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Technical Specification

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services: Communication Diversion (CDIV); Part 2: Test Suite Structure and Test Purposes (TSS&TP)

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

The present document is part 2 of a multi-part deliverable covering < Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services: 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 for the user".

Introduction

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

1 Scope

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for Communications Diversion (CDIV) services, TS 183 004 [1].

A further part of the present document 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.

Within the TISPAN NGN Release 1 Next Generation Network (NGN) the stage 3 description is specified using the IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP).

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

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ETSI TS 183 004: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services: Communication Diversion (CDIV); Protocol specification".
- [2] ETSI TS 124 229: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 8.7.0 Release 8)".
- [3] RFC 4244: "An Extension to the Session Initiation Protocol for Request History Information".
- [4] RFC 4458: "Session Initiation Protocol (SIP) URIs for Applications such as Voicemail and Interactive Voice Response (IVR)".
- [5] IETF RFC 3261 (June 2002) "SIP: Session Initiation Protocol".

- [6] ETSI TS 183 007: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services; Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR); Protocol specification".
- [7] ETSI TS 183 011: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services: Anonymous Communication Rejection (ACR) and Communication Barring (CB); Protocol specification".
- [8] ETSI TS 183 028: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Common Basic Communication procedures; Protocol specification".
- [9] ETSI TS 183 008: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR); Protocol specification".
- [10] ETSI TS 186 014-1: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services: Communication Diversion (CDIV); Part 1: Protocol Implementation conformance Statement (PICS)".
- [11] ETSI TS 183 029: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services: Explicit Communication Transfer (ECT); Protocol specification".
- [12] ISO/IEC 9646-1: "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 1: General concepts".
- [13] ETSI TS 181 002: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Multimedia Telephony with PSTN/ISDN simulation services".
- [14] ETSI TS 181 006: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Direct Communication Service in NGN; Service Description [Endorsement of OMA-ERELD-PoC-V1]"

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-1 [12] apply.

3.2 Abbreviations

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

3GPP	3 rd Generation Partnership Project; www.3gpp.org
ACR	Anonymous Communication Rejection
AoC	Advice of Charge
AS	SIP Application Server
BGCF	Border Gateway Control Function
CD	Communication Deflection
CDIV	Communication DIVersion

CFB	Communication Forwarding Busy
CFNL	Communication Forwarding on Not Logged-in
CFNR	Communication Forward No Reply
CFU	Communication Forward Unconditional
HOLD	Communication Hold
IFC	Initial Filter Criteria
IMS	IP Multimedia Subsystem
IP	Internet Protocol
ISDN	Integrated Service Data Network
MCID	Malicious Communication Identification
NGN	Next Generation Network
OIP	Originating Identification Presentation
OIR	Originating Identification Restriction
PSTN	Public Switched Telephone Network
SIP	Session Initiation Protocol
TIP	Terminating Identification Presentation
TIR	Terminating Identification Restriction
UA	User Agent
UE	User Equipment

4 Test Suite Structure (TSS)

Table 1: Test suite structure

Netw		
	DivertigS-CSCF	CDIV_N01
	ASdivertingUser	CDIV_N02
	ASNotification	CDIV_N03
		CDIV_N04
		CDIV_N05
		CDIV_N06
		CDIV_N07
		CDIV_N08
		CDIV_N09
		CDIV_N10
	ASdiverted-to	CDIV_N11
User		
	OrigUE	CDIV_U01
	Diverted-toUE	CDIV_U02
	DivertingUE	CDIV_U03
Interaction		
	TIP	CDIV_N11_xxx
	TIR	CDIV_N12_xxx
	OIP	CDIV_N13_xxx
	OIR	CDIV_N14_xxx
	ACR-CB	CDIV_N15_xxx
	ECT	CDIV_N16_xxx

5 Test Purposes (TP)

5.1 Introduction

For each test requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite and whether it applies to the network or the user (see figure 1).

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

Figure 1: TP identifier naming convention scheme

5.1.2 Test strategy

As the base standard TS 183 004 [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 TS 186 014-1 [10].

5.1.3 Configuration

For Application Server procedure testing, the ISC interface should be used. In case when the ISC interface is not explicitly available it is also applicable to use any NNI interface such as the Mw, Mg or the Mx interface. The use of the Gm interface is explicitly stated.

5.2 Signalling requirements

5.2.1 Actions at the diverting S-CSCF

TSS Netw/DivertigS-CSCF	TP CDIV_N01_001	Reference	Selection expression
Test purpose			
<i>The S-CSCF forwards the request to the AS based on the initial filter criteria roles indicating the UE B is subscribed to CFU simulation service.</i>			
Ensure that the S-CSCF is able to forward a request to the AS based on the initial filter criteria for the CDIV service if the called user is subscribed to the communication diversion service.			
SIP header values:			
Comments:			
SIP#1 (Mw)	S-CSCF	SIP#2 (ISC)	
INVITE 1	→	→ INVITE 1	
180 Ringing	←	← 180 Ringing	
200 OK (INVITE)	←	← 200 OK (INVITE)	
ACK	→	→ ACK	
BYE	→	→ BYE	
200 OK (BYE)	←	← 200 OK (BYE)	

5.2.2 Actions at the AS of the diverting User

TSS Netw/ASdivertingUser	TP CDIV_N02_001	Reference 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 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			
Remark: for each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in 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	→	→	
180 Ringing	←	←	180 Ringing
200 OK INVITE	←	←	200 OK INVITE
ACK	→	→	ACK
INVITE 2	→	→	INVITE 2
486 (Busy here)	←	←	486 (Busy here)
ACK	→	→	ACK
BYE 1	→	→	BYE 1
200 OK BYE	←	←	200 OK BYE

TSS Netw/ASdivertingUser	TP CDIV_N02_002	Reference 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 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			
Remark: for each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in 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	TP CDIV_N02_003	Reference 4.5.2.6.1	Selection expression PICS 1/1
Test purpose <i>Served user has activated CFU, maximum number of diversion exceeded.</i>			
Ensure that the 480 (Temporarily unavailable) final response 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			
Remark: for each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in 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	TP CDIV_N02_004	Reference 4.5.2.6.1	Selection expression PICS 1/4 OR PICS 1/5
Test purpose <i>Served user has activated CD, maximum number of diversion exceeded.</i>			
Ensure that the 480 (Temporarily unavailable) final response 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			
Remark: for each redirection a history-entry is added the History-Info header and the relevant index is incremented according the rules described in 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	→		

TSS Netw/ASdivertingUser	TP CDIV_N02_005	Reference 4.5.2.6.2.2/ [1]	Selection expression
Test purpose <i>Request URI is set to the diverted to destination History-info header contained in the INVITE.</i>			
<p>The served user subscribes to the CDIV service defined as CDIV in table 2. The first diversion has already undergone, no History header has been received.</p> <p>Ensure that the Request URI shall be set to the public user identity where the communication is to be diverted.</p> <p>Ensure that two hist-info entries shall be generated.</p> <p>Ensure that the first entry shall include the hi-targeted-to-uri of the served user. The Index is set to index=1.</p>			
SIP header values: INVITE: sip:SIP#3@ example.com SIP/2.0 History-Info: <sip:SIP#2?Privacy=history>;index=1, <sip:SIP#3; cause=VA_CAUSE>;index=1.1			
Comments:			
SIP#1	AS	SIP#2	SIP#3
INVITE 1	→		→ INVITE
180 Ringing	←		← 180 Ringing
200 OK (INVITE)	←		← 200 OK (INVITE)
ACK	→		→ ACK
		Communication	
BYE	→		→ BYE
200 OK BYE	←		← 200 OK BYE

TSS Netw/ASdivertingUser	TP CDIV_N02_006	Reference 4.5.2.6.2.2/ [1]	Selection expression PICS 4/1 OR PICS 4/2
Test purpose <i>To header is sent unchanged.</i>			
<p>The served user subscribes to the CDIV service defined as CDIV in table 2. The To header is sent unchanged if the user does not reveal its identity.</p>			
SIP header values: INVITE 1: To: userB@domain INVITE 2: To: userB@domain			
Comments:			
SIP#1	AS	SIP#2	SIP#3
INVITE 1	→		→ INVITE 2
180 Ringing	←		← 180 Ringing
200 OK (INVITE)	←		← 200 OK (INVITE)
ACK	→		→ ACK
		Communication	
BYE	→		→ BYE
200 OK BYE	←		← 200 OK BYE

TSS Netw/ASdivertingUser	TP CDIV_N02_007	Reference 4.5.2.6.2.2/ [1]	Selection expression PICS 4/1 OR PICS 4/2
Test purpose <i>To header changed with respect to the OIR service.</i>			
<p>The served user subscribes to the CDIV service defined as CDIV in table 2. The first diversion has already undergone, no History header has been received.</p> <p>Ensure that when the served user wishes privacy, the served user is subscribed to the OIR Service, the "To header" shall be changed to the URI where the communication is diverted to.</p>			
OIP Subscription option values: Permanent mode = yes or Temporary mode default presentation restricted = yes			
SIP header values: INVITE 1: To: userB@domain INVITE 2: To: userC@domain			
Comments:			
SIP#1	AS	SIP#2	SIP#3
INVITE 1	→		→ INVITE 2
180 Ringing	←		← 180 Ringing
200 OK (INVITE)	←		← 200 OK (INVITE)
ACK	→		→ ACK
Communication			
BYE	→		→ BYE
200 OK BYE	←		← 200 OK BYE

TSS Netw/ASdivertingUser	TP CDIV_N02_008	Reference 4.5.2.6.2.2/ [1]	Selection expression PICS 3/5
Test purpose <i>To header changed with respect to the subscription option "Served user allows the presentation of his/her URI to diverted-to user" set to false.</i>			
<p>The served user subscribes to the CDIV service defined as CDIV in table 2. The first diversion has already undergone, no History header has been received.</p> <p>Ensure that if the served used has the subscription option "Served user allows the presentation of his/her URI to diverted-to user" set to false, then the "To header" shall be changed to the URI the URI where the communication is diverted to.</p>			
Subscription options: Served user allows the presentation of his/her URI to <i>diverted-to</i> user = no			
SIP header values: INVITE 1: To: userB@domain INVITE 2: To: userC@domain			
Comments:			
SIP#1	AS	SIP#2	SIP#3
INVITE 1	→		→ INVITE 2
180 Ringing	←		← 180 Ringing
200 OK (INVITE)	←		← 200 OK (INVITE)
ACK	→		→ ACK
Communication			
BYE	→		→ BYE
200 OK BYE	←		← 200 OK BYE

TSS Netw/ASdivertingUser	TP CDIV_N02_009	Reference 4.5.2.6.2.3/ [1]	Selection expression
Test purpose <i>The request-URI is set to the public user identity of the diverted to user multiple diversion.</i>			
The served user subscribes to the CDIV service defined as CDIV in table 2. Subsequent diversion has already undergone, a History header has been received. When multiple diversions has undergone ensure that the Request URI – shall be set to the public user identity where the communication is diverted to.			
SIP header values: INVITE 1: History-Info: <sip:SIP#1?Privacy=history>;index=1, <sip:SIP#n-1; cause=302?Privacy=history>;index=1.1 INVITE 2: INVITE sip:SIP#n@ example.com SIP/2.0			
Comments:			
SIP#1	AS	SIP#n-1	SIP#n
INVITE 1	→		→ INVITE 2
180 Ringing	←		← 180 Ringing
200 OK (INVITE)	←		← 200 OK (INVITE)
ACK	→		→ ACK
		Communication	
BYE	→		→ BYE
200 OK BYE	←		← 200 OK BYE

TSS Netw/ASdivertingUser	TP CDIV_N02_010	Reference 4.5.2.6.2.3/ [1]	Selection expression
Test purpose <i>A new History-Info entry is added to the received History-Info header.</i>			
The served user subscribes to the CDIV service defined as CDIV in table 2. Subsequent diversion has already undergone, a History header has been received. Ensure that when a multiple diversion has undergone, a new History-Info entry shall be added to the History-Info header field.			
SIP header values: INVITE 1: History-Info: <sip:SIP#1>;index=1, <sip:SIP#n-1; cause=302>;index=1.1 INVITE 2: History-Info: <sip:SIP#1>;index=1, <sip:SIP#n-1; cause=302>;index=1.1 <sip:SIP#n; cause=VA_CAUSE>;index=1.1.1			
Comments:			
SIP#1	AS	SIP#n-1	SIP#n
INVITE 1	→		→ INVITE 2
180 Ringing	←		← 180 Ringing
200 OK (INVITE)	←		← 200 OK (INVITE)
ACK	→		→ ACK
		Communication	
BYE	→		→ BYE
200 OK BYE	←		← 200 OK BYE