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Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

The content of this ETS is adapted from CCITT Recommendation I.233.1 [4].

This ETS consists of 4 parts as follows:

Part 1: "Part 1: General description".

Part 2: "Part 2: Integrated Services Digital Network (ISDN); Frame relay bearer service; Service definition".

Part 3: "Part 3: Integrated Services Digital Network (ISDN); Frame relay data transmission service; Service definition".

Part 4: "Part 4: Broadband Integrated Services Digital Network (B-ISDN); Frame relay bearer service; Service definition".

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

Introduction

The purpose of this ETS is to describe the network specific aspects of the frame relay service when it is offered on a Broadband Integrated Services Digital Network (B-ISDN).

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1 Scope

This draft European Telecommunication Standard (ETS) specifies the network specific aspects of the frame relay service when it is offered on a Broadband Integrated Services Digital Network (B-ISDN); the service is called "frame relay bearer service".

This ETS is applicable for all B-ISDNs offering a frame relay bearer service.

This ETS should be complemented with ETS 300 399-1 [1], for the common part of the frame relay service.

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] prETS 300 399-1: "Frame relay services; Part 1: General description".
- [2] prETS 300 467: "Broadband Integrated Services Digital Network (B-ISDN); Support of Frame Relay Bearer Service (FRBS) in B-ISDN and frame relay interworking between B-ISDN and other networks".
- [3] CCITT Recommendation E.164: "Numbering plan for the ISDN era".
- [4] CCITT Recommendation I.233.1: "ISDN frame relaying bearer service".
- [5] ITU-T Recommendation I.432: "B-ISDN user-network interface - Physical layer specification".
- [6] CCITT Recommendation Q.922: "ISDN data link layer specification for frame mode bearer services".
- [7] ITU-T Recommendation Q.933: "Layer 3 signalling specification for frame mode bearer service".
- [8] ITU-T Recommendation Q.2100: "B-ISDN signalling ATM adaptation layer (SAAL) overview description".
- [9] ITU-T Recommendation Q.2110: "B-ISDN ATM Adaptation Layer - Service Specific Connection Oriented Protocol (SSCOP)".
- [10] ITU-T Recommendation Q.2130: "B-ISDN ATM adaptation layer - Service specific coordination function for support of signalling at the user-network interface (SSCF at UNI)".
- [11] CCITT Recommendation X.121: "International numbering plan for public data networks".

3 Definitions

For the purpose of this ETS, the definitions given in ETS 300 399-1 [1], clause 3 apply.

4 Abbreviations

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

ATM	Asynchronous Transfer Mode
B-ISDN	Broadband Integrated Services Digital Network
DLCI	Data Link Connection Identifier
FR-SSCS	Frame Relay - Service Specific Convergence Sublayer
QoS	Quality of Service
SDU	Service Data Unit

5 General definition

This bearer service provides the bi-directional transfer of data units (Frame Relay - Service Specific Convergence Sublayer - Service Data Unit (FR-SSCS-SDU)) from one S_B or T_B reference point to another. The data units are routed through the network on the basis of an attached label. This label is a logical identifier with local significance (termed Data Link Connection Identifier (DLCI) in the protocol description). Per DLCI, the order of the data units is preserved from one S_B or T_B reference point to another.

The user-network interface structure at the S_B or T_B reference point allows for the establishment of multiple on-demand and/or permanent virtual circuits to many destinations.

6 Description of the frame relay service

The description of the frame relay service given in clause 6 of ETS 300 399-1 [1] applies.

7 Service classes

The service class definition in clause 7 of ETS 300 399-1 [1] applies.

The service classes are defined per Asynchronous Transfer Mode (ATM) connection; not all service classes may be offered simultaneously on a single ATM connection. The service classes on ATM connections are provided with peak rate resource allocation. Other resource allocations and their possible impact on the service classes are for further study.

Table 1: Frame relay bearer service classes

Class		Characteristic	Service association						
P		Layer 2 permanent							
	1	a	Layer 1 permanent	♦					
			with Q.933, annex A connection monitoring with Q.933, annex B connection monitoring	♦	♦				
	2	a	Layer 1 on-demand				♦		
with Q.933, annex A connection monitoring with Q.933, annex B connection monitoring						♦	♦		
A		On-demand case A							
	1	Layer 1 permanent	♦						
	2	Layer 1 on-demand					♦		
B		On-demand case B							
	1	Layer 1 permanent			♦				
	2	Layer 1 on-demand						♦	
Q.933 = ITU-T Recommendation Q.933 [6].									

The service classes supported are summarized in table 1. The service associations (columns in table 1) show the valid combinations of the individual frame relay bearer services which apply separately to each CCITT Recommendation E.164 [3] number or group of CCITT Recommendation E.164 [3] numbers on the interface. On a particular user-network interface, more than one CCITT Recommendation E.164 [3] number or groups of CCITT Recommendation E.164 [3] numbers may be assigned simultaneously.

NOTE: It is not implied that a network should offer all frame relay bearer services or all service associations.

8 Procedures

The procedures defined in clause 8 of ETS 300 399-1 [1] apply.

9 Network capabilities for charging

The network capabilities for charging given in clause 9 of ETS 300 399-1 [1] apply.

10 Interworking

The interworking specification given in clause 10 of ETS 300 399-1 [1] applies. For specific B-ISDN interworking scenarios, ETS 300 467 [2] applies.

11 Attributes and values of attributes

The attributes and values are given in table 2.

NOTE: Attribute values 9.1, 9.2, 9.3 and 10 of table 2 are only for on-demand frame relay bearer services.

Table 2: Frame relay bearer service attributes

Information transfer attributes		
1	Information transfer mode	Frame
2	Information transfer rate	Less than or equal to the maximum bit rate of the user information access channel and the throughput of the frame relay connection (DLCI)
3	Information transfer capability	Unrestricted
4	Structure	SDU integrity
5	Establishment of communication	On-demand Permanent
6	Symmetry	Bi-directional symmetric
7	Communication configuration	Point-to-point
Access attributes		
8	Access channel	ATM connection
9	Access protocol	
9.1	Signalling access protocol layer 1	I.432
9.2	Signalling access protocol layer 2 (permanent) Signalling access protocol layer 2 (case A) Signalling access protocol layer 2 (case B)	none or AAL5 + FR-SSCS + Q.922 (data link control) Q.2100 and Q.2110 and AAL5 + FR-SSCS + Q922 (data link control) Q.2100 and Q.2110
9.3	Signalling access protocol layer 3 (permanent) Signalling access protocol layer 3 (case A) Signalling access protocol layer 3 (case B)	Q.933 (annex A or B) Q.2130 and Q.933 for further study
9.4	Information access protocol layer 1	I.432
9.5	Information access protocol layer 2 (core functions)	AAL5 + FR-SSCS
9.6	Information access protocol layer 2 (data link control)	user specific; Q.922 data link control required for interworking with X.25
General attributes		
10	Supplementary services provided for signalling access protocol layer 3, case A:	direct dialling in; multiple subscriber number; calling line identification presentation; calling line identification restriction; connected line identification presentation; connected line identification restriction; malicious call identification; sub-addressing; call forwarding busy; call forwarding unconditional; closed user group; private numbering plan; advice of charge; reverse charging.
11	Quality of Service (QoS).	Implementation dependent (note)
12	Interworking possibilities	Implementation dependent
13	Operational and commercial	See clause 9 of ETS 300 399-1 [1]
I.432 = ITU-T Recommendation I.432 [5] Q.922 = CCITT Recommendation Q.922 [6] Q.933 = ITU-T Recommendation Q.933 [7] Q.2100 = ITU-T Recommendation Q.2100 [8] Q.2110 = ITU-T Recommendation Q.2110 [9] Q.2130 = ITU-T Recommendation Q.2130 [10] X.25 = ITU-T Recommendation X.25.		
NOTE: Congestion management will affect QoS.		

12 Dynamic description

No dynamic description is provided for this ETS.

13 Numbering plan

Both the CCITT Recommendation E.164 [3] and the CCITT Recommendation X.121 [11] numbering plans are applicable depending on the service class (see clause 7). This dependence is shown in table 3.

Table 3: Numbering plan and service class dependency

Service class	Numbering plan
P1a P1b	not applicable not applicable
P2a P2b	CCITT Recommendation E.164 [3] CCITT Recommendation E.164 [3]
A1 A2	CCITT Recommendations E.164 [3] or X.121 [11] (note) stage 1 signalling: CCITT Recommendation E.164 [3] stage 2 signalling: CCITT Recommendations E.164 [3] or X.121 [11] (note)
B1 B2	CCITT Recommendation E.164 [3] CCITT Recommendation E.164 [3]
NOTE: The numbering plan used is service provider dependent.	

Annex A (informative): Bibliography

The following references are given for informative purposes:

- 1) ETS 300 011: "Integrated Services Digital Network (ISDN); Primary rate user-network interface Layer 1 specification and test principles".
- 2) ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface Layer 1 specification and test principles".
- 3) ETS 300 102: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".
- 4) ETS 300 125: "Integrated Services Digital Network (ISDN); User-network interface data link layer specification Application of CCITT Recommendations Q.920/I.440 and Q.921/I.441".
- 5) prETS 300 425: "Private Telecommunication Network (PTN); Specification, functional model and information flows; Call intrusion supplementary service (CISD)".
- 6) ITU-T Recommendation I.320: "ISDN protocol reference model".
- 7) ITU-T Recommendation I.361: "B-ISDN ATM layer specification".
- 8) ITU-T Recommendation I.362: "B-ISDN ATM adaptation layer (AAL) description".
- 9) ITU-T Recommendation I.363: "B-ISDN ATM adaptation layer (AAL) specification".
- 10) ITU-T Recommendation I.365.1: "Frame relaying service specific convergence sublayer (FR-SSCS)".
- 11) ITU-T Recommendation I.371: "Traffic control and congestion control in B-ISDN".
- 12) ITU-T Recommendation I.430: "Basic rate user-network interface - Layer 1 specification".
- 13) ITU-T Recommendation I.431: "Primary rate user-network interface - Layer 1 specification".
- 14) ITU-T Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".
- 15) CCITT Recommendation X.200: "Reference Model of Open Systems Interconnection for CCITT applications".
- 16) ITU-T Recommendation X.210: "Open Systems Interconnection layer service definition conventions".
- 17) CCITT Recommendation I.112: "Vocabulary of terms for ISDNs".

History

Document history	
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