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Part 1: Protocol specification

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Foreword

This second edition European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This second edition changes clause 3 of ETS 300 064-1 (1991) to provide additional clarification on the terms used within the ETS, subclause 6.1 to clarify the options relating to partial numbers within the Direct Dialling In (DDI) supplementary service, subclause 6.3 to clarify the options relating to overlap receiving within the DDI supplementary service, and subclause 10.2.1 to clarify the options relating to partial numbers within the DDI supplementary service.

This ETS is part 1 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) DDI supplementary service, as described below:

Part 1: **"Protocol specification";**

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "TSS&TP specification for the network";

Part 6: "ATS and partial PIXIT proforma specification for the network".

In accordance with CCITT Recommendation I.130, the following three level structure is used to describe the supplementary telecommunication services as provided by European public telecommunications operators under the pan-European ISDN:

- Stage 1: is an overall service description, from the user's standpoint;

- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and

- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

This ETS details the stage 3 aspects (signalling system protocols and switching functions) needed to support the DDI supplementary service. The stage 1 and stage 2 aspects are detailed in ETS 300 062 (1991) and ETS 300 063 (1991), respectively.

Transposition dates	
Date of adoption of this ETS:	20 September 1996
Date of latest announcement of this ETS (doa):	31 December 1996
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 June 1997
Date of withdrawal of any conflicting National Standard (dow):	30 June 1997

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1   Scope

This first part of ETS 300 064 specifies the stage three of the Direct Dialling In (DDI) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [8]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [6]).

The DDI supplementary service enables a user to call directly via a public ISDN a user on a private ISDN by using the public ISDN numbering plan.

The DDI supplementary service is applicable to all telecommunication services.

Further parts of this ETS specify the method of testing required to identify conformance to this ETS.

This ETS is applicable to equipment supporting the DDI supplementary service, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

2   Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative 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 ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1]   ETS 300 195-1 (1995): "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2]   ETS 300 403-1 (1995): "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]".

[3]   ETS 300 403-2 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2: Specification and Description Language (SDL) diagrams".

[4]   CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".

[5]   ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".

[6]   CCITT Recommendation I.130 (1988): "Method for the characterisation of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[7]   ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

[8]   ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

3 Definitions

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

DDI number: The DDI number is that ISDN number or part of an ISDN number which is delivered to the private ISDN. It can be the subscriber, national or international number, or a partial number. The DDI number is defined to be at least that part of the ISDN number which is significant to the private ISDN.

> NOTE: National or international prefixes cannot form part of the DDI number.

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [5], definition 308.

ISDN number: A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [4].

international number: An ISDN number structured as specified in subclause 3.2 (in the paragraphs relating to international number) of CCITT Recommendation E.164 [4].

national number; national significant number: An ISDN number structured as specified in subclause 3.2 (in the paragraphs relating to national significant number) of CCITT Recommendation E.164 [4].

network: The DSS1 protocol entity at the network side of the user-network interface.

partial number: A number that contains only the latter part of an ISDN number, but still fulfils the other requirements of a DDI number, i.e. is at least that part of the ISDN number which is significant to the private ISDN.

private network: The DSS1 protocol entity at the user side of an interface at the T reference point.

public network: The DSS1 protocol entity at the network side of an interface at the T reference point.

service; telecommunication service: See ITU-T Recommendation I.112 [5], definition 201.

subscriber number: An ISDN number structured as specified in subclause 3.2 (in the paragraphs relating to subscriber number) of CCITT Recommendation E.164 [4].

supplementary service: See ITU-T Recommendation I.210 [7], subclause 2.4.

user: The DSS1 protocol entity at the user side of the user-network interface.

4 Abbreviations

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

DDI	Direct Dialling In
DSS1	Digital Subscriber Signalling System No. one
ISDN	Integrated Services Digital Network
PSTN	Public Switched Telephone Network

5 Description

The DDI supplementary service shall be based on the use of the ISDN number and shall not include subaddressing.

> NOTE: CCITT Recommendation E.164 [4] provides the flexibility to administrations to use national numbering plans of fixed or variable number lengths. This flexibility also applies to DDI numbers.

In networks with an open numbering plan, the length of the DDI number can be unknown to the servicing local exchange or to any other entity of the public network.

The DDI number shall be transferred en-bloc or by overlap receiving from the public network to the private network, which shall finally and automatically establish a call to the destination without assistance of an operator.

6 Operational requirements

6.1 Provision and withdrawal

The DDI supplementary service shall be provided after prior arrangement with the administration and shall be withdrawn on the subscriber's request or for administrative reasons.

> NOTE: Subscription to the multiple subscriber number and DDI supplementary services is mutually exclusive. However, in some networks both supplementary services could co-exist on the same access (e.g. for future extension of service provision).

Use of partial numbers to transfer the DDI numbers is a public network option and may require a bilateral agreement between the public network and the private network.

If this option is used, the proper operation of the DDI supplementary service may require a bilateral agreement between the public network and the private network on the starting point of partial numbers in relation to the full ISDN number and configuration within the private network.

If a public network makes use of the partial number but always sends exactly that part of the ISDN number which is significant to the private network, then no bilateral agreement between the public network and the private network is required, and this rule forms the basis of the configuration within the private network.

6.2 Requirements on the originating network side

The basic call control procedures according to ETS 300 403-1 [2], subclause 5.1, shall apply.

6.3 Requirements on the destination network side

When the DDI supplementary service is provided to the called private network, the DDI number shall be passed to the user in the Called party number information element. The en-bloc or the overlap receiving procedure shall be used to transfer the number information according to the rules specified in ETS 300 403-1 [2], subclause 5.2.

The public network may send numbers using either en-bloc receiving or overlap receiving procedures. It is therefore mandatory for the private network to support the overlap receiving procedure, in addition to the en-bloc receiving procedure which is mandatory according to basic call (see ETS 300 403-1 [2]).

7 Coding requirements

The Called party number information element coded as in ETS 300 403-1 [2], subclause 4.5.8, shall be used to indicate the DDI number.

8 State definitions

The states associated with basic call control according to ETS 300 403-1 [2] shall apply.

9 Signalling procedures at the coincident S and T reference point

Not applicable.

> NOTE: If the public network knows that an equipment attached to the access is not a private ISDN, then it does not need to implement the procedures of clause 10 and thus does not need to provide the DDI supplementary service for that access. If the public network does not know whether the attached equipment is a terminal or a private network then the procedures of clause 10 should be provided to that access if the DDI supplementary service is subscribed.

10 Procedures for interworking with private ISDNs

10.1 Activation, deactivation and registration

Not applicable.

10.2 Delivery of the DDI number

10.2.1 Normal operation

The DDI number shall be delivered from the public network to the private network in the number digits field of the Called party number information element, according the procedures of ETS 300 403-1 [2], subclause 5.2.

In the case where only the partial number is sent to the private network, the public network shall code the numbering plan identification field as "ISDN/telephony numbering plan (CCITT Recommendation E.164)" and the type of number field as "unknown". The private network shall recognise numbers sent in this format, however, for implementations destined only for public ISDNs that never use this form, this requirement is not mandatory.

In the case where the full ISDN number is sent to the private network, the public network shall code the "numbering plan identification" field as "ISDN/telephony numbering plan (CCITT Recommendation E.164)" and the type of number field as "national number", "international number" or "subscriber number". The private network shall recognise numbers sent in all three formats.

NOTE: This coding is independent of the use of en-bloc procedures (where the Called party number is sent in a single message) or overlap receiving procedures (where the Called party number is sent in digit by digit or by multiple digits in several messages as it becomes available).

10.2.2 Exceptional procedures

The exceptional procedures of basic call shall apply (see ETS 300 403-1 [2]).

NOTE: As an alternative to clearing the call when incomplete or invalid digits are received, the user may accept the call. This has no impact on the protocol at the user-network access. The procedures at the private network where correct ISDN numbers received within the Called party number information element do not match a destination in a private ISDN are outside the scope of this ETS.

11 Interactions with other networks

No special requirements for interaction with other networks are necessary.

NOTE: The DDI supplementary service may be used to enable successful terminal selection within the private ISDN when some compatibility information is absent when a call originates in a PSTN.

12 Interactions with other supplementary services

The interactions of the DDI supplementary service with other supplementary services shall be as specified in ETS 300 195-1 [1].

13 Parameter values (timers)

The timers associated with basic call control according to ETS 300 403-1 [2] shall apply.

14 Dynamic description (SDL diagrams)

ETS 300 403-2 [3] shall apply.

Annex A (informative): Signalling flows

No DDI supplementary service specific signalling flow is necessary in addition to basic call control according to ETS 300 403-1 [2].

Annex B (informative):   Summary of changes to the first edition

B.1   Technical changes

This revision changes clause 3 to provide additional clarification on the terms used within this ETS.

This revision contains changes to subclause 6.1 to clarify the options relating to partial numbers within the DDI supplementary service.

This revision contains changes to subclause 6.3 to clarify the options relating to overlap receiving within the DDI supplementary service.

This revision contains changes to subclause 10.2.1 to clarify the options relating to partial numbers within the DDI supplementary service.

B.2   Editorial changes

All references have been updated to current published versions as appropriate. In particular, the references to ETS 300 102-1 and ETS 300 102-2 have been replaced by references to ETS 300 403-1 and ETS 300 403-2, respectively.

Terminology has been changed from "user" and "network" to "private network" and "public network", respectively.

Full definitions of partial number and DDI number have been included.

The contents of the note in subclause 10.2.1 have been clarified.

History

Document history			
October 1991	First Edition		
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