



SLOVENSKI STANDARD SIST ETS 300 304 E2:2003

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**Prenos in multipleksiranje (TM) – Sinhrona digitalna hierarhija (SDH) –
Informacijski model v sistemu SDH, gledano s strani omrežnega elementa (NE)**

Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH); SDH
information model for the Network Element (NE) view

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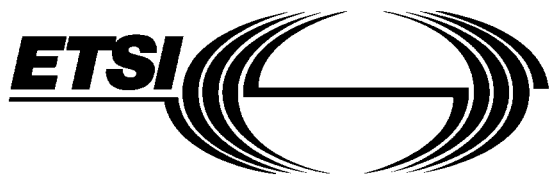
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Foreword

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

This second edition ETS describes the information model for Network Elements (NEs) which use the Synchronous Digital Hierarchy (SDH) multiplexing structure.

Transposition dates	
Date of adoption	18 October 1996
Date of latest announcement of this ETS (doa):	31 May 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 November 1997
Date of withdrawal of any conflicting National Standard (dow):	30 November 1997

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1 Scope

This second edition ETS defines the information model to be used at the interface between Network Elements (NEs) and management systems, for the management of Synchronous Digital Hierarchy (SDH) NEs.

This ETS defines the information model for SDH NEs.

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 NE 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 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.

- (standards.iteh.ai)
- [1] ITU-T Recommendation G.709 (1993): "Synchronous multiplexing structure".
- [2] ITU-T Recommendation G.774 (1992): "Synchronous digital hierarchy (SDH) management information model for the network element view".
- [3] ITU-T Recommendation G.774.03 (1994): "Synchronous digital hierarchy (SDH) management of multiplex-section protection for the network element view".
- [4] ITU-T Recommendation G.783 (1993): "Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks".
- [5] ITU-T Recommendation M.3100 (1995): "Generic network information model".
- [6] ITU-T Recommendation X.721 (1992): "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".
- [7] ITU-T Recommendation G.702 (1988): "Digital hierarchy bit rates".
- [8] ETS 300 371 (1994): "Transmission and Multiplexing (TM); Plesiochronous Digital Hierarchy (PDH) information model for the Network Element (NE) view".

3 Abbreviations

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

AIS	Alarm Indication Signal
AP	Access Point
ATM	Asynchronous Transfer Mode
AU	Administrative Unit
AUG	Administrative Unit Group
CCITT	Comité Consultatif International Télégraphique et Téléphonique
CMIP	Common Management Information Protocol
CMIS	Common Management Information Service
CP	Connection Point
CTP	Connection Termination Point
GTP	Group Termination Point
HPA	Higher Order Path Adaptation
HPC	Higher Order Path Connection
HPT	Higher Order Path Termination
IA	Indirect Adaptor
IOS	Intra-Office Section
ISO	International Organization for Standardization
ITU-T	International Telecommunications Union - Telecommunications sector
LOF	Loss Of Frame
LPA	Lower Order Path Adaptation
LPC	Lower Order Path Connection
LPT	Lower Order Path Termination
MS	Multiplexer Section
MSA	Multiplexer Section Adaptation
MST	Multiplexer Section Termination
MSTTP	Multiplexer Section Trail Termination Point
NE	Network Element
OS	Operation System
OSI	Open Systems Interconnection
PDH	Plesiochronous Digital Hierarchy
Pkg	Packages
POH	Path OverHead
PPI	Plesiochronous Physical Interface
RDN	Relative Distinguished Name
RS	Regenerator Section
RST	Regenerator Section Termination
RSTTP	Regenerator Section Trail Termination Point
SDH	Synchronous Digital Hierarchy
SDHNE	Synchronous Digital Hierarchy Network Element
Snk	Sink
Src	Source
SPI	Synchronous Physical Interface
STM-N	Synchronous Transport Module-N
TMN	Telecommunication Management Network
TP	Termination Point
TTP	Trail Termination Point
TU	Tributary Unit
TUG	Tributary Unit Group
VC-n	Virtual Container n

4 Registration supporting Abstract Syntax Notation one (ASN.1)

```

PrETS5 {ccitt(0) identified-organization(4) etsi(0) ets304(304) informationModel(0) asn1Module(2)
prETS5(0)}
DEFINITIONS IMPLICIT TAGS ::= BEGIN
-- EXPORT Everything
prETS300304 OBJECT IDENTIFIER ::= {ccitt(0) identified-organization(4) etsi(0) ets304(304)
informationModel(0)}
etsObjectClass OBJECT IDENTIFIER ::= {prETS300304 managedObjectClass(3)}
etsPackage OBJECT IDENTIFIER ::= {prETS300304 package(4)}
etsParameter OBJECT IDENTIFIER ::= {prETS300304 parameter(5)}
etsNameBinding OBJECT IDENTIFIER ::= {prETS300304 nameBinding(6)}
etsAttribute OBJECT IDENTIFIER ::= {prETS300304 attribute(7)}
etsAction OBJECT IDENTIFIER ::= {prETS300304 action(9)}
etsNotification OBJECT IDENTIFIER ::= {prETS300304 notification(10)}
END

```

5 Generic objects fragment

In this fragment, a working sub-set of standard and mature object classes have been adopted, mainly from the ITU-T X.700 series of Recommendations.

5.1 Generic objects - object classes

In this context 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
alarmRecord,
attributeValueChangeRecord,
eventForwardingDiscriminator,
log,
objectCreationRecord
objectDeletionRecord
stateChangeRecord,
FROM {joint-iso-ccitt ms(9) smi(3) part2(2) managedObjectClass(3) }
alarmSeverityAssignmentProfile
FROM {ccitt(0) recommendation(0) m(13) m3100(3100) informationModel(0) managedObjectClass(3) }
;
END

```

5.2 Generic objects - packages, attributes, ASN.1, name-bindings

All packages, attributes, ASN.1 and name-bindings associated with object classes are implicitly imported from ITU-T Recommendations defining the appropriate object classes.

6 SDH Termination Point (TP) fragment

6.1 SDH TP - object classes

In this context, 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
au4CTPBidirectional,
au4CTPSink,
au4CTPSource,
augBidirectional,
augSink,
augSource,
electricalSPITTPBidirectional,
electricalSPITTPSink,
electricalSPITTPSource,
msCTPBidirectional,
msCTPSink,
msCTPSource,
msDatacomCTPBidirectional,
msDatacomCTPSink,
msDatacomCTPSource,
msOrderwireCTPBidirectional,

```

```

msOrderwireCTPSink,
msOrderwireCTPSource,
msTTPBidirectional,
msTTPSink,
msTTPSource,
opticalSPITTPBidirectional,
opticalSPITTPSink,
opticalSPITTPSource,
rsCTPBidirectional,
rsCTPSink,
rsCTPSource,
rsDatacomCTPBidirectional,
rsDatacomCTPSink,
rsDatacomCTPSource,
rsOrderwireCTPBidirectional,
rsOrderwireCTPSink,
rsOrderwireCTPSource,
rsTTPBidirectional,
rsTTPSink,
rsTTPSource,
rsUserChannelCTPBidirectional,
rsUserChannelCTPSink,
rsUserChannelCTPSource,
tullCTPBidirectional,
tullCTPSink,
tullCTPSource,
tul2CTPBidirectional,
tul2CTPSink,
tul2CTPSource,
tu2CTPBidirectional,
tu2CTPSink,
tu2CTPSource,
tu3CTPBidirectional,
tu3CTPSink,
tu3CTPSource,
tug2Bidirectional,
tug2Sink,
tug2Source,
tug3Bidirectional,
tug3Sink,
tug3Source,
vc11TTPBidirectional,
vc11TTPSink,
vc11TTPSource,
vc12TTPBidirectional,
vc12TTPSink,
vc12TTPSource,
vc2TTPBidirectional,
vc2TTPSink,
vc2TTPSource,
vc3TTPBidirectional,
vc3TTPSink,
vc3TTPSource,
vc4TTPBidirectional,
vc4TTPSink,
vc4TTPSource,
vcnUserChannelCTPBidirectional,
vcnUserChannelCTPSink,
vcnUserChannelCTPSource
FROM {ccitt(0) recommendation(0) g(7) g774(774) informationModel(0) managedObjectClass(3) }
;
END

```

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6.2 SDH TP - packages

All packages associated with object classes are implicitly imported from ITU-T Recommendations defining the appropriate object classes.

6.3 SDH TP - attributes

All attributes associated with object classes are implicitly imported from ITU-T Recommendations defining the appropriate object classes.

supportedByObjectList

The value of the supportedByObjectList attribute points to the equipment and software objects which implement the TPs.

6.4 SDH TP - name bindings

```

BEGIN
IMPORTS
au4CTPBidirectional-augBidirectional,
au4CTPSink-augBidirectional,
au4CTPSink-augSink,
au4CTPSource-augBidirectional,
au4CTPSource-augSource,
augBidirectional-msTTPBidirectional,
augSink-msTTPSink,
augSource-msTTPSource,
electricalSPITTPBidirectional-sdhNE,
electricalSPITTPSink-sdhNE,
electricalSPITTPSource-sdhNE,
msCTPBidirectional-rsTTPBidirectional,
msCTPSink-rsTTPBidirectional,
msCTPSink-rsTTPSink,
msCTPSource-rsTTPBidirectional,
msCTPSource-rsTTPSource,
msDatacomCTPBidirectional-msTTPBidirectional,
msDatacomCTPSink-msTTPBidirectional,
msDatacomCTPSink-msTTPSink,
msDatacomCTPSource-msTTPBidirectional,
msDatacomCTPSource-msTTPSource,
msOrderwireCTPBidirectional-msTTPBidirectional,
msOrderwireCTPSink-msTTPBidirectional,
msOrderwireCTPSink-msTTPSink,
msOrderwireCTPSource-msTTPBidirectional,
msOrderwireCTPSource-msTTPSource,
msTTPBidirectional-sdhNE,
msTTPSink-sdhNE,
msTTPSource-sdhNE,
opticalSPITTPBidirectional-sdhNE,
opticalSPITTPSink-sdhNE,
opticalSPITTPSource-sdhNE,
rsCTPBidirectional-electricalSPITTPBidirectional,
rsCTPBidirectional-opticalSPITTPBidirectional,
rsCTPSink-electricalSPITTPBidirectional,
rsCTPSink-electricalSPITTPSink,
rsCTPSink-opticalSPITTPBidirectional,
rsCTPSink-opticalSPITTPSink,
rsCTPSource-electricalSPITTPBidirectional,
rsCTPSource-electricalSPITTPSource,
rsCTPSource-opticalSPITTPBidirectional,
rsCTPSource-opticalSPITTPSource,
rsDatacomCTPBidirectional-rsTTPBidirectional,
rsDatacomCTPSink-rsTTPBidirectional,
rsDatacomCTPSink-rsTTPSink,
rsDatacomCTPSource-rsTTPBidirectional,
rsDatacomCTPSource-rsTTPSource,
rsOrderwireCTPBidirectional-rsTTPBidirectional,
rsOrderwireCTPSink-rsTTPBidirectional,
rsOrderwireCTPSink-rsTTPSink,
rsOrderwireCTPSource-rsTTPBidirectional,
rsOrderwireCTPSource-rsTTPSource,
rsTTPBidirectional-sdhNE,
rsTTPSink-sdhNE,
rsTTPSource-sdhNE,
rsUserChannelCTPBidirectional-rsTTPBidirectional,
rsUserChannelCTPSink-rsTTPBidirectional,
rsUserChannelCTPSink-rsTTPSink,
rsUserChannelCTPSource-rsTTPBidirectional,
rsUserChannelCTPSource-rsTTPSource,
tull1CTPBidirectional-tug2Bidirectional,
tull1CTPSink-tug2Bidirectional,
tull1CTPSink-tug2Sink,
tull1CTPSource-tug2Bidirectional,
tull1CTPSource-tug2Source,
tul2CTPBidirectional-tug2Bidirectional,
tul2CTPSink-tug2Bidirectional,
tul2CTPSink-tug2Sink,
tul2CTPSource-tug2Bidirectional,
tul2CTPSource-tug2Source,
tu2CTPBidirectional-tug2Bidirectional,
tu2CTPSink-tug2Bidirectional,
tu2CTPSink-tug2Sink,
tu2CTPSource-tug2Bidirectional,
tu2CTPSource-tug2Source,
tu3CTPBidirectional-tug3Bidirectional,
tu3CTPSink-tug3Bidirectional,
tu3CTPSink-tug3Sink,
tu3CTPSource-tug3Bidirectional,
tu3CTPSource-tug3Source,

```

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```
tug2Bidirectional-tug3Bidirectional,
tug2Sink-tug3Sink,
tug2Source-tug3Source,
tug3Bidirectional-vc4TTPBidirectional,
tug3Sink-vc4TTPSink,
tug3Source-vc4TTPSource,
vc1TTPBidirectional-sdhNE,
vc1TTPSink-sdhNE,
vc1TTPSource-sdhNE,
vc12TTPBidirectional-sdhNE,
vc12TTPSink-sdhNE,
vc12TTPSource-sdhNE,
vc2TTPBidirectional-sdhNE,
vc2TTPSink-sdhNE,
vc2TTPSource-sdhNE,
vc3TTPBidirectional-sdhNE,
vc3TTPSink-sdhNE,
vc3TTPSource-sdhNE,
vc4TTPBidirectional-sdhNE,
vc4TTPSink-sdhNE,
vc4TTPSource-sdhNE,
vcnUserChannelCTPBidirectional-vc3TTPBidirectional,
vcnUserChannelCTPBidirectional-vc4TTPBidirectional,
vcnUserChannelCTPSink-vc3TTPBidirectional,
vcnUserChannelCTPSink-vc3TTPSink,
vcnUserChannelCTPSink-vc4TTPBidirectional,
vcnUserChannelCTPSink-vc4TTPSink,
vcnUserChannelCTPSource-vc3TTPBidirectional,
vcnUserChannelCTPSource-vc3TTPSource,
vcnUserChannelCTPSource-vc4TTPBidirectional,
vcnUserChannelCTPSource-vc4TTPSource
FROM {ccitt(0) recommendation(0) g(7) g774(774) informationModel(0) nameBinding(6) }
;
END
```

6.5 SDH TP - subordination rules

```
BEGIN
IMPORTS
augSinkSubordination,
augSourceSubordination,
augBidirectionalSubordination,
electricalSPITTPSinkSubordination,
electricalSPITTPSourceSubordination,
electricalSPITTPBidirectionalSubordination,
opticalSPITTPSinkSubordination,
opticalSPITTPSourceSubordination,
opticalSPITTPBidirectionalSubordination,
msTTPSinkSubordination,
msTTPSourceSubordination,
msTTPBidirectionalSubordination,
rsTTPSinkSubordination,
rsTTPSourceSubordination,
rsTTPBidirectionalSubordination,
sdhNESubordination,
tug2SinkSubordination,
tug2SourceSubordination,
tug2BidirectionalSubordination,
tug3SinkSubordination,
tug3SourceSubordination,
tug3BidirectionalSubordination,
vc3TTPSinkSubordination,
vc3TTPSourceSubordination,
vc3TTPBidirectionalSubordination,
vc4TTPSinkSubordination,
vc4TTPSourceSubordination,
vc4TTPBidirectionalSubordination,

FROM {ccitt(0) recommendation(0) g(7) g774(774)}
;
END
```

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6.6 SDH TP - constraints

```

BEGIN
IMPORTS
downstreamConnectivityPointer-au4CTPSink,
upstreamConnectivityPointer-au4CTPSource,
downstreamConnectivityPointer-msCTPSink,
upstreamConnectivityPointer-msCTPSource,
upstreamConnectivityPointer-msTTPSink,
downstreamConnectivityPointer-msTTPSource,
downstreamConnectivityPointer-rsCTPSink,
upstreamConnectivityPointer-rsCTPSource,
upstreamConnectivityPointer-rsTTPSink,
downstreamConnectivityPointer-rsTTPSource,
downstreamConnectivityPointer-tull1CTPSink,
upstreamConnectivityPointer-tull1CTPSource,
downstreamConnectivityPointer-tul2CTPSink,
upstreamConnectivityPointer-tul2CTPSource,
downstreamConnectivityPointer-tu2CTPSink,
upstreamConnectivityPointer-tu2CTPSource,
downstreamConnectivityPointer-tu3CTPSink,
upstreamConnectivityPointer-tu3CTPSource,
upstreamConnectivityPointer-vc11TTPSink,
downstreamConnectivityPointer-vc11TTPSource,
upstreamConnectivityPointer-vc12TTPSink,
downstreamConnectivityPointer-vc12TTPSource,
upstreamConnectivityPointer-vc2TTPSink,
downstreamConnectivityPointer-vc2TTPSource,
upstreamConnectivityPointer-vc3TTPSink,
downstreamConnectivityPointer-vc3TTPSource,
FROM {ccitt(0) recommendation(0) g(7) g774(774)}
;
END

ets_upstreamConnectivityPointer-vc4TTPSink CONSTRAINT RULE
  OBJECT CLASS
    vc4TTPSink AND SUBCLASSES;
  IS RELATED TO
    vc4TTPSource, vc4TTPBidirectional,
    au4CTPSink, au4CTPBidirectional;
  USING ATTRIBUTE
    "Recommendation M.3100":upstreamConnectivityPointer;
  ACCORDING TO RULE
    SET SIZE (1) OF CHOICE{
      vc4TTPSource, vc4TTPBidirectional,
      au4CTPSink, au4CTPBidirectional};
;

ets_downstreamConnectivityPointer-vc4TTPSource CONSTRAINT RULE
  OBJECT CLASS
    vc4TTPSource AND SUBCLASSES;
  IS RELATED TO
    vc4TTPSink, vc4TTPBidirectional,
    au4CTPSource, au4CTPBidirectional;
  USING ATTRIBUTE
    "Recommendation M.3100":downstreamConnectivityPointer;
  CASE{
    single ACCORDING TO RULE
      SET SIZE (1) OF CHOICE{
        vc4TTPSink, vc4TTPBidirectional,
        au4CTPSource, au4CTPBidirectional};
;
    broadcast ACCORDING TO RULE
      SET SIZE (1..N) OF CHOICE{
        vc4TTPSink, vc4TTPBidirectional,
        au4CTPSource, au4CTPBidirectional};
  }

```