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8 [[]HJbc`ca fYy`Yn`]bH[f]fUb]a]glcf]h Ua]fG8 BŁ!`bH`][Yb]bc`ca fYy`Y`fBŁ!
A YXgYVc`bc`j d`]j Ub`Y`a YX`Ud`]_UW`g_]a `dfc]c`c`ca `B`fB5 DŁ]b`Xfi [c`fUn`]]Wt
G8 Bli dcfUVb]j`Y[UXYU`fG] DŁ

Integrated Services Digital Network (ISDN); Intelligent Network (IN); Interaction between IN Application Protocol (INAP) and ISDN User Part (ISUP) version 2

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ICS:

33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)
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**Integrated Services Digital Network (ISDN);
Intelligent Network (IN);
Interaction between IN Application Protocol (INAP)
and ISDN User Part (ISUP) version 2**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

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Foreword

This ETSI Technical Report (ETR) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

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1 Scope

This ETSI Technical Report (ETR) specifies the interaction between the Intelligent Network Application Protocol (INAP) and the Integrated Services Digital Network (ISDN) User Part (ISUP) of Signalling System No.7. The basis for the IN part of this ETR is the core INAP (refer to ETS 300 374-1 [8]) and the basis for the public network part is the ISUP version 2 (refer to ETS 300 356-1 [4]).

Public network signalling systems different from ISUP are not considered in this ETR. The interaction to the INAP for these signalling systems can, however, be derived from this ETR in conjunction with the interworking specification for ISUP version 2 (refer to ETS 300 360 [7]).

Although this ETR is titled "Interaction between INAP and ISUP", new protocol elements for the ISUP are defined in this ETR in order to satisfy IN specific requirements. The reason for that approach is that the protocol inherent compatibility mechanism allows for a stepwise upgrade of the ISUP functionality. However, the new function is only available for an IN call, if supported in any of the affected exchanges.

This ETR only considers the case where the Service Switching Point (SSP) is located at a transit level. As a consequence, this could lead to limitations for ISDN supplementary services.

This ETR does not specify enhancements to the Digital Subscriber Signalling System No. one (DSS1) protocol, which may be needed due to additional ISUP functions or IN requirements, respectively.

The main subjects of this interaction specification 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

This ETR incorporates, by dated and undated reference provisions from other publications. These references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETR only when incorporated in it by amendments or revision. For undated references the latest edition of the publication referred to applies.

- [1] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [2] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [3] ITU-T Recommendation Q.1214 (1993): "Distributed functional plane for Intelligent Network CS-1".
- [4] ETS 300 356-1: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1993), modified]".

- [5] ETS 300 356-2: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 2: ISDN supplementary services [ITU-T Recommendation Q.730 (1993), modified]".
- [6] ETS 300 356-15: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 15: Diversion supplementary services [ITU-T Recommendation Q.732, clauses 2 to 5 (1993), modified]".
- [7] ETS 300 360: "Integrated Services Digital Network (ISDN); Signalling System No.7; Signalling interworking specification for ISDN User Part (ISUP) version 2".
- [8] ETS 300 374-1 (1993): "Intelligent Network (IN); Intelligent Network Capability wSet 1 (CS1); Core Intelligent Network Application Protocol (INAP); Part 1: Protocol specification".
- [9] ETS 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1); User-network interface layer 3 specification for basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

3 Definitions

For the purposes of this ETR, the following definitions apply:

Call Control Function (CCF): See ITU-T Recommendation Q.1214 [3], §3.3.

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [1].

service; telecommunication service: See ITU-T Recommendation I.112 [1].

Service Control Function (SCF): See ITU-T Recommendation Q.1214 [3], §3.3.

Service Switching Function (SSF): See ITU-T Recommendation Q.1214 [3], §3.3.

Specialized Resource Function (SRF): See ITU-T Recommendation Q.1214 [3], §3.3.

supplementary service: See ITU-T Recommendation I.210 [2].

4 Symbols and abbreviations

For the purposes of this ETR, the following abbreviations apply:

ACM	Address Complete Message (ISUP)
ANM	Answer Message (ISUP)
CCC	Charge Card Calling
CCF	Call Control Function
CON	Connect message (ISUP)
CPG	Call Progress message (ISUP)
CS1	Capability Set 1
DLE	Destination Local Exchange
DP	Detection Point
DSS1	Digital Subscriber Signalling System No. one
EDP	Event Detection Point
EDP-N	EDP - Notification
EDP-R	EDP - Request
FAR	Facility Request message (ISUP)
FE	Functional Entity
FOT	Forward Transfer message (ISUP)
FRJ	Facility Reject message (ISUP)
FRQ	Facility Request message (ISUP)
IAM	Initial Address Message (ISUP)
IDR	Identification Request message (ISUP)
IE	Information Element
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
INR	Information Request message (ISUP)
IP	Intelligent Peripheral
IRS	Identification Response message (ISUP)
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
OLE	Originating Local Exchange
PRM	Premium Rate
REL	Release message (ISUP)
RES	Resume message (ISUP)
RLC	Release Complete message (ISUP)
SAM	Subsequent Address Message (ISUP)
SCF	Service Control Function
SCP	Service Control Point
SDL	Specification and Description Language
SGM	Segmentation Message (ISUP)
SRF	Specialized Resource Function
SS	Signalling System
SSF	Service Switching Function
SSP	Service Switching Point
SUS	Suspend message (ISUP)
TCAP	Transaction Capabilities Application Part
TDP	Trigger Detection Point
TDP-N	TDP - Notification
TDP-R	TDP - Request
TMR	Transmission Medium Requirement
UAN	Universal Access Number
UPT	Universal Personal Telecommunication
VCC	Virtual Card Calling
VOT	Televoting

5 Description

ITU-T Recommendation Q.1214 [3] provides a distributed functional plane architecture for IN Capability Set 1 (CS1). Interactions between the following Functional Entities (FEs) are relevant for this specification:

- Call Control Function (CCF);
- Service Switching Function (SSF);
- Service Control Function (SCF);
- Specialized Resource Function (SRF).

The functional entities can be implemented in one or more network elements, called physical entities. The Service Control Point (SCP) is the physical entity in the intelligent network, that implements the SCF. The CCF and SSF are realized in the Service Switching Point (SSP) and the SRF is realized in the Intelligent Peripheral (IP).

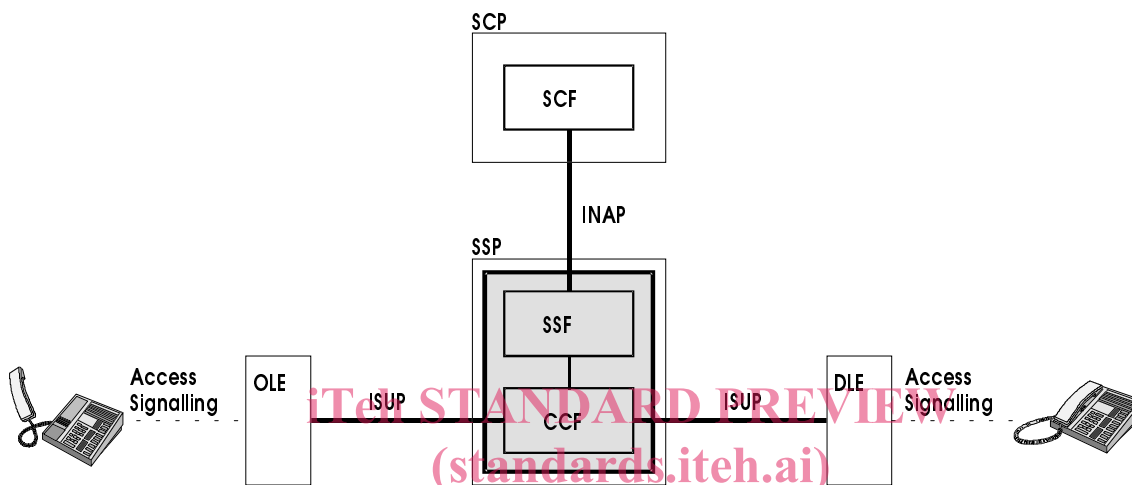


Figure 1: Signalling configuration for an IN call without SRF support

The SSF contains the capabilities beyond those that are needed for basic call control. Consequently, this ETR concentrates on the actions that are performed in the CCF.

Figure 1 illustrates in a simplified manner a signalling configuration which is to be considered in this ETR. In the configuration it is assumed, that SRF support is not needed. The network signalling system used for call set-up is the ISUP version 2 as specified in ETS 300 356-1 [4]. The interface between SSF and SCF is the core INAP as specified in ETS 300 374-1 [8].

The interaction between ISUP and INAP takes place in the CCF and SSF. The following main subjects have to be considered in this area:

- detection point processing in the CCF;
- receipt of INAP operations in the SSF.

Detection point processing

The provision of Detection Points (DPs) is required in the ISUP basic call handling in order to access IN functionality and to allow IN service logic influence the processing of IN calls. The detection points (DPs) indicate points in call (PICs) at which transfer of control can occur. If a DP is recognized an operation from the SSF to the SCF will be sent. Thus the communication towards the SCP is performed. The DPs defined in ITU-T Recommendation Q.1214 [3] are listed in table 1.

The column "Support" indicates whether the DP is supported within ISUP version 2 (see ETS 300 356-1 [4]).

Table 1: List of Detection points

DPs for the originating side		Support	DPs for the terminating side		Support
DP 1	Origination_Attempt_Authorized	No impact on ISUP	DP 12	Terminating_Attempt_Authorized	No impact on ISUP
DP 2	Collected_Information	Yes			
DP 3	Analyzed_Information	Yes			
DP 4	Route_Select_Failure	Yes			
DP 5	O_Called_Party_Busy	Yes	DP 13	T_Called_Party_Busy	Yes
DP 6	O_No_Answer	Yes	DP 14	T_No_Answer	Yes
DP 7	O_Answer	Yes	DP 15	T_Answer	Yes
DP 8	O_Mid_Call	No	DP 16	T_Mid_Call	No
DP 9	O_Disconnect	Yes	DP 17	T_Disconnect	Yes
DP 10	O_Abandon	Yes	DP 18	T_Abandon	Yes

Receipt of INAP operations

Table 2 lists the INAP operations with direction SCF-SSF and indicates which operation will influence the ISUP call handling.

Table 2: INAP operations (direction: SCF-SSF)

Operation	Influence on ISUP call handling	Reference in this ETR
ActivateServiceFiltering	Yes	9.7 "Service filtering"
ActivityTest	No	
ApplyCharging	No	
CallGap	Yes	9.6 "Call gap"
CallInformationRequest	No	
CollectInformation	Yes	9.2 "IN call with SCP request to collect further digits"
Connect	Yes	9.1.1.1.1 "Connect operation and" 9.5.3 "Hand-off method - procedure in the initiating SSP"
Continue	Yes	9.1.1.1.2 "Continue operation"
ConnectToResource	Yes	9.5.1 "SSP supports requested IP capabilities"
DisconnectForwardConnection	Yes	9.5.2 "Assist method - procedure in the initiating SSP"
EstablishTemporaryConnection	Yes	9.5.2 "Assist method - procedure in the initiating SSP"
FurnishChargingInformation	No	
InitiateCallAttempt	Yes	9.8 "SCP initiated call"
ReleaseCall	Yes	9.1.4 "ReleaseCall operation"
RequestNotificationChargingEvent	Yes	The treatment is national network specific and not described further within this ETR.
RequestReportBCSMEEvent	Yes	9.3 "Detection Point processing"
ResetTimer	No	
SendChargingInformation	Yes	9.1.1.2 "SendChargingInformation operation"

Support of the SCF-SRF relationship

In ETS 300 374-1 [8], a number of scenarios for support of the SCF, SSF, and SRF functional entities as physical entities have been identified. The scenarios differ in the method to support the SCF-SRF relationship and are explained in ETS 300 374-1 [8], table 1 and figures 2 to 6. Table 3 summarizes these configurations and indicates whether the scenario can be supported with the current ISUP (see ETS 300 356-1 [4]) and the extensions made in this ETR.