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Omrežni vidiki (NA) – Velemestno omrežje (MAN) – Medsebojno povezovanje omrežij MAN

Network Aspects (NA); Metropolitan Area Network (MAN); Interconnection of MANs

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Interconnection of MANs

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Foreword

This European Telecommunication Standard (ETS) has been prepared by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Introduction

The purpose of Metropolitan Area Network (MAN) interconnection is to enable users connected to different MANs using the same bearer service to communicate with each other.

MANs are based upon a shared medium access and cover a restricted geographical area.

In order to cover larger areas, MAN interconnection is needed.

As described in ETS 300 211 [1], a MAN is composed of one MSS (MAN Switching System) and one or more access facilities connected to the MSS. Since interconnection of MANs is achieved by the coupling of MSSs, in this ETS the term "MAN interconnection" is synonymous to "MSS interconnection".

The Protocol Implementation Conformance Statement (PICS) proforma for the protocol specified in this ETS can be found in ETS 300 268 [4], with the exceptions specified in Clause 8.

The reference for the PICS proforma structure and definitions is ETS 300 268 [4] Clause 4.

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1 Scope

This European Telecommunication Standard (ETS) describes the direct interconnection between European Metropolitan Area Networks (MANs), as defined in European MAN ETSs, by means of dedicated links.

Interworking between MANs and other networks is outside the scope of this ETS.

Although MAN interconnection is intended to cover all services as defined in ETS 300 211 [1] (i.e. connectionless, isochronous and connection-oriented non-isochronous), this ETS is restricted to the connectionless service, as defined in ETS 300 217 [2].

Interconnection within a network operator domain and between different network operator domains is specified.

This ETS provides the general principles and functional requirements and specifies the corresponding interfaces for interconnection of MANs, assuming ETS 300 211 [1] as a basis.

The protocol at the interfaces between MAN Switching Systems (MSSs) is the MSS Interconnection Protocol (MIP), specified in this ETS and based on Distributed Queue Dual Bus (DQDB) protocol as specified in ETS 300 212 [3].

The interconnection of MSSs via Asynchronous Transfer Mode (ATM) links is specified in DE/NA-2104: "Interconnection of MSSs based on an ATM interface".

This ETS defines the reference configuration, functional blocks, and their corresponding Protocol Reference Models (PRMs), related to MAN direct interconnection.

Neither routing protocol, nor congestion procedures are specified.

The scope of this ETS is presently limited to the case where there is no need for an explicit operator selection.

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2 Normative references

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This ETS incorporates by dated or 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 300 211 (1992): "Network Aspects (NA); Metropolitan Area Network (MAN) Principles and Architecture". |
| [2] | ETS 300 217 (1992): "Network Aspects (NA); Connectionless Broadband Data Service (CBDS)". |
| [3] | ETS 300 212 (1992): "Network Aspects (NA); Metropolitan Area Network (MAN) Media access control layer and physical layer specification". |
| [4] | ETS 300 268: "Network Aspects (NA); Metropolitan Area Network (MAN) Protocol Implementation Conformance Statement". |
| [5] | CCITT Recommendation E.164 (1991): "Numbering plan interworking for the ISDN era". |
| [6] | CCITT Recommendation M.3010 (1992): "Principles for a Telecommunications Management Network". |
| [7] | ETS 300 273: "Network Aspects (NA); Metropolitan Area Network (MAN) Medium Access Control (MAC) layer management". |

- [8] DE/NA-052104: "Interconnection of MSSs based on an ATM interface".
- [9] ISO/IEC 8802-6: "Distributed Queue Dual Bus (DQDB) Subnetwork of a Metropolitan Area Network".

3 Abbreviations and definitions

3.1 Abbreviations

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

AF1	Access Facility 1
AF2	Access Facility 2
ATM	Asynchronous Transfer Mode
BAsize	Buffer Allocation size
BEtag	Beginning End tag
BT	Bit sublayer
CBDS	Connectionless Broadband Data Service
CEQ	Customer Equipment
CIB	CRC Indicator Bit
DA	Destination Address
DM	Derived MAC sublayer
DQDB	Distributed Queue Dual Bus
HE	Header Extension
HEL	Header Extension Length
IM	Initial MAC sublayer
IMI	Inter MSS Interface
IMPDU	Initial MAC Protocol Data Unit
IMSI	Inter MAN System Interface
INI	Inter Network operator Interface
MAN	Metropolitan Area Network
MIP	MSS Interconnection Protocol
MMF	MSS Management Function
MIMF	MAN Interconnection Management Functions
MSS	MAN Switching System
NE	Network Entity
PDU	Protocol Data Unit
PI	Protocol Identification
PICS	Protocol Implementation Conformance Statement
PL	Physical Layer
PRM	Protocol Reference Model
QOS	Quality Of Service
RF	Relay Function
SA	Source Address
SLT	Slot sublayer
SM	Segment sublayer
SV	Service sublayer
TAF	Transit Access Functions
TAT	Transit Access Termination
TC	Transmission Convergence sublayer
TM	Transmission sublayer
TMN	Telecommunication Management Network
TN	Transit Network
UMI	User MAN Interface

3.2 Definitions

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

Metropolitan Area Network (MAN): see ETS 300 211 [1].

Inter MSS Interface (IMI): interface between two MSSs within the same network operator domain.

MAN Switching System (MSS): see ETS 300 211 [1].

Inter Network operator Interface (INI): interface between two MSSs, belonging to different network operators.

Transit Access Termination (TAT): the collection of functions residing in the MSS, for terminating the transit link at the Z_M reference point and for the interconnection with other MSSs.

Transit Network (TN): a network which provides transmission, switching and maintenance functions to allow the MSS interconnection. It can be implemented through point-to-point links, digital cross connect, B-ISDN transit node, etc. For further details see ETS 300 211 [1].

Network operator domain: the area (not strictly geographical) which a single network operator is responsible for; inside this area the MAN Network Entities (NEs) are managed according to the Telecommunication Management Network (TMN) architectural model.

Dedicated link: is a semi-permanent or permanent point-to-point connection, which may be offered by digital cross connect.

Telecommunication Management Network (TMN): see CCITT Recommendation M.3010 [6].

Relay Functions (RF) block: contains the relay functionality.

Transit Access Functions (TAF) block: contains functions to receive and transmit information over a medium. It is based on the MIP specified in this document which is based on the DQDB protocol as specified in ETS 300 212 [3].

MAN Interconnection Management Functions (MIMF) functional component: it includes both protocol layer management functions for the TAF block and management functions related to operational aspects of the RF block; it also contains functionality to gather statistics for traffic exchanged between MSSs.

MSS Management Functions (MMFs) block: contains the functions related to the management of MSS local resources and optionally the connected Access Facility 1 (AF1) and Access Facility 2 (AF2) resources.