

Information technology — Elements of management information related to the OSI Network Layer

ICS 35.100.30

National foreword

This British Standard reproduces verbatim ISO/IEC 10733:1998 and implements it as the UK national standard. It supersedes BS ISO/IEC 10733 inc Amd 8408:1993 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee IST/6, Data communications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

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Information technology — Elements of management information related to the OSI Network Layer

*Technologies de l'information — Éléments d'information de gestion relatifs à
la couche OSI réseau*



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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 10733 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.283.

This second edition cancels and replaces the first edition (ISO/IEC 10733:1993), which has been technically revised. It also incorporates Amendment 1:1996, Technical Corrigendum 1:1994, Technical Corrigendum 2:1996 and Technical Corrigendum 3:1997.

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

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 Network Layer management information.

This Recommendation | International Standard is an update of ITU-T Rec. X.283 (1993) and ISO/IEC 10733:1993 to incorporate all Amendments and Technical corrigenda.

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INFORMATION TECHNOLOGY – ELEMENTS OF MANAGEMENT INFORMATION RELATED TO THE OSI NETWORK LAYER

1 Scope

This Recommendation | International Standard provides the specification of management information within an Open System related to those operations of the OSI Network Layer. Specifics on how Network layer management is accomplished is beyond the scope of this Recommendation | International Standard. Network Layer management information is defined by specifying:

- the managed object class definition of Network Layer Managed Objects following guidelines put forth by the *Structure of Management Information* (see 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 Network 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 Network Layer management information.

2 Normative references

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 the 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.213 (1995) | ISO/IEC 8348:1996, *Information technology – Open Systems Interconnection – Network service definition*.
- ITU-T Recommendation X.233 (1993) | ISO/IEC 8473-1:1994, *Information technology – Protocol for providing the connectionless-mode network service: Protocol specification*.
- ITU-T Recommendation X.263 (1995) | ISO/IEC TR 9577:1996, *Information technology – Protocol Identification in the network layer*.
- ITU-T Recommendation X.284 (1997) | ISO/IEC 10737:1998, *Information technology – Elements of management information related to the OSI Transport Layer*.
- CCITT Recommendation X.612 (1992) | ISO/IEC 9574:1992, *Information technology – Provision of the OSI Connection – mode network service by packet-mode terminal equipment connected to an Integrated Services Digital Network (ISDN)*.
- CCITT Recommendation X.701 (1992) | ISO/IEC 10040:1992, *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 10164-2:1992, *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.223 (1993), *Use of X.25 to provide the OSI connection-mode network service for ITU-T applications.*
ISO/IEC 8878:1992, *Information technology – Telecommunications and information exchange between systems – Use of X.25 to provide the OSI Connection-mode Network Service.*
- 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 for CCITT applications.*
ISO/IEC 7498-4:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 4: Management framework.*

2.3 Additional references

- CCITT Recommendation D.10 (1991), *General tariff principles for international public data communication services*.
- CCITT Recommendation D.11 (1991), *Special tariff principles for international packet-switched public data communication services by means of the virtual call facility*.
- CCITT Recommendation D.12 (1980), *Measurement unit for charging by volume in the international packet-switched data communication service*.
- ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.
- ITU-T Recommendation X.2 (1996), *International data transmission services and optional user facilities in public data networks and ISDNs*.
- ITU-T Recommendation X.25 (1993), *Interface between Data Terminal Equipment (DTE), and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit*.
- ITU-T Recommendation X.121 (1996), *International numbering plan for public data networks*.
- ISO/IEC 8208:1995, *Information technology – Data communications – X.25 Packet Layer Protocol for Data Terminal Equipment*.
- ISO 8648:1988, *Information processing systems – Open Systems Interconnection – Internal organization of the Network Layer*.
- ISO/IEC 8881:1989, *Information processing systems – Data communications – Use of the X.25 packet level protocol in local area networks*.
- ISO 9542:1988, *Information processing systems – Telecommunications and information exchange between systems – End system to Intermediate system routeing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO 8473)*.
- ISO/IEC 10030:1990, *Information technology – Telecommunications and information exchange between systems – End System Routeing Information Exchange Protocol for use in conjunction with ISO/IEC 8878*.
- ISO/IEC 10177:1993, *Information technology – Telecommunications and information exchange between systems – Provision of the connection-mode Network internal layer service by intermediate systems using ISO/IEC 8208, the X.25 Packet Layer Protocol*.
- ISO/IEC TR 13532:1995, *Information technology – Telecommunications and information exchange between systems – Protocol combinations to provide and support the OSI Network Service*.
- ISO/IEC 10589:1992, *Information technology – Telecommunications and information exchange between systems – Intermediate system to intermediate system intra-domain routeing information exchange protocol for use in conjunction with the protocol for providing the connectionless-mode Network Service (ISO 8473)*.

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) Network Layer;
- d) Network 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.

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 symbols and abbreviations apply:

BCUG	Bilateral Closed User Group
CLNP	Connectionless-mode Network Protocol
CLNS	Connectionless-mode Network Service
CMIP	Common Management Information Protocol
CMIS	Common Management Information Service
CONS	Connection-mode Network Service
CUG	Closed User Group
ES	End System
ESH	End System Hello
ER PDU	Error Report Protocol Data Unit
IS	Intermediate System
ISH	Intermediate System Hello
IVMO	Initial Values Managed Object
LCN	Logical Channel Number
MCS	Management Conformance Summary

MICS	Management Information Conformance Statement
MO	Managed Object
MOCS	Managed Object Conformance Statement
MRCS	Managed Relationship Conformance Statement
NSAP	Network Service Access Point
NSE	Network Service Element
NUI	Network User Identification
PLE	Packet Layer Entity
PVC	Permanent Virtual Circuit
RD PDU	Redirect Protocol Data Unit
RDN	Relative Distinguished Name
SNDCF	Subnetwork Dependent Convergence Function
SNPA	Subnetwork Point of Attachment
VC	Virtual Call

5 Elements of network layer management information

5.1 Managed object hierarchy

5.1.1 Summary of managed objects

The following set of managed object classes are defined for the OSI Network Layer:

- a) The network subsystem managed object (see 5.3).
- b) The network entity managed object (see 5.4).
- c) The NSAP managed object (see 5.5).
- d) The connectionless-mode network service managed object (see 5.6).
- e) The linkage managed object (see 5.7).
- f) The connection-mode network service managed object (see 5.8).
- g) The network connection managed object (see 5.9).
- h) The X.25 PLE DTE managed object (see 5.10.3).
- i) The X.25 PLE DCE managed object (see 5.10.4).
- j) The X.25 PLE DTE initial values managed object (see 5.10.5).
- k) The X.25 PLE DCE initial values managed object (see 5.10.6).
- l) The permanent virtual circuit DTE managed object (see 5.11.4).
- m) The permanent virtual circuit DCE managed object (see 5.11.5).
- n) The virtual call initial values managed object (see 5.11.6).
- o) The virtual call DTE managed object (see 5.11.7).
- p) The virtual call DCE managed object (see 5.11.8).
- q) The Recommendation D Series counts managed object (see 5.11.9).

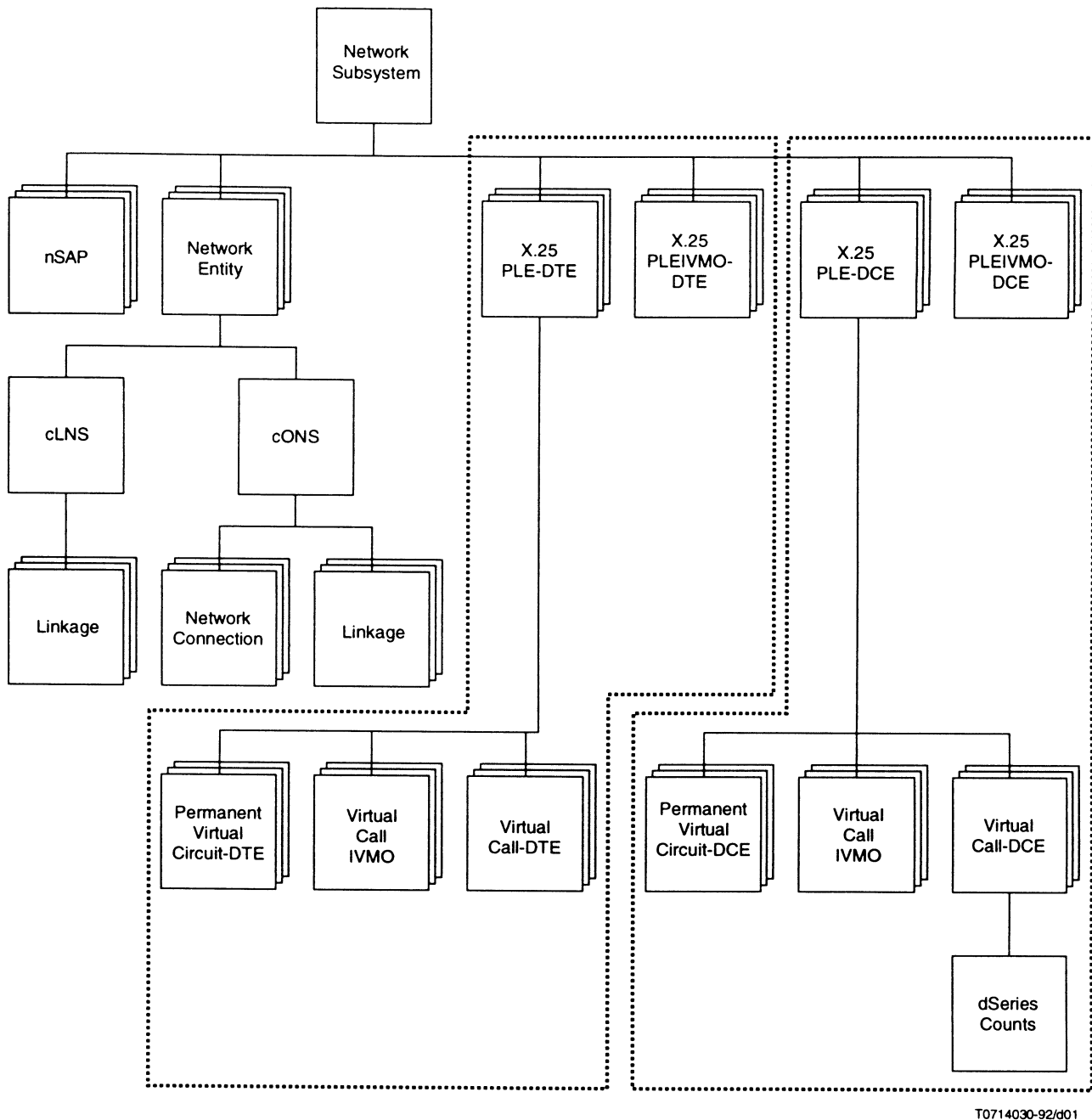
The following Managed Object classes are never instantiated, but exist only for the purposes of deriving subclasses.

- a) The X.25 PLE managed object (see 5.10.1).
- b) The X.25 PLE initial values managed object (see 5.10.2).
- c) The virtual circuit managed object (see 5.11.1).
- d) The virtual circuit DTE managed object (see 5.11.2).
- e) The virtual circuit DCE managed object (see 5.11.3).

These Managed Objects represent OSI Management's view of those elements of an Open System which support the OSI Network 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 shadowed (multiple) boxes. These objects are defined in detail in the following subclauses.



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Figure 1 – Network Layer containment hierarchy

The networkSubsystem MO is subordinate to the system MO. The x25PLE MO and IVMOs are examples of what are termed 'SNPA' MOs. The 'SNPA' MOs are subnetwork specific MOs. It is expected that there will in future be a number of additional 'SNPA' MOs, for example for ISDN.

The 'SNPA' MO is concerned with the protocol used to access a subnetwork. For example, there is an 'SNPA' MO corresponding to each X.25 Packet layer entity. The cLNS MO is concerned with the functions of the CLNS protocols (see ITU-T Rec. X.233 | ISO/IEC 8473-1, ISO 9542 and ISO/IEC 10589) which apply to the general operation of the protocol as a whole rather than being specifically related to individual points of attachment, whereas the linkage MO applies to the subnetwork dependent convergence functions. The cONS MO and its associated linkage MOs apply similarly to protocols associated with CONS (see ITU-T Rec. X.223 | ISO/IEC 8878, CCITT Rec. X.612 | ISO/IEC 9574, ISO/IEC 10030, ISO/IEC 10177, etc.)

For the requirements regarding which MOs in the containment tree shall be instantiated for a conforming implementation, see the applicable clauses of the conformance statement.

5.1.3 Relationships

5.1.3.1 General

The following subclauses describe the individual relationships. The use of relationship attributes is illustrated by examples in Annex C.

5.1.3.2 Linkage

There is a relationship (sN-ServiceProvider and sN-SAP both pointing to the same MO) between linkage MOs and 'SNPA' MOs. For example, a linkage concerned with the operation of the ITU-T Rec. X.233 | ISO/IEC 8473-1 SND CF for X.25 has a relationship with an x25PLE-DTE MO. A linkage has a relationship identifying only one 'SNPA', so in the case of a network entity containing one ITU-T Rec. X.233 | ISO/IEC 8473-1 protocol machine operating over a number of X.25 Packet Layer Entities, there would be a number of linkage MOs, each related to a different x25PLE-DTE MO. But although one linkage is related to only one 'SNPA', it is possible for a number of other linkages to be related to the same 'SNPA'; for example, there could be cONS Linkages and cLNS linkages both using the same x25PLE-DTE and therefore the same 'SNPA' MO.

In some cases of network layer operation there is no specific access protocol; for example, ITU-T Rec. X.233 | ISO/IEC 8473-1 contains an SND CF for use over the data link service directly. In such cases, the linkage has relationships (sN-ServiceProvider and sN-SAP pointing to different MOs), not to an 'SNPA' but to appropriate MOs in the Data Link Layer.

5.1.3.3 NSAPs

There is a relationship (localSAPNames) between a networkEntity MO and an nSAP MO. Each nSAP MO is related to only one networkEntity, although one networkEntity may be related to several nSAP MOs.

5.1.3.4 Layer n + 1 clients

The nSAP MO has a set of relationships (userEntityName) to Layer n + 1 clients (typically the Transport Layer Entity). The Transport Layer Entity has a relationship (actualNSAP) to the nSAP MO.

5.1.3.5 Layer n – 1 services

Both the linkage and x25PLE MOs have relationships (sN-ServiceProvider and sN-SAP) to the appropriate Data Link Layer MOs.

5.1.3.6 Connections

There is a relationship (underlyingConnectionNames) between a transportConnection MO and its underlying networkConnection MO (if one exists), and between the networkConnection MO and the underlying virtualCall-DTE MO. The relationship between the virtualCall-DTE MO and any underlying Datalink Layer MO is implicitly available as a result of the parent x25PLE-DTE or x25PLE-DCE MOs relationships to the Data Link Layer, as described above.

In addition there is a relationship (localNSAPMO) from the networkConnection MO to the corresponding nSAP MO.

5.1.4 Minimum event filtering capabilities

The network 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 upon:

- a) The source managed object class.
- b) The object identifier values in the probable cause and specific problems field of communication alarms, and the communication type field 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:

- a) 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 ManagementExtension.

The use of any other fields is prohibited.

5.2 Common behaviour templates

commonCreationDeletion-B BEHAVIOUR

DEFINED AS

!Managed object class imports the ISO/IEC 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 ISO/IEC 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 packets. They shall not count user data octets in data packets which are rejected for any reason, nor user data octets in non data packets.!

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 Specification.

The value NLM.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 this 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 The network subsystem managed object

-- *Managed Object for Network Layer Subsystem*
 --
 -- *There is exactly one of these MOs within a system. It exists to provide a container for the*
 -- *Network Entity MOs, nSAP MOs and the 'SNPA' MOs as described in clause.*
 --
 -- *The networkSubsystem 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.*

networkSubsystem MANAGED OBJECT CLASS**DERIVED FROM "GMI":subsystem;****CHARACTERIZED BY networkSubsystem-P PACKAGE****ATTRIBUTES****"GMI":systemId****INITIAL VALUE NLM.networkSubsystemId-Value****GET;;;****REGISTERED AS { NLM.moi networkSubsystem (1) };***-- Name Bindings***networkSubsystem-system NAME BINDING****SUBORDINATE OBJECT CLASS networkSubsystem AND SUBCLASSES;****NAMED BY****SUPERIOR OBJECT CLASS "DMI":system AND SUBCLASSES;****WITH ATTRIBUTE "GMI":systemId;****REGISTERED AS { NLM.nboi networkSubsystem-system (1) };****5.4 The network entity managed object**

-- *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.*

networkEntity MANAGED OBJECT CLASS**DERIVED FROM "GMI":communicationsEntity;****CHARACTERIZED BY networkEntity-P PACKAGE****BEHAVIOUR commonCreationDeletion-B;****ATTRIBUTES****networkEntityTitles****GET-REPLACE****ADD-REMOVE,****systemTypes GET;****NOTIFICATIONS****"DMI":objectDeletion,****"DMI":objectCreation;****;;****REGISTERED AS { NLM.moi networkEntity (22) };***-- Name Bindings*

networkEntity-networkSubsystem-Automatic NAME BINDING
 SUBORDINATE OBJECT CLASS networkEntity AND SUBCLASSES;
 NAMED BY
 SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
 WITH ATTRIBUTE "GMI":communicationsEntityId;
 BEHAVIOUR networkEntity-networkSubsystem-Automatic-B BEHAVIOUR
 DEFINED AS !This name binding shall be used when the
 networkEntity MO is created automatically by the operation
 of the system. The details of these operations are outside
 the scope of this Specification.!;;
 REGISTERED AS { NLM.nboi networkEntity-networkSubsystem-Automatic (27) };

networkEntity-networkSubsystem-Management NAME BINDING
 SUBORDINATE OBJECT CLASS networkEntity AND SUBCLASSES;
 NAMED BY
 SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
 WITH ATTRIBUTE "GMI":communicationsEntityId;
 BEHAVIOUR networkEntity-networkSubsystem-Management-B BEHAVIOUR
 DEFINED AS !This name binding shall be used when the
 networkEntity MO is created automatically by system management.!;;
 CREATE;
 DELETE;
 REGISTERED AS { NLM.nboi networkEntity-networkSubsystem-Management (28) };

-- Attributes

networkEntityTitles ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.NAddresses;
 MATCHES FOR EQUALITY;
 BEHAVIOUR networkEntityTitles-B BEHAVIOUR
 DEFINED AS !The set of Network Entity Titles
 (having the same abstract syntax as an NSAP address),
 which unambiguously identify the Network Entity in
 an End or Intermediate System. The value may be entered by a system
 management operation or it may be derived by some local means, for example
 by autoconfiguration.!;;
 REGISTERED AS { NLM.aoi networkEntityTitles (3) };

systemTypes ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.SystemTypes;
 MATCHES FOR EQUALITY;
 BEHAVIOUR systemTypes-B BEHAVIOUR
 DEFINED AS !The set of system roles supported by this Network Entity.
 This may be End System, Intermediate System or both. The actual
 role in which a particular instance of the protocol machine
 is operating is determined by the operationalSystemType attribute
 of the cLNS or cONS MO.!;;
 REGISTERED AS { NLM.aoi systemTypes (108) };

5.5 The NSAP managed object

-- There is one nSAP MO for each set of NSAPs supported by the Network Subsystem
 -- associated with a single Transport layer client.
 -- Each NSAP MO corresponds to a set of one or more NSAPs
 -- supported by the Network Subsystem.
 --
 -- There is not more than one Transport layer client associated with a single nSAP MO,
 -- but there may be more than one nSAP MO, and corresponding sets of NSAPs,
 -- associated with a single Transport layer client.
 -- Its definition permits it to be created and deleted explicitly by
 -- management operation or to be created and deleted automatically as
 -- part of system operation.

nSAP MANAGED OBJECT CLASS
 DERIVED FROM "GMI":sap2;
 CHARACTERIZED BY nSAP-P PACKAGE
 BEHAVIOUR commonCreationDeletion-B;

```

    ATTRIBUTES
        "GMI":sap2Address
            INITIAL VALUE DERIVATION RULE nAddressesIV-B
            GET;
    NOTIFICATIONS
        "DMI":objectDeletion,
        "DMI":objectCreation;
    ;;
REGISTERED AS { NLM.moi nSAP (4) };

-- Behaviours

nAddressesIV-B BEHAVIOUR
    DEFINED AS !If the package is created using the nSAP-networkSubsystem-Automatic
        name binding the initial value of this attribute is not constrained by this
        Specification. However, if the package is created using the
        nSAP-networkSubsystem-Management name binding the initial value shall
        be specified in the CMIP create.!!;

-- Name Bindings

nSAP-networkSubsystem-Automatic NAME BINDING
    SUBORDINATE OBJECT CLASS nSAP AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
        WITH ATTRIBUTE "GMI":sapId;
    BEHAVIOUR nSAP-networkSubsystem-Automatic-B BEHAVIOUR
        DEFINED AS !This name binding shall be used when the nSAP MO is created automatically by the
            operation of the network entity. For example, by the use of autoconfiguration or dynamic
            NSAP Address assignment techniques. The details of the operation of these techniques are
            outside the scope of this Specification.!!;
REGISTERED AS { NLM.nboi nSAP-networkSubsystem-Automatic (4) };

nSAP-networkSubsystem-Management NAME BINDING
    SUBORDINATE OBJECT CLASS nSAP AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
        WITH ATTRIBUTE "GMI":sapId;
    BEHAVIOUR nSAP-networkSubsystem-Management-B BEHAVIOUR
        DEFINED AS !This name binding shall be used when the nSAP MO is created by system
            management.
            The value of the sap2Address attribute shall be specified in the CMIP create.!!;
    CREATE;
    DELETE;
REGISTERED AS { NLM.nboi nSAP-networkSubsystem-Management (5) };

```

5.6 The connectionless-mode network service managed object

```

-- There is no more than one of these MOs per network 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.
--
-- When the protocol machine is operable, the operationalState shall
-- have the value 'enabled'; otherwise it shall have the value 'disabled'.
-- Transitions of operationalState shall be reported using the
-- stateChange notification. A cLNS MO may be created in the
-- 'enabled' operational state.

```

```

cLNS MANAGED OBJECT CLASS
    DERIVED FROM "GMI":clProtocolMachine;
    CHARACTERIZED BY cLNS-P PACKAGE
        BEHAVIOUR commonStateChange-B,
        commonCreationDeletion-B;

```

ATTRIBUTES

"DMI":administrativeState GET-REPLACE,
 "GMI":cIProtocolMachinelId
 INITIAL VALUE NLM.cLNSId-Value
 GET,
 supportedProtocols GET,
 operationalSystemType
 INITIAL VALUE DERIVATION RULE operationalSystemTypeIV-B
 GET;

ATTRIBUTE GROUPS

"DMI":state
 "DMI":administrativeState
 "DMI":operationalState;

ACTIONS

"GMI":activate,
 "GMI":deactivate;

NOTIFICATIONS

"DMI":objectCreation,
 "DMI":objectDeletion,
 "DMI":stateChange;

;;

CONDITIONAL PACKAGES**cLNS8473-P**

PRESENT IF !The protocol defined in ITU-T Rec. X.233 IISO/IEC 8473-1 is used to implement the CLNS!;

cLNSChecksum-P

PRESENT IF !The ITU-T Rec. X.233 IISO/IEC 8473-1 Generate Checksum option is implemented!;

-- The following packages are associated with ISO/IEC 10589

"ISO/IEC 10589":cLNSISISBasic-P

PRESENT IF !The system is an ISO 10589 IS!;

"ISO/IEC 10589":cLNSISISAuthentication-P

PRESENT IF !The system is an ISO 10589 IS
 and the authentication procedures are implemented!;

"ISO/IEC 10589":cLNSISISPartitionRepair-P

PRESENT IF !The system is an ISO 10589 Level 2 IS
 and the partition repair procedures are implemented!;

"ISO/IEC 10589":cLNSISISLevel2-P

PRESENT IF !The system is an ISO 10589 Level 2 IS!;

"ISO/IEC 10589":cLNSISISLevel2Authentication-P

PRESENT IF !The system is an ISO 10589 Level 2 IS
 and the authentication procedures are implemented!;

REGISTERED AS { NLM.moi cLNS (21) };

-- Packages

cLNS8473-P PACKAGE**BEHAVIOUR cLNS8473-P-B BEHAVIOUR**

DEFINED AS !Present when ITU-T Rec. X.233 IISO/IEC 8473-1 is used to provide the CLNS!;;
 cLNS8473PImportedNotifications-B,
 cLNS8473PImportedCounters-B;

ATTRIBUTES

"DMI":octetsSentCounter GET,
 "DMI":octetsReceivedCounter GET,
 segmentsReceived GET,
 segmentsSent GET,
 segmentsDiscarded GET,
 assemblingSegmentsDiscarded GET,
 errorReportsReceived GET,
 pDUDiscards GET,
 congestionDiscards GET,
 maximumLifetime GET-REPLACE;

ATTRIBUTE GROUPS

"GMI":counters
 "DMI":octetsSentCounter
 "DMI":octetsReceivedCounter
 segmentsReceived
 segmentsDiscarded

```

        assemblingSegmentsDiscarded
        errorReportsReceived
        pDUDiscards
        congestionDiscards;
    NOTIFICATIONS
        "DMI":communicationsAlarm
        notificationPDUHeader;
REGISTERED AS { NLM.poi cLNS8473-P (20) };

cLNSChecksum-P PACKAGE
    BEHAVIOUR cLNSChecksum-P-B BEHAVIOUR
        DEFINED AS !When present checksum generation is controlled by
            the enableChecksum attribute.!;;
    ATTRIBUTES
        enableChecksum REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.false
        GET-REPLACE;
REGISTERED AS { NLM.poi cLNSChecksum-P (1) };

-- Behaviours

cLNS8473PImportedCounters-B BEHAVIOUR
    DEFINED AS !The cLNS8473-P package imports octetsSentCounter and octetsReceivedCounter from
        ISO/IEC 10165-2. They are used to count the number of octets of data transmitted or received by
        the local network entity in ITU-T Rec. X.233 | ISO/IEC 8473-1 Data PDUs. (i.e. those which which
        have a source or
        destination N-Address, respectively, which corresponds to that one of those of the local network
        entity.)!;

cLNS8473PImportedNotifications-B BEHAVIOUR
    DEFINED AS !The cLNS8473-P package imports the communicationsAlarm notification from
        Rec. 721 | ISO/IEC 10165-2.
    It is used to report the following cLNS managed object events.
    pDUDiscard:
        Generated when a data NPDU is discarded due
        to any of the reasons specified in ITU-T Rec. X.233 | ISO/IEC 8473-1 Table 7, with
        the exception of 'PDU Discarded due to Congestion' The header of the PDU in error
        shall be reported as a parameter in the additionalInformation field of the
        communicationsAlarm, using the notificationPDUHeader parameters.
        The significance sub-parameter of each item of additionalInformation
        shall be set to the value 'False' (i.e. not significant) so that a managing
        system receiving the event report will be less likely to reject it.
        The value NLM.pDUDiscard and that corresponding to the Reason For Discard
        shall both be reported in the specificProblems parameter.
        The probableCause shall be set to NLM.communicationsProtocolError.
        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 AdditionalInformation field.
        A PDU which does not contain one of the protocol identifiers defined
        in ITU-T Rec. X.233 | ISO/IEC 8473-1 shall not cause this event.
        A PDU with a protocol ID 1000 0001 shall not cause this event if it does not also contain
        the Version/Protocol Identifier extension in 7.2.4 of ITU-T Rec. X.233 | ISO/IEC 8473-1.
        If an error report PDU is generated, the PDU header and Discard Reason in the error
        report shall be the same as those in the corresponding notification.!
;

operationalSystemTypeIV-B BEHAVIOUR
    DEFINED AS !If the MO is created by management operation (using the
        cLNS-networkEntity-Management or
        cONS-networkEntity-Management name binding), the initial value of the
        operationalSystemType attribute shall be specified in the CMIP create. Otherwise,
        the value shall be determined in an implementation specific manner. The value
        shall be one of those present in the systemTypes attribute of the
        superior Network Entity MO.!!;

-- Name Bindings

cLNS-networkEntity-Management NAME BINDING
    SUBORDINATE OBJECT CLASS cLNS AND SUBCLASSES;

```

```

NAMED BY
  SUPERIOR OBJECT CLASS networkEntity AND SUBCLASSES;
  WITH ATTRIBUTE "GMI":clProtocolMachinelid;
BEHAVIOUR cLNS-networkEntity-Management-B BEHAVIOUR
  DEFINED AS !The name binding that applies when the cLNS managed object
    can be created and deleted by management.!;;
CREATE;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS { NLM.nboi cLNS-networkEntity-Management (3) };

cLNS-networkEntity-Automatic NAME BINDING
  SUBORDINATE OBJECT CLASS cLNS AND SUBCLASSES;
  NAMED BY
    SUPERIOR OBJECT CLASS networkEntity AND SUBCLASSES;
    WITH ATTRIBUTE "GMI":clProtocolMachinelid;
  BEHAVIOUR cLNS-networkEntity-Automatic-B BEHAVIOUR
    DEFINED AS !The name binding that applies when the cLNS managed object
      cannot be created or deleted by management.!;;
  REGISTERED AS { NLM.nboi cLNS-networkEntity-Automatic (16) };

-- Attributes

assemblingSegmentsDiscarded ATTRIBUTE
  DERIVED FROM "GMI":nonWrapping64BitCounter;
  BEHAVIOUR assemblingSegmentsDiscarded-B BEHAVIOUR
    DEFINED AS !Counter of segments discarded due to reassembly time expiry.
      This is the number of data and error report NPDUs discarded
      due to reassembly time expiry.!;;
  REGISTERED AS { NLM.aoi assemblingSegmentsDiscarded (8) };

congestionDiscards ATTRIBUTE
  DERIVED FROM "GMI":nonWrapping64BitCounter;
  BEHAVIOUR congestionDiscards-B BEHAVIOUR
    DEFINED AS !Counter of PDUs discarded due to congestion.
      This is the number of data or error report PDUs discarded due to congestion.
      This counter is incremented irrespective of the setting of the Error Report bit in the
      received PDU.!;;
  REGISTERED AS { NLM.aoi congestionDiscards (11) };

enableChecksum ATTRIBUTE
  WITH ATTRIBUTE SYNTAX NLM.Boolean;
  MATCHES FOR EQUALITY;
  BEHAVIOUR enableChecksum-B BEHAVIOUR
    DEFINED AS !When True, the generation of checksums is enabled.!;;
  REGISTERED AS { NLM.aoi enableChecksum (4) };

errorReportsReceived ATTRIBUTE
  DERIVED FROM "GMI":nonWrapping64BitCounter;
  BEHAVIOUR errorReportsReceived-B BEHAVIOUR
    DEFINED AS !Counter of received error reports.
      This is the number of error report NPDUs received which were addressed to the local
      network entity.!;;
  REGISTERED AS { NLM.aoi errorReportsReceived (9) };

maximumLifetime ATTRIBUTE
  WITH ATTRIBUTE SYNTAX NLM.Lifetime;
  MATCHES FOR EQUALITY, ORDERING;
  BEHAVIOUR maximumLifetime-B BEHAVIOUR
    DEFINED AS !Maximum PDU lifetime (in half seconds).
      This attribute controls the maximum value (in half seconds) which may be placed
      in the lifetime field of any ITU-T Rec. X.233 | ISO/IEC 8473-1 data or error report PDU
      generated by the local network entity.
      It does not affect the lifetime field of any PDUs not generated by this network entity,
      for example those relayed by this system acting as an Intermediate System. PDUs generated
      by the local network entity are permitted to have a lower value of lifetime field than this
      attribute, but shall not have a larger value. The means by which the value of the lifetime field
      is determined for an individual PDU is outside the scope of this Specification, provided that it
      meets the above constraints.!;;
  REGISTERED AS { NLM.aoi maximumLifetime (102) };

```

operationalSystemType ATTRIBUTE**WITH ATTRIBUTE SYNTAX** NLM.SystemType;**MATCHES FOR EQUALITY;****BEHAVIOUR** operationalSystemType-B **BEHAVIOUR****DEFINED AS** !The system role in which this instance is operating.

A value of ES indicates that the system

shall perform no forwarding operations upon non-local PDUs.

A value of IS indicates that the system is permitted to perform

forwarding operations, but the decision to forward individual PDUs,

or not to forward them, shall be taken on the basis of the available

routing information.!!;

REGISTERED AS { NLM.aoi operationalSystemType (109) };**pDUDiscards ATTRIBUTE****DERIVED FROM** "GMI":nonWrapping64BitCounter;**BEHAVIOUR** pDUDiscards-B **BEHAVIOUR****DEFINED AS** !Counter of PDUs discarded (except for congestion).

This is the number of data or error report PDUs discarded for any of the reasons

specified in ITU-T Rec. X.233 | ISO/IEC 8473-1 Table 7 with the exception of 'PDU discarded due to congestion'.

This counter is incremented irrespective of the setting of the Error Report bit in the received PDU.!!;

*-- NOTE – This counter is therefore a count of the number of**-- communicationsAlarm notifications with a specificProblem value of**-- pDUDiscard generated (as opposed to CMIP events,**-- may be suppressed) as required by GDMO subclause 9.8.5 (SC21 N4852).***REGISTERED AS** { NLM.aoi pDUDiscards (10) };**segmentsDiscarded ATTRIBUTE****DERIVED FROM** "GMI":nonWrapping64BitCounter;**BEHAVIOUR** segmentsDiscarded-B **BEHAVIOUR****DEFINED AS** !Counter of segments discarded.

This is the number of data and error report NPDUs discarded

without being delivered to a Network Service user or forwarded. This includes

segments discarded for any reason except reassembly time expiry.!!;

REGISTERED AS { NLM.aoi segmentsDiscarded (7) };**segmentsReceived ATTRIBUTE****DERIVED FROM** "GMI":nonWrapping64BitCounter;**BEHAVIOUR** segmentsReceived-B **BEHAVIOUR****DEFINED AS** !Counter of segments received.

This is the number of data and error report NPDUs received

prior to reassembly, including those which may subsequently be discarded.!!;

REGISTERED AS { NLM.aoi segmentsReceived (6) };**segmentsSent ATTRIBUTE****DERIVED FROM** "GMI":nonWrapping64BitCounter;**BEHAVIOUR** segmentsSent-B **BEHAVIOUR****DEFINED AS** !Counter of segments Sent.

This is the number of data and error report NPDUs sent

after segmentation processing occurs.!!;

REGISTERED AS { NLM.aoi segmentsSent (118) };**supportedProtocols ATTRIBUTE****WITH ATTRIBUTE SYNTAX** NLM.SupportedProtocols;**MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;****BEHAVIOUR** supportedProtocols-B **BEHAVIOUR****DEFINED AS** !The set of Connectionless Network protocols supported

by this instance of the cLNS protocol machine, expressed except

where otherwise indicated (for example because there are more

than one protocol described in a single International Standard)

as the registered object identifiers of the relevant

International Standard. The operation of a particular protocol

over a particular linkage is determined by the linkage

operationalProtocols attribute. The value of the

supportedProtocols attribute is determined by the implementation.!!;

REGISTERED AS { NLM.aoi supportedProtocols (110) };*-- Parameters*

notificationPDUHeader PARAMETER

CONTEXT EVENT-INFO;

WITH SYNTAX NLM.OctetString;

BEHAVIOUR notificationPDUHeader-B BEHAVIOUR

DEFINED AS !The header of the data NPDU header which caused this event.!;

REGISTERED AS { NLM.proi notificationPDUHeader (1) };

5.7 The linkage managed object

-- Linkage Managed Object

--

-- There is one of these MOs associated with each separate provision
-- of the underlying service to the superior protocol machine.

-- 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.

--

-- When the linkage is operable, the operationalState shall
-- have the value 'enabled'; otherwise it shall have the value 'disabled'.
-- Transitions of operationalState shall be reported using the
-- stateChange notification. A linkage MO may be created in the
-- 'enabled' operational state.

linkage MANAGED OBJECT CLASS

DERIVED FROM "DMI":top;

CHARACTERIZED BY linkage-P PACKAGE

BEHAVIOUR commonCreationDeletion-B,
commonStateChange-B;

ATTRIBUTES

linkageId GET,

"DMI":operationalState GET,

"DMI":administrativeState GET-REPLACE,

sN-ServiceProvider

INITIAL VALUE DERIVATION RULE sN-ServiceProviderIV-B
GET,

sN-SAP GET,

operationalProtocols

INITIAL VALUE DERIVATION RULE operationalProtocolsIV-B
GET;

ATTRIBUTE GROUPS

"DMI":state

"DMI":administrativeState

"DMI":operationalState;

ACTIONS

"GMI":activate,

"GMI":deactivate;

NOTIFICATIONS

"DMI":stateChange,

"DMI":objectCreation,

"DMI":objectDeletion;

;;

CONDITIONAL PACKAGES

linkage-ISO9542IS-P

PRESENT IF !support for ISO 9542 operating as an IS!,

linkage-ISO9542ES-P

PRESENT IF !support for ISO 9542 operating as an ES!,

linkage-ISO9542Checksum-P

PRESENT IF !support for ISO 9542 PDU Header Checksum Generation function!,

linkageInitialMinimumTimer-P

PRESENT IF !support for the initial minimum timer attribute of the ITU-T Rec. X.233 |

ISO/IEC 8473-1 SDCF when operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over

an ISO/IEC 8208 or ITU-T Rec.X.25 or CO Datalink Service!,

linkageReserveTimer-P

PRESENT IF !support for the reserve timer attribute of the ITU-T Rec. X.233 | ISO/IEC 8473-1

SDCF when operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over an ISO/IEC 8208 or ITU-T

Rec. X.25 or CO Datalink Service!,

linkageIdleTimer-P

PRESENT IF !support for the idle timer attribute of the ITU-T Rec. X.233 | ISO/IEC 8473-1
 SND CF when operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over an ISO/IEC 8208 or ITU-T Rec.
 X.25 or CO Datalink Service!;

linkageISO8473-ISO8208SND CF-P

PRESENT IF !operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over ISO/IEC 8208 or
 ITU-T Rec. X.25!;

linkageCODLService-P

PRESENT IF !operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over the CO Datalink Service!;

-- The following packages are associated with ISO/IEC 10589

"ISO/IEC 10589":linkageISISBasic-P

PRESENT IF !the system is an ISO 10589 IS!;

"ISO/IEC 10589":linkageISISAuthentication-P

PRESENT IF !the authentication procedures are implemented
 on an ISO 10589 IS!;

"ISO/IEC 10589":linkageISISBroadcast-P

PRESENT IF !the linkage is a broadcast circuit
 on an ISO 10589 IS!;

"ISO/IEC 10589":linkageISISDASCallEstablishmentMetricIncrement-P

PRESENT IF !the linkage is a DA Circuit and support is implemented for
 call establishment metric increment values greater than zero on an
 ISO/IEC 10589 IS!;

"ISO/IEC 10589":linkageISISPtToPt-P

PRESENT IF !the linkage is a point to point circuit
 on an ISO 10589 IS!;

"ISO/IEC 10589":linkageISISStatic-P

PRESENT IF !the linkage is an X.25 static circuit (IN or OUT)
 on an ISO 10589 IS!;

"ISO/IEC 10589":linkageISISLevel2-P

PRESENT IF !the system is an ISO/IEC 10589 level 2 IS!;

"ISO/IEC 10589":linkageISISlevel2Broadcast-P

PRESENT IF !the linkage is a broadcast circuit on an ISO 10589 level 2 IS!;

REGISTERED AS { NLM.moi linkage (23) };

-- Packages

linkageCODLService-P PACKAGE**BEHAVIOUR linkageCODLService-P-B BEHAVIOUR**

DEFINED AS !Controls the operation of CO Datalink as an SND CF for ITU-T Rec. X.233 | ISO/IEC
 8473-1.!;;

ATTRIBUTES

callsPlaced GET;
 callsFailed GET;

ATTRIBUTE GROUPS

"GMI":counters
 callsPlaced
 callsFailed;

REGISTERED AS { NLM.poi linkageCODLService-P (9) };

linkageIdleTimer-P PACKAGE**BEHAVIOUR linkageIdleTimer-P-B BEHAVIOUR**

DEFINED AS !Controls the ability, when implemented, of an ISO/IEC 8208 or ITU-T Rec. X.25 or CO
 Datalink SND CF
 for ITU-T Rec. X.233 | ISO/IEC 8473-1 to close an established Virtual Call when it is idle.!;;

ATTRIBUTES

idleTimer REPLACE-WITH-DEFAULT
 GET-REPLACE;

REGISTERED AS { NLM.poi linkageIdleTimer-P (5) };

linkageInitialMinimumTimer-P PACKAGE**BEHAVIOUR linkageInitialMinimumTimer-P-B BEHAVIOUR**

DEFINED AS !Controls the ability, when implemented, of an ISO/IEC 8208 or ITU-T Rec. X.25 or CO
 Datalink SND CF for ITU-T Rec. X.233 | ISO/IEC 8473-1 to close an established Virtual Call
 when it is idle, but only after a minimum time after its establishment.!;;

ATTRIBUTES

initialMinimumTimer REPLACE-WITH-DEFAULT
 GET-REPLACE;

REGISTERED AS { NLM.poi linkageInitialMinimumTimer-P (7) };

linkage-ISO8473-ISO8208SND CF-P PACKAGE**BEHAVIOUR linkage-ISO8473-ISO8208SND CF-P-B BEHAVIOUR**

DEFINED AS !Controls the operation of ISO/IEC 8208 or ITU-T Rec. X.25 as an SND CF for
ITU-T Rec. X.233 | ISO/IEC 8473-1.!!;

ATTRIBUTES

callsPlaced GET,
callsFailed GET;

ATTRIBUTE GROUPS

"GMI":counters

callsPlaced

callsFailed;

REGISTERED AS { NLM.poi linkage-ISO8473-ISO8208SND CF-P (4) };

linkage-ISO9542Checksum-P PACKAGE**BEHAVIOUR linkage-ISO9542Checksum-P-B BEHAVIOUR**

DEFINED AS !When present, checksum generation is controlled
by the enableChecksum attribute.!!;

ATTRIBUTES

enableChecksum REPLACE-WITH-DEFAULT

DEFAULT VALUE NLM.false

GET-REPLACE;

REGISTERED AS { NLM.poi linkage-ISO9542Checksum-P(17) };

linkage-ISO9542ES-P PACKAGE**BEHAVIOUR****linkage-ISO9542ES-P-B BEHAVIOUR**

DEFINED AS !Controls the operation of ISO 9542 on an End System.!!;

linkage-ISO9542ImportedAlarmNotifications-B,

linkage-ISO9542ISReachabilityChange-B,

linkage-ISO9542ESReachabilityChange-B;

ATTRIBUTES

iSO9542OperationalSubsets GET-REPLACE,

holdingTimerMultiplier

REPLACE-WITH-DEFAULT

DEFAULT VALUE NLM.holdingTimerMultiplierDefault

PERMITTED VALUES NLM.HoldingTimerMultiplierPermitted

REQUIRED VALUES NLM.HoldingTimerMultiplierRequired

GET-REPLACE,

manualISSNPAAddress REPLACE-WITH-DEFAULT

GET-REPLACE ADD-REMOVE,

defaultESConfigTimer REPLACE-WITH-DEFAULT

GET-REPLACE,

activeESConfigTimer GET,

iSReachabilityChanges GET,

invalid9542PDUs GET;

ATTRIBUTE GROUPS

"GMI":counters

iSReachabilityChanges

invalid9542PDUs;

NOTIFICATIONS

"DMI":communicationsAlarm,

"GMI":communicationsInformation

reachabilityChange;

REGISTERED AS { NLM.poi linkage-ISO9542ES-P (21) };

linkage-ISO9542IS-P PACKAGE**BEHAVIOUR linkage-ISO9542IS-P-B BEHAVIOUR**

DEFINED AS !Controls the operation of ISO 9542 on an Intermediate System.!!;

linkage-ISO9542ImportedAlarmNotifications-B,

linkage-ISO9542ISReachabilityChange-B,

linkage-ISO9542ESReachabilityChange-B;

ATTRIBUTES

iSO9542OperationalSubsets GET-REPLACE,

holdingTimerMultiplier

REPLACE-WITH-DEFAULT

DEFAULT VALUE NLM.holdingTimerMultiplierDefault

PERMITTED VALUES NLM.HoldingTimerMultiplierPermitted

REQUIRED VALUES NLM.HoldingTimerMultiplierRequired

GET-REPLACE,

iSConfigurationTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.iSConfigurationTimerDefault
 GET-REPLACE,
suggestedESConfigurationTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.suggestedESConfigurationTimerDefault
 GET-REPLACE,
redirectHoldingTime
 REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.redirectHoldingTime-Default
 PERMITTED VALUES NLM.RedirectHoldingTime-Permitted
 GET-REPLACE,
eSReachabilityChanges GET,
invalid9542PDUs GET;
ATTRIBUTE GROUPS
 "GMI":counters
 eSReachabilityChanges
 invalid9542PDUs;
NOTIFICATIONS
 "DMI":communicationsAlarm,
 "GMI":communicationsInformation
 reachabilityChange;
REGISTERED AS { NLM.poi linkage-ISO9542IS-P (22) };
linkageReserveTimer-P PACKAGE
BEHAVIOUR linkageReserveTimer-P-B BEHAVIOUR
 DEFINED AS !Controls the ability, when implemented, of an ISO/IEC 8208 or ITU-T Rec. X.25 or
 CO Datalink SNDCF
 for ITU-T Rec. X.233 | ISO/IEC 8473-1 to close an established Virtual Call when it is idle, but
 retain resources for its
 re-establishment.!!;
ATTRIBUTES
 reserveTimer REPLACE-WITH-DEFAULT
 GET-REPLACE;
REGISTERED AS { NLM.poi linkageReserveTimer-P (6) };

-- Behaviours

linkage-ISO9542ISReachabilityChange-B BEHAVIOUR
DEFINED AS
 !This package imports the communicationsInformation notification
 from Rec. X.723 | ISO/IEC 10165-5.
 It is used to report the following events.
iSReachabilityChange:
 Generated when an ES or IS detects a change
 in the reachability of a neighbouring IS.
 The value NLM.iSReachabilityChange shall be reported in the
 informationType field.
 The new State, NET of the IS concerned, snpaAddress (where
 available) and the reason for the change shall be reported
 in the informationData field using the reachabilityChange
 PARAMETER.!!;

linkage-ISO9542ESReachabilityChange-B BEHAVIOUR
DEFINED AS
 !This package imports the communicationsInformation notification
 from Rec. X.723 | ISO/IEC 10165-5.
 It is used to report the following events.
eSReachabilityChange:
 Generated when an ES or IS detects a change
 in the reachability of a neighboring ES.
 The value NLM.eSReachabilityChange shall be reported in the
 informationType field.
 The new State, set of NSAPAddresses of the IS concerned,
 the snpaAddress (where available) and the reason for
 the change shall be reported in the informationData field
 using the reachabilityChange PARAMETER.!!;

linkage-ISO9542ImportedAlarmNotifications-B BEHAVIOUR

DEFINED AS !This package imports the communicationsAlarm notification from Rec. X.721 (1992) | ISO/IEC 10165-2. It is used to report the following events.

invalid9542PDU:

Generated when an ISO 9542 PDU is received which is discarded as result of the PDU Header Error Detection or Protocol Error Processing Functions specified in ISO 9542.

The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.

The value NLM.ISO9542PDUDiscard shall be reported in the specificProblems parameter.

The probableCause shall be set to NLM.communicationsProtocolError.

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 AdditionalInformation field.!

operationalProtocolIV-B BEHAVIOUR

DEFINED AS !If the linkage MO is created by management operation (using the linkage-cLNS-Management name binding), the initial value of the operationalProtocols attribute shall be specified in the CMIP create. Otherwise, the value shall be determined in an implementation specific manner.!

sN-ServiceProviderIV-B BEHAVIOUR

DEFINED AS !If the linkage MO is created by management operation (using the linkage-cONS-Management or linkage-cONS-Management name bindings), the initial value of the sN-ServiceProvider attribute shall be specified in the CMIP create. Otherwise, the value shall be determined in an implementation specific manner.!

-- Name Bindings

linkage-cLNS-Management NAME BINDING

SUBORDINATE OBJECT CLASS linkage AND SUBCLASSES;
NAMED BY

SUPERIOR OBJECT CLASS cLNS AND SUBCLASSES;
WITH ATTRIBUTE linkageld;

BEHAVIOUR sN-ServiceProviderIV-B, operationalProtocolIV-B,
linkage-cLNS-Management-B BEHAVIOUR

DEFINED AS !The name binding which applies when the linkage managed object can be created and deleted by management as a subordinate object of the cLNS managed object class.!!;

CREATE WITH-REFERENCE-OBJECT;
DELETE;

REGISTERED AS { NLM.nboi linkage-cLNS-Management (20) };

linkage-cONS-Management NAME BINDING

SUBORDINATE OBJECT CLASS linkage AND SUBCLASSES;
NAMED BY

SUPERIOR OBJECT CLASS cONS AND SUBCLASSES;
WITH ATTRIBUTE linkageld;

BEHAVIOUR sN-ServiceProviderIV-B,
linkage-cONS-Management-B BEHAVIOUR

DEFINED AS !The name binding which applies when the linkage managed object can be created and deleted by management as a subordinate object of the cONS managed object class.!!;

CREATE WITH-REFERENCE-OBJECT;
DELETE;

REGISTERED AS { NLM.nboi linkage-cONS-Management (21) };

linkage-cLNS-Automatic NAME BINDING

SUBORDINATE OBJECT CLASS linkage AND SUBCLASSES;
NAMED BY

SUPERIOR OBJECT CLASS cLNS AND SUBCLASSES;
WITH ATTRIBUTE linkageld;

BEHAVIOUR sN-ServiceProviderIV-B, operationalProtocolIV-B,
linkage-cLNS-Automatic-B BEHAVIOUR

DEFINED AS !The name binding which applies when the linkage managed object cannot be created and deleted by management as a subordinate object of the cLNS managed object class.!!;
 REGISTERED AS { NLM.nboi linkage-cLNS-Automatic (22) };

linkage-cONS-Automatic NAME BINDING

SUBORDINATE OBJECT CLASS linkage AND SUBCLASSES;
 NAMED BY

SUPERIOR OBJECT CLASS cONS AND SUBCLASSES;
 WITH ATTRIBUTE linkageld;

BEHAVIOUR sN-ServiceProviderIV-B,
 linkage-cONS-Automatic-B BEHAVIOUR

DEFINED AS !The name binding which applies when the linkage managed object cannot be created and deleted by management as a subordinate object of the cONS managed object class.!!;

REGISTERED AS { NLM.nboi linkage-cONS-Automatic (23) };

-- Attributes

activeESConfigTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR activeESConfigTimer-B BEHAVIOUR

DEFINED AS !Currently active value for the ISO 9542 ES configuration timer in seconds.!!;

REGISTERED AS { NLM.aoi activeESConfigTimer (22) };

callsFailed ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR callsFailed-B BEHAVIOUR

DEFINED AS !Counter of the number of X.25 call failures while attempting establishment by the SNDCEF.!!;

REGISTERED AS { NLM.aoi callsFailed (30) };

callsPlaced ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR callsPlaced-B BEHAVIOUR

DEFINED AS !Counter of the number of X.25 VCs successfully established by the SNDCEF.!!;

REGISTERED AS { NLM.aoi callsPlaced (29) };

defaultESConfigTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR resettingTimer-B, defaultESConfigTimer-B BEHAVIOUR

DEFINED AS !Default value for the ISO 9542 ES configuration timer in seconds. This value is used when the ES has not received, or has not chosen to accept, a suggested configuration timer value from an Intermediate System.!!;

REGISTERED AS { NLM.aoi defaultESConfigTimer (21) };

eSReachabilityChanges ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR eSReachabilityChanges-B BEHAVIOUR

DEFINED AS !Count of the number of changes in reachability of End Systems from this system.!!;

REGISTERED AS { NLM.aoi eSReachabilityChanges (27) };

holdingTimerMultiplier ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Integer;

BEHAVIOUR holdingTimerMultiplier-B BEHAVIOUR

DEFINED AS !The factor to derive holding timer from configuration timer.

This value, when multiplied by a configuration timer yields the value of the holding timer parameter issued with configuration information. The semantics of this parameter are such that it is permissible to also add a delta value to the result to compensate for possible delays and imprecision of timers. The result of the calculation is truncated, upon overflow, to the maximum value for the parameter permitted by the protocol (65535).!!;

REGISTERED AS { NLM.aoi holdingTimerMultiplier (20) };

idleTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR idleTimer-B BEHAVIOUR

DEFINED AS !Time in seconds before release of an idle call.

This timer determines the interval (in seconds) for which a call is permitted to remain idle (i.e. no data traffic in either direction) before being released by the Sndcf.!!;

REGISTERED AS { NLM.aoi idleTimer (31) };

initialMinimumTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR initialMinimumTimer-B BEHAVIOUR

DEFINED AS !Minimum time in seconds to retain call after establishment.

This timer determines the interval (in seconds) that a call shall remain connected after being established, irrespective of traffic. (NOTE – This should be set small enough so that the call is cleared before the start of the next charging interval.!!);

REGISTERED AS { NLM.aoi initialMinimumTimer (33) };

invalid9542PDUs ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR invalid9542PDUs-B BEHAVIOUR

DEFINED AS !Counter of invalid 9542 PDUs received.

This is the number of ISO 9542 PDUs received which are discarded as a result of the PDU Header Error Detection or Protocol Error Processing Functions specified in ISO 9542.!!;

-- NOTE – This counter is therefore a count of the number of

-- communicationsAlarm notifications with a specificProblem value of

-- NLM.ISO9542PDUDiscard generated.

REGISTERED AS { NLM.aoi invalid9542PDUs (101) };

iSConfigurationTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR resettingTimer-B, iSConfigurationTimer-B BEHAVIOUR

DEFINED AS !Value in seconds for the ISO 9542 IS configuration timer.

It is used to determine how often an IS reports configuration information to ESs.!!;

REGISTERED AS { NLM.aoi iSConfigurationTimer (24) };

iSO9542OperationalSubsets ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.ISO9542Subsets;

MATCHES FOR EQUALITY;

BEHAVIOUR iSO9542OperationalSubsets-B BEHAVIOUR

DEFINED AS !The set of ISO 9542 subsets operational on this linkage.!!;

REGISTERED AS { NLM.aoi iSO9542OperationalSubsets (115) };

iSReachabilityChanges ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR iSReachabilityChanges-B BEHAVIOUR

DEFINED AS !Counter of the number of changes in reachability of Intermediate Systems from this system.!!;

REGISTERED AS { NLM.aoi iSReachabilityChanges (23) };

linkageId ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.GraphicStringBase;

MATCHES FOR EQUALITY, SUBSTRINGS;

BEHAVIOUR linkageId-B BEHAVIOUR

DEFINED AS !The naming attribute of the linkage MO instance.!!;

REGISTERED AS { NLM.aoi linkageId (17) };

manualISSNPAAAddress ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.ManualISSNPAAAddress;

MATCHES FOR SET-COMPARISON, SET-INTERSECTION;

BEHAVIOUR manualISSNPAAAddress-B BEHAVIOUR

DEFINED AS !The set of SNPA Addresses to which calls associated with the Sndcf are to be established in the absence of any other information. The maximum set cardinality shall be implementation specific. An attempt to set the value of an element of this set to a type of SNPAAddress which is not supported by this linkage shall result in a failure of the SET operation.!!;

REGISTERED AS { NLM.aoi manualISSNPAAAddress (28) };

operationalProtocols ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.SupportedProtocols;

MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;

BEHAVIOUR operationalProtocols-B BEHAVIOUR

DEFINED AS !The set of network layer protocols supported
by this instance of the linkage MO, expressed
as the registered object identifiers of the relevant
International Standard!;;

REGISTERED AS { NLM.aoi operationalProtocols (111) };

redirectHoldingTime ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.RedirectHoldingTime;

MATCHES FOR EQUALITY, ORDERING;

BEHAVIOUR redirectHoldingTime-B BEHAVIOUR

DEFINED AS !The holding time (in seconds) to be specified in Redirect PDUs
generated by this system!;;

REGISTERED AS { NLM.aoi redirectHoldingTime (26) };

reserveTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR reserveTimer-B BEHAVIOUR

DEFINED AS !Time in seconds to reserve resources for call re-establishment.

This timer determines the interval (in seconds) for which an attempt
shall be made to retain those resources, as determined by the implementation,
whose retention will increase the probability of successful re-establishment of an idled VC!;;

REGISTERED AS { NLM.aoi reserveTimer (32) };

sN-SAP ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.LocalDistinguishedName;

MATCHES FOR EQUALITY;

BEHAVIOUR sN-SAP-B BEHAVIOUR

DEFINED AS !Distinguished name of the service provider SAP MO
(if present).

This is obtained via an internal interface when the linkage is
enabled. The sN-SAP may be a relationship to an SAP MO in the
Datalink Layer, or it may be a relationship to another Managed Object
within the Network Layer which is not an SAP MO.

For example, when operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over the ISO/IEC 8208 or
ITU-T Rec. X.25 SDCP,
it is a relationship to the same x25PLE-DTE MO which is pointed to by the
sN-ServiceProvider Attribute!;;

REGISTERED AS { NLM.aoi sN-SAP (18) };

sN-ServiceProvider ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.LocalDistinguishedName;

MATCHES FOR EQUALITY;

BEHAVIOUR sN-ServiceProvider-B BEHAVIOUR

DEFINED AS !Distinguished name of the SN service provider MO.

This attribute identifies the subnetwork entity to be used to support the linkage,
when enabled. The subnetwork service provider may be in the Datalink Layer,
or it may be in the Network Layer
(for example when operating ITU-T Rec. X.233 | ISO/IEC 8473-1 over the ISO/IEC 8208 or
ITU-T Rec. X.25 SDCP)!;;

REGISTERED AS { NLM.aoi sN-ServiceProvider (19) };

suggestedESConfigurationTimer ATTRIBUTE

DERIVED FROM "GMI":timer;

BEHAVIOUR resettingTimer-B, suggestedESConfigurationTimer-B BEHAVIOUR

DEFINED AS !Value to be used for the ISO 9542 suggested ES configuration timer
value (in seconds),
advertised in IS hellos generated by this network entity!;;

REGISTERED AS { NLM.aoi suggestedESConfigurationTimer (25) };

-- Parameters

reachabilityChange PARAMETER

CONTEXT EVENT-INFO;

WITH SYNTAX NLM.ReachabilityChangeSyntax;

REGISTERED AS { NLM.proi reachabilityChange (12) };

5.8 The connection-mode network service managed object

- There is no more than one of these MOs per network 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.
-
- When the protocol machine is operable, the operationalState shall
- have the value 'enabled'; otherwise it shall have the value 'disabled'.
- Transitions of operationalState shall be reported using the
- stateChange notification. A cONS MO may be created in the
- 'enabled' operational state.

cONS MANAGED OBJECT CLASS

```

DERIVED FROM "GMI":coProtocolMachine;
CHARACTERIZED BY cONS-P PACKAGE
  BEHAVIOUR commonStateChange-B,
    commonCreationDeletion-B;
ATTRIBUTES
  "DMI":administrativeState GET-REPLACE,
  "GMI":coProtocolMachineld
    INITIAL VALUE NLM.cONSId-Value
    GET,
  operationalSystemType
    INITIAL VALUE DERIVATION RULE operationalSystemTypeIV-B
    GET;
ATTRIBUTE GROUPS
  "DMI":state
    "DMI":administrativeState
    "DMI":operationalState;
ACTIONS
  "GMI":activate,
  "GMI":deactivate,
  "GMI":deactivateWhenNoUsers;
NOTIFICATIONS
  "DMI":objectCreation,
  "DMI":objectDeletion,
  "DMI":stateChange;

```

```
;;
```

```
REGISTERED AS { NLM.moi cONS (24) };
```

```
-- Name Bindings
```

cONS-networkEntity-Management NAME BINDING

```

SUBORDINATE OBJECT CLASS cONS AND SUBCLASSES;
NAMED BY
  SUPERIOR OBJECT CLASS networkEntity AND SUBCLASSES;
  WITH ATTRIBUTE "GMI":coProtocolMachineld;
BEHAVIOUR cONS-networkEntity-Management-B BEHAVIOUR
  DEFINED AS !The name binding that applies when the cONS managed object
    can be created and deleted by management.!;;
CREATE;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS { NLM.nboi cONS-networkEntity-Management (8) };

```

cONS-networkEntity-Automatic NAME BINDING

```

SUBORDINATE OBJECT CLASS cONS AND SUBCLASSES;
NAMED BY
  SUPERIOR OBJECT CLASS networkEntity AND SUBCLASSES;
  WITH ATTRIBUTE "GMI":coProtocolMachineld;
BEHAVIOUR cONS-networkEntity-Automatic-B BEHAVIOUR
  DEFINED AS !The name binding that applies when the cONS managed object
    cannot be created or deleted by management.!;;
REGISTERED AS { NLM.nboi cONS-networkEntity-Automatic (17) };

```

5.9 The network connection managed object

-- There is one instance of this MO corresponding to each network connection. It is created and deleted by the operation of the protocol machine.

--

-- In some configurations the underlyingConnectionNames attribute may contain more than one distinguished name. In this case, the type of the underlying MO (and hence the particular underlying resource) can only be determined by inspection of the MO pointed to by this distinguished name.

networkConnection MANAGED OBJECT CLASS

DERIVED FROM "GMI":singlePeerConnection;
CHARACTERIZED BY networkConnection-P PACKAGE
BEHAVIOUR

commonCreationDeletion-B,
 successfulConnectionEstablishment-B,
 deactivateConnection-B,
 networkConnection-P-B BEHAVIOUR
DEFINED AS !The "GMI":underlyingConnectionNames attribute shall contain the distinguished name(s) of the other MO(s) which represent the resources used to support this connection. In the case of the CONS operating directly over X.25, this shall be the single distinguished name of the underlying virtual call or permanent virtual circuit MO.!;;

ATTRIBUTES

localNSAPMO GET,
 remoteNSAPAddress GET;

ACTIONS

"GMI":deactivate;

NOTIFICATIONS

"DMI":objectCreation,
 "DMI":objectDeletion,
 "GMI":communicationsInformation;

;;

REGISTERED AS { NLM.moi networkConnection (13) };

-- Name Bindings

networkConnection-cONS NAME BINDING

SUBORDINATE OBJECT CLASS networkConnection AND SUBCLASSES;
NAMED BY

SUPERIOR OBJECT CLASS cONS AND SUBCLASSES;
WITH ATTRIBUTE "GMI":connectionId;

DELETE;

REGISTERED AS { NLM.nboi networkConnection-cONS (19) };

-- Attributes

localNSAPMO ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.LocalDistinguishedName;
MATCHES FOR EQUALITY;

BEHAVIOUR localNSAPMO-B BEHAVIOUR

DEFINED AS !Pointer to local nSAP MO.

This is a relationship attribute which points to the local nSAP MO which is associated with the connection.!;;

REGISTERED AS { NLM.aoi localNSAPMO (106) };

remoteNSAPAddress ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.NAddress;
MATCHES FOR EQUALITY;

BEHAVIOUR remoteNSAPAddress-B BEHAVIOUR

DEFINED AS !The remote NSAP Address associated with the connection.!;;

REGISTERED AS { NLM.aoi remoteNSAPAddress (107) };

5.10 The X.25 PLE and related managed objects

5.10.1 The X.25 PLE managed object

-- This MO class is never instantiated. It serves as a generic
 -- x25PLE MO from which both the x25PLE-DTE and x25PLE-DCE MO
 -- classes are derived.
 --
 -- Note that the values of the x25PLEId naming attribute are
 -- required to be unique across all instances of MOs derived from
 -- this, which have a common superior.

x25PLE MANAGED OBJECT CLASS

```
DERIVED FROM "DMI":top;
CHARACTERIZED BY x25PLE-P PACKAGE
  BEHAVIOUR commonStateChange-B,
    commonCreationDeletion-B,
    logicalChannelAssignmentsX25PLE-P-B BEHAVIOUR
  DEFINED AS !The logicalChannelAssignments attribute shall not be replaceable
    when the value of the operationalState attribute is 'enabled'.!;;
ATTRIBUTES
  x25PLEId GET,
  "DMI":operationalState GET,
  "DMI":administrativeState GET-REPLACE,
  protocolVersionSupported GET,
  localDTEAddress GET-REPLACE,
  x25PLEMode GET-REPLACE,
  defaultThroughputClasses REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.nullBidirectionalValues
    GET-REPLACE,
  flowControlParameterNegotiation REPLACE-WITH-DEFAULT
    GET-REPLACE,
  defaultPacketSizes REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.nullBidirectionalValues
    GET-REPLACE,
  defaultWindowSizees REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.nullBidirectionalValues
    GET-REPLACE,
  throughputClassNegotiation REPLACE-WITH-DEFAULT
    GET-REPLACE,
  sN-ServiceProvider REPLACE-WITH-DEFAULT
    GET-REPLACE,
  sN-SAP GET,
  logicalChannelAssignments GET-REPLACE;
ATTRIBUTE GROUPS
  "DMI":state
    "DMI":administrativeState
    "DMI":operationalState;
ACTIONS
  "GMI":activate,
  "GMI":deactivate;
NOTIFICATIONS
  "DMI":stateChange,
  "DMI":objectCreation,
  "DMI":objectDeletion;
```

```
;;
REGISTERED AS { NLM.moi x25PLE (25) };
```

5.10.2 The X.25 PLE initial values managed object

-- This MO class is never instantiated. It serves as a generic
 -- x25PLE IVMO from which both the x25PLEIVMO-DTE and x25PLEIVMO-DCE
 -- MO classes are derived.
 --
 -- Note that the values of the x25PLEIVMOId naming attribute are
 -- required to be unique across all instances of MOs derived from
 -- this, which have a common superior.

x25PLEIVMO MANAGED OBJECT CLASS

```

DERIVED FROM "DMI":top;
CHARACTERIZED BY x25PLEIVMO-P PACKAGE
BEHAVIOUR commonCreationDeletion-B;
ATTRIBUTES
    defaultPacketSizes REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.nullBidirectionalValues
        GET-REPLACE,
    defaultThroughputClasses REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.nullBidirectionalValues
        GET-REPLACE,
    defaultWindowSizes REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.nullBidirectionalValues
        GET-REPLACE,
    flowControlParameterNegotiation REPLACE-WITH-DEFAULT
        GET-REPLACE,
    localDTEAddress GET-REPLACE,
    logicalChannelAssignments GET-REPLACE,
    sN-ServiceProvider GET-REPLACE,
    throughputClassNegotiation REPLACE-WITH-DEFAULT
        GET-REPLACE,
    x25PLEIVMOId GET,
    x25PLEMode GET-REPLACE;
NOTIFICATIONS
    "DMI":objectCreation,
    "DMI":objectDeletion;
;;
REGISTERED AS { NLM.moi x25PLEIVMO (26) };

```

5.10.3 The X.25 PLE DTE managed object

```

-- There may be multiple instances of these MOs within a system,
-- corresponding to Multiple X.25 PLEs.
--
-- The definition of this MO
-- permits it to be created and deleted explicitly by
-- management operation or to be created and deleted automatically as
-- part of system operation. When an instance of this MO
-- is created automatically, an instance of the
-- x25PLEIVMO-DTE may be used as the source
-- of the initial values for attributes of this MO.
--
-- When the x25 PLE is operable, the operationalState shall
-- have the value 'enabled'; otherwise it shall have the value 'disabled'.
-- Transitions of operationalState shall be reported using the
-- stateChange notification.

```

x25PLE-DTE MANAGED OBJECT CLASS

```

DERIVED FROM x25PLE;
CHARACTERIZED BY x25PLE-DTE-P PACKAGE
BEHAVIOUR
    x25PLEImportedNotifications-B;
ATTRIBUTES
    callDeflectionSubscription REPLACE-WITH-DEFAULT
        GET-REPLACE,
    callRequestResponseTimer REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.callRequestResponseTimerDefault
        GET-REPLACE,
    extendedPacketSequenceNumbering REPLACE-WITH-DEFAULT
        GET-REPLACE,
    maxActiveCircuits REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.nullChoiceInteger
        GET-REPLACE,
    minimumRecallTimer REPLACE-WITH-DEFAULT
        GET-REPLACE,
    resetRequestResponseTimer REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.resetRequestResponseTimerDefault
        GET-REPLACE,

```

```

restartRequestRetransmissionCount REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.restartRequestRetransmissionCountDefault
    GET-REPLACE,
restartRequestResponseTimer REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.restartRequestResponseTimerDefault
    GET-REPLACE,
clearRequestResponseTimer REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.clearRequestResponseTimerDefault
    GET-REPLACE,
interruptResponseTimer REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.interruptResponseTimerDefault
    GET-REPLACE,
resetRequestRetransmissionCount REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.resetRequestRetransmissionCountDefault
    GET-REPLACE,
clearRequestRetransmissionCount REPLACE-WITH-DEFAULT
    DEFAULT VALUE NLM.clearRequestRetransmissionCountDefault
    GET-REPLACE,
callAttempts GET,
protocolErrorsDetectedLocally GET,
protocolErrorsAccusedOf GET,
callEstablishmentRetryCountsExceeded GET;
ATTRIBUTE GROUPS
    "GMI":counters
        callAttempts
        protocolErrorsDetectedLocally
        protocolErrorsAccusedOf
        callEstablishmentRetryCountsExceeded;
NOTIFICATIONS
    "DMI":communicationsAlarm
        notificationData;
;;
CONDITIONAL PACKAGES
dTEX25PLECounters-P
    PRESENT IF !the instance supports the dTEX25PLECounters-P
        capabilities!,
receivingWindowRotationRecoveryProcedures-P
    PRESENT IF !The optional window rotation recovery procedures
        are implemented at a receiving DTE!,
transmittingWindowRotationRecoveryProcedures-P
    PRESENT IF !The optional window rotation recovery procedures
        are implemented at a transmitting DTE!,
packetRetransmissionProcedures-P
    PRESENT IF !The optional packet retransmission procedures
        are implemented!,
onlineRegistration-P
    PRESENT IF !The optional online registration facility
        is implemented!;
REGISTERED AS { NLM.moi x25PLE-DTE (17) };

```

5.10.4 The X.25 PLE DCE managed object

```

-- There may be multiple instances of these MOs within a system,
-- corresponding to Multiple X.25 PLEs.
--
-- The definition of this MO
-- permits it to be created and deleted explicitly by
-- management operation or to be created and deleted automatically as
-- part of system operation. When an instance of this MO
-- is created automatically, an instance of the
-- x25PLEIVMO-DCE may be used as the source
-- of the initial values for attributes of this MO.
--
-- When the x25 PLE is operable, the operationalState shall
-- have the value 'enabled'; otherwise it shall have the value 'disabled'.
-- Transitions of operationalState shall be reported using the
-- stateChange notification.

```

x25PLE-DCE MANAGED OBJECT CLASS

DERIVED FROM x25PLE;

CHARACTERIZED BY x25PLE-DCE-P PACKAGE

ATTRIBUTES

callAttempts GET,
 callsConnected GET,
 cUG REPLACE-WITH-DEFAULT
 GET-REPLACE,
 fastSelectAcceptance REPLACE-WITH-DEFAULT
 GET-REPLACE,
 incomingCallsBarred REPLACE-WITH-DEFAULT
 GET-REPLACE,
 oneWayLogicalChannelOutgoing REPLACE-WITH-DEFAULT
 GET-REPLACE,
 outgoingCallsBarred REPLACE-WITH-DEFAULT
 GET-REPLACE;

ATTRIBUTE GROUPS

"GMI":counters
 callAttempts
 callsConnected;

;;

CONDITIONAL PACKAGES

dCECommonVirtualCircuitCounters-P

PRESENT IF !the instance supports the dCECommonVirtualCircuitCounters capabilities!;

dCEX25PLEFacilities-P

PRESENT IF !the instance supports the dCEX25PLEFacilities capabilities!;

dCEX25PLETimers-P

PRESENT IF !the instance supports the dCEX25PLETimers capabilities!;

REGISTERED AS { NLM.moi x25PLE-DCE (27) };

5.10.5 The X.25 PLE DTE initial values managed object

- There may be multiple instances of the x25PLEIVMO-DTE in a system.
- An x25PLEIVMO-DTE may be used to supply initial
- values for the attributes of the x25PLE-DTE MO.
- Different instances of x25PLEIVMO-DTE may contain different initial values.
-
- Its definition permits it to be created and deleted explicitly by
- management operation.

x25PLEIVMO-DTE MANAGED OBJECT CLASS

DERIVED FROM x25PLEIVMO;

CHARACTERIZED BY x25PLEIVMO-DTE-P PACKAGE

ATTRIBUTES

callDeflectionSubscription REPLACE-WITH-DEFAULT
 GET-REPLACE,
 callRequestResponseTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.callRequestResponseTimerDefault
 GET-REPLACE,
 clearRequestResponseTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.clearRequestResponseTimerDefault
 GET-REPLACE,
 clearRequestRetransmissionCount REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.clearRequestRetransmissionCountDefault
 GET-REPLACE,
 extendedPacketSequenceNumbering REPLACE-WITH-DEFAULT
 GET-REPLACE,
 interruptResponseTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.interruptResponseTimerDefault
 GET-REPLACE,
 maxActiveCircuits REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.nullChoiceInteger
 GET-REPLACE,
 minimumRecallTimer REPLACE-WITH-DEFAULT
 GET-REPLACE,
 resetRequestResponseTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.resetRequestResponseTimerDefault
 GET-REPLACE,

```

        resetRequestRetransmissionCount REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.resetRequestRetransmissionCountDefault
        GET-REPLACE,
        restartRequestResponseTimer REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.restartRequestResponseTimerDefault
        GET-REPLACE,
        restartRequestRetransmissionCount REPLACE-WITH-DEFAULT
        DEFAULT VALUE NLM.restartRequestRetransmissionCountDefault
        GET-REPLACE;
    ;;
CONDITIONAL PACKAGES
    receivingWindowRotationRecoveryProcedures-P
    PRESENT IF !The optional window rotation recovery procedures are implemented
        at a receiving DTE!,
    transmittingWindowRotationRecoveryProcedures-P
    PRESENT IF !The optional window rotation recovery procedures are implemented
        at a transmitting DTE!,
    packetRetransmissionProcedures-P
    PRESENT IF !The optional packet retransmission procedures are implemented!,
    onlineRegistration-P
    PRESENT IF !The optional online registration facility is implemented!;

REGISTERED AS { NLM.moi x25PLEIVMO-DTE (20) };

```

5.10.6 The X.25 PLE DCE initial values managed object

```

-- There may be multiple instances of the x25PLEIVMO-DCE in a system.
-- An x25PLEIVMO-DCE may be used to supply initial
-- values for the attributes of the x25PLE-DCE MO.
-- Different instances of x25PLEIVMO-DCE may contain different initial values.
--
-- Its definition permits it to be created and deleted explicitly by
-- management operation.

```

x25PLEIVMO-DCE MANAGED OBJECT CLASS

```

    DERIVED FROM x25PLEIVMO;
    REGISTERED AS { NLM.moi x25PLEIVMO-DCE (28) };

```

```

-- Packages

```

dCECommonVirtualCircuitCounters-P PACKAGE

```

    BEHAVIOUR dCECommonVirtualCircuitCounters-P-B BEHAVIOUR
    DEFINED AS !provides the set of common counters used in the normal operation of a
        DCE environment, as defined in the appropriate clauses.!,
    octetsSentReceivedCounter-B;
    ATTRIBUTES
    dataPacketsReceived GET,
    dataPacketsSent GET,
    interruptPacketsReceived GET,
    interruptPacketsSent GET,
    interruptTimerExpiries GET,
    "DMI":octetsReceivedCounter GET,
    "DMI":octetsSentCounter GET,
    providerInitiatedDisconnects GET,
    providerInitiatedResets GET,
    remotelyInitiatedRestarts GET,
    remotelyInitiatedResets GET,
    resetTimeouts GET,
    x25SegmentsReceived GET,
    x25SegmentsSent GET;
    ATTRIBUTE GROUPS
    "GMI":counters
    dataPacketsReceived
    dataPacketsSent
    interruptPacketsReceived
    interruptPacketsSent
    interruptTimerExpiries

```

"DMI":octetsReceivedCounter
 "DMI":octetsSentCounter
 providerInitiatedDisconnects
 providerInitiatedResets
 remotelyInitiatedRestarts
 remotelyInitiatedResets
 resetTimeouts
 x25SegmentsReceived
 x25SegmentsSent;

REGISTERED AS { NLM.poi dCECommonVirtualCircuitCounters-P (23) };

dCEX25PLEFacilities-P PACKAGE

BEHAVIOUR dCEX25PLEFacilities-P-B BEHAVIOUR

DEFINED AS !provides the set of Facilities which are optional, and may be implemented in a
 DCE environment, as defined in the appropriate clauses.!!;

ATTRIBUTES

bilateralCUG REPLACE-WITH-DEFAULT
 GET-REPLACE,
 bilateralCUGWithOutgoingAccess REPLACE-WITH-DEFAULT
 GET-REPLACE,
 callDeflectionSubscription REPLACE-WITH-DEFAULT
 GET-REPLACE,
 callRedirection REPLACE-WITH-DEFAULT
 GET-REPLACE,
 chargingInformation REPLACE-WITH-DEFAULT
 GET-REPLACE,
 cUGWithIncomingAccess REPLACE-WITH-DEFAULT
 GET-REPLACE,
 cUGWithOutgoingAccess REPLACE-WITH-DEFAULT
 GET-REPLACE,
 dBitModification REPLACE-WITH-DEFAULT
 GET-REPLACE,
 defaultThroughputClassesAssignment REPLACE-WITH-DEFAULT
 GET-REPLACE,
 extendedPacketSequenceNumbering REPLACE-WITH-DEFAULT
 GET-REPLACE,
 huntGroup REPLACE-WITH-DEFAULT
 GET-REPLACE,
 incomingCallBarredWithinCUG REPLACE-WITH-DEFAULT
 GET-REPLACE,
 localChargingPrevention REPLACE-WITH-DEFAULT
 GET-REPLACE,
 nonStandardDefaultPacketSizes REPLACE-WITH-DEFAULT
 GET-REPLACE,
 nonStandardDefaultWindowSizees REPLACE-WITH-DEFAULT
 GET-REPLACE,
 nUIOverride REPLACE-WITH-DEFAULT
 GET-REPLACE,
 nUISubscription REPLACE-WITH-DEFAULT
 GET-REPLACE,
 oneWayLogicalChannelIncoming REPLACE-WITH-DEFAULT
 GET-REPLACE,
 onlineFacilityRegistration REPLACE-WITH-DEFAULT
 GET-REPLACE,
 outgoingCallBarredWithinCUG REPLACE-WITH-DEFAULT
 GET-REPLACE,
 packetRetransmission REPLACE-WITH-DEFAULT
 GET-REPLACE,
 reverseChargingAcceptance REPLACE-WITH-DEFAULT
 GET-REPLACE,
 rOASubscription REPLACE-WITH-DEFAULT
 GET-REPLACE;

REGISTERED AS { NLM.poi dCEX25PLEFacilities-P (26) };

dCEX25PLETimers-P PACKAGE

BEHAVIOUR dCEX25PLETimers-P-B BEHAVIOUR

DEFINED AS !provides the set of timers used during the normal operation in a DCE
 environment, as defined in the appropriate clauses.!!;

ATTRIBUTES

clearIndication GET-REPLACE,
 -- *T13 timer.*
 incomingCall GET-REPLACE,
 -- *T11 timer.*
 resetIndication GET-REPLACE,
 -- *T12 timer.*
 restartIndication GET-REPLACE;
 -- *T10 timer.*

REGISTERED AS { NLM.poi dCEX25PLETimers-P (25) };

dTEX25PLECounters-P PACKAGE**BEHAVIOUR dTEX25PLECounters-P-B BEHAVIOUR**

DEFINED AS !Provides the set of counters which may be associated
 with the x25PLE-DTE MO!;
 octetsSentReceivedCounter-B;

ATTRIBUTES

"DMI":octetsReceivedCounter GET,
 -- *Note that the DMI definition is in terms of user data octets.*
 "DMI":octetsSentCounter GET,
 -- *Note that the DMI definition is in terms of user data octets.*
 callTimeouts GET,
 callsConnected GET,
 clearCountsExceeded GET,
 clearTimeouts GET,
 dataPacketsReceived GET,
 dataPacketsSent GET,
 -- *Note that the "DMI":PDUsSentCounter*
 -- *cannot be used here since it is defined as total number of PDUs sent,*
 -- *not just data PDUs.*
 dataRetransmissionTimerExpiries GET,
 providerInitiatedResets GET,
 providerInitiatedDisconnects GET,
 remotelyInitiatedResets GET,
 remotelyInitiatedRestarts GET,
 resetTimeouts GET,
 restartCountsExceeded GET;

ATTRIBUTE GROUPS

"GMI":counters
 "DMI":octetsSentCounter
 "DMI":octetsReceivedCounter
 callTimeouts
 callsConnected
 clearCountsExceeded
 clearTimeouts
 dataPacketsReceived
 dataPacketsSent
 dataRetransmissionTimerExpiries
 providerInitiatedDisconnects
 providerInitiatedResets
 remotelyInitiatedResets
 remotelyInitiatedRestarts
 resetTimeouts
 restartCountsExceeded;

REGISTERED AS { NLM.poi dTEX25PLECounters-P (18) };

packetRetransmissionProcedures-P PACKAGE**BEHAVIOUR packetRetransmissionProcedures-P-B BEHAVIOUR**

DEFINED AS !Controls the operation of the optional packet retransmission procedures
 as described in 13.4 of ISO/IEC 8208 or ITU-T Rec. X.25 (2nd Edition).!;

ATTRIBUTES

rejectResponseTimer REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.rejectResponseTimerDefault
 GET-REPLACE,
 rejectRetransmissionCount REPLACE-WITH-DEFAULT
 DEFAULT VALUE NLM.rejectRetransmissionCountDefault
 GET-REPLACE;

REGISTERED AS { NLM.poi packetRetransmissionProcedures-P (14) };

receivingWindowRotationRecoveryProcedures-P PACKAGE**BEHAVIOUR****receivingWindowRotationRecoveryProcedures-P-B BEHAVIOUR****DEFINED AS !Controls the operation of the optional window rotation recovery procedures at a receiving DTE as described in 11.2.2 of ISO/IEC 8208 or ITU-T Rec. X.25 (2nd Edition).!;;****ATTRIBUTES****windowStatusTransmissionTimer REPLACE-WITH-DEFAULT****DEFAULT VALUE NLM.windowStatusTransmissionTimerDefault****GET-REPLACE;****REGISTERED AS { NLM.poi receivingWindowRotationRecoveryProcedures-P (12) };****transmittingWindowRotationRecoveryProcedures-P PACKAGE****BEHAVIOUR****transmittingWindowRotationRecoveryProcedures-P-B BEHAVIOUR****DEFINED AS !Controls the operation of the optional window rotation recovery procedures at a transmitting DTE as described in 11.2.1 of ISO/IEC 8208 or ITU-T Rec. X.25 (2nd Edition).!;;****ATTRIBUTES****windowRotationTimer REPLACE-WITH-DEFAULT****DEFAULT VALUE****NLM.windowRotationTimerDefault****GET-REPLACE,****dataPacketRetransmissionCount REPLACE-WITH-DEFAULT****DEFAULT VALUE NLM.dataPacketRetransmissionCountDefault****GET-REPLACE;****REGISTERED AS { NLM.poi transmittingWindowRotationRecoveryProcedures-P (13) };****onlineRegistration-P PACKAGE****BEHAVIOUR onlineRegistration-P-B BEHAVIOUR****DEFINED AS !Controls the operation of the optional online registration facility as described in 13.1 of ISO/IEC 8208 or ITU-T Rec. X.25 (2nd Edition).!;;****ATTRIBUTES****registrationRequestResponseTimer REPLACE-WITH-DEFAULT****DEFAULT VALUE NLM.registrationRequestResponseTimerDefault****GET-REPLACE,****registrationRequestRetransmissionCount REPLACE-WITH-DEFAULT****DEFAULT VALUE NLM.registrationRequestRetransmissionCountDefault****GET-REPLACE,****registrationPermitted REPLACE-WITH-DEFAULT****DEFAULT VALUE NLM.registrationPermittedDefault****GET-REPLACE;****REGISTERED AS { NLM.poi onlineRegistration-P (11) };***-- Behaviours***x25PLEImportedNotifications-B BEHAVIOUR****DEFINED AS !The x25PLE-P package imports the communicationsAlarm notification from Rec. X.721 (1992) | ISO/IEC 10165-2.****It is used to report the following x25PLE managed object events.
providerInitiatedDisconnect:****Issued upon receipt of a clear packet with a cause code other than 'DTE originated'.****The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER.****The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.****The value NLM.providerInitiatedDisconnect shall be reported in the specificProblems parameter.****The probableCause shall be set to NLM.communicationsProtocolError.****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 additionalInformation field.**

remotelyInitiatedReset:

Issued upon occurrence of a remotely initiated reset.
 This event is issued in lieu of a 'providerInitiatedReset' when operating in a DTE-DXE environment.
 The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER
 The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.
 The value NLM.remotelyInitiatedDisconnect shall be reported in the specificProblems parameter.
 The probableCause shall be set to NLM.communicationsProtocolError.
 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 additionalInformation field.

providerInitiatedReset:

Issued upon occurrence of a provider initiated reset.
 This event is issued when operating in a DTE-DCE environment.
 The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER
 The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.
 The value NLM.providerInitiatedReset shall be reported in the specificProblems parameter.
 The probableCause shall be set to NLM.communicationsProtocolError.
 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 additionalInformation field.

remotelyInitiatedRestart:

Issued upon receipt of a remotely (including provider) initiated restart.
 The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER
 The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.
 The value NLM.remotelyInitiatedRestart shall be reported in the specificProblems parameter.
 The probableCause shall be set to NLM.communicationsProtocolError.
 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 additionalInformation field.

restartCountExceeded:

Issued on restart failure due to restart count (R20) exceeded.
 The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER
 The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.
 The value NLM.restartCountExceeded shall be reported in the specificProblems parameter.
 The probableCause shall be set to NLM.communicationsProtocolError.
 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 additionalInformation field.

protocolErrorDetectedLocally:

Issued upon receipt of a packet which causes the "A=Error" action in the ISO/IEC 8208 or ITU-T Rec. X.25 state tables to be taken. The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER. The values of cause and diagnostic codes shall be those which would have been placed in a diagnostic packet had one been generated by the DTE (i.e. as if it were a DTE). The actual generation of such a packet is not required.

The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it. The value NLM.communicationsProtocolErrorDetectedLocally shall be reported in the specificProblems parameter.

The probableCause shall be set to NLM.communicationsProtocolError. 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 additionalInformation field.

accusedOfProtocolError:

Issued upon receipt of a diagnostic packet or a clear, reset or restart packet with a cause code equal to one of the following:

- Remote Procedure Error,
- Incompatible Destination,
- Invalid Facility Request,
- Local Procedure Error.

No other x25PLE communication alarm shall be generated as a result of this particular instance of packet.

The information relating to the packet shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER

The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it. The value NLM.accusedOfProtocolError shall be reported in the specificProblems parameter.

The probableCause shall be set to NLM.communicationsProtocolError. 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 additionalInformation field.

callEstablishmentRetryCountExceeded:

Issued on retry failure during call establishment due to retry limit exceeded.

The information relating to the call shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER

The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it. The value NLM.callEstablishmentRetryCountExceeded shall be reported in the specificProblems parameter.

The probableCause shall be set to NLM.communicationsProtocolError. 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 additionalInformation field.

clearCountExceeded:

Issued on retry failure due to clear limit (R23) exceeded.
 The information relating to the call shall be reported as a parameter in the additionalInformation field of the communicationsAlarm, using the notificationData PARAMETER
 The significance sub-parameter of each item of additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event report will be less likely to reject it.
 The value NLM.clearCountExceeded shall be reported in the specificProblems parameter.
 The probableCause shall be set to NLM.communicationsProtocolError.
 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 additionalInformation field.

!;

-- Name Bindings

x25PLEIVMO-networkSubsystem NAME BINDING

SUBORDINATE OBJECT CLASS x25PLEIVMO AND SUBCLASSES;
 NAMED BY
 SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
 WITH ATTRIBUTE x25PLEIVMOId;
 CREATE WITH-REFERENCE-OBJECT;
 DELETE;
 REGISTERED AS { NLM.nboi x25PLEIVMO-networkSubsystem (10) };

x25PLE-networkSubsystem-Management NAME BINDING

SUBORDINATE OBJECT CLASS x25PLE AND SUBCLASSES;
 NAMED BY
 SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
 WITH ATTRIBUTE x25PLEId;
 BEHAVIOUR x25PLE-networkSubsystem-Management-B BEHAVIOUR
 DEFINED AS !The name binding that applies when the x25PLE Managed Object or its subclasses are created by management operation.!!;
 CREATE WITH-REFERENCE-OBJECT;
 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
 REGISTERED AS { NLM.nboi x25PLE-networkSubsystem-Management (9) };

x25PLE-networkSubsystem-Automatic NAME BINDING

SUBORDINATE OBJECT CLASS x25PLE AND SUBCLASSES;
 NAMED BY
 SUPERIOR OBJECT CLASS networkSubsystem AND SUBCLASSES;
 WITH ATTRIBUTE x25PLEId;
 BEHAVIOUR x25PLE-networkSubsystem-Automatic-B BEHAVIOUR
 DEFINED AS !The name binding that applies when the x25PLE Managed Object or its subclasses are created by automatic operation of the system.
 The creation of an instance of the x25PLE MO or its subclass using this name binding may reference an instance of the x25PLEIVMO (or of its subclass). The means by which such an instance (if any) of the x25PLEIVMO (or its subclass) is identified a local matter.
 When this occurs,
 some of the initial values of the attributes of the instance of the x25PLE MO (or its subclass) may be supplied by the values of the attributes in the specified instance of the x25PLEIVMO. However, any such value may be overridden by a value supplied by local means (for example across an internal interface). Where values are supplied by the IVMO, the initial value of an attribute of the x25PLE MO (or its subclass) shall be the value of the corresponding attribute in the x25PLEIVMO (that is, which has the same attribute template label). The naming attribute of the x25PLE MO (or its subclass) is assigned a value according to local mechanisms.!!;
 DELETE;
 REGISTERED AS { NLM.nboi x25PLE-networkSubsystem-Automatic (18) };

-- *Attributes*

bilateralCUG ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR bilateralCUG-B BEHAVIOUR

DEFINED AS !The subscription of the bilateral closed user group facility as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!!;

REGISTERED AS { NLM.aoi bilateralCUG (125) };

bilateralCUGWithOutgoingAccess ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR bilateralCUGWithOutgoingAccess-B BEHAVIOUR

DEFINED AS !The subscription of the bilateral CUG with outgoing access facility as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!!;

REGISTERED AS { NLM.aoi bilateralCUGWithOutgoingAccess (127) };

callAttempts ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR callAttempts-B BEHAVIOUR

DEFINED AS !Counter of the total number of calls attempted.!!;

REGISTERED AS { NLM.aoi callAttempts (52) };

callDeflectionSubscription ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR callDeflectionSubscription-B BEHAVIOUR

DEFINED AS !The subscription of the call deflection facility as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of "False" indicates non-subscription.!!;

REGISTERED AS { NLM.aoi callDeflectionSubscription (114) };

callEstablishmentRetryCountsExceeded ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR callEstablishmentRetryCountsExceeded-B BEHAVIOUR

DEFINED AS !Counter associated with the callEstablishmentRetryCountExceeded event which generates a communications alarm notification.!!;

REGISTERED AS { NLM.aoi callEstablishmentRetryCountsExceeded (65) };

callRedirection ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR callRedirection-B BEHAVIOUR

DEFINED AS !The subscription of the call redirection facility as described in ITU-T Recommendation X.2 Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!!;

REGISTERED AS { NLM.aoi callRedirection (129) };

callRequestResponseTimer ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Integer;

MATCHES FOR EQUALITY, ORDERING;

BEHAVIOUR callRequestResponseTimer-B BEHAVIOUR

DEFINED AS !Value for Timer T21 (Call Request Response Timer) in seconds.!!;

REGISTERED AS { NLM.aoi callRequestResponseTimer (77) };

callTimeouts ATTRIBUTE

DERIVED FROM "GMI":nonWrapping64BitCounter;

BEHAVIOUR callTimeouts-B BEHAVIOUR

DEFINED AS !Counter of the number of times timer T21 expiry is experienced by the PLE.!!;

REGISTERED AS { NLM.aoi callTimeouts (55) };

callsConnected ATTRIBUTE
 DERIVED FROM "GMI":nonWrapping64BitCounter;
 BEHAVIOUR callsConnected-B BEHAVIOUR
 DEFINED AS !Counter of the total number of calls which have reached the open state.!!;
 REGISTERED AS { NLM.aoi callsConnected (53) };

chargingInformation ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.Boolean;
 MATCHES FOR EQUALITY;
 BEHAVIOUR chargingInformation-B BEHAVIOUR
 DEFINED AS !The subscription of the charging information facility
 as described in ITU-T Recommendation X.2.
 Expressed as a boolean where a value of 'True' indicates
 subscription and a value of 'False' indicates non-subscription.!!;
 REGISTERED AS { NLM.aoi chargingInformation (132) };

clearCountsExceeded ATTRIBUTE
 DERIVED FROM "GMI":nonWrapping64BitCounter;
 BEHAVIOUR clearCountsExceeded-B BEHAVIOUR
 DEFINED AS !Counter associated with the clearCountExceeded event
 which generates a communications alarm notification.!!;
 REGISTERED AS { NLM.aoi clearCountsExceeded (66) };

clearIndication ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR clearIndication-B BEHAVIOUR
 DEFINED AS !Value for the Clear Indication, T13 timer, in seconds.!!;
 REGISTERED AS { NLM.aoi clearIndication (133) };

clearRequestResponseTimer ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR clearRequestResponseTimer-B BEHAVIOUR
 DEFINED AS !Value for Timer T23 (Clear Request Response Timer)
 in seconds.!!;
 REGISTERED AS { NLM.aoi clearRequestResponseTimer (79) };

clearRequestRetransmissionCount ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.Integer;
 MATCHES FOR EQUALITY, ORDERING;
 BEHAVIOUR clearRequestRetransmissionCount-B BEHAVIOUR
 DEFINED AS !Value for count R23 (Clear Request Retransmission Count).!!;
 REGISTERED AS { NLM.aoi clearRequestRetransmissionCount (81) };

clearTimeouts ATTRIBUTE
 DERIVED FROM "GMI":nonWrapping64BitCounter;
 BEHAVIOUR clearTimeouts-B BEHAVIOUR
 DEFINED AS !Counter of the number of times timer T23 expiry is experienced
 by the PLE.!!;
 REGISTERED AS { NLM.aoi clearTimeouts (56) };

cUG ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.Boolean;
 MATCHES FOR EQUALITY;
 BEHAVIOUR cUG-B BEHAVIOUR
 DEFINED AS !The subscription of the closed user group facility
 as described in ITU-T Recommendation X.2. Expressed as a boolean
 where a value of 'True' indicates subscription and a value
 of 'False' indicates non-subscription.!!;
 REGISTERED AS { NLM.aoi cUG (134) };

cUGWithIncomingAccess ATTRIBUTE
 WITH ATTRIBUTE SYNTAX NLM.Boolean;
 MATCHES FOR EQUALITY;
 BEHAVIOUR cUGWithIncomingAccess-B BEHAVIOUR
 DEFINED AS !The subscription of the closed user group with incoming access facility
 as described in ITU-T Recommendation X.2. Expressed as a boolean
 where a value of 'True' indicates subscription
 and a value of 'False' indicates non-subscription.!!;
 REGISTERED AS { NLM.aoi cUGWithIncomingAccess (136) };

cUGWithOutgoingAccess ATTRIBUTEWITH ATTRIBUTE SYNTAX **NLM.Boolean;****MATCHES FOR EQUALITY;****BEHAVIOUR cUGWithOutgoingAccess-B BEHAVIOUR**

DEFINED AS !The subscription of the CUG with outgoing access facility as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!;;

REGISTERED AS { NLM.aoi cUGWithOutgoingAccess (137) };**dBitModification ATTRIBUTE**WITH ATTRIBUTE SYNTAX **NLM.Boolean;****MATCHES FOR EQUALITY;****BEHAVIOUR dBitModification-B BEHAVIOUR**

DEFINED AS !The subscription of the D bit modification facility as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!;;

REGISTERED AS { NLM.aoi dBitModification (139) };**dataPacketRetransmissionCount ATTRIBUTE**WITH ATTRIBUTE SYNTAX **NLM.Integer;****MATCHES FOR EQUALITY, ORDERING;****BEHAVIOUR dataPacketRetransmissionCount-B BEHAVIOUR**

DEFINED AS !Value for count R25 (Data Packet Retransmission Count).!;;

REGISTERED AS { NLM.aoi dataPacketRetransmissionCount (85) };**dataPacketsReceived ATTRIBUTE****DERIVED FROM "GMI":nonWrapping64BitCounter;****BEHAVIOUR dataPacketsReceived-B BEHAVIOUR**

DEFINED AS !Counter of the total number of data packets received.!;;

REGISTERED AS { NLM.aoi dataPacketsReceived (51) };**dataPacketsSent ATTRIBUTE****DERIVED FROM "GMI":nonWrapping64BitCounter;****BEHAVIOUR dataPacketsSent-B BEHAVIOUR**

DEFINED AS !Counter of the total number of data packets sent.!;;

REGISTERED AS { NLM.aoi dataPacketsSent (50) };**dataRetransmissionTimerExpiries ATTRIBUTE****DERIVED FROM "GMI":nonWrapping64BitCounter;****BEHAVIOUR dataRetransmissionTimerExpiries-B BEHAVIOUR**

DEFINED AS !Counter of the number of expiries of timer T25.

Returns zero if the option is not implemented.!;;

REGISTERED AS { NLM.aoi dataRetransmissionTimerExpiries (58) };**defaultPacketSizes ATTRIBUTE**WITH ATTRIBUTE SYNTAX **NLM.BidirectionalValues;****MATCHES FOR EQUALITY;****BEHAVIOUR defaultPacketSizes-B BEHAVIOUR**

DEFINED AS !The default value of the packet sizes.

A value of NULL indicates the ISO/IEC 8208 or ITU-T Rec. X.25 default value of 128. Any other value indicates the value agreed by the nonstandard default packet sizes facility.!;;

REGISTERED AS { NLM.aoi defaultPacketSizes (103) };**defaultThroughputClasses ATTRIBUTE**WITH ATTRIBUTE SYNTAX **NLM.BidirectionalValues;****MATCHES FOR EQUALITY;****BEHAVIOUR defaultThroughputClasses-B BEHAVIOUR**

DEFINED AS !The default throughput class values.

A value of NULL indicates the normal default.

Any other value indicates the value agreed by the defaultThroughputClassesAssignment facility.!;;

REGISTERED AS { NLM.aoi defaultThroughputClasses (112) };**defaultThroughputClassesAssignment ATTRIBUTE**WITH ATTRIBUTE SYNTAX **NLM.DefaultTCA;****MATCHES FOR EQUALITY;****BEHAVIOUR defaultThroughputClassesAssignment-B BEHAVIOUR**

DEFINED AS !The subscription of the default throughput classes assignment facility as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!!;

REGISTERED AS { NLM.aoi defaultThroughputClassesAssignment (144) };

defaultWindowSizes ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.BidirectionalValues;

MATCHES FOR EQUALITY;

BEHAVIOUR defaultWindowSizes-B **BEHAVIOUR**

DEFINED AS !The default value of the window sizes.

A value of NULL indicates the ITU-T Recommendation I International Standard default value of 2. Any other value indicates the value agreed by the nonstandard default window sizes facility.!!;

REGISTERED AS { NLM.aoi defaultWindowSizes (104) };

extendedPacketSequenceNumbering ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.PacketSequencing;

MATCHES FOR EQUALITY;

BEHAVIOUR extendedPacketSequenceNumbering-B **BEHAVIOUR**

DEFINED AS !The modulo of the packet sequence number space.

Expressed as an integer. The ITU-T Recommendation I International Standard only requires support for at least one of the two values 8 and 128, but it is possible that some future revision may extend the range. A system is only required to support the setting of values which are also required by the protocol standard. A system shall return an error when an attempt is made to set the value to a value which is not supported by that system.!!;

REGISTERED AS { NLM.aoi extendedPacketSequenceNumbering (49) };

fastSelectAcceptance ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR fastSelectAcceptance-B **BEHAVIOUR**

DEFINED AS !The subscription of the fast select acceptance

as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!!;

REGISTERED AS { NLM.aoi fastSelectAcceptance (145) };

flowControlParameterNegotiation ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR flowControlParameterNegotiation-B **BEHAVIOUR**

DEFINED AS !The subscription of the flow control parameter negotiation facility as described in ITU-T Recommendation X.2.

When this has the value 'true', the use of flow control parameter negotiation (by specifying values for the window and packet size in call request and accept packets) is permitted. When it has the value 'false', no such values shall be specified in call request and accept packets, and any values specified in an IVMO or via an internal interface shall be ignored.!!;

REGISTERED AS { NLM.aoi flowControlParameterNegotiation (119) };

huntGroup ATTRIBUTE

WITH ATTRIBUTE SYNTAX NLM.Boolean;

MATCHES FOR EQUALITY;

BEHAVIOUR huntGroup-B **BEHAVIOUR**

DEFINED AS !The subscription of the hunt group facility

as described in ITU-T Recommendation X.2. Expressed as a boolean where a value of 'True' indicates subscription and a value of 'False' indicates non-subscription.!!;

REGISTERED AS { NLM.aoi huntGroup (146) };