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Q.4007.3

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TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

SERIES Q: SWITCHING AND SIGNALLING

Testing specifications - Testing specifications for SIP-IMS

Explicit communication transfer using IP multimedia core network subsystem; Conformance testing – Part 3: User side; Test suite structure and test purposes

Recommendation ITU-T Q.4007.3



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## **Recommendation ITU-T Q.4007.3**

Explicit communication transfer using IP multimedia core network subsystem; Conformance testing – Part 3: User side; Test suite structure and test purposes

## **Summary**

Recommendation ITU-T Q.4007.3 is Part 3 of the testing specifications for explicit communication transfer (ECT) using IP multimedia core network subsystem for the user side. The standard specifies the test suite structure and test purposes (TSS&TP) for the user side which can be used for testing against Recommendation ITU-T Q.3623 v.1.

The version number, v.1, indicates that this is version one of Recommendation ITU-T Q.4007.3, and that it relates to Release 10 of the relevant 3GPP/ETSI standard.

## **History**

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T Q.4007.3 v.1	2016-08-29	11	11.1002/1000/12995

## **Keywords**

Explicit communication transfer, ECT, IP multimedia subsystem, IMS, network side, session description protocol, SDP, session initiation protocol, SIP, PICS, testing, user side.

<sup>\*</sup> To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, <a href="http://handle.itu.int/11.1002/1000/11830-en">http://handle.itu.int/11.1002/1000/11830-en</a>.

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## **Recommendation ITU-T Q.4007.3**

# Explicit communication transfer using IP multimedia core network subsystem; Conformance testing – Part 3: User side; Test suite structure and test purposes

## 1 Scope

This Recommendation provides the test suite structure and test purposes (TSS&TP) for the protocol specification as defined in explicit communication transfer (ECT) using IP multimedia (IM) core network (CN) subsystem in compliance with the relevant requirements.

This Recommendation is part 3 of a multi-part deliverable covering the explicit communication transfer (ECT) using IP multimedia (IM) core network (CN) subsystem; conformance test specification, as identified below:

Part 1: "Protocol implementation conformance statement (PICS)";

Part 2: "Network side; Test suite structure and test purposes (TSS&TP)";

Part 3: "User side; Test suite structure and test purposes (TSS&TP)".

### 2 References

[ITU-T O 3623 v 1]

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[110 1 (1.0020 1.11]	transfer using IP multimedia core network subsystem – Protocol specification.
[ITU-T Q.4007.1 v.1]	Recommendation ITU-T Q.4007.1 v.1 (2016), Explicit communication transfer using IP multimedia core network subsystem; Conformance testing – Part 1: Network side and user side; Protocol implementation conformance statement.

[ETSI TS 124 628] ETSI TS 124 628 (2011), Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Common Basic Communication procedures using IP Multimedia

(IM) Core Network (CN) subsystem; Protocol specification (3GPP TS

Recommendation ITU-T 0.3623 v.1 (2016). Explicit communication

24.628 version 10.3.0 Release 10).

### 3 Definitions

None.

## 4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

IUT Implementation Under Test

PIXIT Protocol Implementation extra Information for Testing

SIP Session Initiation Protocol

TP Test Purpose

UE User Equipment

URI Uniform Resource Identifier

## 5 Test suite structure (TSS) and configuration

User	Transferor	ECT_U01_xxx
	Transferee	ECT_U02_xxx
	TransferTarget	ECT_U03_xxx

Figure 5-1 – Test suite structure

## 5.1 Configuration

The scope of this Recommendation is to test the signalling and procedural aspects of the stage 3 requirements as described in [ITU-T Q.3623 v.1]. The stage 3 description respects the requirements of several network entities and also the requirements regarding end devices. Consequently several interfaces (reference points) are addressed to satisfy the test of the different entities.

In order to test the appropriate entities the configurations below are applicable:

**Testing of user equipment:** There are several requirements regarding end devices. Therefore a special configuration is applicable (see Figure 5-1.1).

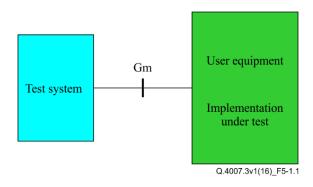


Figure 5-1.1 – Applicable configuration to test the user equipment

## **6** Test purposes

#### 6.1 Introduction

For each test requirement a test purpose (TP) is defined.

## **6.1.1** TP naming convention

Test purposes (TPs) are numbered, starting at 001, within each group. Groups are organized according to the test suite structure (TSS). Additional references are added to identify the actual test suite and whether it applies to the network or the user (see Table 6-1.1).

Table 6-1.1 – 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)

## 6.1.2 Test strategy

As the base standard [ITU-T Q.3623 v.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 [ITU-T Q.4007.1 v.1].

## **6.2** Signalling requirements

## 6.2.1 Actions at the transferor user equipment

TSS	TP	Reference	Selection expression
User/Transferor	ECT_U01_001	Clause 4.5.2.1of	PICS 5.5.1/1 AND
		[ITU-T Q.3623 v.1]	PICS 5.6.1/1
Test purpose			[ITU-T Q.4007 v.1]
The user equipment (UE) transfer	rs a communication with	a transferee to the t	ransfer target (transferor blind
transfer).	3 a communication with	a transferee to the ti	ansier larger (transferor, billia
Ensure that the UE is able to trans	sfer a communication wit	h the transferee, option	nally put on hold before, to the
transfer target using the blind trans		with user transferee is	s terminated before information
about the progress of the transfer is	received.		
SIP header values:			
REFER: Request URI: Gm#2			
	contains <b>Gm#3</b> URI, meth	iod=invite	
	By contains <b>Gm#1</b> URI		
NOTIFY(100): Event contains refer		00 Trying	
NOTIFY(200): Event contains <b>refer</b>	sipfrag contains <b>SIP/2.0 1</b>	oo rrying	
	sipfrag contains SIP/2.0 2	00 OK	
Comments:	npirag comaine en 7210 2		
UE (Gm#1)		Test equipr	ment (Gm#2)
	Establishment of		,
CASE A			
Session #	1 on hold		
REFER	<b>→</b>	REFER	
202 Accepted	+	202 Accepte	ed
BYF	<b>→</b>	BYF	
200 OK (BYE)	<del>,</del>	200 OK (BY	E)
(= : = /		=== === (= :	,
NOTIFY(100)	<b>+</b>	NOTIFY(100	0)
200 OK NOTIFY	<b>→</b>	200 OK NO	TIFY
NOTIEV(200)	<b>←</b>	NOTIEV/20/	
NOTIFY(200)	•	NOTIFY(200	J)

TSS User/Transferor	TP ECT_U01_001	Reference Clause 4.5.2.1of [ITU-T Q.3623 v.1]	Selection expression PICS 5.5.1/1 AND PICS 5.6.1/1 [ITU-T Q.4007 v.1]
200 OK NOTIFY	<b>→</b>	200 OK NO	TIFY
CASE B REFER 202 Accepted	<b>→</b> ←	REFER 202 Accepte	ed
BYE 200 OK (BYE)	<b>→</b>	BYE 200 OK (BY	E)
NOTIFY(100) 200 OK NOTIFY	<b>←</b> →	NOTIFY(100 200 OK NO	,
NOTIFY(200) 200 OK NOTIFY	<b>←</b> →	NOTIFY(200 200 OK NO	

TSS	TP	Reference	Selection expression
User/Transferor	ECT_U01_002	4.5.2.1	PICS 5.5.1/1 AND
		[ITU-T Q.3623 v.1]	PICS 5.6.1/2
			[ITU-T Q.4007 v.1]

## Test purpose

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

### SIP header values:

REFER: Request URI: Gm#2

Refer-To contains Gm#3 URI; method=invite

Referred-By contains Gm#1 URI

NOTIFY(100): Event contains refer

message/sipfrag contains SIP/2.0 100 Trying

NOTIFY(200): Event contains refer			
message/sipfrag	contains SIP/2.0 200 OK		
Comments: UE ( Gm#1)		Test equipment ( Gm#2)	
	Establishment of session	on #1	
CASE A			
Session #1 on h			
REFER	<b>→</b>	REFER	
202 Accepted	<b>←</b>	202 Accepted	
NOTIFY(100)	<b>←</b>	NOTIFY(100)	
200 OK NOTIFY	<del>-</del>	200 OK NOTIFY	
INVITE(inactive/sendonly)		INVITE(inactive/sendonly)	
200 OK INVITE(inactive/recvonly)		200 OK INVITE(inactive/recvonly)	
ACK		ACK	
NOTIFY(200)	<b>←</b>	NOTIEV(200)	
200 OK NOTIFY	<b>→</b>	NOTIFY(200) 200 OK NOTIFY	
200 OK NOTIFT	7	200 OK NOTIFT	
BYE	<b>→</b>	BYE	
200 OK (BYE)	<del>-</del>	200 OK (BYE)	
	<del>-</del>	200 011 (212)	
CASE B			
REFER	<b>→</b>	REFER	
202 Accepted	<b>←</b>	202 Accepted	
NOTIFY(100)	<b>←</b>	NOTIFY(100)	
200 OK NOTIFY	<del>}</del>	200 OK NOTIFY	
	7	200 OK NOTH 1	

TSS User/Transferor	TP ECT U01 002	Reference 4.5.2.1	Selection expression PICS 5.5.1/1 AND
		[ITU-T Q.3623 v.1]	PICS 5.6.1/2 [ITU-T Q.4007 v.1]
INVITE(inactive/sendonly) 200 OK INVITE(inactive/recvonly) ACK		`	tive/sendonly) TE(inactive/recvonly)
NOTIFY(200) 200 OK NOTIFY	<b>←</b> →	NOTIFY(200 200 OK NOT	,
BYE 200 OK (BYE)	<b>→</b>	BYE 200 OK (BYI	≣)

TSS	TP	Reference	Selection expression
User/Transferor	ECT_U01_003	4.5.2.1	PICS 5.5.1/1 AND
		[ITU-T Q.3623 v.1]	PICS 5.6.1/3
			[ITU-T Q.4007 v.1]

#### 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, to the Transfer Target, having a session, using the consultative transfer method. The UE or the Transfer Target can optionally be put on hold before. 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%3Bto-

tag%3DSession1%3B

from-tag%3DSession1& Require=replaces

Referred-By contains Gm#1 URI

NOTIFY(100): Event contains refer

message/sipfrag contains SIP/2.0 100 Trying

NOTIFY(200): Event contains refer

message/sipfrag contains SIP/2.0 200 OK

Comments: UE ( Gm#1)			Test equipment ( Gm#2)
OL (GIII#1)	Establishment	t of session i	
	(Session #1 on hold)		
	Establishment	t of session a	#2
REFER 202 Accepted		<b>→</b>	REFER 202 Accepted
CASE A NOTIFY(100) 200 OK NOTIFY		<b>←</b> →	NOTIFY(100) 200 OK NOTIFY
NOTIFY(200) 200 OK NOTIFY		<b>←</b> →	NOTIFY(200) 200 OK NOTIFY
BYE #1 200 OK (BYE)		<b>→</b> ←	BYE 200 OK (BYE)
BYE 200 OK (BYE)		<b>←</b> →	BYE #2 200 OK (BYE)
CASE B NOTIFY(100) 200 OK NOTIFY		<b>←</b> →	NOTIFY(100) 200 OK NOTIFY
BYE 200 OK (BYE)		<b>←</b> →	BYE #2 200 OK (BYE)
NOTIFY(200) 200 OK NOTIFY		<b>←</b> →	NOTIFY(200) 200 OK NOTIFY
BYE #1 200 OK (BYE)		<b>→</b>	BYE 200 OK (BYE)

## 6.2.2 Actions at the transferee UE

TSS	TP	Reference	Selection expression
User/Transferee	ECT_U02_001	4.5.2.5	PICS 5.5.1/1 AND
		[ITU-T Q.3623 v.1]	(PICS 5.6.1/1
			OR PICS 5.6.1/2) AND
			PICS 5.6.1/5
			[ITU-T Q.4007 v.1]

#### Test purpose

The user equipment (UE) receives the request to establish a communication to the transfer target (transferee blind/assured transfer)

Ensure that the UE establishes a session with a 'transfer target' if a REFER request was received containing a Refer-To header and a Referred-By header. The Request Line of INVITE request sent by the UE is set to the URI received in the Refer-To header. The received Referred-By header is sent in the INVITE request. Ensure that a NOTIFY request is sent containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted. Ensure that a NOTIFY request is sent containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

#### SIP header values:

REFER: Request URI: Gm#1

Refer-To: contains Gm#3 URI;method=invite

Referred-By: contains Gm#2 URI

NOTIFY(100): Event contains refer

Subscription-State: active;expires=(any value) message/sipfrag contains SIP/2.0 100 Trying

NOTIFY(200): Event contains refer

message/sipfrag contains SIP/2.0 200 OK

INVITE: Request URI: Gm#3

Referred-By contains Gm#2 URI

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

TSS User/Transferee	TP ECT_U02_001	Reference 4.5.2.5 [ITU-T Q.3623 v.1]	Selection expression PICS 5.5.1/1 AND (PICS 5.6.1/1 OR PICS 5.6.1/2) AND PICS 5.6.1/5 [ITU-T Q.4007 v.1]
CASE B NOTIFY(100) (Session #1) 200 OK NOTIFY	<b>→</b> ←	NOTIFY(100 200 OK NOT	•
202 Accepted (Session #1) INVITE(inactive/sendonly) (Session #1) 200 OK INVITE	→ → ←	202 Accepte INVITE 200 OK INVI	d TE(inactive/recvonly)
ACK INVITE (Session #2) 180 Ringing	→ → ←	ACK INVITE 180 Ringing	,
200 OK INVITE (Session #2) ACK NOTIFY(200) (Session #1)	÷ ÷	200 OK INVI ACK NOTIFY(200	
200 OK NOTIFY	Apply post test	200 OK NOT	

TSS	TP	Reference	Selection expression
User/Transferee	ECT_U02_002	4.5.2.5	PICS 5.5.1/1 AND
		[ITU-T Q.3623 v.1]	PICS 5.6.1/3 AND
			PICS 5.6.1/5
			[ITU-T Q.4007 v.1]

#### Test purpose

The user equipment receives the request to establish a communication to the transfer target (transferee consultative transfer)

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

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

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

#### SIP header values:

REFER: Request URI: Gm#1

Refer-To: contains Gm#3 URI; method=invite?Replaces=<any value>%3Bto-tag%3D<any To

tag

value>%3Bfrom-tag%3D<any From tag value>&Require=replaces

Referred-By: contains Gm#2 URI

NOTIFY(100): Event contains refer

Subscription-State: active; expires=(any value) message/sipfrag contains SIP/2.0 100 Trying

NOTIFY(200): Event contains refer

message/sipfrag contains SIP/2.0 200 OK

INVITE: Request URI: Gm#3

Referred-By contains Gm#2 URI

Replaces: <any value>;to-tag=<any To tag value>=from-tag=<any From tag value>

Require: contains replaces

Comments:		
UE ( Gm#1)		Test equipment ( Gm#2)
	Establishment of session	
		Session #1 on hold
REFER	<b>←</b>	REFER
CASE A	_	
202 Accepted (Session #1)	<b>→</b>	202 Accepted
NOTIFY(100)	<b>→</b>	NOTIFY(100)
200 OK NOTIFY	<b>←</b>	200 OK NOTIFY
INVITE(inactive/sendonly) (Session #1)	<b>→</b>	INVITE
200 OK INVITE	<b>←</b>	200 OK INVITE(inactive/recvonly)
ACK	<b>→</b>	ACK
INVITE (Session #2)	<b>→</b>	INVITE
180 Ringing	<del>(</del>	180 Ringing
200 OK INVITE	<del>(</del>	200 OK INVITE
ACK	<b>→</b>	ACK
NOTIFY(200)	<b>→</b>	NOTIFY(200)
200 OK NOTIFY	<b>←</b>	200 OK NOTIFY
CASE B NOTIFY(100) (Session #1)	<b>→</b>	NOTIFY(100)
200 OK NOTIFY	<del>-</del>	200 OK NOTIFY
	•	200 01(1011)
202 Accepted (Session #1)	<b>→</b>	202 Accepted
INVITE(inactive/sendonly) (Session #1)	<b>→</b>	INVITE
200 OK INVITE	<b>←</b>	200 OK INVITE(inactive/recvonly)
ACK	<b>→</b>	ACK
INVITE (Session #2)	<b>→</b>	INVITE
180 Ringing	<b>←</b>	180 Ringing
200 OK INVITE	<del>(</del>	200 OK INVITE
ACK	<b>→</b>	ACK
NOTIFY(200) (Session #1)	<b>→</b>	NOTIFY(200)
200 OK NOTIFY	<b>←</b>	200 OK NOTIFY
	Apply post test routine	

TSS User/Transferee	TP ECT_U02_003	Reference 4.5.2.5 [ITU-T Q.3623 v.1]	Selection expression PICS 5.5.1/1 AND NOT PICS 5.6.1/5 [ITU-T Q.4007 v.1]
Test purpose UE incapabe of handling the REFER request.			

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

SIP header values:

REFER: Request URI=Gm#1, Refer-To other URI (PIXIT); method=invite

Referred-By contains Gm#2 URI

Comments: UE ( Gm#1) Test equipment (Gm#2)

Establishment of session #1 Session #1 on hold

REFER **REFER** 

CASE A

403 Forbidden 403 Forbidden

CASE A

501 Not implemented 501 Not implemented

Apply post test routine

#### 6.2.3 Actions at the transfer target's UE

TSS User/TransferTarget	TP ECT_U03_001	Reference 4.5.2.17 [ITU-T Q.3623 v.1]	Selection expression PICS 5.5.1/1 AND [ITU-T Q.4007 v.1]
Test purpose The user equipment receives the request to terminate a communication to the transferor. Ensure that a user equipment in a confirmed session receives an INVITE request to establish a new session and a			
Replaces header is present (consultative	transfer):		
<ul> <li>The user equipment accepts the requipment</li> </ul>	uest		
<ul> <li>The user equipment terminates the s</li> </ul>	ession indicated ir	the Replaces header	

### SIP header values:

INVITE: Request URI: Gm#1

Referred-By contains any URI

Replaces: <CalIID Session #1>;to-tag=<Session #1;from-tag=<Session #1>

Comments: UE ( Gm#1)		Test equipment ( Gm#2)
OE ( Sill#1)	Establishment of sessi	• • • • •
INVITE	<b>←</b>	INVITE (Session #2)
180 Ringing	<b>→</b>	180 Ringing
200 OK INVITE	<b>→</b>	200 OK INVITE
ACK	←	ACK
BYE (Session #1)	<b>→</b>	BYE
200 OK BYE	<b>←</b>	200 OK BYE
	Apply post test routi	ine

TSS	TP	Reference	Selection expression
User/TransferTarget	ECT_U03_002	4.5.2.17	PICS 5.5.1/1 AND
_		[ITU-T Q.3623 v.1]	[ITU-T Q.4007 v.1]
Test purpose			
The user equipment receives a Referred-	By header.		
<ul> <li>Ensure that a user equipment which it</li> </ul>	receives a Referred-	By header in an INVIT	E request accepts the request.
SIP header values:			
INVITE: Request URI: Gm#1			
Referred-By contains	any URI		
Comments:			
UE ( Gm#1)		Test equipn	nent ( Gm#2)
	Establishment of s	session #1	
INVITE	<b>←</b>	INVITE (Ses	sion #2)
180 Ringing	<b>→</b>	180 Ringing	
200 OK INVITE	<b>→</b>	200 OK INVI	TE
ACK	<b>←</b>	ACK	
	_		
BYE (Session #1)	<b>→</b>	BYE	
200 OK BYE	<del>(</del>	200 OK BYE	
	Apply post test	routine	

# SERIES OF ITU-T RECOMMENDATIONS

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