Final draft ETSI EN 301 464 V1.1.1 (2000-10)

European Standard (Telecommunications series)

Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 interactions with the Intelligent Network Application Part (INAP); Part 1: Protocol specification

[ITU-T Recommendation Q.1601 (1999), modified]

ETSI

Reference

DEN/SPAN-01035

Keywords

ISDN, SS7, ISUP, IN, INAP, CS2

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at http://www.etsi.org/tb/status/

If you find errors in the present document, send your comment to:
editor@etsi.fr

Copyright Notification

ETSI

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN), and is now submitted for the Vote phase of the ETSI standards Two-step Approval Procedure.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

Endorsement notice

The elements of ITU-T Recommendation Q.1601 (1999) apply, with the following modifications:

> NOTE: New or modified text is indicated using sidebars. In addition, underlining and/or strike-out are used to highlight detailed modifications where necessary.

Modifications to ITU-T Recommendation Q.1601

Replace clauses 1 and 2 (Scope and References) with the following:

1 Scope

The present document specifies the interaction between the ISUP and INAP.

The interaction between other signalling systems and INAP can be found by consulting the relevant interworking recommendation to the ISUP in combination with the ISUP/INAP interaction recommendation.

The present document specifies procedures in order to provide interaction between ISUP and INAP, i.e. to support IN services in an ISDN environment. In addition new protocol elements for the ISUP are defined in order to satisfy IN specific requirements. Based on the protocol inherent compatibility mechanism a stepwise upgrade of the ISUP functionality is possible. However, the new function is only available for an IN call, if supported in any of the affected exchanges.

The present document only considers the case where the SSP is located at a transit level. As a consequence this could lead to limitations for ISDN supplementary services.

The present document does not specify enhancements to the DSS1 protocol, which may be needed due to additional ISUP functions or IN requirements, respectively.

The main subjects of the present document are the following:

- description of specific call control functions for IN calls;

- impacts on the ISUP basic call and the ISDN supplementary services for IN calls;

- enhancement of the ISUP protocol due to IN specific requirements.

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, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1]   ETSI EN 301 140-5: "Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 5: Distributed Functional Plane (DFP) [ITU-T Recommendation Q.1224 (1997), modified]".

[2]   ETSI EN 300 356-1: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 4 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (2000) modified]".

[3]   ETSI EN 300 356-3: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[4]   ETSI EN 300 356-4: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[5]   ETSI EN 300 356-5: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[6]   ETSI EN 300 356-6: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[7]   ETSI EN 300 356-10: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[8]   ETSI EN 300 356-11: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[9]   ETSI EN 300 356-14: "Integrated Services Digital Network (ISDN); Signalling System No.7; 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]".

[10]   ETSI EN 300 356-15: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 4 for the international interface; Part 15: Diversion supplementary services [ITU-T Recommendation Q.732, clauses 2 to 5 (2000) modified]".

[11]   ETSI EN 301 140-1: "Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2); Part 1: Protocol specification".

[12]   ETSI EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

Throughout the text of ITU-T Recommendation Q.1601

Replace references as shown below.

Reference in ITU-T Recommendation Q.1601	Modified reference
ITU-T Recommendation Q.1224	ITU-T Recommendation Q.1224 as modified by EN 301 140-5 [1]
ITU-T Recommendation Q.1228	EN 301 140-1 [11]
ITU-T Recommendation Q.731	ITU-T Recommendation Q.731 as modified by EN 300 356, parts 3, 4, 5, 6, 10 and 11 [3] to [8]
ITU-T Recommendation Q.732	ITU-T Recommendation Q.732 as modified by EN 300 356, parts 14 [9] and 15 [10]
ITU-T Recommendation Q.763	ITU-T Recommendation Q.763 as modified by EN 300 356-1 [2]
ITU-T Recommendation Q.764	ITU-T Recommendation Q.764 as modified by EN 300 356-1 [2]
ITU-T Recommendation Q.931	ITU-T Recommendation Q.931 as modified by EN 300 403-1 [12]

Table 2

Amend the table as shown:

Operation	Influence on ISUP call handling	Reference
⋮	⋮	⋮
~~AnalyseInformattion~~	~~For further study (Note)~~	
	⋮	⋮
~~CancelStatusReportRequest~~	~~For further study (Note)~~	
	⋮	⋮
~~HoldCallInNetwork~~	~~For further study (Note)~~	
	⋮	⋮
~~RequestCurrentStatusReport~~	~~For further study (Note)~~	
~~RequestEveryStatusChangeReport~~	~~For further study (Note)~~	
~~RequestFirstStatusMatchReport~~	~~For further study (Note)~~	
	⋮	⋮
~~SelectFacility~~	~~For further study (Note)~~	
~~SelectRoute~~	~~For further study (Note)~~	
⋮	⋮	⋮

Subclause 10.1.1.1, Successful call set-up

Modify the first sentence as follows:

"If an IAM is received in a SSP and the call is recognised as IN call, i.e. by detecting a DP as TDP-R (see subclause 9.3 Detection Point processing), an InitialDP operation ~~or a DP specific operation for a TDP-R~~ is sent from the SSF to the SCF. If the IAM had been segmented the remainder of the call set-up information is awaited (see subclause 9.1.1.7 Simple segmentation). The mapping of parameters is shown in the table below."

Table 4

Amend the table as shown:

ISUP message IAM (Note 1)	INAP operation InitialDP
⋮	⋮
~~Calling party subaddress IE contained in access transport~~	~~callingPartySubaddress~~
⋮	⋮

Table 5

Amend the table as shown:

INAP operation Connect (Note 1)	ISUP message IAM
⋮	⋮
callingPartyNumber	(Note 4) <u>(see also Annex ZA)</u>
locationNumber	Location number (Note 7)
⋮	⋮

Table 5, note 3

Replace reference to "[5], subclause 3.3.16" with "[11], subclause 9.11".

Table 5, note 7

Add note 7 to table 5.

"NOTE 7: The symantics of the Location Number parameter are network specific. Use of this parameter across a network boundary only has significance where a bilateral agreement on the NNI has been made as to its format. Restrictions to the mapping may be imposed in the future when the SSF-SCF is an internetwork interface."

Subclause10.1.1.2, Normal call release

Replace reference to "[5], subclause 3.1.1.5" with "[11], subclause 7.1.5".

Subclause 10.1.1.3, Suspend, resume

Modify the first paragraph as follows:

"Upon receipt of a SUS message with the indication "network initiated" the timer T_{SUS} is started to ensure that a RES message with the indication "network initiated" or a REL message is received. In the case that at least one DP monitor mode is set to 'interrupted'. ~~The received SUS message is not passed on.~~ If the timer T_{SUS} expires, the procedures described in ~~[10]~~ Q.764/subclause 2.4.3 apply. The value of timer T_{SUS} depends on the time limits received in serviceInteractionIndicatorsTwo parameter."

Subclause10.1.2, IN call with SCP request to collect further digits

Modify the first two paragraphs as follows:

"After sending the InitialDP operation to the SCP a RequestReportBCSMEvent operation to arm DP2 accompanied by a CollectInformation operation may be received from the SCP (see~~[5] subclause 3.3.15~~ [11] subclause 9.10). In this case the specified number of digits will be collected in the SSP. Encountering DP2, i.e. the specified number of digits has been received, will result in sending an EventReportBCSM operation ~~or a CollectedInformation operation, respectively,~~ to the SCP.

In addition to subclause 9.1.5 the digits sent to the SCP in the EventReportBCSM operation ~~or the CollectedInformation operation~~ shall be taken into account when constructing the called IN number parameter."

Subclause10.1.3.1, General

Modify the second and third paragraph as follows:

"In the "notifyAndContinue" mode the event is reported as EDP-N (notification mode) in the EventReportBCSM operation ~~or a DP specific operation, respectively,~~ to the SCF and normal call processing continues as described in subclause 9.1 (IN basic call).

In the "interrupted" mode the event is reported as EDP-R (request mode) in the EventReportBCSM operation ~~or a DP specific operation, respectively,~~ and the SSF will wait for instructions from the SCF."

Subclause 10.1.3.1.3, Release message

Replace reference to "[5], subclause 3.1.1.5" with "[11], subclause 7.1.5".

Subclause 10.1.4, Set-up of an IN call to destination B

Modify the first paragraph as follows:

"This section describes the set-up of an IN call to destination B after an user interactive dialogue has been performed or after the SSF has reported an EDP-R in the EventReportBCSM operation ~~or a DP specific operation, respectively,~~ to the SCF. In these situations the call set-up differs from the normal call set-up for the "IN basic call"."

Subclause 10.1.5, User interactive dialogue (in-band)

Modify the first paragraph as follows:

"If in response to the InitialDP operation, the EventReportBCSM operation ~~or a DP specific operation~~, a ConnectToResource or EstablishTemporaryConnection operation is received (...)"

Subclause 10.1.6, Call gapping

Replace reference to "[5], subclause 7.3.6" with "[11], subclause 9.6".

Subclause 10.1.7, Service filtering

Replace reference to "[5], subclause 7.3.1" with "[11], subclause 9.1".

Subclause 10.1.8.1, Continue operation

Modify the subclause as follows:

The actions described in ~~[10]~~ Q.764/subclause 2.1.1.1 will be performed. For routing of the call the called party number is derived from the destinationRoutingAddress (see Table 12/Q.1601 (Mapping of parameters from InitiateCallAttempt to IAM)).

The following table illustrates the mapping of parameters received in the InitiateCallAttempt operation to parameters sent in the IAM message.

Table 12/Q.1601: Mapping of parameters from InitiateCallAttempt to IAM

INAP operation InitiateCallAttempt (Note 1)	ISUP message IAM
destinationRoutingAddress	Called party number
callingPartyNumber	Calling party number
serviceInteractionIndicatorsTwo	see 10.1.1.1.1.4 (Mapping of the INAP serviceInteractionIndicatorsTwo)
carrier	TNS (Note 2)
locationNumber	Location number (Note 3)
bearerCapability(bearerCap)	User service information (Note 4)
bearerCapability(tmr)	TMR
NOTE 1: Optional parameters may be absent, i.e. they are only mapped, if received.	
NOTE 2: The carrier selection field received in the Carrier parameter is not mapped. The octets following to the carrier selection field are as a national option mapped to the TNS parameter or not mapped.	
NOTE 3: The symantics of the Location Number parameter are network specific. Use of this parameter across a network boundary only has significance where a bilateral agreement on the NNI has been made as to its format. Restrictions to the mapping may be imposed in the future when the SSF-SCF is an internetwork interface.	
NOTE 4: In case the User service information is used then the TMR is set as accordingly.	

Except the called party number parameter and the TMR parameter the remaining mandatory parameters of the IAM message are set as follows:

a) Nature of connection indicators

Satellite indicator:	set as in an OLE,
Continuity check indicator:	set as in an OLE,
Echo control device indicator:	set as in an OLE.

b) Forward call indicators

National/international call indicator: set as in an OLE,

End-to-end method indicator: 00 (no end-to-end method available),

Interworking indicator: 0 (no interworking encountered),

End-to-end information indicator: 0 (no end-to-end information available),

ISDN user part indicator: 1 (ISDN user part used all the way),

ISDN user part preference indicator: 00 (ISDN user part preferred all the way),

ISDN access indicator: 0 (originating access non-ISDN),

SCCP method indicator: 00 (no indication).

c) Calling party's category

00001010 (ordinary subscriber)

d) ~~Transmission medium requirement~~

~~00000011 (3.1 kHz audio)~~

In case no bearerCapability is received the TMR parameter is set to 00000011 (3.1 kHz audio)

Besides the parameters listed in Table 12 the IAM contains the following optional parameters:

- propagation delay counter (set as in an OLE);

- hop counter (set as in an OLE).

New Subclause 10.1.7a 'Connect operation'

"In the case of rerouteing a Connect operation may be received after receipt of the InitiateCallAttempt operation, for that the bearerCapability is mapped in IAM in addition to the mapping given in 10.1.1 (IN basic call) according to following table."

Table 12a/Q.1601: Mapping of parameters from Connect to IAM

INAP operation Connect (Note 1)	ISUP message IAM
bearerCapability(bearerCap)	User service information (Note2)
bearerCapability(tmr)	TMR
NOTE 1: Optional parameters may be absent, i.e. they are only mapped, if received. NOTE 2: In case the User service information is used then the TMR is set as accordingly.	

Other parameters are set as given in 10.1.8.1.

Subclause 10.1.9 'Procedure in the SSP providing the GVNS access function'

Delete: '~~GVNS: Outgoing call~~' from 10.1.9.1

Table 19

Modify the table as follows:

ISDN Supplementary service	ISUP protocol possibly impacted by IN services	if impacted by IN service(s) the following action will be performed	Affected exchange
~~International telecommunication charge card~~	~~No~~		
~~Multilevel precedence and preemption~~	~~No~~		
~~Reverse charging~~	~~Yes~~	~~National network specific~~	

Subclause 12.3.1.1, Actions in the service switching point

Add the following:

"If 'acceptCCSRequest' was indicated by the IN service logic, then on receipt of a REL message the diagnostic field is passed on transparently."

Subclause 12.3.2.1, Actions in the service switching point

Add the following:

If 'acceptCCSRequest' was indicated by the IN service logic, then on receipt of a ACM/CPG message the CCNR Possible Indicator is passed on transparently.

Appendix I

Appendix I has the status of an integral part of the present document.

Appendix II

Appendix II has the status of an informative annex, describing a network option.

Appendix III

Appendix III has the status of an informative annex.

Annex ZA (informative):
Mapping of the INAP callingPartyNumber parameter

ZA.1 Introduction

This annex describes an additional feature that may be provided by some public ISDNs as a national option.

This additional feature shall place no requirement on the provision and operation of existing services (e.g. MCID, CLIP, etc.) supported in ISDNs that do not support this additional feature. Other network operators possibly involved in a call shall be informed that this feature may be applied, this may be done with a bi-lateral agreement.

NOTE: In future versions, an alternative method of performing this interaction may be defined.

As a national option, the INAP callingPartyNumber parameter gives the SCF the ability to modify the outgoing ISUP signalling':

- Calling Party Number parameter; or

- Generic Number (Additional Calling Party Number).

The ISUP parameter modified is dependent on the value of the callingPartyNumber parameter's Screening Indicator received in the INAP Connect operation.

ZA.2 Screening Indicator = "network provided" or "user provided, verified and passed"

Where the Screening Indicator received in the INAP callingPartyNumber parameter is either "network provided" or "user provided, verified and passed", the calling Party Number parameter is mapped to the Calling Party Number parameter in the outgoing ISUP signalling. Any Generic Number (Additional calling party number) parameter received from the incoming ISUP shall not transited through to the outgoing ISUP.

Thus these values of the INAP Screening Indicator of the callingPartyNumber may be used to:

- change a calling user provided number where the special arrangement does not apply at the originating exchange; or

- to provide a calling party number on behalf of the calling user.

Where the CLIP supplementary service applies at the destination user, and no restriction applies, the number is presented to the destination user. This value will also override the number recorded in all subsequent networks as the source of the call (e.g. for MCID purposes), and identifies the number as being partially provided by the user.

ZA.3   Screening Indicator = "user provided, not verified" or "user provided, verified and failed"

If the Screening Indicator received in the incoming ISUP Calling Party Number parameter is "Network Provided", then where the Screening Indicator received in the INAP callingPartyNumber parameter is "user provided, not verified" or "user provided, verified and failed", the callingPartyNumber parameter is mapped directly to the Generic Number parameter (Additional Calling Party Number).

Thus these values of the INAP Screening Indicator of the callingPartyNumber may be used to:

-    change a calling user provided number where the special arrangement applies at the originating exchange.

Where the CLIP supplementary service applies at the destination user, and no restriction applies, the number is presented to the destination user.

History

Document history			
V1.1.1	April 2000	Public Enquiry	PE 20000818: 2000-04-19 to 2000-08-18
V1.1.1	October 2000	Vote	V 20001208: 2000-10-09 to 2000-12-08