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TECHNICAL SPECIFICATION

**Core Network and Interoperability Testing (INT);
Communication Waiting (CW) using IP Multimedia (IM)
Core Network (CN) subsystem;
Conformance test specification (3GPP™ Release 12);
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 Core Network and Interoperability Testing (INT).

The present document is part 2 of a multi-part deliverable covering the Conformance Test Specification of Communication Waiting (CW) 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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1   Scope

The present document provides the Test Suite Structure (TSS) and Test Purposes (TP) for the test specifications for the Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem as specified in ETSI TS 124 615 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4] and ETSI ETS 300 406 [5].

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.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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

[1]   ETSI TS 124 615: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification (3GPP TS 24.615 Release 12)".

[2]   ETSI TS 186 022-1: "Core Network and Interoperability Testing (INT); Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem; Conformance test specification (3GPP™ Release 12); Part 1: Protocol Implementation Conformance Statement (PICS)".

[3]   ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".

[4]   ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[5]   ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

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 124 615 [1] and the following apply:

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [3].

PICS pro forma: Refer to ISO/IEC 9646-1 [3].

Point of Control and Observation: Refer to ISO/IEC 9646-1 [3].

Protocol Implementation Conformance Statement (PICS): Refer to ISO/IEC 9646-1 [3].

System Under Test (SUT): Refer to ISO/IEC 9646-1 [3].

Test Purposes (TP): Refer to ISO/IEC 9646-1 [3].

   NOTE: This may contain additional information.

3.2 Symbols

For the purposes of the present document, the symbols given in ETSI TS 124 615 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 124 615 [1] and the following apply:

AS	Application Server
CW	Communication Waiting
ISC	IP Multimedia Subsystem Service Control
IUT	Implementation Under Test
SUT	System Under Test
UE	User Equipment

4 Test Suite Structure (TSS) and configuration

4.1 Test Suite Structure

Table 4.1: Test suite structure

CW			
	destination_UE		CW_U01_xxx
	originating_UE		CW_U02_xxx
	AS		CW_N01_xxx
	interaction	CDIV	CW_N02_xxx
	configuration		CW_N03_xxx

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 124 615 [1]. The stage 3 description respects the requirements to several network entities and requirements regarding 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 4.1 points to this.
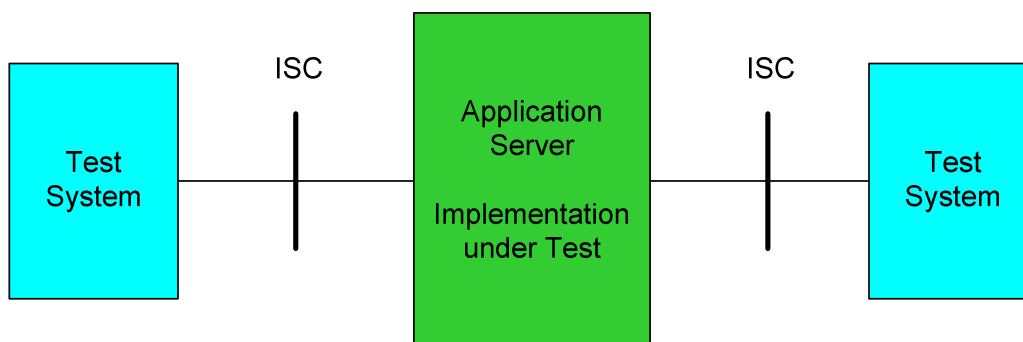

Figure 4.1: Applicable interface to test AS functionalities

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). 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.
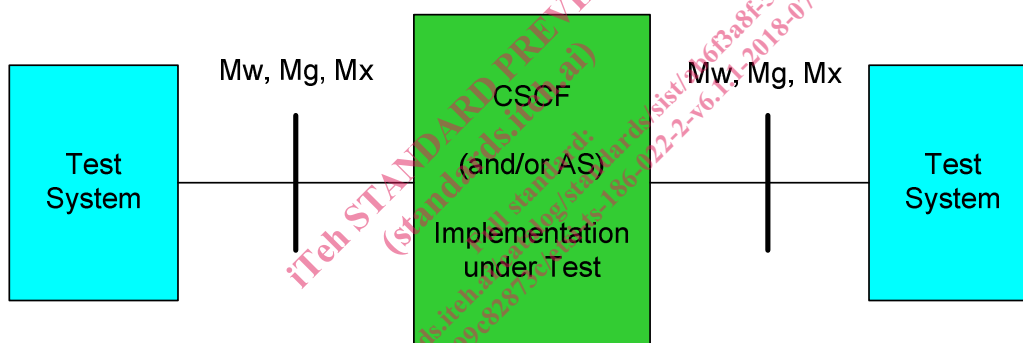

Figure 4.2: Applicable interfaces to test using the (generic) NNI interface

Figure 4.3 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.
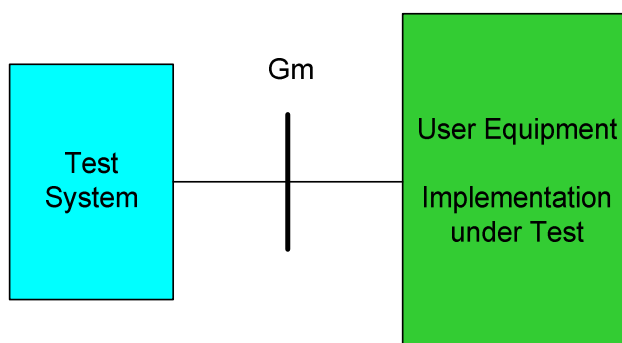

Figure 4.3: Applicable configuration to test the User Equipment

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).

Table 5.1: 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)

5.1.2   Test strategy

As the base standard ETSI TS 124 615 [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 186 022-1 [2]. The criteria applied include the following:

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

5.2 TPs for Communication Waiting (CW)

5.2.1 Test purposes at the destination (user B) UE

TSS CW/destination_UE	TP CW_U01_001	Reference 4.5.5.3.2/[1]	Selection expression PICS 4.5.1/1 AND PICS 4.6.1/4
Test purpose *The terminating User Equipment applies the Communication Waiting indication to the user.* 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 4.5.5.3.2/[1]	Selection expression PICS 4.5.1/1 AND PICS 4.6.1/4
Test purpose *The terminating User Equipment sends a 180 Ringing if UDUB does not apply.* 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 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 ← **Apply post test routine**			

TSS CW/destination_UE	TP CW_U01_003	Reference 4.5.5.3.2/[1]	Selection expression PICS 4.5.1/1 AND PICS 4.6.1/3 AND PICS 4.6.1/4

Test purpose
The terminating User Equipment sends a 180 Ringing if UDUB does not apply. A Communication Waiting indication is contained in the 180.

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
Content_Disposition: 3gpp-alternative-service
MIME XML
   ims-cw xmlns="urn:3gpp:ns:cw:1.0"

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 4.5.5.3.2/[1]	Selection expression PICS 4.5.1/1 AND PICS 4.6.1/3

Test purpose
The terminating User Equipment is able to send a Communication Waiting indication in a 180 response.

Ensure that the user B User Equipment is able to accept a waiting communication and sends a Communication Waiting indication I 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