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SERIES Q: SWITCHING AND SIGNALLING

Testing specifications – Testing specifications for SIP-IMS

Communication waiting service using IP multimedia core network subsystem; Conformance testing – Part 3: User side; Test suite structure and test purposes

Recommendation ITU-T Q.4006.3

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Recommendation ITU-T Q.4006.3

Communication waiting service using IP multimedia core network subsystem; Conformance testing – Part 3: User side; Test suite structure and test purposes

Summary

Recommendation ITU-T Q.4006.3 v.1 (2016) is part 3 of the testing specifications for communication waiting service (CW) implemented on IP multimedia subsystem (IMS) basis on the user side. The Recommendation specifies the test suite structure and test purposes (TSS&TP) which can be used for testing against Recommendation ITU-T Q.3622 v.1, "Communication waiting using IP multimedia core network subsystem – Protocol specification".

The version number, v.1, indicates that this is version one of Recommendation ITU-T Q.4006.3 and that it relates to Release 10 of the relevant 3GPP/ETSI standard.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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Keywords

Communication waiting, CW, IP multimedia subsystem, IMS, network side, session description protocol, SDP, session initiation protocol, SIP, testing, test purposes, TP, test suite structure, TSS, user side.

* 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, <http://handle.itu.int/11.1002/1000/11830-en>.

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Recommendation ITU-T Q.4006.3

Communication waiting service 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 (TSS) and test purposes (TP) for the test specifications for the communication waiting (CW) for the user side using IP multimedia (IM) core network (CN) subsystem as specified in [ITU-T Q.3622 v.1] in compliance with the relevant requirements and in accordance with the relevant guidance given in [ITU-T X.296].

2 References

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.

[ITU-T Q.3622 v.1]	Recommendation ITU-T Q.3622 v.1 (2016), <i>Communication waiting using IP multimedia core network subsystem – Protocol specification</i> .
[ITU-T Q.4006.1 v.1]	Recommendation ITU-T Q.4006.1 v.1 (2016), <i>Communication waiting service using IP multimedia core network subsystem; Conformance testing – Part 1: Network side and user side; Protocol implementation conformance statement</i> .
[ITU-T X.290]	Recommendation ITU-T X.290 (1995), <i>OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts</i> .
[ITU-T X.296]	Recommendation ITU-T X.296 (1995), <i>OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements</i> .

3 Definitions

For the purposes of this Recommendation, the terms and definitions given in [ITU-T Q.3622 v.1] and the following apply:

- 3.1 implementation under test (IUT):** Refer to [ITU-T X.290].
- 3.2 PICS proforma:** Refer to [ITU-T X.290].
- 3.3 point of control and observation:** Refer to [ITU-T X.290].
- 3.4 protocol implementation conformance statement (PICS):** Refer to [ITU-T X.290].
- 3.5 system under test (SUT):** Refer to [ITU-T X.290].
- 3.6 test purpose (TP):** Refer to [ITU-T X.290].

NOTE – This may contain additional information.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AS	Application Server
CW	Communication Waiting
IMS	IP Multimedia Subsystem
IP	Internet protocol
ISC	IP Multimedia Subsystem Service Control
IUT	Implementation Under Test
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SUT	System Under Test
TP	Test Purposes
TSS	Test Suite Structure
UE	User Equipment

5 Test suite structure (TSS) and test configuration

Table 1

CW			
	destination_UE		CW_U01_xxx
	originating_UE		CW_U02_xxx

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.3622 v.1]. The stage 3 description respects the requirements to several network entities and also to requirements regarding end devices. Therefore several interfaces (reference points) are addressed to satisfy the test of the different entities.

Therefore to test the appropriate entity the configurations below is applicable:

Testing of user equipment: There are several requirements regarding end devices. Therefore a special configuration is applicable.

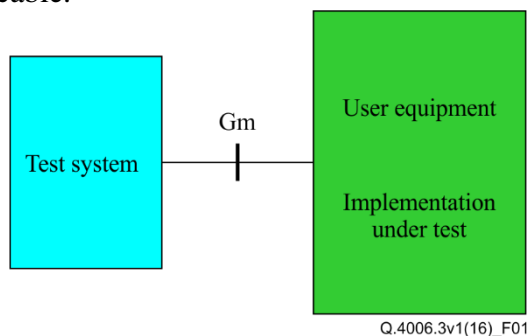


Figure 1 – Applicable configuration to test the user equipment

6 Test purposes (TP)

6.1 Introduction

For each test requirement a 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., "CW"	
<iut>	= type of IUT:	U	User - equipment
		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.3622 v.1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the protocol implementation conformance statement (PICS) specification [ITU-T Q.4006.1 v.1]. The criteria applied include the following:

- whether or not a test case can be built from the TP is not considered.

6.2 TPs for communication waiting (CW)

6.2.1 Test purposes at the destination (user B) UE

TSS CW/destination_UE	TP CW_U01_001	Reference Clause 4.5.5.3.2 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4
Test purpose <i>The terminating user equipment applies the communication waiting indication to the user.</i>			
Ensure that the user B user equipment is able to notify the user that the communication establishment is waiting.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml Content-Disposition: 3gpp-alternative-service MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system		User equipment	
Establish a confirmed communication			
INVITE	→		
100 Trying	←		
180 Ringing	←		
		Indicate Communication Waiting to the user	
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_002	Reference Clause 4.5.5.3.2 of ITU-T Q.3622 v.1	Selection expression PICS 5.1/1 AND PICS 5.2/4
Test purpose <i>The terminating user equipment sends a 180 Ringing if UDUB does not apply.</i>			
Ensure that the user B user equipment is able to send a 180 Ringing if the terminal is not User determined User Busy.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system		User equipment	
Establish a confirmed communication			
INVITE	→		
100 Trying	←		
180 Ringing	←		
Apply post test routine			

TSS	TP	Reference	Selection expression
CW/destination_UE	CW_U01_003	Clause 4.5.5.3.2 of [ITU-T Q.3622 v.1]	PICS 5.1/1 AND PICS 5.2/3 AND PICS 5.2/4
Test purpose <i>The terminating user equipment sends a 180 Ringing if UDUB does not apply. A communication waiting indication is contained in the 180.</i>			
Ensure that the user B user equipment is able to send a 180 Ringing if the terminal is not User determined User Busy. Ensure that Communication Waiting is contained in the Alert-Info header and the value is <urn:alert:service:call-waiting>.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
180 Ringing Alert-Info: <urn:alert:service:call-waiting>			
Comments:			
Test system		User equipment	
Establish a confirmed communication			
INVITE	→		
100 Trying	←		
180 Ringing	←		
Alert-Info: <urn:alert:service:call-waiting>			
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_004	Reference Clause 4.5.5.3.2 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/3
Test purpose <i>The terminating user equipment is able to send a communication waiting indication in a 180 response.</i>			
Ensure that the user B user equipment is able to accept a waiting communication and sends a communication waiting indication in the 180 Ringing response. An Alert-Info header is contained in the 180 and the value is <urn:alert:service:call-waiting>.			
Preconditions:			
SIP header values:			
180 Ringing Alert-Info: <urn:alert:service:call-waiting>			
Comments:			
Test system		User equipment	
Establish a confirmed communication			
INVITE		➔	
100 Trying		➔	
180 Ringing		Alert-Info:	
<urn:alert:service:call-waiting>		➔	
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_005	Reference Clause 4.5.5.3.3 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4 AND PICS 5.2/5
Test purpose <i>The terminating user equipment starts timer T_{AS-CW} and the timer is expired.</i>			
Ensure that the user B user equipment is able to start timer T _{AS-CW} . If the timer is expired, the user equipment stops the communication waiting to the user.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system		User equipment	
Establish a confirmed communication			
INVITE		→	
100 Trying		←	
180 Ringing		←	
		Start timer T _{UE-CW}	
		Timeout T _{UE-CW}	
480 Temporarily Unavailable		←	
ACK		→	
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_006	Reference Clause 4.5.5.3.2 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND NOT PICS 5.2/4
Test purpose <i>The terminating user equipment sends a 415 Unsupported Media Type if the received INVITE contains a XML CW MIME attachment indicating CW.</i>			
Ensure that the user B User Equipment is able to send a 415 Unsupported Media Type if the User Equipment does not support the CW XML MIME attachment indicating Communication Waiting.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system		User equipment	
Establish a confirmed communication			
INVITE	→		
415 Unsupported Media Type	←		
ACK	→		

TSS CW/destination_UE	TP CW_U01_007	Reference Clause 4.5.5.3.3 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4
Test purpose <i>The terminating user equipment holds current communication and accepts the waiting call.</i>			
Ensure that the user B user equipment is able set the current active communication on hold and accepts the waiting communication. After the communication with the previous waiting communication is active, the CW indication is stopped.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system		User equipment	
Establish a confirmed communication (1)			
INVITE (2)		➔	
100 Trying		➔	
180 Ringing (2)		➔	
INVITE (1, sendonly)		➔	
200 OK INVITE (1, recvonly)		➔	
ACK		➔	
200 OK INVITE (2)		➔	
ACK		➔	
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_008	Reference Clause 4.5.5.3.3 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4
Test purpose <i>The terminating user equipment is able to release current communication and accepts the waiting call.</i> Ensure that the user B user equipment is able release the current active communication and accepts the waiting communication. After the communication with the previous waiting communication is active, the CW indication to the user is stopped.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system	User equipment		
Establish a confirmed communication (1)			
INVITE (2)	➔		
100 Trying	⬅		
180 Ringing (2)	⬅		
BYE (1)	⬅		
200 OK BYE (1)	➔		
200 OK INVITE (2)	⬅		
ACK	➔		
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_009	Reference Clause 4.5.5.3.3 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4
Test purpose <i>The terminating user equipment is able to accept the waiting call after the current active communication is released by the User A.</i>			
Ensure that the user B user equipment is able to accept the waiting communication after the remote active user (user A) released the active communication. After the communication with the previous waiting communication is activated the CW indication to the user is stopped.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system	User equipment		
Establish a confirmed communication (1)			
INVITE (2)	➔		
100 Trying	➔		
180 Ringing (2)	➔		
BYE (1)	➔		
200 OK BYE (1)	➔		
200 OK INVITE (2)	➔		
ACK	➔		
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_010	Reference Clause 4.5.5.3.3 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4
Test purpose <i>The terminating user equipment is able to accept the waiting call after the current active communication is released by the user C.</i>			
Ensure that the user B user equipment is able to apply the terminating UE procedures upon receipt of BYE from user C. After the communication with the previous waiting communication is released, the CW indication to the user is stopped.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/ vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments:			
Test system		User equipment	
Establish a confirmed communication (1)			
INVITE (2)		→	
100 Trying		←	
180 Ringing (2)		←	
CASE A			
BYE (2)		→	
200 OK BYE (2)		←	
487 Request Terminated		←	
ACK		→	
CASE B			
CANCEL (2)		→	
200 OK CANCEL (2)		←	
487 Request Terminated		←	
ACK		→	
Apply post test routine			

TSS CW/destination_UE	TP CW_U01_005	Reference Clause 4.5.5.3.3 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/4 AND PICS 5.2/5
Test purpose <i>The terminating user equipment starts timer T_{AS-CW} and the timer expires. The value is used from the Expires header in the received INVITE.</i> Ensure that the user equipment from user B is able to start timer T_{AS-CW} . The value is used from the Expires header in the received INVITE indicating communication waiting. If the timer is expired, the user equipment stops the communication waiting to the user.			
Preconditions:			
SIP header values: INVITE: MIME body Content-Type: application/vnd.3gpp.cw+xml MIME XML ims-cw xmlns="urn:3gpp:ns:cw:1.0" communication-waiting-indication			
Comments: <div> <div>Test system</div> <div>User equipment</div> <div> <p>Establish a confirmed communication</p> <p>INVITE →</p> <p>100 Trying ←</p> <p>180 Ringing ←</p> <p>Start timer T_{UE-CW}</p> <p>Timeout T_{UE-CW}</p> <p>480 Temporarily Unavailable ←</p> <p>ACK →</p> <p>Apply post test routine</p> </div> </div>			

6.2.2 Test purposes at the originating (user C) UE

TSS CW/originating_UE	TP CW_U02_001	CB reference Clause 4.5.2.10 of [ITU-T Q.3622 v.1]	Selection expression PICS 5.1/1 AND PICS 5.2/2
Test purpose <i>The originating user receives the communication waiting indication.</i> Ensure that the originating user equipment has the ability to receive the "communication is waiting" indication in the Alert-Info header value <urn:alert:service:call-waiting>. Ensure that this notification is reported to the user.			
Preconditions:			
SIP header values: 180 Ringing Alert-Info: <urn:alert:service:call-waiting>			
Comments: <div> <div>User equipment</div> <div>Test system</div> <div> <p>←</p> <p>→</p> <p>→</p> <p>Apply post test routine</p> </div> </div>			

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