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Telekomunikacijsko upravljivo omrežje (TMN) - Nadzorovanje zmogljivosti vmesnikov pleziorhne digitalne hierarhije (PDH) - Informacijski model, gledano s strani omrežnega elementa (NE)

Telecommunications Management Network (TMN); Performance monitoring for Plesynchronous Digital Hierarchy (PDH) interfaces; Information model for the Network Element (NE) view

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Telecommunications Management Network (TMN).

National transposition dates	
Date of adoption of this EN:	14 May 1999
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1 Scope

The present document provides an information model for the performance monitoring of Synchronous Digital Hierarchy (SDH) network. This model describes the managed object classes and their properties for the performance monitoring function, as defined in ITU-T Recommendation G.784 [1] and EN 301 167 [2] and as related to SDH Network Elements (NEs). These objects are useful to describe information exchanged across interfaces defined in ITU-T Recommendation M.3010 [3] Telecommunications Management Network (TMN) architecture for the management of the performance monitoring function.

PDH performance monitoring functions are used to monitor specified performance events of specified termination points managed objects as defined in EN 300 371 [4] and to report these performance data, as well as quality of service alarms to its managing system according to a given schedule.

ITU-T Recommendation M.2120 [5] defines maintenance of transport network, ITU-T Recommendation G.784 [1] defines the management of SDH based NE. The present document defines the object model based on ITU-T Recommendation Q.822 [6] according to the requirements described in ITU-T Recommendation G.784 [1], EN 301 167 [2] and ITU-T Recommendation M.2120 [5]. This model uses generic mechanism defined in ITU-T Recommendation Q.822 [6].

The present document defines:

- an information model, as related to the performance monitoring function for the Plesynchronous Digital Hierarchy (PDH).

The present document does not define:

- the protocol stack to be used for message communication;
- the network level management processes;
- the application contexts;
- the conformance requirements to be met by an implementation of this information model;
- information models for other systems or equipment.

The information model defined here (and the corresponding message set) is concerned with the management of NEs, the equipment by which they are implemented and the functions contained within them. More precisely, it applies to an equipment domain visible at the element manager to element interface and is only concerned with information available within that domain. Information proper to the domain of a network level management process is not included within this model.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ITU-T Recommendation G.784 (1994): "Synchronous Digital Hierarchy (SDH) Management".
- [2] EN 301 167: "Transmission and Multiplexing (TM); Management of Synchronous Digital Hierarchy (SDH) transmission equipment; Fault management and performance monitoring; Functional description".
- [3] ITU-T Recommendation M.3010 (1996): "Principles for a Telecommunications Management Network".
- [4] EN 300 371: "Telecommunications Management Network (TMN); Plesiochronous Digital Hierarchy (PDH) information model for the Network Element (NE) view".
- [5] ITU-T Recommendation M.2120 (1997): "PDH path, section and transmission system and SDH path and multiplex section fault detection and localization procedures".
- [6] ITU-T Recommendation Q.822 (1994): "Stage 1, stage 2 and stage 3 description for the Q3 interface - Performance Management".
- [7] ITU-T Recommendation G.774-01 (1996): "Synchronous Digital Hierarchy (SDH) performance monitoring for the network element view".
- [8] ITU-T Recommendation G.774-06 (1997): "Synchronous Digital Hierarchy (SDH) unidirectional performance monitoring for the network element view".
- [9] EN 300 417-1-1: "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 1-1: Generic processes and performance".
- [10] EN 300 417-5-1: "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 5-1: Plesiochronous Digital Hierarchy (PDH) path layer functions".
- [11] ITU-T Recommendation G.826 (1996): "Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate".
- [12] ITU-T Recommendation X.739 (1993): "Information technology - Open Systems Interconnection - Systems Management: Metric objects and attributes".
- [13] ITU-T Recommendation M.3100 (1995): "Generic network information model".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BBE	Background Block Error
CSES	Consecutive Severely Errored Seconds
CTP	Connection Termination Point
ES	Errored Second
FEBBE	Far End Background Block Error
FEES	Far End Errored Second
FESES	Far End Severely Errored Seconds
NE	Network Element
PDH	Plesynchronous Digital Hierarchy
SDH	Synchronous Digital Hierarchy
SEMF	Synchronous Equipment Management Function
SES	Severely Errored Second
TMN	Telecommunications Management Network
TR	Threshold Reset
TTP	Trail Termination Point
UAS	Unavailable Seconds

4 Performance Monitoring Management Model

The performance monitoring requirements to be met by the SDH Equipment Management Function (SEMF) are described in ITU-T Recommendation G.784 [1], subclause 5.3 and in EN 301 167 [2], subclauses 5.1 to 5.2. The functional model given in the SEMF for performance monitoring of SDH signals is basically applicable for PDH signals as well.

5 Managed object class definitions

In the context of the present document, the IMPORTS clause specifies the object classes which can be instantiated in the Scope of the present document. The IMPORTS clause does not include uninstantiated superclasses.

```
BEGIN
IMPORTS
currentData,
historyData
FROM Q822-PM-ASN1Module {itu(0) recommendation(0) q(17) q822(822) informationModel(0)
managedObjectClass(3)}
;
END
```

PDH Current Data Unidirectional

```
pdhCurrentDataUnidirectional    MANAGED OBJECT CLASS
DERIVED FROM "Recommendation Q.822: 1993": currentData;
CHARACTERIZED BY
- "Recommendation Q.822: 1993": zeroSuppressionPkg,
- "Recommendation Q.822: 1993": thresholdPkg
pdhCurrentDataUnidirectionalPackage  PACKAGE
- BEHAVIOUR pdhCurrentDataUnidirectionalBehaviour;
- ATTRIBUTES
- "Recommendation M.3100: 1995": currentProblemList    GET,
- "Recommendation X.739: 1993": granularityPeriod    PERMITTED VALUES
    PDHPMASN1.UnidGranularityPeriod;;;
CONDITIONAL PACKAGES
- "Recommendation G.774-01: 1994": historyPackage    PRESENT IF
    "an instance does not support flexible assignment of the history length",
- "Recommendation G.774-01: 1994": unavailableTimeAlarmPackage    PRESENT IF
    "starting and ending of unavailable period has to be reported and the
- granularity period is 24 hours";
REGISTERED AS {};
```

```
pdhCurrentDataUnidirectionalBehaviour  BEHAVIOUR
DEFINED AS
"The pdhCurrentDataUnidirectional class is used to define generic characteristic for unidirectional
PDH performance monitoring from which subclasses are defined in order to hold performance event
counts for a specific monitoring point. Subclasses of this class are used in order to support
performance monitoring of PDH trails at various layers as described in EN 300 417-5-1. The
performance monitoring events ES, SES and BBE which are monitored by some of the subclasses of this
subclass are defined in annex B/G.826 and are based on the performance event primitives specified in
EN 300 417-1-1 and EN 300 417-5-1. The granularityPeriod attribute can only be assigned a value at
creation time.
```

This class can only contain one reference to an instance of the thresholdData object class in the thresholdDataInstance attribute.

If a threshold is reached or crossed then the currentProblemList attribute shall indicate it with the probable cause thresholdCrossed. Subclass of this class is used to monitor the near-end or far-end performance data of the trail.

A period of unavailable time begins at the onset of 10 consecutive SES events. These ten seconds are considered to be part of unavailable time. A new period of available time begins at the onset of ten consecutive non-SES events. These ten seconds are considered to be part of available time.

The unavailability conditions are kept separate for near end and far end monitoring. This means that near end unavailability is deduced from near end conditions only (e.g. 10 consecutive SES at the near end) and far end unavailability is deduced from far end conditions only (e.g. 10 consecutive SES at the far end).