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UIT-T

SECTOR DE NORMALIZACIÓN
DE LAS TELECOMUNICACIONES
DE LA UIT

G.853.1

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SERIE G: SISTEMAS Y MEDIOS DE TRANSMISIÓN,
SISTEMAS Y REDES DIGITALES

Sistemas de transmisión digital – Redes digitales –
Gestión de red de transporte

**Elementos comunes del punto de vista de la
información para la gestión de una red de
transporte**

Recomendación UIT-T G.853.1

(Anteriormente Recomendación del CCITT)

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RECOMENDACIÓN UIT-T G.853.1

ELEMENTOS COMUNES DEL PUNTO DE VISTA DE LA INFORMACIÓN PARA LA GESTIÓN DE UNA RED DE TRANSPORTE

Resumen

El objetivo de esta Recomendación es proporcionar la especificación desde el punto de vista de la información para abstracciones de gestión de los componentes de arquitectura de la red de transporte conforme a la Recomendación G.805. Los recursos definidos en esta Recomendación proporcionan una base para la descripción de servicios de gestión de nivel de red de transporte.

Orígenes

La Recomendación UIT-T G.853.1 ha sido preparada por la Comisión de Estudio 4 (1997-2000) del UIT-T y fue aprobada por el procedimiento de la Resolución N.º 1 de la CMNT el 26 de marzo de 1999.

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Recomendación G.853.1

ELEMENTOS COMUNES DEL PUNTO DE VISTA DE LA INFORMACIÓN PARA LA GESTIÓN DE UNA RED DE TRANSPORTE

(Ginebra, 1999)

1 Alcance

La presente especificación del punto de vista de la información se relaciona con la especificación del modelo de recurso de la red de transporte desde el punto de vista de la empresa definido en la Recomendación G.852.2.

2 Referencias

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.

- [1] Recomendación UIT-T G.851.1 (1996), *Gestión de la red de transporte – Aplicación del marco del modelo de referencia de procesamiento distribuido abierto*.
- [2] Recomendación UIT-T G.852.2 (1999), *Descripción del punto de vista de la empresa del modelo de recursos de red de transporte*.
- [3] Recomendación UIT-T G.805 (1995), *Arquitectura funcional genérica de las redes de transporte*.
- [4] Recomendación UIT-T M.3100 (1995), *Modelo genérico de información de red*.

3 Definiciones

Ninguna.

4 Abreviaturas

En esta Recomendación se utilizan las siguientes siglas.

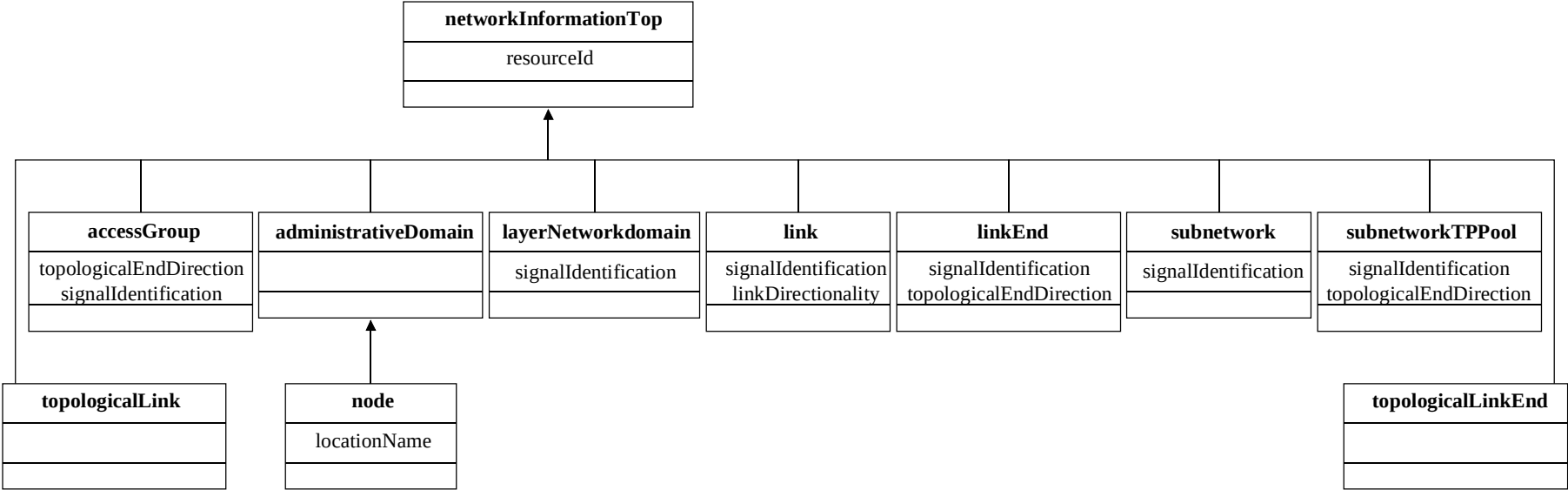
AD	Dominio administrativo (<i>administrative domain</i>)
AG	Grupo de acceso (<i>access group</i>)
bid	Bidireccional (<i>bidirectional</i>)
CTP	Punto de terminación de la conexión (<i>connection termination point</i>)
gtp	Punto de terminación de grupo (<i>group termination point</i>)
Id	Identificador
inv	Invariante
LC	Conexión de enlace (<i>link connection</i>)
LE	Terminal de enlace (<i>link end</i>)
LEnd	Terminal de enlace (<i>link end</i>)

LND	Dominio de red de capa (<i>layer network domain</i>)
NE	Elemento de red (<i>network element</i>)
NTTP	Punto de terminación de camino de red (<i>network trail termination point</i>)
PhysMed	Medio físico (<i>physical medium</i>)
PhysPort	Puerto físico (<i>physical port</i>)
SDH	Jerarquía digital síncrona (<i>synchronous digital hierarchy</i>)
SN	Subred (<i>subnetwork</i>)
SNC	Conexión de subred (<i>subnetwork connection</i>)
SNTP	Punto de terminación de subred (<i>subnetwork termination point</i>)
TC	Conexión en cascada (<i>tandem connection</i>)
tem	Modelo de recurso de red de transporte – Punto de vista de la empresa (<i>transport network resource model-enterprise viewpoint</i>) (Rec. G.852.2)
TEntity	Entidad de transporte (<i>transport entity</i>)
tim	Modelo de recurso de red de transporte – Punto de vista de la información (<i>transport network resource model-information viewpoint</i>) (Rec. G.853.1)
TL	Enlace topológico (<i>topological link</i>)
TLE	Extremo de enlace topológico (<i>topological link end</i>)
TP	Punto de terminación (<i>termination point</i>)
TransportC	Conexión de transporte (<i>transport connection</i>)
TTP	Punto de terminación de camino (<i>trail termination point</i>)
uni	Unidireccional (<i>unidirectional</i>)
UML	Lenguaje de modelado unificado (<i>unified modelling language</i>)

5 Convenios

Ninguno.

6 Definiciones de tipos de objeto de información



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Figura 1a/G.853.1 – Diagrama de tipos de objeto de información relacionados con la red (entidades topológicas)

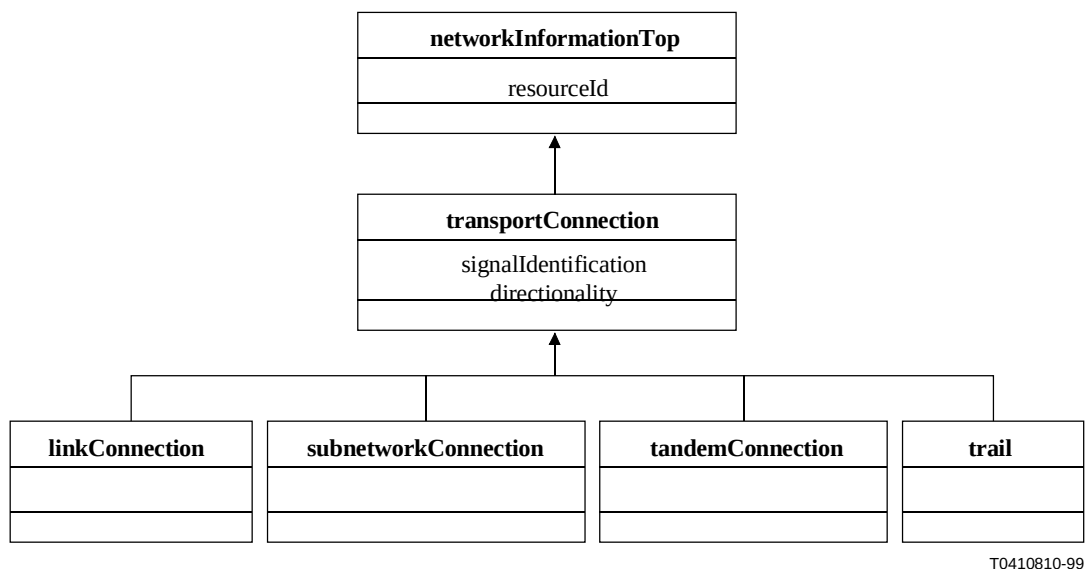


Figura 1b/G.853.1 – Diagrama de tipos de objeto de información relacionados con la red (entidades topológicas)

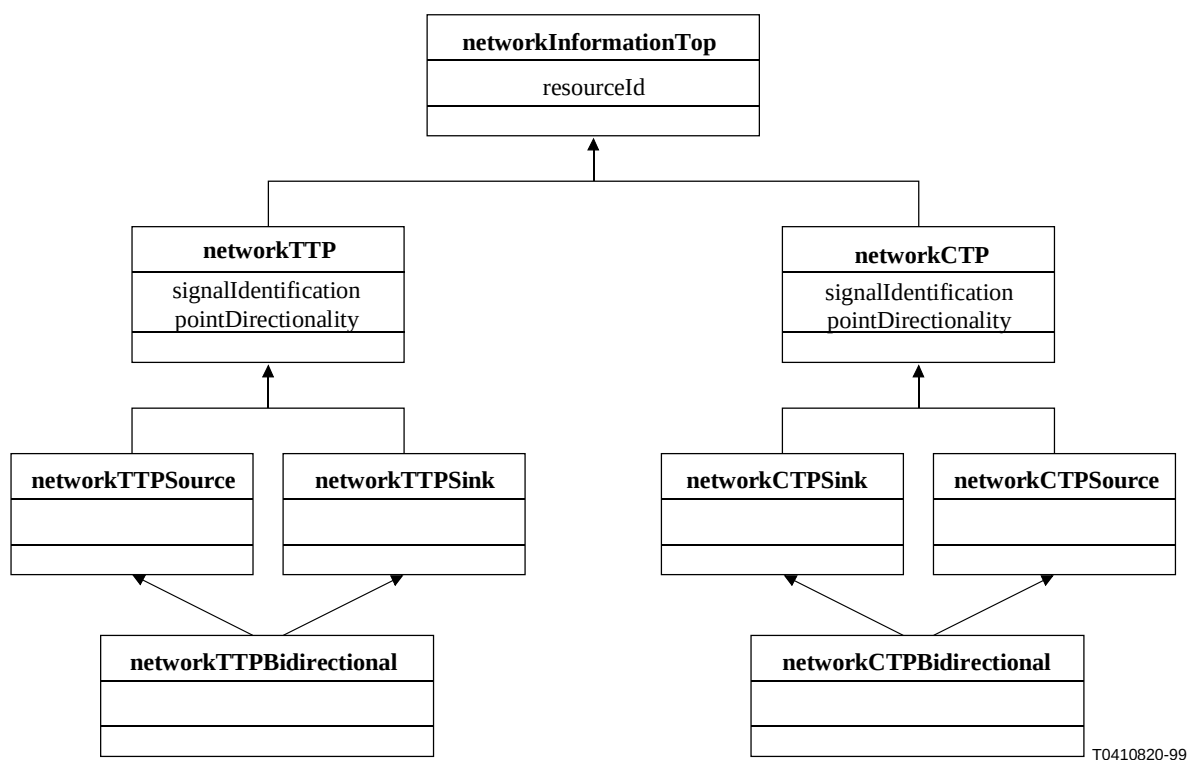


Figura 1c/G.853.1 – Diagrama de tipos de objeto de información relacionados con la red (entidades topológicas)

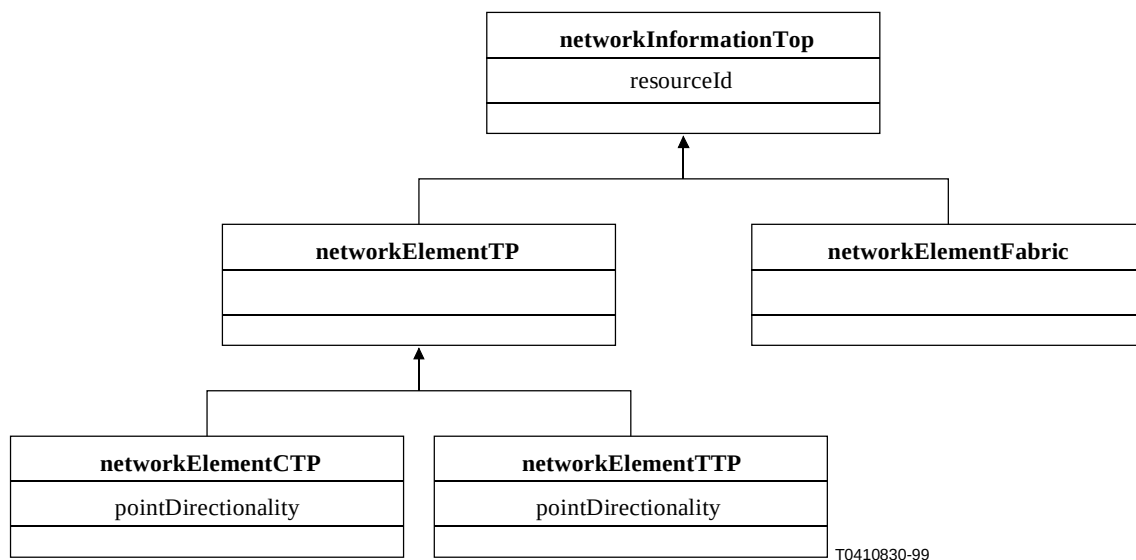


Figura 1d/G.853.1 – Diagrama de tipos de objeto de información relacionados con la red

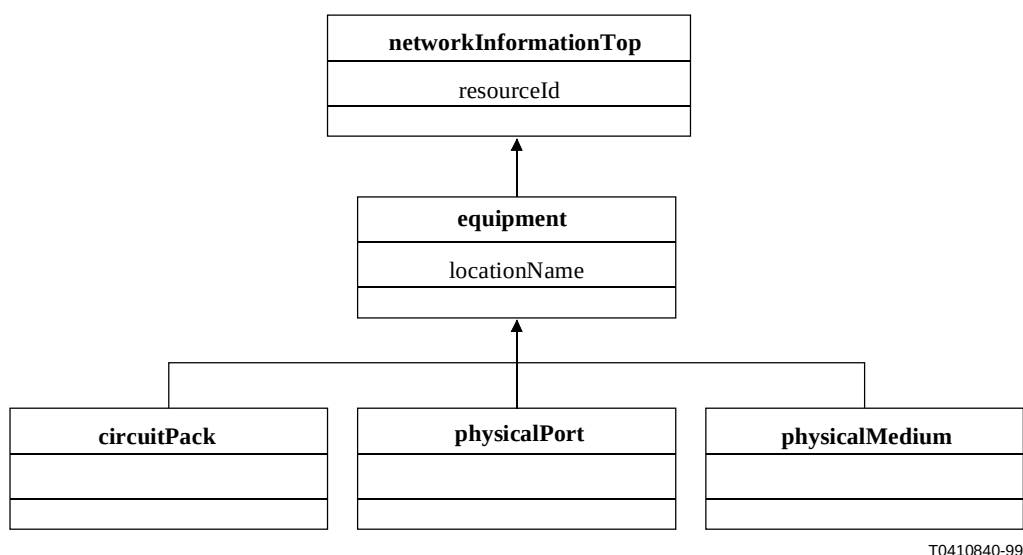


Figura 1e/G.853.1 – Diagrama de tipos de objeto de información de carácter físico

6.1 Grupo de acceso (accessGroup)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:access group>.

DEFINITION

"An accessGroup information object represents 'a group of co-located networkTTPs that are connected to the same subnetwork or link' (G.852.2 definition).

The accessGroup information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

topologicalEndDirection

"The topologicalEndDirection attribute characterizes the ability of the accessGroup to originate and/or terminate the traffic to be carried."

signalIdentification

"An accessGroup has a characteristic information which represents the specific format of signal that the resource carries. The specific format values will be defined in the technology-specific extensions."

POTENTIAL_RELATIONSHIPS

<accessGroupIsMadeOfNetworkTTPs>

<accessGroupIsRelatedToSntpPool >

<linkBinds >

<linkConnectionIsTerminatedByTopologicalEntities >

<linkEndIsBoundTo >

6.2 Dominio administrativo (administrativeDomain)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:administrative domain>

DEFINITION

"An administrativeDomain information object represents 'a domain in which the resources are grouped for a management purpose by an administrator' (G.852.2 definition).

The administrativeDomain information object type is a subtype of the networkInformationTop information object type."

POTENTIAL_RELATIONSHIPS

<administrativeDomainIsMadeOf>

6.3 Paquete de circuitos (circuitPack)

DEFINITION

"A circuitPack information object is a particular equipment that represents a physical circuitPack.

The circuitPack information object type is a subtype of the equipment information object type."

POTENTIAL_RELATIONSHIPS

<circuitPackSupportsPhysicalPorts>

6.4 Equipo (equipment)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:equipment>

DEFINITION

"An equipment information object represents 'physical components of a managed element, including replaceable components' (G.852.2 definition).

The equipment information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

locationName

"The locationName attribute identifies the location of an equipment that permits to locate where transport functions are."

POTENTIAL_RELATIONSHIPS

<equipmentImplements>
<equipmentIsMadeOfEquipments>

6.5 Dominio de red de capa (layerNetworkDomain)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:layer network domain>

DEFINITION

"A layerNetworkDomain information object represents '*a transport administrative domain in which all resources pertain to the same G.805 layer*' (G.852.2 definition).

The layerNetworkDomain information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

signalIdentification

The signalIdentification describes the signal that is transferred across the layer network domain."

POTENTIAL_RELATIONSHIPS

<layerNetworkDomainCanServeLnds>
<layerNetworkDomainIsMadeOf>

6.6 Enlace (link)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link>

DEFINITION

"A link information object represents '*the capacity between two subnetworks, two access groups or one subnetwork and one access group*' (G.852.2 definition).

The link information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

signalIdentification

"The signalIdentification describes the signal that is transferred across the link."

linkDirectionality

"The linkDirectionality attribute characterizes the ability of the associated resource to carry traffic in one, two, or undefined direction."

POTENTIAL_RELATIONSHIPS

<compoundLinkHasLinks>
<concatenatedLinkHasLinks>
<linkBinds>
<linkHasLinkConnections>
<linkIsTerminatedByLinkEnds>
<snIsPartitionedByLinks>

6.7 Conexión de enlace (linkConnection)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link connection>

DEFINITION

"A linkConnection information object represents '*the transparent capacity of transfer of information characterized by a given signal identification between two fixed points*' (G.852.2 definition)."

The linkConnection information object type is a subtype of the transportConnection information object type."

POTENTIAL_RELATIONSHIPS

<linkConnectionIsBoundTo>
<linkConnectionIsBundleOfLinkConnections>
<linkConnectionIsMadeOfTransportEntities>
<linkConnectionIsSupportedByTrail>
<linkConnectionIsTerminatedByPointToPoint>
<linkConnectionIsTerminatedByTopologicalEntities>
<linkHasLinkConnections>
<subnetworkConnectionIsMadeOfTransportEntities>
<subnetworkTPIsRelatedToExtremity>
<tandemConnectionIsMadeOfTransportEntities>
<trailIsMadeOfTransportEntities>

6.8 Extremo de enlace (linkEnd)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link end>

DEFINITION

"A linkEnd information object represents the extremity of a link. It can contain a set (possibly empty) of networkCTPs.

The linkEnd information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

topologicalEndDirection

"The topologicalEndDirection attribute characterizes the ability of the linkEnd resource to originate and/or terminate the traffic to be carried."

signalIdentification

"A linkEnd carries a specific format. The specific formats will be defined in the technology-specific extensions."

POTENTIAL_RELATIONSHIPS

<compoundLinkEndHasLinkEnds>
<linkEndIsBoundTo>
<linkEndHasNetworkCTPs>
<linkIsTerminatedByLinkEnds>
<subnetworkTPPoolIsRelatedToExtremity>

6.9 Punto de terminación de conexión de red (networkCTP)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:connection termination point>

DEFINITION

"The networkCTP information object represents *'the potential extremity of a link connection. It relates to the G.805 port and its associated part of the adaptation function that is in the server layer'* (G.852.2 definition).

The networkCTP information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

pointDirectionality

"The pointDirectionality attribute characterizes the ability of the networkCTP to terminate or/and originate the signal to be carried."

signalIdentification

"A networkCTP has a characteristic information which represents the specific format of signal that the resource carries. The specific format values will be defined in the technology-specific extensions."

POTENTIAL_RELATIONSHIPS

<linkConnectionIsBoundTo>
<linkConnectionIsTerminatedByPointToPoint>
<linkEndHasNetworkCTPs>

<networkCTPIsBundleOfNetworkCTPs>
<networkTTPAdaptsNetworkCTP>
<subnetworkTPIsRelatedToExtremity>

6.10 Punto de terminación de conexión de red bidireccional (networkCTPBidirectional)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:connection termination point>

DEFINITION

"The networkCTPBidirectional information object represents *'the extremity of a link connection and is intended to be bound to the output of an unidirectional link connection or to the input of an unidirectional link connection or to the input and output of a bidirectional link connection (G.852.2 definition) .'*"

The networkCTPBidirectional information object type is a subtype of the networkCTPSink and networkCTPSource information object types."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to bidirectional."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.11 Sumidero de puntos de terminación de conexión de red (networkCTPSink)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:connection termination point>

DEFINITION

"The networkCTPSink information object represents *'the extremity of a link connection and is intended to be bound to the output of an unidirectional link connection (G.852.2 definition) .'*"

The networkCTPSink information object type is a subtype of the networkCTP information object type."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to sink."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.12 Fuente de puntos de terminación de conexión de red (networkCTPSource)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:connection termination point>

DEFINITION

"The networkCTPSource information object represents *'the extremity of a link connection and is intended to be bound to the input of a unidirectional link connection (G.852.2 definition) .'*"

The networkCTPSource information object type is a subtype of the networkCTP information object type."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to source."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.13 Punto de terminación de conexión de elemento de red (networkElementCTP)

DEFINITION

"A networkElementCTP information object represents a M.3100 connection termination point source, sink or bidirectional.

The networkElementCTP information object type is a subtype of the networkElementTP information object type."

ATTRIBUTE

pointDirectionality

"The pointDirectionality attribute characterizes the ability of the networkElementCTP to terminate or/and originate the signal to be carried."

POTENTIAL_RELATIONSHIPS

<equipmentImplements>

6.14 Tejido de elemento de red (networkElementFabric)

DEFINITION

"A networkElementFabric information object class represents a M.3100 fabric.

The networkElementFabric information object type is a subtype of the networkInformationTop information object type."

POTENTIAL_RELATIONSHIPS

<representSameResourceAs>

<equipmentImplements>

6.15 Punta de terminación de elemento de red (networkElementTP)

DEFINITION

"The networkElementTP information object represents a M.3100 termination point.

The networkElementTP information object type is a subtype of the networkInformationTop information object type."

POTENTIAL_RELATIONSHIPS

<representSameResourceAs>

<equipmentImplements>

6.16 Punto de terminación de camino de elemento de red (networkElementTTP)

DEFINITION

"A networkElementTTP information object class represents a M.3100 trail termination point source, sink or bidirectional.

The networkElementTTP information object type is a subtype of the networkElementTP information object type."

ATTRIBUTE

pointDirectionality

"The pointDirectionality attribute characterizes the ability of the networkElementTTP to terminate or/and originate the signal to be carried."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.17 Parte superior de información de red (networkInformationTop)

DEFINITION

"The networkInformationTop information object type is the root of the inheritance diagram of TIM. All the other information object types are subtypes of networkInformationTop, either directly or indirectly."

ATTRIBUTE

resourceId

"Each resource has a unique identification"

POTENTIAL_RELATIONSHIPS

<administrativeDomainIsMadeOf>

<layerNetworkDomainIsMadeOf>

<representSameResourceAs>

6.18 Punto de terminación de camino de red (networkTTP)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail termination point>

DEFINITION

"The networkTTP information object represents 'an extremity of a trail. It represents the combination of a part of the adaptation function, the access point and the trail termination function' (G.852.2 definition).

The networkTTP information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

pointDirectionality

"The pointDirectionality attribute characterizes the ability of the networkTTP to terminate or/and originate the signal to be carried."

signalIdentification

"A networkTTP has a characteristic information which represents the specific format of signal that the resource carries. The specific format values will be defined in the technology-specific extensions."

POTENTIAL_RELATIONSHIPS

<accessGroupIsMadeOfNetworkTTPs>

<linkConnectionIsBoundTo>

<networkTTPAdaptsNetworkCTP>

<subnetworkTPIsRelatedToExtremity>

<topologicalLinkEndIsSupportedByNetworkTTP>

<trailIsTerminatedByPointToPoint>

6.19 Punto de terminación de camino de red bidireccional (networkTTPBidirectional)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail termination point>

DEFINITION

"The networkTTPBidirectional information object represents a particular networkTTP that 'may either originate or terminate a trail, or both' (G.852.2 definition)."

The networkTTPBidirectional information object type is a subtype of the information object types networkTTPSink and networkTTPSource."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to bidirectional."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.20 Sumidero de puntos de terminación de camino de red (networkTTPSink)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail termination point>

DEFINITION

"The networkTTPSink information object represents a particular networkTTP that 'terminates a trail' (G.852.2 definition)."

The networkTTPSink information object type is a subtype of the networkTTP information object type."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to sink."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.21 Fuente de puntos de terminación de camino de red (networkTTPSource)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail termination point>

DEFINITION

"The networkTTPSource information object represents a particular networkTTP that '*originates a trail*' (G.852.2 definition)."

The networkTTPSource information object type is a subtype of the networkTTP information object type."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to source."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.22 Nodo (node)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:node>

DEFINITION

"A node information object represents '*a collection of resources grouped in a single geographical location. It is a kind of administrative domain (for example, it can be one town or one building)*' (G.852.2 definition).

The node information object type is a subtype of the administrativeDomain information object type."

ATTRIBUTE

locationName

"The locationName attribute identifies the location of a node."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.23 Medio físico (physicalMedium)

DEFINITION

"A physicalMedium information object represents a physical medium that can transfer a signal (i.e. optical fibre).

The physicalMedium information object type is a subtype of the equipment information object type."

POTENTIAL_RELATIONSHIPS

<extremitiesTerminatePhysicalMedium>

6.24 Puerto físico (physicalPort)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:physical port>

DEFINITION

"A physicalPort information object represents a physical port.

The physicalPort information object type is a subtype of the equipment information object type."

POTENTIAL_RELATIONSHIPS

<circuitPackSupportsPhysicalPorts>

<extremitiesTerminatePhysicalMedium>

6.25 Subred (subnetwork)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork>

DEFINITION

"A subnetwork information object represents '*a topological component used to effect routing of a specific characteristic information*' (G.852.2 definition).

The subnetwork information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

signalIdentification

"A subnetwork carries a specific format. The specific formats will be defined in the technology-specific extensions."

POTENTIAL_RELATIONSHIPS

<linkBinds>
<linkConnectionIsTerminatedByTopologicalEntities>
<linkEndIsBoundTo>
<snIsPartitionedByLinks>
<snIsPartitionedBySn>
<subnetworkHasSubnetworkConnections>
<subnetworkIsDelimitedBy>
<subnetworkIsDelimitedBySnTpPools>

6.26 Conexión de subred (subnetworkConnection)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork connection>

DEFINITION

"A subnetworkConnection information object represents 'a transport entity that transfers information across a subnetwork.' (G.852.2 definition).

The subnetworkConnection information object type is a subtype of the transportConnection information object type."

POTENTIAL_RELATIONSHIPS

<linkConnectionIsMadeOfTransportEntities>
<sncBidIsSupportedByUnis>
<subnetworkConnectionIsBundleOfSubnetworkConnections>
<subnetworkConnectionIsMadeOfTransportEntities>
<subnetworkConnectionIsTerminatedByPointToPoint>
<subnetworkHasSubnetworkConnections>
<tandemConnectionIsMadeOfTransportEntities>
<trailIsMadeOfTransportEntities>

6.27 Punto de terminación de subred (subnetworkTP)

DEFINITION

"The subnetworkTP information object class is an abstraction that represents the potential termination of a transport entity and the associated port (see G.805 definition).

It also represents the potential for connection across subnetworks.

The subnetworkTP information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

pointDirectionality

"The pointDirectionality attribute characterizes the ability of the subnetworkTP to terminate or/and originate the signal to be carried."

signalIdentification

"A subnetworkTP has a characteristic information which represents the specific format of signal that the resource carries. The specific format values will be defined in the technology-specific extensions."

POTENTIAL_RELATIONSHIPS

<isConnectedTo>
<subnetworkConnectionIsTerminatedByPointToPoint>
<subnetworkIsDelimitedBy>
<subnetworkTPIsBundleOfSubnetworkTPs>
<subnetworkTPIsRelatedToExtremity>
<subnetworkTPPoolIsMadeOfSubnetworkTP>

6.28 Punto de terminación de subred bidireccional (subnetworkTPBidirectional)

DEFINITION

"The subnetworkTPBidirectional information object type is a subtype of the subnetworkTPSink and subnetworkTPSource information object types."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to bidirectional."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.29 Fondo común de puntos de terminación de subred (subnetworkTPPool)

DEFINITION

"A subnetworkTPPool information object is an abstraction that represents a set (possibly empty) of subnetworkTPs at the frontier of a given subnetwork.

The subnetworkTPPool information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

signalIdentification

"A subnetwork carries a specific format. The specific formats will be defined in the technology-specific extensions."

topologicalEndDirection

"The topologicalEndDirection attribute characterizes the ability of the subnetworkTpPool to originate and/or terminate the traffic to be carried."

POTENTIAL_RELATIONSHIPS

<accessGroupIsRelatedToSntpPool>

<linkBinds>

<subnetworkTPPoolIsMadeOfSubnetworkTP>

<subnetworkTPPoolIsRelatedToExtremity>

<subnetworkIsDelimitedBySnTpPools>

6.30 Sumidero de puntos de terminación de subred (subnetworkTPSink)

DEFINITION

"The subnetworkTPSink information object class is an abstraction that represents the potential termination of a transport entity and the associated unidirectional port (see G.805 definition).

It also represents the potential for connection across subnetworks.

The subnetworkTPSink information object type is a subtype of the subnetworkTP information object type."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to sink."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.31 Fuente de puntos de terminación de subred (subnetworkTPSource)

DEFINITION

"The subnetworkTPSource information object class is an abstraction that represents the potential origin of a transport entity and the associated unidirectional port (see G.805 definition).

It also represents the potential for connection across subnetworks.

The subnetworkTPSource information object type is a subtype of the subnetworkTP information object type."

INVARIANT

inv_directionality

"The pointDirectionality attribute value is set to source."

POTENTIAL_RELATIONSHIPS

No additional relationship.

6.32 Conexión en cascada (tandemConnection)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:tandem connection>

DEFINITION

"A tandemConnection information object represents *'an arbitrary series of contiguous link connections and/or subnetwork connections. A tandem connection is created for monitoring purposes'* (G.852.2 definition).

The tandemConnection information object type is a subtype of the transportConnection information object type."

POTENTIAL_RELATIONSHIPS

<tandemConnectionIsMadeOfTransportEntities>

6.33 Enlace topológico (topologicalLink)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:topologicalLink>

DEFINITION

"A topologicalLink information object represents *'a link provided by one and only one server trail, in a client layer'* (G.852.2 definition).

This topologicalLink information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

signalIdentification

"The signalIdentification describes the signal that is transferred across the link."

linkDirectionality

"The linkDirectionality attribute characterizes the ability of the associated resource to carry traffic in one, two, or undefined direction."

INVARIANT

signalIdentification

"The signalIdentification describes the signal that is transferred across the topological link."

linkDirectionality

"The linkDirectionality attribute characterizes the ability of the associated resource to carry traffic in one or two direction."

inv_directionality

"The linkDirectionality attribute value can not be set to undefined."

POTENTIAL_RELATIONSHIPS

<topologicalLinkIsSupportedByTrail>

<compoundLinkHasLinks>

<linkBinds>

<linkHasLinkConnections>

<linkIsTerminatedByLinkEnds>

<snIsPartitionedByLinks>

6.34 Extremo de enlace topológico (topologicalLinkEnd)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE: topological link end>

DEFINITION

"A topologicalLinkEnd information object represents the extremity of a topologicalLink.

The topologicalLinkEnd information object type is a subtype of the networkInformation Top information object type."

ATTRIBUTE

topologicalEndDirection

"The topologicalEndDirection attribute characterizes the ability of the linkEnd resource to originate and/or terminate the traffic to be carried."

signalIdentification

"A linkEnd carries a specific format. The specific formats will be defined in the technology-specific extensions."

INVARIANT

inv_directionality

"The topologicalEndDirection attribute value can not be set to undefined."

POTENTIAL_RELATIONSHIPS

<compoundLinkEndHasLinkEnds>

<linkEndIsBoundTo>

<linkEndHasNetworkCTPs>

<linkIsTerminatedByLinkEnds>

<subnetworkTPPoolIsRelatedToExtremity>

<topologicalLinkEndIsSupportedByNetworkTTP>

6.35 Camino (trail)

Este tipo de información está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail>

DEFINITION

"A trail information object represents a *'transport entity which is responsible for the transfer and integrity of information between two trail termination points'* (G.852.2 definition).

The trail information object type is a subtype of the transportConnection information object type."

POTENTIAL_RELATIONSHIPS

<linkConnectionIsSupportedByTrail>

<topologicalLinkIsSupportedByTrail>

<trailIsBundleOfTrails>

<trailIsMadeOfTransportEntities>

<trailIsTerminatedByPointToPoint>

6.36 Conexión de transporte (transportConnection)

DEFINITION

"A transportConnection information object represents a G.805 connection, or a G.805 trail (see G.805 definition). The information transfer can be unidirectional or bidirectional, qualifying the directionality of the transportConnection.

This transportConnection information object type is a subtype of the networkInformationTop information object type."

ATTRIBUTE

signalIdentification

"The signalIdentification describes the signal that is transferred across the transportConnection."

directionality

"The directionality characterizes the ability of a transportConnection to carry traffic in one or two directions."

POTENTIAL_RELATIONSHIPS

No additional relationship.

7 Definición de los tipos de atributo

7.1 Direccionalidad (directionality)

DEFINITION

"The directionality attribute characterizes the ability of the associated resource to carry traffic in one or two directions. The semantic of this attribute is imported from M.3100 directionality attribute."

INVARIANT

inv_lifetime

"The directionality associated with an information object must not change during its whole lifetime."

STATE

unidirectional

"The resource is able to carry the signal in only one direction."

bidirectional

"The resource is able to carry the signal in two directions."

7.2 Direccionalidad del enlace (linkDirectionality)

DEFINITION

"The directionality attribute characterizes the ability of the associated resource to carry traffic in one, two or undefined direction."

STATE

undefined

"There is no indication on the ability of the resource to carry the signal in one or two directions."

unidirectional

"The resource is able to carry the signal in only one direction from A_end to Z_end."

bidirectional

"The resource is able to carry the signal in two directions."

7.3 Nombre de la ubicación (locationName)

DEFINITION

"The locationName attribute identifies the location of a resource. The semantic of this attribute is imported from M.3100 locationName attribute."

7.4 Direccionalidad puntual (pointDirectionality)

DEFINITION

"The pointDirectionality attribute characterizes the ability of the associated resource to terminate or/and originate the signal to be carried."

INVARIANT

inv_lifetime

"The directionality associated with an information object must not change during its whole lifetime."

STATE

sink

"The resource terminates the signal to be carried."

source

"The resource originates the signal to be carried."

bidirectional

"The resource is able to originate and terminate the signal to be carried."

7.5 Id de recurso (resourceId)

DEFINITION

"The resourceId attribute represents the unique identification of a resource."

NOTE – This attribute can be implemented as an attribute in a GDMO-based specification or as an object reference in a CORBA environment. It does not represent a user label."

INVARIANT

inv_unique

"The resourceId associated with an information object must be unique for its associated class."

7.6 Identificación de señal (signalIdentification)

DEFINITION

The signalIdentification attribute represents the specific format of signal that the resource carries. The specific formats will be defined in the technology-specific extensions.

INVARIANT

Invariants depend on transmission technology.

STATE

States depend on transmission technology.

TRANSITION

Transitions depend on transmission technology.

7.7 Sentido de extremo topológico (topologicalEndDirection)

DEFINITION

"The topologicalEndDirection attribute characterizes the ability of the associated resource to originate and/or terminate the traffic to be carried."

STATE

undefined

"There is no information about the capability of the resource to terminate or originate the signal transport processing."

sink

"The resource is able to terminate the signal transport processing."

source

"The resource is able to originate the signal transport processing."

bidirectional

"The resource is able to originate and terminate the signal transport processing."

7.8 Etiqueta de usuario (userLabel)

DEFINITION

"The userLabel attribute represents a label given by an user to a resource."

8 Definiciones de los tipos de relaciones de información

8.1 Grupo de acceso se compone de puntos de terminación de camino (accessGroupIsMadeOfNetworkTTPs)

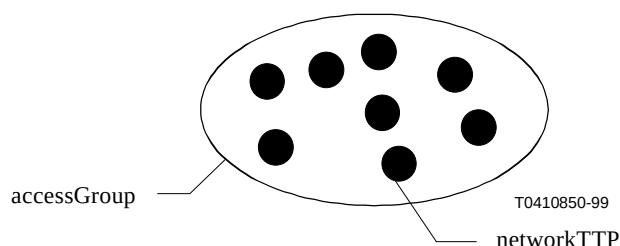
Este tipo de relación está relacionado con las siguientes entidades de empresa:

<COMMUNITY:tem, ROLE:access group, PROPERTY:grouping>,

<COMMUNITY:tem, ROLE:access group, PROPERTY:grouping_constraint>

DEFINITION

"The accessGroupIsMadeOfNetworkTTPs relationship class describes the relationship that exists between an accessGroup and the networkTTPs that are part of it.



"

ROLE

containerAG

"Played by an instance of the <accessGroup> information object type or subtype."

elementTTP

"Played by an instance of a sub-type of the <networkTTP> information object type."

INVARIANT

inv_containerAGRoleCardinality

"One and only one instance of the role *containerAG* must participate in the relationship."

inv_elementAGRoleCardinality

"One or more instances of the role *elementTTP* must participate in the relationship."

inv_signalIdentification

"The *containerAG* and the *elementTTPs* must contain the same signalIdentification information."

inv_directionality

"The objects involved in the relationship must have a compatible directionality:

containerAG	elementTTP
sink	sink
source	source
bidirectional	bidirectional
undefined	sink, source or/and bidirectional

"

8.2 Grupo de acceso está relacionado con fondo común de puntos de terminación de subred (accessGroupIsRelatedToSntpPool)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:access group>

DEFINITION

"The accessGroupIsRelatedToSntpPool relationship class describes the relationship that exists between an accessGroup and a subnetworkTpPool."

ROLE

extremityAG

"Played by instances of the <accessGroup> information object type or subtype."

abstractionPool

"Played by an instance of the <subnetworkTPPool> information object type or subtype."

INVARIANT

inv_extremityAGRoleCardinality

"One and only one instance of the role *extremityAG* must participate in the relationship."

inv_abstractionPoolRoleCardinality

"One and only one instance of the role *extremityAG* must participate in the relationship."

inv_signalIdentification

"The *abstractionPool* and the *extremityAG* must contain the same signalIdentification information."

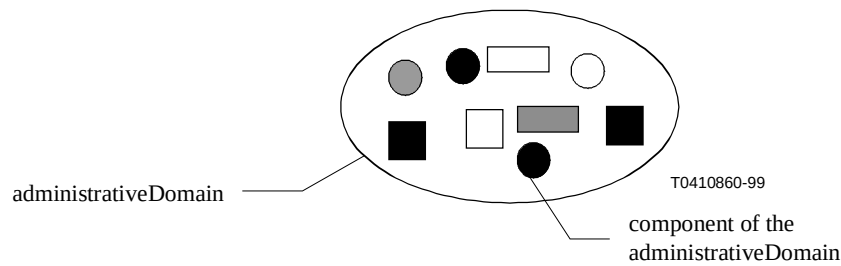
8.3 Dominio administrativo se compone de (administrativeDomainIsMadeOf)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:administrative domain>

DEFINITION

"The administrativeDomainIsMadeOf relationship class describes the relationship that exists between an administrativeDomain and the information objects that are part of it."



"

ROLE

containerAD

"Played by an instance of the <administrativeDomain> information object type."

element

"Played by an instance of a subtype of the <networkInformationTop> information object type."

INVARIANT

inv_containerADRoleCardinality

"One and only one instance of the role *containerAD* must participate in the relationship."

inv_elementADRoleCardinality

"One or more instances of the role *element* must participate in the relationship."

8.4 Paquete de circuitos soporta puertos físicos (circuitPackSupportsPhysicalPorts)

DEFINITION

"The circuitPackSupportsPhysicalPorts relationship class describes the relationship that exists between a circuitPack and the ports that are supported by a circuitPack."

ROLE

containerPack

"Played by an instance of the <circuitPack> information object type or subtype."

elementPort

"Played by instances of the <physicalPort> information object type or subtype."

INVARIANT

inv_containerPackRoleCardinality

"One and only one instance of the role *containerPack* must participate in the relationship."

inv_elementPackRoleCardinality

"One or more instances of the role *elementPort* must participate in the relationship."

8.5 Extremo de enlace compuesto tiene extremos de enlace (compoundLinkEndHasLinkEnds)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:linkEnd, PROPERTY:parallel_composition>

DEFINITION

"The compoundLinkEndHasLinkEnds relationship class describes the group of linkEnds to form a compound linkEnd."

ROLE

compoundLEnd

"Played by an instance of the <linkEnd> information object type or subtype."

componentLEnd

"Played by instances of the <linkEnd> information object type or subtype."

INVARIANT

inv_compoundRoleCardinality

"One and only one instance of the role *compoundLEnd* must participate in the relationship."

inv_componentRoleCardinality

"One or more instances of the role *componentLEnd* must participate in the relationship."

inv_signalIdentification

"The *compoundLEnd* and the *componentLEnd* must contain the same signalIdentification information."

inv_directionality

"The *compoundLEnd* and the *componentLEnd* must have the same topologicalEndDirection."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *compoundLink* and *componentLink*."

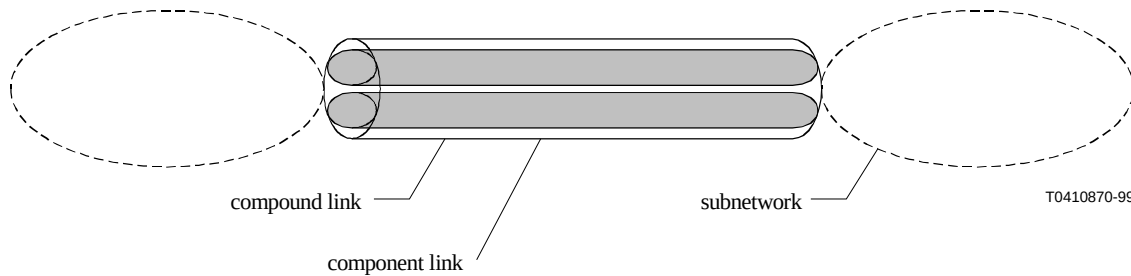
8.6 Enlace compuesto tiene enlaces (compoundLinkHasLinks)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link, PROPERTY:parallel_composition>

DEFINITION

"The compoundLinkHasLinks relationship class describes the group of links to form a compound link."



"

ROLE

compoundLink

"Played by an instance of the <link> information object type or subtype."

componentLink

"Played by instances of the <link> information object type or subtype."

INVARIANT

inv_compoundRoleCardinality

"One and only one instance of the role *compoundLink* must participate in the relationship."

inv_componentRoleCardinality

"One or more instances of the role *componentLink* must participate in the relationship."

inv_signalIdentification

"The *compoundLink* and the *componentLink* must contain the same signalIdentification information."

inv_directionality

"The *compoundLink* and the *componentLink* must have the same linkDirectionality."

inv_extremities

"All the objects involved in the relationship must have the same extremities."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *compoundLink* and *componentLink*."

inv_capacity

"The capacity of the object playing the role *compoundLink* must be equal to the sum of the capacities of all the objects playing the role *componentLink*."

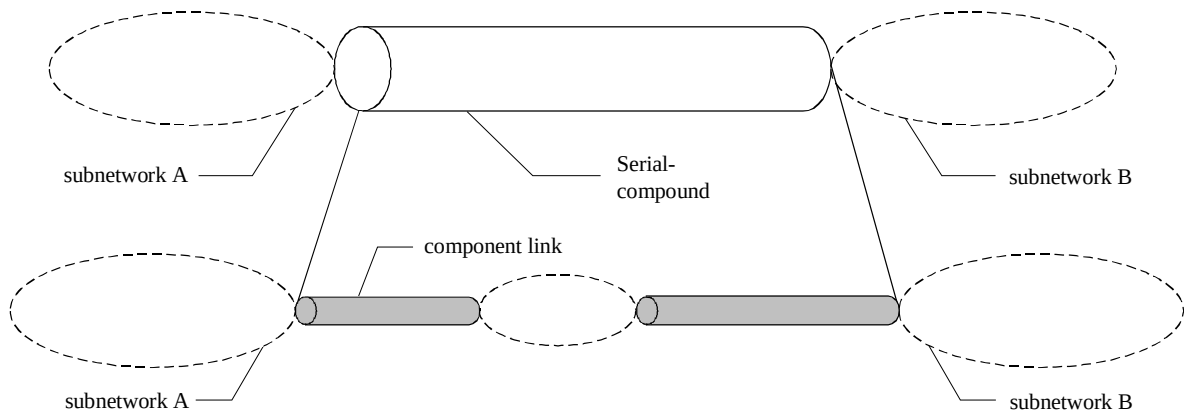
8.7 Enlace concatenado tiene enlaces (concatenatedLinkHasLinks)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link, PROPERTY:serial_composition>

DEFINITION

"The concatenatedLinkHasLinks relationship class describes the group of links to form a concatenated link."



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"

ROLE

serialLink

"Played by an instance of the <link> information object type and subtype."

serieLink

"Played by instances of the <link> information object type and subtype or by an instance of the <topologicalLink> information object type."

INVARIANT

inv_serialRoleCardinality

"One and only one instance of the role *serialLink* must participate in the relationship."

inv_serieRoleCardinality

"One or more instances of the role *serieLink* must participate in the relationship."

inv_signalIdentification

"The *serialLink* and the *serieLink* must contain the same signalIdentification information."

inv_directionality

"The *serialLink* and the *serieLink* must have a compatible linkDirectionality."

inv_contiguityAend

"One and only one *serieLink* must have a a_end equal to the a_end of the *serialLink*."

inv_contiguityZend

"One and only one *serieLink* must have a z_end equal to the z_end of the *serialLink*."

inv_capacity

"The capacity of the *serialLink* must be lower or equal than the lowest capacity of the *serieLink*."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *serialLink* and *serieLink*."

8.8 Implementos de equipo (equipmentImplements)

DEFINITION

"The equipmentImplements relationship class describes the relationship that exists between an equipment and the network element resources."

ROLE

containerEquipment

"Played by an instance of the <equipment> information object type or subtype."

NEImplemented

"Played by instances of the <networkElementTP>, <networkElementFabric> information object type or subtype."

INVARIANT

inv_containerEquipmentRoleCardinality

"One and only one instance of the role *containerEquipment* must participate in the relationship."

inv_elementEquipmentRoleCardinality

"One or more instances of the role *NEImplemented* must participate in the relationship."

8.9 Equipo se compone equipos (equipmentIsMadeOfEquipments)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:equipment>

DEFINITION

"The equipmentIsMadeOfEquipments relationship class describes the relationship that exists between an equipment and its components."

ROLE

containerEquipment

"Played by an instance of the <equipment> information object type or subtype."

elementEquipment

"Played by instances of the <equipment> information object type or subtype."

INVARIANT

inv_containerRoleCardinality

"One and only one instance of the role *containerEquipment* must participate in the relationship."

inv_elementRoleCardinality

"One or more instances of the role *elementEquipment* must participate in the relationship."

8.10 Extremidades terminan medio físico (extremitiesTerminatePhysicalMedium)

DEFINITION

"The extremitiesTerminatePhysicalMedium relationship class describes the relationship that exists between a physicalMedium and its extremities."

ROLE

transportPhysMed

"Played by an instance of the <physicalMedium> information object type or subtype."

a_endPhysPort

"Played by an instance of the <physicalPort> information object type or subtype."

z_endPhysPort

"Played by an instance of the <physicalPort> information object type or subtype."

INVARIANT

inv_transportRoleCardinality

"One and only one instance of the role *transportPhysMed* must participate in the relationship."

inv_aendRoleCardinality

"One and only one instance of the role *a_endPhysPort* must participate in the relationship."

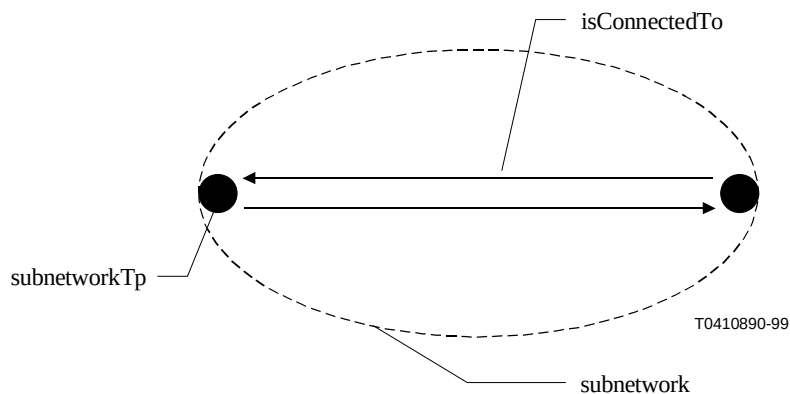
inv_zendRoleCardinality

"One and only one instance of the role *z_endPhysPort* must participate in the relationship."

8.11 Está conectado con (isConnectedTo)

DEFINITION

"The isConnectedTo relationship class describes the relationship that exists between subnetworkTPs through which the signal transfers."



"

ROLE

peerSNTP

"Played by two instances of the <subnetworkTP> information object type or subtype."

INVARIANT

inv_peerRoleCardinality

"One instance must be of the <subnetworkTPSink> object type or subtype and the other must be of the <subnetworkTPSource> object type or subtype."

inv_signalIdentification

"In a given relationship instance of isConnectedTo, the information objects playing the role *peerSNTP* must have all the same signalIdentification value."

8.12 Dominio de red de capa puede servir dominios de red de capa (layerNetworkDomainCanServeLnds)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:layer-network domain, PROPERTIES:relations>

DEFINITION

"The layerNetworkDomainCanServeLnds relationship class describes the relationship that exists between a server layerNetworkDomain and the client layerNetworkDomain."

ROLE

clientLND

"Played by instances of the <layerNetworkDomain> information object type or subtype."

serverLND

"Played by an instance of the <layerNetworkDomain> information object type or subtype."

INVARIANT

inv_clientRoleCardinality

"One or more instances of the role *clientLND* must participate in the relationship."

inv_serverRoleCardinality

"One and only one instance of the role *serverLND* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of layerNetworkDomainCanServeLnds, the information object playing the role *serverLND* must have a different signalIdentification value than the information object playing the role *clientLND* as defined in Recommendation G.805 (compliant values are technologies dependent and defined in the corresponding Recommendations, e.g. Recommendation G.783 for SDH)."

8.13 Dominio de capa de red se compone de (layerNetworkDomainIsMadeOf)

DEFINITION

"The layerNetworkDomainIsMadeOf relationship class describes the relationship that exists between a layerNetworkDomain and the objects that compose it."

ROLE

containerLND

"Played by an instance of the <layerNetworkDomain> information object type or subtype."

element

"Played by an instance of the subtype of the <networkInformationTop> information object type."

INVARIANT

inv_containerLNDRoleCardinality

"One and only one instance of the role *containerLND* must participate in the relationship."

inv_elementLNDRoleCardinality

"One or more instances of the role *element* must participate in the relationship."

inv_signalIdentification

"The *containerLND* and the *element* must contain the same signalIdentification information."

8.14 Enlace vincula (linkBinds)

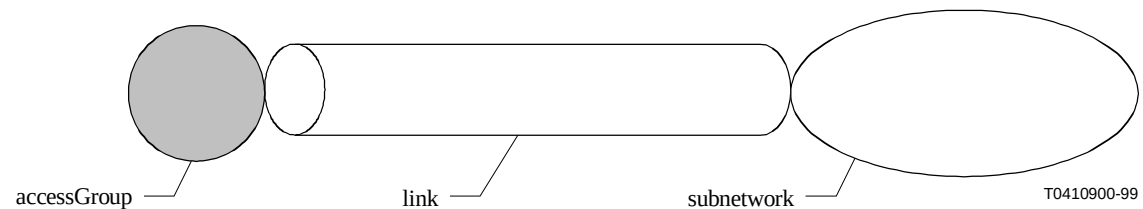
Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link>

DEFINITION

"The linkBinds relationship class describes the relationship that exists between a link and its two extremities.

These can be any of the following: subnetwork/accessGroup/subnetworkTPPool. The two associated extremities are referred to as the *a_end* and the *z_end*.



"

ROLE

transferCapacityLink

"Played by an instance of the <link> information object type or subtype."

a_endTopological

"Played by an instance of the <subnetwork> information object type or subtype or by an instance of the <accessGroup> information object type or subtype or by an instance of the <subnetworkTPPool> information object type or subtype."

z_endTopological

"Played by an instance of the <subnetwork> information object type or subtype or by an instance of the <accessGroup> information object type or subtype or by an instance of the <subnetworkTPPool> information object type or subtype."

INVARIANT

inv_transferCapacityRoleCardinality

"One and only one instance of the role *transferCapacityLink* must participate in the relationship."

inv_aendRoleCardinality

"One and only one instance of the role *a_endTopological* must participate in the relationship."

inv_zendRoleCardinality

"One and only one instance of the role *z_endTopological* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of *linkBinds*, the information objects playing the role *transferCapacityLink*, *a_endTopological* and *z_endTopological* must have all the same *signalIdentification* value."

inv_directionality

"If the role *a_endTopological* or *z_endTopological* is played by an *accessGroup*, then the objects involved in the relationship must have a compatible directionality."

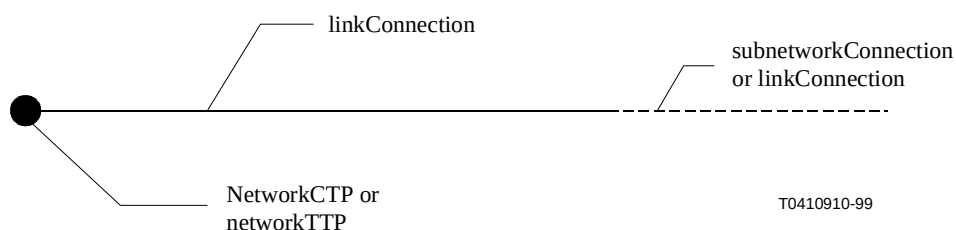
8.15 Conexión de enlace está vinculada con (*linkConnectionIsBoundTo*)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link connection, PROPERTY:connectivity_constraints>

DEFINITION

"The *linkConnectionIsBoundTo* relationship class describes the relationship that exists between a link connection the extremities that can be bound to.



"

ROLE

boundLC

"Played by an instance of the <linkConnection> information object type or subtype."

boundA_end

"Played by instances of the <networkCTP>, <networkTTP>, <subnetworkConnection> or <linkConnection> information object type or subtype."

boundZ_end

"Played by instances of the <networkCTP>, <networkTTP>, <subnetworkConnection> or <linkConnection> information object type or subtype."

INVARIANT

inv_cardinalityTransportEntity

"One and only one instance of the role *boundLC* must participate in the relationship."

inv_cardinalityAend

"One and only one instance of the role *boundA_end* must participate in the relationship."

inv_cardinalityZend

"One and only one instance of the role *boundZ_end* must participate in the relationship."

inv_directionality

"If the information object playing the role *boundLC* is bidirectional, then the information objects playing the roles *boundA_end* and *boundZ_end* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *trailIsTerminatedByPointToPoint*, the information objects playing the role *boundLC*, *boundA_end* and *boundZ_end* must have all the same *signalIdentification* value."

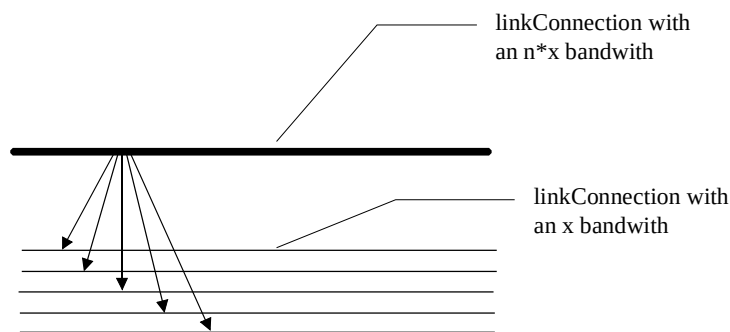
8.16 Conexión de enlace es haz de conexiones de enlace (linkConnectionIsBundleOfLinkConnections)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link connection, PROPERTY:bundling>

DEFINITION

"The *linkConnectionIsBundleOfLinkConnections* relationship class describes the relationship that exists between a bundled link connection and its component link connections.



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"

ROLE

bundleLC

"Played by an instance of the <linkConnection> information object type or subtype."

bundledLC

"Played by an instance of a subtype of the <linkConnection> information object type or subtype."

INVARIANT

inv_bundleRoleCardinality

"One and only one instance of the role *bundleLC* must participate in the relationship."

inv_bundledRoleCardinality

"One or more instances of the role *bundledLC* must participate in the relationship."

inv_signalIdentification

"The *bundledLC* and the *bundleLC* must contain the same *signalIdentification* information."

inv_directionality

"The *bundledLC* and the *bundleLC* must have the same *directionality*."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *bundledLC* and *bundleLC*."

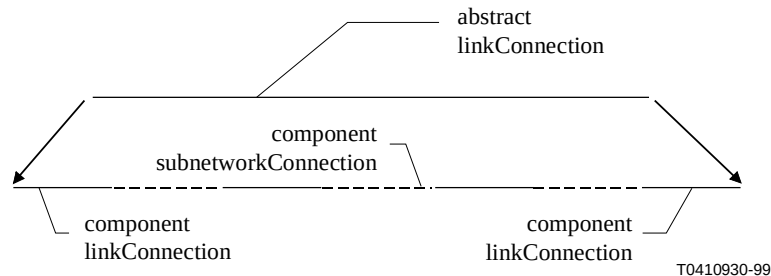
8.17 Conexión de enlace se compone de entidades de transporte (linkConnectionIsMadeOfTransportEntities)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link connection, PROPERTY:serial_composition>

DEFINITION

"The linkConnectionIsMadeOfTransportEntities relationship class describes the relationship that exists between a composite link connection and its component transport entities.



"

ROLE

compositeLC

"Played by an instance of the <linkConnection> information object type or subtype."

componentTEntity

"Played by an instance of the <subnetworkConnection> information object type or subtype, or <linkConnection> information object type or subtype."

INVARIANT

inv_compositeLCRoleCardinality

"One and only one instance of the role *compositeLC* must participate in the relationship."

inv_componentLCRoleCardinality

"At least one instance of the role *componentTEntity* must participate in the relationship."

inv_directionality

"If the information object playing the role *compositeLC* is bidirectional, then all the information objects playing the role *componentTEntity* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of linkConnectionIsMadeOfTransportEntities, the information objects playing the role *compositeLC* and *componentTEntity* must have all the same signalIdentification value."

inv_contiguity

"The *componentTEntity* connections being contiguous, both the first and the last one must be instances of the linkConnection information object type or subtype."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *compositeLC* and *componentTEntity*."

8.18 Conexión de enlace está soportada por camino (linkConnectionIsSupportedByTrail)

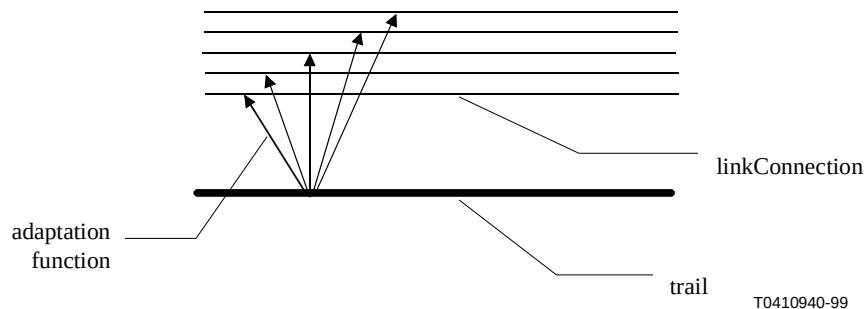
Este tipo de relación está relacionado con las siguientes entidades de empresa:

<COMMUNITY:tem, ROLE:link connection, PROPERTY:adaptation_relation>,

<COMMUNITY:tem, ROLE:trail, PROPERTY:adaptation_relation>

DEFINITION

"The linkConnectionIsSupportedByTrail relationship class describes the relationship that exists between linkConnections of a given layer network (known as the client layer network) and the trail that supports them in a server layer network.



"

ROLE

clientLC

"Played by instances of the <linkConnection> information object type or subtype."

serverTrail

"Played by an instance of the <trail> information object type or subtype."

INVARIANT

inv_serverTrailRoleCardinality

"One and only one instance of the role *serverTrail* must participate in the relationship."

inv_clientLCRoleCardinality

"At least one instance of the role *clientLC* must participate in the relationship."

inv_directionality

"If the information object playing the role *serverTrail* is bidirectional, then the information objects playing the role *clientLC* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *linkConnectionIsSupportedByTrail*, the information object playing the role *serverTrail* must have a different *signalIdentification* value than the information object playing the role *clientLC* as defined in Recommendation G.805 (compliant values are technologies dependent and defined in the corresponding Recommendations, e.g. Recommendation G.783 for SDH)."

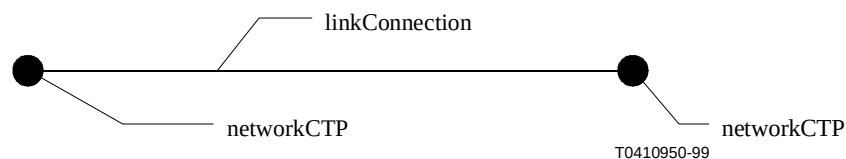
8.19 Conexión de enlace está terminada por punto a punto (linkConnectionIsTerminatedByPointToPoint)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link connection, PROPERTY:extremities>

DEFINITION

"The *linkConnectionIsTerminatedByPointToPoint* relationship class describes the relationship that exists between a link connection and its two extremities.



"

ROLE

transportEntityLC

"Played by an instance of the <linkConnection> information object type or subtype."

a_endCTP

"Played by instances of the <networkCTP> information object type or subtype."

z_endCTP

"Played by instances of the <networkCTP> information object type or subtype."

INVARIANT

inv_transportEntityLCRoleCardinality

"One and only one instance of the role *transportEntityLC* must participate in the relationship."

inv_aendCTPRoleCardinality

"One and only one instance of the role *a_endCTP* must participate in the relationship."

inv_zendCTPRoleCardinality

"One and only one instance of the role *z_endCTP* must participate in the relationship."

inv_directionAend
 "The object playing the role *a_endCTP* must have a pointDirectionality set to source or bidirectional."
 inv_directionZend
 "The object playing the role *z_endCTP* must have a pointDirectionality set to sink or bidirectional."
 inv_directionality
 "If the information object playing the role *transportEntityLC* is bidirectional, then the information objects playing the roles *a_endCTP* and *z_endCTP* must be bidirectional."
 inv_signalIdentification
 "In a given relationship instance of *linkConnectionIsTerminatedByPointToPoint*, the information objects playing the role *transportEntityLC*, *a_endCTP* and *z_endCTP* must have all the same signalIdentification value."

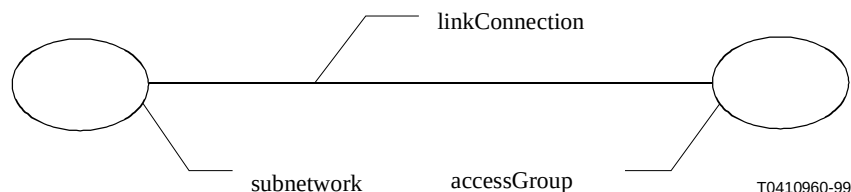
8.20 Conexión de enlace está terminada por entidades topológicas (linkConnectionIsTerminatedByTopologicalEntities)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link connection, PROPERTY:topological_constraints>

DEFINITION

"The *linkConnectionIsTerminatedByTopologicalEntities* relationship class describes the relationship that exists between the resources represented by a pair of subnetwork or access group and the link connection that may bind them. The two associated information objects are referred to as the A_end and the Z_end. Through a unidirectional link connection, traffic goes only from the A_end to the Z_end; through a bidirectional one, traffic may go from A_end to Z_end and from Z_end to A_end."



"

ROLE

transportEntityLC

"Played by an instance of the <linkConnection> information object type or subtype."

a_endTopologicalEntity

"Played by an instance of the <subnetwork> or <accessGroup> information object type or subtype."

z_endTopologicalEntity

"Played by an instance of the <subnetwork> or <accessGroup> information object type or subtype."

INVARIANT

inv_transportEntityRoleCardinality

"One and only one instance playing the role *transportEntityLC* must participate in the relationship."

inv_aendTopologicalEntityRoleCardinality

"One and only one instance playing the role *a_endTopologicalEntity* must participate in the relationship."

inv_zendTopologicalEntityRoleCardinality

"One and only one instance playing the role *z_endTopologicalEntity* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of *linkConnectionIsTerminatedByTopologicalEntities*, the information objects must have all the same signalIdentification value."

8.21 Extremo de enlace está vinculado con (linkEndIsBoundTo)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link end, PROPERTY:bounding>

DEFINITION

"The *linkEndIsBoundTo* relationship class describes the relationship that exists between a link end and a subnetwork or an access group."

ROLE

transferCapacityLE

"Played by an instance of the <linkEnd> information object type or subtype."

topologicalEntity

"Played by an instance of the <subnetwork> information object type or subtype or <accessGroup> information object type."

INVARIANT

inv_transferCapacityRoleCardinality

"One and only one instance of the role *transferCapacityLE* must participate in the relationship."

inv_extremityRoleCardinality

"One and only one instance of the role *topologicalEntity* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of linkEndIsBoundTo, the information objects playing the role *transferCapacityLE* and *topologicalEntity* must have all the same signalIdentification value."

8.22 Extremo de enlace tiene puntos de terminación de conexión (linkEndHasNetworkCTPs)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link end, PROPERTY:pre-provisioned capacity>

DEFINITION

"The linkEndHasNetworkCTPs relationship class describes the relationship that exists between a linkEnd and the networkCTPs that are part of it."

ROLE

containerLE

"Played by an instance of the <linkEnd> information object type or subtype."

elementCTP

"Played by instances of the <networkCTP> information object type or subtype."

INVARIANT

inv_containerLERoleCardinality

"One and only one instance of the role *containerLE* must participate in the relationship."

inv_elementLERoleCardinality

"One or more instances of the role *elementCTP* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of linkEndHasNetworkCTPs, the information objects playing the role *elementCTP* and *containerLE* must have all the same signalIdentification value."

inv_directionality

"The objects involved in the relationship must have a compatible directionality:

role: containerLE	role: elementCTP
source	source
sink	sink
bidirectional	bidirectional
undefined	source, sink or bidirectional

"

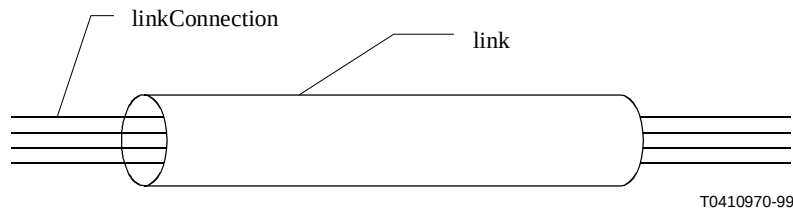
8.23 Enlace tiene conexiones de enlace (linkHasLinkConnections)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link, PROPERTY:grouping>

DEFINITION

"The linkHasLinkConnections relationship class describes the relationship that exists between a link and the linkConnections that are part of it."



"

ROLE

containerLink

"Played by an instance of the <link> information object type or subtype."

elementLC

"Played by an instance of the <linkConnection> information object type or subtype."

INVARIANT

inv_containerLinkRoleCardinality

"One and only one instance of the role *containerLink* must participate in the relationship."

inv_elementLinkRoleCardinality

"One or more instances of the role *elementLC* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of linkHasLinkConnections, the information objects playing the role *containerLink* and *elementLC* must have all the same signalIdentification value."

inv_directionality

"The objects involved in the relationship must have a compatible directionality:

containerLink	elementLC
unidirectional	unidirectional
bidirectional	bidirectional
undefined	unidirectional or/and bidirectional

"

8.24 Enlace está terminado por extremos de enlace (linkIsTerminatedByLinkEnds)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:link, PROPERTY:extremities>

DEFINITION

"The linkIsTerminatedByLinkEnds relationship class describes the relationship that exists between a link and its two extremities."

ROLE

transferCapacityLink

"Played by an instance of the <link> information object type or subtype."

a_endLE

"Played by an instance of the <linkEnd> information object type or subtype."

z_endLE

"Played by an instance of the <linkEnd> information object type or subtype."

INVARIANT

inv_transferCapacityRoleCardinality

"One and only one instance of the role *transferCapacityLink* must participate in the relationship."

inv_aendLERoleCardinality

"One and only one instance of the role *a_endLE* must participate in the relationship."

inv_zendLERoleCardinality

"One and only one instance of the role *z_endLE* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of linkIsTerminatedByLinkEnds, the information objects playing the role *transferCapacityLink*, *a_endLE* and *z_endLE* must have all the same signalIdentification value."

inv_directionality

"The objects involved in the relationship must have a compatible directionality:

role: transferCapacityLink	role: a_endLE	role: z_endLE
unidirectional	source	sink
bidirectional	bidirectional	bidirectional
undefined	source, sink or/and bidirectional	source, sink or/and bidirectional

"

8.25 Punto de terminación de conexión de red es haz de puntos de terminación de conexión de red (networkCTPIsBundleOfNetworkCTPs)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:connection termination point, PROPERTY:bundling>

DEFINITION

"The networkCTPIsBundleOfNetworkCTPs relationship class describes the relationship that exists between a networkCTP and the networkCTPs that are part of it."

ROLE

bundleCTP

"Played by an instance of the <networkCTP> information object type or subtype."

bundledCTP

"Played by an instance of a subtype of the <networkCTP> information object type or subtype."

INVARIANT

inv_bundleRoleCardinality

"One and only one instance of the role *bundleCTP* must participate in the relationship."

inv_bundledRoleCardinality

"One or more instances of the role *bundledCTP* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of networkCTPIsBundleOfNetworkCTPs, the information objects playing the role *bundleCTP* and *bundledCTP* must have all the same signalIdentification value."

inv_directionality

"The objects involved in the relationship must have a compatible directionality."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *bundleCTP* and *bundledCTP*."

8.26 Punto de terminación de camino de red adapta punto de terminación de conexión de red (networkTTPAdaptsNetworkCTP)

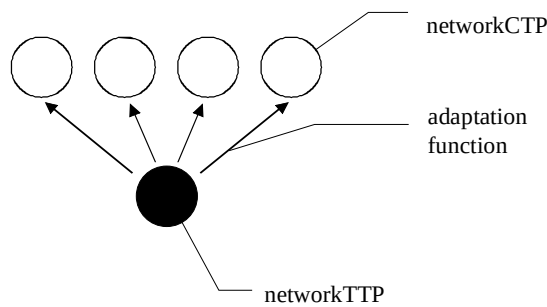
Este tipo de relación está relacionado con las siguientes entidades de empresa:

<COMMUNITY:tem, ROLE:trail termination point, PROPERTY:adaptation>,

<COMMUNITY:tem, ROLE:connection termination point, PROPERTY:adaptation>

DEFINITION

"The networkTTPAdaptsNetworkCTP relationship class describes the relationship that exists between networkCTPs of a given layer network (known as the client layer network) and the networkTTP that supports them in a server layer network."



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"

ROLE

clientCTP

"Played by instances of the <networkCTP> information object type or subtype."

serverTTP

"Played by an instance of the <networkTTP> information object type or subtype."

INVARIANT

inv_serverTTPRoleCardinality

"One and only one instance of the role *serverTTP* must participate in the relationship."

inv_clientCTPRoleCardinality

"At least one instance of the role *clientCTP* must participate in the relationship."

inv_directionality

"If the information object playing the role *serverTTP* is bidirectional, then the information objects playing the role *clientCTP* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *topologicalLinkEndIsSupportedByNetworkTTP*, the information object playing the role *serverTTP* must have a different *signalIdentification* value than the information object playing the role *clientCTP* as defined in Recommendation G.805 (compliant values are technologies dependent and defined in the corresponding Recommendations, e.g. Recommendation G.783 for SDH)."

8.27 Representa mismo recurso que (representSameResourceAs)

DEFINITION

"The *representSameResourceAs* relationship class describes the relationship that exists between two object that represent the same resource."

ROLE

resourceInfo

"Played by instances of the subtype of <networkInformationTop> information object type."

INVARIANT

inv_resourceInfoRoleCardinality

"At least two instances of the role *resourceInfo* must participate in the relationship."

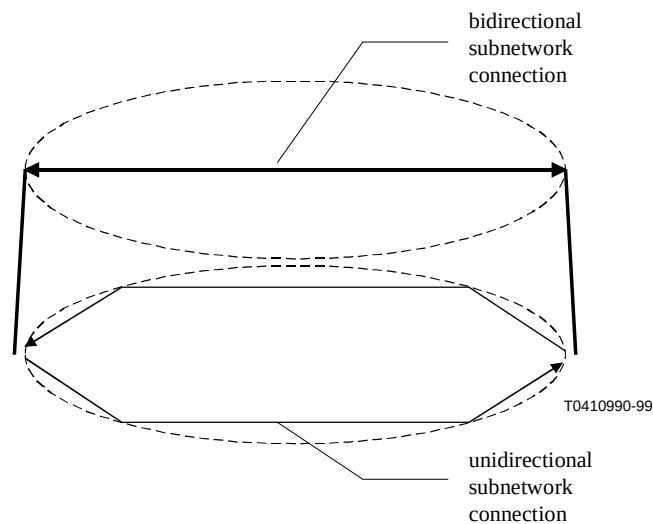
8.28 Conexión de subred bidireccional está soportada por (conexión instancias unidireccionales) (sncBidIsSupportedByUnis)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork connection, PROPERTY:bidirectional_characteristic>

DEFINITION

"The *sncBidIsSupportedByUnis* relationship class describes the relationship that exists between a bidirectional subnetworkConnection instance and the two unidirectional (co- and contra-directional with regard to an orientation reference) subnetworkConnection instances that together provide bidirectionality (e.g. case of a unidirectional SDH ring)."



"

ROLE

bidSNC

"Played by an instance of the <subnetworkConnection> information object type or subtype."

uni1SNC

"Played by an instance of the <subnetworkConnection> information object type or subtype."

uni2SNC

"Played by an instance of the <subnetworkConnection> information object type or subtype."

INVARIANT

inv_uni1RoleCardinality

"One and only one instance of the role *uni1SNC* must participate in the relationship."

inv_uni2RoleCardinality

"One and only one instance of the role *uni2SNC* must participate in the relationship."

inv_bidRoleCardinality

"One and only one instance of the role *bidSNC* must participate in the relationship."

inv_directionality

"The instance of the role *uni1SNC* and the instance of the role *uni2SNC* must be both unidirectional, the first one co-directional and the second one contra-directional with regard to an orientation reference."

inv_signalIdentification

"In a given relationship instance of *sncBidIsSupportedByUnis*, the information objects playing the role *bidSNC*, *uni1SNC* and *uni2SNC* must have all the same signalIdentification value."

inv_roles

"In an instance of the relationship, an instance can not play two roles."

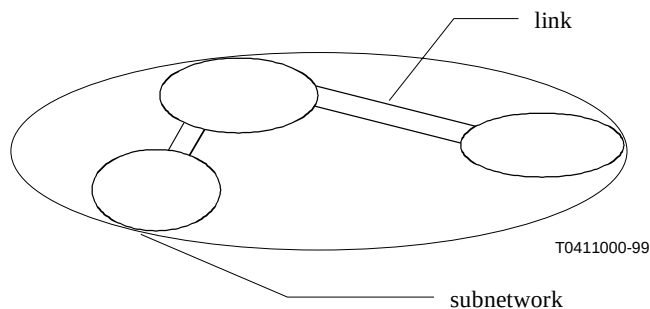
8.29 Subred es subdividida por enlaces (snIsPartitionedByLinks)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork, PROPERTY:composition>

DEFINITION

"The *snIsPartitionedByLinks* relationship class describes the relationship that exists between a subnetwork and the links that are part of it.



"

ROLE

compositeSN

"Played by an instance of the <subnetwork> information object type or subtype."

componentLink

"Played by an instance of the <link> information object type or subtype."

INVARIANT

inv_compositeSNRoleCardinality

"One and only one instance of the role *compositeSN* must participate in the relationship."

inv_componentLinkRoleCardinality

"One or more instances of the role *componentLink* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of *linkHasLinkConnections*, the information objects playing the role *compositeSN* and *componentLink* must have all the same *signalIdentification* value."

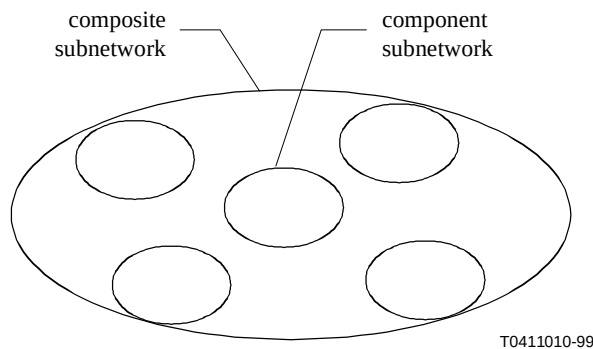
8.30 Subred es subdividida por subred (*snIsPartitionedBySn*)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork, PROPERTY:composition>

DEFINITION

"The *snIsPartitionedBySn* relationship class describes the relationship that exists between a subnetwork and the smaller subnetwork (or subclasses) instances that are part of its decomposition due to partitioning.



"

ROLE

compositeSN

"Played by an instance of the <subnetwork> information object type or subtype."

componentSN

"Played by an instance of the <subnetwork> information object type or subtype."

INVARIANT

inv_compositeSNRoleCardinality

"One and only one instance of the role *compositeSN* must participate in the relationship."

inv_componentSNRoleCardinality

"At least one instance of the role *componentSN* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of *snIsPartitionedBySn*, the information objects playing the role *compositeSN* and *componentSN* must have all the same *signalIdentification* value."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *compositeSN* and *componentSN*."

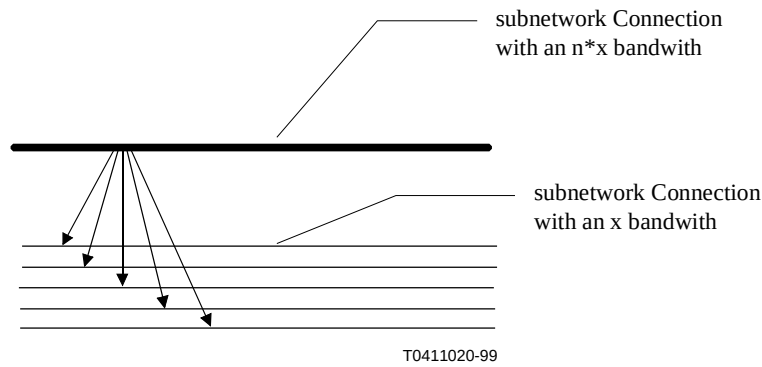
8.31 Conexión de subred es haz de conexiones de subred (*subnetworkConnectionIsBundleOfSubnetworkConnections*)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork connection, PROPERTY:bundling>

DEFINITION

"The *subnetworkConnectionIsBundleOfSubnetworkConnections* relationship class describes the relationship that exists between a *subnetworkConnection* and the *subnetworkConnections* that are part of it.



"

ROLE

bundleSNC

"Played by an instance of the <subnetworkConnection> information object type or subtype."

bundledSNC

"Played by an instance of a subtype of the <subnetworkConnection> information object type or subtype."

INVARIANT

inv_bundleRoleCardinality

"One and only one instance of the role *bundleSNC* must participate in the relationship."

inv_bundledRoleCardinality

"One or more instances of the role *bundledSNC* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of linkHasLinkConnections, the information objects playing the role *bundleSNC* and *bundledSNC* must have all the same signalIdentification value."

inv_directionality

"The objects involved in the relationship must have a compatible directionality."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *bundleSNC* and *bundledSNC*."

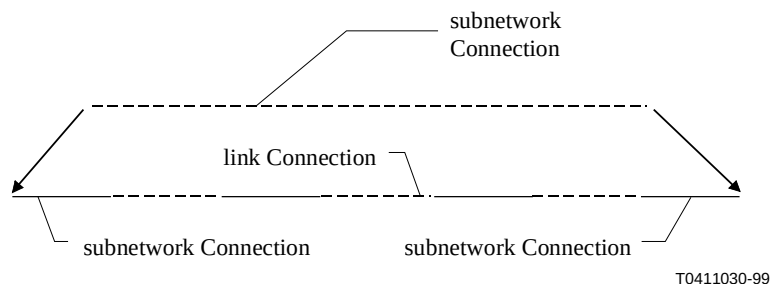
8.32 Conexión de subred se compone de entidades de transporte (subnetworkConnectionIsMadeOfTransportEntities)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork connection, PROPERTY: serial_composition>

DEFINITION

"The subnetworkConnectionIsMadeOfTransportEntities relationship class describes the relationship that exists between a composite subnetwork connection and its component transport entities."



"

ROLE

compositeSNC

"Played by an instance of the <subnetworkConnection> information object type or subtype."

componentTEntity

"Played by instances of the <subnetworkConnection> information object type or subtype, or <linkConnection> information object type or subtype."

INVARIANT

inv_compositeSNCRoleCardinality

"One and only one instance of the role *compositeSNC* must participate in the relationship."

inv_componentSNCRoleCardinality

"At least one instance of the role *componentTEntity* must participate in the relationship."

inv_directionality

"If the information object playing the role *compositeSNC* is bidirectional, then all the information objects playing the role *componentTEntity* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *subnetworkConnectionIsMadeOfTransportEntities*, the information objects playing the role *compositeSNC* and *componentTEntity* must have all the same *signalIdentification* value."

inv_contiguity

"The component transport entities being contiguous, both the first and the last one must be instances of the *subnetworkConnection* information object type or of one of its subtypes."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *compositeSNC* and *componentTEntity*."

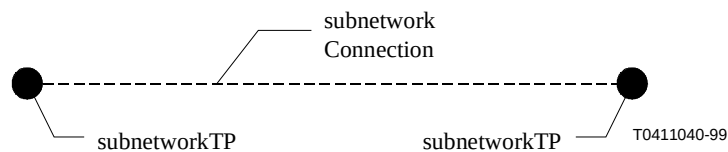
8.33 Conexión de subred está terminada por punto a punto (*subnetworkConnectionIsTerminatedByPointToPoint*)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork connection, PROPERTY:connectivity_constraints>

DEFINITION

"The *subnetworkConnectionIsTerminatedByPointToPoint* relationship class describes the relationship that exists between a subnetwork connection and its two terminations.



"

ROLE

transportEntitySNC

"Played by an instance of the <*subnetworkConnection*> information object type or subtype."

a_endSNTP

"Played by instances of the <*subnetworkTP*> information object type or subtype."

z_endSNTP

"Played by instances of the <*subnetworkTP*> information object type or subtype."

INVARIANT

inv_cardinalityTransportEntity

"One and only one instance of the role *transportEntitySNC* must participate in the relationship."

inv_aendRoleCardinality

"One and only one instance of the role *a_endSNTP* must participate in the relationship."

inv_zendRoleCardinality

"One and only one instance of the role *z_endSNTP* must participate in the relationship."

inv_directionAend

"The object playing the role *a_endSNTP* must have a *pointDirectionality* set to source or bidirectional."

inv_directionZend

"The object playing the role *z_endSNTP* must have a *pointDirectionality* set to sink or bidirectional."

inv_directionality

"If the information object playing the role *transportEntitySNC* is bidirectional, then the information objects playing the roles *a_endSNTP* and *z_endSNTP* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *subnetworkConnectionIsTerminatedByPointToPoint*, the information objects playing the role *transportEntitySNC*, *a_endSNTP* and *z_endSNTP* must have all the same *signalIdentification* value."

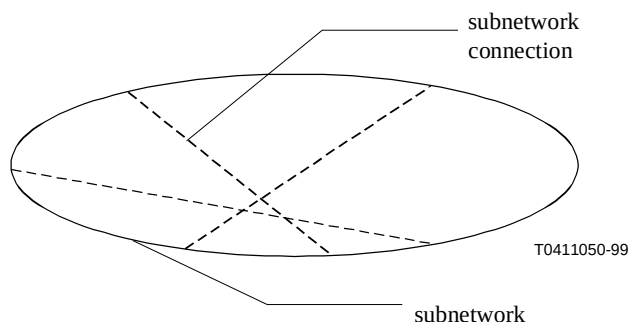
8.34 Subred tiene conexiones de subred (subnetworkHasSubnetworkConnections)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork, PROPERTY:connectivity>

DEFINITION

"The subnetworkHasSubnetworkConnections relationship class describes the relationship that exists between a subnetwork and the subnetworkConnections that are part of it.



"

ROLE

containerSN

"Played by an instance of the <subnetwork> information object type or subtype."

elementSNC

"Played by an instance of the <subnetworkConnection> information object type or subtype."

INVARIANT

inv_containerSNRoleCardinality

"One and only one instance of the role *containerSNC* must participate in the relationship."

inv_elementSNCRoleCardinality

"One or more instances of the role *elementSNC* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of subnetworkHasSubnetworkConnections, the information objects playing the role *containerSNC* and *elementSNC* must have all the same signalIdentification value."

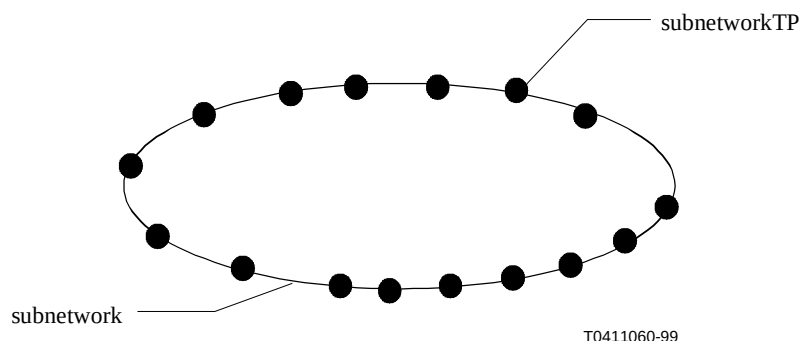
8.35 Subred está delimitada por (subnetworkIsDelimitedBy)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:subnetwork, PROPERTY:related_extremities>

DEFINITION

"The subnetworkIsDelimitedBy relationship class describes the relationship that exists between a subnetwork and the subnetworkTPs that delimit it.



"

ROLE

containerSN

"Played by an instance of the <subnetwork> information object type or a subtype."

elementSNTP

"Played by an instance of the <subnetworkTP> information object type or subtype."

INVARIANT

inv_containerSNRoleCardinality

"One and only one instance of the role *containerSN* must participate in the relationship."

inv_elementSNTPRoleCardinality

"One or more instances of the role *elementSNTP* must participate in the relationship."

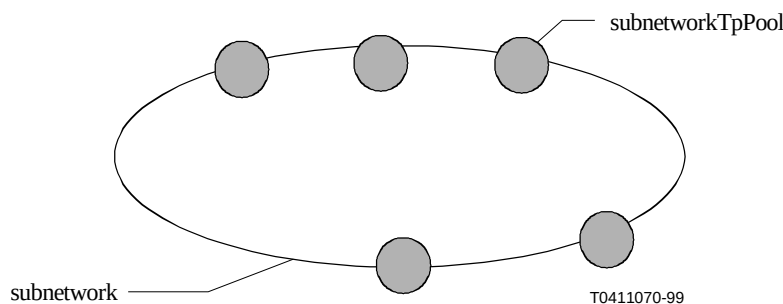
inv_signalIdentification

"In a given relationship instance of *subnetworkIsDelimitedBy*, the information objects playing the role *containerSN* and *elementSNTP* must have all the same *signalIdentification* value."

8.36 Subred está delimitada por fondos comunes de puntos de terminación de subred (subnetworkIsDelimitedBySnTpPools)

DEFINITION

"The *subnetworkIsDelimitedBySnTpPools* relationship class describes the relationship that exists between a subnetwork and the *subnetworkTpPools* that delimit it.



"

ROLE

containerSN

"Played by an instance of the <subnetwork> information object type or a subtype."

elementPool

"Played by an instance of the <subnetworkTpPool> information object type or subtype."

INVARIANT

inv_containeSNRoleCardinality

"One and only one instance of the role *containerSN* must participate in the relationship."

inv_elementPoolRoleCardinality

"One or more instances of the role *elementPool* must participate in the relationship."

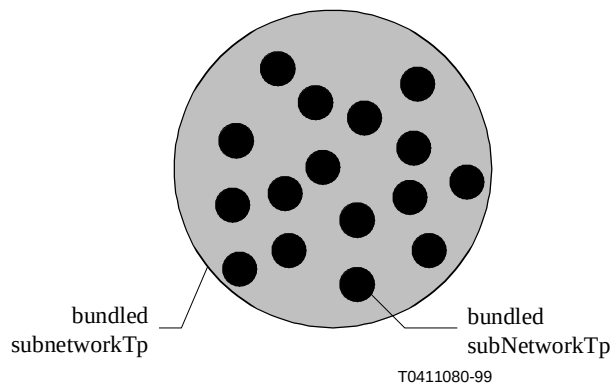
inv_signalIdentification

"In a given relationship instance of *subnetworkIsDelimitedBySnTpPools*, the information objects playing the role *containerSN* and *elementPool* must have all the same *signalIdentification* value."

8.37 Punto de terminación de subred es haz de puntos de terminación de subred (subnetworkTPIsBundleOfSubnetworkTPs)

DEFINITION

"The *subnetworkTPIsBundleOfSubnetworkTPs* relationship class describes the relationship that exists between a subnetworkTP and the subnetworkTPs that are part of it. (This relationship is similar to the information specification of the M.3100 gtp managed object class.)



"

ROLE

bundleSNTP

"Played by an instance of the <subnetworkTP> information object type or subtype."

bundledSNTP

"Played by an instance of the <subnetworkTP> information object type or subtype."

INVARIANT

inv_bundleRoleCardinality

"One and only one instance of the role *bundleSNTP* must participate in the relationship."

inv_bundledRoleCardinality

"One or more instances of the role *bundledSNTP* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of subnetworkIsDelimitedBySnTpPools, the information objects playing the role *bundleSNTP* and *bundledSNTP* must have all the same signalIdentification value."

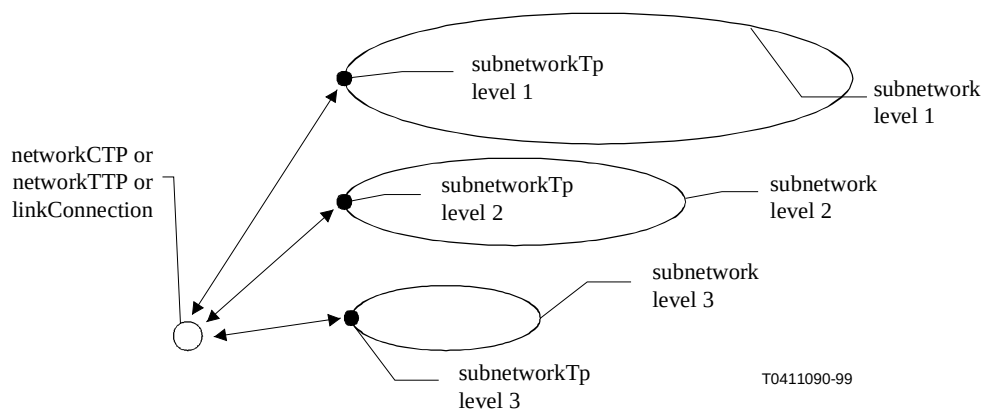
inv_roles

"In an instance of the relationship, an instance can not play both roles: *bundleSNTP* and *bundledSNTP*."

8.38 Punto de terminación de subred está relacionado con extremidad (subnetworkTPIsRelatedToExtremity)

DEFINITION

"The subnetworkTPIsRelatedToExtremity relationship class describes the relationship that exists between subnetworkTPs at a different level of partitioning and the extremity to which they are related.



"

ROLE

extremity

"Played by one and only one instance of the <networkTTP>, <networkCTP> sub-types or <linkConnection> type or subtype."

abstractionSNTP

"Played by instances of the <subnetworkTP> sub-types."

INVARIANT

inv_extremityRoleCardinality

"One and only one instance of the role *extremity* must participate in the relationship."

inv_abstractionRoleCardinality

"One or more instances of the role *abstractionSNTP* must participate in the relationship."

inv_constraints

"The following constraints on the types of related object have to be respected:

role: extremity	role: abstractionSNTP
networkCTPwith pointDirectionality = sink	subnetworkTPSource
networkTTPwith pointDirectionality = source	subnetworkTPSource
linkConnection with directionality = uni	subnetworkTPSource
networkCTP with pointDirectionality = source	subnetworkTPSink
networkTTP with pointDirectionality = sink	subnetworkTPSink
linkConnectionwith directionality = uni	subnetworkTPSink
networkCTP with pointDirectionality = bidirectional	subnetworkTPBidirectional
networkTTPwith pointDirectionality = bidirectional	subnetworkTPBidirectional
linkConnectionwith directionality = bid	subnetworkTPBidirectional

"

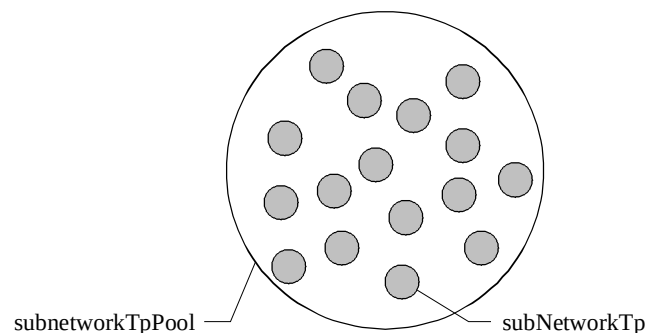
inv_signalIdentification

"In a given relationship instance of subnetworkTPIsRelatedToExtremity, the information objects playing the role *extremity* and *abstractionSNTP* must have all the same signalIdentification value."

8.39 Fondo común de puntos de terminación de subred se compone de puntos de terminación de subred (subnetworkTPPoolIsMadeOfSubnetworkTP)

DEFINITION

"The subnetworkTPPoolIsMadeOfSubnetworkTP relationship class describes the relationship that exists between a subnetworkTPPool and the SubnetworkTPs that are part of it.



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"

ROLE

containerPool

"Played by an instance <subnetworkTPPool> the information object type or subtype."

elementSNTP

"Played by instances of the <subnetworkTP> information object type or subtype."

INVARIANT

inv_containerPoolRoleCardinality

"One and only one instance of the role *containerPool* must participate in the relationship."

inv_elementPoolRoleCardinality

"One or more instances of the role *elementSNTP* must participate in the relationship."

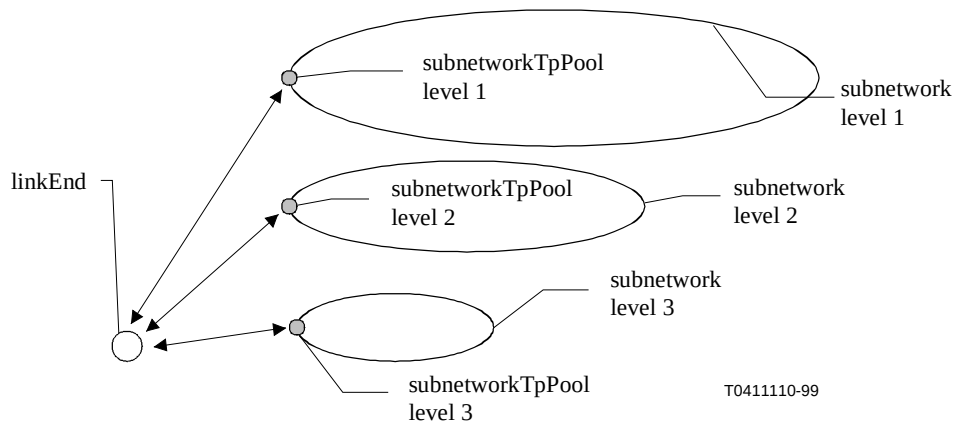
inv_signalIdentification

"In a given relationship instance of subnetworkTPPoolsMadeOfSubnetworkTP, the information objects playing the role *containerPool* and *elementSNTP* must have all the same signalIdentification value."

8.40 Fondo común de puntos de terminación de subred está relacionado con extremidad (subnetworkTPPoolsRelatedToExtremity)

DEFINITION

"The subnetworkTPPoolsRelatedToExtremity relationship class describes the relationship that exists between subnetworkTPPools at a different level of partitioning and the extremity to which they are related.



"

ROLE

extremityGroup

"Played by an instance of the <linkEnd>, <accessGroup>, <link> or <topologicalLink> or subtypes."

abstractionSNTPPool

"Played by instances of the <subnetworkTPPool> or subtypes."

INVARIANT

inv_extremityEndRoleCardinality

"One and only one instance of the role *extremityGroup* must participate in the relationship."

inv_abstractionRoleCardinality

"At least one instance of the role *abstractionSNTPPool* must participate in the relationship."

inv_directionality

"If the information object playing the role *extremityGroup* is bidirectional, then all the information objects playing the role *abstractionSNTPPool* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of subnetworkTPPoolsRelatedToExtremity, the information objects playing the role *extremityGroup* and *abstractionSNTPPool* must have all the same signalIdentification value."

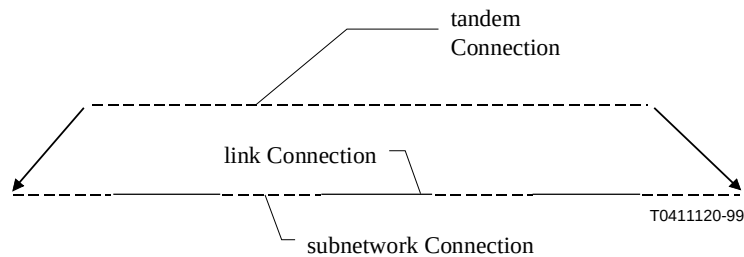
8.41 Conexión en cascada se compone de entidades de transporte (tandemConnectionIsMadeOfTransportEntities)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:tandem connection, PROPERTY:connectivity_constraint>

DEFINITION

"The tandemConnectionIsMadeOfTransportEntities relationship class describes the relationship that exists between a tandem connection and its component transport entities.



"

ROLE

compositeTC

"Played by an instance of the <tandemConnection> information object type or subtype."

componentTransportC

"Played by an instance of the <subnetworkConnection> information object type or subtype, or <linkConnection> information object type or subtype."

INVARIANT

inv_compositeTCRoleCardinality

"One and only one instance of the role *compositeTC* must participate in the relationship."

inv_componentTCRoleCardinality

"At least one instance of the role *componentTransportC* must participate in the relationship."

inv_directionality

"If the information object playing the role *compositeTC* is bidirectional, then all the information objects playing the role *componentTransportC* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *tandemConnectionIsMadeOfTransportEntities*, the information objects playing the role *compositeTC* and *componentTransportC* must have all the same *signalIdentification* value."

8.42 Extremo de enlace topológico es soportado por punto de terminación de camino de red (topologicalLinkEndIsSupportedByNetworkTTP)

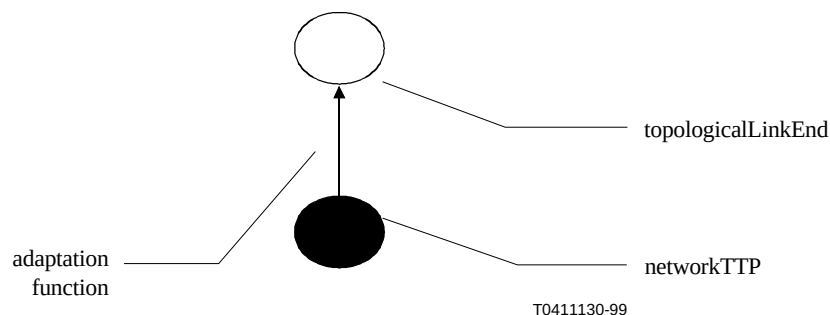
Este tipo de relación está relacionado con las siguientes entidades de empresa:

<COMMUNITY:tem, ROLE:topological link end, PROPERTY:adaptation-relation>

<"ITU-T Rec. G.852.2", COMMUNITY:tem, ROLE:trail termination point, PROPERTY:adaptation>."

DEFINITION

"The *topologicalLinkEndIsSupportedByNetworkTTP* relationship class describes the relationship that exists between a *topologicalLinkEnd* of a given layer network (known as the client layer network) and the *networkTTP* that supports them in a server layer network.



"

ROLE

clientTLE

"Played by instances of the <topologicalLinkEnd> information object type or subtype."

serverTTP

"Played by an instance of the <networkTTP> information object type or subtype."

INVARIANT

inv_serverTTPRoleCardinality

"One and only one instance of the role *serverTTP* must participate in the relationship."

inv_clientTLERoleCardinality

"At least one instance of the role *clientTLE* must participate in the relationship."

inv_directionality

"If the information object playing the role *serverTTP* is bidirectional, then the information objects playing the role *clientTLE* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *topologicalLinkEndIsSupportedByNetworkTTP*, the information object playing the role *serverTTP* must have a different signalIdentification value than the information object playing the role *clientTLE* as defined in Recommendation G.805 (compliant values are technologies dependent and defined in the corresponding Recommendations, e.g. G.783 for SDH)."

8.43 Enlace topológico es soportado por camino (topologicalLinkIsSupportedByTrail)

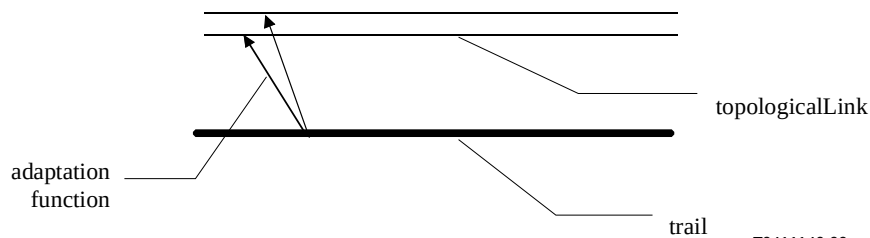
Este tipo de relación está relacionado con las siguientes entidades de empresa:

<COMMUNITY:tem, ROLE:topological link, PROPERTY:adaptation_relation>

<COMMUNITY:tem, ROLE:trail, PROPERTY:adaptation_relation>

DEFINITION

"The *topologicalLinkIsSupportedByTrail* relationship class describes the relationship that exists between *topologicalLinks* of a given layer network (known as the client layer network) and the trail that supports them in a server layer network.



"

ROLE

clientTL

"Played by instances of the <topologicalLink> information object type or subtype."

serverTrail

"Played by an instance of the <trail> information object type or subtype."

INVARIANT

inv_serverTrailRoleCardinality

"One and only one instance of the role *serverTrail* must participate in the relationship."

inv_clientTLRoleCardinality

"At least one instance of the role *clientTL* must participate in the relationship."

inv_directionality

"If the information object playing the role *serverTrail* is bidirectional, then the information objects playing the role *clientTL* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *topologicalLinkEndIsSupportedByNetworkTTP*, the information object playing the role *serverTrail* must have a different signalIdentification value than the information object playing the role *clientTL* as defined in Recommendation G.805 (compliant values are technologies dependent and defined in the corresponding Recommendations, e.g. G.783 for SDH)."

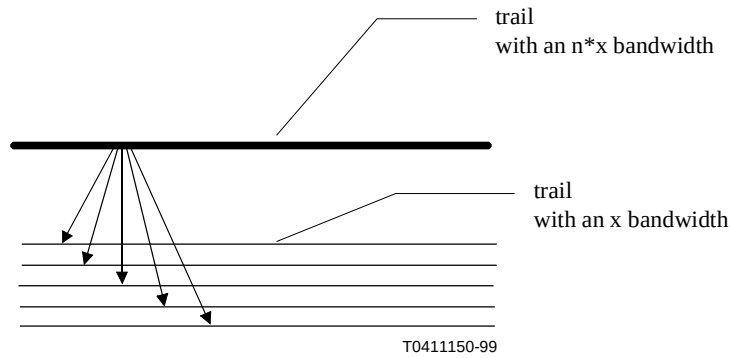
8.44 Camino es haz de caminos (trailIsBundleOfTrails)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail, PROPERTY:bundling>

DEFINITION

"The *trailIsBundleOfTrails* relationship class describes the relationship that exists between a trail and the trails that are part of it.



"

ROLE

bundleTrail

"Played by an instance of the <trail> information object type or subtype."

bundledTrail

"Played by an instance of a subtype of the <trail> information object type or subtype."

INVARIANT

inv_bundleRoleCardinality

"One and only one instance of the *bundleTrail* container must participate in the relationship."

inv_bundledRoleCardinality

"One or more instances of the role *bundledTrail* must participate in the relationship."

inv_signalIdentification

"In a given relationship instance of *trailsBundleOfTrails*, the information objects playing the role *bundleTrail* and *bundledTrail* must have all the same *signalIdentification* value."

inv_directionality

"The objects involved in the relationship must have a compatible directionality."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *bundleTrail* and *bundledTrail*."

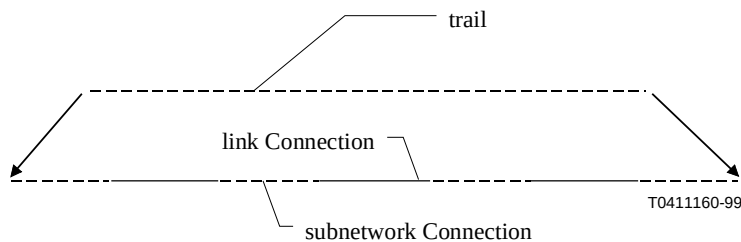
8.45 Camino se compone de entidades de transporte (*trailsMadeOfTransportEntities*)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail, PROPERTY:composition>

DEFINITION

"The *trailsMadeOfTransportEntities* relationship class describes the relationship that exists between a trail and its component transport entities.



"

ROLE

compositeTrail

"Played by an instance of the <trail> information object type or subtype."

componentTransportC

"Played by an instance of the <subnetworkConnection> information object type or subtype, or <linkConnection> information object type or subtype."

INVARIANT

inv_compositeTrailRoleCardinality

"One and only one instance of the role *compositeTrail* must participate in the relationship."

inv_componentTrailRoleCardinality

"At least one instance of the role *componentTransportC* must participate in the relationship."

inv_directionality

"If the information object playing the role *compositeTrail* is bidirectional, then all the information objects playing the role *componentTransportC* must be bidirectional."

inv_signalIdentification

"In a given relationship instance of *trailsMadeOfTransportEntities*, the information objects playing the role *compositeTrail* and *componentTransportC* must have all the same signalIdentification value."

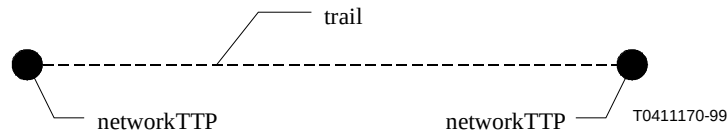
8.46 Camino está terminado por punto a punto (*trailsTerminatedByPointToPoint*)

Este tipo de relación está relacionado con la siguiente entidad de empresa:

<COMMUNITY:tem, ROLE:trail, PROPERTY:extremities>

DEFINITION

"The *trailsTerminatedByPointToPoint* relationship class describes the relationship that exists between a trail and its two extremities.



"

ROLE

transportEntityTrail

"Played by an instance of the <trail> information object type or subtype."

a_endNTTP

"Played by instances of the <networkTTP> information object type or subtype."

z_endNTTP

"Played by instances of the <networkTTP> information object type or subtype."

INVARIANT

inv_transportEntityRoleCardinality

"One and only one instance of the role *transportEntityTrail* must participate in the relationship."

inv_aendRoleCardinality

"One and only one instance of the role *a_endNTTP* must participate in the relationship."

inv_zendRoleCardinality

"One and only one instance of the role *z_endNTTP* must participate in the relationship."

inv_directionAend

"The object playing the role *a_endNTTP* must have a pointDirectionality set to source or bidirectional."

inv_directionZend

"The object playing the role *z_endNTTP* must have a pointDirectionality set to sink or bidirectional."

inv_directionality

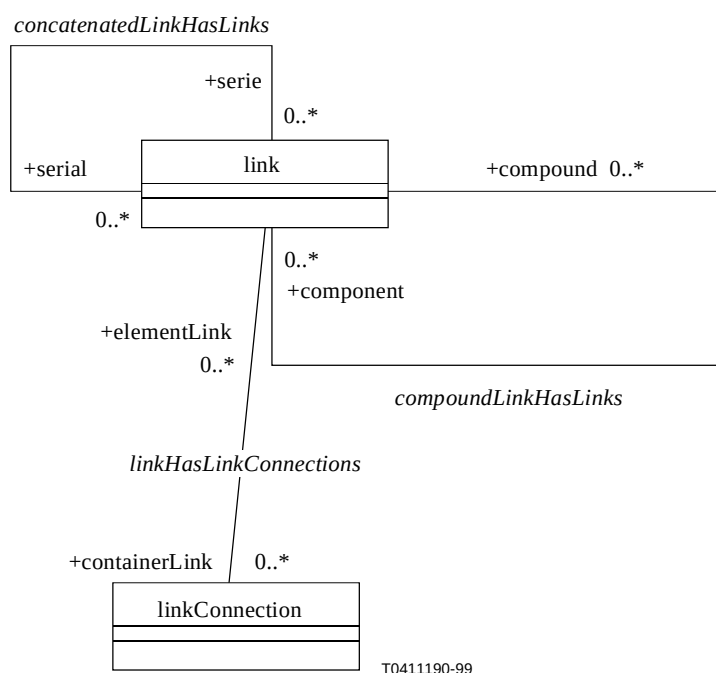
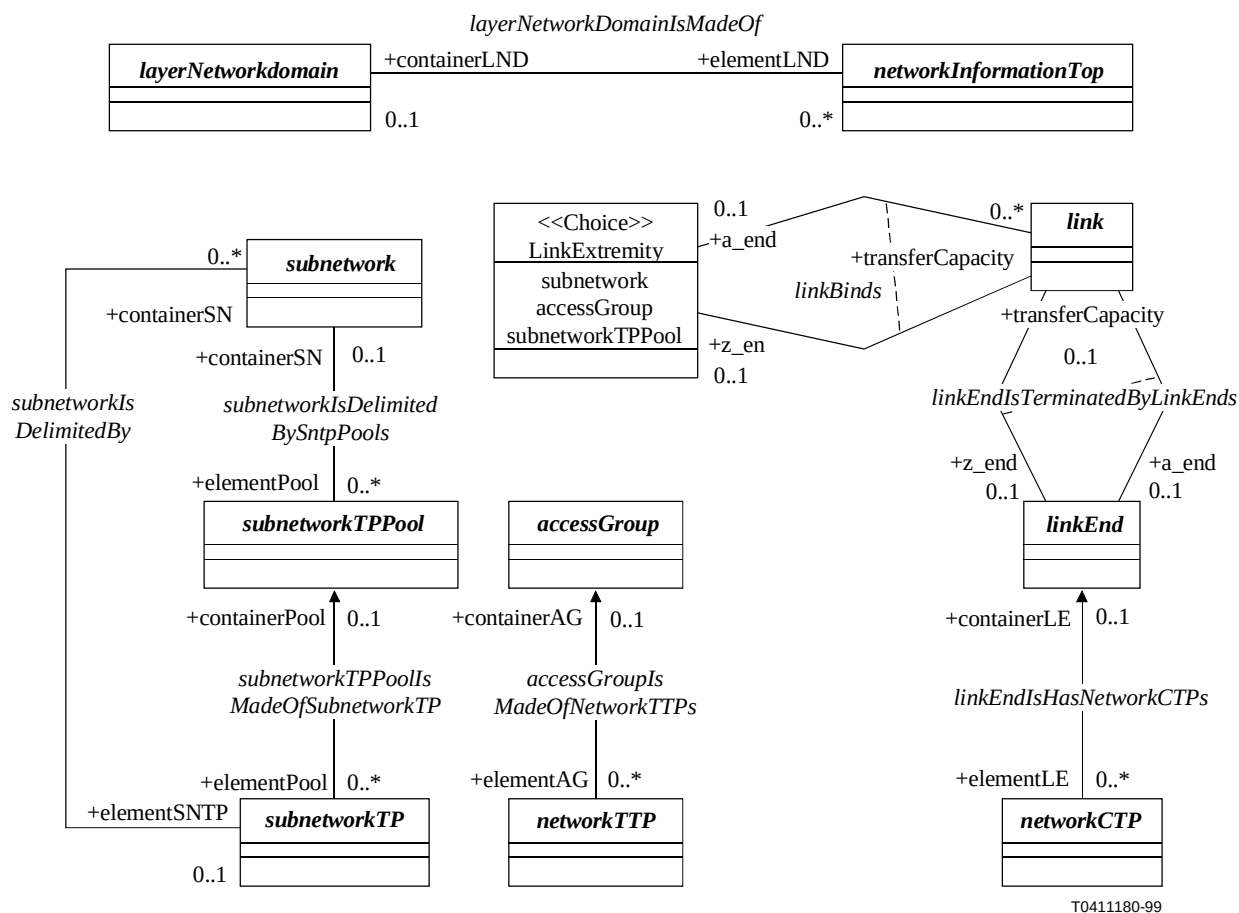
"If the information object playing the role of *transportEntityTrail* is bidirectional, then the information objects playing the roles *a_endNTTP* and *z_endNTTP* must be bidirectional."

inv_signalIdentification

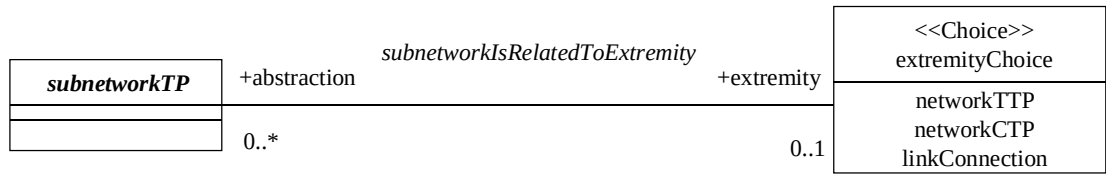
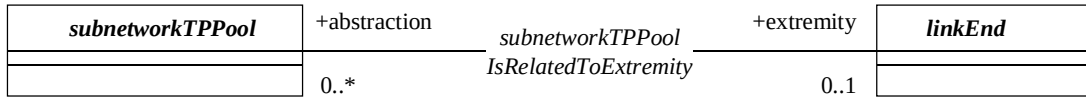
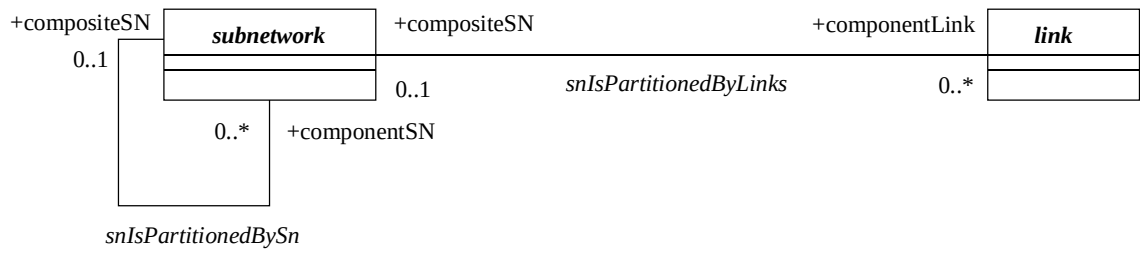
"In a given relationship instance of *trailsTerminatedByPointToPoint*, the information objects playing the role *transportEntityTrail*, *a_endNTTP* and *z_endNTTP* must have all the same signalIdentification value."

Diagramas de relaciones UML

A.1 Topología

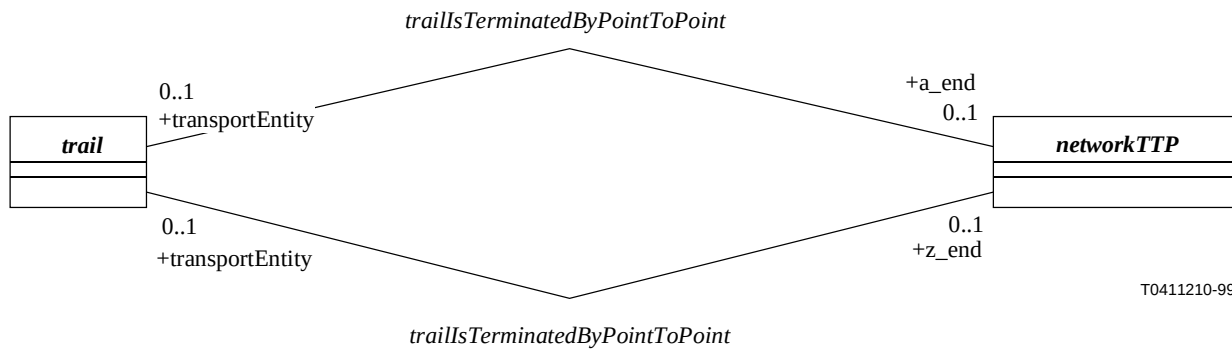
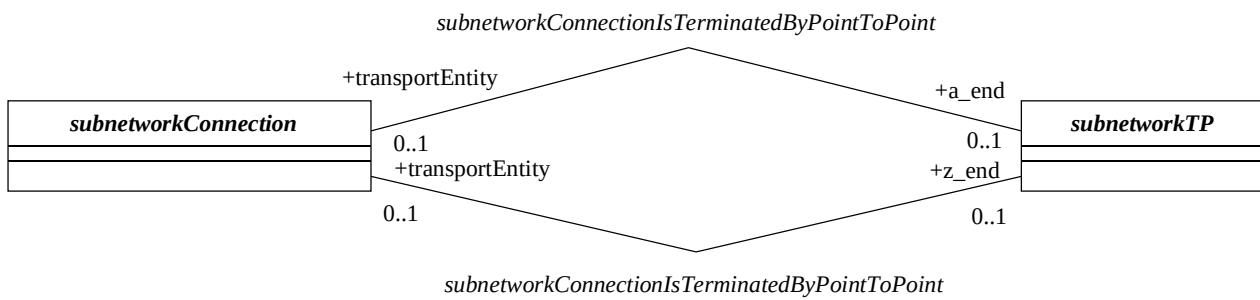
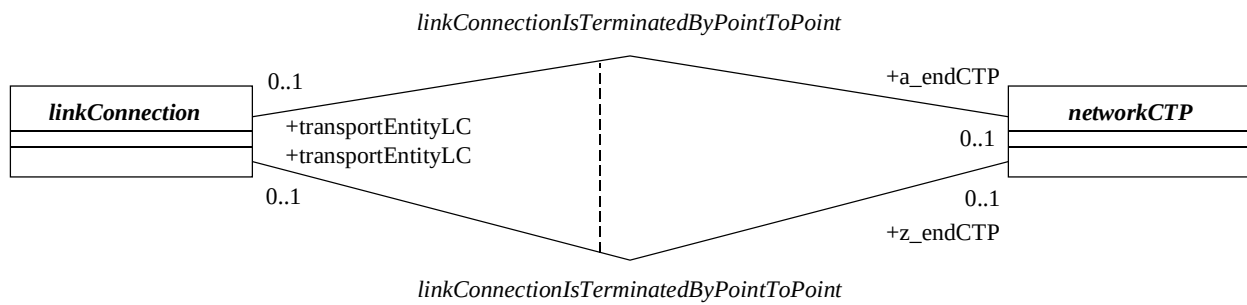


A.2 Relaciones de subdivisión

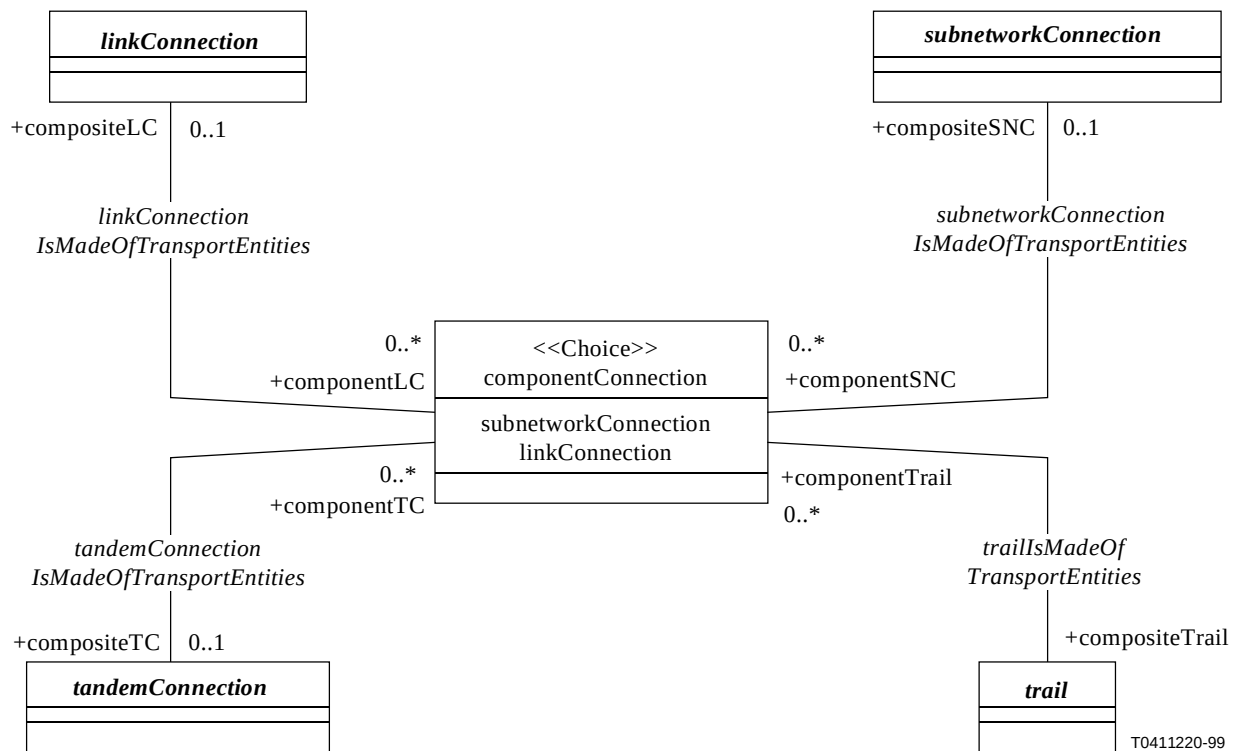


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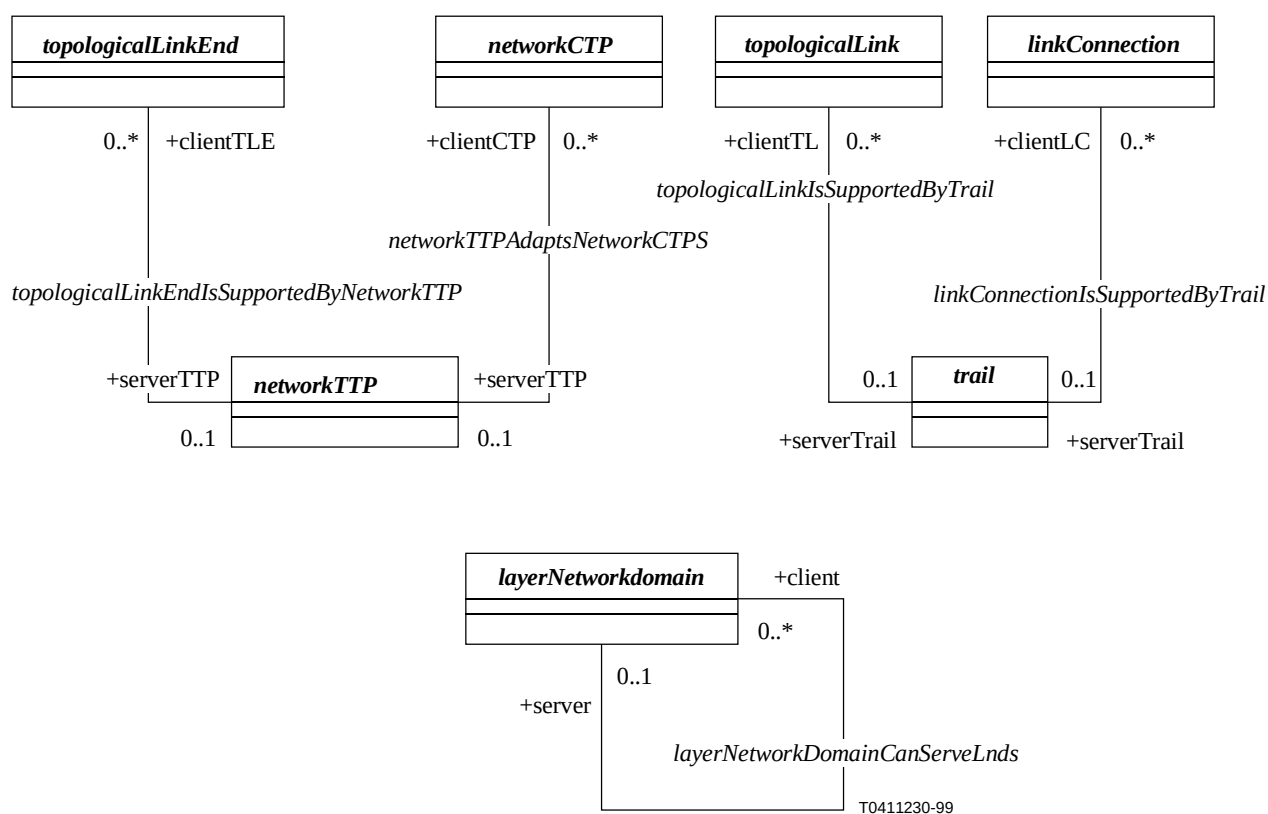
A.3 Extremidades de la conexión



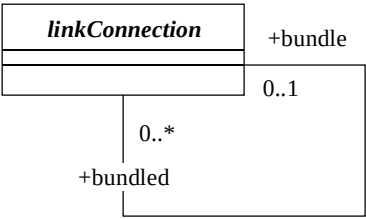
A.4 Composición de la conexión



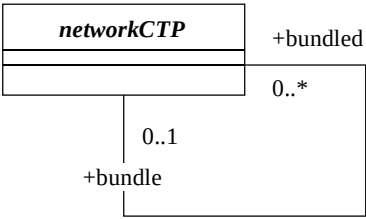
A.5 Relaciones entre capas



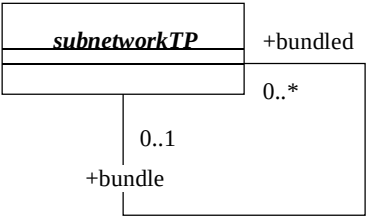
A.6 Relación entre haces



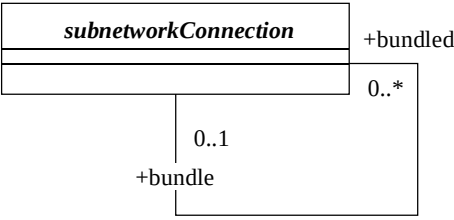
linkConnectionIsBundleOfLinkConnections



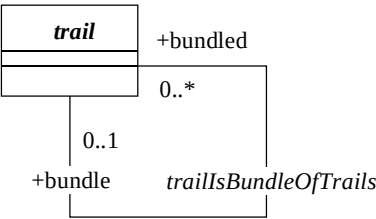
networkCTPIsBundledOfNetworkCTPs



subnetworkTPIsBundleOfSubnetworkTPs

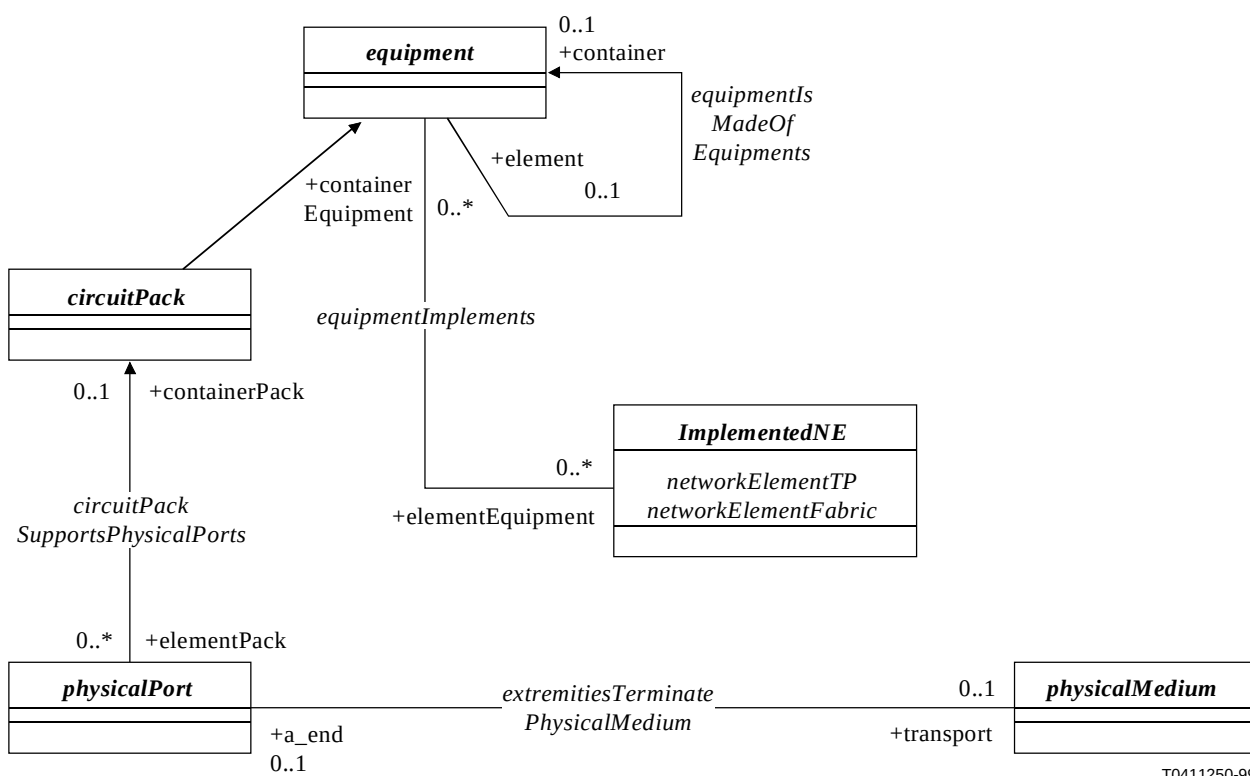


subnetworkConnectionIsBundleOfSubnetworkConnections



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A.7 Relación entre entidades físicas



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Serie I	Red digital de servicios integrados
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Serie K	Protección contra las interferencias
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Serie N	Mantenimiento: circuitos internacionales para transmisiones radiofónicas y de televisión
Serie O	Especificaciones de los aparatos de medida
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Serie Q	Conmutación y señalización
Serie R	Transmisión telegráfica
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