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TECHNICAL SPECIFICATION

**Core Network and Interoperability Testing (INT);
Explicit Communication Transfer (ECT) using
IP Multimedia (IM) Core Network (CN) subsystem;
Conformance Test Specification (3GPP™ Release 12);
Part 2: Test Suite Structure and Test Purposes (TSS&TP)**

Reference

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Keywords

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

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

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

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

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).

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1   Scope

The present document provides the Test Suite Structure and Test Purposes (TSS&TP) for the protocol specification Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem as defined in ETSI TS 124 629 [1] in compliance with the relevant requirements.

2   References

2.1   Normative references

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

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

[1]   ETSI TS 124 629: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.629 Release 12)".

[2]   ETSI TS 101 594-1: "Core Network and Interoperability Testing (INT); Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Conformance Test Specification (3GPP™ Release 12); Part 1: Protocol Implementation Conformance Statement (PICS)".

[3]   ETSI TS 124 628: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Common Basic Communication procedures using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.628 Release 12)".

2.2   Informative references

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

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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 124 629 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in ETSI TS 124 629 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 124 629 [1] and the following apply:

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

4 Test Suite Structure (TSS) and configuration

4.1 Test Suite Structure

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

Figure 4.1.1: Test suite structure

4.2 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 124 629 [1]. The stage 3 description respects the requirements to several network entities and also to requirements regarding to end devices. Therefore several interfaces (reference points) are addressed to satisfy the test of the different entities.

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

Testing of the Application Server: This entity is responsible to perform the service. Hence the ISC interface is the appropriate access point. Figure 4.2.1 points to this.
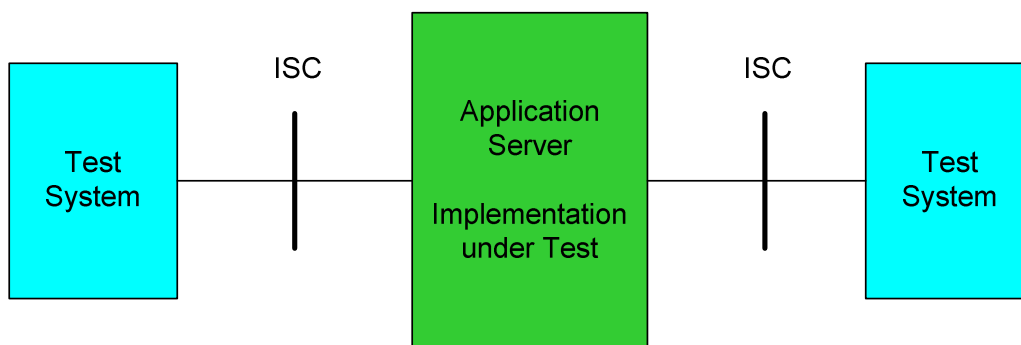
Figure 4.2.1: Applicable interface to test AS functionalities

If the ISC interface is not accessible it is also applicable to perform the test of the AS using any NNI (Mw, Mg, Mx) interface (consider figure 4.2.2). In case only the Gm interface is accessible this shall be used instead. In this case, be aware that the verification of several requirements is impeded.
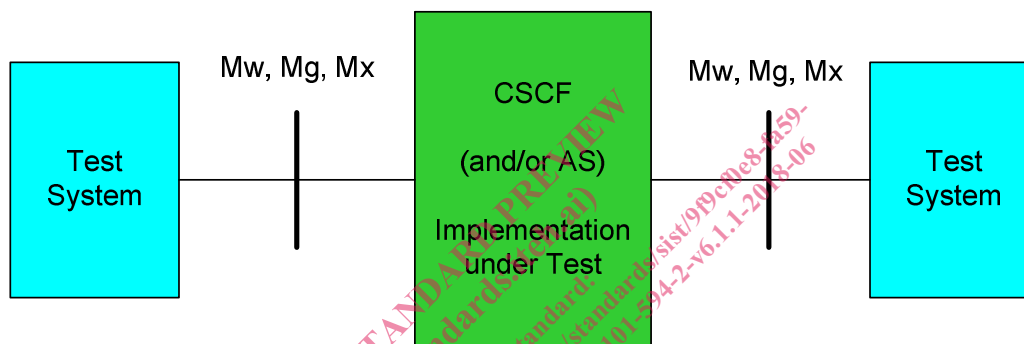
Figure 4.2.2: Applicable interfaces to test using the (generic) NNI interface

Figure 4.2.2 illustrates the usage of any NNI interface.

Testing of User Equipment: There are several requirements regarding to the end devices. Therefore a special configuration appears.
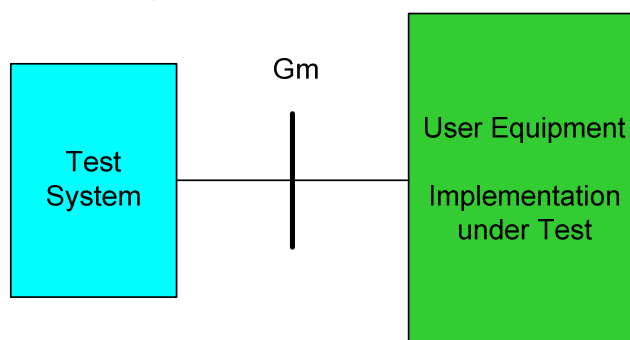
Figure 4.2.3: Applicable configuration to test the User Equipment

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 table 5.1.1).

Table 5.1.1: TP identifier naming convention scheme

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

5.1.2   Test strategy

As the base standard ETSI TS 124 629 [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 101 594-1 [2].

5.2   Signalling requirements

5.2.1   Actions at the Transferor UE

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

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

SIP header values:
REFER: Request URI: **Gm#2**
              Refer-To contains **Gm#3** URI, method=invite
              Referred-By contains **Gm#1** URI
          CASE Contact header of session #1 contains a GRUU
              Target-Dialog: <Call-ID of session #1> ;local-tag=<From tag of session #1>;
                     remote-tag=<To tag of session #1>

NOTIFY(100):Event contains **refer**
          message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
          message/sipfrag contains **SIP/2.0 200 OK**

Comments:
UE (Gm#1)   **Test equipment (Gm#2)**
                                    Establishment of session #1
CASE A
                        Session #1 on hold
REFER   →   REFER
2xx OK REFER   ←   2xx OK REFER

BYE   →   BYE
200 OK (BYE)   ←   200 OK (BYE)

NOTIFY(100)   ←   NOTIFY(100)
200 OK NOTIFY   →   200 OK NOTIFY

NOTIFY(200)   ←   NOTIFY(200)
200 OK NOTIFY   →   200 OK NOTIFY

CASE B
REFER   →   REFER
202 Accepted   ←   202 Accepted

BYE   →   BYE
200 OK (BYE)   ←   200 OK (BYE)

NOTIFY(100)   ←   NOTIFY(100)
200 OK NOTIFY   →   200 OK NOTIFY

NOTIFY(200)   ←   NOTIFY(200)
200 OK NOTIFY   →   200 OK NOTIFY

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

Test purpose

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

SIP header values:

REFER: Request URI: **Gm#2**
       Refer-To contains **Gm#3** URI; method=invite
       Referred-By contains **Gm#1** URI
    CASE Contact header of session #1 contains a GRUU
      Target-Dialog: <Call-ID of session #1> ;local-tag=<From tag of session #1>;
           remote-tag=<To tag of session #1>

NOTIFY(100):Event contains **refer**
      message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
      message/sipfrag contains **SIP/2.0 200 OK**

Comments:

UE (Gm#1)   Test equipment (Gm#2)
                           Establishment of session #1

CASE A
                Session #1 on hold

REFER   →   REFER
2xx OK REFER   ←   2xx OK REFER

NOTIFY(100)   ←   NOTIFY(100)
200 OK NOTIFY   →   200 OK NOTIFY

INVITE(inactive/sendonly)   INVITE(inactive/sendonly)
200 OK INVITE(inactive/recvonly)   200 OK INVITE(inactive/recvonly)
ACK   ACK

NOTIFY(200)   ←   NOTIFY(200)
200 OK NOTIFY   →   200 OK NOTIFY

BYE   →   BYE
200 OK (BYE)   ←   200 OK (BYE)

CASE B
REFER   →   REFER
202 Accepted   ←   202 Accepted

NOTIFY(100)   ←   NOTIFY(100)
200 OK NOTIFY   →   200 OK NOTIFY

INVITE(inactive/sendonly)   INVITE(inactive/sendonly)
200 OK INVITE(inactive/recvonly)   200 OK INVITE(inactive/recvonly)
ACK   ACK

NOTIFY(200)   ←   NOTIFY(200)
200 OK NOTIFY   →   200 OK NOTIFY

BYE   →   BYE
200 OK (BYE)   ←   200 OK (BYE)

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

Test purpose

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

SIP header values:

REFER: Request URI: **Gm#2**

        Refer-To: contains **Gm#3 URI;** method=invite?Replaces=**call-id1**%3B**to-tag**%3D**Session1**%3B

            from-tag%3D**Session1**& Require=replaces

        Referred-By contains **Gm#1** URI

   CASE Contact header of session #1 contains a GRUU

        Target-Dialog: <Call-ID of session #1> ;local-tag=<From tag of session #1>;

            remote-tag=<To tag of session #1>

NOTIFY(100):Event contains **refer**

      message/sipfrag contains **SIP/2.0 100 Trying**

NOTIFY(200):Event contains **refer**

      message/sipfrag contains **SIP/2.0 200 OK**

Comments:

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

TSS	TP	Reference	Selection expression
User/Transferor	ECT_U01_004	4.5.2.1	PICS 4.5.1/1 AND PICS 4.6.1/3 AND PICS 4.6.1/6

Test purpose
The UE transfers a communication with a Transferee to the Transfer Target (Transferor, consultative transfer).
Ensure that the UE is able to transfer a communication with the Transferee, optionally put on hold before, to the Transfer Target, having a session, optionally put on hold before, using the consultative transfer method. The REFER request contains a replaces header escaped in the Refer-To header to request the termination of the session between Transferor and Transfer Target (session #2).
If the transfer attempt is not completed, the transfer is terminated by sending a REFER request and the method parameter of the Refer-To is set to 'cancel'.

SIP header values:
REFER1: Request URI: **Gm#2**
　　　　Refer-To: contains **Gm#3 URI;** method=invite?Replaces=**call-id1**%3B**to-tag**%3D**Session1**%3B
　　　　　　from-tag%3D**Session1**& Require=replaces

NOTIFY(100):Event contains **refer**
　　　　message/sipfrag contains **SIP/2.0 100 Trying**

REFER2: Request URI: **Gm#2**
　　　　Refer-To: contains **Gm#3 URI;** method=**cancel**
　　CASE Contact header of session #1 contains a GRUU
　　　　Target-Dialog: <Call-ID of session #1 ;local-tag=<From tag of the session #1>;
　　　　　　remote-tag=<To tag of the session #1>

Comments:
UE (Gm#1)　　　　　　　　　　　　　　　　　　　　　**Test equipment (Gm#2)**
　　　　　　　　　　　　Establishment of session #1
　　　　(Session #1 on hold)
　　　　　　　　　　　　Establishment of session #2
　　　　(Session #2 on hold)
REFER1　　　　　　　　　　　　➜　　　　　　REFER1
2xx OK REFER　　　　　　　　　　←　　　　　　2xx OK REFER

CASE A
NOTIFY(100)　　　　　　　　　　←　　　　　　NOTIFY(100)
200 OK NOTIFY　　　　　　　　　➜　　　　　　200 OK NOTIFY

REFER2　　　　　　　　　　　　➜　　　　　　REFER
2xx OK REFER　　　　　　　　　　←　　　　　　2xx OK REFER
Apply post test routine

5.2.2 Actions at the Transferor AS

TSS Netw/TransferorAS	TP ECT_N01_001	Reference 4.5.2.4	Selection expression PICS 4.5.1/2 AND PICS 4.7.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)
Test purpose *Communication transfer:* ***Assured transfer***. *Transferor was originator of the originating call.* Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. After the communication between the Transferee and the Transfer Target is confirmed, the communication between Transferor and Transferee is terminated. The Transferor was the initiator of the originating communication.			

SIP header values:
REFER 1: Refer-To contains **ISC#3** URI; method=invite
       Referred-By contains **ISC#1** URI
   CASE: Request received on a separate dialogue
      Target-Dialog: <Call-ID of session #1> ;local-tag=<From tag of the session #1e>;
            remote-tag=<To tag of the session #1>
   CASE: Request received on the same dialogue
      Call-ID: <session #1>
REFER 2: Refer-To contains **ECT Session Identifier** URI; method=invite
      Referred-By contains ISC#ISC#1 URI
INVITE 3: Request URI = **ECT Session Identifier** URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100):Event contains **refer**
      Subscription-State: **active;expires=(any value)**
      message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
      message/sipfrag contains **SIP/2.0 200 OK**
      Subscription-State: terminated;reason=noresource			

Comments: ISC#1	AS Transferor Session #1	ISC#2	ISC#3
INVITE 1	→	→ INVITE	
180 Ringing	←	← 180 Ringing	
200 OK (INVITE)	←	← 200 OK (INVITE)	
ACK	→	→ ACK	
INVITE 2 (sendonly)	→	→ INVITE (sendonly)	
200 OK (recvonly)	←	← 200 OK (recvonly)	
ACK	→	→ ACK	
REFER 1	→ REFER		
	REFER 2 →	REFER	
	2xx OK REFER ←	2xx OK REFER	
2xx OK REFER	← 2xx OK REFER		
INVITE (inactive)	←	← INVITE (inactive)	
200 OK (inactive)	→	→ 200 OK (inactive)	
ACK	←	← ACK	
NOTIFY(100)	←	← NOTIFY(100)	
200 OK NOTIFY	→	→ 200 OK NOTIFY	
	INVITE ←	INVITE 3	
	INVITE 4 →		→ INVITE
	180 Ringing ←		← 180 Ringing
	180 Ringing →	180 Ringing	
	200 OK ←		← 200 OK
	200 OK →	200 OK	
		ACK →	ACK
NOTIFY(200)	←	← NOTIFY(200)	
200 OK NOTIFY	→	→ 200 OK NOTIFY	
BYE	→	→ BYE	
200 OK (BYE)	←	← 200 OK (BYE)	
		Communication ISC#2 with ISC#3	
	Apply post test routine		