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SERIES Q: SWITCHING AND SIGNALLING, AND ASSOCIATED MEASUREMENTS AND TESTS

Testing specifications – Testing specifications for SIP-IMS

PSTN/ISDN terminal equipment using IP Multimedia core network subsystem – Conformance testing – Part 1: PICS

Recommendation ITU-T Q.4014.1

ITU-T Q-SERIES RECOMMENDATIONS

SWITCHING AND SIGNALLING, AND ASSOCIATED MEASUREMENTS AND TESTS

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.3709
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR SDN	Q.3710–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
Testing specifications for IMT-2020 and IoT	Q.4060–Q.4099
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR IMT-2020	Q.5000–Q.5049
COMBATING COUNTERFEITING AND STOLEN ICT DEVICES	Q.5050–Q.5069

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

Recommendation ITU-T Q.4014.1

PSTN/ISDN terminal equipment using IP Multimedia core network subsystem – Conformance testing – Part 1: PICS

Summary

Recommendation ITU-T Q.4014.1 is part 1 of the testing specifications of the terminal equipment used in the IP multimedia subsystem (IMS) based PSTN/ISDN emulation subsystem based on the media gateway control protocol, the session initiation protocol and the associated session description protocol.

This Recommendation specifies the protocol implementation conformance statement (PICS) to test PSTN/ISDN terminal equipment using the IP multimedia core network subsystem.

History

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Table of Contents

			Page
1	Scope		1
2	References		1
3	Definitions		2
	3.1	Terms defined elsewhere	2
	3.2	Terms defined in this Recommendation	3
4	Abbreviations and acronyms		3
5	Conventions		3
6	Guidance for completing the ICS proforma		4
	6.1	Purposes and structure of ICS proforma	4
	6.2	ICS proforma abbreviations and conventions	4
	6.3	Instructions for completing the PICS proforma	5
7	Identification of the implementation under test		5
	7.1	Date of the statement	6
	7.2	Identification of ETSI TS 183 043	7
	7.3	Global statement of conformance	8
	7.4	User role	8
Bibliography			12

Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called an implementation conformance statement (ICS).

Recommendation ITU-T Q.4014.1

PSTN/ISDN terminal equipment using IP Multimedia core network subsystem – Conformance testing – Part 1: PICS

1 Scope

This Recommendation provides the implementation conformance statement (ICS) proforma for the *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based PSTN/ISDN Emulation; Stage 3* specification defined in [ETSI TS 183 043] in compliance with the relevant requirements and in accordance with the relevant guidance given in [ITU-T X.296] and [b-ETSI 300 406].

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 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*.

[ETSI TS 124 147] ETSI TS 124 147 (2015), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Conferencing using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3.*

[ETSI TS 124 229] ETSI TS 124 229 (2019), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 Release 10).*

[ETSI TS 124 605] ETSI TS 124 605 (2013), *Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.605 version 10.1.0 Release 10).*

[ETSI TS 124 608] ETSI TS 124 608 (2013), *Digital cellular telecommunications system (Phase 2+);Universal Mobile Telecommunications System (UMTS); LTE; Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.608 version 10.1.0 Release 10).*

[ETSI TS 124 628] ETSI TS 124 628 (2013), *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 24.628 version 10.4.0 Release 10).*

[ETSI TS 129 163] ETSI TS ETSI TS 129 163 (2019), *Digital cellular telecommunications system (Phase 2+) (GSM);Universal Mobile Telecommunications System (UMTS); LTE; Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks*.

[ETSI TS 183 036] ETSI TS 183 036 (2012), *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); ISDN/SIP interworking; Protocol specification*.

[ETSI TS 183 043] ETSI TS 183 043 (2011), *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based PSTN/ISDN Emulation; Stage 3 specification*.

[IETF RFC 768] IETF RFC 768 (1980), *User Datagram Protocol*.

[IETF RFC 793] IETF RFC 793 (1981), *Transmission Control Protocol*.

[IETF RFC 2327] IETF RFC 2327 (1998), *SDP: Session Description Protocol*.

[IETF RFC 2805] IETF RFC 2805 (2000), *Media Gateway Control Protocol Architecture and Requirements*.

[IETF RFC 3261] IETF RFC 3261 (2002), *SIP: Session Initiation Protocol*.

[IETF RFC 3262] IETF RFC 3262 (2002), *Integration of Resource Management and Session Initiation Protocol (SIP)*.

[IETF RFC 3312] IETF RFC 3312 (2002), *Reliability of Provisional Responses in the Session Initiation Protocol (SIP)*.

[IETF RFC 3323] IETF RFC 3323 (2002), *A Privacy Mechanism for the Session Initiation Protocol (SIP)*.

[IETF RFC 3325] IETF RFC 3325 (2002), *Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity within Trusted Networks*.

[IETF RFC 5009] IETF RFC 5009 (2007), *Private Header (P-Header) Extension to Session Initiation Protocol (SIP) for Authorization of Early Media*.

[IETF RFC 6080] IETF RFC 6080 (2011), *A Framework for Session Initiation Protocol User Agent Profile Delivery*.

[IETF RFC 6140] IETF RFC 6140 (2011), *Registration for Multiple Phone Numbers in the Session Initiation Protocol (SIP)*.

3 Definitions

3.1 Terms defined elsewhere

The terms and definitions defined in [ETSI TS 183 043] and [ETSI TS 124 229] and in [ITU-T X.290] and [ITU-T X.296] shall apply.

In particular, the following terms and definitions defined in [ITU-T X.290] apply:

3.1.1 implementation conformance statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities

have been implemented. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

3.1.2 ICS proforma: A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

3.1.3 protocol ICS (PICS): An ICS for an implementation or system claimed to conform to a given protocol specification.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

IAD	Integrated Access Device
ICS	Implementation Conformance Statement
IMS	IP Multimedia Subsystem
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
PES	PSTN/ISDN Emulation Sub-system
PDU	Protocol Data Unit
PICS	Protocol ICS
PSTN	Public Switched Telephone Network
SCS	System Conformance Statement
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SUT	System Under Test
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networking

5 Conventions

A protocol implementation conformance statement (PICS) proforma that conforms to this PICS proforma specification shall be technically equivalent to that described in clause 6 and shall preserve the numbering and ordering of the items as in clause 6.

A PICS that conforms to this PICS proforma specification shall:

a) describe an implementation which is claimed to conform to *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based PSTN/ISDN Emulation; Stage 3 specification*;

b) be a conforming PICS proforma which has been completed in accordance with the instructions for completion given in clause 6;

c) include the information necessary to uniquely identify both the supplier and the implementation.

6 Guidance for completing the ICS proforma

6.1 Purposes and structure of ICS proforma

The purpose of this PICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in [ETSI TS 183 043] and [ETSI TS 124 229] may provide information about the implementation in a standardized manner.

The ICS proforma is subdivided into clauses for the following categories of information:

– guidance for completing the PICS proforma;
– identification of the implementation;
– identification of [ETSI TS 183 043];
– global statement of conformance:
  • user role;
  • major capabilities;
  • [IETF RFC 3261] capabilities;
  • IMS-based PSTN/ISDN emulation capabilities.

6.2 ICS proforma abbreviations and conventions

The ICS proforma contained in this clause is comprised of information in tabular form in accordance with the guidelines presented in [ITU-T X.296].

Item column

The item column contains a number which identifies the item in the table.

Item description column

The item description column describes in free text each respective item (e.g., parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

Status column

The following notations, defined in [ITU-T X.296], are used for the status column:

m mandatory – the capability is required to be supported.
o optional – the capability may be supported or not.
n/a not applicable – in the given context, it is impossible to use the capability.
o.i qualified optional – for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection.
ci conditional – the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table.

Reference column

The reference column makes reference to [ETSI TS 124 229] and [ETSI TS 183 043], except where explicitly stated otherwise.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in [ITU-T X.296], are used for the support column:

– Y or y – supported by the implementation.
– N or n – not supported by the implementation.

– N/A, n/a or – no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

If this PICS proforma is completed in order to describe a multiple-profile support in a system, it is necessary to be able to answer that a capability is supported for one profile and not supported for another. In that case, the supplier shall enter the unique reference to a conditional expression, preceded by "?" (e.g., ?3). This expression shall be given in the space for comments provided at the bottom of the table. It uses predicates defined in the system conformance statement (SCS), each of which refers to a single profile and which takes the value TRUE if and only if that profile is to be used.

EXAMPLE 1: ?3: IF prof1 THEN Y ELSE N

NOTE – As stated in [ITU-T X.296], support for a received protocol data unit (PDU) requires the ability to parse all valid parameters of that PDU. Supporting a PDU while having no ability to parse a valid parameter is non-conformant. Support for a parameter on a PDU means that the semantics of that parameter are supported.

References to items

For each possible item answer (answer in the support column) within the ICS proforma a unique reference exists, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.), respectively.

Prerequisite line

A prerequisite line takes the form: Prerequisite: <predicate>.

A prerequisite line after a clause or table title indicates that the whole clause or the whole table is not required to be completed if the predicate is FALSE.

6.3 Instructions for completing the PICS proforma

The supplier of the implementation shall complete the ICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided, using the notation described in clause 6.2.

If necessary, the supplier may provide additional comments in space at the bottom of the tables or separately.

More detailed instructions are given at the beginning of the different clauses of the ICS proforma.

7 Identification of the implementation under test

Identification of the implementation under test (IUT) and the system in which it resides referred to as the system under test (SUT) should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the PICS should be named as the contact person.

7.1 Date of the statement

.....

7.1.1 Implementation under test (IUT) identification

IUT name:

.....

.....

IUT version:

.....

7.1.2 System under test (SUT) identification

SUT name:

.....

.....

Hardware configuration:

.....

.....

.....

Operating system:

.....

7.1.3 Product supplier

Name:

.....

Address:

.....

.....

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

.....

7.1.4 Client (if different from product supplier)

Name:

.....

Address:

.....

.....

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

7.1.5 PICS contact person

(A person to contact if there are any queries concerning the content of the ICS)

Name:

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

.....

7.2 Identification of ETSI TS 183 043

This PICS proforma applies to the following standard:

[ETSI TS 183 043]: *Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based PSTN/ISDN Emulation; Stage 3 specification*.

7.3 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No).....

NOTE – Answering "No" to this question indicates non-conformance to the <reference specification type> specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS proforma.

7.4 User role

This clause contains the PICS proforma tables related to the user role. They need to be completed only for user implementations:

7.4.1 Major capabilities

Table 1 – End device interworking

Item	End device basic requirements	Reference	Status	Support
1	IMS-based PSTN/ISDN Emulation	[ETSI TS 183 043]	o.1	
2	ISDN/SIP interworking	[ETSI TS 183 036]	o.1	

o..1: It is mandatory to support at least one of these items.

Comments:

Table 2 – Used IP transport protocols

Item	Used IP transport protocols	Reference	Status	Support
1	UDP Transport	[IETF RFC 768]	o.1	
2	TCP Transport	[IETF RFC 793]	o.1	

o..1: It is mandatory to support at least one of these items.

Comments:

Table 3 – Functional entities

Item	Functional entities	Reference	Status	Support
1	Access Gateway Control Function (AGCF)	5.2.2 of [ETSI TS 183 043]	o.1	
2	Voice over IP gateway (VGW) acting as Access Gateway	5.2.7 of [ETSI TS 183 043]	o.1	

o..1: It is mandatory to support at least one of these items.

Comments:

7.4.2 IETF RFC 3261 capabilities

Table 4 – Capabilities regarding the requirements in [IETF RFC 3261]

Item	Does the SUT	Reference	Status	Support
1	Supports Registration procedures configured registrar address	[IETF RFC 3261] section 10.2.6	o	
2	Supports Registration procedures registration using the 'multicast' mechanism	[IETF RFC 3261] section 10.2.6	o	
3	Send send the REGISTER request and the Contact header contains a GRUU	[ETSI TS 124 229] section 5.1.1.2.1	o	
4	Supports the Registration for Multiple Phone Numbers in the Session Initiation Protocol (SIP)	[IETF RFC 6140]	o	
5	Performs the functions of an external attached network	[ETSI TS 124 229] section 5.1.1.2.1	o	
6	Support removing bindings	[IETF RFC 3261], section 10.2.2	o	
7	Support querying bindings	[IETF RFC 3261], section 10.2.1	o	
8	Support SIP timer T1	[IETF RFC 3261], section 17.1.2.1, Table 4	m	
9	Support SIP timer T2	[IETF RFC 3261], section 17.1.2.1, Table 4	m	
10	Support SIP timer T4	[IETF RFC 3261], section 17.1.2.1, Table 4	m	
11	Support SIP timer E	[IETF RFC 3261], section 17.1.2.1, Table 4	m	
12	Support SIP timer F	[IETF RFC 3261], section 17.1.2.1, Table 4	m	
13	Support SIP timer K	[IETF RFC 3261], section 17.1.2.1, Table 4	m	
14	Supports the Integration of Resource Management and Session Initiation Protocol (SIP)	[IETF RFC 3312]	o	
15	Supports Reliability of Provisional Responses in the Session Initiation Protocol	[IETF RFC 3262]	o	
16	Support the extension to the Session Initiation Protocol (SIP) for Authorization of Early Media	[IETF RFC 5009]	o	
17	Supports the P Preferred Identity in INVITE requests	[IETF RFC 3325]	o	
18	Sends a BYE request to terminate an early dialogue	Section 17.1.2.2 and Annex A of [IETF RFC 3261]	o	
19	Support the Call Waiting for analogue lines	C.9 of [ETSI TS 183 043]	o	

Comments:

7.4.3 IMS-based PSTN/ISDN emulation capabilities

Table 5 – IMS-based PSTN/ISDN emulation capabilities

Item	Does the SUT	Reference	Status	Support
1	Support Framework for Session Initiation Protocol User Agent Profile Delivery	[IETF RFC 6080]	o	
2	Support the AOC Extended XML Schema	E.3 of [ETSI TS 183 043]	o	
3	Determined independently of access indications that the complete called party number has been received	F.1 of [ETSI TS 183 043]	o	
4	Support the overlap dialling using multiple-INVITE method	F.2.1.1.1 of [ETSI TS 183 043]	o	
5	Support the Overlap dialling using in dialog method	F.3 of [ETSI TS 183 043]	o	
6	Support the Flash Hook management for analogue access	B.4.2 of [ETSI TS 183 043]	o	
7	Support the interworking of History-Info header into the H.248 andisp package	C.7.2.6 of [ETSI TS 183 043]	o	
8	Support the Three Party Service for analogue lines	C.14 of [ETSI TS 183 043]	o	
9	Support the Loose Coupling procedure for analogue lines	B.4.2.2.2 of [ETSI TS 183 043]	o	
10	Support the Tight Coupling procedure for analogue lines	B.4.2.2.3 of [ETSI TS 183 043]	o	
11	Support the Loose Coupling procedure using Option1 with INVITE method	C.14.2 of [ETSI TS 183 043]	o	
12	Support the Loose Coupling procedure using Option 2 with REFER method	C.14.2A of [ETSI TS 183 043]	o	
13	support the Loose Coupling procedure using Option 3 by sending INVITE request with URI list	C.14.2B of [ETSI TS 183 043]	o	
14	Support the Call Waiting for analogue lines	C.9/[ETSI TS 183 043]	o	
15	Support the Malicious Call Identification (Loose coupling) for analogue lines	C.11 of [ETSI TS 183 043]	o	
16	Support the Malicious Call Identification (Tight coupling) for analogue lines	C.11A of [ETSI TS 183 043]	o	
17	Support MCID service is provisioned and requires initial flash-hook detection assume direct invocation of MCID	C.11A of [ETSI TS 183 043]	o	
17	Support MCID invoke using re-INVITE including a XML-MIME with XML mcid body with MCID XML Request schema containing a McidRequestIndicator set to 1	B.4.2.2.2 of [ETSI TS 183 043]	o	
19	Support the Message Waiting Indicator for analogue lines	C.12 of [ETSI TS 183 043]	o	

Comments:

7.4.4 ISDN/SIP interworking capabilities

Table 6 – ISDN/SIP interworking capabilities

Item	Does the SUT	Reference	Status	Support
1	Support the PSTN XML schema	Annex F of [ETSI TS 129 163]	o	
2	Support the change of the From header value in the UPDATE request indicated with the 'from-change' tag in the Supported header	4.5.2.1 of [ETSI TS 124 608]	o	
3	Support the interworking of the connected number in the ISDN CONNECT message int the 200 IK INVITE	5.2.2.1.2 of [ETSI TS 183 036]	o	
4	Support the interworking procedures for Communication Hold (HOLD)	5.2.1 of [ETSI TS 183 036]	o	
5	Support the interworking procedures for Communication Diversion Services (CDIV)	5.2.5 of [ETSI TS 183 036]	o	
6	Support the conference event package	5.3.3 of [ETSI TS 124 147]	o	
7	Support the interworking of the Three-party (3PTY)	5.2.13 of [ETSI TS 183 036]	o	
8	Support the REFER method when received?	5.3.1.4.2 of [ETSI TS 124 147]	o	
9	Support the interworking of Closed User Group (CUG)	5.2.9 of [ETSI TS 183 036]	o	
10	Support the interworking of Call Waiting (CW)	5.2.11 of [ETSI TS 183 036]	o	
11	Supports the interworking of Terminal Portability (TP)	5.2.12 of [ETSI TS 183 036]	o	
12	Supports the interworking of Explicit Communication Transfer (ECT)	5.2.7 of [ETSI TS 183 036]	o	
13	Supports the interworking of User-to-User service 1 (UUS1)	5.2.10.1.1, 5.2.10.1.2 of [ETSI TS 183 036]	o	
14	Supports the interworking of User-to-User service 2 (UUS2)	5.2.10.1.3 of [ETSI TS 183 036]	o	
15	Supports the interworking of User-to-User service 3 (UUS3)	5.2.10.1.4 of [ETSI TS 183 036]	o	
16	Supports the interworking of Subaddressing (SUB)	5.2.8 of [ETSI TS 183 036]	o	
17	Supports the interworking of Malicious Call Identification (MCID).	5.2.6 of [ETSI TS 183 036]	o	
18	Supports the interworking of Malicious Call Identification (MCID). The XML 'mcid' MIME body is used	5.2.6 of [ETSI TS 183 036]	o	
19	Support the interworking of Message Waiting Indication (MWI)	5.2.17 of [ETSI TS 183 036]	o	

Comments:

Bibliography

[b-ETSI 300 406] ETSI ETS 300 406 (1995), *Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology*.

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