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SIST ETS 300 104:1996
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Digitalno omrežje z integriranimi storitvami (ISDN) - Zahteve za priključitev terminalske opreme na ISDN z uporabo osnovnega dostopa ISDN - Značilnosti 3. plasti (Kandidat NET 3, 2. del)

Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access Layer 3 aspects (Candidate NET 3, Part 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);
Attachment requirements for terminal equipment to connect to
an ISDN using ISDN basic access**

Layer 3 aspects

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**(The text of this ETS may be utilized, wholly or in part,
for the establishment of NET 3 Part 2**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI) and was adopted, having passed through the ETSI standards approval procedure.

The text of this ETS may be utilized, wholly or in part, for the establishment of NET 3 part 2.

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Scope

In accordance with CCITT Recommendation I.420 [5] and ETS 300 102-1 [2] and ETS 300 102-2 [3], this standard specifies the layer 3 access control protocol to be offered by terminal equipment as defined in subclause 1.1.2 at the T reference point or coincident S and T reference point at an interface to a public telecommunications network presented at an ISDN basic access point.

The static attachment requirements and tests specified in this ETS are for TEs having the capability of both originating a circuit switched call and receiving an incoming circuit switched call. In addition, certain TEs of a specialised nature may employ supplementary services as part of their default operation characteristics. The requirements and tests for these specialised terminals are also not covered in this standard.

NOTE: No requirements or tests are included in this document concerning the procedures for packet communications, user-to-user signalling or supplementary services except for the case of the terminal portability supplementary service which can be considered as an essential feature of many ISDN terminals. However, TEs implementing packet facilities, user-to-user signalling or supplementary services may be subject to additional and/or alternative testing by those Administrations whose ISDNs provide the support of packet calls, user-to-user signalling and/or supplementary services.

1 General

1.1 Introduction

1.1.1 This standard specifies the basic requirements concerning the layer 3 basic call control protocol which Terminal Equipment (TE) has to meet for attachment to the public ISDN basic user-network interface at the T reference point or coincident S and T reference point. The requirements specified in this standard are in addition to those relating to the layer 1 and 2 aspects given in NET 3, Part 1. This standard does not cover all the requirements which a specific type of TE has to meet. However, standards/NETs which define attachment requirements relevant to a specific type of TE should refer to this standard for the attachment requirements within the scope of this standard. <https://standards.iteh.ai/catalog/standards/sist/fc442ee8-d46c-4790-beb2-3e9311e3-3001041996>

1.1.2 Unless otherwise stated, the use of the term terminal equipment (TE) within this standard refers to customer's terminal apparatus which may be a TE1 (Terminal Equipment Type 1), a TA (Terminal Adaptor) or an NT2 (Network Termination Type 2) as defined in CCITT Recommendation I.411 [4].

1.1.3 Communication between adjacent layers (primitive procedures) is conceptual and allows the description of interactions between functions dedicated to different layers within a TE. These primitive procedures do not constrain implementation, are system internal and therefore cannot be tested in isolation. However, as seen from outside, the design of TE shall be such that the sequence of events across the user-network interface must be the same as if the primitives were implemented as described in ETS 300 102-1 [2] and ETS 300 102-2 [3].

1.2 Configurations at User Premises

The operational configurations specified in subclause 1.2 of NET 3, Part 1 [1] are applicable to this standard.

1.3 Relationship to other Attachment standards/NETs

Where a TE supports services specified in other NETs, additional requirements may apply and will be found in the specific terminal NET.

1.4 Testing and Approval Methodology

1.4.1 The tests specified in Annex A of this ETS shall verify the suitability of the TE for attachment to the public telecommunications network. Those functions and procedures which are optional as indicated in this ETS and for which there are tests in Annex A of this ETS shall be subject to an attachment test if they are implemented in the TE. The means of determining whether an optional function/procedure has been

implemented is by either Apparatus Supplier's declaration or as a result of testing the equipment for this function/procedure. Where no declaration is made by the Apparatus Supplier as to the implementation (or not) of an optional function/procedure, and the testing of this feature reveals that the option is incorrectly (or partially) implemented, the option shall be deemed to have been implemented and the apparatus shall be evaluated accordingly.

1.4.2 The user-network interface at the T reference point or coincident S and T reference point provides the only access for testing the terminal equipment. However, actions at the user side of the equipment under test (e.g. at the man-machine interface, execution of higher layer processes, at the interface at the R reference point in the case of terminal adaptors) shall be used to invoke actions at layer 3 of the D-channel protocol within the equipment under test.

1.4.3 Connection of Equipment Under Test to the Tester shall be carried out in accordance with subclause 1.4.3 of NET 3, Part 1 [1].

1.4.4 The attachment tests for each layer of the D-channel protocol are specified separately (layers 1 and 2 in NET 3, Part 1, Annex A, Parts 1 and 2 respectively and layer 3 in Annex A of this document) and the test configuration(s) to be used in testing each layer is specified in that part of the ETS relating to the attachment tests for that layer.

1.4.5 When carrying out a test, it may be necessary for the equipment under test to be maintained in the active state of a call. In such cases, it may be necessary for the tester to achieve this by procedural means related to functional entities outside the scope of this ETS (e.g. layer 4 and upwards). The procedural means may include:

- a) the tester sending a specified bit pattern within the B-channel subsequent to the CONNECT or CONNECT ACKNOWLEDGE message being sent in the D-channel; and/or
- b) if possible, disabling the TE timers (associated with layer 4 and upwards or lower layers of the user plane (reference CCITT Recommendation I.320 [8]).

Any actions necessary to prevent the equipment under test from premature clearing shall be indicated by the supplier (see subclause 1.5).

1.5 Information to be provided by the Apparatus Supplier

The apparatus supplier shall provide two kinds of information:

- information with respect to the protocol: Protocol Implementation Conformance Statement (PICS);
- information with respect to the man-machine interface: Protocol Implementation eXtra Information for Testing (PIXIT).

The complete list of the information to be provided by the apparatus supplier is a matter between the apparatus supplier and the testing house but an example of the possible information (relating to layer 3 protocol aspects) to be supplied is given for information in Annex B to this ETS.

1.6 Test Environment

The conditions under which the tests specified in Annex A shall be carried out are specified in subclause 1.7 of NET 3, Part 1 [1].

2 Layer 3 Requirements

2.1 General

This section defines the requirements for TE operation relating to the D-channel Layer 3 protocol with reference to Basic Call Control.

A TE shall support the protocols associated with the user side in accordance with ETS 300 102-1 [2] and ETS 300 102-2 [3] and where applicable meet those functional requirements which are compulsory to provide the communication functionality specified in a ETS/NET concerned with a specific type of TE.

The layer 3 D-channel protocol implemented in the TE shall satisfy ETS 300 102-1 [2] and and ETS 300 102-2 [3] as indicated in the Tables 1 to 15 in section 2.2 of this ETS.

2.2 Static Attachment Requirements

The static attachment requirements (SAR) define features and functions which at minimum must be supported to ensure the operational integrity of an ISDN I-series terminal. For layer 3 the SAR is specified in Tables 1 to 15 below.

Within Tables 1 to 15, the following notation is used:-

M = mandatory ie the TE implementation shall satisfy clauses in that section relating to the operation of the layer 3 protocol in the TE.

O = optional ie it is optional whether the TE implements that function but if the function is implemented it shall satisfy the clauses in that section relating to the operation of the TE layer 3 protocol.

N/A = not applicable ie either the requirements specified in the section on the TE shall not be applied for attachment approval or else the section relates solely to the operation of the network, or it relates to the operation at the man-machine interface.

GID = the section provides General Information and Definitions.

ETS = ETS 300 102-1 [2].

SAR = Static Attachment Requirement (minimal acceptance).

COMMENT = Available field for supportive comments/values. (The comments references apply to this document).

2.2.1 Functional Characteristics

2.2.1.1 General

Table 1: Layer 3 Functional Characteristics Requirements

FUNCTIONAL CHARACTERISTICS			
Function = General	ETS	SAR	COMMENTS
General	§1	GID	

2.2.1.2 Overview of Call Control

Table 2: Layer 3 Call States Requirements

FUNCTIONAL CHARACTERISTICS			
Function = Call States	ETS	SAR	COMMENTS
Overview of Call Control	§2	GID	Background Info.
Circuit Switched Calls	§2.1	GID	
Call states at the user side of the interface	§2.1.1	GID	
Null state (U0)	§2.1.1.1	M	
Call Initiated (U1)	§2.1.1.2	M	
Overlap sending (U2)	§2.1.1.3	O	
Outgoing call proceeding (U3)	§2.1.1.4	NOTE	
Call delivered (U4)	§2.1.1.5	NOTE	
Call present (U6)	§2.1.1.6	M	Transitory state
Call received (U7)	§2.1.1.7	O	M if alerting used
Connect request (U8)	§2.1.1.8	M	
Incoming call proceeding (U9)	§2.1.1.9	O	M if call proc.used
Active (U10)	§2.1.1.10	M	
Disconnect request (U11)	§2.1.1.11	M	
Disconnect indication (U12)	§2.1.1.12	M	
Suspend request (U15)	§2.1.1.13	O	M if call rearrangement used
Resume request (U17)	§2.1.1.14	O	M if call rearrangement used
Release request (U19)	§2.1.1.15	M	
Overlap receiving (U25)	§2.1.1.16	O	M if overlap receiving used
Call states at the network side of the interface	§2.1.2	N/A	
Packet mode access connections	§2.2	N/A	see NOTE in scope
Temporary signalling connections	§2.3	N/A	see NOTE in scope
States associated with the global call reference	§2.4	O)
Call states at the user side of the interface	§2.4.1	O)
Null (Rest 0)	§2.4.1.1	O) M if Restart procedure used.
Restart request (Rest 1)	§2.4.1.2	O)
Restart (Rest 2)	§2.4.1.3	O)
Call states at the network side of the interface	§2.4.2	N/A)

Note to table 2:

NOTE: A given TE may not need this call state, but to fulfil procedures specified in ETS 300 102-1 [2], clause 5 and all its subsections, all TEs must implement the call state.

2.2.1.3 Message Definition and Content

Table 3: Layer 3 Message Definition and Content Requirements

FUNCTIONAL CHARACTERISTICS			
Function = Message definition and content	ETS	SAR	COMMENTS
Message Functional Definitions and Content	§3	GID	NOTE 1
Messages for Circuit Mode Connections	§3.1	GID	Summary of message repertoire
ALERTING	§3.1.1	NOTE 2	
CALL PROCEEDING	§3.1.2	NOTE 2	
CONGESTION CONTROL	§3.1.3	N/A	see NOTE in Scope
CONNECT	§3.1.4	M	
CONNECT ACKNOWLEDGE	§3.1.5	NOTE 2	
DISCONNECT	§3.1.6	M	
FACILITY	§3.1.7	N/A	see NOTE in Scope
INFORMATION	§3.1.8	NOTE 2	
NOTIFY	§3.1.9	NOTE 2	
PROGRESS	§3.1.10	NOTE 2	
RELEASE	§3.1.11	M	
RELEASE COMPLETE	§3.1.12	M	
RESUME	§3.1.13	O	NOTE 4
RESUME ACKNOWLEDGE	§3.1.14	O	NOTE 4
RESUME REJECT	§3.1.15	O	NOTE 4
SETUP	§3.1.16	M	
SETUP ACKNOWLEDGE	§3.1.17	O	
STATUS	§3.1.18	M	
STATUS ENQUIRY	§3.1.19	O	
SUSPEND	§3.1.20	O	NOTE 4
SUSPEND ACKNOWLEDGE	§3.1.21	O	NOTE 4
SUSPEND REJECT	§3.1.22	O	NOTE 4
USER INFORMATION	§3.1.23	N/A	see NOTE in Scope
Messages for Packet Mode Connections	§3.2	N/A	see NOTE in Scope
Messages for user to user signalling not associated with circuit switched calls	§3.3	N/A	see NOTE in Scope
Messages used with the Global Call Reference	§3.4		
RESTART	§3.4.1	NOTE 3	
RESTART ACKNOWLEDGE	§3.4.2	NOTE 3	
STATUS	§3.4.3	O	

Notes to table 3:

- NOTE 1: Refer to ETS 300 102-1 [2], subclause 3.1.1 to subclause 3.1.23 for the content of each message.
- NOTE 2: It is optional whether a TE ever transmits this message but all TEs must be able to receive the message and handle it correctly as defined in the procedures specified in ETS 300 102-1 [2], clause 5 and all its subsections.
- NOTE 3: The implementation of both the RESTART and the RESTART ACKNOWLEDGE messages is optional. However, if the capability to transmit the RESTART message is implemented then it is mandatory to implement the capability to receive the RESTART ACKNOWLEDGE message. Similarly, if the capability to receive the RESTART message is implemented, it is mandatory to implement the capability to transmit the RESTART ACKNOWLEDGE message.
- NOTE 4: The support of the call re-arrangement procedure is optional. However, if call re-arrangement is implemented then all the messages RESUME, RESUME ACKNOWLEDGE, RESUME REJECT, SUSPEND, SUSPEND ACKNOWLEDGE, SUSPEND REJECT must be implemented.

2.2.1.4 Message Format and Information Element Coding

Table 4: Layer 3 Message Format and Coding Requirements

FUNCTIONAL CHARACTERISTICS			
Function = Message Format and Information Element Coding	ETS	SAR	COMMENTS
General Message Format and Information Element Coding Overview	§4	NOTE 1	
Protocol Discriminator	§4.1	M	
Call Reference	§4.2	M	
Message Type	§4.3	M	
Other Information Elements	§4.4	M	
Coding Rules	§4.5		
Codeset 0	§4.5.1	M	
Codeset 5	§4.5.1.1	M	
Extensions of Codesets	§4.5.1.2	NOTE 6	
Locking Shift Procedure	§4.5.2	M	
Non-locking Shift Procedure	§4.5.3	NOTE 2	
Bearer Capability	§4.5.4	NOTE 2	
Call Identity	§4.5.5	M	
Call State	§4.5.6	O	NOTE 3
Called Party Number	§4.5.7	M	
Called Party Subaddress	§4.5.8	M	
Calling Party Number	§4.5.9	N/A	see NOTE in Scope
Calling Party Subaddress	§4.5.10	N/A	see NOTE in Scope
Cause	§4.5.11	N/A	see NOTE in Scope
Channel Identification	§4.5.12	M	
Congestion Level	§4.5.13	NOTE 2	
Display	§4.5.14	N/A	see NOTE in Scope
High Layer Compatibility	§4.5.15	NOTE 7	
Keypad Facility	§3.1.16	O	
Low Layer Compatibility	§4.5.17	N/A	see NOTE in Scope
More Data	§4.5.18	O	
Network-specific Facilities	§4.5.19	N/A	see NOTE in Scope
Notification Indicator	§4.5.20	N/A	see NOTE in Scope
Progress Indicator	§4.5.21	NOTE 2	
Restart Indicator	§4.5.22	NOTE 2	
Segmented Message	§4.5.23	O	
Sending Complete	§4.5.24	N/A	
Signal	§4.5.25	N/A	
Transit Network Selection	§4.5.26	NOTE 4	
User to user	§4.5.27	N/A	see NOTE in Scope
Date/Time	§4.5.28	O	
Facility	§4.5.29	N/A	see NOTE in Scope
Information Element	§4.6.1	NOTE 5	
Information Element for Packet Communications	§4.6.2	N/A	see NOTE in Scope
	§4.7	N/A	see NOTE in Scope

Notes to table 4:

- NOTE 1: Refer to ETS 300 102-1 [2], subclause 4.2 to subclause 4.5.28 for the content of each information element.
- NOTE 2: It is optional whether a TE ever transmits this information element but all TEs must be able to receive the information element and handle it correctly as defined in the procedures specified in ETS 300 102-2 [2], clause 5 and all its subsections.
- NOTE 3: The support of the call re-arrangement procedure is optional. However ETSs/NETs relating to a specific terminal type may require the procedure to be mandatory for those specific types of terminals. Furthermore, even if the call re-arrangement procedure is used, the support of this information element is optional.
- NOTE 4: It is optional for a TE to generate this information element, but TEs which implement the Overlap receiving procedure shall recognize the information element and handle it correctly as defined in the procedures specified in ETS 300 102-2 [2], clause 5 and all its subsections.

- NOTE 5: It is mandatory that the TE recognises the Date/time information element meaning that no error handling procedures shall be initiated upon its reception. ETSs/NETs relating to a specific terminal type may require the use of the contents of the Date/time information element but otherwise it may be ignored.
- NOTE 6: It is mandatory for the TE to handle correctly the shifting procedures between different codesets. It is optional whether the TE recognizes or generates any of the information elements in codeset 5.
- NOTE 7: It is mandatory that the TE recognizes the Display Information Element meaning that no error handling procedures shall be initiated upon its reception but it is optional whether the contents of the information element are displayed.

2.2.1.5 Layer 3 System Parameters

Table 5: Layer 3 System Parameter Requirements

FUNCTIONAL CHARACTERISTICS			
Function = Layer 3 System Parameters	ETS	SAR	COMMENTS
List of System Parameters	§9		
Timers in the Network Side	§9.1	N/A	
Timers in the User Side	§9.2		
T301		N/A	
T302		NOTE	
T303		O	
T304		O	
T305		M	
T308		M	
T309		O	
T310		O	
T313		M	
T314		NOTE	
T316		NOTE	
T317		NOTE	
T318		NOTE	
T319			
T321		N/A	
T322		NOTE	

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Note to table 5:

NOTE: Mandatory if the corresponding procedure is implemented, otherwise not applicable.