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ITU-T M.3100

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Amendment 1
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SERIES M: TMN AND NETWORK MAINTENANCE: INTERNATIONAL TRANSMISSION SYSTEMS, TELEPHONE CIRCUITS, TELEGRAPHY, FACSIMILE AND LEASED CIRCUITS

Telecommunications management network

Generic Network Information Model

Amendment 1

ITU-T Recommendation M.3100 — Amendment 1

(Previously CCITT Recommendation)

ITU-T M-SERIES RECOMMENDATIONS

TMN AND NETWORK MAINTENANCE: INTERNATIONAL TRANSMISSION SYSTEMS, TELEPHONE CIRCUITS, TELEGRAPHY, FACSIMILE AND LEASED CIRCUITS

Introduction and general principles of maintenance and maintenance organization	M.10—M.299
International transmission systems	M.300—M.559
International telephone circuits	M.560—M.759
Common channel signalling systems	M.760—M.799
International telegraph systems and phototelegraph transmission	M.800—M.899
International leased group and supergroup links	M.900—M.999
International leased circuits	M.1000—M.1099
Mobile telecommunication systems and services	M.1100—M.1199
International public telephone network	M.1200—M.1299
International data transmission systems	M.1300—M.1399
Designations and information exchange	M.1400—M.1999
International transport network	M.2000—M.2999
Telecommunications management network	**M.3000—M.3599**
Integrated services digital networks	M.3600—M.3999
Common channel signalling systems	M.4000—M.4999

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATION M.3100

GENERIC NETWORK INFORMATION MODEL

AMENDMENT 1

Summary

This amendment provides enhancements to the generic network information model. The model describes managed object classes and their properties that are generic and useful to describe information exchanged across all interfaces defined in M.3010 TMN architecture. These generic managed object classes are intended to be applicable across different technologies, architectures and services. The managed object classes in this amendment may be specialized to support the management of various telecommunications networks.

Source

Amendment 1 to ITU-T Recommendation M.3100 was prepared by ITU-T Study Group 4 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 26th of March˚1999.

Keywords

Actions, ASN.1, Attributes Generic Network Information Model, Managed Object Class, Notifications.

FOREWORD

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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T s purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

Recommendation M.3100

GENERIC NETWORK INFORMATION MODEL

AMENDMENT 1

(Geneva, 1999)

1 Introduction

1.1 Scope

This amendment provides a generic network level information model enhancement to Recommendation M.3100. It identifies managed object classes that are common to managed telecommunications networks. The amendment further provides additions to Recommendation˚M.3100 in support of telemetry (scan and control) and provides an enhancement of the previous circuit pack.

1.2 Related Recommendations

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

— ITU-T Recommendation G.851.1 (1996), *Management of the transport network — Application of the RM-ODP framework.*

— ITU-T Recommendation G.851.2[1], *Methodology for GDMO engineering viewpoint.*

— ITU-T Recommendation G.852.1 (1996), *Enterprise viewpoint for simple subnetwork connection management.*

— ITU-T Recommendation G.852.2 (1999), *Enterprise viewpoint description of transport network resource model.*

— ITU-T Recommendation G.852.3 (1999), *Enterprise viewpoint for topology management.*

— ITU-T Recommendation G.852.6 (1999), *Enterprise viewpoint for trail management.*

— ITU-T Recommendation G.852.8 (1999), *Enterprise viewpoint for pre-provisioned adaptation management.*

— ITU-T Recommendation G.852.10 (1999), *Enterprise viewpoint for pre-provisioned link connection management.*

— ITU-T Recommendation G.852.12 (1999), *Enterprise viewpoint for pre-provisioned link management.*

— ITU-T Recommendation G.853.1 (1999), *Common elements of the information viewpoint for the management of a transport network.*

— ITU-T Recommendation G.853.2 (1996), *Subnetwork connection management information viewpoint.*

— ITU-T Recommendation G.853.3 (1999), *Information viewpoint for topology management*.

— ITU-T Recommendation G.853.6 (1999), *Information viewpoint for trail management.*

— ITU-T Recommendation G.853.8 (1999), *Information viewpoint for pre-provisioned adaptation management.*

— ITU-T Recommendation G.853.10 (1999), *Information viewpoint for pre-provisioned link connection management.*

— ITU-T Recommendation G.853.12 (1999), *Information viewpoint for pre-provisioned link management.*

— ITU-T Recommendation G.854.1 (1996), *Computational interfaces for basic transport network model.*

— ITU-T Recommendation G.854.3 (1999), *Computational viewpoint for topology management.*

— ITU-T Recommendation G.854.6 (1999), *Computational viewpoint for trail management.*

— ITU-T Recommendation G.854.8 (1999), *Computational viewpoint for pre-provisioned adaptation management.*

— ITU-T Recommendation G.854.10 (1999) *Computational viewpoint for pre-provisioned link connection management.*

— ITU-T Recommendation G.854.12 (1999) *Computational viewpoint for pre-provisioned link management.*

— ITU-T Recommendation M.3100 (1995), *Generic network information model.*

1.3 Abbreviations

None.

1.4 Definitions

None.

1.5 A note on GDMO references

This amendment is an integral part of Recommendation M.3100. This implies that all definitions (object classes, packages, attributes, ...) defined in Recommendation M.3100 as well as technical corrigenda 1 are local and can be referenced without the document identifier.

The following GDMO directive is added to help automatic processing of the Recommendation:

--<GDMO.Document "ITU-T Recommendation M.3100">--

2 Network Topology and Connectivity Fragment

2.1 Overview of the model

The inheritance hierarchy of the managed objects that represented the network level management information model for generic transport networks is illustrated in Figure 2-1.

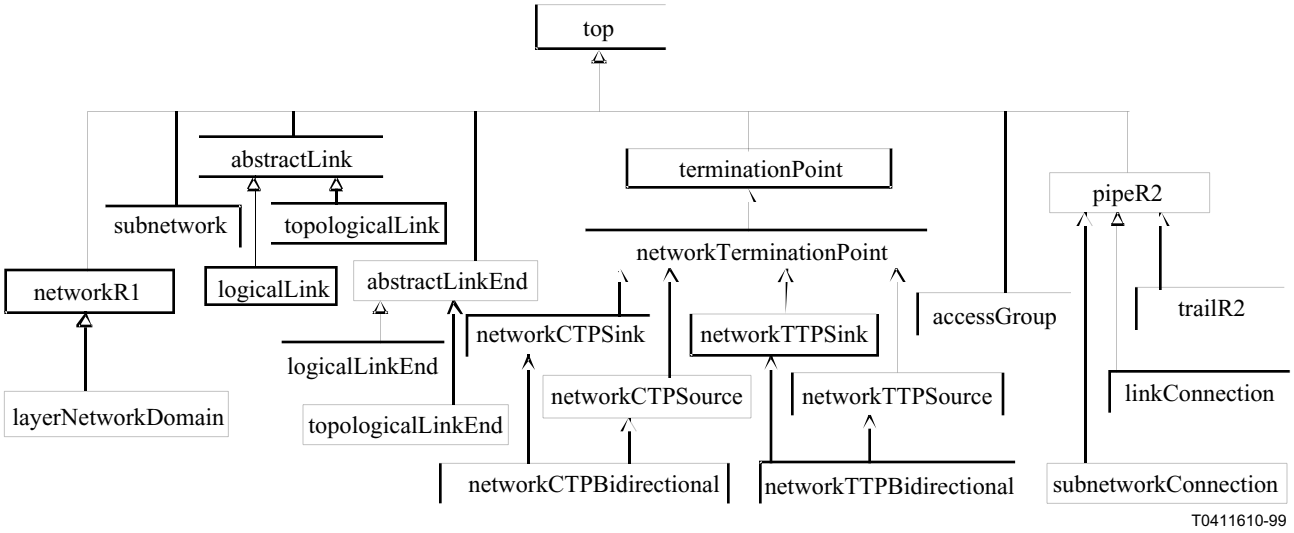

Figure 2-1/M.3100 — Inheritance

Figure 2-2 shows the naming hierarchy of managed objects.

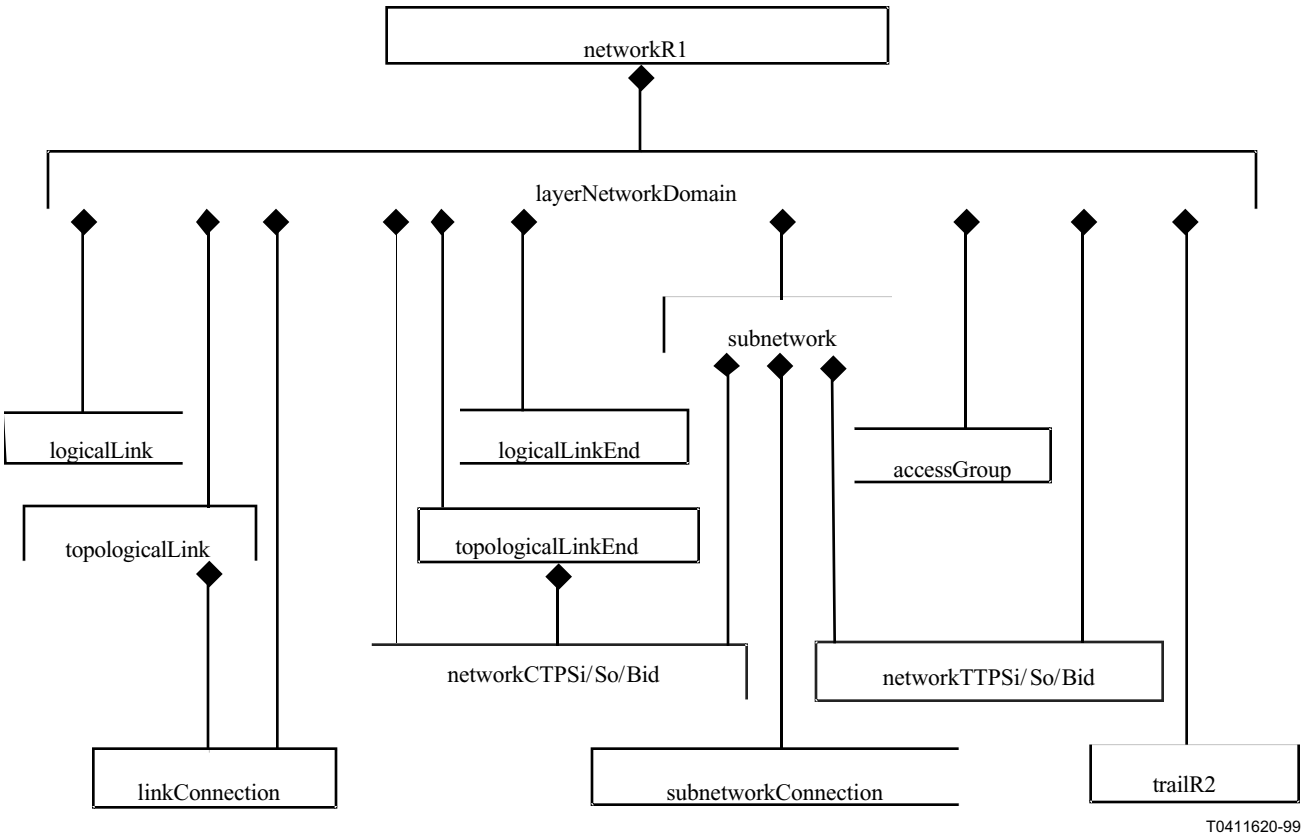

Figure 2-2/M.3100 — Naming hierarchy

Figure 2-3 shows the key topological and connectivity entity-relationships for managed objects in the network level management information model.

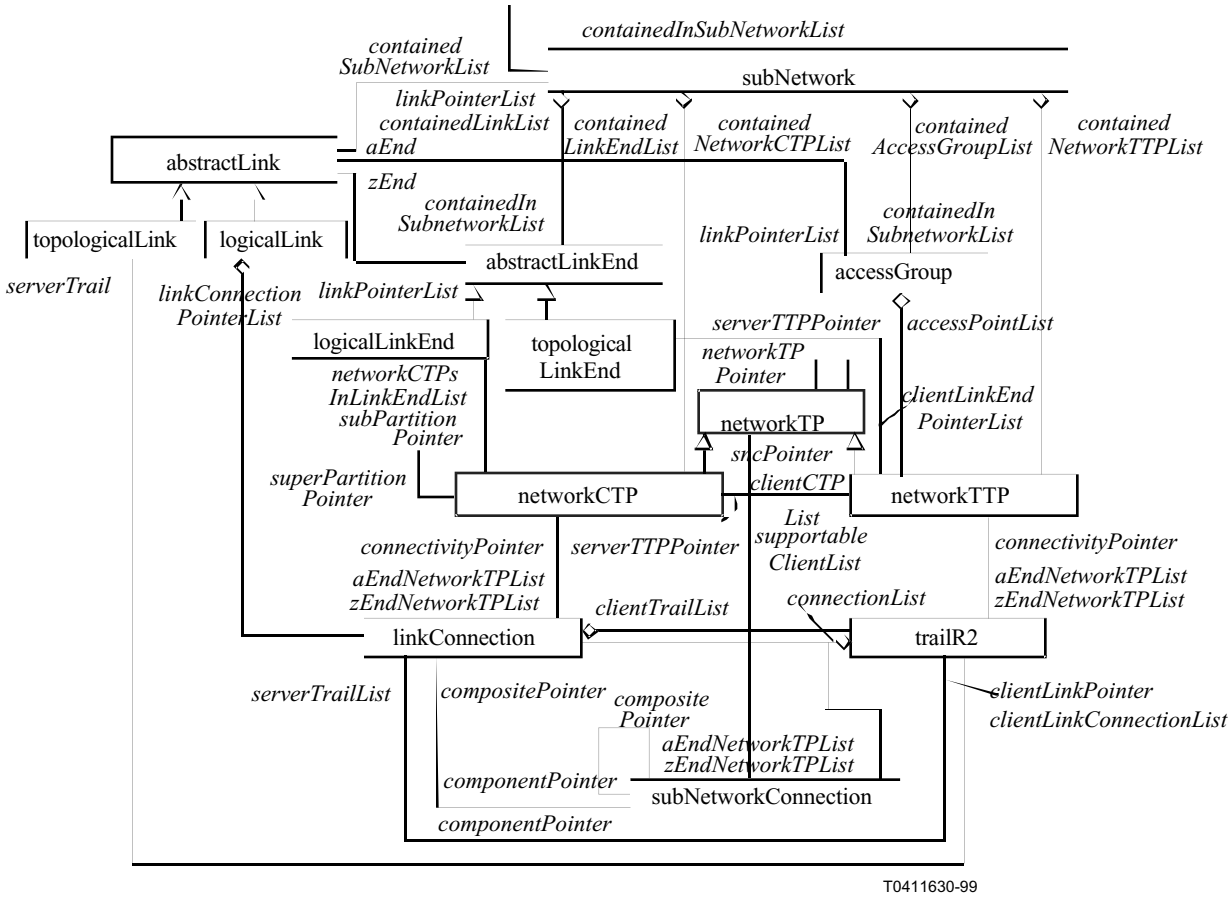

Figure 2-3/M.3100 — Entity relationships

2.2 Object classes

The following managed object specifications were developed using a methodology for development of a GDMO Engineering Viewpoint. The GDMO definitions of these managed objects make reference to the communities from which the definitions were defined. These references are indicated in the behaviour clauses of the following specifications by tags enclosed in angled brackets ('<'°and°'>').

The naming conventions used in the following GDMO definition follow the naming conventions of GDMO. In general, in GDMO a single RDN (specified by the naming attribute of the managed object class and defined in its NAME BINDING) is used to uniquely identify an object instance relative to its parent. In some cases, this method of naming object instances is different from the definitions of the communities on which these managed objects are based where multiple identifiers have been used. In such cases the use of a single unique naming attribute is an optimisation for the GDMO engineering viewpoint.

2.2.1 Abstract Link

The abstractLink class is not instantiable.

abstractLink MANAGED OBJECT CLASS
DERIVED FROM "ITU-T X.721 | ISO/IEC 10165-2:1992":top;
CHARACTERIZED BY
createDeleteNotificationsPackage,
abstractLinkPackage PACKAGE
BEHAVIOUR
abstractLinkBehaviour BEHAVIOUR
DEFINED AS

"The abstract link object class gives a topological description of the capacity between two adjacent Subnetworks, or two Link Ends; or a Subnetwork and an Access Group when Network trail termination points lie outside the boundary of the largest subnetwork.

The use made of the individual attributes and notifications is detailed below:

— a end: the link end, subnetwork or access group which terminates one end of the Link <ITU-T G.853.1,RELATIONSHIP:linkBinds>;
— available link capacity: the number of free Link Connections or free bandwidth <ITU-T˚G.853.8,ATTRIBUTE:pamAvailableLinkCapacity>;
— z end: the link end, subnetwork or access group which terminates the other end of the Link <ITU-T G.853.1,RELATIONSHIP:linkBinds>;
— signal Id: shows the signal Id of the Link Connections that provide the capacity for the Link;
— a link must be provided with capacity by Link connections of the same signal Id;

attribute value change notification: shall be emitted when the values change of the following attributes: availableLinkCapacity, totalLinkCapacity.";;

ATTRIBUTES

aEnd	**GET SET-BY-CREATE,**
availableLinkCapacity	**GET,**
signalId	**GET SET-BY-CREATE,**
zEnd	**GET SET-BY-CREATE;;;**

CONDITIONAL PACKAGES
attributeValueChangeNotificationPackage PRESENT IF
"the attributeValueChange notification defined in Recommendation X.721 is supported by an instance of this managed object class",
usageCostPackage PRESENT IF
"the link has an allocated usage cost ",
userLabelPackage PRESENT IF
"a userLabel is supported.
<ITU-T G.852.2,PERMISSION:userLabelFacility>";
REGISTERED AS {m3100ObjectClass 44};

2.2.2 Abstract Link End

The abstractLinkEnd class is not instantiable.

abstractLinkEnd MANAGED OBJECT CLASS
DERIVED FROM "ITU-T X.721 | ISO/IEC 10165-2:1992":top;
CHARACTERIZED BY
attributeValueChangeNotificationPackage,
createDeleteNotificationsPackage,
abstractLinkEndPackage PACKAGE
BEHAVIOUR
abstractLinkEndBehaviour BEHAVIOUR

```
            DEFINED AS
            "The Abstract Link End  object class is a class of managed objects which contains Network
            Connection Termination Points for the purpose of  representing topology.

            The use made of individual attributes and notification is detailed below:

            — available link end capacity: represents the spare capacity of the link end;
            — link pointer: is a distinguished name of the related link managed object instance;
            — contained in subnetwork list: is a distinguished name that represents the parent subnetwork
              of the logical link.

            An attribute value change notification shall be emitted when the value of the
            availableLinkEndCapacity or the containedInSubNetworkList is changed.";;
        ATTRIBUTES
            availableLinkEndCapacity        GET,
            linkPointer                     GET;;;
    CONDITIONAL PACKAGES
        containedInSubNetworkListPackage PRESENT IF
            "this link end object instance is not named from a subnetwork managed object ",
        userLabelPackage PRESENT IF
            "a userLabel is supported.
        <ITU-T G.852.2, PERMISSION:userLabelFacility>";
REGISTERED AS {m3100ObjectClass 45};
```

2.2.3 Access Group

```
accessGroup MANAGED OBJECT CLASS
    DERIVED FROM  "ITU-T X.721|ISO/IEC 10165-2:1992":top;
    CHARACTERIZED BY
        accessGroupPackage PACKAGE
            BEHAVIOUR
            accessGroupBehaviour BEHAVIOUR
            DEFINED AS
                "<ITU-T G.852.2,RESOURCE:access group>
                The Access Group object class is a class of managed objects which groups Network Trail
                Termination Points for management purposes.
                <ITU-T Rec.G.852.3,ACTION:create link,ACTION POLICY:inputAEnd>
                <ITU-T Rec.G.852.3,ACTION:create link,ACTION POLICY:inputZEnd>";;
            ATTRIBUTES
                accessGroupId                   GET,
                accessPointList                 GET-REPLACE ADD-REMOVE
                                    networkTTPAndAccessGroupNotCompatible
                                    failureToAssociateNetworkTTP
                                    failureToDisassociateNetworkTTP,
                topologicalEndDirectionality    GET,
                signalId                        GET;;;
    CONDITIONAL PACKAGES
        containedInSubNetworkListPackage PRESENT IF
            "the access group object is contained in a subnetwork",
        linkPointerListPackage PRESENT IF
            "topology management is supported
            <ITU-T G.852.3,ACTION:create link, ACTION POLICY:inputAEnd>,
            <ITU-T G.852.3,ACTION:create link, ACTION POLICY:inputZEnd>>",
        userLabelPackage PRESENT IF
            "a userLabel is supported <ITU-T G.852.2,PERMISSION:userLabelFacility>";
REGISTERED AS {m3100ObjectClass 46};
```

2.2.4 Layer Network Domain

layerNetworkDomain MANAGED OBJECT CLASS
DERIVED FROM networkR1;
CHARACTERIZED BY
layerNetworkDomainPkg PACKAGE
BEHAVIOUR
layerNetworkDomainBehaviour BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:layer network domain>
This managed object represents a transport administrative domain in which all resources pertain to the same G.805 layer. <ITU-T G.853.1,OBJECT:layerNetworkDomain >
It represents the topological aspects of the transport network layer.
<ITU-T G.853.1,RELATIONSHIP:layerNetworkDomainIsMadeOf >";;
ATTRIBUTES
signalId GET;;;
REGISTERED AS {m3100ObjectClass 47};

2.2.5 Link Connection

linkConnection MANAGED OBJECT CLASS
DERIVED FROM pipeR2;
CHARACTERIZED BY
linkConnectionPackage PACKAGE
BEHAVIOUR
linkConnectionBehaviour BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:link connection>
The Link Connection object class is a class of managed objects responsible for the transparent transfer of information between Network Connection Termination Points.
A Link Connection may be a component of a Trail. A sequence of one or more Link Connections (and subnetwork connections) may be linked together to form a Trail.
<ITU-T G.853.1,RELATIONSHIP:linkConnectionIsSupportedByTrail>,
<ITU-T G.853.1,RELATIONSHIP:trailIsMadeOfTransportEntities>
A Link Connection may be either uni- or bidirectional.
<ITU-T G.853.1,OBJECT:transportConnection >
A point-to-point unidirectional Link Connection can be established between a Network connection termination point source or Network connection termination point bidirectional; and a Network connection termination point sink or Network connection termination point bidirectional.
A point-to-point bidirectional Link Connection can be established between a Network connection termination point bidirectional; and a Network connection termination point bidirectional.
An operation to create a Link Connection will not be successful and will fail with an invalid TP type if a requested endpoint is a Network Trail Termination Point.
For all types of Link Connection, the network termination point(s) pointed to by the A End attribute is related to the network termination point(s) pointed to by the Z End attribute in such a way that traffic can flow between the network termination points represented by these managed objects in a unidirectional or bidirectional manner as indicated by the directionality attribute.
<ITU-T G.853.3, ATTRIBUTE:directionality>";;
ATTRIBUTES
connectionId GET;;;
CONDITIONAL PACKAGES
serverTrailListPackage PRESENT IF
"the link connection is supported by a server trail
<ITU-T G.853.8,RELATIONSHIP:linkConnectionIsSupportedByTrail>",
compositePointerPackage PRESENT IF
"the link connection is a component of that subnetwork connection
<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionIsMadeOfTransportEntities>",

clientTrailPackage PRESENT IF
"the link connection serves a client trail
<ITU-T G.853.1,RELATIONSHIP:trailIsMadeOfTransportEntities>";
REGISTERED AS {m3100ObjectClass 48};

2.2.6 Logical Link

logicalLink MANAGED OBJECT CLASS
DERIVED FROM abstractLink;
CHARACTERIZED BY
logicalLinkCapacityPackage,
logicalLinkPackage PACKAGE
BEHAVIOUR
logicalLinkBehaviour BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:link>
A logical link managed object represents a link that may be administratively composed of link connections or bandwidth that may be provided by one or more topological links or other logical links.";;
ATTRIBUTES
linkDirectionality GET,
linkId GET;;;
CONDITIONAL PACKAGES
linkConnectionPointerListPackage PRESENT IF
"pre-provisioned link connections are supported by the transport technology";
REGISTERED AS {m3100ObjectClass 49};

2.2.7 Logical Link End

logicalLinkEnd MANAGED OBJECT CLASS
DERIVED FROM abstractLinkEnd;
CHARACTERIZED BY
linkEndCapacityPackage,
logicalLinkEndPackage PACKAGE
BEHAVIOUR
logicalLinkEndBehaviour BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:link end>
The Logical Link End object class represents the end of a logical link.

When present, the Network CTPs In Link End List Package identifies the network CTPs that are present in the Logical Link End. There is no name binding between or Logical Link End and the network CTPs that are associated with the Logical Link.";;
ATTRIBUTES
linkEndId GET,
logicalEndDirectionality GET;;;
CONDITIONAL PACKAGES
networkCTPsInLinkEndListPackage PRESENT IF
"pre-provisioned network CTPs are supported by the transport technology";
REGISTERED AS {m3100ObjectClass 50};

2.2.8 Network Connection Termination Point Bidirectional

networkCTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
networkCTPSink,
networkCTPSource;
CHARACTERIZED BY
networkCTPBidPackage PACKAGE

BEHAVIOUR
networkCTPBidBehaviour BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:connection termination point>
If it is necessary to configure an instance of this object class to be unidirectional, a subclass may be specified for which directionality is permitted to be settable.";;;;
REGISTERED AS {m3100ObjectClass 51};

2.2.9 Network Connection Termination Point Sink

networkCTPSink MANAGED OBJECT CLASS
DERIVED FROM networkTerminationPoint;
CHARACTERIZED BY
networkCTPSinkPackage PACKAGE
BEHAVIOUR
networkCTPSinkBehaviour BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:connection termination point>
The Network CTP Sink object class is a class of managed objects that terminates Link connections and/or originates Subnetwork Connections. The resource receives information (traffic), via a Link connection, from an instance representing a NetworkConnection Termination Point, and sends it on, via a Subnetwork Connection, to instances representing either NWCTP Sources or a NWTTP Sink in the same Subnetwork.
An instance of this class may only have connectivity relationships (link connection or subnetwork connection) with instances that represent Network Connection Termination Points, Source or Bidirectional, which are at the same layer.
<ITU-T G.852.3,COMMUNITY_POLICY:signalid>
An instance of this class may be subnetwork connected, via a Subnetwork Connection, to a single instance which represents a Network Trail Termination Point, Sink or Bidirectional, at the same layer.
<ITU-T G.853.1:RELATIONSHIP:subnetworkConnectionIsTerminatedByPointToPoint, ROLE:a_endCTP>
The Subnetwork Connection Pointer attribute points to the managed object representing the relationship with the network termination point(s), within the same Subnetwork, that receive(s) information (traffic) from this network termination point, or is null.
<ITU-T G.853.1: RELATIONSHIP:subnetworkConnectionIsTerminatedByPointToPoint , ROLE: a_endCTP>
The referenced managed object shall represent a Subnetwork Connection. Where the NWCTP sink participates in many subnetwork connections for different subnetworks, the Subnetwork Connection Pointer is null.
Any network termination points identified by the related Subnetwork Connection indicate that a relationship exists, but this does not indicate that information can flow between the network termination points. This capability is indicated by a combination of the State Attributes including the Operational State.
The Connectivity Pointer attribute points to the managed object representing the Connection which relates this instance to the instance representing the Network Connection Termination Point, Source or Bidirectional, that sends information (traffic) to this network termination point, or is null.
<ITU-T G.853.1,RELATIONSHIP:linkConnectionIsTerminatedByPointToPoint, ROLE: z_endCTP>";;;;
CONDITIONAL PACKAGES
channelNumberPackage PRESENT IF
"the channel number attribute is supported by an instance of this managed object class",
ctpInstancePackage PRESENT IF
"an instance supports it",
networkCTPPackage PRESENT IF
"pointers to instances of network termination points at higher or lower levels of subnetwork partitioning are supported by this managed object class
<ITU-T G.853.1,RELATIONSHIP:subnetworkTPPoolIsMadeOfSubnetworkTP>",
serverTTPPointerPackage PRESENT IF
"the server trail termination point pointer attribute is supported by an instance of this managed object class <ITU-T G.853.1,RELATIONSHIP:networkTTPAdaptsNetworkCTP>";
REGISTERED AS {m3100ObjectClass 52};

2.2.10 Network Connection Termination Point Source

networkCTPSource MANAGED OBJECT CLASS
DERIVED FROM networkTerminationPoint;
CHARACTERIZED BY
networkCTPSourcePackage PACKAGE
BEHAVIOUR
networkCTPSourceBehaviour BEHAVIOUR
DEFINED AS

"<ITU-T G.852.2,RESOURCE:connection termination point>

The Network CTP Source object class is a class of managed objects that originates Link connections and/or terminates Subnetwork Connections. The resource sends information (traffic), via a Link connection, to instances representing Network Connection Termination Points, and receives it, via a Subnetwork Connection, from an instance representing either a NWCTP Sink or a NWTTP Source in the same Subnetwork.

An instance of this class may only have connectivity relationships (link connection or subnetwork connection) with instances that represent Network Connection Termination Points, Sink or Bidirectional, which are at the same layer.

<ITU-T G.852.3,COMMUNITY_POLICY:signalid>

An instance of this class may be subnetwork connected, via a Subnetwork Connection, to a single instance which represents a Network Trail Termination Point, Source or Bidirectional, at the same layer.

<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionIsTerminatedByPointToPoint, ROLE: z_endCTP>

The Subnetwork Connection Pointer attribute points to the managed object representing the relationship with the network termination point, within the same Subnetwork, that sends information (traffic) to this network termination point, or is null. The referenced managed object shall represent a Subnetwork Connection.

<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionIsTerminatedByPointToPoint, ROLE: z_endCTP>

Where the NWCTP source participates in many subnetwork connections for different subnetworks, the Subnetwork Connection Pointer is null.

Any network termination points identified by the related Subnetwork Connection indicate that a relationship exists, but this does not indicate that information can flow between the network termination points. This capability is indicated by a combination of the State Attributes, including the Operational State.

The Connectivity Pointer attribute points to the managed object representing the Connection which relates this instance to the instance representing the Network Connection Termination Point, Source or Bidirectional, that sends information (traffic) to this network termination point, or is null.

<ITU-T G.853.1,RELATIONSHIP:linkConnectionIsTerminatedByPointToPoint, ROLE: a_endCTP>";;;;

CONDITIONAL PACKAGES
channelNumberPackage PRESENT IF
"the channel number attribute is supported by an instance of this managed object class",
ctpInstancePackage PRESENT IF
"an instance supports it",
networkCTPPackage PRESENT IF
"pointers to instances of network termination points at higher or lower levels of subnetwork partitioning are supported by this managed object class
<see ITU-T G.853.1,RELATIONSHIP:subnetworkTPPoolIsMadeOfSubnetworkTP>",
serverTTPPointerPackage PRESENT IF
"the server trail termination point pointer attribute is supported by an instance of this managed object class <see ITU-T G.853.1,RELATIONSHIP:networkTTPAdaptsNetworkCTP>";

REGISTERED AS {m3100ObjectClass 53};

2.2.11 Network Termination Point

The networkTerminationPoint class is not instantiable.

networkTerminationPoint MANAGED OBJECT CLASS
DERIVED FROM terminationPoint;
CHARACTERIZED BY
createDeleteNotificationsPackage,
networkTerminationPointPackage PACKAGE

BEHAVIOUR
networkTerminationPointBehaviour BEHAVIOUR
DEFINED AS

"This managed object represents the network termination of a transport entity, such as an instance representing a Trail or a Link Connection.

The sncPointer is used to point to a Subnetwork Connection. However, not all network termination points will have a flexible connection, and it may be more appropriate to point to another network termination point, for example in a regenerator the two network connection termination points would point to each other as there is no flexibility between them. In this instance the networkTPPointer shall be used. Both pointers are conditional.

<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionIsTerminatedByPointToPoint, ROLE: a_endCTP or z_endCTP>

The Connectivity Pointer attribute points to the managed object representing the Link connection or Trail which relates this instance to other instance(s) representing the Network Termination Point(s).
<ITU-T G.853.1,RELATIONSHIP:trailIsTerminatedByPointToPoint, ROLE: a_endCTP or z_endCTP>
<ITU-T G.853.1,RELATIONSHIP:linkConnectionIsterminatedByPointToPoint, ROLE: a_endCTP or z_endCTP>";;

ATTRIBUTES
pointDirectionality GET,
signalId GET SET-BY-CREATE;;;

CONDITIONAL PACKAGES

configuredConnectivityPackage PRESENT IF
"configured connectivity indication is supported by this managed object instance",

connectivityPointerPackage PRESENT IF
"the network termination point terminates a link connection or a trail
<ITU-T G.853.1,RELATIONSHIP:trailIsTerminatedByPointToPoint, ROLE: a_endCTP or z_endCTP>,
< ITU-T G.853.1,RELATIONSHIP:linkConnectionIsterminatedByPointToPoint, ROLE: a_endCTP or z_endCTP>",

"ITU-T X.721|ISO/IEC 10165-2:1992":administrativeStatePackage PRESENT IF
"the resource represented by this managed object is capable of being administratively removed from service (point view)",

"ITU-T X.721|ISO/IEC 10165-2:1992":availabilityStatusPackage PRESENT IF
"the resource represented by this managed object is capable of representing its availability (point view)",

locationNamePackage PRESENT IF
"an instance supports it",

neAssignmentPackage PRESENT IF
"the Network Element view of termination points is available",

sncPointerPackage PRESENT IF
"a network termination point may be flexibly connected to another network termination point
<ITU-T G.853.1,RELATIONSHIP:extremitiesTerminateSubnetworkConnection>",

networkTPPointerPackage PRESENT IF
"there is no flexibity between network termination points (degenerate case only)",

userLabelPackage PRESENT IF
"a userLabel is supported < ITU-T G.852.2, PERMISSION userLabelFacility>";

REGISTERED AS {m3100ObjectClass 54};

2.2.12 Network Trail Termination Point Bidirectional

networkTTPBidirectional MANAGED OBJECT CLASS
DERIVED FROM
networkTTPSink,
networkTTPSource;
CHARACTERIZED BY
networkTTPBidPackage PACKAGE BEHAVIOUR
networkTTPBidBehaviour BEHAVIOUR

DEFINED AS

"<ITU-T G.852.2,RESOURCE:trail termination point>

If it is necessary to configure an instance of this object class to be unidirectional, a subclass may be specified for which directionality is permitted to be settable.";;;;

REGISTERED AS {m3100ObjectClass 55};

2.2.13 Network Trail Termination Point Sink

networkTTPSink MANAGED OBJECT CLASS
DERIVED FROM networkTerminationPoint;
CHARACTERIZED BY
networkTTPSinkPackage PACKAGE
BEHAVIOUR
networkTTPSinkBehaviour BEHAVIOUR
DEFINED AS

"<ITU-T G.852.2,RESOURCE:trail termination point>

The Network TTP Sink object class is a class of managed objects that terminates Trails and Subnetwork Connections in the Network viewpoint.

An instance of this class may only have Trail relationships with Network Trail Termination Points, Source or Bidirectional, which are at the same layer.
<ITU-T G.852.3,COMMUNITY_POLICY:signalid>

An instance of this class may be subnetwork connected, via a Subnetwork Connection, to a single Network Connection Termination Point Sink or Bidirectional, or a Network Trail Termination Point Source at the same layer.
<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionIsTerminatedByPointToPoint, ROLE: z_endCTP>

The Subnetwork Connection Pointer attribute points to the managed object representing the relationship with one or more Network Connection Termination Points, within the same Subnetwork, that send information (traffic) to this network termination point, or is null.

Any network termination point identified by the related Subnetwork Connection indicates that a relationship exists, but this does not indicate that information can flow between the network termination points. This capability is indicated in a combination of the State attributes, including the Operational State.

The Connectivity Pointer attribute points to the managed object representing the Trail which relates this instance to the instances representing the Network Trail Termination Points, that send information (traffic) to this network termination point at the same layer, or is null.
<ITU-T G.853.1,RELATIONSHIP:trailIsTerminatedByPointToPoint, ROLE: z_endCTP>";;;;

CONDITIONAL PACKAGES
supportableClientListPackage PRESENT IF
"an instance supports it",
ttpInstancePackage PRESENT IF
"an instance supports it",
clientCTPListPackage PRESENT IF
"management of the client networkCTPs of this managed object is supported
<ITU-T G.853.1,RELATIONSHIP:networkTTPAdaptsNetworkCTP>";

REGISTERED AS {m3100ObjectClass 52};

2.2.14 Network Trail Termination Point Source

networkTTPSource MANAGED OBJECT CLASS
DERIVED FROM networkTerminationPoint;
CHARACTERIZED BY
networkTTPSourcePackage PACKAGE
BEHAVIOUR
networkTTPSourceBehaviour BEHAVIOUR
DEFINED AS

"<ITU-T G.852.2,RESOURCE:trail termination point>

The Network TTP Source object class is a class of managed objects that originates Trails and Subnetwork Connections in the Network viewpoint.

An instance of this class may only have Trail relationships with Network Trail Termination Points, Sink or Bidirectional, which are at the same layer.
<ITU-T G.852.3, COMMUNITY_POLICY:signalid>

An instance of this class may be subnetwork connected, via a Subnetwork Connection, to a single Network Connection Termination Point Source or Bidirectional, or a Network Trail Termination Point Sink at the same layer. It may also be connected, via a Subnetwork Connection, to multiple instances of Network CTPs at the same layer when it is operating in the broadcast mode in order to transmit multiple copies of the same signal.
<ITU-T G.853.1,RELATIONSHIP: subnetworkConnectionIsTerminatedByPointToPoint, ROLE: a_endCTP>

The Subnetwork Connection Pointer attribute points to the managed object representing the relationship with one or more Network Connection Termination Points, within the same Subnetwork, that receive information (traffic) from this network termination point, or is null.

Any network termination point identified by the related Subnetwork Connection indicates that a relationship exists, but this does not indicate that information can flow between the network termination points. This capability is indicated by a combination of the State Attributes, including the Operational State.

The Connectivity Pointer attribute points to the managed object representing the Trail which relates this instance to the instances representing the Network Trail Termination Points, that receive information (traffic) from this network termination point at the same layer, or is null.

<ITU-T G.853.1,RELATIONSHIP: linkConnectionIsTerminatedByPointToPoint, ROLE: z_endCTP > ";;;;

CONDITIONAL PACKAGES

supportableClientListPackage PRESENT IF
"an instance supports it",

ttpInstancePackage PRESENT IF
"an instance supports it",

clientLinkEndPointerPackage PRESENT IF
"link ends are supported by the subnetwork in the client layer",

clientCTPListPackage PRESENT IF
"management of the client networkCTPs of this managed object is supported
<ITU-T G.853.1,RELATIONSHIP:networkTTPAdaptsNetworkCTP>";

REGISTERED AS {m3100ObjectClass 57};

2.2.15 PipeR2

The pipeR2 class is not instantiable because the transfer is effected via trail and link connection.

pipeR2 MANAGED OBJECT CLASS
DERIVED FROM " ITU-T X.721|ISO/IEC 10165-2:1992":top;
CHARACTERIZED BY
pipeR2Package PACKAGE
BEHAVIOUR
pipeR2Behaviour BEHAVIOUR
DEFINED AS

"The pipeR2 object class is a class of managed objects which ensures the transfer of information between two or more termination points.

The directionality attribute indicates whether transmission is unidirectional or bidirectional.

The Signal Id attribute describes the signal that is transferred across a Connectivity instance. The managed objects representing the network termination points that are related by this instance must have signal Ids that are compatible.

If an instance of this class is bidirectional, the a- and z-termination points shall also be bidirectional. If an instance of this class is unidirectional, the a-point shall be the source TP or bidirectional TP and the z-termination point shall be the sink TP or bidirectional TP.

For unidirectional connections, the aEndNWTPList attribute shall identify the source end.

The operational state indicates the capability to carry a signal.";;

ATTRIBUTES

directionality	**GET,**
signalId	**GET SET-BY-CREATE,**
aEndNetworkTPList	**GET SET-BY-CREATE,**
zEndNetworkTPList	**GET SET-BY-CREATE;;;**

CONDITIONAL PACKAGES

"ITU-T X.721|ISO/IEC 10165-2:1992":administrativeStatePackage PRESENT IF

"the administrativeState attribute defined in Recommendation X.721 is supported by an instance of this managed object class (arc view)",

alarmSeverityAssignmentPointerPackage PRESENT IF

"the tmnCommunicationsAlarmInformationPackage package is present AND the managed object supports configuration of alarm severities (arc view)",

attributeValueChangeNotificationPackage PRESENT IF

"the attributeValueChange notification defined in Recommendation X.721 is supported by an instance of this managed object class",

"ITU-T X.721|ISO/IEC 10165-2:1992":availabilityStatusPackage PRESENT IF

"the availabilityStatus attribute defined in Recommendation X.721 is supported by an instance of this managed object class (arc view)",

createDeleteNotificationsPackage PRESENT IF

"the objectCreation and objectDeletion notifications defined in Recommendation X.721 are supported by an instance of this managed object class",

operationalStatePackage PRESENT IF

"the operationalState attribute defined in Recommendation X.721 is supported by an instance of this managed object class (arc view)",

protectedPackage PRESENT IF

"an instance supports it.",

qualityOfConnectivityServicePackage PRESENT IF

"an instance supports it",

stateChangeNotificationPackage PRESENT IF

"the stateChange notification defined in Recommendation X.721 is supported by an instance of this managed object class (arc view)",

supportedByPackage PRESENT IF

"the supportedByObjectList attribute is supported by this managed object",

tmnCommunicationsAlarmInformationPackage PRESENT IF

"the communicationsAlarm notification (as defined in Recommendation X.721) is supported by this managed object (arc view)",

userLabelPackage PRESENT IF

"an instance supports it";

-- *the userLabelPackage may be used for M.1400 type designations*.

REGISTERED AS {m3100ObjectClass 58};

2.2.16 SubNetwork

subNetwork MANAGED OBJECT CLASS

DERIVED FROM "ITU-T X.721|ISO/IEC 10165-2:1992":top;

CHARACTERIZED BY

createDeleteNotificationsPackage,

subNetworkPackage PACKAGE

BEHAVIOURsubNetworkBehaviour BEHAVIOUR

DEFINED AS

"<ITU-T G.852.2,RESOURCE:subnetwork>

The Subnetwork object class represents logical collections of network termination points.

If present the attribute ContainedSubNetworkList will be null if there are no contained Subnetworks. The attribute ContainedInSubNetworkList will also be null if there are no containing (parent) Subnetworks.";;

ATTRIBUTES

signalId GET SET-BY-CREATE,

subNetworkId GET;;;

CONDITIONAL PACKAGES

administrativeOperationalStatesPackage PRESENT IF

"the administrativeState and operationalState attributes defined in Recommendation X.721 are supported by an instance of this managed object class",

attributeValueChangeNotificationPackage PRESENT IF
"the attributeValueChange notification defined in Recommendation X.721 is supported by an instance of this managed object class",
"ITU-T X.721|ISO/IEC 10165-2:1992":availabilityStatusPackage PRESENT IF
"the availabilityStatus attribute defined in Recommendation X.721 is supported by an instance of this managed object class",
containedAccessGroupListPackage PRESENT IF
"access group instances are contained in the subnetwork",
containedInSubNetworkListPackage PRESENT IF
"this subnetwork object instance is contained in a subnetwork (partitioning is supported) <ITU-T G.853.1,RELATIONSHIP:sNIsPartitionedBySn>",
containedLinkEndListPackage PRESENT IF
"there are contained link end in the subnetwork object instance (partitioning is supported)",
containedLinkListPackage PRESENT IF
"there are contained links in the subnetwork object instance (partitioning is supported)",
containedNetworkTPListPackage PRESENT IF
"there are contained network termination points in the subnetwork object instance <ITU-T G.853.3,topmanSubnetwork:RELATIONSHIP:subnetworkIsDelimitedBy>",
containedSubNetworkListPackage PRESENT IF
"there are contained subnetworks in this subnetwork object instance (partitioning is supported) < ITU-T G.853.1,RELATIONSHIP:sNIsPartitionedBySn>",
linkPointerListPackage PRESENT IF
"a topological view using links, subnetworks, and access groups is supported (arc view) <ITU-T G.853.3,topmanSubnetwork:RELATIONSHIP:linkBinds>",
stateChangeNotificationPackage PRESENT IF
"the stateChange notification defined in Recommendation X.721 is supported by an instance of this managed object class",
supportedByPackage PRESENT IF
"an instance supports it",
usageStatePackage PRESENT IF
"the usageState attribute defined in Recommendation X.721 is supported by an instance of this managed object class",
userLabelPackage PRESENT IF
"the user label attribute is supported by an instance of this managed object class <ITU-T G.852.2, PERMISSION:userLabelFacility >";

REGISTERED AS {m3100ObjectClass 59};

2.2.17 SubNetwork Connection

subNetworkConnection MANAGED OBJECT CLASS
DERIVED FROM pipeR2;
CHARACTERIZED BY
subNetworkConnectionPackage PACKAGE
BEHAVIOUR
subNetworkConnectionBehaviour BEHAVIOUR
DEFINED AS

"<ITU-T G.852.2,RESOURCE:subnetwork connection>

The Subnetwork Connection object class is a class of managed objects that associates the network termination point object identified in the A end attribute and the network termination point object(s) listed in the Z end attribute of this managed object. The Subnetwork Connection may be set up between network termination points (or groups of network termination points) specified explicitly, or implicitly between managed objects acting as containers of network termination point managed object instances from which any idle network termination point or group may be used.

If the managed objects listed in the A End and Z End attributes represent groups, the nth element of the A end group is related to the nth element of every Z end group (for every n). There shall be n elements in each group involved in the Subnetwork Connection.

For a group with n elements, the Signal Id shall be taken to be a bundle of n times the characteristic information of the individual elements, all of which are the same.

A point-to-point unidirectional Subnetwork Connection can be established between one of Network connection termination point sink, Network connection termination point bidirectional, Network trail termination point source, Network trail termination point bidirectional or Network group termination point; and one of Network connection termination point source, Network connection termination point bidirectional, Network trail termination point sink, Network trail termination point bidirectional or Network group termination point.

A point-to-point bidirectional Subnetwork Connection can be established between one of Network connection termination point bidirectional, Network trail termination point bidirectional or Network group termination point; and one of Network connection termination point bidirectional, Network trail termination point bidirectional or Network group termination point.

A point-to-multipoint unidirectional Subnetwork Connection can be established between one of Network connection termination point sink, Network connection termination point bidirectional, Network trail termination point source, Network trail termination point bidirectional or Network group termination point; and a set whose members are Network connection termination point sources, Network connection termination point bidirectionals, Network trail termination point sinks, Network trail termination point bidirectional or Network group termination point.

A point-to-multipoint bidirectional Subnetwork Connection can be established between one of Network connection termination point bidirectional, Network trail termination point bidirectional or Network group termination; and a set whose members are Network connection termination point bidirectionals, Network trail termination point bidirectionals or Network group termination points.

The componentListPackage is supported where the Subnetwork Connection is made up of a number of component Subnetwork Connections, and Connections, within the same layer.";;

ATTRIBUTES

subNetworkConnectionId GET;;;

CONDITIONAL PACKAGES

compositePointerPackage PRESENT IF

"the Subnetwork Connection is a component of another Subnetwork Connection within the same layer (partitioned subnetworks).

<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionisMadeOfTransportEntities>",

componentPointerPackage PRESENT IF

"the Subnetwork Connection is made up of a number of component Subnetwork Connections, and Connections, within the same layer (partitioned subnetworks)

<ITU-T G.853.1,RELATIONSHIP:subnetworkConnectionisMadeOfTransportEntities>",

relatedRoutingProfilePackage PRESENT IF

"routing profiles are supported",

userLabelPackage PRESENT IF

"a userLabel is supported <ITU-T G.852.2, PERMISSION:userLabelFacility>";

REGISTERED AS {m3100ObjectClass 60};

2.2.18 Topological Link

topologicalLink MANAGED OBJECT CLASS

DERIVED FROM abstractLink;

CHARACTERIZED BY

topologicalLinkCapacityPackage,

topologicalLinkPackage PACKAGE

BEHAVIOUR

topologicalLinkBehaviour BEHAVIOUR

DEFINED AS

"<ITU-T G.852.2,RESOURCE:topological link>

The topological link object class represents a link in a client layer provided by one and only one server trail.

The serverTrail attribute is a pointer to the trail in the server layer network domain that supports this topological link. The serverTrail attribute may be null if the trail in the server layer network domain that supports this topological link is not assigned.

The use made of the individual attributes and notifications is detailed below:

— total link capacity: the total number of Link Connections or bandwidth available <ITU-T˚G.853.8,ATTRIBUTE:pamMaxProvisionableCapacity>;
— maximum link connection count: the maximum number of link connections available on connection with flexible bandwidth management;
— potential link capacity: the number of potential Link Connections or potential bandwidth that could be provisioned <ITU-T G.853.8, ATTRIBUTE:pamPotentialLinkCapacity>;
— provisioned link capacity: the number of provisioned Link Connections or the provisioned bandwidth <ITU-T G.853.8,ATTRIBUTE:pamProvisionedLinkCapacity>;
— provisioned link connection count: the number of link connections assigned using flexible bandwidth management.

An attribute value change notification shall be emitted when the value of the totalLinkCapacity, maximumLinkConnectionCount, potentialLinkCapacity, provisionedLinkCapacity or provisionedLinkConnectionCount is changed.";;

ATTRIBUTES
directionality GET,
linkId GET,
serverTrail GET;;;

CONDITIONAL PACKAGES
totalLinkCapacityPackage PRESENT IF
"pre-provisioned adaptation or link connection or link management are supported by the transport technology",
maximumLinkConnectionCountPackage PRESENT IF
"flexible bandwidth allocation is supported",
potentialLinkCapacityPackage PRESENT IF
"pre-provisioned adaptation or link connection or link management are supported by the transport technology",
provisionedLinkCapacityPackage PRESENT IF
"pre-provisioned adaptation or link connection or link management are supported by the transport technology",
provisionedLinkConnectionCountPackage PRESENT IF
"flexible bandwidth allocation is supported";
REGISTERED AS {m3100ObjectClass 61};

2.2.19 Topological Link End

topologicalLinkEnd MANAGED OBJECT CLASS
DERIVED FROM abstractLinkEnd;
CHARACTERIZED BY
serverTTPPointerPackage,
topologicalLinkEndCapacityPackage,
topologicalLinkEndPackage PACKAGE
BEHAVIOUR
topologicalLinkEndBehavior BEHAVIOUR
DEFINED AS
"<ITU-T G.852.2,RESOURCE:topological link end>

The Topological Link End object class represents the end of a topological link when viewed from the point perspective.

The Topological Link End object is related to one and only one network TTP in the server layer.

The use made of the individual attributes and notifications is detailed below:

— total link end capacity: the total number of network CTPs or the bandwidth available <ITU-T G.853.8,ATTRIBUTE: pamMaxProvisionableCapacity>;
— maximum network CTP count: the maximum number of network CTPs available at the LinkEnd when using flexible bandwidth management;

— potential link end capacity: the number of potential network CTPs or potential bandwidth that could be provisioned <ITU-T G.853.8, ATTRIBUTE: pamPotentialLinkCapacity>;
— provisioned link end capacity: the number of provisioned network CTPs or the provisioned bandwidth <ITU-T G.853.8, ATTRIBUTE: pamProvisionedLinkCapacity>;
— provisioned network CTP count: the number of network CTP assigned to the link end when using flexible bandwidth management.

An attribute value change notification shall be emitted when the value of the totalLinkEndCapacity, maximumNetworkCTPCount, potentialLinkEndCapacity, provisionedLinkEndCapacity or provisionedNetworkCTPCount is changed.";;

ATTRIBUTES
linkEndId GET,
pointDirectionality GET;;;

CONDITIONAL PACKAGES
totalLinkEndCapacityPackage PRESENT IF
"pre-provisioned adaptation or link connection or link management are supported by the transport technology ",
maximumNetworkCTPCountPackage PRESENT IF
"flexible bandwidth allocation is supported",
potentialLinkEndCapacityPackage PRESENT IF
"pre-provisioned adaptation or link connection or link management are supported by the transport technology ",
provisionedLinkEndCapacityPackage PRESENT IF
"pre-provisioned adaptation or link connection or link management are supported by the transport technology ",
provisionedNetworkCTPCountPackage PRESENT IF
"flexible bandwidth allocation is supported";
REGISTERED AS {m3100ObjectClass 62};

2.2.20 TrailR2

trailR2 MANAGED OBJECT CLASS
DERIVED FROM pipeR2;
CHARACTERIZED BY
trailR2Package PACKAGE
BEHAVIOUR
trailR2Behaviour BEHAVIOUR
DEFINED AS

"<ITU-T G.852.2,RESOURCE:trail>

Trail is a class of managed objects in layer networks which is responsible for the integrity of transfer of characteristic information from one or more other layer networks.

A Trail is composed of two or more Network Trail Termination Points and one or more Link Connection or Subnetwork Connections, and associated Network Connection Termination Points.

A point-to-point unidirectional Trail can be established between a Network TTP source or Network TTP bid; and a Network TTP sink or Network TTP bid.

A point-to-point bidirectional Trail can be established between a Network TTP bid; and a Network TTP bid.

For all types of Trail, the termination point(s) pointed to by the A End attribute is related to the network termination point(s) pointed to by the Z End attribute in such a way that traffic can flow between the network termination points represented by these managed objects in a unidirectional or bidirectional manner as indicated by the directionality attribute.

The layerConnectionList attribute, when present, lists the subnetwork connections and link connections (in the same layer) which compose the trail. This represents a single partitioned view of the decomposition of a trail into its component subnetwork connections and link connections.";;

ATTRIBUTES
trailId GET SET-BY-CREATE;;;

CONDITIONAL PACKAGES
layerConnectionListPackage PRESENT IF
"there is a requirement to view the sequence of subnetwork connections and link connections which make up the trail in the same layer.",

trafficDescriptorPackage PRESENT IF
"flexible bandwidth allocation is supported <ITU-T G.852.6, ACTION: setupPointToPointTrail, ACTION_POLICY: trafficCharacteristics>",
clientLinkPointerPackage PRESENT IF
"there is a requirement to view the link(s) in a higher layer which is supported by this trail",
clientLinkConnectionPointerListPackage PRESENT IF
"there is a requirement to view the link connection(s) in a higher layer which is supported by this trail. <ITU-T G.852.8, ACTION: assign server transport entity to client linking entity, ACTION_POLICY: returnClientTransportEntities>";
REGISTERED AS {m3100ObjectClass 63};

2.3 Packages

2.3.1 Client CTP List Package

clientCTPListPackage PACKAGE
ATTRIBUTES
clientCTPList GET;
REGISTERED AS {m3100Package 49};

2.3.2 Client Link Connection Pointer List Package

clientLinkConnectionPointerListPackage PACKAGE
ATTRIBUTES
clientLinkConnectionPointerList GET;
REGISTERED AS {m3100Package 50};

2.3.3 Client Link End Pointer Package

clientLinkEndPointerPackage PACKAGE
ATTRIBUTES
clientLinkEndPointerList GET;
REGISTERED AS {m3100Package 51};

2.3.4 Client Link Pointer Package

clientLinkPointerPackage PACKAGE
ATTRIBUTES
clientLinkPointerList GET;
REGISTERED AS {m3100Package 52};

2.3.5 Component Pointer Package

componentPointerPackage PACKAGE
BEHAVIOUR
componentPointerPackageBehaviour BEHAVIOUR
DEFINED AS
"This package identifies a sequence of instances of Link connection and Subnetwork Connection managed objects which are components of a Subnetwork Connection, within a given layer.";;
ATTRIBUTES
componentPointers GET;
REGISTERED AS {m3100Package 53};

2.3.6 Composite Pointer Package

compositePointerPackage PACKAGE
BEHAVIOUR
compositePointerPackageBehaviour BEHAVIOUR
DEFINED AS
"This package identifies an instance of the Subnetwork Connection managed object class. Within a given layer, a given subnetwork connection is composed of a sequence of link

connections and subnetwork connections. This pointer points from one of these components to the composite subnetwork connection.";;

ATTRIBUTES

compositePointer GET;

REGISTERED AS {m3100Package 54};

2.3.7 Configured Connectivity

configuredConnectivityPackage PACKAGE

ATTRIBUTES

configuredConnectivity GET;

REGISTERED AS {m3100Package 55};

2.3.8 Connectivity Pointer Package

connectivityPointerPackage PACKAGE

BEHAVIOUR

connectivityPointerPackageBehaviour BEHAVIOUR

DEFINED AS

"This package identifies an instance of a Link connection or Trail managed object class which is terminated by the Network Termination Point.";;

ATTRIBUTES

connectivityPointer GET;

REGISTERED AS {m3100Package 56};

2.3.9 Contained Access Group List Package

containedAccessGroupListPackage PACKAGE

ATTRIBUTES

containedAccessGroupList GET-REPLACE ADD-REMOVE;

REGISTERED AS {m3100Package 57};

2.3.10 Contained In SubNetwork List Package

containedInSubNetworkListPackage PACKAGE

BEHAVIOUR

containedInSubNetworkListPackageBehaviour BEHAVIOUR

DEFINED AS

"This package identifies the aggregate subnetwork(s) that a component subnetwork is contained in through partitioning.

The component subnetwork may be named from a different layerNetworkDomain (associated with a different networkR1 administrative domain with a compatible signal identification) than the aggregate subnetwork if permitted by a policy.";;

ATTRIBUTES

containedInSubNetworkList GET-REPLACE ADD-REMOVE;

REGISTERED AS {m3100Package 58};

2.3.11 Contained Link End List Package

containedLinkEndListPackage PACKAGE

ATTRIBUTES

containedLinkEndList GET-REPLACE ADD-REMOVE;

REGISTERED AS {m3100Package 59};

2.3.12 Contained Link List Package

containedLinkListPackage PACKAGE

BEHAVIOUR

containedLinkListPackageBehaviour BEHAVIOUR

DEFINED AS

"This package identifies the links that a subnetwork contains through partitioning.

The link may be named from a different layerNetworkDomain (associated with a different networkR1 administrative domain with a compatible signal identification) than the aggregate subnetwork if permitted by a policy.";;

ATTRIBUTES

containedLinkList GET-REPLACE ADD-REMOVE;

REGISTERED AS {m3100Package 60};

2.3.13 Contained Network TP List Package

containedNetworkTPListPackage PACKAGE

ATTRIBUTES

containedNetworkTPList GET-REPLACE ADD-REMOVE
networkTTPAndSubnetworkNotCompatible
failureToAssociateNetworkTTP
failureToDisassociateNetworkTTP;

REGISTERED AS {m3100Package 61};

2.3.14 Contained SubNetwork List Package

containedSubNetworkListPackage PACKAGE

BEHAVIOUR

containedSubNetworkListPackageBehaviour BEHAVIOUR

DEFINED AS

"This package identifies the component subnetwork(s) that an aggregate subnetwork contains through partitioning.

The component subnetwork may be named from a different layerNetworkDomain (associated with a different networkR1 administrative domain with a compatible signal identification) than the aggregate subnetwork if permitted by policy.";;

ATTRIBUTES

containedSubNetworkList GET-REPLACE ADD-REMOVE;

REGISTERED AS {m3100Package 62};

2.3.15 Layer Connection List

layerConnectionListPackage PACKAGE

ATTRIBUTES

connectionList GET SET-BY-CREATE;

REGISTERED AS {m3100Package 63};

2.3.16 Logical Link Capacity Package

logicalLinkCapacityPackage PACKAGE

BEHAVIOUR

logicalLinkCapacityPacakageBehaviour BEHAVIOUR

DEFINED AS

"This package provides the support for the management of the capacity of a logical link. It specifies actions to assign and release link connections and/or bandwidth to a link.";;

ACTIONS

assignLinkConnectionOnLogicalLink,
deassignLinkConnectionFromLogicalLink;

REGISTERED AS {m3100Package 64};

2.3.17 Link Connection Pointer List Package

linkConnectionPointerListPackage PACKAGE

BEHAVIOUR

linkConnectionPointerListPackageBehaviour BEHAVIOUR

DEFINED AS

"This package identifies the list of link connections associated with a logical link.";;

ATTRIBUTES
linkConnectionPointerList GET-REPLACE ADD-REMOVE;
REGISTERED AS {m3100Package 65};

2.3.18 Link End Capacity Package

linkEndCapacityPackage PACKAGE
BEHAVIOUR
linkEndCapacityPackageBehaviour BEHAVIOUR
DEFINED AS
"This package provides the support for the management of the capacity of a link end. It specifies actions to assign and release network CTPs and/or bandwidth to a link end.";;
ACTIONS
assignNetworkCTPOnLogicalLinkEnd,
deassignNetworkCTPFromLogicalLinkEnd;
REGISTERED AS {m3100Package 66};

2.3.19 Link Pointer List Package

linkPointerListPackage PACKAGE
BEHAVIOUR
linkPointerListPackageBehaviour BEHAVIOUR
DEFINED AS
"This package identifies instances of the link managed object class.";;
ATTRIBUTES
linkPointerList GET;
REGISTERED AS {m3100Package 67};

2.3.20 Maximum Link Connection Count Package

maximumLinkConnectionCountPackage PACKAGE
ATTRIBUTES
maximumLinkConnectionCount GET;
REGISTERED AS {m3100Package 68};

2.3.21 Maximum Network CTP Count Package

maximumNetworkCTPCountPackage PACKAGE
ATTRIBUTES
maximumNetworkCTPCount GET;
REGISTERED AS {m3100Package 69};

2.3.22 NE Assignment Package

neAssignmentPackage PACKAGE
BEHAVIOUR
neAssignmentPackageBehaviour BEHAVIOUR
DEFINED AS
"The NE Assignment package provides a pointer from the lowest level Network TP in the partitioning hierarchy to a NE TP which represents the functionality which supports the Network TP. The sub-partition pointer for a NWCTP which utilises the NE assignment pointer will be NULL.";;
ATTRIBUTES
neAssignmentPointer GET;
REGISTERED AS {m3100Package 70};

2.3.23 Network CTPs In Link End List Package

networkCTPsInLinkEndListPackage PACKAGE
BEHAVIOUR
networkCTPsInLinkEndListPackageBehaviour BEHAVIOUR

DEFINED AS

"The Network CTPs In Link End List Package identifies the network CTPs that are present in the Logical Link End or Topological Link End managed object. ";;

ATTRIBUTES

networkCTPsInLinkEndList GET;

REGISTERED AS {m3100Package 71};

2.3.24 Network CTP Package

networkCTPPackage PACKAGE

BEHAVIOUR

networkCTPPackagePackageBehaviour BEHAVIOUR

DEFINED AS

"The Network CTP package identifies instances of the Network CTP managed object class at higher and lower levels of subnetwork partitioning (within a given layer) by the use of partitioning pointers. The Super Partition pointer is a pointer to a Network CTP which is in a higher level partition. This pointer will only be present for the Network CTPs in the lower partition which have a direct correspondence to the Network CTPs at the higher level. The higher level Network CTPs have an inverse pointer, the sub-partition pointer to the lower level. Where the lowest level of NWCTP points to a NE CTP via the NE assignment pointer, the value of the sub-partition pointer is null.";;

ATTRIBUTES

superPartitionPointer GET,

sub-partitionPointer GET;

REGISTERED AS {m3100Package 72};

2.3.25 Network TP Pointer Package

networkTPPointerPackage PACKAGE

BEHAVIOUR

networkTPPointerPackageBehaviour BEHAVIOUR

DEFINED AS

"This package defines a pointer to an instance of a network termination point. ";;

ATTRIBUTES

networkTPPointer GET;

REGISTERED AS {m3100Package 73};

2.3.26 Potential Link Capacity Package

potentialLinkCapacityPackage PACKAGE

ATTRIBUTES

potentialLinkCapacity GET;

REGISTERED AS {m3100Package 74};

2.3.27 Potential Link End Capacity Package

potentialLinkEndCapacityPackage PACKAGE

ATTRIBUTES

potentialLinkEndCapacity GET;

REGISTERED AS {m3100Package 75};

2.3.28 Provisioned Link Capacity Package

provisionedLinkCapacityPackage PACKAGE

ATTRIBUTES

provisionedLinkCapacity GET;

REGISTERED AS {m3100Package 76};

2.3.29 Provisioned Link Connection Count Package

provisionedLinkConnectionCountPackage PACKAGE
ATTRIBUTES
provisionedLinkConnectionCount GET;
REGISTERED AS {m3100Package 77};

2.3.30 Provisioned Link End Capacity Package

provisionedLinkEndCapacityPackage PACKAGE
ATTRIBUTES
provisionedLinkEndCapacity GET;
REGISTERED AS {m3100Package 78};

2.3.31 Provisioned Network CTP Count Package

provisionedNetworkCTPCountPackage PACKAGE
ATTRIBUTES
provisionedNetworkCTPCount GET;
REGISTERED AS {m3100Package 79};

2.3.32 Quality Of Connectivity Service Package

qualityOfConnectivityServicePackage PACKAGE
ATTRIBUTES
qualityOfConnectivityService GET
REGISTERED AS {m3100Package 80};

2.3.33 Related Routing Profile Package

relatedRoutingProfilePackage PACKAGE
ATTRIBUTES
relatedRoutingProfile GET;
REGISTERED AS {m3100Package 81};

2.3.34 Server TTP Pointer Package

serverTTPPointerPackage PACKAGE
ATTRIBUTES
serverTTPPointer GET;
REGISTERED AS {m3100Package 82};

2.3.35 SubNetwork Connection Pointer Package

sncPointerPackage PACKAGE
BEHAVIOUR
sncPointerPackageBehaviour BEHAVIOUR
DEFINED AS
"This package defines a pointer to instance(s) of the Subnetwork Connection managed object class, within a given layer.
The Subnetwork Connection Pointer attribute points to the managed object representing the relationship with the Network TP or subclass, within the same Subnetwork, that sends information (traffic) to this network TP or subclass, or is null. The referenced managed object shall represent a Subnetwork Connection. Where the network TP participates in many subnetwork connections for different subnetworks, the Subnetwork Connection Pointer is null.";;
ATTRIBUTES
subNetworkConnectionPointer GET;
REGISTERED AS {m3100Package 83};

2.3.36 Supported By Package

```
supportedByPackage PACKAGE
        ATTRIBUTES
                supportedByObjectList    GET-REPLACE ADD-REMOVE;
REGISTERED AS {m3100Package 84};
```

2.3.37 Topological Link Capacity Package

```
topologicalLinkCapacityPackage PACKAGE
        BEHAVIOUR
                topologicalLinkCapacityPackageBehaviour BEHAVIOUR
                        DEFINED AS
                                "This package provides the support for the management of the capacity of a topological link.
                                It specifies actions to assign and release link connections and/or bandwidth to a topological
                                link.";;
        ACTIONS
                addCapacityToTopologicalLink,
                removeCapacityFromTopologicalLink;
REGISTERED AS {m3100Package 85};
```

2.3.38 Topological Link End Capacity Package

```
topologicalLinkEndCapacityPackage PACKAGE
        BEHAVIOUR
                topologicalLinkEndCapacityPackageBehaviour BEHAVIOUR
                        DEFINED AS
                                "This package provides the support for the management of the capacity of a topological link
                                end. It specifies actions to assign and release network CTPs and/or bandwidth to a topological
                                link end.";;
        ACTIONS
                addCapacityToTopologicalLinkEnd,
                removeCapacityFromTopologicalLinkEnd;
REGISTERED AS {m3100Package 86};
```

2.3.39 Total Link Capacity Package

```
totalLinkCapacityPackage        PACKAGE
        ATTRIBUTES
                totalLinkCapacity               GET;
REGISTERED AS {m3100Package 87};
```

2.3.40 Total Link End Capacity Package

```
totalLinkEndCapacityPackage   PACKAGE
        ATTRIBUTES
                totalLinkEndCapacity            GET;
REGISTERED AS {m3100Package 88};
```

2.3.41 Traffic Descriptor Package

```
trafficDescriptorPackage PACKAGE
        ATTRIBUTES
                trafficDescriptor               GET-REPLACE
                                                newServiceCharacteristicsExistsAlready
                                                newTrafficDescriptorExistsAlready
                                                invalidServiceCharacteristicsRequested
                                                invalidTrafficDescriptorRequested;
REGISTERED AS {m3100Package 89};
```

2.3.42 Unknown Status Package

```
unknownStatusPackage   PACKAGE
        ATTRIBUTES
                "ITU-T X.721|ISO/IEC 10165-2:1992":unknownStatus          GET;
REGISTERED AS {m3100Package 90};
```

2.3.43 Usage Cost Package

```
usageCostPackage  PACKAGE
        ATTRIBUTES
                usageCost                                   GET;
REGISTERED AS {m3100Package 91};
```

2.3.44 Usage State Package

```
usageStatePackage  PACKAGE
        ATTRIBUTES
                "ITU-T X.721|ISO/IEC 10165-2:1992":usageState    GET;
REGISTERED AS {m3100Package 92};
```

2.4 Attributes

2.4.1 Access Group Id

```
accessGroupId ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
        MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
        BEHAVIOUR
                accessGroupIdBehaviour BEHAVIOUR
                        DEFINED AS
                                "The Access Group Id is an attribute type whose distinguished value can be used as an RDN
                                when naming an instance of the Access Group object class.";;
REGISTERED AS {m3100Attribute 83};
```

2.4.2 Access Point List

```
accessPointList ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.TPList;
        MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
        BEHAVIOUR
                accessPointListBehaviour BEHAVIOUR
                        DEFINED AS
                                "The Access Point List attribute lists all the Network Trail Termination Points within an
                                instance of the managed object class Access Group.";;
REGISTERED AS {m3100Attribute 84};
```

2.4.3 A End

```
aEnd ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectInstance;
        MATCHES FOR EQUALITY;
                BEHAVIOUR
                        aEndBehaviour BEHAVIOUR
                                DEFINED AS
                                "This attribute is a pointer to a subnetwork, a link end or an access group in the same
                                network layer domain.";;
REGISTERED AS {m3100Attribute 85};
```

2.4.4 A-End Network TP List

aEndNetworkTPList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
aEndNWTPListBehaviour BEHAVIOUR
DEFINED AS
"The value of this attribute identifies one or more network termination points of an instance of a subclass of the Connectivity object class. This attribute cannot be null.";;
REGISTERED AS {m3100Attribute 86};

2.4.5 Assigned Link End Capacity

assignedLinkEndCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointCapacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
assignedLinkEndCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of Network CTPs associated with a Link End that have been assigned or the bandwidth that has been assigned.";;
REGISTERED AS {m3100Attribute 87};

2.4.6 Available Link End Capacity

availableLinkEndCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointCapacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
availableLinkEndCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of Network CTPs associated with a Link End that have spare capacity or the amount of spare bandwidth associated with a Link End.";;
REGISTERED AS {m3100Attribute 88};

2.4.7 Available Link Capacity

availableLinkCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Capacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
availableLinkCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the available capacity of a link expressed as either the number of link connections that are avaiable or the bandwidth that is available to that link.";;
REGISTERED AS {m3100Attribute 89};

2.4.8 Client CTP List

clientCTPList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
clientCTPListBehaviour BEHAVIOUR
DEFINED AS
"This attribute defines the CTP or list of CTPs which are clients of a TTP or TTPs in another layer. Usually a single TTP in a higher order layer will support a number of CTPs in a lower order layer. Alternatively, where concatenation is used, a number of TTPs in a lower order layer may serve a CTP or CTPs in a higher order layer.";;
REGISTERED AS {m3100Attribute 90};

2.4.9 Client Link End Pointer List

clientLinkEndPointerList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
clientLinkEndPointerBehaviour BEHAVIOUR
DEFINED AS
"This attribute is a set of pointers to the link ends that reflect the properties of a network trail termination point in the client layer network domain(s).";;
REGISTERED AS {m3100Attribute 91};

2.4.10 Client Link Pointer List

clientLinkPointerList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
clientLinkPointerBehaviour BEHAVIOUR
DEFINED AS
"This attribute is a set of pointers to the topological links that reflect the capacity of a trail in the client layer network domain(s).";;
REGISTERED AS {m3100Attribute 92};

2.4.11 Client Link Pointer List

clientLinkConnectionPointerList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
clientLinkConnectionPointerListBehaviour BEHAVIOUR
DEFINED AS
"This attribute of a trail that is a set of pointers to the link connections in the client layer network domain(s) that are supported by the trail.";;
REGISTERED AS {m3100Attribute 93};

2.4.12 Component Pointers

componentPointers ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
componentPointersBehaviour BEHAVIOUR
DEFINED AS
"This attribute is used where the Subnetwork Connection is made up of a number of component Subnetwork Connections and Link connections within the same layer.";;
REGISTERED AS {m3100Attribute 94};

2.4.13 Composite Pointer

compositePointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
compositePointerBehaviour BEHAVIOUR
DEFINED AS
"This attribute is used where the connectivity instance is a component of a Subnetwork Connection within the same layer.";;
REGISTERED AS {m3100Attribute 95};

2.4.14 Configured Connectivity

configuredConnectivity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ConfiguredConnectivity;
MATCHES FOR EQUALITY;
BEHAVIOUR
configuredConnectivityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the configured connectivity of a Network Termination Point managed object (or subclass). The possible values for this attribute are sourceConnect, sinkConnect, bidirectionalConnect and noConnect.

For a Network Termination Point managed object with pointDirectionality equal to sink, the allowed values for this attribute are noConnect and sinkConnect.

For a Network Termination Point managed object with pointDirectionality equal to source, the allowed values for this attribute are noConnect and sourceConnect.

For a Network Termination Point managed object with pointDirectionality equal to bidirectional, the allowed values for this attribute are noConnect and bidirectionalConnect. For some technologies, sinkConnect and sourceConnect may also be allowed for a bidirectional Network Termination Point managed object.";;
REGISTERED AS {m3100Attribute 96};

2.4.15 Connection List

connectionList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
connectionListBehaviour BEHAVIOUR
DEFINED AS
"This attribute defines the list of Link Connections and subnetwork connections in a given layer which may compose a Trail in the same layer. This composition of Connectivity instances may be a simple sequence or, in the multipoint case, a tree structure.";;
REGISTERED AS {m3100Attribute 97};

2.4.16 Connectivity Pointer

connectivityPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ConnectivityPointer;
MATCHES FOR EQUALITY;
BEHAVIOUR
connectivityPointerBehaviour BEHAVIOUR
DEFINED AS
"This attribute points to the Link connection or Trail terminated by the Network Termination Point.";;
REGISTERED AS {m3100Attribute 98};

2.4.17 Contained Access Group List

containedAccessGroupList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
containedAccessGroupListBehaviour BEHAVIOUR
DEFINED AS
"This attribute defines the list of Access Group instances which are contained in the Subnetwork.";;
REGISTERED AS {m3100Attribute 99};

2.4.18 Contained In SubNetwork List

containedInSubNetworkList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
containedInSubNetworkListBehaviour BEHAVIOUR
DEFINED AS
"This attribute defines the list of parent Subnetworks which contain the Access Group, Link End, or Subnetwork in a given layer.";;
REGISTERED AS {m3100Attribute 100};

2.4.19 Contained Link End List

containedLinkEndList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
containedLinkEndBehaviour BEHAVIOUR
DEFINED AS
"This attribute is used to describe the internal topology of a subnetwork from the point perspective (in a given layer). This topology comprises link ends and subnetworks. The link ends are listed in this attribute.";;
REGISTERED AS {m3100Attribute 101};

2.4.20 Contained Link List

containedLinkList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
containedLinkBehaviour BEHAVIOUR
DEFINED AS
"This attribute is used to describe the internal topology of a subnetwork (in a given layer). This topology comprises links and subnetworks. The links are listed in this attribute.";;
REGISTERED AS {m3100Attribute 102};

2.4.21 Contained Network TP List

containedNetworkTPList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
containedNetworkTPListBehaviour BEHAVIOUR
DEFINED AS
"This attribute is a list of pointers to network TPs that are contained in a subnetwork.";;
REGISTERED AS {m3100Attribute 103};

2.4.22 Contained SubNetwork List

containedSubNetworkList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
containedSubNetworkListBehaviour BEHAVIOUR
DEFINED AS
"This attribute is used to describe the internal topology of a subnetwork (in a given layer). This topology comprises links and subnetworks. The subnetworks are listed in this attribute.";;
REGISTERED AS {m3100Attribute 104};

2.4.23 Layer Network Domain Id

```
layerNetworkDomainId ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
        MATCHES FOR EQUALITY;
REGISTERED AS {m3100Attribute 105};
```

2.4.24 Link Connection Pointer List

```
linkConnectionPointerList ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
        MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
        BEHAVIOUR
                linkConnectionPointerListBehaviour BEHAVIOUR
                        DEFINED AS
                                "This attribute defines the list of Link Connections in a given layer which may compose a
                                Logical Link in the same layer.";;
REGISTERED AS {m3100Attribute 106};
```

2.4.25 Link Directionality

```
linkDirectionality ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.LinkDirectionality;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
                linkDirectionalityBehaviour      BEHAVIOUR
                        DEFINED AS
                                "The Link Directionality attribute type specifies whether the associated link managed object is
                                uni- or bidirectional, or  undefined";;
REGISTERED AS {m3100Attribute 107};
```

2.4.26 Link End Id

```
linkEndId  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
                linkEndIdBehaviour BEHAVIOUR
                        DEFINED AS
                                "The Link End Id is an attribute type whose distinguished value can be used as an RDN when
                                naming an instance of the Link End object class.";;
REGISTERED AS {m3100Attribute 108};
```

2.4.27 Link Id

```
linkId ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
        MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
        BEHAVIOUR
                linkIdBehaviour BEHAVIOUR
                        DEFINED AS
                                "The Link Id is an attribute type whose distinguished value can be used as an RDN when
                                naming an instance of the Link object class.";;
REGISTERED AS {m3100Attribute 109};
```

2.4.28 Link Pointer

linkPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
linkPointerBehaviour BEHAVIOUR
DEFINED AS
"The Link Pointer attribute points to a link from a link end.
";;
REGISTERED AS {m3100Attribute 110};

2.4.29 Link Pointer List

linkPointerList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY;
BEHAVIOUR
linkPointerListBehaviour BEHAVIOUR
DEFINED AS
"This attribute points to the links terminated by the subnetwork or the link terminated by an access group";;
REGISTERED AS {m3100Attribute 111};

2.4.30 Logical Link End Directionality

logicalEndDirectionality ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointDirectionality;
MATCHES FOR EQUALITY;
BEHAVIOUR
logicalEndDirectionalityBehaviour BEHAVIOUR
DEFINED AS
"The Logical End Directionality attribute type specifies whether the associated link end managed object is sink, source, or bidirectional.";;
REGISTERED AS {m3100Attribute 112};

2.4.31 Maximum Link Connection Count

maximumLinkConnectionCount ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Count;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
maximumLinkConnectionCountBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the maximum number of link connections associated with a link when flexible bandwidth allocation is supported.";;
REGISTERED AS {m3100Attribute 113};

2.4.32 Maximum Network CTP Count

maximumNetworkCTPCount ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Count;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
maximumNetworkCTPCountBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the maximum number of Network CTPs associated with a Link End.";;
REGISTERED AS {m3100Attribute 114};

2.4.33 NE Assignment Pointer

neAssignmentPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NeAssignmentPointer;
MATCHES FOR EQUALITY;
BEHAVIOUR
neAssignmentPointerBehaviour BEHAVIOUR
DEFINED AS
"The NE Assignment Pointer attribute points from the lowest level Network TP in the partitioning hierarchy to a NE TP which represents the functionality which supports the Network TP. The sub-partition pointer for a NWCTP which utilises the NE assignment pointer will be NULL.";;
REGISTERED AS {m3100Attribute 115};

2.4.34 Network CTPs In Link End List

networkCTPsInLinkEndList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.TPList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
networkCTPsInLinkEndListBehaviour BEHAVIOUR
DEFINED AS
"This attribute lists the NetworkCTPs that are represented by a Link End.";;
REGISTERED AS {m3100Attribute 116};

2.4.35 Network TP Pointer

networkTPPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
networkTPPointerBehaviour BEHAVIOUR
DEFINED AS
"The Network TP Pointer attribute points to a network termination point.";;
REGISTERED AS {m3100Attribute 117};

2.4.36 Point Directionality

pointDirectionality ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointDirectionality;
MATCHES FOR EQUALITY;
BEHAVIOUR
pointDirectionalityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the directionality of a networkTP managed object instance.";;
REGISTERED AS {m3100Attribute 118};

2.4.37 Potential Link Capacity

potentialLinkCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Capacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
potentialLinkCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of link connections or the amount of bandwidth that has not yet been assigned to a Link, but that could be assigned to the Link from the server trail.";;
REGISTERED AS {m3100Attribute 119};

2.4.38 Potential Link End Capacity

potentialLinkEndCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointCapacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
potentialLinkEndCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of Network CTP or the amount of bandwidth that have not yet been assigned to a Link End, but that could be assigned to the Link End from the server trail termination point.";;
REGISTERED AS {m3100Attribute 120};

2.4.39 Provisioned Link Capacity

provisionedLinkCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Capacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
provisionedLinkCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of link connections assigned to a Link or the amount of bandwidth assigned to a Link.";;
REGISTERED AS {m3100Attribute 121};

2.4.40 Provisioned Link Connection Count

provisionedLinkConnectionCount ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Count;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
provisionedLinkConnectionCountBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of link connections assigned to that link when flexible bandwidth allocation is supported.";;
REGISTERED AS {m3100Attribute 122};

2.4.41 Provisioned Link End Capacity

provisionedLinkEndCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointCapacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
provisionedLinkEndCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of network CTPs assigned to a LinkEnd or the amount of bandwidth assigned to a LinkEnd.";;
REGISTERED AS {m3100Attribute 123};

2.4.42 Provisioned Network CTP Count

provisionedNetworkCTPCount ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Count;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
provisionedNetworkCTPCountBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the number of Network CTPs associated with a Link End that have been assigned.";;
REGISTERED AS {m3100Attribute 124};

2.4.43 Quality Of Connectivity Service

qualityOfConnectivityService ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
qualityOfConnectivityServiceBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the quality of service for Connectivity and its subclasses, and requires further definition.";;
REGISTERED AS {m3100Attribute 125};

2.4.44 Related Routing Profile

relatedRoutingProfile ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectInstance;
MATCHES FOR EQUALITY;
REGISTERED AS {m3100Attribute 126};

2.4.45 Server Trail

serverTrail ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2. RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
serverTrailBehaviour BEHAVIOUR
DEFINED AS
"This attribute pointer to a trail in the server layer that supports the link in a client.";;
REGISTERED AS {m3100Attribute 127};

2.4.46 Server TTP Pointer

serverTTPPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY;
BEHAVIOUR
serverTTPPointerbehaviour BEHAVIOUR
DEFINED AS
"This attribute defines the TTP which may serve a CTP and/or link End in another layer. Usually a TTP or TTPs in a higher order layer will serve a CTP or CTPs in a lower order layer.";;
REGISTERED AS {m3100Attribute 128};

2.4.47 Signal Identification

signalId ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.SignalId;
MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
BEHAVIOUR
signalIdBehaviour BEHAVIOUR
DEFINED AS
"This attribute defines the characteristic information of the layer (in the G.805 sense) to which the entity under consideration belongs. It is used to determine whether subnetwork connection/connectivity is possible. The signal Id may be a simple rate and format or may be a bundle of entities with the same characteristic information which form an aggregate signal.";;
REGISTERED AS {m3100Attribute 129};

2.4.48 Sub-partition Pointer

sub-partitionPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
sub-partitionPointerBehaviour BEHAVIOUR
DEFINED AS
"The Sub-partition Pointer is a pointer to a Network CTP which is in a lower level partition. Where the lowest level of NWCTP points to a NE CTP via the NE Assignment Pointer, the value of the Sub-partition Pointer is null.";;
REGISTERED AS {m3100Attribute 130};

2.4.49 SubNetwork Connection Id

subNetworkConnectionId ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
BEHAVIOUR
subNetworkConnectionIdBehaviour BEHAVIOUR
DEFINED AS
"The Subnetwork Connection Id is an attribute type whose distinguished value can be used as an RDN when naming an instance of the subnetwork Connection object class.";;
REGISTERED AS {m3100Attribute 131};

2.4.50 Subnetwork Connection Pointer

subNetworkConnectionPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.SubNetworkConnectionPointerList;
MATCHES FOR EQUALITY;
BEHAVIOUR
subNetworkConnectionPointerBehaviour BEHAVIOUR
DEFINED AS
"The Subnetwork Connection Pointer attribute points to the ordered list of subnetwork Connection(s) which have a relationship with the network termination point When no subnetwork connection is present this pointer points to a subnetwork or is NULL. This list has a single entry for point-to-point applications, and may have mutliple entries for point-to-multipoint applications.";;
REGISTERED AS {m3100Attribute 132};

2.4.51 SubNetwork Id

subNetworkId ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
MATCHES FOR EQUALITY;
BEHAVIOUR
subNetworkIdBehaviour BEHAVIOUR
DEFINED AS
"The Subnetwork Id is an attribute type whose distinguished value can be used as an RDN when naming an instance of the Subnetwork object class.";;
REGISTERED AS {m3100Attribute 133};

2.4.52 Super Partition Pointer

superPartitionPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
superPartitionPointerBehaviour BEHAVIOUR
DEFINED AS
"The Super Partition Pointer is a pointer to a Network CTP which is in a higher level partition. It will only be present for those Network CTPs in the lower partition which have a direct correspondence to the Network CTPs at the higher level. It can be null.";;
REGISTERED AS {m3100Attribute 134};

2.4.53 Topological End Directionality

topologicalEndDirectionality ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.TopologicalEndDirectionality;
MATCHES FOR EQUALITY;
BEHAVIOUR
topologicalEndDirectionalityBehaviour BEHAVIOUR
DEFINED AS
"The Topological End Directionality attribute type specifies whether the associated link end managed object is sink, source, bidirectional, or undefined.";;
REGISTERED AS {m3100Attribute 135};

2.4.54 Topological Group Pointer

topologicalGroupPointer ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.RelatedObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
topologicalGroupPointerBehaviour BEHAVIOUR
DEFINED AS
"The Topological Group Pointer is an attribute type which identifies an instance of the Topological Point managed object class or identifies an instance of the Access Group managed object class.";;
REGISTERED AS {m3100Attribute 136};

2.4.55 Topological Point Id

topologicalPointId ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.NameType;
MATCHES FOR EQUALITY;
BEHAVIOUR
topologicalPointIdBehaviour BEHAVIOUR
DEFINED AS
"The Topological Point Id is an attribute type whose distinguished value can be used as an RDN when naming an instance of the Topological Point object class.";;
REGISTERED AS {m3100Attribute 137};

2.4.56 Total Link Capacity

totalLinkCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Capacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
totalLinkCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the total capacity of a Link which may be the number of Link connections contained in a Link or the total bandwidth available to the Link.";;
REGISTERED AS {m3100Attribute 138};

2.4.57 Total Link End Capacity

totalLinkEndCapacity ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PointCapacity;
MATCHES FOR EQUALITY, ORDERING;
BEHAVIOUR
totalLinkEndCapacityBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the total capacity of a Link End which is either the total number of NetworkCTPs associated with a Link End or the total bandwidth of the Link End.";;
REGISTERED AS {m3100Attribute 139};

2.4.58 Traffic Descriptor

trafficDescriptor ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.TrafficDescriptor;
MATCHES FOR EQUALITY;
BEHAVIOUR
trafficDescriptorBehaviour BEHAVIOUR
DEFINED AS
"This attribute contains the traffic descriptor of a trail. It is to be used with flexible bandwidth allocation.";;
REGISTERED AS {m3100Attribute 140};

2.4.59 Usage Cost

usageCost ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.UsageCost;
MATCHES FOR EQUALITY;
BEHAVIOUR
usageCostBehaviour BEHAVIOUR
DEFINED AS
"This attribute contains the costs for a transport entity. It is to be used as selection/routing criteria.";;
REGISTERED AS {m3100Attribute 141};

2.4.60 Z-End

zEnd ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectInstance;
MATCHES FOR EQUALITY;
BEHAVIOUR
zEndBehaviour BEHAVIOUR
DEFINED AS
"This attribute is a pointer to a subnetwork, a link end, or access group in the same network layer domain.";;
REGISTERED AS {m3100Attribute 142};

2.4.61 Z-End Network TP List

zEndNetworkTPList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ObjectList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
zEndNetworkTPListBehaviour BEHAVIOUR
DEFINED AS
"The value of this attribute identifies one or more network termination points of an instance of a subclass of the Connectivity object class.";;
REGISTERED AS {m3100Attribute 143};

2.5 Actions

2.5.1 Add Capacity to Topological Link

addCapacityToTopologicalLink ACTION
BEHAVIOUR
addCapacityToTopologicalLinkBehaviour BEHAVIOUR
DEFINED AS
"This action adds capacity to a topological link by adding link connections or increasing the available bandwidth.
This action will return an AddCapacityToTopologicalLinkResult with a resultingLinkConnections field containing a NULL value when dynamic bandwidth is being assigned.
<ITU-T G.854.8:OPERATION, addCapacityToTopologicalLink >";;
MODECONFIRMED;
PARAMETERS
noSuchLink,
insufficientCapacity,
invalidChannelsNumber,
channelsAlreadyProvisioned,
failureToCreateLCs,
failureToAssociateLCs,
failureToSupportLCs,
failureToIncreaseCapacity;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.AddCapacityToTopologicalLinkInformation;
WITH REPLY SYNTAX
M3100ASN1TypeModule2.AddCapacityToTopologicalLinkResult;
REGISTERED AS {m3100Action 12};

2.5.2 Add Capacity to Topological Link End

addCapacityToTopologicalLinkEnd ACTION
BEHAVIOUR
addCapacityToTopologicalLinkEndBehaviour BEHAVIOUR
DEFINED AS
"This action adds capacity to a topological link end by adding network CTPs or by increasing the available bandwidth.
<ITU-T G.854.8:OPERATION, addCapacityToTopologicalLinkEnd >";;
MODECONFIRMED;
PARAMETERS
noSuchLinkEnd,
insufficientCapacity,
invalidChannelsNumber,
channelsAlreadyProvisioned,
failureToCreateLCs,
failureToAssociateLCs,
failureToSupportLCs,
failureToIncreaseCapacity;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.AddCapacityToTopologicalLinkEndInformation;
WITH REPLY SYNTAX
M3100ASN1TypeModule2.AddCapacityToTopologicalLinkEndResult;
REGISTERED AS {m3100Action 13};

2.5.3 Assign Link Connection on Logical Link

assignLinkConnectionOnLogicalLink ACTION
BEHAVIOUR
assignLinkConnectionOnLogicalLinkBehaviour BEHAVIOUR
DEFINED AS
"This action assigns link connections to a Logical Link.
The pointers to the link connections that are assigned will be added to the linkConnectionPointerList attribute of the logicalLink managed object.
<ITU-T G.854.10:OPERATION, assignLinkConnectionOnLink >";;
MODECONFIRMED;
PARAMETERS
linkAndLinkConnectionNotCompatible,
invalidLinkConnection,
notEnoughLinkConnections,
linkConnectionAlreadyAssigned,
inconsistentSignalIdentification,
inconsistentDirectionality,
failureToSetLinkConnectionCallerId,
failureToDecreaseCapacity;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.AssignLinkConnectionOnLogicalLinkInformation;
WITH REPLY SYNTAX
M3100ASN1TypeModule2.AssignLinkConnectionOnLogicalLinkResult;
REGISTERED AS {m3100Action 14};

2.5.4 Assign NetworkCTP on Logical Link End

assignNetworkCTPOnLogicalLinkEnd ACTION
BEHAVIOUR
assignNetworkCTPOnLogicalLinkEndBehaviour BEHAVIOUR
DEFINED AS
"This action assigns networkCTPs to a logical link end.
<ITU-T G.854.10:OPERATION, assignNetworkCTPOnLinkEnd >";;
MODECONFIRMED;
PARAMETERS
linkEndAndNetworkCTPNotCompatible,
invalidNetworkCTP,
notEnoughNetworkCTPs,
networkCTPAlreadyAssigned,
inconsistentSignalIdentification,
inconsistentDirectionality,
failureToSetNetworkCTPCallerId,
failureToDecreaseCapacity;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.AssignNetworkCTPOnLogicalLinkEndInformation;
WITH REPLY SYNTAX
M3100ASN1TypeModule2.AssignNetworkCTPOnLogicalLinkEndResult;
REGISTERED AS {m3100Action 15};

2.5.5 De-assign Link Connection from Logical Link

deassignLinkConnectionFromLogicalLink ACTION
BEHAVIOUR
deassignLinkConnectionFromLogicalLinkBehaviour BEHAVIOUR
DEFINED AS
"This action de-assigns a link connection in a layer domain to a logical link in the same layer domain.
<ITU-T G.854.10:OPERATION, deassignLinkConnectionFromLink >";;

MODECONFIRMED;
PARAMETERS
linkAndLinkConnectionNotCompatible,
invalidLinkConnection,
notAssignedToCaller,
failureToDeassignLinkConnection,
failureToIncreaseCapacity;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.DeassignLinkConnectionFromLogicalLinkInformation;
REGISTERED AS {m3100Action 16};

2.5.6 De-assign Network CTP from Logical Link End

deassignNetworkCTPFromLogicalLinkEnd ACTION
BEHAVIOUR
deassignNetworkCTPFromLogicalLinkEndBehaviour BEHAVIOUR
DEFINED AS
"This action de-assigns a network CTP instance from a logical link end.
<ITU-T G.854.10:OPERATION, deassignNetworkCTPFromLinkEnd >";;
MODECONFIRMED;
PARAMETERS
linkEndAndNetworkCTPNotCompatible,
invalidNetworkCTP,
notAssignedToCaller,
failureToDeassignNetworkCTP,
failureToIncreaseCapacity;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.DeassignNetworkCTPFromLogicalLinkEndInformation;
REGISTERED AS {m3100Action 17};

2.5.7 Remove Capacity from Topological Link

removeCapacityFromTopologicalLink ACTION
BEHAVIOUR
removeCapacityFromTopologicalLinkBehaviour BEHAVIOUR
DEFINED AS
"This action removes capacity from the topological link by removing link connections and/or bandwidth from the link.
<ITU-T G.854.8:OPERATION, removeCapacityFromTopologicalLink >";;
MODECONFIRMED;
PARAMETERS
noSuchLink,
insufficientCapacity,
invalidChannelsNumber,
failureToDecreaseCapacity,
failureToRemoveLC;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.RemoveCapacityFromTopologicalLinkInformation;
WITH REPLY SYNTAX
M3100ASN1TypeModule2.RemoveCapacityFromTopologicalLinkResult;
REGISTERED AS {m3100Action 18};

2.5.8 Remove Capacity from Topological Link End

removeCapacityFromTopologicalLinkEnd ACTION
BEHAVIOUR
removeCapacityFromTopologicalLinkEndBehaviour BEHAVIOUR
DEFINED AS
"This action removes capacity from a topological link end by removal of network CTPs from the topological link end and/or by the removal of bandwidth.
This action will return an RemoveCapacityToTopologicalLinkResult with a resultingLinkConnections field containing a NULL value when dynamic bandwidth is being unassigned.
<ITU-T G.854.8:OPERATION, removeCapacityFromTopologicalLinkEnd >";;
MODECONFIRMED;
PARAMETERS
noSuchLinkEnd,
insufficientCapacity,
invalidChannelsNumber,
failureToDecreaseCapacity,
failureToRemoveLC;
WITH INFORMATION SYNTAX
M3100ASN1TypeModule2.RemoveCapacityFromTopLinkEndInformation;
WITH REPLY SYNTAX
M3100ASN1TypeModule2.RemoveCapacityFromTopLinkEndResult;
REGISTERED AS {m3100Action 19};

2.6 Notifications

None.

2.7 Parameters

boundSubnetwork PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 6};

channelsAlreadyProvisioned PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.Channels;
REGISTERED AS {m3100Parameter 7};

failureToAddLinkConnections PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 8};

failureToAddNetworkCTPs PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 9};

failureToAssociateLCs PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 10};

failureToAssociateNetworkTTP PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 11};

```
failureToDeassignLinkConnection      PARAMETER
        CONTEXT                      SPECIFIC-ERROR;
        WITH SYNTAX                  M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 12};

failureToDeassignNetworkCTP  PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 13};

failureToDecreaseCapacity    PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.Capacities;
REGISTERED AS {m3100Parameter 14};

failureToIncreaseCapacity    PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.Capacities;
REGISTERED AS {m3100Parameter 15};

failureToRemoveLC            PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 16};

failureToBindLink        PARAMETER
        CONTEXT          SPECIFIC-ERROR;
        WITH SYNTAX      M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 17};

failureToBindLinkEnd     PARAMETER
        CONTEXT          SPECIFIC-ERROR;
        WITH SYNTAX      M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 18};

failureToBindTopologicalLink  PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 19};

failureToCreateAccessGroup   PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 20};

failureToCreateLink          PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 21};

failureToCreateLCs           PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 22};

failureToCreateLinkEnd       PARAMETER
        CONTEXT              SPECIFIC-ERROR;
        WITH SYNTAX          M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 23};
```

```
failureToCreateNetworkTTP       PARAMETER
        CONTEXT                 SPECIFIC-ERROR;
        WITH SYNTAX             M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 24};

failureToCreateSubnetwork       PARAMETER
        CONTEXT                 SPECIFIC-ERROR;
        WITH SYNTAX             M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 25};

failureToDisassociateNetworkTTP       PARAMETER
        CONTEXT                       SPECIFIC-ERROR;
        WITH SYNTAX                   M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 26};

failureToRemoveAccessGroup    PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 27};

failureToRemoveNetworkCTPs    PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 28};

failureToRemoveNetworkTTP     PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 29};

failureToRemoveSubnetwork     PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 30};

failureToSetDirectionality    PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 31};

failureToSetLinkConnectionCallerId   PARAMETER
        CONTEXT                      SPECIFIC-ERROR;
        WITH SYNTAX                  M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 32};

failureToSetNetworkCTPCallerId       PARAMETER
        CONTEXT                      SPECIFIC-ERROR;
        WITH SYNTAX                  M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 33};

failureToSetUserIdentifier PARAMETER
        CONTEXT            SPECIFIC-ERROR;
        WITH SYNTAX        M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 34};

failureToSupportLCs     PARAMETER
        CONTEXT         SPECIFIC-ERROR;
        WITH SYNTAX     M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 35};
```

```
inconsistentDirectionality          PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 36};

inconsistentSignalIdentification    PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 37};

insufficientCapacity                PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.Capacity;
REGISTERED AS {m3100Parameter 38};

invalidChannelsNumber               PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.Channels;
REGISTERED AS {m3100Parameter 39};

invalidLinkConnection               PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 40};

invalidNetworkCTP                   PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 41};

invalidServiceCharacteristicsRequested      PARAMETER
        CONTEXT                             SPECIFIC-ERROR;
        WITH SYNTAX                         M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 42};

invalidTPType                       PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 43};

invalidTrafficDescriptorRequested   PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 44};

linkConnectionAlreadyAssigned       PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 45};

linkEndAndNetworkCTPNotCompatible   PARAMETER
        CONTEXT                     SPECIFIC-ERROR;
        WITH SYNTAX                 M3100ASN1TypeModule2.ObjectList;
REGISTERED AS {m3100Parameter 46};

linkAndLinkConnectionNotCompatible      PARAMETER
        CONTEXT                         SPECIFIC-ERROR;
        WITH SYNTAX                     M3100ASN1TypeModule2.ObjectList;
REGISTERED AS {m3100Parameter 47};
```

```
networkCTPAlreadyAssigned     PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 48};

networkTTPAndAccessGroupNotCompatible PARAMETER
        CONTEXT                       SPECIFIC-ERROR;
        WITH SYNTAX                   M3100ASN1TypeModule2. None;
REGISTERED AS {m3100Parameter 49};

networkTTPAndSubnetworkNotCompatible  PARAMETER
        CONTEXT                       SPECIFIC-ERROR;
        WITH SYNTAX                   M3100ASN1TypeModule2. None;
REGISTERED AS {m3100Parameter 50};

networkTTPAssociatedWithAccessGroup   PARAMETER
        CONTEXT                       SPECIFIC-ERROR;
        WITH SYNTAX                   M3100ASN1TypeModule2. ObjectInstance;
REGISTERED AS {m3100Parameter 51};

networkTTPAssociatedWithSubnetwork    PARAMETER
        CONTEXT                       SPECIFIC-ERROR;
        WITH SYNTAX                   M3100ASN1TypeModule2. ObjectInstance;
REGISTERED AS {m3100Parameter 52};

networkTTPsExisting           PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 53};

networkTTPTerminatesTrail     PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 54};

newServiceCharacteristicsExistsAlready    PARAMETER
        CONTEXT                           SPECIFIC-ERROR;
        WITH SYNTAX                       M3100ASN1TypeModule2.SignalId;
REGISTERED AS {m3100Parameter 55};

newTrafficDescriptorExistsAlready     PARAMETER
        CONTEXT                       SPECIFIC-ERROR;
        WITH SYNTAX                   M3100ASN1TypeModule2.SignalId;
REGISTERED AS {m3100Parameter 56};

noLinkCapacity                PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 57};

noLinkEndCapacity             PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 58};

noSuchLink                    PARAMETER
        CONTEXT               SPECIFIC-ERROR;
        WITH SYNTAX           M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 59};
```

noSuchLinkEnd PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 60};

notAssignedToCaller PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.ObjectInstance;
REGISTERED AS {m3100Parameter 61};

notEnoughLinkConnections PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.Count;
REGISTERED AS {m3100Parameter 62};

notEnoughNetworkCTPs PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.Count;
REGISTERED AS {m3100Parameter 63};

subnetworkInUse PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.None;
REGISTERED AS {m3100Parameter 64};

2.8 Name Bindings

2.8.1 Access Group

accessGroup-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS accessGroup AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE accessGroupId;
BEHAVIOUR
accessGroup-layerNetworkDomainBehaviour BEHAVIOUR
DEFINED AS
"If, during a create operation, the topologicalEndDirectionality attribute fails to be set or the access group object fails to be created, the create operation will fail with the specific error with the value of either failureToSetDirectionality or failureToCreateAccessGroup respectively.
If, during a delete operation, the accessPointList is not NULL the delete operation will fail with the specific error with the value networkTTPsExisting. If the access group managed object is not deleted, the delete operation will fail with the specific error with the value failureToRemoveAccessGroup.
<ITU-T˚G.854.3:OPERATION,createAccessGroup, OUTPUT_PARAMETERS:accessGroup>
<ITU-T˚G.854.3:OPERATION,createAccessGroup, OUTPUT_PARAMETERS:none>";;
CREATE
WITH-REFERENCE-OBJECT
failureToSetDirectionality
failureToCreateAccessGroup;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
networkTTPsExisting
failureToRemoveAccessGroup;
REGISTERED AS {m3100NameBinding 63};

2.8.2 Layer Network Domain

layerNetworkDomain-networkR1 NAME BINDING
SUBORDINATE OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS networkR1 AND SUBCLASSES;
WITH ATTRIBUTE networkId;
CREATE
WITH-REFERENCE-OBJECT;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {m3100NameBinding 64};

2.8.3 Logical Link

logicalLink-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS logicalLink AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE linkId;
BEHAVIOUR
logicalLink-layerNetworkDomainBehaviour BEHAVIOUR
DEFINED AS
"The logicalLink managed object is created by the establishLink or establishLinkAndLinkEnds action.
<ITU-T G.854.3,OPERATION:createLink,OUTPUT_PARAMETERS:link>
The logicalLink managed object is deleted by the removeLink or removeLinkAndLinkEnds.
<ITU-T˚G.854.3,OPERATION:deleteLink,OUTPUT_PARAMETERS:none>";;
REGISTERED AS {m3100NameBinding 65};

2.8.4 Link Connection

linkConnection-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS linkConnection AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE connectionId;
REGISTERED AS {m3100NameBinding 66};

linkConnection-topologicalLink NAME BINDING
SUBORDINATE OBJECT CLASS linkConnection AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS topologicalLink AND SUBCLASSES;
WITH ATTRIBUTE connectionId;
REGISTERED AS {m3100NameBinding 67};

2.8.5 Logical Link End

logicalLinkEnd-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS logicalLinkEnd AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE linkEndId;
REGISTERED AS {m3100NameBinding 68};

logicalLinkEnd-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS logicalLinkEnd AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE linkEndId;
REGISTERED AS {m3100NameBinding 69};

2.8.6 Topological Link End

topologicalLinkEnd-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS topologicalLinkEnd AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE linkEndId;
REGISTERED AS {m3100NameBinding 70};

topologicalLinkEnd-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS topologicalLinkEnd AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE linkEndId;
REGISTERED AS {m3100NameBinding 71};

2.8.7 Network CTP Sink

networkCTPSink-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS networkCTPSink AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE cTPId;
BEHAVIOUR
networkCTPSink-subNetworkBehaviour BEHAVIOUR
DEFINED AS
"The subordinate managed object is automatically instantiated deleted when the superior managed object is instantiated, or when additional resources (including planned resources) are added to, or removed from, the subnetwork, according to the configuration of the Subnetwork.";;
REGISTERED AS {m3100NameBinding 72};

networkCTPSink-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS networkCTPSink AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE cTPId;
REGISTERED AS {m3100NameBinding 73};

2.8.8 Network CTP Source

networkCTPSource-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS networkCTPSource AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE cTPId;
BEHAVIOUR
networkCTPSource-subNetworkBehaviour BEHAVIOUR
DEFINED AS
"The subordinate managed object is automatically instantiated deleted when the superior managed object is instantiated, or when additional resources (including planned resources) are added to, or removed from, the subnetwork, according to the configuration of the subnetwork.";;
REGISTERED AS {m3100NameBinding 74};

networkCTPSource-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS networkCTPSource AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE cTPId;
REGISTERED AS {m3100NameBinding 75};

2.8.9 Network TTP Sink

networkTTPSink-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS networkTTPSink AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE tTPId;
BEHAVIOUR
networkTTPSink-layerNetworkDomainBehaviour BEHAVIOUR
DEFINED AS
" If, during a delete operation, the networkTTP terminates a trail then the delete operation will fail with a specific error with the value networkTTPTerminatesTrail.

If, during a delete operation, the networkTTP is associated with a subnetwork or an access group then the delete operation will fail with a specific error with the value networkTTPAssociatedWithSubnetwork or the value networkTTPAssociatedWithAccessGroup respectively.
<ITU-T G.854.6,OPERATION:createNetworkTTP,OUTPUT_PARAMETERS:networkTTP>
<ITU-T G.854.6,OPERATION:deleteNetworkTTP,OUTPUT_PARAMETERS:none>";;
CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
failureToCreateNetworkTTP;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
networkTTPTerminatesTrail
networkTTPAssociatedWithSubnetwork
networkTTPAssociatedWithAccessGroup
failureToCreateNetworkTTP;
REGISTERED AS {m3100NameBinding 76};

networkTTPSink-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS networkTTPSink AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE tTPId;
BEHAVIOUR
networkTTPSink-subNetworkBehaviour BEHAVIOUR
DEFINED AS "
If, during a delete operation, the networkTTP terminates a trail then the delete operation will fail with a specific error with the value networkTTPTerminatesTrail.";;
CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
failureToCreateNetworkTTP;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
networkTTPTerminatesTrail
failureToRemoveNetworkTTP;
REGISTERED AS {m3100NameBinding 77};

2.8.10 Network TTP Source

networkTTPSource-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS networkTTPSource AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE tTPId;
BEHAVIOUR
networkTTPSource-layerNetworkDomainBehaviour BEHAVIOUR

DEFINED AS

"If, during a delete operation, the networkTTP terminates a trail then the delete operation will fail with a specific error with the value networkTTPTerminatesTrail.

If, during a delete operation, the networkTTP is associated with a subnetwork or an access group then the delete operation will fail with a specific error with the value networkTTPAssociatedWithSubnetwork or the value networkTTPAssociatedWithAccessGroup respectively.";;

CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
failureToCreateNetworkTTP;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
networkTTPTerminatesTrail
networkTTPAssociatedWithSubnetwork
networkTTPAssociatedWithAccessGroup
failureToRemoveNetworkTTP;
REGISTERED AS {m3100NameBinding 79};

networkTTPSource-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS networkTTPSource AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE tTPId;
BEHAVIOUR
networkTTPSource-subNetworkBehaviour BEHAVIOUR
DEFINED AS

"If, during a delete operation, the networkTTP terminates a trail then the delete operation will fail with a specific error with the value networkTTPTerminatesTrail.";;

CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
failureToCreateNetworkTTP;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
networkTTPTerminatesTrail
failureToRemoveNetworkTTP;
REGISTERED AS {m3100NameBinding 80};

2.8.11 SubNetwork

subNetwork-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS subNetwork AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE subNetworkId;
BEHAVIOUR
subNetwork-layerNetworkDomainBehaviour BEHAVIOUR
DEFINED AS

"If, during a create operation in which networkTTP managed object instances are required to be created or associated with the subnetwork, the networkTTP managed object instances failed to be created or associated then a specific error will be returned with the values failureToCreateNetworkTTP or failureToAssociateNetworkTTP respectively and the create operation will fail.

If, during a delete operation, the subnetwork is found to be in use (to have subnetwork connection present) or is bound to other resources a specific error with the value subnetworkInUse or boundSubnetwork respectively will be returned and the create operation will fail.

<ITU-T G.854.1,OPERATION:ssccSetupSubnetworkConnection, OUTPUT_PARAMETERS:newSNC>,
<ITU-T G.854.1,OPERATION:ssccReleaseSubnetworkConnection, OUTPUT_PARAMETERS:none>";;

CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
failureToAssociateNetworkTTP
failureToCreateNetworkTTP
failureToCreateSubnetwork;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
subnetworkInUse
boundSubnetwork
failureToRemoveSubnetwork;
REGISTERED AS {m3100NameBinding 81};

2.8.12 Subnetwork Connection

subNetworkConnection-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS subNetworkConnection AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS subNetwork AND SUBCLASSES;
WITH ATTRIBUTE subNetworkConnectionId;
REGISTERED AS {m3100NameBinding 82};

2.8.13 Topological Link

topologicalLink-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS topologicalLink AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE linkId;
BEHAVIOUR
topologicalLink-layerNetworkDomainBehaviour BEHAVIOUR
DEFINED AS
"The topologicalLink managed object is either automatically created when the trail in the server network layer domain that supports the link is created or is created by an establishTopologicalLink or an establishTopologicalLinkAndLinkEnds action. <ITU-T G.854.3,OPERATION:createTopologicalLink OUTPUT_PARAMETERS:topologicalLink>,
The topologicalLink managed object is deleted either by a removeTopologicalLink or removeTopologicalLinkAndLinkEnds action or by the deletion of the trail if the topologicalLink managed object had previously been created automatically.
<ITU-T˚G.854.3,OPERATION:deleteTopologicalLink,OUTPUT_PARAMETERS:none>";;
REGISTERED AS {m3100NameBinding 83};

2.8.14 Trail

trailR2-layerNetworkDomain NAME BINDING
SUBORDINATE OBJECT CLASS trailR2 AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS layerNetworkDomain AND SUBCLASSES;
WITH ATTRIBUTE trailId;
REGISTERED AS {m3100NameBinding 84};

3 Telemetry fragment

The telemetry fragment models external points (relays and contact closures) which are used to control external devices (generators, heaters, etc.) or monitor external conditions.

3.1 Object classes

externalPoint MANAGED OBJECT CLASS
DERIVED FROM "ITU-T X.721|ISO/IEC 10165-2:1992":top;
CHARACTERIZED BY
createDeleteNotificationsPackage,
attributeValueChangeNotificationPackage,
stateChangeNotificationPackage,
externalPointPackage PACKAGE
BEHAVIOUR
externalPointBehaviour BEHAVIOUR
DEFINED AS
"This object class is a superclass for controlPoint and scanPoint object classes which are used to control external devices or monitor external conditions respectively. This object class contains common aspects of controlPoint and scanPoint object classes. The operational state and administrative state represent the state of the control and scan functions, i.e. not the state of the external entity.";;
ATTRIBUTES
"ITU-T X.721|ISO/IEC 10165-2:1992":operationalState GET,
"ITU-T X.721|ISO/IEC 10165-2:1992":administrativeState GET-REPLACE,
supportedByObjectList GET,
externalPointId GET SET-BY-CREATE,
externalPointMessage GET-REPLACE;;;
CONDITIONAL PACKAGES
locationNamePackage PRESENT IF
"an instance supports it";
REGISTERED AS {m3100ObjectClass 40};

controlPoint MANAGED OBJECT CLASS
DERIVED FROM externalPoint;
CHARACTERIZED BY
controlPointPackage PACKAGE
BEHAVIOUR
controlPointPackageBehaviour BEHAVIOUR
DEFINED AS
"This managed object class is used to control external devices associated with the managed system, such as relay closure for bell, lamp, generator, heater, or air conditioner. Each instance of this class represents one control point.
The current state of a control point can be either closed (i.e. activate) or open (i.e. released). A control point may optionally have a normal state (i.e. closed or open, one or the other).
The external device represented by a control point can be remotely operated through the 'control' action. A control operation can be momentary (i.e. momentarily close or open) or continuous (continuously close or open).
Valid control type of a control point may be momentary only, continuous only, or both. A control action will be denied if the control action type (continuous or momentary) is not valid for the control point.
The effect of a control action on a control point is given in Table 1.
Current state, valid control type, normal state (optional), text message (such as user-friendly label or text) and location (optional) of the control points are by separate attributes.";;
ATTRIBUTES
currentControlStateGET,
validControlType GET-REPLACE SET-BY-CREATE;
ACTIONS
externalControl;;;
CONDITIONAL PACKAGES
normalControlStatePackage PRESENT IF
"an instance supports it";
REGISTERED AS {m3100ObjectClass 41};

Table 1/M.3100

Control Point Valid Action Type (Optional)	State Before	Control Action Type	Action Result	State After
momentary only	closed	close-continuously	error: invalid action type	closed
		open-continuously	error: invalid action type	closed
		close-momentarily	error: already in condition	closed
		open-momentarily	completed	open then closed
	open	close-continuously	error: invalid action type	open
		open-continuously	error: invalid action type	open
		close-momentarily	completed	closed then open
		open-momentarily	error: already in condition	open
continuous only	closed	close-continuously	error: already in condition	closed
		open-continuously	completed	open
		close-momentarily	error: invalid action type	closed
		open-momentarily	error: invalid action type	closed
	open	close-continuously	completed	closed
		open-continuously	error: already in condition	open
		close-momentarily	error: invalid action type	open
		open-momentarily	error: invalid action type	open
momentary and continuous	closed	close-continuously	error: already in condition	closed
		open-continuously	completed	open
		close-momentarily	error: already in condition	closed
		open-momentarily	completed	open then closed
	open	close-continuously	completed	closed
		open-continuously	error: already in condition	open
		close-momentarily	completed	closed then open
		open-momentarily	error: already in condition	open

scanPoint MANAGED OBJECT CLASS
DERIVED FROM externalPoint;
CHARACTERIZED BY
externalScanPackage PACKAGE
BEHAVIOUR
externalScanBehaviour BEHAVIOUR
DEFINED AS

"This managed object class is used to monitor external conditions related to the managed element, for that, events of external devices (such as power failure, fire alarm, door open, humidity, etc.) are monitored. Each instance of this object class represents one scan point. Environmental alarm will be emitted if a scan point detects an abnormal condition. The text message specified in the externalPointMessage attribute is to be included in the additionalText field of the environmentalAlarm notification when an alarm is emitted for the scan point. The severity of such alarms can be configured through an optional package.

The currentProblemList represents the current problems of the external entity being monitored, i.e. not current

```
                ATTRIBUTES
                        currentProblemList GET,
                        serviceAffected          GET;
                NOTIFICATIONS
                        "ITU-T X.721|ISO/IEC 10165-2:1992":environmentalAlarm;;;
        CONDITIONAL PACKAGES
                alarmSeverityAssignmentPointerPackage PRESENT IF
                    "an instance supports it";
REGISTERED AS {m3100ObjectClass  42};
```

3.2 Packages

```
normalControlStatePackage PACKAGE
        ATTRIBUTES
                normalControlStateGET-REPLACE;
REGISTERED AS {m3100Package 43};
```

3.3 Attributes

```
currentControlState  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ControlState;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
                currentControlStateBehaviour    BEHAVIOUR
                        DEFINED AS
                            "This attribute indicates the current state of the control point";;
REGISTERED AS  {m3100Attribute 71};

normalControlState  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ControlState;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
                normalControlStateBehaviour    BEHAVIOUR
                        DEFINED AS
                            "This attribute indicates the normal state of the control point";;
REGISTERED AS {m3100Attribute 72};


validControlType  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ValidControlType;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
                validControlTypeBehaviour       BEHAVIOUR
                        DEFINED AS
                            "This attribute indicates the valid type of control signal for this control point";;
REGISTERED AS {m3100Attribute 73};


externalPointId ATTRIBUTE
        WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Integer;
        MATCHES FOR EQUALITY, ORDERING;
        BEHAVIOUR
                externalPointIdBehaviour          BEHAVIOUR
                        DEFINED AS
                            "This attribute identifies the port number where the monitored or controlled external device is
                            attached. It also serves as the naming attribute for the managed object.";;
REGISTERED AS {m3100Attribute  74};
```

serviceAffected ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Boolean;
MATCHES FOR EQUALITY;
BEHAVIOUR
serviceAffectingBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates whether the alarm condition for monitored external device is service affecting or not.";;
REGISTERED AS {m3100Attribute 75};

externalPointMessage ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.ExternalPointMessage;
MATCHES FOR EQUALITY;
BEHAVIOUR
externalPointMessageBehaviour BEHAVIOUR
DEFINED AS
"This attibute can provide some textual definition of the external point. It can also be used for identifying the location of the external point";;
REGISTERED AS {m3100Attribute 76};

3.4 Actions

externalControl ACTION
BEHAVIOUR
externalControlBeh BEHAVIOUR
DEFINED AS
"This action instructs the NE to momentarily operate (close or open) or continuously operate (close or open) an external control device (such as a relay closure) represented by a control point. The control action type parameter is included in the request.";;
MODE CONFIRMED;
WITH INFORMATION SYNTAX M3100ASN1TypeModule2.ControlActionType;
WITH REPLY SYNTAX M3100ASN1TypeModule2.ControlResult;
REGISTERED AS {m3100Action 10};

3.5 Name bindings

externalPoint-equipment NAME BINDING
SUBORDINATE OBJECT CLASS externalPoint AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS equipment AND SUBCLASSES;
WITH ATTRIBUTE externalPointId;
CREATE;
DELETE;
REGISTERED AS {m3100NameBinding 56};

externalPoint-managedElement NAME BINDING
SUBORDINATE OBJECT CLASS externalPoint AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS managedElement AND SUBCLASSES;
WITH ATTRIBUTE externalPointId;
CREATE;
DELETE;
REGISTERED AS {m3100NameBinding 57};

```
externalPoint-managedElementComplex NAME BINDING
        SUBORDINATE OBJECT CLASS externalPoint AND SUBCLASSES;
        NAMED BY
                SUPERIOR OBJECT CLASS managedElementComplex AND SUBCLASSES;
        WITH ATTRIBUTE      externalPointId;
        CREATE;
        DELETE;
REGISTERED AS {m3100NameBinding 58};
```

4 Circuit pack fragment

The model supports the following circuit pack functionality:

- request re-initialization of a circuit pack;
- for a circuit pack that supports multiple physical ports, indicate the associated entity of the ports;
- indicate the available signal rates of a circuit pack;
- indicate and configure the signal rate and payload mapping for the port(s) of a circuit pack.

The circuitPackR1 object is subclassed from equipmentR2 instead of circuitPack, in order to use the attribute values of the availabilityStatus besides "notInstall", including "degrade" for indicating that only a subset of the ports is not functioning.

The textType attribute inherited from equipmentR2 is used to indicate the type of the circuit pack (the syntax of textType is GraphicString, and the syntax of the circuitPackType attribute is printableString).

The comment field of the ASN.1 data type SignalRate is an OID which reflects the rate and format.

4.1 Object classes

```
circuitPackR1 MANAGED OBJECT CLASS
        DERIVED FROM equipmentR2;
        CHARACTERIZED BY
                createDeleteNotificationsPackage,
                administrativeOperationalStatesPackage,
                stateChangeNotificationPackage,
                equipmentsEquipmentAlarmR1Package,
                currentProblemListPackage,
                equipmentAlarmEffectOnServicePackage,
                alarmSeverityAssignmentPointerPackage,
                circuitPackR1Package PACKAGE
                        BEHAVIOUR circuitPackR1Behaviour;
                        ATTRIBUTES
                                "ITU-T X.721|ISO/IEC 10165-2:1992":availabilityStatus GET;;;
        CONDITIONAL PACKAGES
                circuitPackResetPackage             PRESENT IF
                        "an instance supports it.",
                numberOfPortPackage                 PRESENT IF
                        "an instance supports it.",
                portAssociationsPackage             PRESENT IF
                        "an instance supports it.",
                circuitPackConfigurationPackage     PRESENT IF
                        "an instance supports it.",
                containedBoardPackage               PRESENT IF
                        "the resource represented by this circuit pack is allowed to contain other circuit packs";
REGISTERED AS {m3100ObjectClass 43};
```

circuitPackR1Behaviour BEHAVIOUR
DEFINED AS

"The circuitPackR1 object class is a class of managed objects that represents a plug-in replaceable unit that can be inserted into or removed from the equipment holder of the Network Element. Examples of plug-in cards include line cards, processors and power supply units. The inherited attribute textType (of syntax GraphicString) is used to indicate the type of the circuit pack. The value of this attribute should match one of the values of the acceptableCircuitPackTypeList attribute (of syntax PrintableString) of the containing equipmentHolder object. If the type of a circuit pack is of GraphicString characters outside of the PrintableString character set, it will not match any value of the acceptableCircuitPackList attribute. In this case, no instance of circuitPackR1 should be instantiated and the holderStatus attribute of the equipmentHolder object shall have the value 'unknownType'. The attribute availabilityStatus is used to indicate the availability of the circuit pack. The availabilityStatus attribute is a set-valued attribute. The following values may be used:

— fail: the circuit pack is failed;

— inTest: the circuit pack is in test;

— notInstall: the physical circuit pack is not inserted, or if inserted but its type does not match the type specified in the textType attribute of the circuitPackR1 instance (even if the physical circuit pack is one of the acceptable circuit pack type of the containing equipment holder);

— degraded: a subset of the ports of the circuit pack has defects;

— dependency: the circuit pack is disabled because of a resource which the circuit pack depends on is not available; and

— offLine: the circuit pack is under initializing (i.e. resetting).

The circuitPackR1 may contain additional circuitPackR1 objects.";

4.2 Packages

circuitPackConfigurationPackage PACKAGE
BEHAVIOUR circuitPackConfigurationPackageBehaviour;
ATTRIBUTES
availableSignalRateList GET,
portSignalRateAndMappingList GET-REPLACE ADD-REMOVE
serviceAffectedErrorParameter;
REGISTERED AS {m3100Package 44};

circuitPackConfigurationPackageBehaviour BEHAVIOUR
DEFINED AS

"A replace operation of the portSignalRateAndMappingList attribute may cause the deletion and creation of termination point objects. If this is the case, objectDeletion and objectCreation notifications will be emitted from the deleted and created objects. However, if such deletion and/or creation affects existing user services, the replace request should be denied and an error response of processingFailure with syntax defined in the serviceAffectedErrorParameter parameter should be returned.";

circuitPackResetPackage PACKAGE
ACTIONS
circuitPackReset;
REGISTERED AS {m3100Package 45};

numberOfPortPackage PACKAGE
ATTRIBUTES
numberOfPorts GET;
REGISTERED AS {m3100Package 46};

portAssociationsPackage PACKAGE
ATTRIBUTES
portAssociations GET;
REGISTERED AS {m3100Package 47};

containedBoardPackage PACKAGE
ATTRIBUTES
acceptableCircuitPackTypeList GET-REPLACE ADD-REMOVE;
REGISTERED AS {m3100Package 48};

4.3 Attributes

availableSignalRateList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.AvailableSignalRateList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
availableSignalRateListBehaviour BEHAVIOUR
DEFINED AS
"This attribute identifies the signal rates supported by the circuit pack entity.";;
REGISTERED AS {m3100Attribute 77};

numberOfPorts ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.Count;
MATCHES FOR EQUALITY;
BEHAVIOUR
numberOfPortsBehaviour BEHAVIOUR
DEFINED AS
"This attribute indicates the total number of ports supported by the circuit pack.";;
REGISTERED AS {m3100Attribute 78};

portAssociations ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PortAssociations;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
portAssociationBehaviour BEHAVIOUR
DEFINED AS
"This attribute is a sequence of pairs that relate a port on the multiport circuit pack with the associated entity.";;
REGISTERED AS {m3100Attribute 79};

portSignalRateAndMappingList ATTRIBUTE
WITH ATTRIBUTE SYNTAX M3100ASN1TypeModule2.PortSignalRateAndMappingList;
MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
BEHAVIOUR
portSignalRateAndMappingListBehaviour BEHAVIOUR
DEFINED AS
"This attribute identifies the signal rate associated with a circuit pack port (e.g. port=0, rate=stm1) and its payload mapping (e.g. au3 or au4). The signal rate and payload mapping is provisionable. For example, a port with signal rate stm4 may have a payload mapping of au4-4. Another possible mapping of this rate is a sequence of four individual au4 (i.e. au4, au4, au4, au4) or a sequence of mixed au3 and au4 (e.g. au3, au3, au3, au4, au4, au3, au3, au3).";;
REGISTERED AS {m3100Attribute 80};

4.4 Actions

circuitPackReset ACTION
BEHAVIOUR
circuitPackResetBeh BEHAVIOUR
DEFINED AS
"This action is used to request to initialize a circuit pack. The request can be a complete reset or a partial reset. A complete reset request is indicated by the value of NULL in the action argument. A partial request is indicated by a non-negative integer. The value zero implies the

least level of reset. The higher integer value implies a more thorough reset. The determination of the highest integer that is equivalent to a complete reset is a local matter. When the circuit pack in the process of resetting, the value offLine of the availabilityStatus attribute shall be indicated. If the circuit pack is user service sensitive, then a reset shall be performed only when the circuit pack is in the locked adiministrariveState. If the circuit pack is not in the locked administrariveState, a reset request shall be denied and the value entityInService of the resetError parameter shall be returned.";;

MODE CONFIRMED;
PARAMETERS circuitPackResetError;
WITH INFORMATION SYNTAX M3100ASN1TypeModule2.ResetLevel;
REGISTERED AS {m3100Action 11};

4.5 Name bindings

circuitPackR1-circuitPackR1-autoCreated NAME BINDING
SUBORDINATE OBJECT CLASS circuitPackR1 AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS circuitPackR1 AND SUBCLASSES;
WITH ATTRIBUTE equipmentId;
BEHAVIOUR circuitPackR1-circuitPackR1-autoCreateBeh;
DELETE
DELETES-CONTAINED-OBJECTS;
REGISTERED AS {m3100NameBinding 89};

circuitPackR1-circuitPackR1-autoCreateBeh BEHAVIOUR
DEFINED AS
"This name binding is used only when a circuitPack provides slots for the contained boards (e.g. lower-order termination). When the circuitPack is inserted into the containing board, the circuitPack object representing the inserted board is automatically created.";

circuitPackR1-equipmentHolder-autoCreated-Delete NAME BINDING
SUBORDINATE OBJECT CLASS circuitPackR1 AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS equipmentHolder AND SUBCLASSES;
WITH ATTRIBUTE equipmentId;
BEHAVIOUR circuitPackR1-equipmentHolder-autoCreate-Delete-Beh;
DELETE
DELETES-CONTAINED-OBJECTS;
REGISTERED AS {m3100NameBinding 59};

circuitPackR1-equipmentHolder-autoCreate-Delete-Beh BEHAVIOUR
DEFINED AS
"This name binding is used to name an instance of a circuitPack relative to an equipmentHolder instance. The creation of the circuitPack object is the result of inserting the physical circuit pack into the resource represented by the superior object.
The circuit pack including contained objects can be deleted as the result of system management.";

circuitPackR1-equipmentHolder-explicitlyCreated-Delete NAME BINDING
SUBORDINATE OBJECT CLASS circuitPackR1 AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS equipmentHolder AND SUBCLASSES;
WITH ATTRIBUTE equipmentId;
BEHAVIOUR circuitPackR1-equipmentHolder-explicitlyCreate-Delete-Beh;
CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
createErrorParameter
generalErrorParameter;

DELETE
DELETES-CONTAINED-OBJECTS;
REGISTERED AS {m3100NameBinding 60};

circuitPackR1-equipmentHolder-explicitlyCreate-Delete-Beh BEHAVIOUR
DEFINED AS
"This name binding is used to name an instance of a circuitPack relative to another equipmentHolder instance. The creation of the circuitPack object is the result of system management.
The circuit pack including contained objects can be deleted as the result of system management.";

circuitPackR1-equipmentHolder-autoCreated NAME BINDING
SUBORDINATE OBJECT CLASS circuitPackR1 AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS equipmentHolder AND SUBCLASSES;
WITH ATTRIBUTE equipmentId;
BEHAVIOUR circuitPackR1-equipmentHolder-autoCreated-Beh;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS
generalErrorParameter;
REGISTERED AS {m3100NameBinding 61};

circuitPackR1-equipmentHolder-autoCreated-Beh BEHAVIOUR
DEFINED AS
"This name binding is used to name an instance of a circuitPack relative to another equipmentHolder instance. The creation of the circuitPack object is the result of inserting the physical circuit pack into the resource represented by the superior object.
The management system may delete this circuit pack and recreate a new one in order to plan the specific type of the circuit pack, using the explicitlyCreated name binding.
The circuit pack can only be deleted as the result of system management when there are no contained objects.";

circuitPackR1-equipmentHolder-explicitlyCreated NAME BINDING
SUBORDINATE OBJECT CLASS circuitPackR1 AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS equipmentHolder AND SUBCLASSES;
WITH ATTRIBUTE equipmentId;
BEHAVIOUR circuitPackR1-equipmentHolder-explicitlyCreated-Beh;
CREATE
WITH-REFERENCE-OBJECT,
WITH-AUTOMATIC-INSTANCE-NAMING
createErrorParameter
generalErrorParameter;
DELETE
ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {m3100NameBinding 62};

circuitPackR1-equipmentHolder-explicitlyCreated-Beh BEHAVIOUR
DEFINED AS
"This name binding is used to name an instance of a circuitPack relative to another equipmentHolder instance. The creation of the circuitPack object is the result of system management protocol. If the circuitPackType is incompatible with the types supported by the equipmentHolder, the create request will result in a CMIP processing failure error. The generalErrorParameter is then used to report the error and may provide the value of the circuitPackType attribute. The circuit pack can only be deleted as the result of system management when there are no contained objects.";

4.6 Parameters

circuitPackResetError PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.ResetError;
BEHAVIOUR circuitPackResetErrorBeh;
REGISTERED AS {m3100Parameter 4};

circuitPackResetErrorBeh BEHAVIOUR
DEFINED AS
"This parameter is included in the error parameter of the CMIP APDU when the reset action fails for any other reason than the package not being implemented. If the managed system is unable to return an error because of the reset action itself, it is expected that other failures within the managed system will occur and be reported, or be detected by the managing system (e.g. loss of association).";

serviceAffectedErrorParameter PARAMETER
CONTEXT SPECIFIC-ERROR;
WITH SYNTAX M3100ASN1TypeModule2.ServiceAffectingErrorParameter;
BEHAVIOUR serviceAffectedErrorParameterBeh;
REGISTERED AS {m3100Parameter 5};

serviceAffectedErrorParameterBeh BEHAVIOUR
DEFINED AS
"This parameter is included in the processingFailure response when the operation fails for the reason that the operation affects existing user service.";

5 Connect Action Information

The connect action request information is updated to allow for additional information. The following production replaces the previous version of ConnectInformation (from M.3100/Cor.1):

```
ConnectInformation ::= SEQUENCE OF SEQUENCE {
                        itemType              CHOICE {
                                unidirectional      [0]  ConnectionType,
                                bidirectional       [1]  ConnectionTypeBi,
                                addleg              [2]  AddLeg},
                        administrativeState          AdministrativeState   OPTIONAL,
                        namedCrossConnection    [3] NamedCrossConnection   OPTIONAL,
                        ...,
                        userLabel               [4] UserLabel OPTIONAL,
                        redline                 [5] Boolean OPTIONAL,
                        ...,
                        additionalInfo          [6] AdditionalInformation OPTIONAL
                }

"ProbableCause, AdministrativeState, AvailabilityStatus, AttributeList, AdditionalInformation
        FROM Attribute-ASN1Module {joint-iso-ccitt ms(9) smi(3) part2(2) asn1Module (2) 1}
```

6 ASN.1 definitions

6.1 Rules of extensibility

The following types will be indicated as being extensible:

— ENUMERATED;

— tagged SET;

— tagged SEQUENCE;

— tagged CHOICE.

Under the rules of extensibility new enumerations (for ENUMERATED types), new bit name assignments (for named BIT STRING types), new named numbers (for named INTEGER types), and new tagged elements (for tagged SET, SEQUENCE, and CHOICE types) may be added in future versions of this Recommendation.

When processing information in a System Management Application Protocol (SMAP) PDU, the accepting SMAP-machine shall ignore:

— enumerations not recognized;

— unrecognized named numbers;

— unrecognized named bits;

— unrecognized tagged elements of sets, sequences and choices.

6.2 ASN.1 module

```
M3100ASN1TypeModule2  {itu-t recommendation m gnm(3100) informationModel(0) asn1Modules(2)
asn1Module2(1) }
DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- EXPORTS everything
IMPORTS

AdditionalInformation, AdministrativeState, AvailabilityStatus, OperationalState,
PerceivedSeverity, ProbableCause
        FROM Attribute-ASN1Module{joint-iso-ccitt ms(9) smi (3) part2 (2) asn1Module(2) 1}

Bundle, CharacteristicInformation, Directionality, NameType, PointerOrNull, UserLabel, LogicalProblem,
ResourceProblem, ProblemCause, ObjectList, RelatedObjectInstance
        FROM ASN1DefinedTypesModule
        {ccitt recommendation m(13) gnm(3100) informationModel(0) asn1Modules(2)
        asn1DefinedTypesModule(0)}

ObjectInstance
        FROM CMIP-1 {joint-iso-ccitt ms(9) cmip(1) modules(0) protocol(3)}

DistinguishedName
        FROM InformationFramework {joint-iso-ccitt ds(5) modules(1) informationFramework(1)} ;
                -- NOTE — This Recommendation imports DistinguishedName from CCITT Rec. X.501 (1988). The
                -- specification for this syntax can now be found in an informative annex of
                -- ITU-T Rec. X.711 (1997) | ISO/IEC 9596-1:1998.

AddCapacityToTopologicalLinkEndInformation ::=  RequestedPointCapacity
AddCapacityToTopologicalLinkEndResult ::= SEQUENCE {
                                        resultingCapacity                       PointCapacity,
                                        resultingnetworkCTPs                    NWTPList,
                                        resultingProvisionedLinkEndCapacity     PointCapacity
                                }

AddCapacityToTopologicalLinkInformation ::=  RequestedCapacity
AddCapacityToTopologicalLinkResult ::= SEQUENCE {
                                        resultingCapacity               Capacity,
                                        resultingLinkConnections        LinkConnectionList
                                }
```

```
AddNWTTPsToAccessGroupInformation ::= SEQUENCE {
                                        nwTTPs          SET OF ObjectInstance,
                                        accessGroup     ObjectInstance OPTIONAL
                                    }
AddNWTTPsToAccessGroupResult ::= SEQUENCE {
                                        accessGroup     ObjectInstance,
                                        addedNWTTPs     SET OF ObjectInstance
                                    }

AssignLinkConnectionOnLogicalLinkInformation ::= SEQUENCE {
                                        layerNetworkDomain              ObjectInstance,
                                        requestedLinkConnections        LinkConnectionList
                                    }

AssignLinkConnectionOnLogicalLinkResult ::= LinkConnectionList
AssignNetworkCTPOnLogicalLinkEndInformation ::=  CTPList

AssignNetworkCTPOnLogicalLinkEndResult ::= CTPList

AvailableSignalRateList ::= SET OF SignalRate

Bandwidth ::=  SEQUENCE OF SEQUENCE {
            ingress             INTEGER,
            egress              INTEGER
            }

Boolean ::= BOOLEAN

Capacities ::= SEQUENCE {
                    availableLinkCapacity           Capacity,
                    maxProvisionableCapacity        Capacity,
                    potentialLinkCapacity           Capacity,
                    provisionedLinkCapacity             Capacity
            }

Capacity ::= CHOICE {
            numberOfLinkConnections     [0] INTEGER,
            bandwidth                   [1] Bandwidth
            }

Channels ::= SET OF Channel

Channel  ::= INTEGER

ComponentPointers ::= SET OF ObjectInstance

CompositePointer ::= RelatedObjectInstance

ConfiguredConnectivity  ::= ENUMERATED {
                        sourceConnect           (0),
                        sinkConnect             (1),
                        bidirectionalConnect    (2),
                        noConnect               (3)
                    }

ConnectionList ::= SET OF ObjectInstance
```

```
ConnectivityEndPoint ::= CHOICE {
                        sncTp           [1] ObjectInstance,
                        linkEnd         [2] ObjectInstance,
                        accessGroup     [3] ObjectInstance
                    }

ConnectivityPointer ::= RelatedObjectInstance

ControlActionType ::= ENUMERATED {
                        closeContinuously  (0),
                        openContinuously   (1),
                        closeMomentarily   (2),
                        openMomentarily    (3)
                        }

ControlResult ::= ENUMERATED {
                        complete                        (0),
                        alreadyInCondition                      (1),
                        fail-InvalidControlActionType   (2),
                        fail-ReasonUnknown              (3)
                    }

ControlState ::= ENUMERATED {
                    closed      (0),
                    open        (1)
                    }

Count ::= INTEGER
CTPList ::=  NWTPList
DeassignLinkConnectionFromLogicalLinkInformation ::=  LinkConnectionList
DeassignNetworkCTPFromLogicalLinkEndInformation ::=  CTPList

ExternalPointMessage ::= GraphicString

Implicit      ::= BOOLEAN (TRUE)

Integer ::= INTEGER

LinkConnectionList  ::= ConnectionList

LinkDirectionality ::= ENUMERATED  {
                        unidirectional      (0),
                        bidirectional       (1),
                        undefined           (2)
                    }

LinkEnd  ::= CHOICE {
                    subnetwork      [0] ObjectInstance,
                    accessGroup     [1] ObjectInstance,
                    linkEnd         [2] ObjectInstance
                }

MappingList ::= SEQUENCE OF PayloadLevel

NeAssignmentPointer      ::=  CHOICE {
                    notAvailable    NULL,
                    relatedObject   ObjectInstance,
                    string          GraphicString
                }

None  ::= NULL
```

```
NWTPList ::= SET OF ObjectInstance

PayloadLevel ::= CharacteristicInformation

PointCapacity ::= CHOICE {
                    numberOfTPs       [0] INTEGER,
                    bandwidth         [1] Bandwidth
                }

PointDirectionality  ::= ENUMERATED {
                            sink          (1),
                            source        (2),
                            bidirectional (3)
                    }

PortAssociations ::= SET OF PortAssociation
PortAssociation ::= SEQUENCE {
                            portId NameType,
                            portTrail     PointerOrNull -- the choice of NULL means unassigned
                    }

PortSignalRateAndMappingList ::= SET OF SEQUENCE {
                                    portId        NameType,
                                    signalRate    SignalRate,
                                    mappingList MappingList   OPTIONAL
                                }

PtoPoint ::= SEQUENCE {
                    aEnd        ConnectivityEndPoint,
                    zEnd        ConnectivityEndPoint
                }

QofConnectivityService ::=  ObjectInstance
RemoveCapacityFromTopLinkEndInformation ::=  RequestedPointCapacity

RemoveCapacityFromTopLinkEndResult ::= SEQUENCE {
                                            resultingCapacity               PointCapacity,
                                            resultingLinkConnections        LinkConnectionList
                                        }
RemoveCapacityFromTopologicalLinkInformation ::=  RequestedCapacity

RemoveCapacityFromTopologicalLinkResult ::= Capacity

RequestedPointCapacity ::= CHOICE {
                            specificTPs         [1] NWTPList,
                            capacity            [2] PointCapacity
                    }

RequestedCapacity ::= CHOICE {
                            specificChannels    [1] SEQUENCE OF Channel,
                            capacity            [2] Capacity
                    }

ResetError ::= ENUMERATED {
                    resetFail           (0),
                    entityInService     (1) ,
                    ...
                }
```

```
ResetLevel ::= CHOICE{
                    completeReset       NULL,
                    partialReset        INTEGER
                }

ServiceAffectingErrorParameter ::= ENUMERATED {
                                        affectingExistingService    (0) ,
                                        …
                                    }

SignalId ::= CHOICE {
                    simple          [0] CharacteristicInformation,
                    bundle          [1] Bundle,
                    complex         [3] SEQUENCE OF Bundle
                }

SignalRate ::= CHOICE {
                    objectClass                 [0] OBJECT IDENTIFIER,
                    characteristicInformation   [1] CharacteristicInformation
                }

SubNetworkConnectionPointerList ::= SEQUENCE OF RelatedObjectInstance

TopologicalEndDirectionality ::= ENUMERATED  {
                                    undefined           (0),
                                    sink                (1),
                                    source              (2),
                                    bidirectional       (3)
                                }

TPList ::= SET OF ObjectInstance

TrafficDescriptor ::= ObjectInstance

UsageCost::=INTEGER(0..255)

UserIdentifier ::= NameType

ValidControlType ::= ENUMERATED {
                momentaryOnly   (0),
                continuousOnly  (1),
                both            (2)
        }


END
```

--The following GDMO directive is added to help automatic processing of the Recommendation:

--<GDMO.EndDocument>--

7 Add the following appendix:

APPENDIX I

This non-normative appendix provides information that illustrates the use of the network topology fragment in assembling usable network level information models. The topology fragment model, while comprised of a singular set of object classes, offers a limited number of alternative relationships between the objects via optional name bindings and conditional packages. These alternatives address different modelling optimizations and, when taken together, reflect more than a single model architecture. In fact, when considered as a whole, the number of possible combinations of alternative elements could be quite large.

In order to provide guidance to the users of the topology fragment, examples that illustrate some of the more common combinations of model components are given. Each example model is internally consistent and does not exhibit the redundancies apparent in the topology fragment in its entirety.

Subclause I.1 discusses general design aspects concerning inter-layer relationships. Subclause I.2 describes aspects of intra-layer topology. Subclauses I.3 and I.4 give two different example assemblies of model components.

I.1 Inter-layer Relationship Alternatives

The aggregation of object classes that may have numerous instances, such as termination points, into containers or pools and higher level aggregates is needed for both inter-layer relationships (representing adaptation functions) and intra-layer relationships (i.e. for subnetwork topology). For both types of aggregation, alternative approaches are supported.

Figure I.1 shows a view of a set of basic resource entities that demonstrates inter-layer relationships between server layer networkTTPs and client layer topological components. These client layer components include networkCTP, topological link end and subnetwork. In the context of Figure˚I.1, the networkTTP is in one layerNetworkDomain (server) and the remaining components are in another layerNetworkDomain (client). In this view, two basic options are indicated for relating network termination points to client layer components:

A — pointer relation to topologicalLinkEnd and naming relation of topologicalLinkEnd to layerNetworkDomain. Naming relationships are used to bind networkCTP to topologicalLinkEnd and thence to layerNetworkDomain;

B — pointer relation to client layer networkCTP, naming relation of networkCTP to subnetwork, and naming relation of subnetwork to layerNetworkDomain.

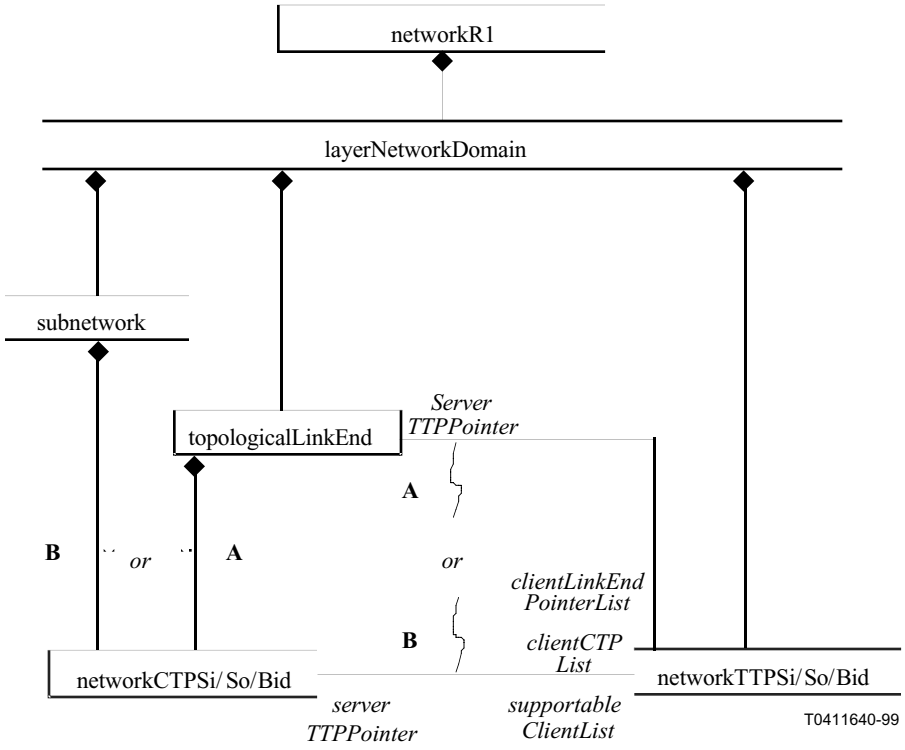

Figure I.1/M.3100˚—˚Alternative entity-relationships for inter-layer associations

As indicated by the *or* conditions, a given implementation might use only those relationships marked as "A" or those marked as "B," without mixing elements of each.

I.2 Intra-layer Topology Alternatives

Aggregation within a given layer topology can be done using a hierarchical scheme. This scheme has two levels. The first level of aggregation associates termination points with link ends or access groups. The second level associates these structures with larger structures, i.e. subnetworks.

Alternatively, the termination points may be associated with subnetwork directly, and pools formed by grouping sets of termination points. These approaches are included as part of the two following example models.

I.3 Example #1

An entity-relationship diagram for the first example model is shown in Figure I.2. GDMO name bindings are indicated by lines with diamond-shaped tips. Other types of aggregation or association relationships are indicated by plain lines. Pointer attribute names are indicated by italicized text next to the object classes with which the attributes are associated. Inter-layer aggregation uses the scenario described as "A" above. Within a given layer network domain, network termination points are aggregated by either topologicalLinkEnd or accessGroup objects. Two-way pointers associate subnetwork objects with topologicalLinkEnd and accessGroup objects. In this example, only the *topological* subclasses of abstractLink and abstractLinkEnd objects have been used for simplicity. A topologicalLink joins subnetworks together via topologicalLinkEnd objects.

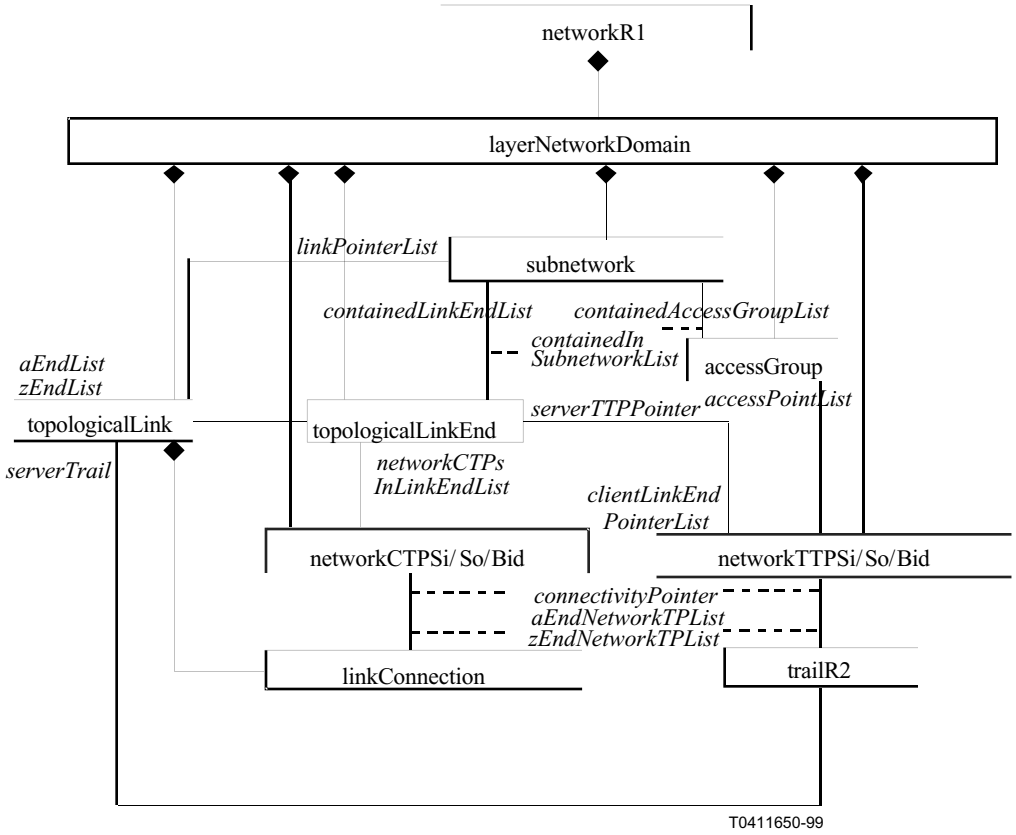

Figure I.2/M.3100

I.4 Example #2

In the second example assembly, inter-layer aggregation uses the scenario described as "B" above. Within a given layer network domain, network termination points are bound to a given subnetwork via GDMO name bindings. In this case, name bindings to subnetwork apply to only one level of partitioning (usually the lowest); pointers may be used to relate higher levels of partitioning (not shown). Termination points may be aggregated into either topologicalLinkEnd or accessGroup objects, but not for the same purpose as in example #1, i.e. not to associate to subnetwork objects.

In this example, both subclasses of abstractLink and abstractLinkEnd objects are used. Either topologicalLink or logicalLink objects join subnetwork objects together without involving subclasses of abstractLinkEnd. The abstractLinkEnd subclass objects are used to provide a topological point view of links that join together different administrative domains defined by different instances of networkR1. These links are not modelled directly (point view used also in example #1).

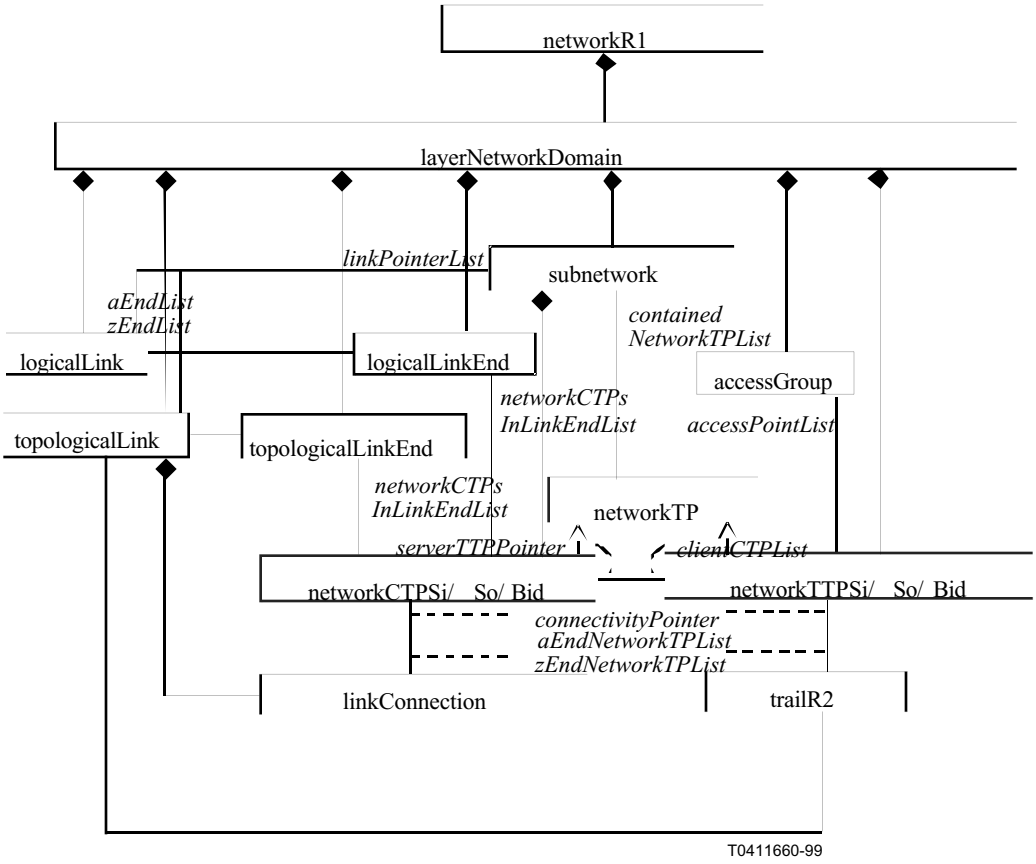

Figure I.3/M.3100

Connectivity object classes are for the most part similar in the two examples. The linkConnection object joins networkCTP subclasses; trail joins networkTTP subclasses. Subnetwork connections may be established between networkTP objects.

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