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Information technology — Telecommunications and information exchange between systems — Elements of management information related to OSI Network Layer standards

Technologies de l'information — Télécommunications et échange d'informations entre systèmes — Éléments d'information de gestion relatifs à la structure de 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*, Sub-Committee SC 6, *Telecommunications and information exchange between systems*.

Annex A forms an integral part of this International Standard. Annexes B and C are for information only.

Introduction

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

This International Standard is positioned with respect to other related International Standards by the layers defined in the *Reference Model for Open System Interconnection* (ISO 7498). In particular, it is concerned with the definition of Network Layer management information.

Information technology — Telecommunications and information exchange between systems — Elements of management information related to OSI Network Layer standards

1 Scope

This International Standard provides the specification of management information within an Open System related to those operations of the OSI Network Layer specified by CCITT Recommendations and International Standards. Specifics on how Network layer management is accomplished is beyond the scope of this document. 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* (ISO/IEC 10165 and CCITT Recommendations X.720 - X.723),
- 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.

2 Normative references

The following CCITT Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this 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 International Standard are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The CCITT Secretariat maintains a list of the currently valid CCITT Recommendations.

2.1 Identical CCITT Recommendations | International Standards

CCITT Recommendation X.213 (1992) | ISO/IEC 8348 : 1993, *Information technology — Open Systems Interconnection — Network Service Definition.*

CCITT Recommendation X.701 (1992) | ISO/IEC 10040 : 1992, *Information technology — Open Systems Interconnection — Systems management overview.*

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.*

CCITT Recommendation X.723 (1992) | ISO/IEC 10165-5 : 1993, *Information technology — Open Systems Interconnection — Structure of management information : Generic management information.*

CCITT Recommendation X.730 (1992) | ISO/IEC 10164-1 : 1993, *Information technology — Open Systems Interconnection — Systems Management : Object management function.*

CCITT Recommendation X.731 (1992) | ISO/IEC 10164-2 : 1993, *Information technology — Open Systems Interconnection — Systems Management : State management function.*

CCITT Recommendation X.732 (1992) | ISO/IEC 10164-3 : 1993, *Information technology — Open Systems Interconnection — Systems Management : Attributes for representing relationships.*

CCITT Recommendation X.733 (1992) | ISO/IEC 10164-4 : 1992, *Information technology — Open Systems Interconnection — Systems Management : Alarm reporting function.*

CCITT Recommendation X.734 (1992) | ISO/IEC 10164-5 : 1993, *Information technology — Open Systems Interconnection — Systems Management : Event report management function.*

2.2 Paired CCITT Recommendations | International Standards equivalent in technical content

CCITT Recommendation X.25 (1988), *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.*

ISO/IEC 8208 : 1990, *Information technology — Data communications — X.25 Packet Layer Protocol for Data Terminal Equipment.*

CCITT Recommendation X.200 (1988), *Reference Model of Open Systems Interconnection for CCITT Applications.*

ISO 7498 : 1984, *Information processing systems — Open Systems Interconnection — Basic Reference Model.*

CCITT Recommendation X.208 (1988), *Specification of abstract syntax notation one (ASN.1).*

ISO/IEC 8824 : 1990, *Information technology — Open Systems Interconnection — Specification of the Abstract Syntax Notation One (ASN.1).*

CCITT Recommendation X.223 (1988), *Use of X.25 to Provide the OSI Connection-mode Network Service for CCITT Applications.*

ISO/IEC 8878 : 1991, *Information technology — Telecommunications and information exchange between systems — Use of X.25 to provide the OSI Connection-mode Network Service.*

CCITT Recommendation X.700[1], *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.*

CCITT Recommendation X.710 (1991), *Common Management Information Service Definition for CCITT Applications.*

ISO/IEC 9595 : 1991:, *Information technology — Open Systems Interconnection — Common management information service definition.*

CCITT Recommendation X.711 (1991), *Common Management Information Protocol Specification for CCITT Applications.*

ISO/IEC 9596-1 : 1991, *Information technology — Open Systems Interconnection — Common management information protocol — Part 1: Specification.*

2.3 Additional references

ISO 8473 : 1988, *Information processing systems — Data communications — Protocol for providing the Connectionless-mode network service.*

ISO 8648 : 1988, *Information processing systems — Open Systems Interconnection — Internal organization of the Network Layer.*

[1] Presently at the state of draft Recommendation

ISO/IEC 8880-1 : 1990, *Information technology — Telecommunications and information exchange between systems — Protocol combinations to provide and support the OSI Network Service — Part 1: General principles.*

ISO/IEC 8880-2 : 1990, *Information technology — Telecommunications and information exchange between systems — Protocol combinations to provide and support the OSI Network Service — Part 2: Provision and support of the connection-mode Network Service.*

ISO/IEC 8880-3 : 1990, *Information technology — Telecommunications and information exchange between systems — Protocol combinations to provide and support the OSI Network Service — Part 3: Provision and support of the connectionless-mode Network Service.*

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/TR 9577 : 1990, *Information technology — Telecommunications and information exchange between systems — Protocol identification in the Network Layer.*

ISO/IEC 10030 : 1990, *Information technology — Telecommunications and information exchange between systems — End system routeing information exchange protocol for use in conjunction with ISO 8878.*

ISO/IEC 10177 : 1993, *Information technology — Data communications — Intermediate system support of the OSI connection-mode network service using ISO/IEC 8208 in accordance with ISO/IEC 10028.*

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).*

CCITT Recommendation D.10, *General tariff principles for international public data networks.*

CCITT Recommendation *D.11, Special tariff principles for international packet-switched public data communication services by means of the virtual call facility.*

CCITT Recommendation D.12, *Measurement unit for charging by volume in the international packet-switched data communication service.*

CCITT Recommendation E.164, *The numbering plan for the ISDN era.*

CCITT Recommendation X.2 (1988), *International data transmission services and optional user facilities in public data networks and ISDNs.*

CCITT Recommendation X.121 (1988), *International numbering plan for public data networks.*

3 Definitions

3.1 Basic reference model

This International Standard makes use of the following terms defined in ISO 7498.

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 International Standard makes use of the following terms defined in 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 GDMO

This International Standard makes use of the following terms defined in ISO/IEC 10165-4.

a) Managed Object Class Definition

b) Template

c) Parameter

3.4 Management framework

This International Standard makes use of the following terms defined in ISO/IEC 7498-4.

a) Management Information

4 Symbols and 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	CCITT Rec. X.723 | ISO/IEC 10165-5

This International Standard makes use of the following symbols and abbreviations.

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 Definition

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
MO	Managed Object
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 X25 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 clauses of this International Standard.

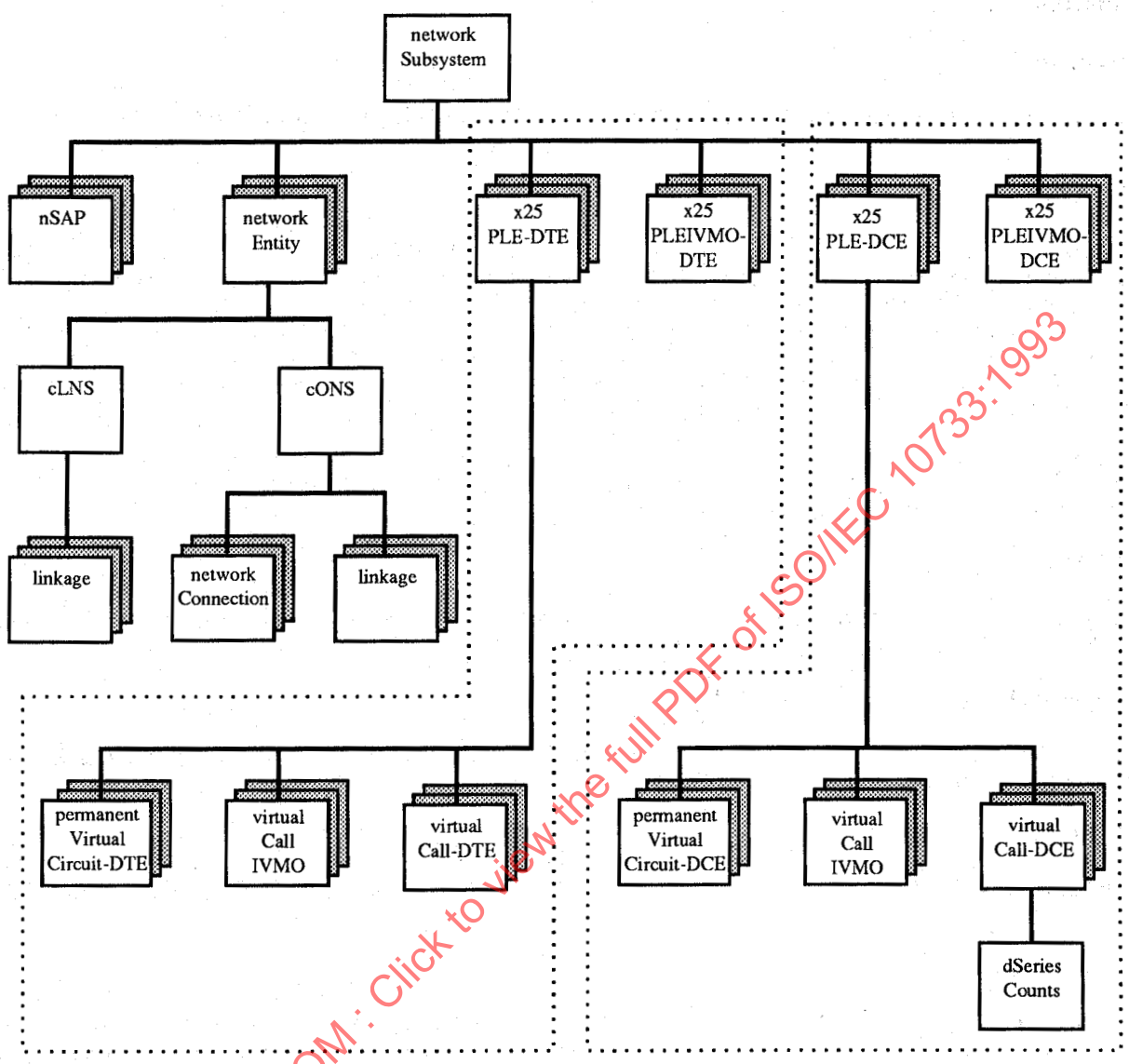

Figure 1 - Network Layer Containment Hierarchy

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 (ISO 8473, 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 (ISO/IEC 8878, ISO/IEC 9574, ISO 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 clauses 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 ISO 8473 SNDCF 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 ISO 8473 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, ISO 8473 contains an SNDCF 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 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 International Standard to ASN.1 syntax defined in Rec. X.723 | ISO/IEC 10165-5 or 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 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.
--
--
-- The networkSubsystem managed object can not 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":subsystemId
                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":subsystemId;
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":clProtocolMachineId
                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 ISO 8473 is used to implement the CLNS,
        cLNSChecksum-P
            PRESENT IF The ISO 8473 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/IEC 10589 IS,
        "ISO/IEC 10589":cLNSISISAuthentication-P
            PRESENT IF The system is an ISO/IEC 10589 IS
                and the authentication procedures are implemented,
        "ISO/IEC 10589":cLNSISISPartitionRepair-P
            PRESENT IF The system is an ISO/IEC 10589 Level 2 IS
                and the partition repair procedures are implemented,
        "ISO/IEC 10589":cLNSISISLevel2-P
            PRESENT IF The system is an ISO/IEC 10589 Level 2 IS,
        "ISO/IEC 10589":cLNSISISLevel2Authentication-P
            PRESENT IF The system is an ISO/IEC 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 ISO 8473 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 ISO 8473 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 ISO 8473 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 ISO 8473
            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 defined in 7.2.4 of ISO 8473.
            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":clProtocolMachineId;
    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":clProtocolMachineId;
    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 ISO 8473 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 ISO 8473 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 9.8.5.
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. An 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 operationalProtocolIV-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 ISO 8473
                SNDCF when operating ISO 8473 over an ISO/IEC 8208 or
                CO Datalink Service,
        linkageReserveTimer-P
            PRESENT IF support for the reserve timer attribute of the ISO 8473 SNDCF
                when operating ISO 8473 over an ISO/IEC 8208 or
                CO Datalink Service,
        linkageIdleTimer-P
            PRESENT IF support for the idle timer attribute of the ISO 8473 SNDCF
                when operating ISO 8473 over an ISO/IEC 8208 or
                CO Datalink Service,
        linkage-ISO8473-ISO8208SNDCF-P
            PRESENT IF operating ISO 8473 over ISO/IEC 8208 ,
        linkageCODLService-P
            PRESENT IF operating ISO 8473 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/IEC 10589 IS,
        "ISO/IEC 10589":linkageISISAuthentication-P
            PRESENT IF the authentication procedures are implemented
                on an ISO/IEC 10589 IS,
        "ISO/IEC 10589":linkageISISBroadcast-P
            PRESENT IF the linkage is a broadcast circuit
                on an ISO/IEC 10589 IS,
        "ISO/IEC 10589":linkageISISDACallEstablishmentMetricIncrement-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/IEC 10589 IS,
        "ISO/IEC 10589":linkageISISStatic-P
            PRESENT IF the linkage is an X.25 static circuit (IN or OUT)
                on an ISO/IEC 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/IEC 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 SNDCF for ISO 8473;;
    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 CO Datalink SNDCF
            for ISO 8473 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 CO Datalink SNDCF
            for ISO 8473 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-ISO8208SNDCF-P PACKAGE
    BEHAVIOUR linkage-ISO8473-ISO8208SNDCF-P-B BEHAVIOUR
        DEFINED AS Controls the operation of ISO/IEC 8208 as an SNDCF for ISO 8473;;
    ATTRIBUTES
        callsPlaced GET,
        callsFailed GET;
    ATTRIBUTE GROUPS
        "GMI":counters
            callsPlaced
            callsFailed;
REGISTERED AS {NLM.poi linkage-ISO8473-ISO8208SNDCF-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 CO Datalink SNDCF
            for ISO 8473 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 neighboring 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 linkageId;
    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 linkageId;
    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 linkageId;
    BEHAVIOUR sN-ServiceProviderIV-B, operationalProtocolIV-B,
        linkage-cLNS-Automatic-B BEHAVIOUR
        DEFINED AS The name binding which applies when the linkage managed object
            can not 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 linkageId;
    BEHAVIOUR sN-ServiceProviderIV-B,
        linkage-cONS-Automatic-B BEHAVIOUR
        DEFINED AS The name binding which applies when the linkage managed object
            can not 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 SNDCF;;
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 SNDCF;;
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 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.GraphicString;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR linkageId-B BEHAVIOUR
        DEFINED AS The naming attribute of the linkage MO instance;;
REGISTERED AS {NLM.aoi linkageId (17)};

manualISSNPAAddress ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.ManualISSNPAAddress;
    MATCHES FOR SET-COMPARISON, SET-INTERSECTION;
    BEHAVIOUR manualISSNPAAddress-B BEHAVIOUR
        DEFINED AS The set of SNPA Addresses to which calls associated with the SNDCF are to 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 manualISSNPAAddress (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 a SAP MO in the
            Datalink Layer, or it may be a relationship to another Managed Object
            within the Network Layer which is not a SAP MO.
            For example, when operating ISO 8473 over the ISO/IEC 8208 SNDCF,
            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 ISO 8473 over the ISO/IEC 8208 SNDCF).;;
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":coProtocolMachineId
                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":coProtocolMachineId;
    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":coProtocolMachineId;
    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 logicalChannelAssigments 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,
            defaultWindowSizes 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 X25 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
            x25PLEPImportedNotifications-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,
        nonStandardDefaultWindowSizes 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,
        rPOASubscription 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 (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 (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 (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 (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

x25PLEPImportedNotifications-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 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 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 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 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 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 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 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 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 ATTRIBUTE
    WITH 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 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 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 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 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 Recommendation | 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 Recommendation | 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 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 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 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)};


incomingCall ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR incomingCall-B BEHAVIOUR
        DEFINED AS Value for the Incoming Call, T11 timer, in seconds.;;
REGISTERED AS { NLM.aoi incomingCall (147)};


incomingCallBarredWithinCUG ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR incomingCallBarredWithinCUG-B BEHAVIOUR
        DEFINED AS The subscription of the incoming call barred within a CUG facility
            as described in 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 incomingCallBarredWithinCUG (149)};
```

```
incomingCallsBarred ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR incomingCallsBarred-B BEHAVIOUR
        DEFINED AS The subscription of the incoming calls barred facility
            as described in 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 incomingCallsBarred (148)};


interruptPacketsReceived ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR interruptPacketsReceived-B BEHAVIOUR
        DEFINED AS Counter of the number of interrupt packets received
            by the PLE or over the PVC/VC;;
REGISTERED AS {NLM.aoi interruptPacketsReceived (68)};


interruptPacketsSent ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR interruptPacketsSent-B BEHAVIOUR
        DEFINED AS Counter of the number of interrupt packets sent
            by the PLE or over the PVC/VC;;
REGISTERED AS {NLM.aoi interruptPacketsSent (67)};


interruptResponseTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR interruptResponseTimer-B BEHAVIOUR
        DEFINED AS Value for Timer T26 (Interrupt Response Timer) in seconds;;
REGISTERED AS {NLM.aoi interruptResponseTimer (82)};


interruptTimerExpiries ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR interruptTimerExpiries-B BEHAVIOUR
        DEFINED AS Counter of the number of expiries of timer T26
            experienced by the PLE or over the PVC/VC;;
REGISTERED AS {NLM.aoi interruptTimerExpiries (69)};


localChargingPrevention ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR localChargingPrevention-B BEHAVIOUR
        DEFINED AS The subscription of the local charging prevention facility
            as described in 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 localChargingPrevention (150)};
```

```
localDTEAddress ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.DTEAddress;
    MATCHES FOR EQUALITY;
    BEHAVIOUR localDTEAddress-B BEHAVIOUR
        DEFINED AS The full DTE address of this PLE
            expressed as an X.121, E.164, etc. address;;
REGISTERED AS {NLM.aoi localDTEAddress (39)};


logicalChannelAssignments ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.LogicalChannelAssignments;
    MATCHES FOR EQUALITY;
    BEHAVIOUR logicalChannelAssignments-B BEHAVIOUR
        DEFINED AS Represents the logical channel assignments of this PLE,
            expressed as a four-tuple where the values represent
                the set (with maximum permitted cardinality (LIC - 1), minimum required
                    cardinality of zero) of PVC channels (with maximum value (LIC -1),
                    and minimum value 1) assigned,
                the incoming channel range,
                the two-way channel range,
                the outgoing channel range,
            respectively.
            The presence of each of the ranges shall be optional. Absence of a particular range
            shall signify that there are no channels of that type assigned. Within each range, the
            low value shall be less than or equal to the high value, and there shall be no value in any
            set or range which is greater than or equal to a value in a subsequent range when ordered
            as above.
            This attribute is subject to the rules for logical assignments described in
            ISO/IEC 8208 3.7.;;
REGISTERED AS {NLM.aoi logicalChannelAssignments (48)};


maxActiveCircuits ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.MaxActiveCircuits;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR maxActiveCircuits-B BEHAVIOUR
        DEFINED AS The maximum number of active circuits permitted on this PLE.
            When the NULL value is specified, the maximum number of active circuits
            shall be limited only by the resources available to the entity;;
REGISTERED AS {NLM.aoi maxActiveCircuits (41)};


minimumRecallTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR minimumRecallTimer-B BEHAVIOUR
        DEFINED AS Minimum time in seconds before recall permitted.
            This timer determines the minimum interval (in seconds) which shall elapse
            following an unsuccessful first call attempt before a subsequent call attempt is
            permitted;;
REGISTERED AS {NLM.aoi minimumRecallTimer (43)};
```

```
nonStandardDefaultPacketSizes ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.NonStandardDPS;
    MATCHES FOR EQUALITY;
    BEHAVIOUR nonStandardDefaultPacketSizes-B BEHAVIOUR
        DEFINED AS The subscription of the non standard default packet sizes facility
            as described in 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 nonStandardDefaultPacketSizes (151)};


nonStandardDefaultWindowSizes ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.NonStandardDWS;
    MATCHES FOR EQUALITY;
    BEHAVIOUR nonStandardDefaultWindowSizes-B BEHAVIOUR
        DEFINED AS The subscription of the non standard default window sizes facility
            as described in 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 nonStandardDefaultWindowSizes (152)};


nUIOverride ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR nUIOverride-B BEHAVIOUR
        DEFINED AS The subscription of the NUI override facility
            as described in 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 nUIOverride (154)};


nUISubscription ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR nUISubscription-B BEHAVIOUR
        DEFINED AS The subscription of the NUI subscription facility
            as described in 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 nUISubscription (153)};


oneWayLogicalChannelIncoming ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR oneWayLogicalChannelIncoming-B BEHAVIOUR
        DEFINED AS The subscription of the one way logical channel incoming facility
            as described in 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 oneWayLogicalChannelIncoming (156)};
```

```
oneWayLogicalChannelOutgoing ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR oneWayLogicalChannelOutgoing-B BEHAVIOUR
        DEFINED AS The subscription of the one way logical channel outgoing facility
            as described in 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 oneWayLogicalChannelOutgoing (157)};


onlineFacilityRegistration ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR onlineFacilityRegistration-B BEHAVIOUR
        DEFINED AS The subscription of the on-line facility registration facility
            as described in 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 onlineFacilityRegistration (158)};


outgoingCallBarredWithinCUG ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR outgoingCallBarredWithinCUG-B BEHAVIOUR
        DEFINED AS The subscription of the outgoing call barred within a CUG facility
            as described in 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 outgoingCallBarredWithinCUG (160)};


outgoingCallsBarred ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR outgoingCallsBarred-B BEHAVIOUR
        DEFINED AS The subscription of the outgoing calls barred facility
            as described in 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 outgoingCallsBarred (159)};


packetRetransmission ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR packetRetransmission-B BEHAVIOUR
        DEFINED AS The subscription of the packet retransmissions facility
            as described in Recommendation X.2. Expressed as a boolean
            where a value of 'True' indicates subscription and a value
            of 'False' indicates non-subscription. If non-subscription,
            then the attributes for rejectTimer and rejectCount
            will have NULL values.;;
REGISTERED AS { NLM.aoi packetRetransmission (161)};
```

```
protocolErrorsAccusedOf ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR protocolErrorsAccusedOf-B BEHAVIOUR
        DEFINED AS Counter associated with the accusedOfProtocolError event
            which generates a communications alarm notification.;;
REGISTERED AS {NLM.aoi protocolErrorsAccusedOf (64)};

protocolErrorsDetectedLocally ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR protocolErrorsDetectedLocally-B BEHAVIOUR
        DEFINED AS Counter associated with the protocolErrorDetectedLocally event
            which generates a communications alarm notification;;
REGISTERED AS {NLM.aoi protocolErrorsDetectedLocally (63)};

protocolVersionSupported ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.ProtocolVersion;
    MATCHES FOR EQUALITY;
    BEHAVIOUR protocolVersionSupported-B BEHAVIOUR
        DEFINED AS The supported Recommendation | International Standard protocol version
            available on the PLE interface;;
REGISTERED AS {NLM.aoi protocolVersionSupported (38)};

providerInitiatedDisconnects ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR providerInitiatedDisconnects-B BEHAVIOUR
        DEFINED AS Counter for the providerInitiatedDisconnect events
            which generate communication alarm notifications.;;
REGISTERED AS {NLM.aoi providerInitiatedDisconnects (54)};

providerInitiatedResets ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR providerInitiatedResets-B BEHAVIOUR
        DEFINED AS Counter associated with the providerInitiatedReset event
            which generates a communication alarm notification.;;
REGISTERED AS {NLM.aoi providerInitiatedResets (59)};

rPOASubscription ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR rPOASubscription-B BEHAVIOUR
        DEFINED AS The subscription of the RPOA Subscription facility
            as described in 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 rPOASubscription (167)};

registrationPermitted ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR registrationPermitted-B BEHAVIOUR
        DEFINED AS When true, the use of online facility registration is permitted.;;
REGISTERED AS {NLM.aoi registrationPermitted (105)};
```

```
registrationRequestResponseTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR registrationRequestResponseTimer-B BEHAVIOUR
        DEFINED AS Value for Timer T28 (Registration Request Response Timer) in seconds;;
REGISTERED AS {NLM.aoi registrationRequestResponseTimer (44)};


registrationRequestRetransmissionCount ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR registrationRequestRetransmissionCount-B BEHAVIOUR
        DEFINED AS Value for count R28 (Registration Request Retransmission Count);;
REGISTERED AS {NLM.aoi registrationRequestRetransmissionCount (46)};


rejectResponseTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR rejectResponseTimer-B BEHAVIOUR
        DEFINED AS Value for Timer T27 (Reject Response Timer) in seconds;;
REGISTERED AS {NLM.aoi rejectResponseTimer (86)};


rejectRetransmissionCount ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR rejectRetransmissionCount-B BEHAVIOUR
        DEFINED AS Value for count R27 (Reject Retransmission Count);;
REGISTERED AS {NLM.aoi rejectRetransmissionCount (87)};


remotelyInitiatedResets ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR remotelyInitiatedResets-B BEHAVIOUR
        DEFINED AS Counter associated with the remotelyInitiatedReset event
            which generates a communication alarm notification.;;
REGISTERED AS {NLM.aoi remotelyInitiatedResets (57)};


remotelyInitiatedRestarts ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR remotelyInitiatedRestarts-B BEHAVIOUR
        DEFINED AS Counter of the number of remotely initiated restarts.
            This is the total number of remotely initiated (including provider initiated) restarts
            experienced by the PLE, excluding the
            restart associated with bringing up the PLE interface;;
REGISTERED AS {NLM.aoi remotelyInitiatedRestarts (61)};


resetIndication ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR resetIndication-B BEHAVIOUR
        DEFINED AS Value for the Reset Indication, T12 timer, in seconds.;;
REGISTERED AS { NLM.aoi resetIndication (163)};
```

```
resetRequestResponseTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR resetRequestResponseTimer-B BEHAVIOUR
        DEFINED AS Value for Timer T22 (Reset Request Response Timer) in seconds;;
REGISTERED AS {NLM.aoi resetRequestResponseTimer (78)};


resetRequestRetransmissionCount ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR resetRequestRetransmissionCount-B BEHAVIOUR
        DEFINED AS Value for count R22 (Reset Request Retransmission Count);;
REGISTERED AS {NLM.aoi resetRequestRetransmissionCount (80)};


resetTimeouts ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR resetTimeouts-B BEHAVIOUR
        DEFINED AS Counter of the number of timer T22 expiries experienced
            by the PLE;;
REGISTERED AS {NLM.aoi resetTimeouts (60)};


restartCountsExceeded ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    BEHAVIOUR restartCountsExceeded-B BEHAVIOUR
        DEFINED AS Counter associated with the restartCountExceeded event
            which generates a communication alarm notification.;;
REGISTERED AS {NLM.aoi restartCountsExceeded (62)};


restartIndication ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR restartIndication-B BEHAVIOUR
        DEFINED AS Value for the Restart Indication, T10 timer, in seconds.;;
REGISTERED AS { NLM.aoi restartIndication (164)};


restartRequestResponseTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR restartRequestResponseTimer-B BEHAVIOUR
        DEFINED AS Value for Timer T20 (Restart Request Response Timer) in seconds;;
REGISTERED AS {NLM.aoi restartRequestResponseTimer (42)};


restartRequestRetransmissionCount ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR restartRequestRetransmissionCount-B BEHAVIOUR
        DEFINED AS Value for count R20 (Restart Request Retransmission Count);;
REGISTERED AS {NLM.aoi restartRequestRetransmissionCount (45)};
```

```
reverseChargingAcceptance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR reverseChargingAcceptance-B BEHAVIOUR
        DEFINED AS The subscription of the reverse charging acceptance facility
            as described in 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 reverseChargingAcceptance (165)};


throughputClassNegotiation ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR throughputClassNegotiation-B BEHAVIOUR
        DEFINED AS The subscription of the throughput class negotiation facility
            as described in 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 throughputClassNegotiation (168)};


windowRotationTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR windowRotationTimer-B BEHAVIOUR
        DEFINED AS Default for Timer T25 (Window Rotation Timer) in seconds;;
REGISTERED AS {NLM.aoi windowRotationTimer (84)};


windowStatusTransmissionTimer ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Integer;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR windowStatusTransmissionTimer-B BEHAVIOUR
        DEFINED AS Value for Timer T24 (Window Status Transmission Timer) in seconds;;
REGISTERED AS {NLM.aoi windowStatusTransmissionTimer (83)};


x25PLEId ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.GraphicString;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR x25PLEId-B BEHAVIOUR
        DEFINED AS The name of this instance of x25PLE MO;;
REGISTERED AS {NLM.aoi x25PLEId (36)};


x25PLEMode ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.X25PLEMode;
    MATCHES FOR EQUALITY;
    BEHAVIOUR x25PLEMode-B BEHAVIOUR
        DEFINED AS The DCE/DTE mode in which the X.25 PLE is currently operating.
            One of the following modes of operation may be indicated.
            (0) DTE mode applying to both CCITT Rec. X.25 and ISO/IEC 8208 operation,
            (1) DCE mode applying to CCITT Rec. X.25 operation only, and
            (2) DTE acting as a DCE applying to ISO/IEC 8208 operation only.;;
REGISTERED AS {NLM.aoi x25PLEMode (120)};
```

```
x25PLEIVMOId ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.GraphicString;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR x25PLEIVMOId-B BEHAVIOUR
        DEFINED AS The name of this instance of x25PLE IVMO;;
REGISTERED AS {NLM.aoi x25PLEIVMOId (37)};


x25SegmentsReceived ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR x25SegmentsReceived-B BEHAVIOUR
        DEFINED AS Value for count of X.25 Segments Received.;;
REGISTERED AS {NLM.aoi x25SegmentsReceived (171)};


x25SegmentsSent ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR x25SegmentsSent-B BEHAVIOUR
        DEFINED AS Value for count of X.25 Segments Sent.;;
REGISTERED AS {NLM.aoi x25SegmentsSent (170)};

-- Parameters


notificationData PARAMETER
    CONTEXT EVENT-INFO;
    WITH SYNTAX NLM.NotificationDataSyntax;
    BEHAVIOUR notificationData-B BEHAVIOUR
        DEFINED AS Information relating to the call
            which resulted in the notification;;
REGISTERED AS {NLM.proi notificationData (7)};
```

5.11 The virtual circuit and related managed objects

5.11.1 The virtual circuit managed object

```
-- This MO Class is never instantiated. It serves as a generic Virtual Circuit MO from which both the
-- Virtual Circuit DTE and Virtual Circuit DCE MOs are derived.
-- Note that the values of the virtualCircuitId naming attribute are
-- required to be unique across all instances of MOs derived from this
-- which have a common superior.
--

virtualCircuit MANAGED OBJECT CLASS
    DERIVED FROM "DMI":top;
    CHARACTERIZED BY virtualCircuit-P PACKAGE
        BEHAVIOUR
            commonCreationDeletion-B,
            virtualCircuitNaming-B;
        ATTRIBUTES
            virtualCircuitId GET,
            logicalChannel GET,
            packetSizes GET,
            throughputClasses GET,
            windowSizes GET;
        NOTIFICATIONS
            "DMI":objectCreation,
            "DMI":objectDeletion;
        ;;
REGISTERED AS {NLM.moi virtualCircuit (14)};
```

5.11.2 The virtual circuit DTE managed object

```
-- This MO Class is never instantiated. It serves as a generic Virtual Circuit DTE MO from which both the
-- Virtual Call DTE and the Permanent Virtual Circuit DTE MOs are derived.
-- Note that the values of the virtualCircuitId naming attribute are
-- required to be unique across all instances of MOs derived from this
-- which have a common superior.
--

virtualCircuit-DTE MANAGED OBJECT CLASS
    DERIVED FROM virtualCircuit;
    CONDITIONAL PACKAGES
    dTEVirtualCircuitCounters-P
    PRESENT IF the instance supports the dTEVirtualCircuitCounters
        capabilities;
REGISTERED AS {NLM.moi virtualCircuit-DTE (18)};
```

5.11.3 The virtual circuit DCE managed object

```
--  This MO Class is never instantiated. It serves as a generic Virtual Circuit DCE MO from which both the
--  Virtual Call DCE and the Permanent Virtual Circuit DCE MOs are derived.
--  Note that the values of the virtualCircuitId naming attribute are
--  required to be unique across all instances of MOs derived from this
--  which have a common superior.
--

virtualCircuit-DCE MANAGED OBJECT CLASS
    DERIVED FROM virtualCircuit;
        CONDITIONAL PACKAGES
            dCECommonVirtualCircuitCounters-P
                PRESENT IF the instance supports the dCECommonVirtualCircuitCounters capabilities
    ;
REGISTERED AS {NLM.moi virtualCircuit-DCE (29)};
```

5.11.4 The permanent virtual circuit DTE managed object

```
--
-- An instance of this MO exists for each Permanent Virtual Circuit.
-- It may be both created and deleted by management.
--

permanentVirtualCircuit-DTE MANAGED OBJECT CLASS
    DERIVED FROM virtualCircuit-DTE;
    CHARACTERIZED BY permanentVirtualCircuit-DTE-P PACKAGE
        BEHAVIOUR permanentVirtualCircuit-DTE-P-B BEHAVIOUR
            DEFINED AS When the MO is created, the protocol machine
                shall be reinitialized and a reset PDU with a cause
                code of DTE originated (encoded as 00000000) and a
                diagnostic code of DTE operational (161) shall be
                transmitted. When the MO is deleted, the protocol machine
                shall be reinitialized and a reset PDU with a cause
                code of DTE originated (encoded as 00000000) and a
                diagnostic code of DTE not operational (162) shall be
                transmitted.;;
        ATTRIBUTES
            logicalChannel INITIAL VALUE DERIVATION RULE logicalChannelIV-B,
            packetSizes INITIAL VALUE DERIVATION RULE optionalCMIPIV-B,
            throughputClasses INITIAL VALUE DERIVATION RULE optionalCMIPIV-B,
            windowSizes INITIAL VALUE DERIVATION RULE optionalCMIPIV-B;
    ;;
REGISTERED AS {NLM.moi permanentVirtualCircuit-DTE(19)};
```

5.11.5 The permanent virtual circuit DCE managed object

```
--  An instance of this MO exists for each Permanent Virtual Circuit. It may be both created and
--  deleted by management.
--

permanentVirtualCircuit-DCE MANAGED OBJECT CLASS
    DERIVED FROM virtualCircuit-DCE;
    CHARACTERIZED BY permanentVirtualCircuit-DCE-P PACKAGE
        BEHAVIOUR permanentVirtualCircuit-DCE-P-B BEHAVIOUR
                DEFINED AS When the MO is created, the protocol machine shall be re-initialized
                    and a reset PDU shall be transmitted. A cause code of remote DTE Operational
                    (encoded as X000 1001) or Network Operational (encoded as X000 1111) may,
                    for example, be included. When the MO is deleted the protocol machine shall
                    be reinitialized and a reset PDU shall be transmitted. A cause code of
                    Out of Order (encoded as X000 0001) or Network Out of Order
                    (encoded as X001 1101) may, for example, be included.;,
            commonStateChange-B;


        ATTRIBUTES
            chargingDirection GET,
            logicalChannel INITIAL VALUE DERIVATION RULE logicalChannelIV-B,
            packetSizes INITIAL VALUE DERIVATION RULE optionalCMIPIV-B,
            throughputClasses INITIAL VALUE DERIVATION RULE optionalCMIPIV-B,
            windowSizes INITIAL VALUE DERIVATION RULE optionalCMIPIV-B,
            "DMI":operationalState GET,
            remoteDTEAddress GET,
            remoteLogicalChannel GET;
        ATTRIBUTE GROUPS
            "DMI":state
                "DMI":operationalState;
        NOTIFICATIONS
            "DMI":stateChange;
    ;;
REGISTERED AS {NLM.moi permanentVirtualCircuit-DCE (30)};
```

5.11.6 The virtual call initial values managed object

```
--
-- There may be multiple instances of the virtualCallIVMO in a system.
-- A virtualCallIVMO may be used to supply initial
-- values for the attributes of the virtualCall-DTE or virtualCall-DCE MO.
-- Different instances of virtualCallIVMO may contain different initial values.
--
-- Its definition permits it to be created and deleted explicitly by
-- management operation.

virtualCallIVMO MANAGED OBJECT CLASS
    DERIVED FROM "DMI":top;
    CHARACTERIZED BY virtualCallIVMO-P PACKAGE
        BEHAVIOUR commonCreationDeletion-B;
        ATTRIBUTES
            virtualCallIVMOId GET,
            fastSelect REPLACE-WITH-DEFAULT
                GET-REPLACE,
            packetSizes REPLACE-WITH-DEFAULT
                GET-REPLACE,
            reverseCharging REPLACE-WITH-DEFAULT
                GET-REPLACE,
            throughputClasses REPLACE-WITH-DEFAULT
                GET-REPLACE,
            windowSizes REPLACE-WITH-DEFAULT
                GET-REPLACE;
        NOTIFICATIONS
            "DMI":objectCreation,
            "DMI":objectDeletion;
        ;;
REGISTERED AS {NLM.moi virtualCallIVMO(15)};
```

5.11.7 The virtual call DTE managed object

```
-- An instance of this MO exists for each Virtual Call. It is not created by
-- management, but by the operation of the protocol state machine.
-- An existing instance may, however, be deactivated by management action,
-- which will cause the associated VC to be cleared.
--
-- An instance of this MO is created and exists as long as real resources
-- are consumed by the existence of the virtual call. It is an implementation
-- matter to determine the point during call establishment when real
-- resources are consumed, and conversely, when during call clearing,
-- when they are released.


virtualCall-DTE MANAGED OBJECT CLASS
    DERIVED FROM virtualCircuit-DTE;
    CHARACTERIZED BY virtualCall-DTE-P PACKAGE
        BEHAVIOUR
            deactivateConnection-B,
            successfulConnectionEstablishment-B;
        ATTRIBUTES
            callingAddressExtension GET,
            calledAddressExtension GET,
            direction GET,
            fastSelect GET,
            originallyCalledAddress GET,
            redirectReason GET,
            remoteDTEAddress GET,
            reverseCharging GET;
        ACTIONS
            "GMI":deactivate;
        NOTIFICATIONS
            "GMI":communicationsInformation;
    ;;
REGISTERED AS {NLM.moi virtualCall-DTE (16)};
```

5.11.8 The virtual call DCE managed object

```
--  An instance of this MO is created and exists as long as real resources are consumed by the existence
--  of the Virtual Call. It is an implementation matter to determine the point during a call establishment
--  when real resources are consumed, and conversely, when during call clearing, when they are released.

virtualCall-DCE MANAGED OBJECT CLASS
    DERIVED FROM virtualCircuit-DCE;
    CHARACTERIZED BY virtualCall-DCE-P PACKAGE
        BEHAVIOUR
            deactivateConnection-B,
            successfulConnectionEstablishment-B;
        ATTRIBUTES
            chargingDirection GET,
            cUGSelection GET,
            direction GET,
            fastSelect GET,
            remoteDTEAddress GET,
            transitDelaySelectionAndIndication GET;
        ACTIONS
            "GMI":deactivate;
        NOTIFICATIONS
            "GMI":communicationsInformation;
        ;;
    CONDITIONAL PACKAGES
        dCEVirtualCallFacilities-P
            PRESENT IF the instance supports the dCEVirtualCallFacilities capabilities;
REGISTERED AS {NLM.moi virtualCall-DCE (31)};
```

5.11.9 The recommendation D series counts managed object

```
-- There is one instance of this MO created by management action or
-- automatically for each instance of a virtual call where the Tariff
-- Principles applying to Data Communications Services over dedicated
-- Public Data Networks are applicable. The provisions of the tariff
-- principles are defined in Recommendations D.10, D.11 and D.12.


dSeriesCounts MANAGED OBJECT CLASS
    DERIVED FROM "DMI":top;
    CHARACTERIZED BY dSeriesCounts-P PACKAGE
        BEHAVIOUR dSeriesCounts-P-B BEHAVIOUR
            DEFINED AS provides the set of packet and segment counts required to collect
                the charges levied according to the tariff principles contained in
                Recommendations D.10, D.11 and D.12 for international packet switched
                public data communications services. The values collected are reported
                at object deletion.;;
        ATTRIBUTES
            dSeriesId GET,
            dSeriesResetRequestIndicationPackets GET,
            dSeriesSegmentsSent GET,
            dSeriesSegmentsReceived GET;
        ATTRIBUTE GROUPS
            "GMI":counters
                dSeriesResetRequestIndicationPackets
                dSeriesSegmentsSent
                dSeriesSegmentsReceived;
        NOTIFICATIONS
            "DMI":objectCreation,
            "DMI":objectDeletion;
;;
REGISTERED AS {NLM.moi dSeriesCounts (32)};

-- Packages


dTEVirtualCircuitCounters-P PACKAGE
    BEHAVIOUR
        octetsSentReceivedCounter-B;
    ATTRIBUTES
        "DMI":octetsSentCounter GET,
            -- Note that the DMI definition is in terms of user data octets.
        "DMI":octetsReceivedCounter GET,
            -- Note that the DMI definition is in terms of user data octets.
        dataPacketsReceived GET,
        dataPacketsSent GET,
            -- Note the "DMI":PDUsSentCounter
            -- cannot be used here since it is defined as total number of PDUs sent,
            -- not just data PDUs.
        dataRetransmissionTimerExpiries GET,
        interruptPacketsReceived GET,
        interruptPacketsSent GET,
        interruptTimerExpiries GET,
        providerInitiatedResets GET,
        remotelyInitiatedResets GET,
```

```
        resetTimeouts GET;
    ATTRIBUTE GROUPS
        "GMI":counters
            "DMI":octetsReceivedCounter
            "DMI":octetsSentCounter
            dataPacketsReceived
            dataPacketsSent
            dataRetransmissionTimerExpiries
            interruptPacketsReceived
            interruptPacketsSent
            interruptTimerExpiries
            providerInitiatedResets
            remotelyInitiatedResets
            resetTimeouts;
REGISTERED AS {NLM.poi dTEVirtualCircuitCounters-P (19)};

dCEVirtualCallFacilities-P PACKAGE
    BEHAVIOUR dCEVirtualCallFacilities-P-B BEHAVIOUR
        DEFINED AS provides the set of optional facilities used during the normal operation of a
            DCE, as defined in the appropriate clauses ;;
    ATTRIBUTES
        bilateralCUGSelection GET,
        callRedirectionDeflectionNotification GET,
        calledLineAddressModifiedNotification GET,
        cUGWithOutgoingAccessSelection GET,
        nUISelection GET,
        reverseCharging GET,
        rPOASelection GET;
REGISTERED AS {NLM.poi dCEVirtualCallFacilities-P (24)};

-- Behaviours

logicalChannelIV-B BEHAVIOUR
    DEFINED AS The initial value of the logical channel attribute
        shall be specified in the CMIP create;

optionalCMIPIV-B BEHAVIOUR
    DEFINED AS The initial value of this attribute may be supplied
        in the CMIP create. When not so supplied, the default
        value shall be used;

virtualCircuitNaming-B BEHAVIOUR
    DEFINED AS A system shall ensure that all instances of MOs derived
        from the virtualCircuit MO which have a common x25PLE or subclass
        as their superior MO, shall have unique values for the
        virtualCircuitId attribute. This applies to both automatically
        generated names and those supplied by means of a CMIP create.;
```

-- **Name Bindings**

```
permanentVirtualCircuit-DTE-x25PLE-DTE NAME BINDING
    SUBORDINATE OBJECT CLASS permanentVirtualCircuit-DTE AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS x25PLE-DTE AND SUBCLASSES;
        WITH ATTRIBUTE virtualCircuitId;
    BEHAVIOUR logicalChannelIV-B;
    CREATE WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE;
REGISTERED AS {NLM.nboi permanentVirtualCircuit-DTE-x25PLE-DTE (26)};


permanentVirtualCircuit-DCE-x25PLE-DCE NAME BINDING
    SUBORDINATE OBJECT CLASS permanentVirtualCircuit-DCE AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS x25PLE-DCE AND SUBCLASSES;
        WITH ATTRIBUTE virtualCircuitId;
    BEHAVIOUR logicalChannelIV-B;
    CREATE WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE;
REGISTERED AS {NLM.nboi permanentVirtualCircuit-DCE-x25PLE-DCE (29)};


virtualCall-DTE-x25PLE-DTE NAME BINDING
    SUBORDINATE OBJECT CLASS virtualCall-DTE AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS x25PLE-DTE AND SUBCLASSES;
        WITH ATTRIBUTE virtualCircuitId;
    BEHAVIOUR virtualCall-DTE-x25PLE-DTE-B BEHAVIOUR
        DEFINED AS Created only by the operation of the protocol or local
            interface. The instance name is derived automatically
            (as for CREATE WITH-AUTOMATIC-INSTANCE-NAMING).
            The creation of an instance of the virtualCall-DTE MO
            using this name binding may reference an instance of the
            virtualCallIVMO. The means by which such an instance (if any)
            of the virtualCallIVMO is identified is a local matter.
            When this occurs,
            some of the initial values of the attributes of the instance
            of the virtualCall-DTE MO may be supplied by the values of the
            attributes in the specified instance of the virtualCallIVMO. 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 virtualCall-DTE MO
            shall be the value of the corresponding attribute in the virtualCallIVMO
            (that is, which has the same attribute template label). The naming
            attribute of the virtualCall-DTE is assigned a value
            according to local mechanisms.;;
REGISTERED AS {NLM.nboi virtualCall-DTE-x25PLE-DTE (24)};
```

```
virtualCall-DCE-x25PLE-DCE-Automatic NAME BINDING
    SUBORDINATE OBJECT CLASS virtualCall-DCE AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS x25PLE-DCE AND SUBCLASSES;
        WITH ATTRIBUTE virtualCircuitId;
    BEHAVIOUR virtualCall-DCE-x25PLE-DCE-Automatic-B BEHAVIOUR
        DEFINED AS The name binding that applies when the virtualCall-DCE
            Managed Object is created automatically by the operation of the
            system. The instance name is derived automatically
            (as for CREATE WITH-AUTOMATIC-INSTANCE-NAMING).
            The creation of an instance of the virtualCall-DCE MO
            using this name binding may reference an instance of the
            virtualCallIVMO. The means by which such an instance (if any)
            of the virtualCallIVMO is identified is a local matter.
            When this occurs,
            some of the initial values of the attributes of the instance
            of the virtualCall-DCE MO may be supplied by the values of the
            attributes in the specified instance of the virtualCallIVMO. 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 virtualCall-DCE MO
            shall be the value of the corresponding attribute in the virtualCallIVMO
            (that is, which has the same attribute template label). The naming
            attribute of the virtualCall-DCE is assigned a value
            according to local mechanisms.;;
    DELETE;
REGISTERED AS {NLM.nboi virtualCall-DCE-x25PLE-DCE-Automatic (30)};

virtualCall-DCE-x25PLE-DCE-Management NAME BINDING
    SUBORDINATE OBJECT CLASS virtualCall-DCE AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS x25PLE-DCE AND SUBCLASSES;
        WITH ATTRIBUTE virtualCircuitId;
    BEHAVIOUR virtualCall-DCE-x25PLE-DCE-Management-B BEHAVIOUR
        DEFINED AS The name binding that applies when the virtualCall-DCE Managed Object
            is created by management operation.;;
    CREATE WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE;
REGISTERED AS {NLM.nboi virtualCall-DCE-x25PLE-DCE-Management (31)};

virtualCallIVMO-x25PLE NAME BINDING
    SUBORDINATE OBJECT CLASS virtualCallIVMO AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS x25PLE AND SUBCLASSES;
        WITH ATTRIBUTE virtualCallIVMOId;
    CREATE;
    DELETE;
REGISTERED AS {NLM.nboi virtualCallIVMO-x25PLE (25)};
```

```
dSeriesCounts-virtualCall-DCE-Automatic NAME BINDING
    SUBORDINATE OBJECT CLASS dSeriesCounts AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS virtualCall-DCE AND SUBCLASSES;
        WITH ATTRIBUTE dSeriesId;
    BEHAVIOUR dSeriesCounts-virtualCall-DCE-Automatic-B BEHAVIOUR
        DEFINED AS Created only by the operation of the protocol or local interface. The instance
            name is derived automatically (as for CREATE WITH-AUTOMATIC-INSTANCE-NAMING);;
        DELETE;
REGISTERED AS {NLM.nboi dSeriesCounts-virtualCall-DCE-Automatic (32)};


dSeriesCounts-virtualCall-DCE-Management NAME BINDING
    SUBORDINATE OBJECT CLASS dSeriesCounts AND SUBCLASSES;
    NAMED BY
        SUPERIOR OBJECT CLASS virtualCall-DCE AND SUBCLASSES;
        WITH ATTRIBUTE dSeriesId;
    BEHAVIOUR dSeriesCounts-virtualCall-DCE-Management-B BEHAVIOUR
        DEFINED AS The name binding that applies when the dSeriesCounts Managed Object
            is created by management operation.;;
    DELETE;
REGISTERED AS {NLM.nboi dSeriesCounts-virtualCall-DCE-Management (33)};
```

-- Attributes

```
bilateralCUGSelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR bilateralCUGSelection-B BEHAVIOUR
        DEFINED AS Indicates the use of the bilateral closed user group selection facility
            for that call.;;
REGISTERED AS { NLM.aoi bilateralCUGSelection (126)};


calledAddressExtension ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.NAddress;
        -- In the OSI context this will always be an NSAP address but in other uses
        -- it may not. In any case it may be null, for example, when used by ISO 8473.
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR calledAddressExtension-B BEHAVIOUR
        DEFINED AS The contents of the called address extension field.;;
REGISTERED AS {NLM.aoi calledAddressExtension (100)};


calledLineAddressModifiedNotification ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR calledLineAddressModifiedNotification-B BEHAVIOUR
        DEFINED AS Indicates the use of the called line address modified notification facility
            for that call.;;
REGISTERED AS { NLM.aoi calledLineAddressModifiedNotification (128)};
```

```
callingAddressExtension ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.NAddress;
        -- In the OSI context this will always be an NSAP address but in other uses
        -- it may not. In any case it may be null, for example, when used by ISO 8473.
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR callingAddressExtension-B BEHAVIOUR
        DEFINED AS The contents of the calling address extension field.;;
REGISTERED AS {NLM.aoi callingAddressExtension (99)};


callRedirectionDeflectionNotification ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR callRedirectionDeflectionNotification-B BEHAVIOUR
        DEFINED AS Indicates the use of the call redirection deflection notification facility
            for that call.;;
REGISTERED AS { NLM.aoi callRedirectionDeflectionNotification (130)};


chargingDirection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR chargingDirection-B BEHAVIOUR
        DEFINED AS Indicates the use of the charging direction facility
            for that call.;;
REGISTERED AS { NLM.aoi chargingDirection (131)};


cUGSelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR cUGSelection-B BEHAVIOUR
        DEFINED AS Indicates the use of the closed user group selection facility
            for that call.;;
REGISTERED AS { NLM.aoi cUGSelection (135)};


cUGWithOutgoingAccessSelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR cUGWithOutgoingAccessSelection-B BEHAVIOUR
        DEFINED AS Indicates the use of the Closed User Group With Outgoing Access Selection facility
            for that call. It may only take the value 'True' if the DTE
            does not have a preferential closed user group, as described
            in Recommendation X.25 and ISO/IEC 8208.;;
REGISTERED AS { NLM.aoi cUGWithOutgoingAccessSelection (138)};


dSeriesId ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.GraphicString;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR dSeriesId-B BEHAVIOUR
        DEFINED AS The name of this instance of the dSeriesCounts MO.;;
REGISTERED AS { NLM.aoi dSeriesId (140)};
```

```
dSeriesResetRequestIndicationPackets ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR dSeriesResetRequestIndicationPackets-B BEHAVIOUR
        DEFINED AS Value for count of Reset Request or Indication Packets
            with restrictions defined in Recommendation D.11 ;;
REGISTERED AS {NLM.aoi dSeriesResetRequestIndicationPackets (141)};


dSeriesSegmentsReceived ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR dSeriesSegmentsReceived-B BEHAVIOUR
        DEFINED AS Value for count of Segments Received, in 64 octets,
            as per Recommendation D.12;;
REGISTERED AS {NLM.aoi dSeriesSegmentsReceived (143)};


dSeriesSegmentsSent ATTRIBUTE
    DERIVED FROM "GMI":nonWrapping64BitCounter;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR dSeriesSegmentsSent-B BEHAVIOUR
        DEFINED AS Value for count of Segments Sent, in 64 octets,
            as per Recommendation D.12;;
REGISTERED AS {NLM.aoi dSeriesSegmentsSent (142)};


direction ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Direction;
        -- Enumerated( Incoming, Outgoing)
    MATCHES FOR EQUALITY;
        BEHAVIOUR direction-B BEHAVIOUR
            DEFINED AS The direction (incoming or outgoing) of the call;;
REGISTERED AS {NLM.aoi direction (92)};


fastSelect ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.FastSelect;
        -- Enumerated( Not Specified, Fast Select, Fast Select With Restricted Response, No Fast Select)
    MATCHES FOR EQUALITY;
    BEHAVIOUR fastSelect-B BEHAVIOUR
        DEFINED AS Type of fast select used or to be used for call.
            In the case of an IVMO, this specifies that one of 'fast select',
            'fast select with restricted response', or no fast select
            facility is to be used for the call. It includes a value
            'not specified' which indicates that no preference is expressed
            in the IVMO. In the case of a non-IVMO MO, this specifies that one
            of 'fast select' or 'no fast select' was used for the call.;;
REGISTERED AS {NLM.aoi fastSelect (76)};


logicalChannel ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.LogicalChannelId;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR logicalChannel-B BEHAVIOUR
        DEFINED AS The actual Logical Channel ID used for the call;;
REGISTERED AS {NLM.aoi logicalChannel (89)};
```

```
nUISelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR nUISelection-B BEHAVIOUR
        DEFINED AS Indicates the use of the network user identification selection facility
            for that call.;;
REGISTERED AS { NLM.aoi nUISelection (155)};

originallyCalledAddress ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.DTEAddress;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR originallyCalledAddress-B BEHAVIOUR
        DEFINED AS The originally called address;;
REGISTERED AS {NLM.aoi originallyCalledAddress (98)};

packetSizes ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.BidirectionalValues;
    MATCHES FOR EQUALITY;
    BEHAVIOUR packetSizes-B BEHAVIOUR
        DEFINED AS The packet sizes for this VC.
            In the case of an IVMO MO it is the proposed value of the
            packet sizes (incoming and outgoing) to be used when establishing
            the virtual call, expressed in octets. The value of NULL
            indicates that the default packet size for that direction
            (as indicated by the defaultPacketSizes attribute of the
            containing X.25 PLE MO), is to be used.
            In the case of a non-IVMO MO it is the actual packet sizes
            in use for this VC;;
REGISTERED AS {NLM.aoi packetSizes (121)};

redirectReason ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.RedirectReason;
    MATCHES FOR EQUALITY;
    BEHAVIOUR redirectReason-B BEHAVIOUR
        DEFINED AS The reason why the call has been redirected.
            This is the reason why the call has been offered or has been
            connected to an address different from the originally
            called address.
            That is, the value of the first octet of the Facility
            Parameter Field of the CRCDN or CLAMN facility, indicating
            the reason for call redirection or call deflection.
            The zero value indicates that the call was not redirected;;
REGISTERED AS {NLM.aoi redirectReason (97)};
```

```
remoteDTEAddress ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.DTEAddress;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR remoteDTEAddress-B BEHAVIOUR
        DEFINED AS The DTE Address of the remote DTE.
            In the case of an outgoing call, this is the remote DTE address
            from the called address of the transmitted call request packet.
            In the case of an incoming call, it is the calling address from
            the received call request packet.;;
REGISTERED AS {NLM.aoi remoteDTEAddress (93)};


remoteLogicalChannel ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.LogicalChannelId;
        -- 12 bit Channel ID
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR remoteLogicalChannel-B BEHAVIOUR
        DEFINED AS The Remote Logical Channel ID for the Permanent Virtual Circuit;;
REGISTERED AS { NLM.aoi remoteLogicalChannel (162)};


reverseCharging ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR reverseCharging-B BEHAVIOUR
        DEFINED AS Use of reverse charging.
            When 'True' for an outgoing call, it shall be (for an IVMO), or was
            (for a non-IVMO), initiated requesting reverse charging. When
            'True' for an incoming call associated with a virtualCall MO,
            it indicates that reverse charging was accepted.;;
REGISTERED AS {NLM.aoi reverseCharging (75)};


rPOASelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR rPOASelection-B BEHAVIOUR
        DEFINED AS Indicates the use of the registered private operating agency selection
            facility for that call.;;
REGISTERED AS { NLM.aoi rPOASelection (166)};


throughputClasses ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.BidirectionalValues;
    MATCHES FOR EQUALITY, ORDERING;
    BEHAVIOUR throughputClasses-B BEHAVIOUR
        DEFINED AS The throughput classes in use or to be used.
            For an IVMO, this is the throughput classes to be proposed.
            For a non-IVMO it is the actual throughput classes in use.
            For Virtual Calls this is the result of negotiation.;;
REGISTERED AS {NLM.aoi throughputClasses (96)};
```

```
transitDelaySelectionAndIndication ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.Boolean;
    MATCHES FOR EQUALITY;
    BEHAVIOUR transitDelaySelectionAndIndication-B BEHAVIOUR
        DEFINED AS Indicates the use of the transit delay selection and
            indication facility for that call.;;
REGISTERED AS { NLM.aoi transitDelaySelectionAndIndication (169)};

virtualCallIVMOId ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.GraphicString;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR virtualCallIVMOId-B BEHAVIOUR
        DEFINED AS The name of this instance of virtualCallIVMO;;
REGISTERED AS {NLM.aoi virtualCallIVMOId (117)};

virtualCircuitId ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.GraphicString;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR virtualCircuitId-B BEHAVIOUR
        DEFINED AS The name of this instance of virtualCircuit MO or subclass;;
REGISTERED AS {NLM.aoi virtualCircuitId (116)};

windowSizes ATTRIBUTE
    WITH ATTRIBUTE SYNTAX NLM.BidirectionalValues;
    MATCHES FOR EQUALITY;
    BEHAVIOUR windowSizes-B BEHAVIOUR
        DEFINED AS The actual window sizes in use for this VC;;
REGISTERED AS {NLM.aoi windowSizes (124)};
```

6 ASN.1 modules

```
NLM {joint-iso-ccitt network-layer (13) management (0) nLM(2) asn1Module (2) 0}
DEFINITIONS IMPLICIT TAGS::= BEGIN
EXPORTS ; -- everything
IMPORTS communicationsProtocolError
FROM Attribute-ASN1Module {joint-iso-ccitt ms(9) smi(3) part2(2) asn1Module(2) 1};
```

6.1 Object identifier definitions

6.1.1 Abbreviations

```
network-layer OBJECT IDENTIFIER ::= {joint-iso-ccitt network-layer (13)}
nl OBJECT IDENTIFIER ::= {network-layer management (0)}
nloi OBJECT IDENTIFIER ::= {nl nLM(2)}
sseoi OBJECT IDENTIFIER ::= {nloi standardSpecificExtensions (0)}
moi OBJECT IDENTIFIER ::= {nloi managedObjectClass (3)}
poi OBJECT IDENTIFIER ::= {nloi package (4)}
proi OBJECT IDENTIFIER ::= {nloi parameter (5)}
nboi OBJECT IDENTIFIER ::= {nloi nameBinding (6)}
aoi OBJECT IDENTIFIER ::= {nloi attribute (7)}
agoi OBJECT IDENTIFIER ::= {nloi attributeGroup (8)}
acoi OBJECT IDENTIFIER ::= {nloi action (9)}
noi OBJECT IDENTIFIER ::= {nloi notification (10)}
```

6.1.2 Others

```
-- value assignments for specificProblems

pDUDiscard OBJECT IDENTIFIER ::= {sseoi specificProblems(3) pDUDiscard(1)}
pDUDiscardReasonNotSpecified OBJECT IDENTIFIER ::= {pDUDiscard
    reasonNotSpecified(0)}
pDUDiscardProtocolProcedureError OBJECT IDENTIFIER ::= {pDUDiscard
    protocolProcedureError(1)}
pDUDiscardIncorrectChecksum OBJECT IDENTIFIER ::= {pDUDiscard
    incorrectChecksum(2)}
pDUDiscardHeaderSyntaxError OBJECT IDENTIFIER ::= {pDUDiscard
    headerSyntaxError(4)}
pDUDiscardSegmentationNeededButNotPermitted OBJECT IDENTIFIER ::= {pDUDiscard
    segmentationNeededButNotPermitted(5)}
pDUDiscardIncompletePDUReceived OBJECT IDENTIFIER ::= {pDUDiscard
    incompletePDUReceived(6)}
pDUDiscardDuplicateOption OBJECT IDENTIFIER ::= {pDUDiscard
    duplicateOption(7)}
pDUDiscardDestinationAddressUnreachable OBJECT IDENTIFIER ::= {pDUDiscard
    destinationAddressUnreachable(128)}
pDUDiscardDestinationaAddressUnknown OBJECT IDENTIFIER ::= {pDUDiscard
    destinationAddressUnknown(129)}
pDUDiscardUnspecifiedSourceRouteingError OBJECT IDENTIFIER ::= {pDUDiscard
    unspecifiedSourceRouteingError(144)}
pDUDiscardSyntaxErrorInSourceRouteingField OBJECT IDENTIFIER ::= {pDUDiscard
    syntaxErrorInSourceRouteingField(145)}
```

```
pDUDiscardUnknownAddressInSourceRouteingField OBJECT IDENTIFIER ::= {pDUDiscard
    unknownAddressInSourceRouteingField(146)}
pDUDiscardPathNotAcceptable OBJECT IDENTIFIER ::= {pDUDiscard
    pathNotAcceptable(147)}
pDUDiscardLifetimeExpiredWhileDataUnitInTransit OBJECT IDENTIFIER ::= {pDUDiscard
    lifetimeExpiredWhileDataUnitInTransit(160)}
pDUDiscardLifetimeExpiredDuringReassembly OBJECT IDENTIFIER ::= {pDUDiscard
    lifetimeExpiredDuringReassembly(161)}
pDUDiscardUnsupportedOptionNotSpecified OBJECT IDENTIFIER ::= {pDUDiscard
    unsupportedOptionNotSpecified(176)}
pDUDiscardUnsupportedProtocolVersion OBJECT IDENTIFIER ::= {pDUDiscard
    unsupportedProtocolVersion(177)}
pDUDiscardUnsupportedSecurityOption OBJECT IDENTIFIER ::= {pDUDiscard
    unsupportedSecurityOption(178)}
pDUDiscardUnsupportedSourceRouteingOption OBJECT IDENTIFIER ::= {pDUDiscard
    unsupportedSourceRouteingOption(179)}
pDUDiscardUnsupportedRecordingOfRouteOption OBJECT IDENTIFIER ::= {pDUDiscard
    unsupportedRecordingOfRouteOption(180)}
pDUDiscardReassemblyInterference OBJECT IDENTIFIER ::= {pDUDiscard
    reassemblyInterference(181)}
iSO9542PDUDiscard OBJECT IDENTIFIER ::= {sseoi specificProblems(3) iSO9542PDUDiscard(2)}


-- for communication information notification


iSReachabilityChange OBJECT IDENTIFIER ::= {
    sseoi informationtype(4) iSReachabilityChange(1)}
eSReachabilityChange OBJECT IDENTIFIER ::= {
    sseoi informationtype(4) eSReachabilityChange(2)}
successfulConnectionEstablishment OBJECT IDENTIFIER ::={
    sseoi informationtype(4) successfulConnectionEstablishment (3)}


-- for SNPAAddress type


sNPADTEAddress OBJECT IDENTIFIER ::= {
    sseoi sNPAAddrressType(5) dTEAddress(1)}
sNPAMACAddress OBJECT IDENTIFIER ::= {
    sseoi sNPAAddrressType(5) mACAddress(2)}
```

6.2 Other definitions

```
BidirectionalValues ::= SEQUENCE {
    incoming   [0] ChoiceInteger,
    outgoing   [1] ChoiceInteger}
Boolean ::= BOOLEAN
callRequestResponseTimerDefault INTEGER ::= 200
ChoiceInteger ::= CHOICE {
        [0] IMPLICIT NULL, -- The 'I don't care' value
        [1] IMPLICIT INTEGER}
clearRequestRetransmissionCountDefault INTEGER ::= 1
clearRequestResponseTimerDefault INTEGER ::= 180
cLNSId-Value GRAPHIC STRING ::= "CLNS"
cONSId-Value GRAPHIC STRING ::= "CONS"
```

```
DefaultTCA ::= SEQUENCE{
    subscription                [0] BOOLEAN,
    supportedThroughClasses     [1] SET OF INTEGER OPTIONAL,
    selectedThroughputClasses   [2] BidirectionalValues OPTIONAL}
dataPacketRetransmissionCountDefault INTEGER ::= 0
windowRotationTimerDefault INTEGER ::= 200
DTEAddress ::= SEQUENCE {
    numberingPlanId  [0] ENUMERATED {unknown (0), x121(1), e164(2)},
    addressDigits    [1] OCTET STRING}
NUMERICSTRING(FROM("0"|"1"|"2"|"3"|"4"|"5"|"6"|"7"|"8"|"9"))(SIZE(0..15))
    -- Up to 15 Digits 0..9
Direction ::= ENUMERATED {
        incoming(0),
        outgoing(1)}
DiscardReason ::= INTEGER(0..255)
EndToEndDelay ::= INTEGER(0..65535)
    -- Note that according to ISO/IEC 8208 a value of 65535 indicates that the delay is unknown
    -- or exceeds 65534 milliseconds.
false BOOLEAN ::= FALSE
False ::= BOOLEAN (FALSE)
FastSelect ::= ENUMERATED{
        notSpecified(0),
        fastSelect(1),
        fastSelectWithRestrictedResponse(2),
        noFastSelect(3)}
GraphicString ::= GRAPHICSTRING
holdingTimerMultiplierDefault INTEGER ::= 3
HoldingTimerMultiplierPermitted ::= INTEGER(2..63)
HoldingTimerMultiplierRequired ::= INTEGER(3)
Integer ::= INTEGER
interruptResponseTimerDefault INTEGER ::= 180
iSConfigurationTimerDefault INTEGER ::= 10
ISO9542Subsets ::= BITSTRING {configuration(0), redirection(1)}
Lifetime ::= INTEGER(1..255)
LocalDistinguishedName ::= DMI.ObjectInstance
LocalDistinguishedNames ::= DMI.GroupObjects
LogicalChannelAssignments ::= SEQUENCE {
    pVC          [0] SET OF LogicalChannelId,
    incoming     [1] LogicalChannelRange OPTIONAL,
    twoWay       [2] LogicalChannelRange OPTIONAL,
    outgoing     [3] LogicalChannelRange OPTIONAL}
LogicalChannelId ::= INTEGER (1..4095)
LogicalChannelRange ::= SEQUENCE {
    low    [1] LogicalChannelId,
    high   [2] LogicalChannelId}
ManualISSNPAAddress ::= SET OF SNPAAddress
MaxActiveCircuits ::= ChoiceInteger
NotificationDataSyntax ::= SEQUENCE {
    channel          [1] LogicalChannelId OPTIONAL,
    packetHeader     [2] OCTET STRING,
    diagnosticCode   [3] OCTET
    causeCode        [4] OCTET}
NAddress ::= OCTETSTRING(SIZE(0..20))
    --up to 20 octets
NAddresses ::= SET OF NAddress
networkSubsystemId-Value GRAPHIC STRING ::= "NetworkSubsystem"
```

```
NonStandardDPS ::= SEQUENCE{
    subscription            [0] BOOLEAN,
    supportedPacketSizes    [1] SET OF INTEGER OPTIONAL,
    selectedPacketSizes     [2] BidirectionalValues OPTIONAL}
NonStandardDWS ::= SEQUENCE{
    subscription            [0] BOOLEAN,
    supportedWindowSizes    [1] SET OF INTEGER OPTIONAL,
    selectedWindowSizes     [2] BidirectionalValues OPTIONAL}
NUI ::= OctetString(SIZE(0..255))
nullBidirectionalValues BidirectionalValues ::= {NULL, NULL}
nullChoiceInteger ChoiceInteger ::= NULL
OctetString ::= OCTETSTRING
PacketSequencing ::= INTEGER
PDUFormatErrorSyntax ::= PDUHeader
PDUHeader ::= OCTETSTRING(SIZE(1..255))
PDUOtherErrorSyntax ::= SEQUENCE{
    errorCode  [1] INTEGER(0..255),
    header     [2] PDUHeader}
ProtocolVersion ::= ENUMERATED {
    iSO8208V1 (0),
    iSO8208V2 (1),
    x2584 (2),
    x2588 (3)}
ReachabilityChangeSyntax ::= SEQUENCE{
    newState        [1] ENUMERATED { down(0), up(1)},
    nAddresses      [2] SET OF NAddress,
    sNPAAddress     [3] SNPAAddress OPTIONAL,
    reason          [4] ENUMERATED
                        {holdingTimerExpired(0),
                        circuitDisabled(1)} OPTIONAL} -- Down only
RedirectHoldingTime ::= INTEGER(1..65535)
redirectHoldingTime-Default INTEGER ::= 600
RedirectHoldingTime-Permitted ::= INTEGER(1..65535)
RedirectReason ::= INTEGER(0..127)
registrationRequestRetransmissionCountDefault INTEGER ::= 1
registrationRequestResponseTimerDefault INTEGER ::= 300
registrationPermittedDefault BOOLEAN ::= FALSE
rejectRetransmissionCountDefault INTEGER ::= 0
rejectResponseTimerDefault INTEGER ::= 60
resetRequestRetransmissionCountDefault INTEGER ::= 1
resetRequestResponseTimerDefault INTEGER ::= 180
restartRequestRetransmissionCountDefault INTEGER ::= 1
restartRequestResponseTimerDefault INTEGER ::= 180
RPOASequence ::= SEQUENCE OF NUMERICSTRING(SIZE(0..4))
    -- each numeric string limited to 4 decimal digits
    -- an empty sequence is permitted
SDUSize ::= INTEGER (0..65535)
SNPAAddress ::= SEQUENCE{
    type        [1] OBJECT IDENTIFIER,
    address     [2] OCTET STRING}
suggestedESConfigurationTimerDefault INTEGER ::= 600
SupportedProtocol ::= SEQUENCE{
    protocol            [1] OBJECT IDENTIFIER,
```

```
    versions            [2] SET OF ProtocolVersion;
    defectsRepaired     [3] SET OF OBJECT IDENFIFIER OPTIONAL}
SupportedProtocols ::= SET OF SupportedProtocol
SystemType ::= ENUMERATED {eS(1), iS(2)}
SystemTypes ::= SET OF SystemType
windowStatusTransmissionTimerDefault INTEGER ::= 60
X25PLEMode ::= ENUMERATED{
            dTE(0),
            dCE(1),
            dTEasDCE(2)}
END
```

7 Conformance

7.1 Conformance requirements to ISO/IEC 10733

An implementation for which conformance to this International Standard as a managed implementation is claimed shall:

a) support the networkSubsystem MO,

b) for each supported MO, support at least one name binding defined in this International Standard, for which the MO is the subordinate.

7.2 Protocol specific conformance requirements

An implementation claiming conformance to the management operation of CLNS as a managed implementation shall:

a) conform to ISO/IEC 10733 as defined in 7.1,

b) support the networkEntity MO, the CLNS MO, the NSAP MO and the linkage MO.

An implementation claiming conformance to the management operation of CONS as a managed implementation shall:

a) conform to ISO/IEC 10733 as defined in 7.1,

b) support the networkEntity MO, the CONS MO, the NSAP MO, the Connection MO and the linkage MO.

An implementation claiming conformance to the management operation of X.25 DTE as a managed implementation shall:

a) conform to ISO/IEC 10733 as defined in 7.1,

b) support the x25PLE-DTE MO and at least one class derived from virtualCircuit-DTE.

An implementation claiming conformance to the management operation of X.25-DCE as a managed implementation shall:

a) conform to ISO/IEC 10733 as defined in 7.1,

b) support the x25PLE-DCE MO and at least one class derived from virtualCircuit-DCE.

NOTE - Behaviour clauses defined in this standard may not always be testable. Care should be exercised when defining behaviour test suites in order not to impose additional constraints to those defined in this standard for implementations.

Annex A
Allocation of Object Identifiers

(normative)

NOTE - The following Object Identifiers have been allocated by the body of this International Standard. Object Identifiers which had been allocated when this International Standard was at the Draft International Standard stage have not been re-allocated. If any modification, other than a change to the behaviour clause, has been made to any template which had been allocated an object identifier, the new template has been allocated a new Object Identifier and the old Object Identifier (identified thus: *obsolete (1)*) should not be re-used.

joint-iso-ccitt
  ms (9)
    smi (3)
      part2 (2)
        asn1Module (2)
          (1)
  network-layer (13)
    management (0)
      nLM (2)
        standardSpecificExtensions (0)
          specificProblems (3)
            pDUDiscard (1)
              reasonNotSpecified (0)
              protocolProcedureError (1)
              incorrectChecksum (2)
              headerSyntaxError (4)
              segmentationNeededButNotPermitted (5)
              incompletePDUReceived (6)
              duplicateOption (7)
              destinationAddressUnreachable (128)
              destinationAddressUnknown (129)
              unspecifiedSourceRouteingError (144)
              syntaxErrorInSourceRouteingField (145)
              unknownAddressInSourceRouteingField (146)
              pathNotAcceptable (147)
              lifetimeExpiredWhileDataUnitInTransit (160)
              lifetimeExpiredDuringReassembly (161)
              unsupportedOptionNotSpecified (176)
              unsupportedProtocolVersion (177)
              unsupportedSecurityOption (178)
              unsupportedSourceRouteingOption (179)
              unsupportedRecordingOfRouteOption (180)

reassemblyInterference (181)
iSO9542PDUDiscard (2)
informationtype (4)
iSReachabilityChange (1)
eSReachabilityChange (2)
successfulConnectionEstablishment (3)
sNPAAddrressType (5)
dTEAddress (1)
mACAddress (2)
asn1Module (2)
(0)
managedObjectClass (3)
networkSubsystem (1)
obsolete (2)
obsolete (3)
nSAP (4)
obsolete (5)
obsolete (6)
obsolete (7)
obsolete (8)
obsolete (9)
obsolete (10)
obsolete (11)
obsolete (12)
networkConnection (13)
virtualCircuit (14)
virtualCallIVMO (15)
virtualCall-DTE (16)
x25PLE-DTE (17)
virtualCircuit-DTE (18)
permanentVirtualCircuit-DTE (19)
x25PLEIVMO-DTE (20)
cLNS (21)
networkEntity (22)
linkage (23)
cONS (24)
x25PLE (25)
x25PLEIVMO (26)
x25PLE-DCE (27)
x25PLEIVMO-DCE (28)
virtualCircuit-DCE (29)
permanentVirtualCircuit-DCE (30)
virtualCall-DCE (31)
dSeriesCounts (32)
package (4)
cLNSChecksum-P (1)
obsolete (2)
obsolete (3)
linkage-ISO8473-ISO8208SNDCF-P (4)
linkageIdleTimer-P (5)
linkageReserveTimer-P (6)
linkageInitialMinimumTimer-P (7)
obsolete (8)
linkageCODLService-P (9)
obsolete (10)
onlineRegistration-P (11)

receivingWindowRotationRecoveryProcedures-P (12)
transmittingWindowRotationRecoveryProcedures-P (13)
packetRetransmissionProcedures-P (14)
obsolete ***(15)***
obsolete ***(16)***
linkage-ISO9542Checksum-P (17)
dTEX25PLECounters-P (18)
dTEVirtualCircuitCounters-P (19)
cLNS8473-P (20)
linkage-ISO9542ES-P (21)
linkage-ISO9542IS-P (22)
dCECommonVirtualCircuitCounters-P (23)
dCEVirtualCallFacilities-P (24)
dCEX25PLETimers-P (25)
dCEX25PLEFacilities-P (26)
parameter (5)
notificationPDUHeader (1)
obsolete ***(2)***
obsolete ***(3)***
obsolete ***(4)***
obsolete ***(5)***
obsolete ***(6)***
notificationData (7)
obsolete ***(8)***
obsolete ***(9)***
obsolete ***(10)***
obsolete ***(11)***
reachabilityChange (12)
nameBinding (6)
networkSubsystem-system (1)
obsolete ***(2)***
cLNS-networkEntity-Management (3)
nSAP-networkSubsystem-Automatic (4)
nSAP-networkSubsystem-Management (5)
obsolete ***(6)***
obsolete ***(7)***
cONS-networkEntity-Management (8)
x25PLE-networkSubsystem-Management (9)
x25PLEIVMO-networkSubsystem (10)
obsolete ***(11)***
obsolete ***(12)***
obsolete ***(13)***
obsolete ***(14)***
obsolete ***(15)***
cLNS-networkEntity-Automatic (16)
cONS-networkEntity-Automatic (17)
x25PLE-networkSubsystem-Automatic (18)
networkConnection-cONS (19)
linkage-cLNS-Management (20)
linkage-cONS-Management (21)
linkage-cLNS-Automatic (22)
linkage-cONS-Automatic (23)
virtualCall-DTE-x25PLE-DTE (24)
virtualCallIVMO-x25PLE (25)
permanentVirtualCircuit-DTE-x25PLE-DTE (26)
networkEntity-networkSubsystem-Automatic (27)

```
        remoteLogicalChannel (162)
        resetIndication (163)
        restartIndication (164)
        reverseChargingAcceptance (165)
        rPOASelection (166)
        rPOASubscription (167)
        throughputClassNegotiation (168)
        transitDelaySelectionAndIndication (169)
        x25SegmentsSent (170)
        x25SegmentsReceived (171)
    attributeGroup (8)
    action (9)
    notification (10)
END
```

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Annex B
Shorthand Description of Managed Objects

(informative)

The information in this Annex is intended only to give a broad outline of the Network Layer Management Specification. While the information contained herein has been derived from the normative GDMO text in the body of this Specification, it should be treated with caution, as there may be errors.

The following abbreviations are used to describe the property lists of attributes.

G	Get
R	Replace
RWD	Replace With Default
A	Add
RM	Remove

The following abbreviations are used for external label references

DMI:	"CCITT Rec. X.721 (1992) | ISO/IEC 10165-2 : 1992":
GMI:	"CCITT Rec. X.723 | ISO/IEC 10165-5"

Template types with a '*' suffix (for example ATTRIBUTE*) refer to template types defined in conditional packages. All inherited templates, except those inherited from 'top', are included in each Managed Object Class.

The inheritance hierarchy is illustrated in figure B.1.

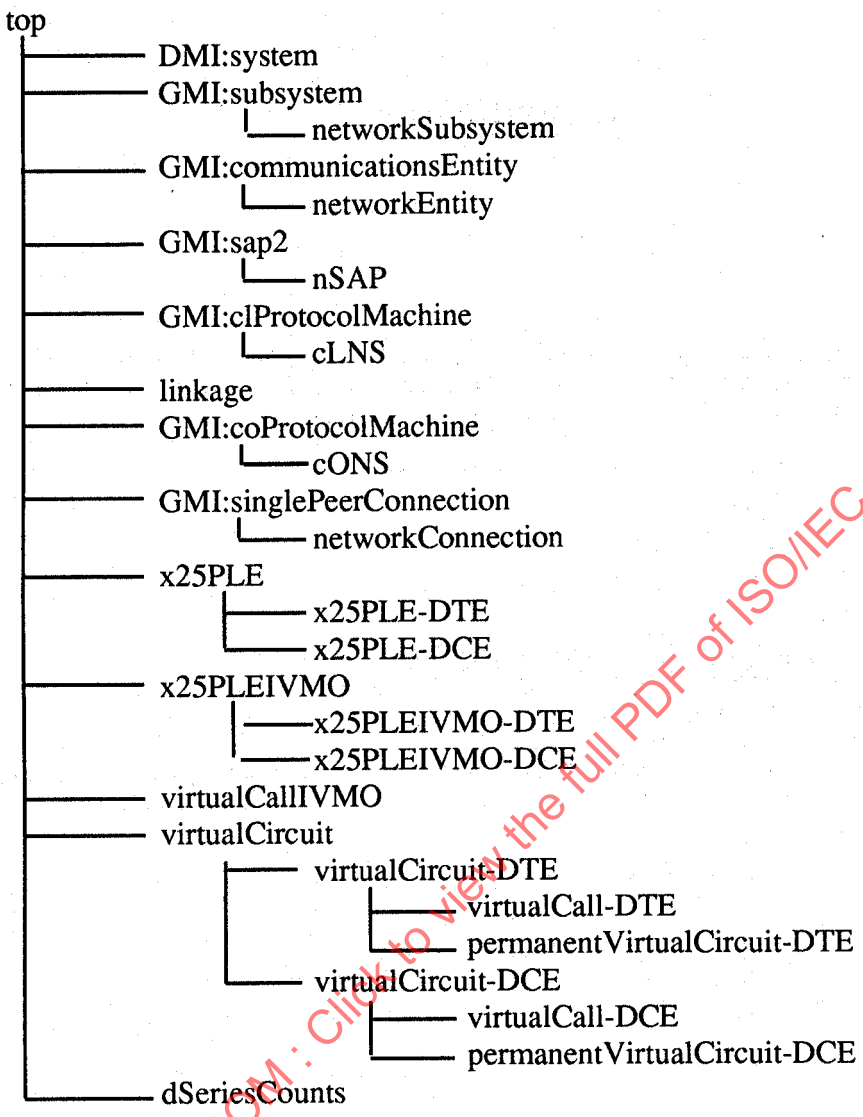

Figure B.1 - Network Layer Inheritance Hierarchy

MANAGED OBJECT CLASS networkSubsystem DERIVED FROM (GMI:subsystem) CONTAINED IN (DMI:system)
GMI:subsystemId ATTRIBUTE (G)
END MANAGED OBJECT CLASS networkSubsystem

MANAGED OBJECT CLASS networkEntity DERIVED FROM (GMI:communicationsEntity) CONTAINED IN (networkSubsystem)
DMI:objectCreation NOTIFICATION
DMI:objectDeletion NOTIFICATION
networkEntityTitles ATTRIBUTE (G, R, A, RM)
The set of Network Entity Titles
systemTypes ATTRIBUTE (G)
The set of system roles supported by this Network Entity.
END MANAGED OBJECT CLASS networkEntity

MANAGED OBJECT CLASS nSAP DERIVED FROM (GMI:sap2) CONTAINED IN (networkSubsystem)
DMI:objectCreation NOTIFICATION
DMI:objectDeletion NOTIFICATION
GMI:sap2Address ATTRIBUTE (G)
END MANAGED OBJECT CLASS nSAP

MANAGED OBJECT CLASS cLNS DERIVED FROM (GMI:clProtocolMachine) CONTAINED IN (networkEntity)
DMI:administrativeState ATTRIBUTE (G, R)
DMI:communicationsAlarm NOTIFICATION*
DMI:objectCreation NOTIFICATION
DMI:objectDeletion NOTIFICATION
DMI:octetsReceivedCounter ATTRIBUTE* (G)
DMI:octetsSentCounter ATTRIBUTE* (G)
DMI:stateChange NOTIFICATION
GMI:activate ACTION
GMI:clProtocolMachineId ATTRIBUTE (G)
GMI:deactivate ACTION
assemblingSegmentsDiscarded ATTRIBUTE* (G)
Counter of segments discarded due to reassembly time expiry.
congestionDiscards ATTRIBUTE* (G)
Counter of PDUs discarded due to congestion.
enableChecksum ATTRIBUTE* (G, R, RWD)
When True, the generation of checksums is enabled.
errorReportsReceived ATTRIBUTE* (G)
Counter of received error reports.
maximumLifetime ATTRIBUTE* (G, R)
Maximum PDU lifetime (in half seconds).
operationalSystemType ATTRIBUTE (G)
The system role in which this instance is operating.
pDUDiscards ATTRIBUTE* (G)
Counter of PDUs discarded (except for congestion).
segmentsDiscarded ATTRIBUTE* (G)
Counter of segments discarded.
segmentsReceived ATTRIBUTE* (G)
Counter of segments received.
segmentsSent ATTRIBUTE* (G)
Counter of segments Sent.
supportedProtocols ATTRIBUTE (G)
The set of Connectionless Network protocols supported
END MANAGED OBJECT CLASS cLNS

MANAGED OBJECT CLASS linkage DERIVED FROM (DMI:top) CONTAINED IN (cONS, cLNS)
DMI:administrativeState ATTRIBUTE (G, R)
DMI:communicationsAlarm NOTIFICATION*
DMI:objectCreation NOTIFICATION
DMI:objectDeletion NOTIFICATION
DMI:operationalState ATTRIBUTE (G)
DMI:stateChange NOTIFICATION
GMI:activate ACTION
GMI:communicationsInformation NOTIFICATION*
GMI:deactivate ACTION
activeESConfigTimer ATTRIBUTE* (G)
Currently active value for the ISO 9542 ES configuration timer
callsFailed ATTRIBUTE* (G)
Counter of the number of X.25 call failures
callsPlaced ATTRIBUTE* (G)
Counter of the number of X.25 VCs successfully established
defaultESConfigTimer ATTRIBUTE* (G, R, RWD)
Default value for the ISO 9542 ES configuration timer
eSReachabilityChanges ATTRIBUTE* (G)
Count of the number of changes in reachability of End Sytems
enableChecksum ATTRIBUTE* (G, R, RWD)
When True, the generation of checksums is enabled.
holdingTimerMultiplier ATTRIBUTE* (G, R, RWD)
The factor to derive holding timer from configuration timer.
iSConfigurationTimer ATTRIBUTE* (G, R, RWD)
Value in seconds for the ISO 9542 IS configuration timer.
iSO9542OperationalSubsets ATTRIBUTE* (G, R)
The set of ISO 9542 subsets operational on this linkage.
iSReachabilityChanges ATTRIBUTE* (G)
Counter of the number of changes in reachability of Intermediate Systems
idleTimer ATTRIBUTE* (G, R, RWD)
Time in seconds before release of an idle call.
initialMinimumTimer ATTRIBUTE* (G, R, RWD)
Minimum time in seconds to retain call after establishment.
invalid9542PDUs ATTRIBUTE* (G)
Counter of invalid 9542 PDUs received.
linkageId ATTRIBUTE (G)
The naming attribute of the linkage MO instance
manualISSNPAAddress ATTRIBUTE* (G, R, RWD, A, RM)
The set of SNPA Addresses to which calls associated with the SNDCF are to established
operationalProtocols ATTRIBUTE (G)
The set of network layer protocols supported
redirectHoldingTime ATTRIBUTE* (G, R, RWD)
The holding time (in seconds) to be specified in Redirect PDUs
reserveTimer ATTRIBUTE* (G, R, RWD)
Time in seconds to reserve resources for call re-establishment.
sN-SAP ATTRIBUTE (G)
Distinguished name of the service provider SAP MO
sN-ServiceProvider ATTRIBUTE (G)
Distinguished name of the SN service provider MO.
suggestedESConfigurationTimer ATTRIBUTE* (G, R, RWD)
Value to be used for the ISO 9542 suggested ES configuration timer
END MANAGED OBJECT CLASS linkage