

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.4006.3

(02/2016)

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

ITU-T



ITU-T Q-SERIES RECOMMENDATIONS
SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1–Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4–Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60–Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100–Q.119
SPECIFICATIONS OF SIGNALLING SYSTEMS No. 4, 5, 6, R1 AND R2	Q.120–Q.499
DIGITAL EXCHANGES	Q.500–Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600–Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700–Q.799
Q3 INTERFACE	Q.800–Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850–Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000–Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100–Q.1199
INTELLIGENT NETWORK	Q.1200–Q.1699
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR IMT-2000	Q.1700–Q.1799
SPECIFICATIONS OF SIGNALLING RELATED TO BEARER INDEPENDENT CALL CONTROL (BICC)	Q.1900–Q.1999
BROADBAND ISDN	Q.2000–Q.2999
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR THE NGN	Q.3000–Q.3899
TESTING SPECIFICATIONS	Q.3900–Q.4099
Testing specifications for next generation networks	Q.3900–Q.3999
Testing specifications for SIP-IMS	Q.4000–Q.4039
Testing specifications for Cloud computing	Q.4040–Q.4059

For further details, please refer to the list of ITU-T Recommendations.

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*
1.0	ITU-T Q.4006.3 v.1	2016-02-13	11	11.1002/1000/12743

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>.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2016

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

	Page
1 Scope.....	1
2 References.....	1
3 Definitions	1
4 Abbreviations and acronyms	2
5 Test suite structure (TSS) and test configuration	2
5.1 Configuration.....	2
6 Test purposes (TP).....	3
6.1 Introduction	3
6.2 TPs for communication waiting (CW)	3

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), *Communication waiting using IP multimedia core network subsystem – Protocol specification*.

[ITU-T Q.4006.1 v.1] Recommendation ITU-T Q.4006.1 v.1 (2016), *Communication waiting service using IP multimedia core network subsystem; Conformance testing – Part 1: Network side and user side; Protocol implementation conformance statement*.

[ITU-T X.290] Recommendation ITU-T X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts*.

[ITU-T X.296] Recommendation ITU-T X.296 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements*.

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

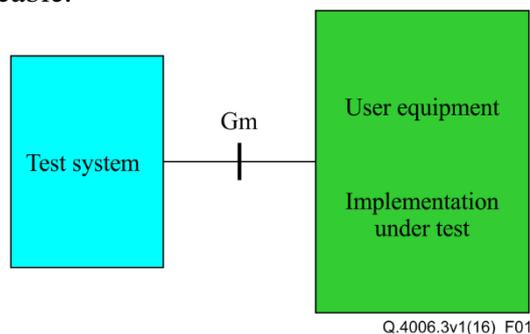
CW			
	destination_UE		CW_U01_XXX
	originating_UE		CW_U02_XXX

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.



Q.4006.3v1(16)_F01

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	TP	Reference	Selection expression
CW/destination_UE	CW_U01_001	Clause 4.5.5.3.2 of [ITU-T Q.3622 v.1]	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	TP	Reference	Selection expression
CW/destination UE	CW_U01_002	Clause 4.5.5.3.2 of ITU-T Q.3622 v.1	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>			
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
<p>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></p> <p>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.</p>			
Preconditions:			
<p>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</p>			
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
<p>Test purpose 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.</p> <p>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.</p>			
Preconditions:			
<p>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</p>			
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			

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
<p>Test purpose The originating user receives the communication waiting indication. 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.</p>			
Preconditions:			
<p>SIP header values: 180 Ringing Alert-Info: <urn:alert:service:call-waiting></p>			
Comments:			
User equipment		Test system	
	←		INVITE
	→		100 Trying
	→		180 Ringing
Apply post test routine			

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities
Series Z	Languages and general software aspects for telecommunication systems