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**Information technology — Elements of  
management information related to the OSI  
Transport layer**

*Technologies de l'information — Éléments d'information de gestion  
concernant la couche Transport OSI*

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 10737 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.284.

This second edition cancels and replaces the first edition (ISO/IEC 10737:1994), which has been technically revised. It also incorporates Amendment 1:1994, Amd.1:1994/Cor.1:1997, Amendment 2:1996 and Technical Corrigendum 1:1997.

Annexes A to G form an integral part of this International Standard.

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## Introduction

This Recommendation | International Standard is one of a set of Recommendations and International Standards produced to facilitate the interconnection of open systems. The set of Recommendations and International Standards covers the services, protocols and management information required to achieve such interconnection.

This Recommendation | International Standard is positioned with respect to other related Recommendations and International Standards by the layers defined in the *Reference Model for Open System Interconnection* (see ITU-T Rec. X.200 | ISO/IEC 7498-1). In particular, it is concerned with the definition of Transport Layer management information.

This Recommendation | International Standard is an update of ITU-T Rec. X.284 (1994) and ISO/IEC 10737:1994 to incorporate all Amendments and Technical Corrigenda.

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## INTERNATIONAL STANDARD

## ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – ELEMENTS OF MANAGEMENT  
INFORMATION RELATED TO THE OSI TRANSPORT LAYER**

**1 Scope**

This Recommendation | International Standard provides the specification of management information within an Open System related to those operations of the OSI Transport Layer specified by ITU-T Recommendations and ISO/IEC International Standards. Specifics on how Transport Layer management is accomplished is beyond the scope of this Recommendation | International Standard. Transport Layer management information is defined by specifying:

- the managed object class definition of Transport Layer Managed Objects following guidelines put forth by the *Structure of Management Information* (ITU-T Recommendations X.720-X.724 and ISO/IEC 10165);
- the relationship of the Managed Objects and attributes to both the operation of the layer and to other objects and attributes of the layer; and
- the action type operations on the attributes of Transport Layer Managed Objects that are available to OSI Systems Management.

Annexes D, E, F and G, which are integral parts of this Recommendation | International Standard, provide ICS proformas associated with Transport Layer management information.

**2 Normative references**

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The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

**2.1 Identical Recommendations | International Standards**

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*.
- ITU-T Recommendation X.214 (1995) | ISO/IEC 8072:1996, *Information technology – Open Systems Interconnection – Transport service definition*.
- ITU-T Recommendation X.224 (1995) / ISO/IEC 8073:1997, *Information technology – Open Systems Interconnection – Protocol for providing the connection-mode transport service*.
- ITU-T Recommendation X.234 (1994) | ISO/IEC 8602:1995, *Information technology – Protocol for providing the OSI connectionless-mode transport service*.
- ITU-T Recommendation X.701 (1997) | ISO/IEC 10040:1998, *Information technology – Open Systems Interconnection – Systems management overview*.
- ITU-T Recommendation X.710 (1997) | ISO/IEC 9595:1998, *Information technology – Open Systems Interconnection – Common management information service*.
- ITU-T Recommendation X.711 (1997) | ISO/IEC 9596-1:1998, *Information technology – Open Systems Interconnection – Common management information protocol: Specification*.

- CCITT Recommendation X.720 (1992) | ISO/IEC 10165-1:1993, *Information technology – Open Systems Interconnection – Structure of management information: Management information model.*
- CCITT Recommendation X.721 (1992) | ISO/IEC 10165-2:1992, *Information technology – Open Systems Interconnection – Structure of management information: Definition of management information.*
- CCITT Recommendation X.722 (1992) | ISO/IEC 10165-4:1992, *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects.*
- ITU-T Recommendation X.723 (1993) | ISO/IEC 10165-5:1994, *Information technology – Open Systems Interconnection – Structure of management information: Generic management information.*
- ITU-T Recommendation X.724 (1996) | ISO/IEC 10165-6:1997, *Information technology – Open Systems Interconnection – Structure of management information: Requirements and guidelines for implementation conformance statement proformas associated with OSI management.*
- CCITT Recommendation X.730 (1992) | ISO/IEC 10164-1:1993, *Information technology – Open Systems Interconnection – Systems Management: Object management function.*
- CCITT Recommendation X.731 (1992) | ISO/IEC 10164-2:1993, *Information technology – Open Systems Interconnection – Systems Management: State management function.*
- CCITT Recommendation X.732 (1992) | ISO/IEC 10164-3:1993, *Information technology – Open Systems Interconnection – Systems Management: Attributes for representing relationships.*
- CCITT Recommendation X.733 (1992) | ISO/IEC 10164-4:1992, *Information technology – Open Systems Interconnection – Systems Management: Alarm reporting function.*
- CCITT Recommendation X.734 (1992) | ISO/IEC 10164-5:1993, *Information technology – Open Systems Interconnection – Systems Management: Event report management function.*
- CCITT Recommendation X.735 (1992) | ISO/IEC 10164-6:1993, *Information technology – Open Systems Interconnection – Systems Management: Log control function.*

## 2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1).*  
ISO/IEC 8824:1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1).*
- CCITT Recommendation X.209 (1988), *Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1).*  
ISO/IEC 8825:1990, *Information technology – Open Systems Interconnection – Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).*
- ITU-T Recommendation X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts.*  
ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.*
- ITU-T Recommendation X.291 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Abstract test suite specification.*  
ISO/IEC 9646-2:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract Test Suite specification.*
- ITU-T Recommendation X.296 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements.*  
ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements.*
- CCITT Recommendation X.700 (1992), *Management framework for Open Systems Interconnection (OSI) for CCITT applications.*  
ISO/IEC 7498-4:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 4: Management framework.*



### 3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

#### 3.1 Basic Reference Model

This Recommendation | International Standard makes use of the following terms defined in *OSI Reference Model* (see ITU-T Rec. X.200 | ISO/IEC 7498-1):

- a) Open System;
- b) (N)-service-access-point;
- c) Transport Layer;
- d) Transport Protocol;
- e) Layer Management;
- f) Systems management.

#### 3.2 Information model

This Recommendation | International Standard makes use of the following terms defined in *Structure of Management Information: Management Information Model* (see CCITT Rec. X.720 | ISO/IEC 10165-1):

- a) Attributes;
- b) Attribute type;
- c) Containment;
- d) Distinguished Name;
- e) Inheritance;
- f) Managed Object;
- g) Management Operations;
- h) Notifications;
- i) Object Class;
- j) Relative Distinguished Name;
- k) Subclass;
- l) Superclass.

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#### 3.3 Guidelines for the Definition of Managed Objects (GDMO)

This Recommendation | International Standard makes use of the following terms defined in *Structure of Management Information: Guidelines for the Definition of Managed Objects* (see CCITT Rec. X.722 | ISO/IEC 10165-4):

- a) Managed Object Class Definition;
- b) Template;
- c) Parameter.

#### 3.4 Management framework

This Recommendation | International Standard makes use of the following term defined in *Management Framework for Open Systems Interconnection* (see CCITT Rec. X.700 | ISO/IEC 7498-4):

- Management Information.

### 4 Abbreviations

Within the Managed Object definitions and GDMO templates, the following abbreviations are used in the standard-name element of a document-identifier when making references to other documents:

DMI	CCITT Rec X.721 (1992)   ISO/IEC 10165-2:1992
GMI	ITU-T Rec X.723 (1993)   ISO/IEC 10165-5:1994

For the purposes of this Recommendation | International Standard, the following abbreviations apply:

AK TPDU	Data Acknowledge TPDU
CMIP	Common Management Information Protocol
CMIS	Common Management Information Service
DR TPDU	Disconnect Request TPDU
EA TPDU	Expedited Acknowledge TPDU
ED TPDU	Expedited Data TPDU
ER TPDU	Error TPDU
GDMO	Guidelines for Definition of Managed Objects
IVMO	Initial Values Managed Object
MCS	Management Conformance Summary
MICS	Management Information Conformance Statement
MO	Managed Object
MOCS	Managed Object Conformance Statement
MRCS	Managed Relationship Conformance Statement
NC	Network Connection
NCC	Network Connection Control
NCMS	Network Connection Management Subprotocol
OSI	Open Systems Interconnection
PM	Protocol Machine
RDN	Relative Distinguished Name
TC	Transport Connection
TPDU	Transport Protocol Data Unit
TSAP	Transport Service Access Point

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## 5 Elements of transport layer management information

### 5.1 Managed object hierarchy

#### 5.1.1 Summary of managed objects

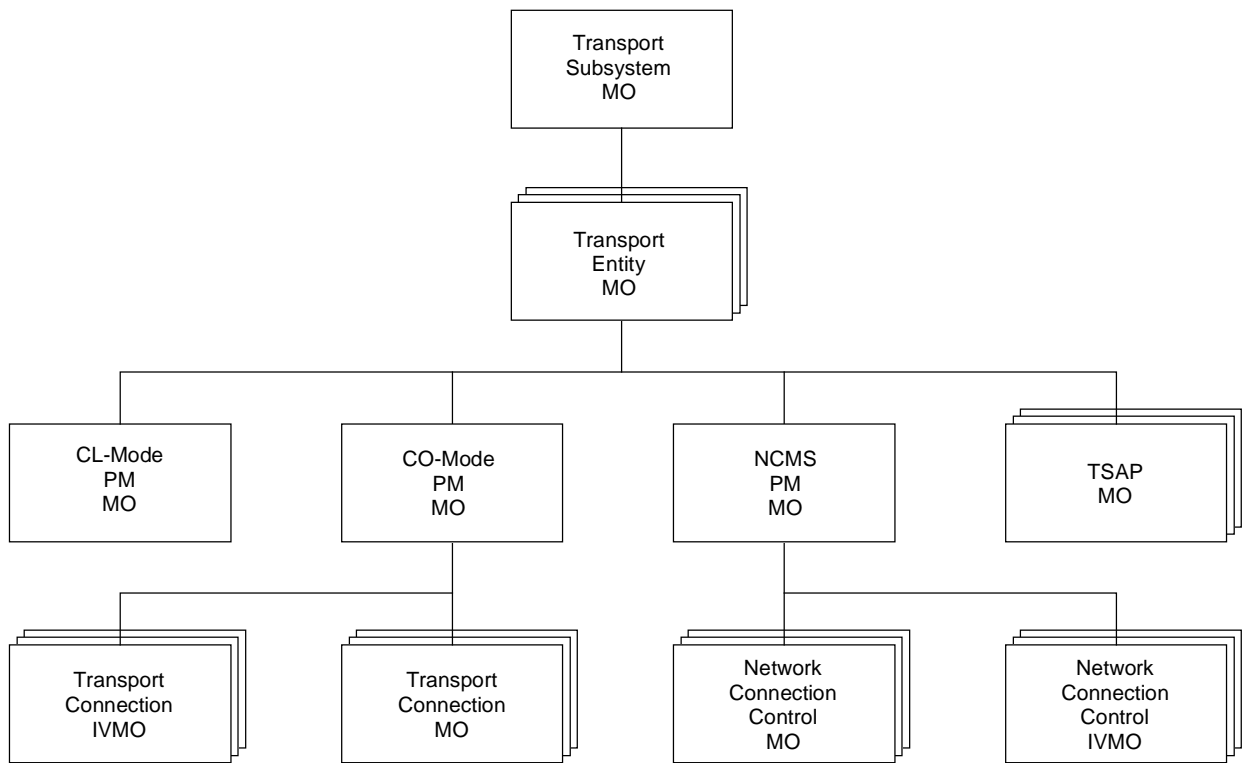
The following set of managed objects are defined for the OSI Transport Layer:

- Transport subsystem managed object (transportSubsystem, see 5.3);
- Transport entity managed object (transportEntity, see 5.4);
- Connectionless-mode transport protocol machine managed object (clmodeTPM, see 5.5);
- Connection-oriented transport protocol machine managed object (comodeTPM, see 5.6);
- TSAP managed object (tSAP, see 5.7);
- Transport connection managed object (transportConnection, see 5.8.1);
- Transport connection initial values managed object (transportConnectionIVMO, see 5.8.2).
- NCMS protocol machine managed object (ncmsPM, see subclause 5.9);
- Network connection control managed object (ncc, see subclause 5.10.1);
- Network connection control initial value managed object (nccIVMO, see 5.10.2).

These Managed Objects represent OSI Management's view of those elements of an Open System which support the OSI Transport Service subject to OSI management operations.

#### 5.1.2 Containment hierarchy

The containment hierarchy is illustrated in Figure 1. Managed Objects which can have multiple instances are illustrated by multiple boxes. These objects are defined in detail in the following subclauses.



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Figure 1 – Transport Layer containment hierarchy  
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### 5.1.3 Relationships <https://standards.iteh.ai/catalog/standards/sist/fb85bd1d-3515-4308-a1b7-6092555d07be/iso-iec-10737-1998>

#### 5.1.3.1 General description

The use of Relationship attributes is illustrated by examples in Annex C. The following describes the individual relationships for Transport Layer in more detail.

#### 5.1.3.2 Layer n – 1 services

The Transport Layer Entity has a relation (actualNSAP) to the NSAP MO.

#### 5.1.3.3 Connections

There is a relationship (underlyingConnectionNames) between a Transport Connection MO and its underlying Network LayerConnection MO (if one exists).

#### 5.1.4 Minimum event filtering capabilities

The Transport Layer management definitions embodied in this Recommendation | International Standard imply the frequent and possibly excessive generation of notifications during regular layer operation. These notifications are especially useful for effective fault management where they facilitate the tracing and pinpointing of error situations. To avoid the excessive dissemination of these event reports under normal operating conditions, it is advisable for a managed system to have as a minimum the capability to perform discrimination based on:

- the source Managed Object class;
- the object Identifier values in the probable cause and specific problems field of Communication alarms, and the communication type field of Communication informations.

#### 5.1.5 Use of optional fields

Where reference is made in this Recommendation | International Standard to ASN.1 syntax defined in ITU-T Rec. X.723 | ISO/IEC 10165-5 or CCITT Rec. X.721 | ISO/IEC 10165-2, only the following fields shall be employed:

- those which are not OPTIONAL in the ASN.1 syntax;

- b) those which are OPTIONAL, but whose use is explicitly required by this Recommendation | International Standard;
- c) those which are OPTIONAL, but whose ASN.1 type is SET OF MngmntExtension.

The use of any other field is prohibited.

## 5.2 Common transport layer GDMO definitions

### commonCreationDeletion-B BEHAVIOUR

#### DEFINED AS

!Managed object class imports the X.721 | 10165-2 objectCreation and objectDeletion notifications. Used as follows:

**ObjectCreation** – Generated whenever an instance of the managed object class is created. Implementations may optionally include the sourceIndicator parameter in the notification. If creation occurred as a result of internal operation of the resource, the value 'resourceOperation' is used. If creation occurred in response to a management operation, the value 'managementOperation' is used. A value of 'unknown' may be returned if it is not possible to determine the source of the operation. None of the other optional parameters are used.

**ObjectDeletion** – Generated whenever an instance of the managed object class is deleted. Implementations may optionally include the sourceIndicator parameter in the notification. If deletion occurred as a result of internal operation of the resource, the value 'resourceOperation' is used. If deletion occurred in response to a management operation, the value 'managementOperation' is used. A value of 'unknown' may be returned if it is not possible to determine the source of the operation. None of the other optional parameters are used.!

### commonStateChange-B BEHAVIOUR

#### DEFINED AS

!Managed object class imports the X.721 | 10165-2 stateChange notification. Used to report the changes to the operationalState attribute, and where present, the administrativeState attribute. A single parameter set is included in the State change definition field. Only the (mandatory) attributeId and (optional) newAttributeValue parameters are used.!

### octetsSentReceivedCounter-B BEHAVIOUR

#### DEFINED AS

!The octetsSentCounter and octetsReceivedCounter shall count only user data octets in valid data TPDUs. They shall not count user data octets in data TPDUs which are rejected for any reason, nor user data octets in non-data TPDUs.!

### successfulConnectionEstablishment-B BEHAVIOUR

#### DEFINED AS

!This Package imports the communicationsInformation notification from "GMI". It is used to report the following events: **successfulConnectionEstablishment**: Generated when a connection is successfully established. However the precise synchronization between the notification and the corresponding protocol and service interface interactions is not defined by this Recommendation | International Standard. The value TLM.successfulConnectionEstablishment shall be reported in the informationType field.!

### deactivateConnection-B BEHAVIOUR

#### DEFINED AS

!The deactivate action causes the connection to be terminated. The termination should occur as rapidly as practical, but no particular time constraints are implied. Typically, this action simulates a disconnect request received across the service interface. If a more rapid means for terminating the connection exists, then this should be used. The termination shall occur in conformance to the protocol standard. The Managed Object remains in existence after completion of the Deactivate Action. It is subsequently deleted when the connection is terminated, in the same way as if the connection has been terminated by other means. A Deactivate action may fail (with the ProcessingError response) if it is temporarily not possible to terminate the connection.!

### resettingTimer-B BEHAVIOUR

#### DEFINED AS

!This attribute specifies the interval between certain events in the operation of the protocol state machine. If the value of the attribute is changed to a new value while the protocol state machine is in operation, the implementation shall take the necessary steps to ensure that for any time interval which was in progress when the corresponding attribute was changed, the next expiration of that interval takes place no later than the expiration of the interval in progress or the specified interval whichever is the sooner. The precision with which this time shall be implemented shall be the same as that associated with the basic operation of the timer attribute.!

### 5.3 Transport subsystem managed object

- *Managed Object for Transport Layer Subsystem*
- *There is exactly one of these MOs within*
- *a system. It exists to provide a container for the layer entity MOs.*
- 
- *The transportSubsystem managed object cannot be created or deleted*
- *explicitly by management operation. It exists inherently in a system;*
- *created and deleted as part of system operation.*

**transportSubsystem MANAGED OBJECT CLASS**

**DERIVED FROM "GMI":subsystem;**

- *which is derived from "DMI":top*

**CHARACTERIZED BY transportSubsystem-P PACKAGE**

**ATTRIBUTES**

**"GMI":subsystemId**

**INITIAL VALUE TLM.transportSubsystemId-Value**

**GET;**

**::**

**REGISTERED AS {TLM.moi transportSubsystem (1)};**

- *Name Bindings*

**transportSubsystem-system NAME BINDING**

**SUBORDINATE OBJECT CLASS transportSubsystem AND SUBCLASSES;**

**NAMED BY**

**SUPERIOR OBJECT CLASS "DMI":system AND SUBCLASSES;**

**WITH ATTRIBUTE "GMI":subsystemId;**

**REGISTERED AS {TLM.nboi transportSubsystem-system (1)};**

### 5.4 Transport entity managed object

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- *There may be multiple instances of these MOs within a system.*
- *Its definition permits it to be deleted and created explicitly by*
- *management operation, or to be created and deleted automatically*
- *as part of system operation.*

**transportEntity MANAGED OBJECT CLASS**

**DERIVED FROM "GMI":communicationsEntity;**

- *which is derived from "DMI":top*

**CHARACTERIZED BY transportEntity-P PACKAGE**

**BEHAVIOUR tEPackageImportedNotifications-B,**

**commonCreationDeletion-B;**

**ATTRIBUTES**

**actualNSAP GET,**

**checksumErrorsDetected GET,**

**protocolErrors GET,**

**targetNSAP GET-REPLACE ADD-REMOVE,**

**undecodedNSDUs GET;**

**ATTRIBUTE GROUPS**

- *The following attribute group is present in each of the transport*
- *MOs which define counters. It allows all of the*
- *counters to be retrieved in a single request.*

**"GMI":counters**

**checksumErrorsDetected**

**protocolErrors**

**undecodedNSDUs;**

**NOTIFICATIONS**

- *protocolErrorNotification;*
- *The following notification is issued by the entity MO*
- *because in some cases it may be impossible to associate the*
- *protocol Error with any of the protocol Machines.*

"DMI":communicationsAlarm  
tEProtocolErrorPDUHeader  
tEProtocolErrorSourceAddress  
tEProtocolErrorReasonCode,  
"DMI":objectDeletion,  
"DMI":objectCreation;;;

REGISTERED AS {TLM.moi transportEntity (2)};

-- Behaviours

-- Definition of the tEPackageImportedNotifications and of the mapping  
-- of specific protocol error parameters into the fields of  
-- communicationsAlarm Notification.  
--

tEPackageImportedNotifications-B BEHAVIOUR

DEFINED AS

!Notification issued when a Transport Entity receives a PDU which is invalid or contains a protocol error. The notification includes the header of the invalid PDU, the source N-Address, and the reason why the PDU is considered to be in error. The Reason code appears only if the protocol error relates to the connection-mode protocol, and if it has been possible to relate the PDU to a particular connection. The reason code is the value placed in the corresponding parameter of the ER TPDU, if sent. The tEPackage imports the communicationsAlarm Notification from DMI, in order to report the ProtocolError event. The probableCause shall be set to TLM.communicationsProtocolError. The tEProtocolErrorPDUheader, tEProtocolErrorSourceAddress and tEProtocolErrorReasonCode are reported as parameters in the additionalInformation field of the communicationsAlarm. The significance subparameter of each item of the problemData shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event will be less likely to reject it. The perceivedSeverity shall be set to Minor. A subsequent communicationsAlarm with a perceivedSeverity value of 'Cleared' shall not be generated. No other fields or parameters shall be used, with the exception of further parameters in the additionalInformationfield.!

-- Name Bindings

(standards.iteh.ai)

transportEntity-transportSubsystem-Automatic NAME BINDING

SUBORDINATE OBJECT CLASS transportEntity AND SUBCLASSES;

NAMED BY <https://standards.iteh.ai/catalog/standards/sist/b85bd1d-3515-4308-a1b7-6092555d07be/iso-iec-10737-1998>

SUPERIOR OBJECT CLASS transportSubsystem AND SUBCLASSES;

WITH ATTRIBUTE "GMI":communicationsEntityId;

BEHAVIOUR transportEntity-transportSubsystem-Automatic-B BEHAVIOUR

DEFINED AS

!This name binding shall be used when the transportEntity MO is created automatically by the operation of the system. The details of this operation are outside the scope of this Recommendation.!!;

REGISTERED AS {TLM.nboi transportEntity-transportSubsystem-Automatic (11)};

transportEntity-transportSubsystem-Management NAME BINDING

SUBORDINATE OBJECT CLASS transportEntity AND SUBCLASSES;

NAMED BY

SUPERIOR OBJECT CLASS transportSubsystem AND SUBCLASSES;

WITH ATTRIBUTE "GMI":communicationsEntityId;

BEHAVIOUR transportEntity-transportSubsystem-Management-B BEHAVIOUR

DEFINED AS

!This name binding shall be used when the transportEntity MO is created by management.!!;

CREATE;

DELETE;

REGISTERED AS {TLM.nboi transportEntity-transportSubsystem-Management (12)};

-- Attributes

actualNSAP ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.LocalDistinguishedNames;

MATCHES FOR EQUALITY, SET-INTERSECTION;

BEHAVIOUR actualNSAP-B BEHAVIOUR

DEFINED AS

!The actual MO name(s) of the NSAP(s)

in use by this Transport Entity!;;

REGISTERED AS {TLM.aoi actualNSAP (4)};

**checksumErrorsDetected ATTRIBUTE**

DERIVED FROM "GMI":nonWrapping64BitCounter;  
BEHAVIOUR cChecksumErrorsDetected-B BEHAVIOUR  
DEFINED AS

!The number of PDUs received with an incorrect checksum!;;

REGISTERED AS {TLM.aoi checksumErrorsDetected (6)};

**protocolErrors ATTRIBUTE**

DERIVED FROM "GMI":nonWrapping64BitCounter;  
BEHAVIOUR protocolErrors-B BEHAVIOUR  
DEFINED AS

!Counter associated to protocol errors!;;

REGISTERED AS {TLM.aoi protocolErrors (7)};

**targetNSAP ATTRIBUTE**

WITH ATTRIBUTE SYNTAX TLM.LocalDistinguishedNames;  
MATCHES FOR EQUALITY, SET-INTERSECTION;  
BEHAVIOUR targetNSAP-B BEHAVIOUR  
DEFINED AS

!The MO name(s) of the NSAP(s) to be used by this Transport Entity. The value of this attribute cannot be changed unless the Operational State of the entity is Off. An implementation may permit it to be set only at creation of the transportEntity MO. An implementation may permit the size of the set to be restricted to 1. An implementation may permit a null value (empty set) to be specified, in which case some system-dependent auto configuration takes place!;;

REGISTERED AS {TLM.aoi targetNSAP (3)};

**undecodedNSDUs ATTRIBUTE**

DERIVED FROM "GMI":nonWrapping64BitCounter;  
BEHAVIOUR undecodedNSDUs-B BEHAVIOUR  
DEFINED AS

!Number of NSDUs that cannot be attributed to any protocol machines!;;

REGISTERED AS {TLM.aoi undecodedNSDUs (5)};

-- Parameters

**tEProtocolErrorPDUHeader PARAMETER**

CONTEXT EVENT-INFO;  
WITH SYNTAX TLM.PDUHeaderSyntax;  
BEHAVIOUR pduHeader-B BEHAVIOUR  
DEFINED AS

!Header of the invalid PDU that caused the event.

Returned in the problemData field of a communicationsAlarm notification!;;

REGISTERED AS {TLM.proi tEProtocolErrorPDUHeader (1)};

**tEProtocolErrorSourceAddress PARAMETER**

CONTEXT EVENT-INFO;  
WITH SYNTAX TLM.SourceAddressSyntax;  
BEHAVIOUR sourceAddress-B BEHAVIOUR  
DEFINED AS

!Source N-Address of the invalid PDU that caused the event. Returned in the problemData field of a communicationsAlarm notification!;;

REGISTERED AS {TLM.proi tEProtocolErrorSourceAddress (2)};

**tEProtocolErrorReasonCode PARAMETER**

CONTEXT EVENT-INFO;  
WITH SYNTAX TLM.ReasonCodeSyntax;  
BEHAVIOUR reasonCode-B BEHAVIOUR  
DEFINED AS

!Reason why the PDU is in error as placed in the corresponding parameter of the ER TPDU. Returned in the problemData field of a communicationsAlarm notification. This parameter is optional!;;

REGISTERED AS {TLM.proi tEProtocolErrorReasonCode (3)};

## 5.5 Connectionless-mode transport protocol machine managed object

-- There is no more than one of these MOs per Transport Entity.  
-- Its definition permits it to be created and deleted explicitly by  
-- management operation, but in some systems it will exist inherently  
-- and neither creation nor deletion by management operation  
-- will be possible. Name bindings are defined for both cases.  
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