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Prenos in multipleksiranje (TM) – Oprema fleksibilnega multiplekserja (FM) – 2. del: Funkcije za upravljanje in krmiljene

Transmission and Multiplexing (TM); Flexible Multiplexer (FM) equipment; Part 2: Management and control functions

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is needed in order to provide the necessary information to network operators and equipment manufacturers for the deployment and design of Flexible Multiplexer equipment to be used in synchronous digital leased line networks. meet the requirements of

This ETS consists of two parts as follows:

Part 1: "Core functions, 2 048 kbit/s aggregate interface functions, tributary interface functions and special functions" (ETS 300 461-1);

Part 2: "Management and control functions".

Transposition dates	
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1 Scope

This European Telecommunication Standard (ETS) addresses management aspects of the Flexible Multiplexer (FM) equipment. The FM management functions are specified and management network architecture is described.

NOTE: The requirements of Flexible Multiplexer equipment with a variety of access methods for use in synchronous digital leased line networks are defined in part 1 of this ETS (ETS 300 461-1 [31]).

Sub-64 kbit/s signals are not precluded and are considered as an option that may be described according to the methodology used in this ETS. In the same way, special functions such as Adaptive Differential Pulse Code Modulation (ADPCM), conference bridges, etc., which are only mentioned in an annex of part 1 (ETS 300 461-1 [31]), are not considered.

The requirements presented here are limited to the basic functions, external characteristics and performance of the equipment. Some management functions may be implemented in a mediation device which may support both Q protocol adaptation and Operations Systems (OS) functionalities.

Part 1 of this ETS (ETS 300 461-1 [31]) defines functions and indicates whether or not they are mandatory. If supported, a function has to be managed according to this part 2 of this ETS. Part 2 of this ETS specifies when necessary the optional management characteristics (attributes, operations and notifications) of the objects.

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] CCITT Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".

[2] CCITT Recommendation G.704 (1991): "Synchronous frame structures used at primary and secondary hierarchical levels".

[3] CCITT Recommendation G.711 (1988): "Pulse code modulation (PCM) of voice frequencies".

[4] CCITT Recommendation G.722 (1988): "7 kHz audio-coding within 64 kbit/s".

[5] CCITT Recommendation G.762 (1990): "General characteristics of a 48-channel transcoder equipment".

[6] ITU-T Recommendation G.774.03 (1992): "Synchronous digital hierarchy (SDH) management of multiplex-section protection for the network element view".

[7] ITU-T Recommendation G.784 (1994): "Synchronous digital hierarchy (SDH) management".

[8] ITU-T Recommendation G.805 (1995): "Generic functional architecture of transport networks".

[9] ITU-T Recommendation G.826 (1993): "Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate".

[10] ITU-T Recommendation M.20 (1992): "Maintenance philosophy for telecommunications networks".

[11] ITU-T Recommendation M.2100 (1992): "Performance limits for bringing-into-service and maintenance of digital paths, sections and transmission systems".

[12] ITU-T Recommendation M.2110 (1993): "Bringing into service international digital paths, sections and transmission systems".

[13] ITU-T Recommendation M.2120 (1993): "Digital path, section and transmission system fault detection and localization procedures".

[14] ITU-T Recommendation M.3010 (1992): "Principles for a telecommunications management network".

[15] CCITT Recommendation M.3100 (1992): "Generic network information model".

[16] ITU-T Recommendation O.151 (1993); "Error performance measuring equipment operating at the primary rate and above".

[17] ITU-T Recommendation V.24 (1993): "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit terminating equipment (DCE)".

[18] CCITT Recommendation V.25bis (1989): "Automatic calling and/or answering equipment on the general switched telephone network (GSTN) using the 100-series interchange circuits".

[19] CCITT Recommendation V.54 (1988): "Loop test devices for modems".

[20] CCITT Recommendation X.24 (1988): "List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DTE) on public data networks".

[21] CCITT Recommendation X.150 (1988): "Principles of maintenance testing for public data networks using data terminal equipment (DTE) and data circuit-terminating equipment (DCE) test loops".

[22] CCITT Recommendation X.710 (1991): "Common management information service definition for CCITT applications".

[23] ITU-T Recommendation X.721 (1992):"Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[24] ITU-T Recommendation X.731 (1992): "Information technology - Open Systems Interconnection - System management: State management function".

[25] ITU-T Recommendation X.733 (1992): "Information technology - Open Systems Interconnection - System management: Alarm reporting function".

[26] ETR 135 (1993): "Transmission and Multiplexing (TM); Network aspects and applications for a 4 (and n x 4) kbit/s data link in 2 048 kbit/s frame".

[27] ETS 300 150 (1992): "Transmission and Multiplexing (TM); Protocol suites for Q interfaces for management of transmission systems".

[28] ETS 300 304 (1994): "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH) information model for the Network Element (NE) view".

[29] ETS 300 371 (1994): "Transmission and Multiplexing (TM); Plesiochronous Digital Hierarchy (PDH) information model for the Network Element (NE) view".

[30] ETS 300 376-1 (1994): "Signalling Protocols and Switching (SPS); "Q3 interface at the Access Network (AN) for configuration management of V5 interfaces and associated user ports Part 1: Q3 interface specification".

[31] ETS 300 461-1 (1996): "Transmission and Multiplexing (TM); Flexible Multiplexer (FM) equipment; Part 1: Core functions, 2 048 kbit/s aggregate interface functions, tributary interface functions and special functions".

[32] ETR 241: "Transmission and Multiplexing (TM); Functional architecture of 2 Mbit/s based Plesiochronous Digital Hierarchy (PDH) transport networks".

3 Definitions and abbreviations

3.1 Definitions

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

Physical Interface (PI): This function terminates and generates the signals of either a tributary or an aggregate circuit. The PI functional block recovers the timing signal (X or T2 reference point) from the received signal. The function detects loss of signal condition. When appropriate, the line code violations are also detected.

lower order section protection switch: This optional function is used when 1+1 protection switching is required for the 2 048 kbit/s digital section.

plesiochronous lower order path termination: This function terminates and generates a logical signal at 2 048 kbit/s at an aggregate interface. The function provides frame generation and recovery and detection of defect and failure conditions on the 2 048 kbit/s logical signal.

lower order path protection switch: This optional function is used when either 1+1 or 1 for n protection switching is required for the 2 048 kbit/s digital path.

remote multiframe alarm indication: This alarm corresponds to the Remote Alarm Indication (RAI) in time slot 16, as defined in part 1 of this ETS (ETS 300 461-1 [31]).

cross connection function: This function allows the cross connection of 64 and n x 64 kbit/s signals between the same or different reference points.

channel associated signalling cross connection function: If channel associated signalling or control is used then this function allows the cross connection of the associated signalling signals at 4 x 500 bit/s or n x 4 x 500 bit/s between the same or different reference points.

Special Function (SF): Examples of optional special functions are analogue multipoint conference bridge, data multipoint bridge and broadcasting.

Tributary Signal Adaptation (TSA): This function modifies the tributary signal, when necessary, into a 64 kbit/s channel suitable for the cross connection function. It also carries out the reverse function.

Tributary Path Termination (TPT)/Tributary Signal Termination (TST): This function generates or terminates tributary information and any related signalling or control signals.

administrative state: The meaning of the administrative state is described in each object definition, when applicable.

null: This attribute value indicates that the function exists and is not activated.

3.2 Symbols

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

2W4WaF	2 Wires 4 Wires adaptation Function
4WG722aF	4 Wires G722 adaptation Function
casCrossConnection	channel associated signalling Cross-Connection
casCTP	channel associated signalling Connection Termination Point
castCTP	channel associated signalling tributary Connection Termination Point
casTTP	channel associated signalling Trail Termination Point
casgtp	channel associated signalling group termination points
e00VBCTP	subrate voice Band Connection Termination Point
e00VBtCTP	subrate voice Band tributary Connection Termination Point
e00WBCTP	subrate Wide Band Connection Termination Point
e00WBtCTP	subrate Wide Band tributary Connection Termination Point
e0CrossConnection	64 kbit/s Cross-Connection
e0CTP	64 kbit/s Connection Termination Point
e0G711ALTTP	64 kbit/s G711 A Law Trail Termination Point
e0G722TTP	64 kbit/s G722 Trail Termination Point
e0gtp	64 kbit/s Group Termination Points
e0tCTP	64 kbit/s tributary Connection Termination Point
e1CrossConnection	2 Mbit/s Cross-Connection
e1CTP	2 Mbit/s Connection Termination Point
e1G704ATTP	2 Mbit/s G704 AIS Trail Termination Point
eNx0CTP	N x 64 kbit/s Connection Termination Point
fmEquipement	replaceable units of the flexible multiplexer
fmFabric	Fabric of the flexible multiplexer
fmPowerFeeding	Power Feeding of the flexible multiplexer
fmSoftware	Software of the flexible multiplexer
fmTimingGenerator	Timing Generator of the flexible multiplexer
imTP	internal management Termination Point
lcCTP	local management Connection Termination Point
lPProtectionGroup	low order path Protection Group

lPProtectionUnit	low order path Protection Unit
lSProtectionGroup	low order section Protection Group
lSProtectionUnit	low order section Protection Unit
mCTP	reference point M Connection Termination Point
mngtCrossConnection	management Cross-Connection
pPI0G703TTP	plesiochronous Physical Interface 64 kbit/s G703 Trail Termination Point
pPI1G703ITSTTP	plesiochronous Physical Interface G703 Input Timing Source Trail Termination Point
pPI1G703OTSTTP	plesiochronous Physical Interface G703 Output Timing Source Trail Termination Point
pPI1G703TTP	plesiochronous Physical Interface G703 Trail Termination Point
pPI2W4WTTP	plesiochronous Physical Interface 2 Wires/4 Wires Trail Termination Point
pPI4WG722TTP	plesiochronous Physical Interface 4 Wires G722 Trail Termination Point
pPIv24v10v11TTP	plesiochronous Physical Interface v24/v10/v11 Trail Termination Point
pPIx24TTP	plesiochronous Physical Interface X24 Trail Termination Point
protectedTTP	protected Trail Termination Point
q3CTP	Q3 Connection Termination Point
saEocCTP	sa bit Embedded operating channel Connection Termination Point
saEoctCTP	sa bit Embedded operating Channel Tributary Connection
sigCTP	signalling Connection Termination Point
sigtCTP	signalling tributary Connection Termination Point
ts16ATTP	time slot 16 AIS Trail Termination Point
tSProtectionGroup	timing Source Protection Group
tSProtectionUnit	timing Source Protection Unit
unprotectedCTP	unprotected Connection Termination Point
v24aF	V24 adaptation Function
x24aF	X24 adaptation Function

3.3 Abbreviations

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

ADPCM	Adaptive Differential Pulse Code Modulation
AIS	Alarm Indication Signal
BVE	Bipolar Violation Error
CAS	Channel Associated Signalling
CMIS	Common Management Information Service