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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 describes the information model for Network Elements (NEs) for performance monitoring.

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	31 August 1995
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 August 1995
Date of withdrawal of any conflicting National Standard (dow):	29 February 1996

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1 Scope

This European Telecommunication Standard (ETS) 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 CCITT Recommendation G.784 [3] and as related to SDH Network Elements (NEs). These objects are useful to describe information exchanged across interfaces defined in CCITT Recommendation M.3010 [5] Telecommunications Management Network (TMN) architecture for the management of the performance monitoring function.

SDH performance monitoring functions are used to monitor specified performance events of specified termination points managed objects and to report these performance data, as well as quality of service alarms to its managing system according to a given schedule.

CCITT Recommendation M.2120 [4] defines maintenance of transport network, CCITT Recommendation G.784 [3] defines the management of SDH based NE. This ETS defines the object model based on ITU-T Recommendation Q.822 [6] according to the requirements described in CCITT Recommendation G.784 [3] and CCITT Recommendation M.2120 [4]. This model uses generic mechanism defined in ITU-T Recommendation Q.822 [6].

This ETS defines:

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

This ETS 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 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] ITU-T Recommendation G.709 (1993): "Synchronous multiplexing structure".

[2] ITU-T Recommendation G.774.1 (1994): "Synchronous digital hierarchy (SDH) performance monitoring for the network element view".

[3] CCITT Recommendation G.784 (1990): "Synchronous digital hierarchy (SDH) management".

[4] CCITT Recommendation M.2120 (1992): "Digital path, section and transmission system fault detection and localization procedures".

[5] CCITT Recommendation M.3010 (1992): "Principles for a telecommunications management network".

[6] ITU-T Recommendation Q.822 (1993): "Stage 1, stage 2 and stage 3 description for the Q3 interface: Performance management".

3 Abbreviations

For the purposes of this ETS, 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
MS	Multiplex Section
NCSES	Number of Consecutive Severely Errored Second
NE	Network Element
OFS	Out of Frame Second
PJC	Pointer Justification Count
PSC	Protection Switch Count
PSD	Protection Switch Duration
RS	Regenerator Section
SDH	Synchronous Digital Hierarchy
SES	Severely Errored Second
SPI	Synchronous Physical Interface
TMN	Telecommunication Management Network
TR	Threshold Reset
TTP	Trail Termination Point
UAS	Unavailable Seconds

4 Performance monitoring management model

The SDH performance monitoring requirements are described in CCITT Recommendation G.774.1 [2], § 5.

5 Managed object class definitions

In the context of this ETS, the IMPORTS clause specifies the object classes which can be instantiated in the scope of this ETS. The IMPORTS clause does not include uninstantiated superclasses.

```
BEGIN
IMPORTS
rsCurrentData,
rsCurrentDataTR,
electricalSourceSPICurrentData,
opticalSourceSPICurrentData,
rsHistoryData,
msCurrentData,
msCurrentDataTR,
protectionCurrentData,
pathTerminationCurrentData,
pathTerminationCurrentDataTR,
msAdaptationCurrentData,
electricalSPIHistoryData,
opticalSPIHistoryData,
msHistoryData,
msAdaptationHistoryData,
protectionHistoryData,
pathTerminationHistoryData
FROM {itu(0) recommendation(0) g(7) g774(774) hyphen(127) pm(01) informationModel(0)
managedObjectClass(3) }
;
END
```

6 Packages

In this context the cSESCurrentDataPackage is mandatory.

```
BEGIN
IMPORTS
cSESCurrentDataPackage,
farEndCSESCurrentDataPackage,
farEndCurrentDataPackage,
farEndHistoryDataPackage,
historyPackage,
laserBiasCurrentDataPackage,
laserBiasTideMarkPackage,
laserTemperatureCurrentDataPackage,
laserTemperatureTideMarkPackage,
oFSCurrentDataPackage,
oFSHistoryDataPackage,
transmitPowerLevelCurrentDataPackage,
transmitPowerLevelTideMarkPackage,
thresholdResetPackage,
uASCurrentDataPackage,
uASHistoryDataPackage,
unavailableTimeAlarmPackage
FROM {itu(0) recommendation(0) g(7) g774(774) hyphen(127) pm(01) informationModel(0)
package(4) }
;
END
```

7 Attributes

```
BEGIN
IMPORTS
cSESEvent,
eS,
fEES,
fEBBE,
fECSESEvent,
laserBias,
laserBiasTideMarkMax,
laserBiasTideMarkMin,
laserTemperature,
laserTemperatureTideMarkMax,
laserTemperatureTideMarkMin,
nCSES,
bBE,
oFS,
pSC,
pSD,
sES,
fESES,
transmitPowerLevel,
transmitPowerLevelTideMarkMax,
transmitPowerLevelTideMarkMin,
uAS,
pJCHigh,
pJCLow
FROM {itu(0) recommendation(0) g(7) g774(774) hyphen(127) pm(01) informationModel(0)
attribute(7) }
;
END
```

8 Actions

None.

9 Notifications

None.

10 Parameters

None.

11 Name bindings

```
BEGIN
IMPORTS
historyData-sdhCurrentData,
msCurrentData-msTTPSink,
msCurrentDataTR-msTTPSink,
msCurrentData-protectedTTPSink,
msCurrentDataTR-protectedTTPSink,
protectionCurrentData-protectionUnit,
rsCurrentData-rsTTPSink,
rsCurrentDataTR-rsTTPSink,
pathTerminationCurrentData-vc4TTPSink,
pathTerminationCurrentData-vc3TTPSink,
pathTerminationCurrentData-vc2TTPSink,
pathTerminationCurrentData-vc12TTPSink,
pathTerminationCurrentData-vc11TTPSink,
pathTerminationCurrentDataTR-vc4TTPSink,
pathTerminationCurrentDataTR-vc3TTPSink,
pathTerminationCurrentDataTR-vc2TTPSink,
pathTerminationCurrentDataTR-vc12TTPSink,
pathTerminationCurrentDataTR-vc11TTPSink,
electricalSourceSPICurrentData-electricalSPITTPSource,
opticalSourceSPICurrentData-opticalSPITTPSource,
msAdaptationCurrentData-au4CTPSource
FROM {itu(0) recommendation(0) g(7) g774(774) hyphen(127) pm(01) informationModel(0)
nameBinding(6) }
;
END
```

Annex A (informative): Bibliography

The following references are supplied for informative purposes.

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

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

3) ITU-T Recommendation G.707 (1993): "Synchronous digital hierarchy bit rates".

4) ITU-T Recommendation G.708 (1993): "Network node interface for the synchronous digital hierarchy".

5) CCITT Recommendation G.783 (1990): "Characteristics of synchronous digital hierarchy (SDH) multiplexing equipment functional blocks".

6) ITU-T Recommendations G.803 (1993): "Architectures of transport networks based on the synchronous digital hierarchy".

7) ITU-T Recommendations G.831 (1993): "Management capabilities of transport networks based on the synchronous digital hierarchy".

8) CCITT Recommendation G.958: "Digital line systems based on the synchronous digital hierarchy for use on optical fibre cables".

9) ITU-T Recommendation M.60 (1993): "Maintenance terminology and definitions".

10) CCITT Recommendation M.3100 (1992): "Generic network information model".

11) ITU-T Recommendation Q.811 (1993): "Lower layer protocol profiles for the Q3 interface".

12) ITU-T Recommendation Q.812 (1993): "Upper layer protocol profiles for the Q3 interface".

13) CCITT Recommendation X.208 (1990): "Specification of Abstract Syntax Notation One (ASN.1)".

14) CCITT Recommendation X.701 (1992): "Information technology - Open Systems Interconnection - Systems management overview".

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

16) CCITT Recommendation X.711 (1991): "Common management information protocol specification for CCITT applications".

17) CCITT Recommendation X.720 (1992): "Information technology - Open Systems Interconnection - Structure of management information: Management information model".

18) CCITT Recommendation X.721 (1992): "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

19) CCITT Recommendation X.722 (1992): "Information technology - Open systems interconnection - Structure of management information: Guidelines for the definition of managed objects".

20) CCITT Recommendation X.730 (1992): "Information technology - Open Systems Interconnection - Systems management: Object management function".

21) CCITT Recommendation X.731 (1992): "Information technology - Open Systems Interconnection - Systems management: State management function".

22) CCITT Recommendation X.733 (1992): "Information technology - Open Systems Interconnection - Systems management: Alarm reporting function".

23) CCITT Recommendation X.734 (1992): "Information technology - Open Systems Interconnection - Systems management: Event report management function".

24) CCITT Recommendation X.735 (1992): "Information technology - Open Systems Interconnection - Systems management: Log control function".

History

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