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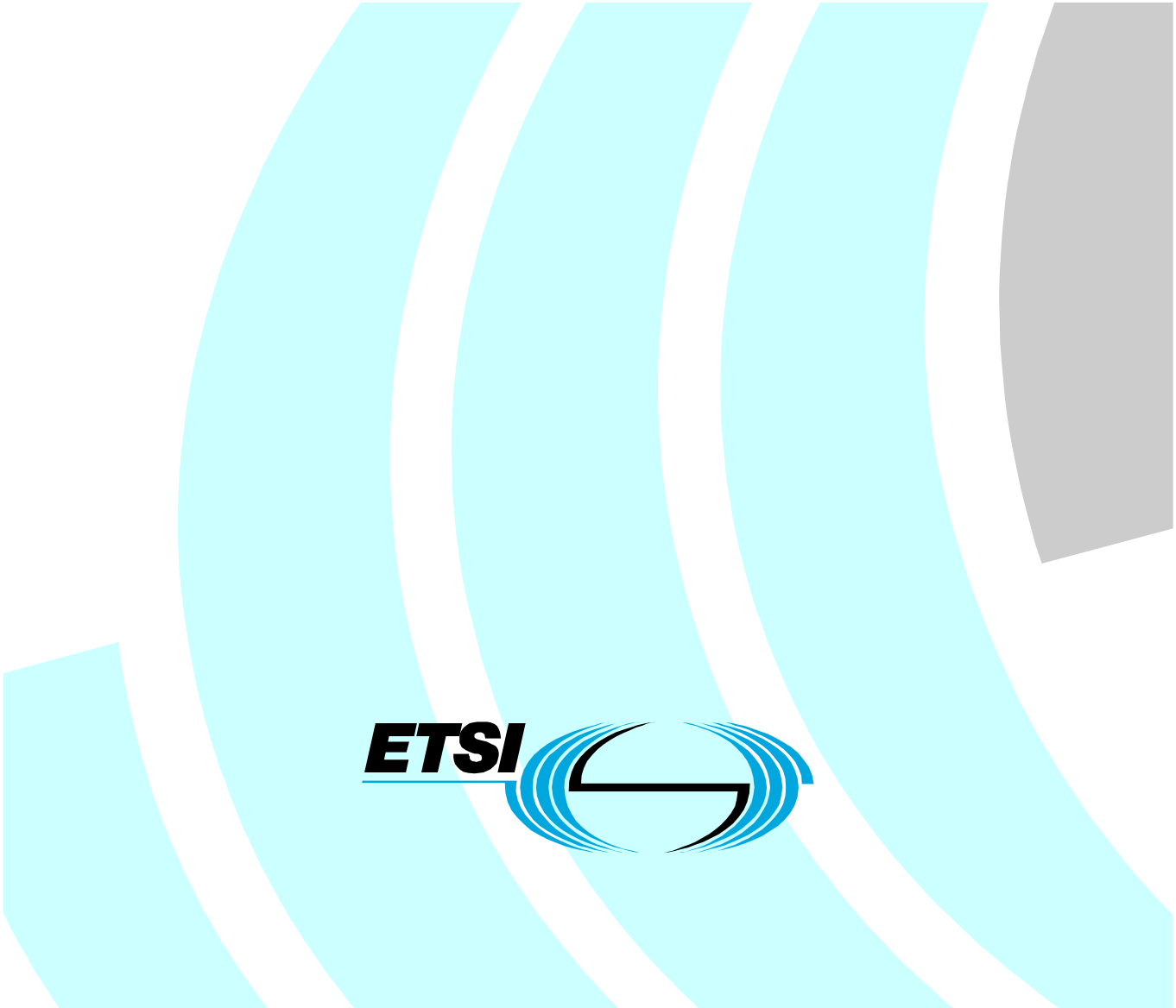
ETSI Standard

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Endorsement of the SIP-ISUP Interworking between the IP Multimedia (IM) Core Network (CN)subsystem and Circuit Switched (CS) networks

[3GPP TS 29.163 (Release 7), modified]



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Contents

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN), and is now submitted for the ETSI standards Membership Approval Procedure.

1 Scope

The present document provides the ETSI endorsement of the 3GPP TS 29.163 (V 7.1.0) [1], clauses 7.2.3 and 7.4.

The clauses 7.2.3 and 7.4 of 3GPP TS 29.163 [1] specify the signalling interworking between ISDN User Part (ISUP) protocols and SIP in order to support services that can be commonly supported by ISUP and SIP-based network domains.

The present document specifies the principles of interworking between the ETSI TISPAN IMS and ISUP based legacy CS networks, in order to support IM basic voice calls.

The present document specifies the interworking between ETSI SIP profile (as specified within ES 283 003 [3]) and ISUP, as specified in EN 300 356-1 [2] respectively.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

[1] 3GPP TS 29.163 (V7.1.0): "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks (Release 7)".

[2] ETSI EN 300 356-1 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1999) modified]".

[3] ETSI ES 283 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Endorsement of "IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP) Stage 3 (Release 6)" for NGN Release 1".

[4] ETSI ES 282 007: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia Subsystem (IMS); Functional architecture".

[5] ETSI EN 300 356-3 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 3: Calling Line Identification Presentation (CLIP) supplementary service [ITU-T Recommendation Q.731, clause 3 (1993) modified]".

[6] ETSI EN 300 356-4 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 4: Calling Line Identification Restriction (CLIR) supplementary service [ITU-T Recommendation Q.731, clause 4 (1993) modified]".

[7] ETSI EN 300 356-5 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 5: Connected Line Identification Presentation (COLP) supplementary service [ITU-T Recommendation Q.731, clause 5 (1993) modified]".

[8] ETSI EN 300 356-6 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 6: Connected Line Identification Restriction (COLR) supplementary service [ITU-T Recommendation Q.731, clause 6 (1993) modified]".

[9] ETSI EN 300 356-7 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 7: Terminal Portability (TP) supplementary service [ITU-T Recommendation Q.733, clause 4 (1993) modified]".

[10] ETSI EN 300 356-8 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 8: User-to-User Signalling (UUS) supplementary service [ITU-T Recommendation Q.737, clause 1 (1997) modified]".

[11] ETSI EN 300 356-9 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 9: Closed User Group (CUG) supplementary service [ITU-T Recommendation Q.735, clause 1 (1993) modified]".

[12] ETSI EN 300 356-10 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 10: Subaddressing (SUB) supplementary service [ITU-T Recommendation Q.731, clause 8 (1992) modified]".

[13] ETSI EN 300 356-11 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 11: Malicious Call Identification (MCID) supplementary service [ITU-T Recommendation Q.731, clause 7 (1997) modified]".

[14] ETSI EN 300 356-12 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 12: Conference call, add-on (CONF) supplementary service [ITU-T Recommendation Q.734, clause 1 (1993) and implementors guide (1998) modified]".

[15] ETSI EN 300 356-14 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 14: Explicit Call Transfer (ECT) supplementary service [ITU-T Recommendation Q.732, clause 7 (1996) and implementors guide (1998) modified]".

[16] ETSI EN 300 356-15 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 15: Diversion supplementary service [ITU-T Recommendation Q.732, clauses 2 to 5 (1999) modified]".

[17] ETSI EN 300 356-16 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 16: Call Hold (HOLD) supplementary service [ITU-T Recommendation Q.733, clause 2 (1993) modified]".

[18] ETSI EN 300 356-17 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 17: Call Waiting (CW) supplementary service [ITU-T Recommendation Q.733, clause 1 (1992) modified]".

[19] ETSI EN 300 356-18 (V4.1.2): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 18: Completion of Calls to Busy Subscriber (CCBS) supplementary service [ITU-T Recommendation Q.733, clause 3 (1997) modified]".

[20] ETSI EN 300 356-19 (V4.2.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 19: Three-Party (3PTY) supplementary service [ITU-T Recommendation Q.734, clause 2 (1996) and implementors guide (1998) modified]".

[21] ETSI EN 300 356-20 (V4.3.1): "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 20: Completion of Calls on No Reply (CCNR) supplementary service [ITU-T Recommendation Q.733, clause 5 (1999) modified]".

[22] ETSI EN 300 356-21: "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 21: Anonymous Call Rejection (ACR) supplementary service [ITU-T Recommendation Q.731, clause 4 (1993)]".

[23] ETSI EN 300 485 (V1.2.3): "Integrated Services Digital Network (ISDN); Definition and usage of cause and location in Digital Subscriber Signalling System No. one (DSS1) and Signalling System No.7 ISDN User Part (ISUP) [ITU-T Recommendation Q.850 (1998), modified]".

3 Definitions and abbreviations

For the purposes of the present document, the terms, definitions and abbreviations given in 3GPP TS 29.163 [1], clauses 7.2.3 and 7.4 apply.

Endorsement notice

The elements of 3GPP TS 29.163 [1] clauses 7.2.3 and 7.4 apply, with the following modifications:

NOTE: Underlining and/or strike-out are used to highlight detailed modifications where necessary.

Replace references as shown below.

Reference in 3GPP TS 29.163 [1]	Modified reference
ITU-T Recommendation Q.761	EN 300 356-1 [2]
ITU-T Recommendation Q.762	EN 300 356-1 [2]
ITU-T Recommendation Q.763	EN 300 356-1 [2]
ITU-T Recommendation Q.764	EN 300 356-1 [2]
3GPP TS 24.229	ES 283 003 [3]
3GPP TS 23.228	ES 282 007 [4]
ITU-T Recommendation Q.850 (1998)	EN 300 485 [23]
ITU-T Recommendation Q.731.3	EN 300 356-3 [5]
ITU-T Recommendation Q.731.4	EN 300 356-4 [6]
ITU-T Recommendation Q.731.5	EN 300 356-5 [7]
ITU-T Recommendation Q.731.6	EN 300 356-6 [8]
ITU-T Recommendation Q.731.7	EN 300 356-11 [13]
ITU-T Recommendation Q.731.8	EN 300 356-10 [12]
ITU-T Recommendation Q.732.2	EN 300 356-15 [16]
ITU-T Recommendation Q.732.3	EN 300 356-15 [16]
ITU-T Recommendation Q.732.4	EN 300 356-15 [16]
ITU-T Recommendation Q.732.5	EN 300 356-15 [16]
ITU-T Recommendation Q.732.7	EN 300 356-14 [15]
ITU-T Recommendation Q.733.1	EN 300 356-17 [18]
ITU-T Recommendation Q.733.2	EN 300 356-16 [17]
ITU-T Recommendation Q.733.3	EN 300 356-18 [19]
ITU-T Recommendation Q.733.4	EN 300 356-7 [9]
ITU-T Recommendation Q.733.5	EN 300 356-20 [21]
ITU-T Recommendation Q.734.1	EN 300 356-12 [14]
ITU-T Recommendation Q.734.2	EN 300 356-19 [20]
ITU-T Recommendation Q.735.1	EN 300 356-9 [11]
ITU-T Recommendation Q.737.1	EN 300 356-8 [10]

Modifications to 3GPP TS 29.163 V 7.1.0 (clauses 7.2.3 and 7.4)

Clause 7.2.3.1.1

Modify as follows:

7.2.3.1.1 Sending of IAM

On reception of a SIP INVITE requesting an audio session, the I-MGCF shall send an IAM message.

An I-MGCF shall support both incoming INVITE requests containing SIP preconditions and 100rel extensions in the SIP Supported or Require headers, and INVITE requests not containing these extensions~~, unless the Note below applies.~~

~~Note: If the I-MGCF is deployed in an IMS network that by local configuration serves no user requiring preconditions, the MGCF may not support incoming requests requiring preconditions.~~

The I-MGCF shall interwork forked INVITE requests with different request URIs.

If a Continuity Check procedure is supported in the ISUP network, the I-MGCF shall send the IAM immediately after the reception of the INVITE, as shown in figure 3. This procedure applies when the value of the continuity indicator is either set to "continuity check required' or "continuity check performed on a previous circuit". If the continuity indicator is set to "continuity check required" the corresponding procedures at the Mn interface described in clause 9.2.2.3 also apply.

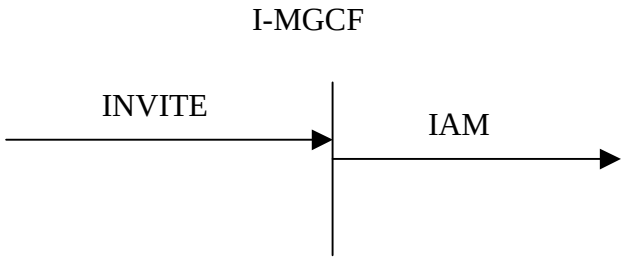


Figure 3: Receipt of an Invite request (continuity procedure supported in the ISUP network)

If no Continuity Check procedure is supported in the ISUP network, and the SDP in the received INVITE request contains preconditions not met, the I-MGCF shall delay sending the IAM until the SIP preconditions are met.

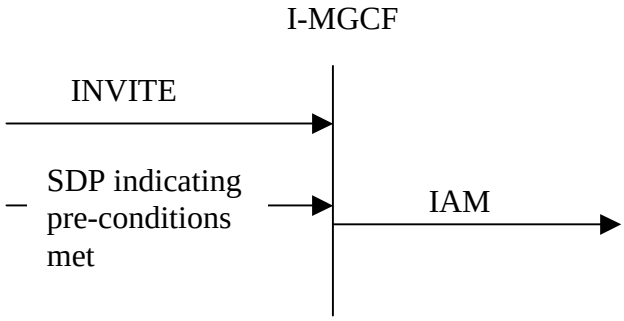


Figure 4: Receipt of an Invite request (continuity procedure not supported in the ISUP network)

The I-MGCF shall reject an INVITE request for a session only containing unsupported media types by sending a status code 500 "Server Internal error". If several media streams are contained in a single INVITE request, the I-MGCF shall select one of the supported media streams, reserve the codec(s) for that media stream, and reject the other media streams and unselected codecs in the SDP answer, as detailed in RFC 3264 [36]. If supported audio media stream(s) and supported non-audio media stream(s) are contained in a single INVITE request, an audio stream should be selected.

The I-MGCF shall include a To tag in the first backward non-100 provisional response, in order to establish an early dialog as described in RFC 3261 [19].

Clause 7.2.3.1.9a

Add clause 7.2.3.1.9a.

7.2.3.1.9a Receipt of REFER

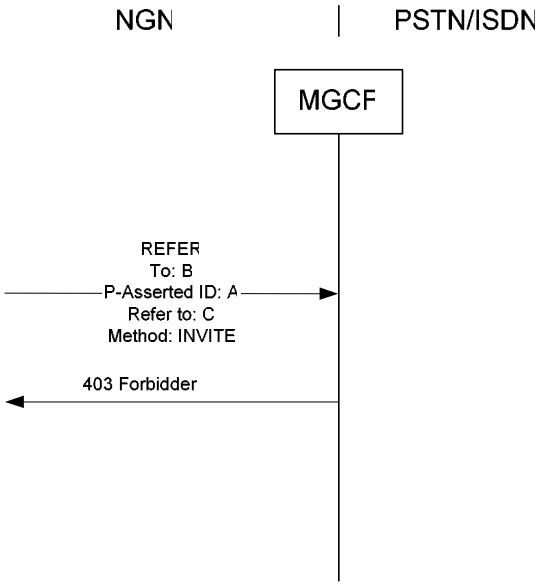


Figure 11a: Receipt of REFER method

A REFER received by the MGCF will always be rejected with a 403 Forbidden response.

Clause 7.2.3.2.1

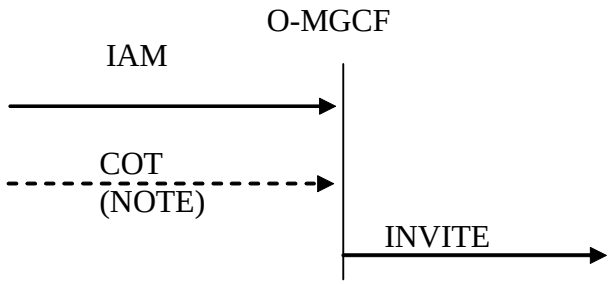
Modify as follows:

7.2.3.2.1 Sending of INVITE

An O-MGCF shall support both the SIP preconditions and 100 rel extensions and indicate the support of the SIP preconditions and 100rel extensions in the INVITE request.

~~Note: If the O-MGCF is deployed in an IMS network that by local configuration serves no user requiring preconditions, it may send the INVITE request without indicating support of preconditions.~~

If the Continuity Check indicator in the Nature of Connection Indicators parameter in the incoming IAM is set to indicate either '*continuity check required on this circuit*' or '*continuity check performed on previous circuit*', the O-MGCF may either defer sending the INVITE request until receiving a COT message or send the INVITE request without waiting for the COT.



NOTE: Waiting for the COT is a network option. Furthermore, it only applies if the Continuity Check indicator in the Nature of Connection Indicators parameter in the incoming IAM is set to indicate either '*continuity check required on this circuit*' or '*continuity check performed on previous circuit*'.

Figure 12: Receipt of an IAM (En bloc signalling in CS network)

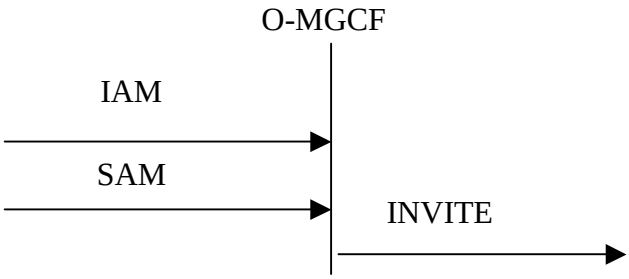


Figure 13: Receipt of an IAM (Overlap signalling in CS network)

After initiating the normal incoming BICC/ISUP call establishment procedures, determining the end of address signalling and selecting to route the call to the IMS domain, the O-MGCF shall send the initial INVITE. ~~Only calls with Transmission Requirements of speech or 3.1 kHz audio will be routed to the IMS domain, all other types of call attempts will be rejected.~~

The end of address signalling shall be determined by the earlier of the following criteria:

a) by receipt of an end-of-pulsing (ST) signal; or

b) by receipt of the maximum number of digits used in the national numbering plan; or

c) by analysis of the called party number to indicate that a sufficient number of digits has been received to route the call to the called party; or

d) by observing that timer Ti/w1 has expired after the receipt of the latest address message and the minimum number of digits required for routing the call have been received.

If the end of the address signalling is determined in accordance with criteria a) b) or c), the timer Ti/w2 is started when INVITE is sent.

Annex ZA (normative): Interworking of Cpc parameter

ZA.1 Interworking SIP to ISUP

Table ZA.1-1 shows the mapping of a cpc parameter received in a P-Asserted-Identity header in the initial INVITE request to the Calling party's category parameter in the ISUP IAM.

Table ZA.1-1: Mapping of the cpc parameter to the ISUP Calling party's category parameter

cpc received in a P-Asserted-Identity	Accept-Contact 'language'	Sent Calling party's category
Operator	French	operator, language French
Operator	English	operator, language English
Operator	German	operator, language German
Operator	Russian	operator, language Russian
Operator	Spanish	operator, language Spanish
Ordinary		ordinary calling subscriber
Priority		calling subscriber with priority
Data		Data call (voice band data)
Test		Test call
Payphone		Payphone

NOTE: In case the cpc is absent or contains values that are not in this table then the ISUP shall contain the default cpc value "ordinary calling subscriber".

ZA.2 Interworking ISUP to SIP

Table ZA.2-1 shows the mapping of a Calling party's category received in a ISUP with the cpc parameter within the regarding P-Asserted-Identity.

Table ZA.2-1: Mapping of the ISUP Calling party's category parameter to the cpc parameter

received calling party's category	cpc sent in a P-Asserted-Identity	Accept-Contact 'language'
operator, language French	Operator	French
operator, language English	Operator	English
operator, language German	Operator	German
operator, language Russian	Operator	Russian
operator, language Spanish	Operator	Spanish
ordinary calling subscriber	Ordinary	
calling subscriber with priority	Priority	
data call (voice band data)	Data	
test call	Test	
payphone	Payphone	

History

Document history			
V1.1.1	April 2006	Membership Approval Procedure	MV 20060609: 2006-04-11 to 2006-06-09