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Digitalno omreġje z integriranimi storitvami (ISDN) - Generiļ ni funkcijski protokol za podporo dopolnilnih storitev - Protokol digitalne naroļ niġke signalizacije ġt. 1 (DSS1) - 1. del: Specifikacija protokola

Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part deliverable covering the Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol, as identified 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: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

The present document is an extended and updated version of ETS 300 196-1 (1993) and its amendment A1 (1995).

National transposition dates	
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Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2002
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1 Scope

The present document specifies the functional protocol for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators for the application to a range of supplementary services at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [3]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol.

The functional protocol is based on the use of the Facility information element and the FACILITY message, as well as on other specific functional messages specified in clause 11.1. The protocol is symmetrical, and is applicable to both the basic and primary rate access structures.

To be functional this protocol requires knowledge of supplementary services supported by the user equipment. This facilitates user equipment operation without human intervention by defining semantics for the protocol elements which user equipment can process on its own.

The procedures specified in the present document can be used for:

- activation and deactivation;
- invocation and operation;
- interrogation;
- status request; and
- status notification,

of supplementary services in association with existing calls or outside any existing call.

In addition, the present document specifies the generic procedures for the channel reservation function performed by the network as it is applied by several supplementary services (e.g. call hold).

Furthermore, the functional signalling procedures that support the delivery of notifications at the user-network interface are covered.

The application of the present document to individual supplementary services is outside the scope of the present document and is defined in those standards which specify the individual supplementary services.

Further parts of the present document specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment, supporting supplementary services using the functional protocol, 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 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.

[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 I.411 (1993): "ISDN user-network interfaces - Reference configurations".

[4] ITU-T Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

[5] ITU-T Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".

[6] ITU-T Recommendation X.209 (1988): "Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)".

[7] ITU-T Recommendation X.219 (1988): "Remote operations: Model, notation and service definition".

[8] ITU-T Recommendation X.229 (1988): "Remote operations: Protocol specification".

[9] ITU-T Recommendation Z.100: "Specification and description language (SDL)".

[10] ETSI EN 300 052-1: "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[11] ETSI EN 300 061-1: "Integrated Services Digital Network (ISDN); Subaddressing (SUB) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[12] ETSI EN 300 122-1: "Integrated Services Digital Network (ISDN); Generic keypad protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[13] ETSI EN 300 267-1: "Integrated Services Digital Network (ISDN); Telephony 7 kHz, videotelephony, audiographic conference and videoconference teleservices; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[14] ETSI ETS 300 402-2: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]".

[15] 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]".

[16] ITU-T Recommendation X.680: "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[17] ITU-T Recommendation X.690: "Information technology - ASN.1 encoding rules - Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".

[18] ITU-T Recommendation X.880: "Information technology - Remote Operations: Concepts, model and notation".

[19] ETSI EN 300 403-2 (V1.3.1): "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".

[20] ITU-T Recommendation Q.931: "ISDN user-network interface layer 3 specification for basic call control".

[21] ETSI EN 301 813-1: "Integrated Services Digital Network (ISDN) and Broadband Integrated Services Digital Network (B-ISDN); Generic Addressing and Transport (GAT) protocol; Part 1: Protocol specification [ITU-T Recommendation Q.860 (2000), modified]".

3 Definitions

For the purposes of the present document, the following terms and definitions apply.

3.1 General definitions

all services: if for the control of supplementary services the parameter basic service is set to "all services", then all the basic services shall be affected that the user is subscribed to, and for which the supplementary service applies and is subscribed to, at the point in time that the request is received.

auxiliary state: state as defined in clause 7.1.2. An auxiliary state may exist for a call reference in parallel with the call state.

basic access: see ITU-T Recommendation Q.9 [4], definition 1551.

basic service: bearer service or teleservice
The terms "bearer service" and "teleservice" are defined in ITU-T Recommendation I.112 [1], definitions 202 and 203.

call control message: message as defined in EN 300 403-1, clause 3.1, which on sending or receipt causes a change of the call state at either the network or the use
Call control messages also include the INFORMATION message and PROGRESS message.

call reference: (excluding dummy call reference) identifier of a signalling transaction
The signalling transaction may either be bearer related, in which case the signalling transaction can be used to control that bearer, or bearer independent, in which case there is no bearer associated with that signalling transaction. Where there is only one bearer required for a call, then the call reference of the associated bearer-related signalling transaction may be used to identify the call.

call state: state as defined in EN 300 403-1, clause 2.1, for either the user or the network as appropriate
A call state may exist for each call reference value (and for each additional responding Connection Endpoint Identifier (CEI) in the incoming call states).

call: see ITU-T Recommendation Q.9 [4], definition 2201.

component: data structure as defined in clause D.1of the present document

connection: see ITU-T Recommendation Q.9 [4], definition 0011. In the present document the use of this term is taken to include a bearer and its associated control signalling.

Corporate Telecommunication Network: consists of sets of equipment (Customer Premises Equipment or Customer Premises Network) which are located at geographically dispersed locations and are interconnected to provide networking services to a defined group of users

NOTE 1: The ownership of the equipment is not relevant to this definition.

NOTE 2: In the present document, even equipment which is not geographically dispersed (e.g. a single PINX or Centrex- provided services to users at a single location) may form a CN.

Data Link Connection Endpoint Identifier; Connection Endpoint Identifier (CEI): identifier used by a layer 3 protocol entity to address its peer entity

dummy call reference: null value indicating that the message is not applicable to an identified signalling transaction
Other rules specify the association of DSS1 protocol entities.

functional protocol: consists of a sequence of functional information elements
A functional information element requires a degree of intelligent processing by a terminal in either generation or analysis.

initiator: entity (user or network) requesting establishment of a signalling connection between an initiator and the responder

Integrated Services Digital Network (ISDN): see ITU-T Recommendation I.112 [1], definition 308.

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

Point-to-point configuration: see EN 300 403-1 [15].

Point-to-multipoint configuration: see EN 300 403-1 [15].

primary rate access: see ITU-T Recommendation Q.9 [4], definition 1552.

responder: entity (user or network) responding to a request from an initiator on establishing a signalling connection

service; telecommunication service: see ITU-T Recommendation I.112 [1], definition 201.

signalling connection: association of DSS1 protocol entities using the bearer-independent supplementary service procedure with the connection-oriented transport mechanism

stimulus protocol: sequence of stimulus information elements
A stimulus information element is generated as a result of a single event at the user-network interface or contains a basic instruction from the network to be executed by the user.

supplementary service: see ITU-T Recommendation I.210 [2], clause 2.4.

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

3.2 Remote operations definitions

The common information element category makes use of the following terms defined in ITU-T Recommendation X.219 [7] or ITU-T Recommendation X.880 [18]:

- remote operation;
- operation;
- operation classes (class 1 to class 5);
- association (initiator; responder);
- invoking (application entity; invoker).

invoke component: see clause 8.2.2.1.

Where reference is made to a "xxxx" invoke component, an invoke component is meant with its operation value set to the value of the operation "xxxx".

return result component: see clause 8.2.2.2.

Where reference is made to a "xxxx" return result component, a return result component is meant which is related to a "xxxx" invoke component.

return error component: see clause 8.2.2.3.

Where reference is made to a "xxxx" return error component, a return error component is meant which is related to a "xxxx" invoke component.

reject component: see clause 8.2.2.4.

3.3 Definition of procedures using the common information element approach

bearer-related transport mechanism: procedure tied to the procedures for basic call control and tied to a connection in progress, active or in the clearing phase
The call reference used by the basic call control procedure is adopted by the bearer-related service invocations to correlate with the appropriate basic call control transaction.

bearer-independent transport mechanism: procedure independent of the procedures for basic call control and not correlated to a connection