UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

UIT-T
SECTOR DE NORMALIZACIÓN
DE LAS TELECOMUNICACIONES
DE LA UIT

M.3100
Enmienda 1
(03/99)

SERIE M: RGT Y MANTENIMIENTO DE REDES: SISTEMAS DE TRANSMISIÓN, CIRCUITOS TELEFÓNICOS, TELEGRAFÍA, FACSÍMIL Y CIRCUITOS ARRENDADOS INTERNACIONALES
Red de gestión de las telecomunicaciones

Modelo genérico de información de red
Enmienda 1

Recomendación UIT-T M.3100 – Enmienda 1

Para más información, véase la Lista de Recomendaciones del UIT-T.

RECOMENDACIÓN UIT-T M.3100

MODELO GENÉRICO DE INFORMACIÓN DE RED

ENMIENDA 1

Resumen

Se exponen en esta enmienda mejoras al modelo genérico de información de red. Dicho modelo describe con carácter genérico clases de objeto gestionado y propiedades de éstas que son de utilidad para describir la información intercambiada a través de todas las interfaces definidas en la arquitectura de la RGT de la Recomendación M.3010. Estas clases genéricas de objeto gestionado deberán ser aplicables a distintas tecnologías, arquitecturas y servicios. Las clases de objeto gestionado de esta enmienda podrán ser especializadas, a fin de soportar la gestión de diversas redes de telecomunicación.

Orígenes

Palabras clave

Acciones, ASN.1, atributos; clase de objeto gestionado, modelo genérico de información de red, notificaciones.

PREFACIO

La UIT (Unión Internacional de Telecomunicaciones) es el organismo especializado de las Naciones Unidas en el campo de las telecomunicaciones. El UIT-T (Sector de Normalización de las Telecomunicaciones de la UIT) es un órgano permanente de la UIT. Este órgano estudia los aspectos técnicos, de explotación y tarifarios y publica Recomendaciones sobre los mismos, con miras a la normalización de las telecomunicaciones en el plano mundial.

La Conferencia Mundial de Normalización de las Telecomunicaciones (CMNT), que se celebra cada cuatro años, establece los temas que han de estudiar las Comisiones de Estudio del UIT-T, que a su vez producen Recomendaciones sobre dichos temas.

La aprobación de Recomendaciones por los Miembros del UIT-T es el objeto del procedimiento establecido en la Resolución N.° 1 de la CMNT.

En ciertos sectores de la tecnología de la información que corresponden a la esfera de competencia del UIT-T, se preparan las normas necesarias en colaboración con la ISO y la CEI.

NOTA

En esta Recomendación, la expresión *empresa de explotación reconocida (EER)* designa a toda persona, compañía, empresa u organización gubernamental que explote un servicio de correspondencia pública. Los términos *Administración, EER* y *correspondencia pública* están definidos en la *Constitución de la UIT (Ginebra, 1992)*.

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Recomendación M.3100

MODELO GENÉRICO DE INFORMACIÓN DE RED

ENMIENDA 1

(Ginebra, 1999)

1 Introducción

1.1 Alcance

Se expone en esta enmienda una mejora a la Recomendación M.3100 sobre un modelo genérico de información de nivel de red. Dicho modelo identifica las clases de objeto gestionado que son comunes a redes de telecomunicaciones gestionadas. La enmienda siguiente proporciona adiciones a la Recomendación M.3100 en relación con la telemetría (exploración y control) y presenta una mejora del paquete de circuitos anterior.

1.2 Recomendaciones relacionadas

Las siguientes Recomendaciones del UIT-T y otras referencias contienen disposiciones que, mediante su referencia en este texto, constituyen disposiciones de la presente Recomendación. Al efectuar esta publicación, estaban en vigor las ediciones indicadas. Todas las Recomendaciones y otras referencias son objeto de revisiones por lo que se preconiza que los usuarios de esta Recomendación investiguen la posibilidad de aplicar las ediciones más recientes de las Recomendaciones y otras referencias citadas a continuación. Se publica periódicamente una lista de las Recomendaciones UIT-T actualmente vigentes.

– Recomendación UIT-T G.851.1 (1996), *Gestión de la red de transporte – Aplicación del marco del modelo de referencia de procesamiento distribuido abierto*.

– Recomendación UIT-T G.851.2[1], *Metodología para el punto de vista de ingeniería GDMO*.

– Recomendación UIT-T G.852.1 (1996), *Punto de vista de la empresa para la gestión de la conexión de subred simple*.

– Recomendación UIT-T G.852.2 (1999), *Descripción desde el punto de vista de la empresa del modelo de recursos de red de transporte*.

– Recomendación UIT-T G.852.3 (1999), *Punto de vista de la empresa para la gestión de topologías*.

– Recomendación UIT-T G.852.6 (1999), *Punto de vista de la empresa para la gestión de camino*.

– Recomendación UIT-T G.852.8 (1999), *Punto de vista de la empresa para la gestión de adaptación proporcionada previamente*.

– Recomendación UIT-T G.852.10 (1999), *Punto de vista de la empresa para la gestión de conexiones de enlaces proporcionadas previamente*.

– Recomendación UIT-T G.852.12 (1999), *Punto de vista de la empresa para la gestión de enlaces proporcionados previamente*.

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[1] Actualmente en estado de proyecto.

– Recomendación UIT-T G.853.1 (1999), *Elementos comunes del punto de vista de la información para la gestión de una red de transporte.*

– Recomendación UIT-T G.853.2 (1996), *Punto de vista de la información de gestión de conexiones de subred.*

– Recomendación UIT-T G.853.3 (1999), *Punto de vista de la información para la gestión de topologías.*

– Recomendación UIT-T G.853.6 (1999), *Punto de vista de la información para la gestión de caminos.*

– Recomendación UIT-T G.853.8 (1999), *Punto de vista de la información para la gestión de adaptación proporcionada previamente.*

– Recomendación UIT-T G.853.10 (1999), *Punto de vista de la información para la gestión de conexiones de enlaces proporcionadas previamente.*

– Recomendación UIT-T G.853.12 (1999), *Punto de vista de la información para la gestión de enlaces proporcionados previamente.*

– Recomendación UIT-T G.854.1 (1996), *Gestión de la red de transporte – Interfaces computacionales para un modelo básico de red de transporte.*

– Recomendación UIT-T G.854.3 (1999), *Punto de vista computacional para la gestión de topologías.*

– Recomendación UIT-T G.854.6 (1999), *Punto de vista computacional para la gestión de caminos.*

– Recomendación UIT-T G.854.8 (1999), *Punto de vista computacional para la gestión de adaptación proporcionada previamente.*

– Recomendación UIT-T G.854.10 (1999), *Punto de vista computacional para la gestión de conexiones de enlaces proporcionadas previamente.*

– Recomendación UIT-T G.854.12 (1999), *Punto de vista computacional para la gestión de enlaces proporcionados previamente.*

– Recomendación UIT-T M.3100 (1995), *Modelo genérico de información de red.*

1.3 Abreviaturas

Ninguna.

1.4 Definiciones

Ninguna.

1.5 Nota relativa a las referencias GDMO

La presente enmienda es parte integrante de la Recomendación M.3100. Esto implica que todas las definiciones (clase de objeto, lotes, atributos, ...) definidas en la Recomendación M.3100, así como en el corrigendum técnico 1, son definiciones locales y pueden ser referenciadas sin el identificador de documento.

La directiva GDMO siguiente se añade para favorecer el tratamiento automático de la presente Recomendación.

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

2 Topología de red y fragmento de conectividad (Network Topology and Connectivity Fragment)

2.1 Visión de conjunto del modelo (Overview of the model)

En la figura 2-1 se ilustra la jerarquía de herencia de los objetos gestionados que representan el modelo de información de gestión a nivel de red para redes de transporte genéricas.

T0411610-99
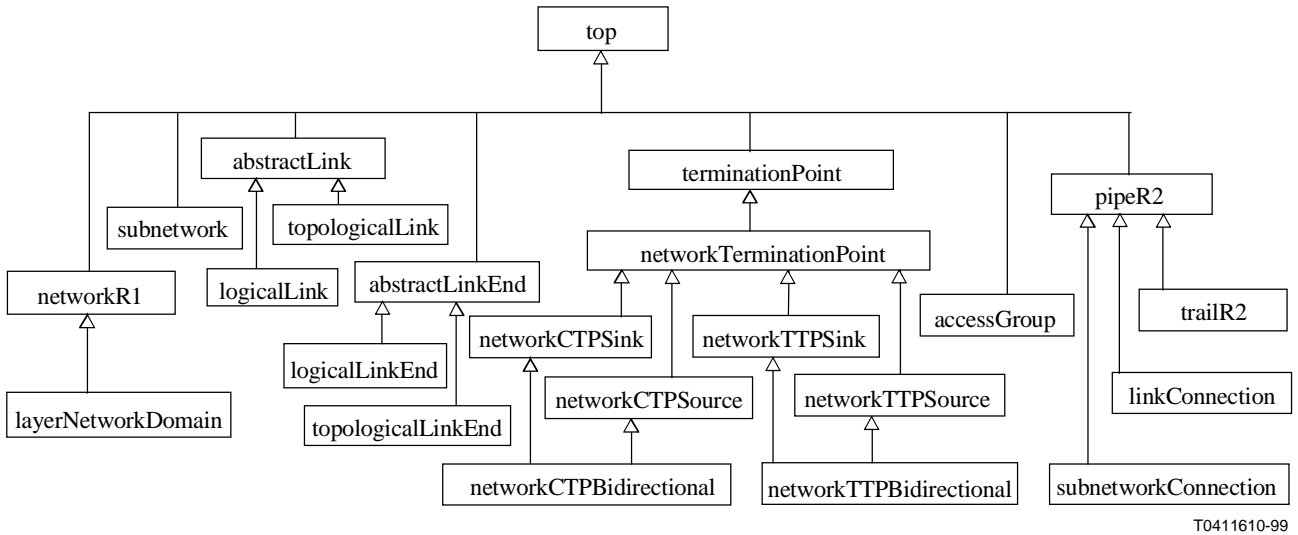
Figura 2-1/M.3100 – Herencia

La figura 2-2 muestra la jerarquía de denominación de objetos gestionados.
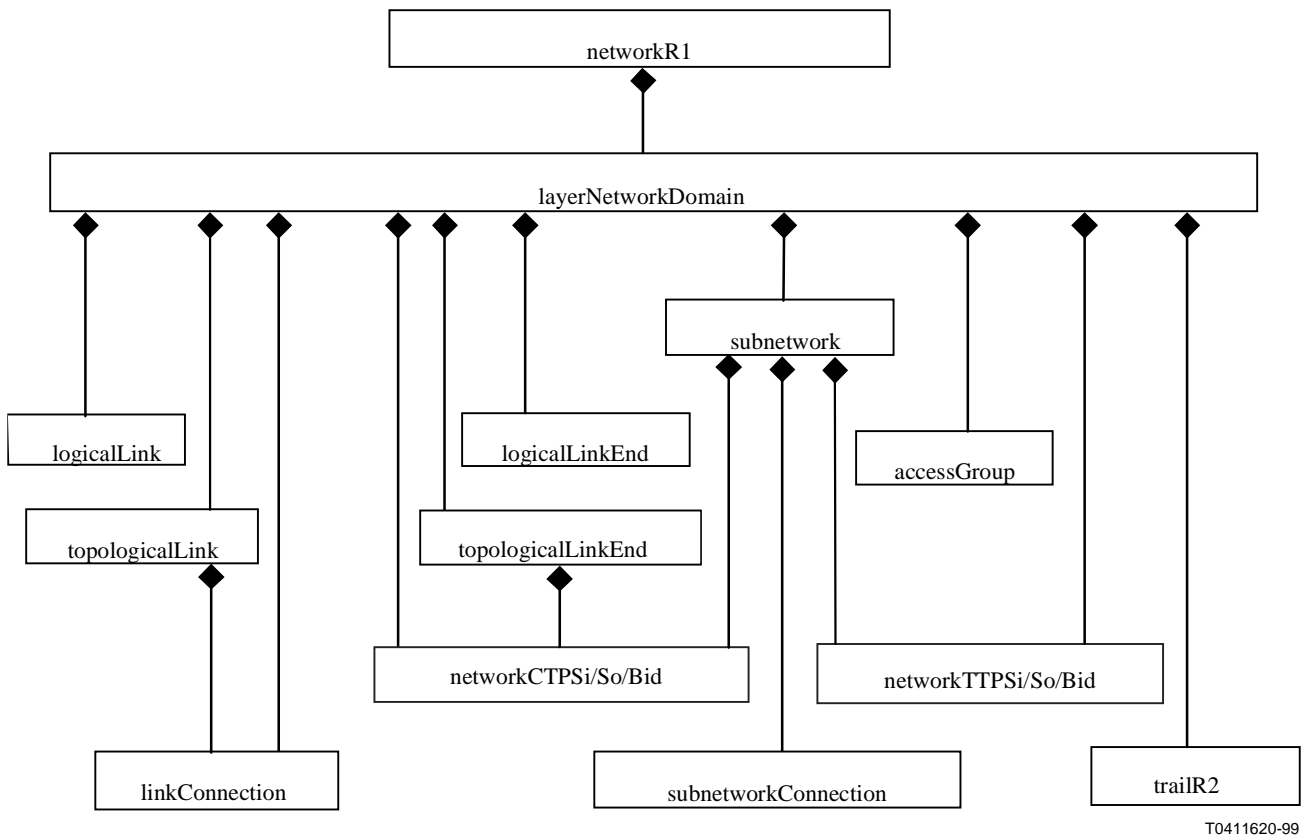
Figura 2-2/M.3100 – Jerarquía de denominación

La figura 2-3 muestra las relaciones entre entidades topológicas y de conectividad claves para objetos gestionados en el modelo de información de gestión a nivel de red.
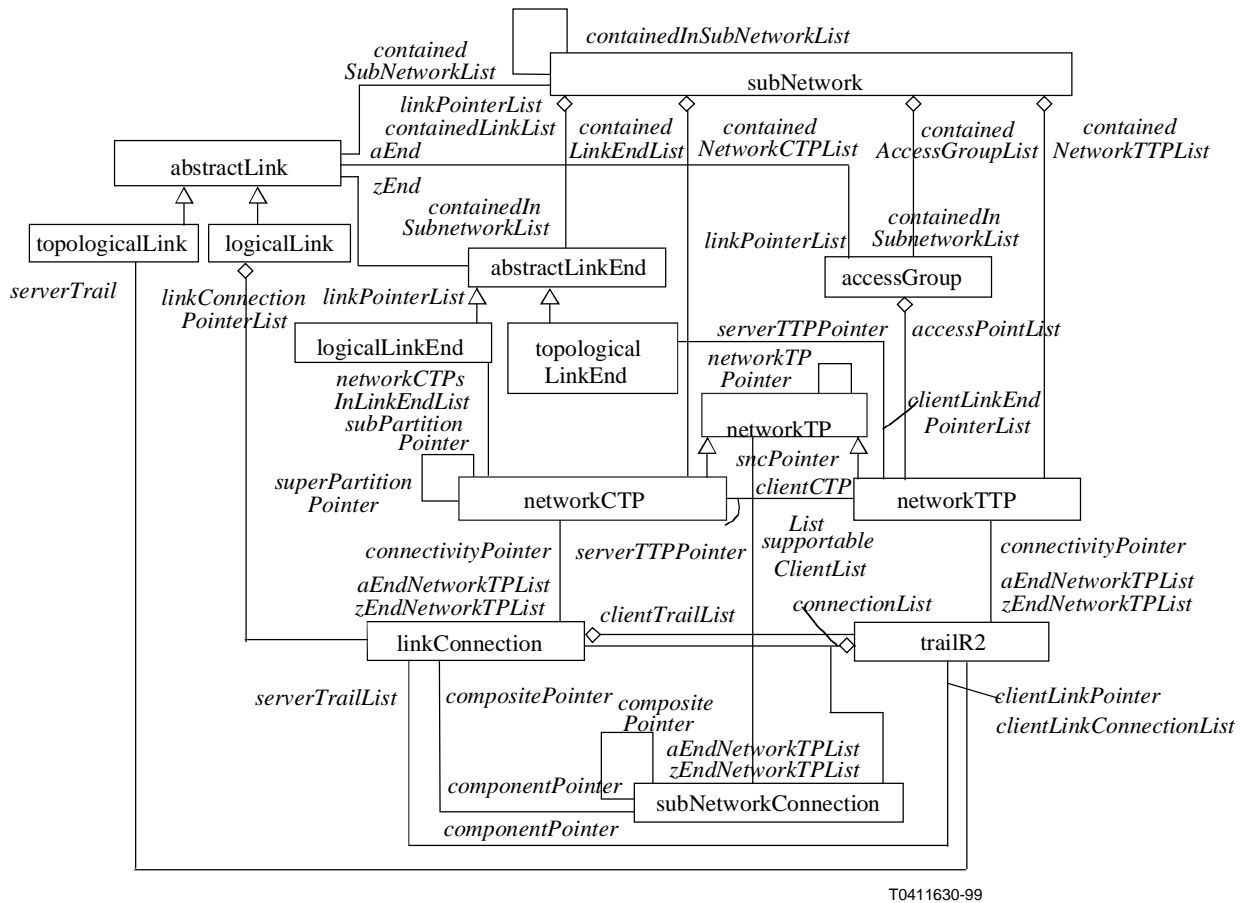
Figura 2-3/M.3100 – Relaciones entre entidades

2.2 Clases de objeto (Object classes)

Las siguientes especificaciones de objetos gestionados se han desarrollado utilizando la metodología del punto de vista de la ingeniería de las directrices para la definición de objetos gestionados (GDMO). Las definiciones GDMO de estos objetos gestionados hacen referencia a las comunidades a partir de las cuales se han formulado las definiciones. Estas referencias se indican en las cláusulas "behaviour" (comportamiento) de las especificaciones mediante etiquetas incluidas entre corchetes angulares ('<' y '>').

Los convenios de denominación utilizados en la definición GDMO siguiente se atienen a los convenios de denominación de las GDMO. Por lo general, en GDMO se utiliza un solo nombre distinguido relativo (RDN) (especificado por el atributo de denominación de la clase de objeto gestionado y definido en su VINCULACIÓN DE NOMBRE) para identificar de manera exclusiva un ejemplar de objeto en relación con su progenitor. En algunos casos, este método de denominación de ejemplares de objetos difiere del de definición de las comunidades en las que se basan esos objetos gestionados cuando se han utilizado múltiples identificadores. Si tal cosa sucede, la utilización de un atributo de denominación único representa una optimización para el punto de vista de la ingeniería de las GDMO.

2.2.1 Enlace abstracto (Abstract Link)

La clase abstractLink (enlace abstracto) no es instanciable.

```
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 Extremo de enlace abstracto (Abstract Link End)

La clase abstractLinkEnd (extremo de enlace abstracto) no es instanciable.

```
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 Grupo de acceso (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 Dominio de red de capa (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 Conexión de enlace (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 Enlace lógico (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 Extremo de enlace lógico (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 Punto de terminación de conexión de red bidireccional (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   Punto de terminación de conexión de red sumidero (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 Punto de terminación de conexión de red fuente (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   Punto de terminación de red (Network Termination Point)

La clase punto de terminación de red (networkTerminationPoint) no es instanciable.

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 Punto de terminación de camino de red bidireccional (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 Punto de terminación de camino de red sumidero (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 Punto de terminación de camino de red fuente (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 Conducción R2 (PipeR2)

La clase conducción R2 (pipeR2) no es instanciable ya que la transferencia es efectuada a través del camino y la conexión de enlace.

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   Subred (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   Conexión de subred (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   Enlace topológico (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   Extremo de enlace topológico (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   Camino R2 (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 Lotes (Packages)

2.3.1 Lote lista de puntos de terminación de conexión de cliente (Client CTP List Package)

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

2.3.2 Lote lista de punteros de conexión de enlace de cliente (Client Link Connection Pointer List Package)

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

2.3.3 Lote puntero de extremo de enlace de cliente (Client Link End Pointer Package)

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

2.3.4 Lote puntero de enlace de cliente (Client Link Pointer Package)

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

2.3.5 Lote puntero de componentes (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 Lote puntero compuesto (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 Conectividad configurada (Configured Connectivity)

configuredConnectivityPackage PACKAGE

    ATTRIBUTES

        configuredConnectivity   **GET;**

REGISTERED AS {m3100Package 55};

2.3.8 Lote puntero de conectividad (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 Lote lista de grupos de acceso contenidos (Contained Access Group List Package)

containedAccessGroupListPackage   PACKAGE

    ATTRIBUTES

        containedAccessGroupList   **GET-REPLACE ADD-REMOVE;**

REGISTERED AS {m3100Package 57};

2.3.10 Lote lista de subredes continentes (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   Lote lista de extremos de enlace contenidos (Contained Link End List Package)

containedLinkEndListPackage   PACKAGE
    ATTRIBUTES
        containedLinkEndList   GET-REPLACE ADD-REMOVE;
REGISTERED AS {m3100Package 59};

2.3.12   Lote lista de enlaces contenidos (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   Lote lista de puntos de terminación de red contenidos (Contained Network TP List Package)

containedNetworkTPListPackage   PACKAGE
    ATTRIBUTES
        containedNetworkTPList   GET-REPLACE ADD-REMOVE
                                      networkTTPAndSubnetworkNotCompatible
                                      failureToAssociateNetworkTTP
                                      failureToDisassociateNetworkTTP;
REGISTERED AS {m3100Package 61};

2.3.14   Lote lista de subredes contenidas (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   Lista de conexiones de capa (Layer Connection List)

layerConnectionListPackage PACKAGE
    ATTRIBUTES
        connectionList   GET SET-BY-CREATE;
REGISTERED AS {m3100Package 63};

2.3.16 Lote capacidad de enlace lógico (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 Lote lista de punteros de conexiones de enlace (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 Lote capacidad de extremo de enlace (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 Lote lista de punteros de enlace (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 Lote cuenta de conexiones de enlace máxima (Maximum Link Connection Count Package)

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

2.3.21 Lote cuenta de puntos de terminación de conexión de red máxima (Maximum Network CTP Count Package)

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

2.3.22 Lote asignación de elemento de red (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 Lote lista de puntos de terminación de conexión de red en extremo de enlace (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 Lote punto de terminación de conexión de red (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 Lote puntero de punto de terminación de red (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   Lote capacidad de enlaces potencial (Potential Link Capacity Package)

```
potentialLinkCapacityPackage    PACKAGE
          ATTRIBUTES
               potentialLinkCapacity               GET;
REGISTERED AS {m3100Package 74};
```

2.3.27   Lote capacidad de extremos de enlace potencial (Potential Link End Capacity Package)

```
potentialLinkEndCapacityPackage      PACKAGE
          ATTRIBUTES
               potentialLinkEndCapacity            GET;
REGISTERED AS {m3100Package 75};
```

2.3.28   Lote capacidad de enlaces proporcionados (Provisioned Link Capacity Package)

```
provisionedLinkCapacityPackage       PACKAGE
          ATTRIBUTES
               provisionedLinkCapacity             GET;
REGISTERED AS {m3100Package 76};
```

2.3.29   Lote cuenta de conexiones (Provisioned Link Connection Count Package)

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

2.3.30   Lote capacidad de extremos de enlace proporcionados (Provisioned Link End Capacity Package)

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

2.3.31   Lote cuenta de puntos de terminación de conexión de red proporcionados (Provisioned Network CTP Count Package)

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

2.3.32   Lote calidad de servicio de conectividad (Quality Of Connectivity Service Package)

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

2.3.33   Lote perfil de encaminamiento relacionado (Related Routing Profile Package)

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

2.3.34 Lote puntero de punto de terminación de camino de servidor (Server TTP Pointer Package)

serverTTPPointerPackagePACKAGE
    ATTRIBUTES
        serverTTPPointer   **GET;**
REGISTERED AS {m3100Package 82};

2.3.35 Lote puntero de conexión de subred (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 Lote soportado por (Supported By Package)

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

2.3.37 Lote capacidad de enlace topológico (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 Lote capacidad de extremo de enlace topológico (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   Lote capacidad de enlace total (Total Link Capacity Package)

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

2.3.40   Lote capacidad de extremo de enlace total (Total Link End Capacity Package)

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

2.3.41   Lote descriptor de tráfico (Traffic Descriptor Package)

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

2.3.42   Lote situación desconocida (Unknown Status Package)

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

2.3.43   Lote coste de utilización (Usage Cost Package)

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

2.3.44   Lote estado de utilización (Usage State Package)

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

2.4   Atributos (Attributes)

2.4.1   Identificador de grupo de acceso (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   Lista de puntos de acceso (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   Extremo A (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   Lista de puntos de terminación de red de extremo A (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   Capacidad de extremo de enlace asignado (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   Capacidad de extremo de enlace disponible (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 Capacidad disponible de un enlace (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 Lista de puntos de terminación de conexión clientes (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 Lista de punteros de extremo de enlace de cliente (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 Lista de punteros de enlace de cliente (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 Lista de punteros de enlace de cliente (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   Punteros componentes (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   Puntero compuesto (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   Conectividad configurada (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   Lista de conexiones (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   Puntero de conectividad (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   Lista de grupos de acceso contenidos (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   Lista de subredes contenidas (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   Lista de extremos de enlace contenidos (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   Lista de enlaces contenidos (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 Lista de puntos de terminación de red contenidos (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 Lista de subredes contenidas (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 Identificador de dominio de red de capa (Layer Network Domain Id)

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

2.4.24 Lista de punteros de conexión de enlace (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 Direccionalidad de enlace (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 Identificador de extremo de enlace (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 Identificador de enlace (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 Puntero de enlace (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 Lista de punteros de enlace (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 Direccionalidad de extremo de enlace lógico (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 Cuenta de conexiones de enlace máxima (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 Cuenta de puntos de terminación de conexión de red máxima (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 Puntero de asignación de elemento de red (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 Lista de puntos de terminación de conexión de red en extremo de enlace (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 Puntero de punto de terminación de red (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 Direccionalidad de punto (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   Capacidad de enlaces potencial (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   Capacidad de extremos de enlace potencial (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   Capacidad de enlaces proporcionados (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   Cuenta de conexiones de enlace proporcionadas (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 Capacidad de extremos de enlace proporcionados (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 Cuenta de puntos de terminación de conexión de red proporcionados (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 Calidad de servicio de conectividad (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 Perfil de encaminamiento relacionado (Related Routing Profile)

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

2.4.45 Camino de servidor (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 Puntero de punto de terminación de camino de servidor (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   Identificación de señal (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   Puntero de subdivisión (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   Id de conexión de subred (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   Puntero de conexión de subred (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   Id de subred (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   Puntero de superdivisión (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   Direccionalidad de extremo topológico (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   Puntero de grupo topológico (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   Identificador de punto topológico (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 Capacidad de enlace total (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 Capacidad de extremo de enlace total (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 Descriptor de tráfico (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 Coste de la utilización (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 Extremo Z (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 Lista de puntos de terminación de red de extremo Z (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 Acciones (Actions)

2.5.1 Añadir capacidad a enlace topológico (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 Añadir capacidad a extremo de enlace topológico (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 Asignación de conexiones de enlace a enlace lógico (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 Asignación de puntos de terminación de conexión a extremo de enlace lógico (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 Desasignación de una conexión de enlace de un enlace lógico (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 Desasignación de un punto de terminación de conexión de red de un extremo de enlace lógico (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 Supresión de capacidad de enlace topológico (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 Supresión de capacidad de extremo de enlace topológico (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 Notificaciones (Notifications)

Ninguna.

2.7 Parámetros (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   Vinculaciones de nombre (Name Bindings)

2.8.1   Grupo de acceso (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   Dominio de red de capa (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   Enlace lógico (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   Conexión de enlace (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   Extremo de enlace lógico (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   Extremo del enlace topológico (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   Punto de terminación de conexión de red sumidero (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   Punto de terminación de conexión de red fuente (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   Punto de terminación de camino de red sumidero (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   Punto de terminación de camino de red fuente (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   Subred (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   Conexión de subred (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   Enlace topológico (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   Camino (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   Fragmento de telemetría (Telemetry fragment)

El fragmento de telemetría modela puntos externos (cierres de relés y cierres de contacto) que se utilizan para controlar dispositivos externos (generadores, hornos, etc.), o supervisar condiciones externas.

3.1 Clases de objeto (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
            currentControlState   GET,
            validControlType   GET-REPLACE SET-BY-CREATE;
      ACTIONS
            externalControl;;;
    CONDITIONAL PACKAGES
        normalControlStatePackage PRESENT IF
            "an instance supports it";
REGISTERED AS {m3100ObjectClass 41};

Tipo de acción válida de un punto de control (opcional)	Estado anterior	Tipo de acción de control	Resultado de la acción	Estado posterior
Sólo transitoria	Cerrado	Cierre-continuamente	Error: tipo de acción no válida	Cerrado
		Apertura-continuamente	Error: tipo de acción no válida	Cerrado
		Cierre-transitoriamente	Error: ya en tal condición	Cerrado
		Apertura-transitoriamente	Completada	Abierto, después cerrado
	Abierto	Cierre-continuamente	Error: tipo de acción no válida	Abierto
		Apertura-continuamente	Error: tipo de acción no válida	Abierto
		Cierre-transitoriamente	Completada	Cerrado, después abierto
		Apertura-transitoriamente	Error: ya en tal condición	Abierto
Sólo continua	Cerrado	Cierre-continuamente	Error: ya en tal condición	Cerrado
		Apertura-continuamente	Completada	Abierto
		Cierre-transitoriamente	Error: tipo de acción no válida	Cerrado
		Apertura-transitoriamente	Error: tipo de acción no válida	Cerrado
	Abierto	Cierre-continuamente	Completada	Cerrado
		Apertura-continuamente	Error: ya en tal condición	Abierto
		Cierre-transitoriamente	Error: tipo de acción no válida	Abierto
		Apertura-transitoriamente	Error: tipo de acción no válida	Abierto
Transitoria y continua	Cerrado	Cierre-continuamente	Error: ya en tal condición	Cerrado
		Apertura-continuamente	Completada	Abierto
		Cierre-transitoriamente	Error: ya en condición	Cerrado
		Apertura-transitoriamente	Completada	Abierto, después cerrado
	Abierto	Cierre-continuamente	Completada	Cerrado
		Apertura-continuamente	Error: ya en tal condición	Abierto
		Cierre-transitoriamente	Completada	Cerrado, después abierto
		Apertura-transitoriamente	Error: ya en tal condición	Abierto

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 problems with the scan function itself. The probable cause of the currentProblemList is by itself not a precise indicator of service affecting alarms (e.g. due to standby resources) and the serviceAffected attribute is used as a unifying indicator of service affecting conditions.";;

```
                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   Lotes (Packages)

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

3.3   Atributos (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   Acciones (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   Vinculaciones de nombre (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 Fragmento paquete de circuitos (Circuit pack fragment)

El modelo soporta las siguientes funciones del paquete de circuitos:

- petición de reinicialización de un paquete de circuitos;

- en el caso de un paquete de circuitos que soporta múltiples puertos físicos, indica la entidad asociada de los puertos;

- indica las velocidades de señalizacióndisponibles de un paquete de circuitos;

- indica y configura la velocidad de señalización de una correspondencia de carga neta del puerto (o puertos) de un paquete de circuitos.

El objeto circuitPackR1se obtiene como subclase a partir de equipmentR2 en lugar de circuitPack, con el fin de utilizar los valores de atributo del availabilityStatus además de "notInstall", incluyendo "degrade" para indicar que solamente un subconjunto de los puertos no está en funcionamiento.

El atributo "textType" (tipo de texto) heredado de equipmentR2 se utiliza para indicar el tipo del paquete de circuitos (la sintaxis de textType es GraphicString, y la sintaxis del atributo circuitPackType es printableString).

El campo comentario de la SignalRate del tipo datos ASN.1 es un OID (identificador de objeto) que refleja la velocidad y el formato.

4.1 Clases de objeto (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   Lotes (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   Atributos (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 Acciones (Actions)

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 Vinculaciones de nombre (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   Parámetros (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   Información de acción de conexión (Connect Action Information)

La información de petición de acción de conexión se actualiza para hacer posible información adicional. La operación que sigue reemplaza a la versión anterior de ConnectInformation (de M.3100/corr.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 Definiciones ASN.1 (ASN.1 definitions)

6.1 Reglas de extensibilidad (Rules of extensibility)

Los tipos siguientes se indicarán como extensibles:

– ENUMERATED (ENUMERADO);

– tagged SET (CONJUNTO rotulado);

– tagged SEQUENCE (SECUENCIA rotulada);

– tagged CHOICE (SELECCIÓN rotulada).

En el marco de las reglas de extensibilidad pueden añadirse en versiones futuras de esta Recomendación nuevas enumeraciones (para los tipos ENUMERATED), nuevas asignaciones de nombre de bit (para los tipos denominados BIT STRING), nuevos números nombrados (para los tipos denominados INTEGER) y nuevos elementos rotulados (para los tipos rotulados SET, SEQUENCE y CHOICE).

Al procesar la información en una PDU de protocolo de aplicación de gestión de sistema (SMAP, *system management application protocol*) la máquina que acepta el SMAP ignorará:

– las enumeraciones no reconocidas;

– los números nombrados no reconocidos;

– los bits nombrados no reconocidos;

– los elementos de secuencias, selecciones y conjuntos rotulados no reconocidos.

6.2 Módulo ASN.1 (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 {
               portIdNameType,
               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   Añádase el siguiente apéndice:

Este apéndice no normativo contiene información que ilustra la utilización del fragmento de topología de red en el ensamblaje de modelos utilizables de información a nivel de red. El modelo de fragmento de topología, si bien formado por un conjunto singular de clases de objetos, ofrece un número limitado de relaciones alternativas entre los objetos vía vinculaciones de nombre opcionales y lotes condicionales. Esas alternativas se refieren a optimizaciones de modelado diferentes y, tomadas conjuntamente, reflejan más que una arquitectura de modelo único. De hecho, cuando se consideran en conjunto, el número de combinaciones posibles de elementos alternativos podría ser muy grande.

Para orientar a los usuarios del fragmento de topología, se dan ejemplos que ilustran algunas de las combinaciones más comunes de los componentes de modelos. Cada ejemplo de modelo es coherente internamente y no muestra las redundancias que se manifiestan en el fragmento de topología en su totalidad.

En la subcláusula I.1 se examinan aspectos generales relativos al diseño a propósito de las relaciones entre capas. En la subcláusula I.2 se describen aspectos de la topología dentro de las capas. En las subcláusulas I.3 y I.4 se dan dos ejemplos diferentes de ensamblaje de componentes de modelo.

I.1   Relaciones dentro de capas alternativas

La agregación de clases de objetos que pueden tener numerosos ejemplares, por ejemplo, puntos de terminación, dentro de contenedores o fondos comunes y agregados de nivel superior se necesita tanto para las relaciones dentro de capa (que representan funciones de adaptación) como para las relaciones entre capas (es decir, para la topología de las subredes). Para ambos tipos de agregación se admiten procedimientos alternativos.

La figura I.1 presenta una visión de un conjunto de entidades de recursos básicos que ilustra las relaciones entre capas entre puntos de terminación de camino de red (networkTTP) de capa de servidor (server) y componentes topológicos de capa de cliente (client). Entre esos componentes de capa de cliente figuran un punto de terminación de conexión de red (networkCTP), un extremo de enlace topológico y una subred. En el contexto de la figura I.1 el punto de terminación de camino de red está en un dominio de red de capa (layerNetworkDomain) (servidor) y los demás componentes están en otro dominio de red de capa (cliente). En esta visión, se indican dos opciones básicas para relacionar puntos de terminación de red con componentes de capa de cliente:

A –   Relación entre puntero y extremo de enlace topológico (topologicalLinkEnd) y relación de denominación entre extremo de enlace topológico y dominio de red de capa. Las relaciones de denominación se utilizan para vincular un punto de terminación de conexión de red con un extremo de enlace topológico y, a partir de ahí, con el dominio de red de capa.

B –   Relación entre puntero y punto de terminación de conexión de red de capa de cliente, relación de denominación entre punto de terminación de conexión de red y subred y relación de denominación entre subred y dominio de red de capa.
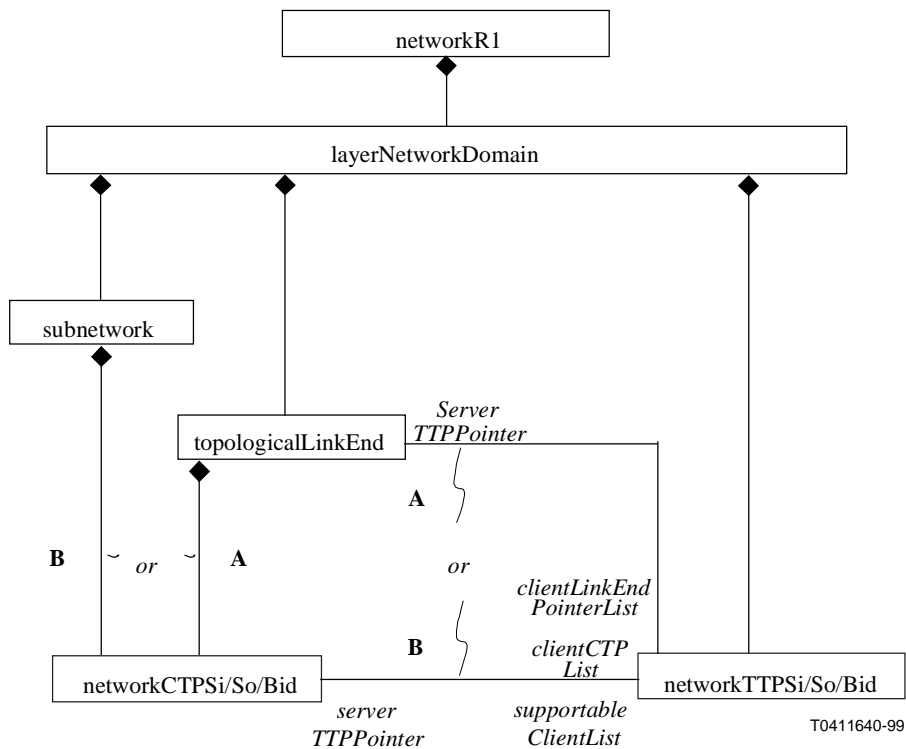
**Figura I.1/M.3100 – Relaciones entre entidades alternativas
para asociaciones entre capas**

Como indican los condicionales *or*, una implementación determinada sólo podrá utilizar las relaciones marcadas "A" o las marcadas "B", sin mezclar elementos de unas y otras.

I.2 Topologías dentro de capas alternativas

La agregación dentro de una determinada topología de capa se puede efectuar utilizando un esquema jerárquico. El esquema tiene dos niveles. El primer nivel de agregación asocia puntos de terminación con extremos de enlace o grupos de acceso. El segundo nivel asocia esas estructuras dentro de unas estructuras mayores, a saber, las subredes.

De manera alternativa, los puntos de terminación se pueden asociar con subredes directamente, y se pueden formar fondos comunes agrupando conjuntos de puntos de terminación. Estos procedimientos se incluyen como parte de los dos ejemplos de modelo que siguen.

I.3 Ejemplo N.º 1

En la figura I.2 se muestra un diagrama de relaciones entre entidades para el primer ejemplo de modelo. Las vinculaciones de nombre que siguen las directrices para la definición de objetos gestionados (GDMO, *guidelines for the definition of managed objects*) se indican mediante líneas que terminan en pequeños cuadrados de diagonal vertical. Otros tipos de relaciones de agregación o asociación se indican mediante líneas simples. Los nombres de los atributos de puntero se indican mediante texto en letra cursiva junto a las clases de objeto con las que están asociados los atributos. La agregación entre capas utiliza el escenario "A" descrito más arriba. Dentro de un determinado dominio de red de capa, los puntos de terminación de red son agregados por los objetos extremo de enlace topológico (topologicalLinkEnd) o grupo de acceso (accessGroup). Punteros bidireccionales asocian objetos de subred con objetos topologicalLinkEnd y accessGroup. En este ejemplo, sólo se

han utilizado las subclases *topológicas* de los objetos enlace abstracto (abstractLink) y extremo de enlace abstracto (abstractLinkEnd), para simplificar. Un enlace topológico (topologicalLink) une varias subredes por medio de objetos topologicalLinkEnd.
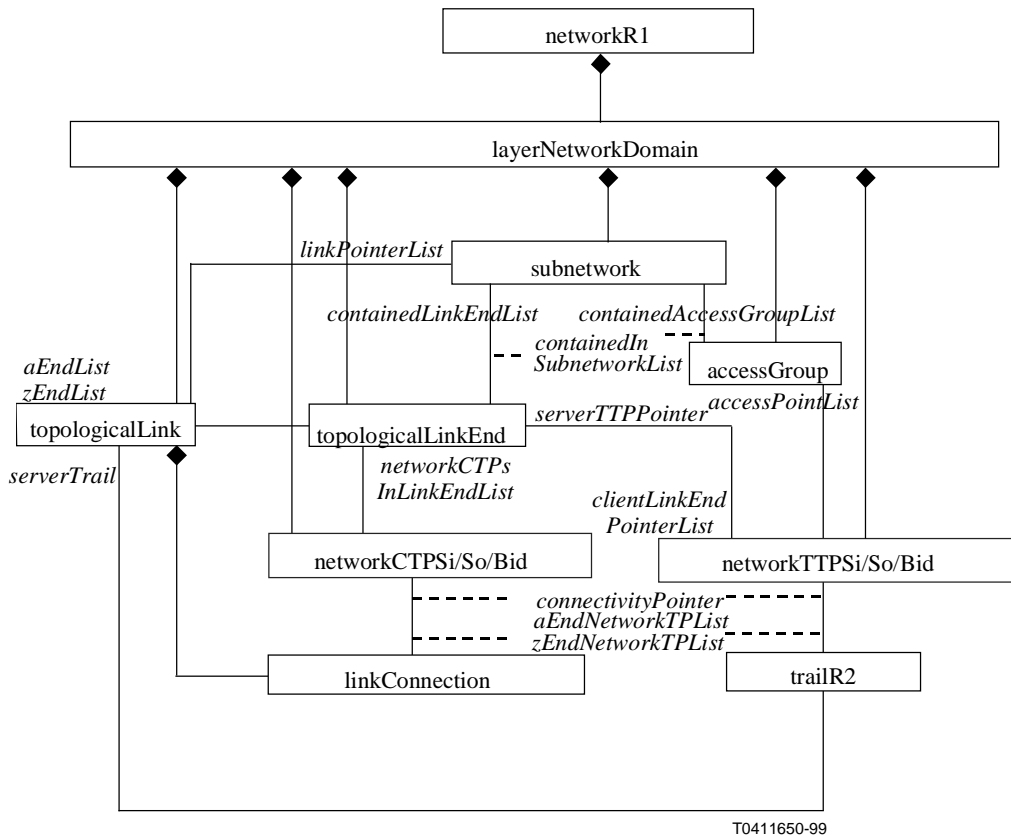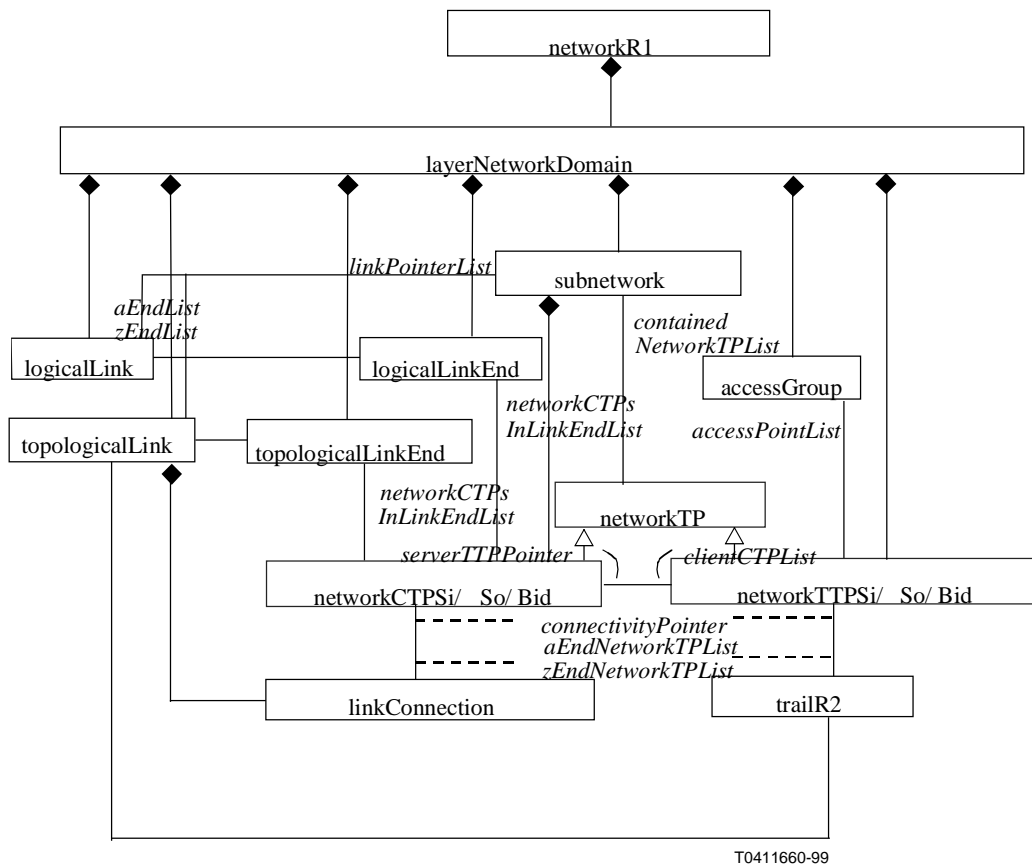

Figura I.2/M.3100

I.4 Ejemplo N.º 2

En el segundo ejemplo de ensamblaje, la agregación entre capas utiliza el escenario "B" descrito más arriba. Dentro de un determinado dominio de red de capa, los puntos de terminación de red son vinculados a una subred determinada por medio de vinculaciones de nombre de GDMO. En este caso, las vinculaciones de nombre a una subred se aplican solamente a un nivel de división (normalmente el más bajo); se pueden utilizar punteros para referirse a niveles superiores de división (no se muestra). Los puntos de terminación se pueden agregar en objetos extremo de enlace topológico (topologicalLinkEnd) u objetos grupo de acceso (accessGroup), pero no a los mismos efectos que en el ejemplo N.º 1, es decir, no para asociar a objetos de subred.

En este ejemplo se utilizan subclases tanto de objetos enlace abstracto (abstractLink) como de objetos extremo de enlace abstracto (abstractLinkEnd). Los objetos enlace topológico (topologicalLink) o enlace lógico (logicalLink) unen objetos de subredes sin que intervengan subclases de abstractLinkEnd. Las subclases de los objetos abstractLinkEnd se utilizan para dar un punto de vista topológico de los enlaces que unen diferentes dominios administrativos definidos por diferentes ejemplares de red R1 (networkR1). Estos enlaces no se modelan directamente (criterio utilizado también en el ejemplo N.º 1).

Figura I.3/M.3100

Las clases de objeto conectividad son, en su mayoría, similares en los dos ejemplos. El objeto conexión de enlace (linkConnection) une subclases de punto de terminación de conexión de red (networkCTP); camino (trail) une subclases de puntos de terminación de camino de red (networkTTP). Entre objetos punto de terminación de red (networkTP) se pueden establecer conexiones de subred.

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