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is not logged in (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "404" in the Request URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 404, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 404 SIP/2.0
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=404>;index=1.1

Comments:

SIP#1		AS	SIP#2		SIP#3
INVITE	→				
				→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_004	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/2 AND PICS 4/1 AND PICS 3/6

Test purpose

Communication Forwarding using CFB UDUB.

The served user subscribes to the CFB service and is in UDUB condition. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is UDUB (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "486" in the Request URI and containing a History-Info header

including a first entry with the hi-targeted-to-URI of the served user and a Reason header indicating cause 486, index = 1

and

including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 486, index = 1.1.

SIP header values:

INVITE: sip:SIP#3@ example.com; cause = 486 SIP/2.0
History-Info: <sip:SIP#2?Reason=SIP%3Bcause%3D486>;index=1,
<sip:SIP#3;cause=486>;index=1.1

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

Comments:

SIP#1		AS		SIP#2		SIP#3
INVITE	→		→	INVITE		
			←	486 Busy Here		
			→	ACK		
					→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_005	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/3 AND PICS 4/1 AND PICS 3/6

Test purpose

Communication Forwarding using CFNR.

The served user subscribes to the CFNR and does not reply. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which does not reply (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "408" in the Request URI and containing a History-Info header

including a first entry with the hi-targeted-to-URI of the served user, index = 1

and

including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 408, index = 1.1.

The initial communication to the served user is terminated with a CANCEL or a BYE request with a Reason header with protocol set to SIP and the cause set to 408.

SIP header values:

INVITE: sip:SIP#3@ example.com; cause = 408 SIP/2.0
History-Info: <sip:SIP#2;index=1,
<sip:SIP#3;cause=408>;index=1.1

CANCEL/BYE:
Reason: SIP; cause=408

Comments:

SIP#1		**AS**		**SIP#2**		**SIP#3**
INVITE	→		→	INVITE		
180 Ringing	←		←	180 Ringing		
		No reply timer expires				
			→	CANCEL/BYE		
			←	200 OK CANCEL/BYE		
			←	487 Request Terminated		
			→	ACK		
					→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_006	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4, Reference [4], 4.3.3.1.2	Selection expression PICS 1/4 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CD (immediate response),

The served user subscribes to the CD service and immediately diverts the communication. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which immediately diverts the communication (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "480" in the Request URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user and a Reason header indicating cause 302, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 480, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 480 SIP/2.0
History-Info: <sip:SIP#2?Reason=SIP%3Bcause%3D302>;index=1,
<sip:SIP#3;cause=480>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_007	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4, Reference [4], 4.3.3.1.2	Selection expression PICS 1/5 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CD during alerting.

The served user subscribes to the CD service and diverts the communication during alerting. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which diverts the communication during alerting (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "487" in the Request URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user and a Reason header indicating cause 302, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 487, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 487 SIP/2.0
History-Info: <sip:SIP#2?Reason=SIP%3Bcause%3D302>;index=1,
<sip:SIP#3;cause=487>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_008	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/7 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFNRc.

The served user subscribes to the CFNRc service and is not reachable. The served user does **not** subscribe to OIR in permanent mode **and** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"yes"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is not reachable (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "503" in the Request URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 503, index = 1.1.

NOTE: According to ETSI TS 124 604 [1], clause 4.5.2.6.2.2.b: "If the diversion is based on a SIP response from the served user, a Reason header in escaped form shall be included in accordance with IETF RFC 4244 [4]".

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 503 SIP/2.0
History-Info: <sip:SIP#2;index=1,
<sip:SIP#3;cause=503>;index=1.1

Comments:

SIP#1		AS	SIP#2		SIP#3
INVITE	→				
				→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_009	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/1 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFU.

The served user subscribes to the CFU service. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user (not) including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "302" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 302, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 302 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=302>;index=1.1

Comments:

SIP#1		AS	SIP#2		SIP#3
INVITE	→				
				→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_010	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/2 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFB NDUB.

The served user subscribes to the CFB service and is in NDUB condition. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is NDUB not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "486" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 486, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 486 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=486>;index=1.1

Comments:

SIP#1		AS	SIP#2		SIP#3
INVITE	➔				
				➔	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_011	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/6 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFNL.

The served user subscribes to the CFNL service and has not logged in. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is not logged in not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "404" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 404, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 404 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2;privacy=history>;index=1,
<sip:SIP#3;cause=404>;index=1.1

Comments:

SIP#1		AS	SIP#2		SIP#3
INVITE	➔				
				➔	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_012	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/2 AND PICS 4/1 AND PICS 3/6

Test purpose

Communication Forwarding using CFB UDUB.

The served user subscribes to the CFB service and is in UDUB condition. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is UDUB not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "486" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header

including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history" and a Reason header indicating cause 486, index = 1

and

including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 486, index = 1.1.

SIP header values:

INVITE: sip:SIP#3@ example.com; cause = 486 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2?Privacy=history&Reason=SIP=cause%3D486>;index=1,
<sip:SIP#3;cause=486>;index=1.1

Comments:

SIP#1		AS		SIP#2		SIP#3
INVITE	→		→	INVITE		
			←	486 Busy Here		
			→	ACK		
					→	INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_013	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/3 AND PICS 4/1 AND PICS 3/6

Test purpose

Communication Forwarding using CFNR.

The served user subscribes to the CFNR and does not reply. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which does not reply not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "408" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header

including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1

and

including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 408, index = 1.1.

The initial communication to the served user is terminated with a CANCEL or a BYE request with a Reason header with protocol set to SIP and the cause set to 408.

SIP header values:

INVITE: sip:SIP#3@ example.com; cause = 408 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2;index=1,
<sip:SIP#3;cause=408>;index=1.1

CANCEL/BYE:
Reason: SIP; cause=408

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
				No reply timer expires	
			→	CANCEL/BYE	
			←	200 OK CANCEL/BYE	
			←	487 Request Terminated (Note)	
			→	ACK	
					→ INVITE

NOTE: The 487 Request Terminated will only be sent, if a CANCEL request had been used to terminate the initial communication.

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_014	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4, Reference [4], 4.3.3.1.2	Selection expression PICS 1/4 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CD (immediate response).

The served user subscribes to the CD service and immediately diverts the communication. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which immediately diverts the communication not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "480" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", and a Reason header indicating cause 302, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 480, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 480 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2?Privacy=history&Reason=SIP=cause%3D302>;index=1,
<sip:SIP#3;cause=480>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
			←	302 Moved Temporarily	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_015	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4, Reference [4], 4.3.3.1.2	Selection expression PICS 1/5 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CD during alerting.

The served user subscribes to the CD service and diverts the communication during alerting. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which diverts the communication during alerting not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "487" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history" and a Reason header indicating cause 302, index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 487, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 487 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2?Privacy=history&Reason=SIP=cause%3D302>;index=1,
<sip:SIP#3;cause=487>;index=1.1

Comments:

SIP#1		AS		SIP#2	SIP#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
			←	302 Moved Temporarily	
			→	ACK	
					→ INVITE

TSS Netw/ASdivertingUser/NotTermUser	TP CDIV_N03_016	Reference [1], 4.5.2.6.2.2, 4.5.2.6.2.4	Selection expression PICS 1/7 AND PICS 4/1 AND PICS 3/6

Test purpose
Communication Forwarding using CFNRc.

The served user subscribes to the CFNRc service and is not reachable. The served user subscribes to OIR in permanent mode **or** the subscription option "Served user allows the presentation of his/her URI to diverted-to user" is set to value **"no"**.

Ensure that the IUT, on receipt of an INVITE request (diversion status DIV_VA, see table 3) for the served user which is not reachable not including a History-Info header, applies communication diversion and forwards the INVITE request towards the diverted-to user containing the cause value "503" in the Request URI, indicating in the To header the diverted-to URI and containing a History-Info header
including a first entry with the hi-targeted-to-URI of the served user with a Privacy header set to "history", index = 1
and
including a second entry with the hi-targeted-to-URI of the diverted-to user, cause = 503, index = 1.1.

SIP header values:
INVITE: sip:SIP#3@ example.com; cause = 503 SIP/2.0
To: <sip:SIP#3>
History-Info: <sip:SIP#2?Privacy=history>;index=1,
<sip:SIP#3;cause=503>;index=1.1

Comments:

SIP#1		AS	SIP#2	SIP#3
INVITE	→			
				→ INVITE

Table 3: Status of diversions, used in CDIV_N03_001-016

DIV_VA	Value	Description
1	First Diversion	INVITE received: History-Info header absent **or** present **and not** containing the hi-targeted-to-uri of the served user in the last history-info entry
2	Subsequent Diversion	INVITE received: History-Info header present **and** containing the hi-targeted-to-uri of the served user in the last history-info entry

5.2.1.2.3 Diverting user

TSS Netw/ASdivertingUser/NotDivUser	TP CDIV_N04_001	Reference [1], 4.5.2.6.5.0	Selection expression PICS 3/1

Test purpose
Communication forwarding using CDIV_VA; Indication of communication diversion to the diverting user using the MESSAGE request.

Ensure that when call diversion of type CDIV_VA is activated and when the diverting user has registered, the AS sends a MESSAGE request to the diverting user including the information where the call is forwarded to.

Subscription options:
Served user receives notification that a communication has been forwarded (indication of communication diversion to the diverting user) = yes

SIP header values: MESSAGE (text/plain)

Comments:

SIP#1	SUT	SIP#2	SIP#3
	Diverting user registers		
	MESSAGE →	MESSAGE	
	200 OK MESSAGE ←	200 OK MESSAGE	

NOTE 1: In case of CFNRc and CFNL the served user needs to become reachable/log in before the MESSAGE request can be delivered.
NOTE 2: The CDIV indication timer may need to expire before the MESSAGE request is delivered.

TSS Netw/ASdivertingUser/NotDivUser	TP CDIV_N04_002	Reference [1], 4.5.2.6.5.0	Selection expression PICS 3/2

Test purpose

Communication forwarding using CDIV_VA; Indication of communication diversion to the diverting user using the MESSAGE request when a new outgoing communication is requested.

Ensure that when communication diversion service CDIV_VA is activated and the diverting user has initiated a new outgoing communication, the AS will send a MESSAGE request containing the forwarded-to address of the activated communication to the diverting user.

Subscription options:

Served user receives reminder indication on outgoing communication that CDIV is currently activated = yes

SIP header values: MESSAGE (text/plain)

Comments:

SIP#1	SUT	SIP#2	SIP#3
	Communication diversion is activated		
		← INVITE	
	MESSAGE	→ MESSAGE	
	200 OK MESSAGE	← 200 OK MESSAGE	

TSS Netw/ ASdivertingUser / NotDivUser	TP CDIV_N04_003	Reference [1], 4.5.2.6.5	Selection expression PICS 2/3 AND PICS 3/1

Test purpose
Communication forwarding using CDIV_VA; Communication Diversion Notification applies.

Ensure that when the diverting user has subscribed the Communication Diversion Notification service and call diversion of type CDIV_VA occurred, the served user receives a NOTIFY request containing the information regarding the current communication diversion.

Subscription options:
Served user receives notification that a communication has been forwarded (indication of communication diversion to the diverting user) = yes

SIP header values:

SUBSCRIBE: Event:comm-div-info
application/comm-div-info+xml
<comm-div-info>
<comm-div-subs-info >
<comm-div-selection-criteria>
< originating-user-selection-criteria>SIP#1
<diverting-user-selection-criteria>SIP#2
<diverted-to-user-selection-criteria>SIP#3
< diversion-time-selection-criteria >(Date-time)
< diversion-reason-selection-criteria >DIV_VAL
<comm-div-ntfy-trigger-criteria>
<notification-time-selection-criteria>(Date/Time range)
</comm-div-info>

NOTIFY: Event:comm-div-info
application/comm-div-info+xml
<comm-div-info>
<comm-div-ntfy-info>
<originating-user-info>SIP#1
<diverting-user-info>SIP#2
<diverted-to-user-info>SIP#3
<diversion-time-info> (time range
<diversion-reason-info>DIV_VAL
<diversion-rule-info-type>
<diversion-rule> (any text)
</comm-div-info>

Comments:

SIP#1	**SUT**		**SIP#2 (served user)**	**SIP#3**
	SUBSCRIBE	←	SUBSCRIBE	
	200 OK SUBSCRIBE	→	200 OK SUBSCRIBE	
	NOTIFY	→	NOTIFY	
	200 OK NOTIFY	←	200 OK NOTIFY	
INVITE 1	→			
	Communication diversion occurs			
	NOTIFY	→	NOTIFY	
	200 OK NOTIFY	←	200 OK NOTIFY	

NOTE 1: In case of CFNRc and CFNL the served user needs to become reachable/log in before the MESSAGE request can be delivered.
NOTE 2: The CDIV indication timer may need to expire before the MESSAGE request is delivered.

Table 4: Communication diversion in use, used in CDIV_N04_001-003

CDIV_VA	Communication diversion	Diversion Reason DIV_VAL
1	CFU	302
2	CFB	486
3	CFNRy	408
4	CFNRc	503
r	CFNL	404

5.2.2 Actions at the AS of the diverted to User

TSS Netw/ASdiverted-to	TP CDIV_N05_001	Reference [1], 4.5.2.7	Selection expression

Test purpose
Previous stored History-Info header returned in a 180 Ringing.

The SUT in the Idle state, receives an INVITE message for the diverted-to-user without TIR with Cause Value in the last History Index; cause-param =CAUSE_VAL defined in table 5, the History-Info header is stored. When the SUT receives a 180 Ringing, the stored History-Info header is covered in this response without escaped Privacy header in the last index if the response does not contain a History-Info header.

SIP header values:
INVITE 1:
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x
180 Ringing 2
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x

Comments:

SIP#1		**SUT**		**SIP#2**
INVITE 1	→		→	INVITE 2
180 Ringing 2	←		←	180 Ringing 1
200 OK (INVITE)	←		←	200 OK (INVITE)
ACK	→		→	ACK
BYE	→		→	BYE
200 OK (BYE)	←		←	200 OK (BYE)

TSS Netw/ASdiverted-to	TP CDIV_N05_002	Reference [1], 4.5.2.7	Selection expression

Test purpose
Previous stored History-Info header returned in a 181 Being Forwarded.

The SUT in the Idle state, receives an INVITE message for the diverted-to-user without TIR with Cause Value in the last History Index; cause-param =CAUSE_VAL defined in table 5, the History-Info header is stored. When the SUT receives a 181 Being Forwarded, the stored History-Info header is covered in this response without escaped Privacy header in the last index if the response does not contain a History-Info header.

SIP header values: SIP header values:
INVITE 1:
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x
181 Being Forwarded 2
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x

Comments:

SIP#1		**SUT**		**SIP#2**
INVITE 1	→		→	INVITE 2
181 Call is Being Forwarded 2	←		←	181 Call is Being Forwarded 1
180 Ringing	←		←	180 Ringing
200 OK (INVITE)	←		←	200 OK (INVITE)
ACK	→		→	ACK
BYE	→		→	BYE
200 OK (BYE)	←		←	200 OK (BYE)

TSS Netw/ASdiverted-to	TP CDIV_N05_003	Reference [1], 4.5.2.7	Selection expression

Test purpose
Previous stored History-Info header returned in a 200 OK response.

The SUT in the Idle state, receives an INVITE message for the diverted-to-user without TIR with Cause Value in the last History Index; cause-param = CAUSE_VAL defined in table 5, the History-Info header is stored. When the SUT receives a 200 OK INVITE, the stored History-Info header is covered in this response without escaped Privacy header in the last index if the response does not contain a History-Info header.

SIP header values: SIP header values:
INVITE 1:
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x
200 OK INVITE 2
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x

Comments:

SIP#1		**SUT**		**SIP#2**
INVITE 1	→		→	INVITE 2
180 Ringing	←		←	180 Ringing
200 OK (INVITE) 2	←		←	200 OK (INVITE) 1
ACK	→		→	ACK
BYE	→		→	BYE
200 OK (BYE)	←		←	200 OK (BYE)

TSS Netw/ASdiverted-to	TP CDIV_N05_004	Reference [1] 4.5.6.2.7, 4.6.3	Selection expression PICS 4/3

Test purpose
Diverted to user is subscribed to the TIR service.

The SUT in the Idle state, receives an INVITE message for the diverted-to-user with TIR with Cause Value in the last History Index; cause-param = CAUSE_VAL defined in table5, the History-Info header is stored. When the SUT receives a 180 Ringing, the stored History-Info header is covered in this response with escaped Privacy=history header in the last index if the response does not contain a History-Info header.

SIP header values: SIP header values:
INVITE 1:
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x
180 Ringing 2
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL; Privacy=history, index=1.x

Comments:

SIP#1		**SUT**		**SIP#2**
INVITE 1	→		→	INVITE 2
180 Ringing 2	←		←	180 Ringing 1
200 OK (INVITE)	←		←	200 OK (INVITE)
ACK	→		→	ACK
BYE	→		→	BYE
200 OK (BYE)	←		←	200 OK (BYE)

TSS Netw/ASdiverted-to	TP CDIV_N05_005	Reference [1] 4.5.6.2.7, 4.6.3	Selection expression PICS 4/3

Test purpose
Diverted to user is subscribed to the TIR service.

The SUT in the Idle state, receives an INVITE message for the diverted-to-user with TIR with Cause Value in the last History Index; cause-param = CAUSE_VAL defined in table 5. the History-Info header is stored. When the SUT receives a 181 Being Forwarded, the stored History-Info header is covered in this response with escaped Privacy=history header in the last index if the response does not contain a History-Info header.

SIP header values: SIP header values:
INVITE 1:
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x
181 Being Forwarded 2
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL; Privacy=history, index=1.x

Comments:

SIP#1		**SUT**		**SIP#2**
INVITE 1	→		→	INVITE 2
181 Call is Being Forwarded 2	←		←	181 Call is Being Forwarded 1
180 Ringing	←		←	180 Ringing
200 OK (INVITE)	←		←	200 OK (INVITE)
ACK	→		→	ACK
BYE	→		→	BYE
200 OK (BYE)	←		←	200 OK (BYE)

TSS Netw/ASdiverted-to	TP CDIV_N05_006	Reference [1] 4.5.6.2.7, 4.6.3	Selection expression PICS 4/3

Test purpose
Diverted to user is subscribed to the TIR service.

The SUT in the Idle state, receives an INVITE message for the diverted-to-user with TIR with Cause Value in the last History Index; cause-param = CAUSE_VAL defined in table 5, the History-Info header is stored. When the SUT receives a 200 OK INVITE, the stored History-Info header is covered in this response with escaped Privacy=history header in the last index if the response does not contain a History-Info header.

SIP header values: SIP header values:
INVITE 1:
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL, index=1.x
200 OK INVITE 2
History-Info header: hi-targeted-to-uri of diverted-to user; cause=CAUSE_VAL; Privacy=history, index=1.x

Comments:

SIP#1		**SUT**		**SIP#2**
INVITE 1	→		→	INVITE 2
180 Ringing	←		←	180 Ringing
200 OK (INVITE) 2	←		←	200 OK (INVITE) 1
ACK	→		→	ACK
BYE	→		→	BYE
200 OK (BYE)	←		←	200 OK (BYE)

Table 5: Cause values the "cause" parameter in the History-Info header, used in CDIV_N05_001-006

Cause Value in History Index; cause-param = "cause" EQUAL CAUSE_VAL	**Cause value**	Call diversion information	**Redirecting Reason**
	404		Unknown
	302		Unconditional
	486		User busy
	408		No reply
	480		Deflection immediate
	503		Mobile subscriber not reachable
	487		Deflection during alerting

5.2.3 Actions at the user equipment

5.2.3.1 Actions at the originating UE

TSS OrigUE	TP CDIV_U01_001	Reference [1] 4.5.2.1	Selection expression PICS 5/1

Test purpose
Communication diversion information received in a 181 Call is Being Forwarded.

Ensure that an User Equipment is able to receive a 181 Call is Being Forwarded and the 181 Response contains a History-Info header.
Ensure that the information contained in the History-Info header (identities, reason of CDIV) is displayed at the device. The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:
INVITE
Supported: histinfo

181 Call is Being Forwarded
History-Info: <sip:SIP#2>;index=1

Comments:

UE			**Test Equipment**
INVITE	→	→	INVITE
181 Call is Being Forwarded	←	←	181 Call is Being Forwarded
180 Ringing	←	←	180 Ringing
200 OK (INVITE)	←	←	200 OK (INVITE)
ACK	→	→	ACK
BYE	→	→	BYE
200 OK (BYE)	←	←	200 OK (BYE)

TSS OrigUE	TP CDIV_U01_002	Reference [1], 4.5.2.1	Selection expression PICS 5/2

Test purpose
Communication diversion information received in a 180 Ringing.

Ensure that an User Equipment is able to receive a 180 Ringing and the 180 Response contains a History-Info header.
Ensure that the information contained in the History-Info header (identities, reason of CDIV) is displayed at the device. The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:
INVITE
Supported: histinfo

180 Ringing
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=CAUSE_VAL>;index=1.1

Comments:

UE			**Test Equipment**
INVITE	→	→	INVITE
181 Call is Being Forwarded	←	←	181 Call is Being Forwarded
180 Ringing	←	←	180 Ringing
200 OK (INVITE)	←	←	200 OK (INVITE)
ACK	→	→	ACK
BYE	→	→	BYE
200 OK (BYE)	←	←	200 OK (BYE)

TSS OrigUE	TP CDIV_U01_003	Reference [1], 4.5.2.1	Selection expression PICS 5/3

Test purpose
Communication diversion information received in a 200 OK INVITE.

Ensure that an User Equipment is able to receive a 200 OK INVITE and the 200 OK final Response contains a History-Info header.
Ensure that the information contained in the History-Info header (identities, reason of CDIV) is displayed at the device. The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:
INVITE
Supported: histinfo

200 OK (INVITE)
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=CAUSE_VAL>;index=1.1

Comments:

UE			**Test Equipment**
INVITE	→	→	INVITE
181 Call is Being Forwarded	←	←	181 Call is Being Forwarded
180 Ringing	←	←	180 Ringing
200 OK (INVITE)	←	←	200 OK (INVITE)
ACK	→	→	ACK
BYE	→	→	BYE
200 OK (BYE)	←	←	200 OK (BYE)

5.2.3.2 Action at the diverted to UE

TSS Diverted-toUE	TP CDIV_U02_001	Reference [1] 4.5.2.15	Selection expression PICS 5/4

Test purpose
Communication diversion information received in an INVITE request.

Ensure that an User Equipment is able to receive a INVITE request and the INVITE contains a History-Info header.
Ensure that the information contained in the History-Info header (identities, reason of CDIV) is displayed at the device. The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:
INVITE: History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=CAUSE_VAL>;index=1.1

Comments:

UE			**Test Equipment**
INVITE	←	←	INVITE
180 Ringing	→	→	180 Ringing
200 OK (INVITE)	→	→	200 OK (INVITE)
ACK	←	←	ACK
BYE	←	←	BYE
200 OK (BYE)	→	→	200 OK (BYE)

TSS Diverted-toUE	TP CDIV_U02_002	Reference [1], 4.5.2.6.2, 4.5.2.7	Selection expression PICS 5/5

Test purpose
The User Equipment is able to send a History-Info header in 180 response.

Ensure that an User Equipment is able to send a History-Info header in a 180 provisional response containing a History-Info header received in the initial INVITE.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:

INVITE:	History-Info:	<sip:SIP#2>;index=1, <sip:SIP#3; cause=CAUSE_VAL>;index=1.1
180 Ringing:	History-Info:	<sip:SIP#2>;index=1, <sip:SIP#3; cause=CAUSE_VAL>;index=1.1

Comments:

UE			Test Equipment
INVITE	←	←	INVITE
180 Ringing	→	→	180 Ringing
200 OK (INVITE)	→	→	200 OK (INVITE)
ACK	←	←	ACK
BYE	←	←	BYE
200 OK (BYE)	→	→	200 OK (BYE)

TSS Diverted-toUE	TP CDIV_U02_003	Reference [1], 4.5.2.6.2, 4.5.2.7	Selection expression PICS 5/6

Test purpose
The User Equipment is able to send a History-Info header in 200 OK INVITE final response.

Ensure that an User Equipment is able to send a History-Info header in a 200 OK final response containing a History-Info header received in the initial INVITE.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:

INVITE:	History-Info:	<sip:SIP#2>;index=1, <sip:SIP#3; cause=CAUSE_VAL>;index=1.1
200 OK:	History-Info:	<sip:SIP#2>;index=1, <sip:SIP#3; cause=CAUSE_VAL>;index=1.1

Comments:

UE			Test Equipment
INVITE	←	←	INVITE
180 Ringing	→	→	180 Ringing
200 OK (INVITE)	→	→	200 OK (INVITE)
ACK	←	←	ACK
BYE	←	←	BYE
200 OK (BYE)	→	→	200 OK (BYE)

5.2.3.3 Actions at the diverting UE

TSS DivertingUE	TP CDIV_U03_001	Reference [1], 4.5.2.6.4	Selection expression PICS 5/7

Test purpose
Communication diversion using the MESSAGE request method.

Ensure that the User Equipment is able to receive a MESSAGE request containing the notification about a performed communication diversion by the network.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:
MESSAGE
Content-Type: text/plain
… text (PIXIT) …

Comments:

UE			**Test Equipment**
MESSAGE	←	←	MESSAGE

TSS DivertingUE	TP CDIV_U03_002	Reference [1], 4.5.2.6.5, 4.10	Selection expression PICS 5/8

Test purpose
Communication diversion using the CDIVN service, subscription of the service.

Ensure that the User Equipment is able to subscribe the communication diversion notification service (CDIVN).
A SUBSCRIBE request is sent. The Event header contains the package name "comm-div-info" and a MIME body containing a XML instance of "http://uri.etsi.org/ngn/params/xml/comm-div-info".
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:
SUBSCRIBE: Event:comm-div-info
application/comm-div-info+xml
<comm-div-info>
<comm-div-subs-info >
<comm-div-selection-criteria>
< originating-user-selection-criteria >
<diverting-user-selection-criteria>
<diverted-to-user-selection-criteria>
< diversion-time-selection-criteria >
< diversion-reason-selection-criteria > CAUSE_VAL
<comm-div-ntfy-trigger-criteria>
<notification-time-selection-criteria>
</comm-div-info>

NOTIFY: Event:comm-div-info

Comments:

UE			**Test Equipment**
SUBSCRIBE	→	→	SUBSCRIBE
200 OK (SUBSCRIBE)	←	←	200 OK (SUBSCRIBE)
NOTIFY	←	←	NOTIFY
200 OK (NOTIFY)	→	→	200 OK (NOTIFY)

TSS DivertingUE	TP CDIV_U03_003	Reference [1], 4.5.2.6.5, 4.10	Selection expression PICS 5/8

Test purpose

Communication diversion using the CDIVN service, notification applies.

Ensure that the User Equipment is able to receive notification based on the communication diversion notification service (CDIVN).
A NOTIFY request is received. The Event header contains the package name "comm-div-info". The Event header contains the package name "comm-div-info" and a MIME body containing a XML instance of "http://uri.etsi.org/ngn/params/xml/comm-div-info".
Ensure that the notification is displayed at the User Equipment.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 6.

SIP header values: SIP header values:

NOTIFY: Event:comm-div-info
application/comm-div-info+xml
<comm-div-info>
<comm-div-ntfy-info>
<originating-user-info>
<diverting-user-info>
<diverted-to-user-info>
<diversion-time-info>
<diversion-reason-info> CAUSE_VAL
<diversion-rule-info-type>
<diversion-rule> (any text)
</comm-div-info>

Comments:

UE			**Test Equipment**
		CDIVN is activated	
NOTIFY	←	←	NOTIFY
200 OK (NOTIFY)	→	→	200 OK (NOTIFY)

Table 6: Cause values the "cause" parameter in the History-Info header and XML element, used in CDIV_U03_001-003

Cause Value in History Index; cause-param = "cause" EQUAL CAUSE_VAL	**Cause value**	Call diversion information	**Redirecting Reason**
	404		Subscriber not Logged-In
	302		Unconditional
	486		User busy
	408		No reply
	480		Deflection immediate
	503		Mobile subscriber not reachable
	487		Deflection during alerting

5.3 Interaction with other services

5.3.1 Terminating Identification Presentation (TIP)

TSS Interaction/TIP	TP CDIV_N06_001	Reference [1] 4.6.2	Selection expression PICS 4/3

Test purpose
The served user subscribes to the CDIV simulation service; the P-Asserted header is passed on unchanged.

Ensure that the communication is forwarded to the diverted to user if the served user is subscribed to the CDIV simulation service.
Ensure that a P-Asserted-Identity and History header field received in the diverting AS is passed unmodified to the originating entity.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 7.

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes

SIP header values:
180 Ringing: P-Asserted-Identity with the URI of the diverted-to user, Privacy is not "id" and not "header"
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=CAUSE_VAL>;index=1.1

200 OK: P-Asserted-Identity with the URI of the diverted-to user, Privacy is not "id" and not "header"
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=CAUSE_VAL>;index=1.1

Comments:

SIP#1		**SUT**		**SIP#2 (served user)**		**SIP#3**
INVITE	→					
Communication diversion is performed (CFU, CFB, CFNR, CD, CFNL, CFNRc)						
			→		→	INVITE
			←		←	180 Ringing
180 Ringing	←					
			←		←	200 OK (INVITE)
200 OK (INVITE)	←					
ACK	→				→	ACK
BYE	→				→	BYE
200 OK (BYE)	←				←	200 OK (BYE)

Table 7: Cause values the "cause" parameter in the History-Info header, used in CDIV_N06_001

Cause Value in History Index; cause-param = "cause" EQUAL CAUSE_VAL	**Cause value**	Call diversion information	**Redirecting Reason**
	404		Subscriber not Logged-In
	302		Unconditional
	486		User busy
	408		No reply
	480		Deflection immediate
	503		Mobile subscriber not reachable
	487		Deflection during alerting

5.3.2 Terminating Identification Restriction (TIR)

TSS Interaction/TIR	TP CDIV_N07_001	Reference [1] 4.6.3	Selection expression PICS 4/3 AND PICS 4/4

Test purpose
The served user subscribes to the CDIV simulation service; the diverted-to URI is restricted to the originating user.

Ensure that the communication is forwarded to the diverted to user if the served user is subscribed to the CDIV simulation service.
A P-Asserted-Identity and History header field received in the diverting AS is passed unmodified to the originating entity.
Ensure that if the served (diverting) user selects the option that the originating user is notified, with the diverted-to number and the diverted-to user indicates the restriction of his identity by sending an escaped Privacy header set to history in the History-Info header in any response, then the AS shall not send the diverted-to user's identity when the communication is answered.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 8.

Subscription options:
Originating user receives notification that his communication has been diverted (forwarded or deflected) = yes
Served user allows the presentation of diverted to URI to *originating* user in diversion notification = yes
TIR subscription: Terminating user has TIR Temporary mode, default restricted
Originating user has the override category = no

SIP header values:
200 OK 1: P-Asserted-Identity with the URI of the diverted-to user
History-Info: <sip:SIP#2>;index=1,
<sip:SIP#3; cause=CAUSE_VAL?Privacy=history>;index=1.1

200 OK 2: P-Asserted-Identity with the URI of the diverted-to user
History-Info: <sip:SIP#2>;index=1
<sip:SIP#3; cause= CAUSE_VAL?Privacy=history>;index=1.1

Comments:

SIP#1		**SUT**	**SIP#2 (served user)**		**SIP#3**
INVITE 1	→				
Communication diversion is performed (CFU, CFB, CFNR, CD, CFNL, CFNRc)					
				→	INVITE
				←	180 Ringing
180 Ringing	←				
				←	200 OK 1 (INVITE)
200 OK 2(INVITE)	←				
ACK	→			→	ACK
BYE	→			→	BYE
200 OK (BYE)	←			←	200 OK (BYE)

Table 8: Cause values the "cause" parameter in the History-Info header, used in CDIV_N07_001

Cause Value in History Index; cause-param = "cause" EQUAL CAUSE_VAL	**Cause value**	Call diversion information	**Redirecting Reason**
	404		Subscriber not Logged-In
	302		Unconditional
	486		User busy
	408		No reply
	480		Deflection immediate
	503		Mobile subscriber not reachable
	487		Deflection during alerting

5.3.3 Originating Identification Restriction (OIR)

TSS Interaction/OIR	TP CDIV_N08_001	Reference [1], 4.6.5	Selection expression PICS 3/1

Test purpose

Diversion Notification applies. Originating users address is not presented to the served user

Ensure that when the diverting user has subscribed the Communication Diversion Notification service and call diversion occurred, the served user receives a NOTIFY request containing the information regarding the current communication diversion and the URI of the originating user is not present if a Privacy header was present in the initial INVITE request the value set to 'id'.

Subscription options:

Served user receives notification that a communication has been forwarded (indication of communication diversion to the diverting user) = yes

SIP header values:

INVITE: Privacy: id

SUBSCRIBE: Event:comm-div-info
application/comm-div-info+xml
<comm-div-info>
<comm-div-subs-info >
<comm-div-selection-criteria>
< originating-user-selection-criteria>SIP#1
<diverting-user-selection-criteria>SIP#2
<diverted-to-user-selection-criteria>SIP#3
< diversion-time-selection-criteria >(Date-time)
< diversion-reason-selection-criteria >DIV_VAL
<comm-div-ntfy-trigger-criteria>
<notification-time-selection-criteria>(Date/Time range)
</comm-div-info>

NOTIFY: Event:comm-div-info
application/comm-div-info+xml
<comm-div-info>
<comm-div-ntfy-info>
<diverting-user-info>SIP#2
<diverted-to-user-info>SIP#3
<diversion-time-info> (time range
<diversion-reason-info>DIV_VAL
<diversion-rule-info-type>
<diversion-rule> (any text)
</comm-div-info>

Comments:

SIP#1	**SUT**	**SIP#2 (served user)**	**SIP#3**
	SUBSCRIBE ←	SUBSCRIBE	
	200 OK SUBSCRIBE →	200 OK SUBSCRIBE	
	NOTIFY →	NOTIFY	
	200 OK NOTIFY ←	200 OK NOTIFY	
INVITE →			
	Communication diversion occurs		
	NOTIFY →	NOTIFY	
	200 OK NOTIFY ←	200 OK NOTIFY	

TSS Interaction/OIR	TP CDIV_N08_002	Reference [1], 4.6.5	Selection expression

Test purpose
Diversion Notification applies. Originating users address is not presented to the diverted.to user

Ensure that when originating user has subscribed to the OIR service and Call diversion occurs the URI of the originating user is not present to the diverted-to user if a Privacy header was present the value set to 'id' in the initial INVITE request received from the originating user.

Subscription options:
Served user allows the presentation of his/her URI to *originating* user in diversion notification=yes

SIP header values:
INVITE 1: Privacy: id

INVITE 2: Privacy: id

Comments:

SIP#1		SUT		SIP#2 (served user)		SIP#3
INVITE 1	→					
CASE A						
					→	INVITE 2
CASE B						
				→		INVITE
				←		486 Busy Here
				→		ACK
					→	INVITE 2
CASE C						
				→		INVITE
				←		180 Ringing
				→		CANCEL
				←		200 OK CANCEL
				←		487 Request Terminated
				→		ACK
					→	INVITE 2

Table 9: Void

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

TSS Interaction/ACR-CB	TP CDIV_N09_001	Reference [1], 4.6.9	Selection expression PICS 4/6

Test purpose
CDIV the diverted-to user has subscribed to a call barring service "inhibition of incoming forwarded communication".

Ensure that the communication is rejected with 603 (Decline) if the diverted-to user has subscribed to the call barring service "inhibition of incoming forwarded communication" and the received INVITE contains a History-Info header indication this call is a forwarded.
The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 10.

SIP header values:
INVITE: History-Info: <sip:SIP#1;index=1,
<sip:SIP#2; cause=CAUSE_VAL>;index=1.1

Comments:

SIP#1		Terminating AS	SIP#2
INVITE 1	→		
603 (Decline)	←		
ACK	→		

Table 10: Cause values the "cause" parameter in the History-Info header, used in CDIV_N09_001

Cause Value in History Index; cause-param = "cause" EQUAL CAUSE_VAL	**Cause value**	Call diversion information	**Redirecting Reason**
	404		Subscriber not Logged-in
	302		Unconditional
	486		User busy
	408		No reply
	480		Deflection immediate
	503		Mobile subscriber not reachable
	487		Deflection during alerting

TSS Interaction/ACR-CB	**TP CDIV_N09_002**	**Reference [1], 4.6.9**	**Selection expression PICS 4/5**
Test purpose *The served user has subscribed to a call barring service Outgoing Communication Barring (OCB).* Ensure that the communication is rejected with 603 (Decline) if the diverting user has subscribed to the call barring service Outgoing Communication Barring (OCB) if the forwarded to number is restricted. The Cause Value in the latest History Index; cause-param =CAUSE_VAL defined in table 11.			
SIP header values:			
Comments:			
SIP#1	**SUT**	**SIP#2 (served user)**	**SIP#3**
INVITE 1 →			
603 (Decline) ←			
ACK →			

Table 11: Cause values the "cause" parameter in the History-Info header

Cause Value in History Index; cause-param = "cause" EQUAL CAUSE_VAL	**Cause value**	Call diversion information	**Redirecting Reason**
	404		Subscriber not Logged-in
	302		Unconditional
	486		User busy
	408		No reply
	480		Deflection immediate
	503		Mobile subscriber not reachable
	487		Deflection during alerting

5.3.5 Explicit Communication Transfer (ECT)

TSS Interaction/ECT	TP CDIV_N10_001	Reference [1], 4.6.10.1.2	Selection expression PICS 4/7

Test purpose
Forwarded Communication, handling of Refer-To header.

Ensure that a forwarded communication is able to transfer and the Refer-To header of the REFER request sent to the Transferee contains a Refer-To header containing the CDIV Session Identifier. The CFU, CFB, CFNR, CD CFNL and CFNRc apply.

SIP header values:
REFER 1: Refer-To:<SIP#4>
REFER 2: Refer-To: <CDIV Session Identifier>

Configuration:
SIP#1: originating user, Transferee
SIP#2: CDIV served user, (Transferee)
SIP#3: CDIV diverted-to user, Transferee
SIP#4: Transfer target

Comments:

SIP#1		SUT		SIP#2 (served user)		SIP#3		SIP#4
				Forwarded communication is active				
REFER 1	→		→	REFER 2				
					→	REFER 2		
					←	202 Accepted		
202 Accepted	←		←	202 Accepted				
			←	INVITE	←	INVITE		
		INVITE	→				→	INVITE
			←	180 Ringing			←	180 Ringing
		180 Ringing	→		→	180 Ringing		
			←	200 OK			←	200 OK
		200 OK	→		→	200 OK		
BYE	→				←	ACK		
200 OK BYE	←						→	ACK
						Transferred communication		
					←	BYE		
							→	BYE
							←	200 OK BYE
					→	200 OK BYE		

TSS Interaction/TIP	TP CDIV_N10_002	Reference [1], 4.6.10.1.3	Selection expression PICS 4/7

Test purpose

Forwarded Communication, handling of Request-Line of the INVITE.

Ensure that a forwarded communication is able to transfer and the AS replaces the Request URI (CDIV Session Identifier) of the INVITE request received from the Transferee with the value of the Transfer target previously stored from the Refer-To header received in the REFER request and sends the INVITE request toward the Transfer target. The INVITE request contains also the History-Info header. The CFU, CFB, CFNR, CD CFNL and CFNRc apply.

SIP header values:

INVITE 1: Request URI: <CDIV Session Identifier>
INVITE 2: Request URI:<SIP#4>
History-Info: <sip:SIP#2 >;index=1,
<sip:SIP#3;cause=302>;index=1.1

Configuration:

SIP#1: originating user, transferee
SIP#2: CDIV served user, (Transferee)
SIP#3: CDIV diverted-to user, Transferee
SIP#4: Transfer target

Comments:

SIP#1		SUT	SIP#2 (served user)	SIP#3	SIP#4
			Forwarded communication is active		
REFER	→		→ REFER		
				→ REFER	
				← 202 Accepted	
202 Accepted	←		← 202 Accepted		
			← INVITE 1	← INVITE 1	
		INVITE 2	→		→ INVITE 2
			← 180 Ringing		← 180 Ringing
		180 Ringing	→	→ 180 Ringing	
			← 200 OK		← 200 OK
BYE	→	200 OK	→	→ 200 OK	
200 OK BYE	←			← ACK	
					→ ACK
				Transferred communication	
				← BYE	
					→ BYE
					← 200 OK BYE
				→ 200 OK BYE	

History

Document history		
V2.1.1	May 2009	Publication
V3.1.1	July 2011	Publication
V3.2.1	June 2015	Publication