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SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Digital transmission systems – Digital networks – Management of transport network

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Common elements of the information viewpoint for the management of a transport network

ITU-T Recommendation G.853.1

(Previously CCITT Recommendation)

ITU-T G-SERIES RECOMMENDATIONS

TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

INTERNATIONAL TELEPHONE CONNECTIONS AND CIRCUITS	G.100–G.199
INTERNATIONAL ANALOGUE CARRIER SYSTEM	
GENERAL CHARACTERISTICS COMMON TO ALL ANALOGUE CARRIER-TRANSMISSION SYSTEMS	G.200–G.299
INDIVIDUAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON METALLIC LINES	G.300–G.399
GENERAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON RADIO-RELAY OR SATELLITE LINKS AND INTERCONNECTION WITH METALLIC LINES	G.400–G.449
COORDINATION OF RADIOTELEPHONY AND LINE TELEPHONY	G.450–G.499
TESTING EQUIPMENTS	
TRANSMISSION MEDIA CHARACTERISTICS	G.600–G.699
DIGITAL TRANSMISSION SYSTEMS	
TERMINAL EQUIPMENTS	G.700–G.799
DIGITAL NETWORKS	G.800–G.899
General aspects	G.800–G.809
Design objectives for digital networks	G.810–G.819
Quality and availability targets	G.820–G.829
Network capabilities and functions	G.830–G.839
SDH network characteristics	G.840–G.849
Management of transport network	**G.850–G.859**
SDH radio and satellite systems integration	G.860–G.869
Optical transport networks	G.870–G.879
DIGITAL SECTIONS AND DIGITAL LINE SYSTEM	G.900–G.999

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

ITU-T RECOMMENDATION G.853.1

COMMON ELEMENTS OF THE INFORMATION VIEWPOINT FOR THE MANAGEMENT OF A TRANSPORT NETWORK

Summary

The objective of this Recommendation is to provide the information viewpoint specification for management abstractions of G.805 transport network architectural components. The resources defined in this Recommendation provide a basis for the description of transport network level management services.

Source

ITU-T Recommendation G.853.1 was prepared by ITU-T Study Group 4 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 26th of March 1999.

FOREWORD

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

CONTENTS

Recommendation G.853.1

COMMON ELEMENTS OF THE INFORMATION VIEWPOINT FOR THE MANAGEMENT OF A TRANSPORT NETWORK

(Geneva, 1999)

1 Scope

This information viewpoint specification is related to the enterprise specification of the transport network resource model defined in Recommendation G.852.2.

2 References

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

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

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

[3] ITU-T Recommendation G.805 (1995), *Generic functional architecture of transport networks*.

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

3 Definitions

None.

4 Abbreviations

This Recommendation users the following abbreviations:

AD	Administrative Domain
AG	Access Group
bid	bidirectional
CTP	Connection Termination Point
gtp	Group Termination Point
Id	Identifier
inv	invariant
LC	Link Connection
LE	Link End

LEnd	Link End
LND	Layer Network Domain
NE	Network Element
NTTP	Network Trail Termination Point
PhysMed	Physical Medium
PhysPort	Physical Port
SDH	Synchronous Digital Hierarchy
SN	Subnetwork
SNC	Subnetwork Connection
SNTP	Subnetwork Termination Point
TC	Tandem Connection
tem	Transport Network Resource Model – Enterprise Viewpoint (G.852.2)
TEntity	Transport Entity
tim	Transport Network Resource Model – Information Viewpoint (G.853.1)
TL	Topological Link
TLE	Topological Link End
TP	Termination Point
TransportC	Transport Connection
TTP	Trail Termination Point
uni	unidirectional
UML	Unified Modelling Language

5 Conventions

None.

6 Information object type definitions

See Figures 1 a) to 1 e).

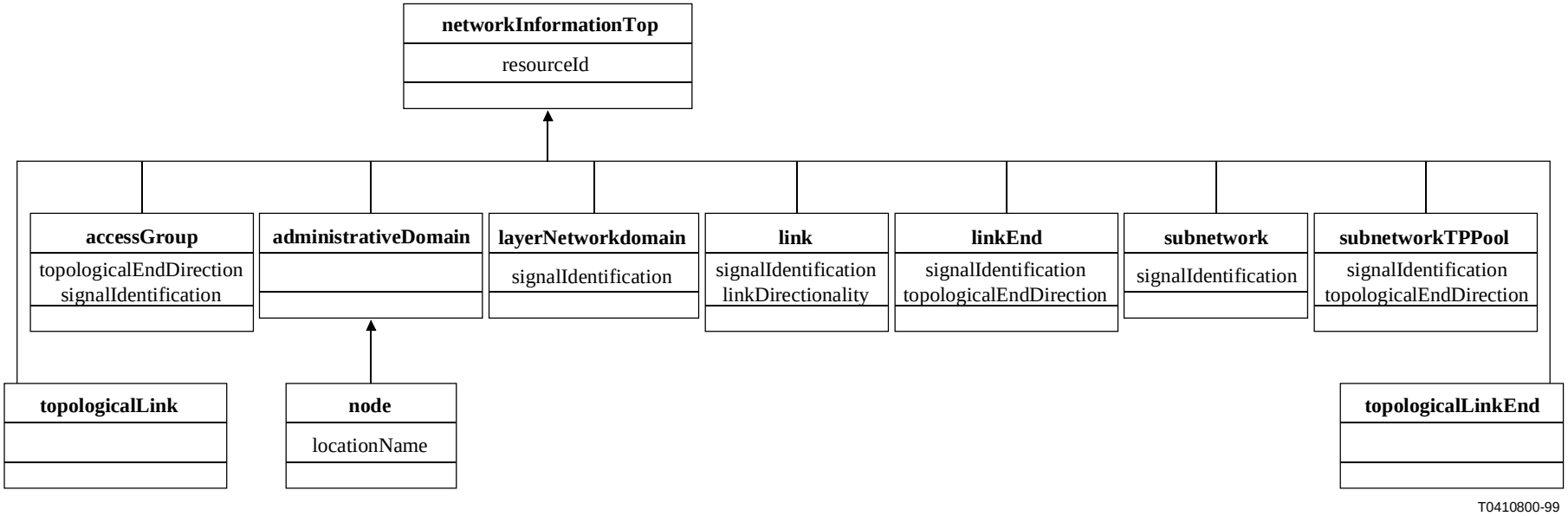


Figure 1 a)/G.853.1 – Network-related information object types diagram (topological entities)

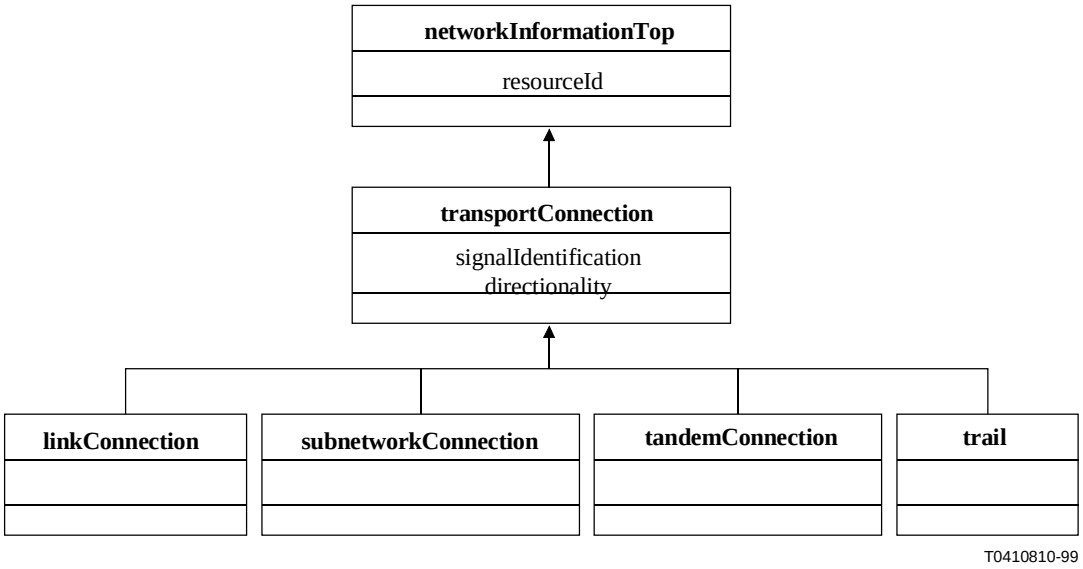


Figure 1 b)/G.853.1 – Network-related information object types diagram (topological entities)

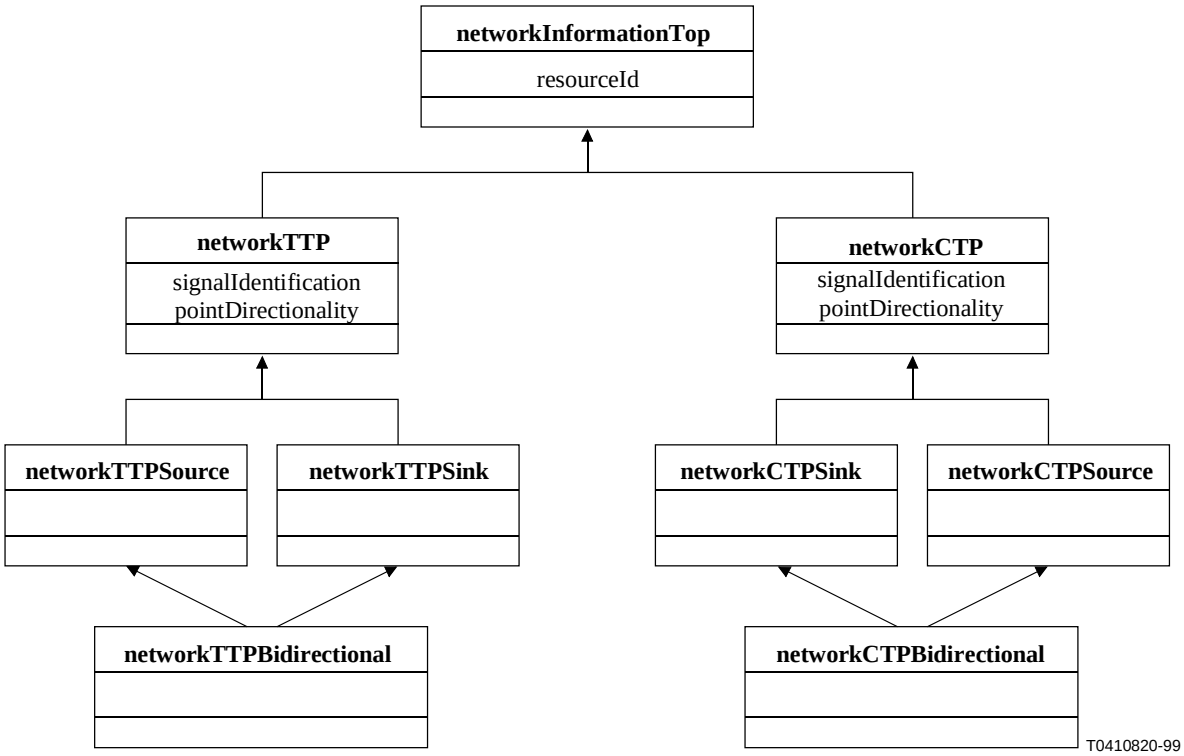


Figure 1 c)/G.853.1 – Network-related information object types diagram (point entities)

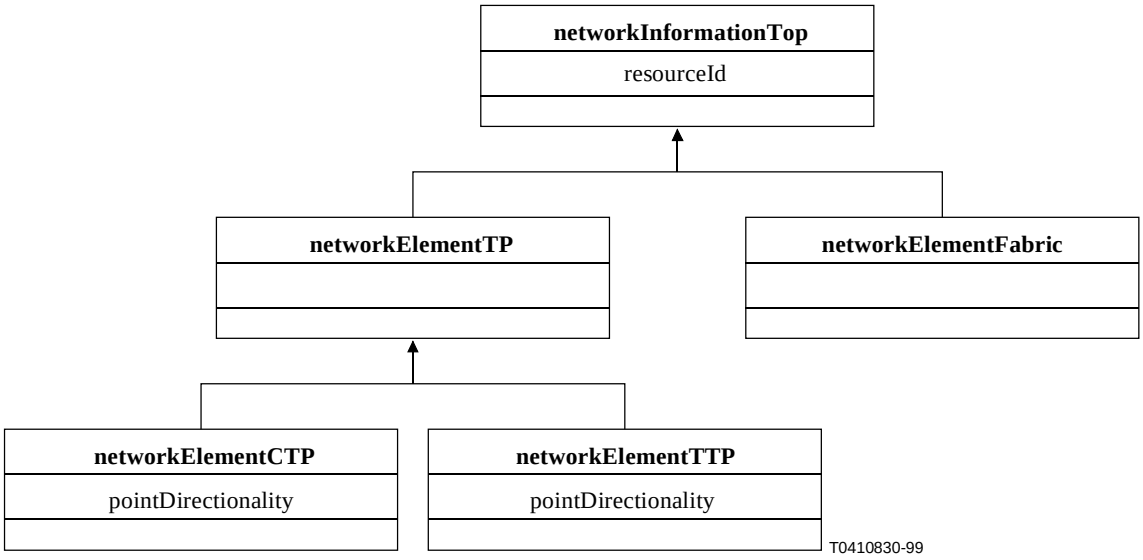


Figure 1 d)/G.853.1 – Network element-related information object types diagram

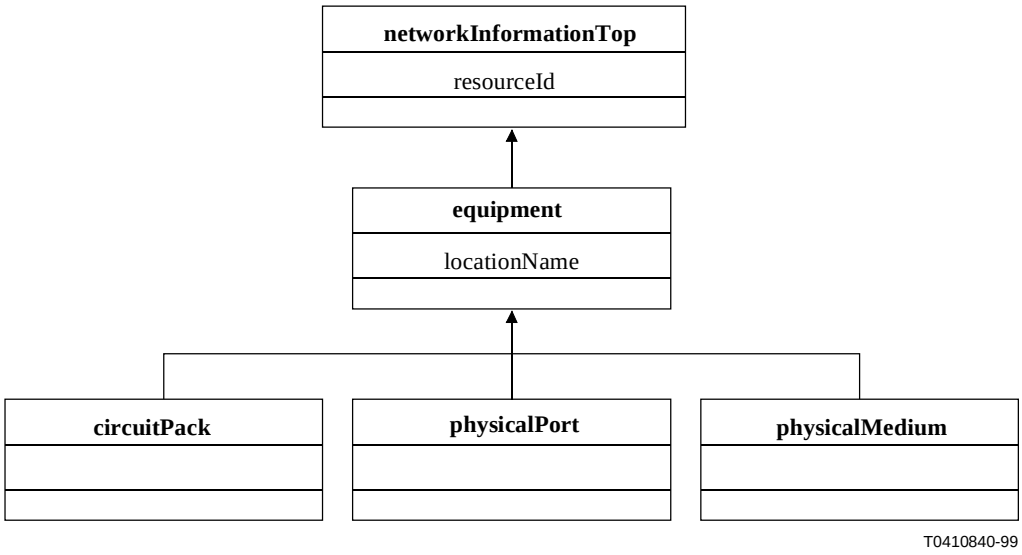


Figure 1 e)/G.853.1 – Physical-related information object types diagram

6.1 accessGroup

This information type is related to the following enterprise entity:
<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 administrativeDomain

This information type is related to the following enterprise entity:
<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 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 equipment

This information type is related to the following enterprise entity:
<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 layerNetworkDomain

This information type is related to the following enterprise entity:
<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 link

This information type is related to the following enterprise entity:
<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 linkConnection

This information type is related to the following enterprise entity:
<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 linkEnd

This information type is related to the following enterprise entity:
<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 networkCTP

This information type is related to the following enterprise entity:
<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 networkCTPBidirectional

This information type is related to the following enterprise entity:
<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 networkCTPSink

This information type is related to the following enterprise entity:
<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 networkCTPSource

This information type is related to the following enterprise entity:
<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 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 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 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 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 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 networkTTP

This information type is related to the following enterprise entity:
<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 networkTTPBidirectional

This information type is related to the following enterprise entity:
<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 networkTTPSink

This information type is related to the following enterprise entity:
<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 networkTTPSource

This information type is related to the following enterprise entity:
<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 node

This information type is related to the following enterprise entity:
<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 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 physicalPort

This information type is related to the following enterprise entity:
<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 subnetwork

This information type is related to the following enterprise entity:
<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 subnetworkConnection

This information type is related to the following enterprise entity:
<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 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 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 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 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 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 tandemConnection

This information type is related to the following enterprise entity:
<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 topologicalLink

This information type is related to the following enterprise entity:
<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 topologicalLinkEnd

This information type is related to the following enterprise entity:
<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 trail

This information type is related to the following enterprise entity:
<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 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 Attribute type definition

7.1 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 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 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 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 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 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 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."

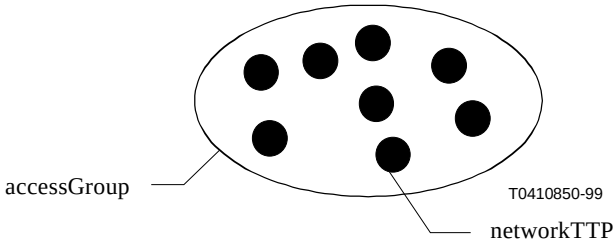
7.8 userLabel

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

8 Information relationship type definitions

8.1 accessGroupIsMadeOfNetworkTTPs

This relationship type is related to the following enterprise entities:
<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 accessGroupIsRelatedToSntpPool

This relationship type is related to the following enterprise entities:
<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

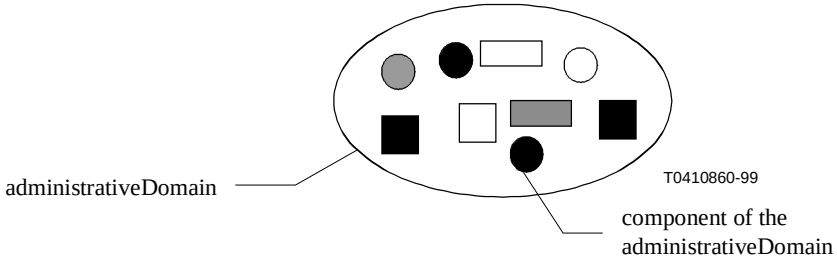
"The *abstractionPool* and the *extremityAG* must contain the same signalIdentification information."

8.3 administrativeDomainIsMadeOf

This relationship type is related to the following enterprise entity:
<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 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 compoundLinkEndHasLinkEnds

This relationship type is related to the following enterprise entity:
<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 *compound*LEnd must participate in the relationship."

inv_componentRoleCardinality

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

inv_signalIdentification

"The *compound*LEnd and the *component*LEnd must contain the same signalIdentification information."

inv_directionality

"The *compound*LEnd and the *component*LEnd must have the same topologicalEndDirection."

inv_roles

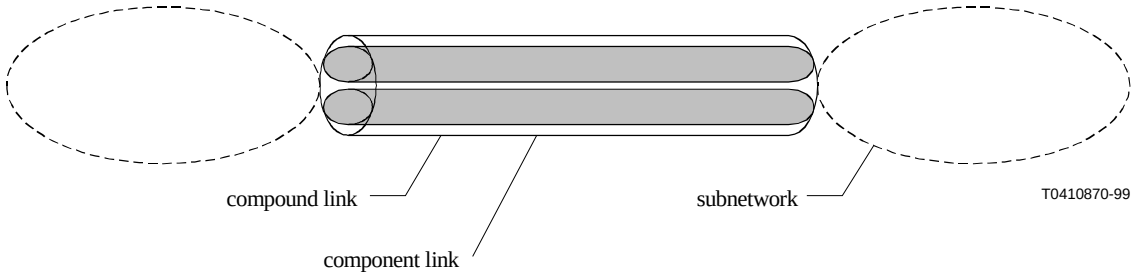
"In an instance of the relationship, an instance can not play both roles: *compound*LEnd and *component*LEnd."

8.6 compoundLinkHasLinks

This relationship type is related to the following enterprise entity:
<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 *compound*Link must participate in the relationship."

inv_componentRoleCardinality

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

inv_signalIdentification

"The *compound*Link and the *component*Link must contain the same signalIdentification information."

inv_directionality

"The *compound*Link and the *component*Link 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: *compound*Link and *component*Link."

inv_capacity

"The capacity of the object playing the role *compound*Link must be equal to the sum of the capacities of all the objects playing the role *component*Link."

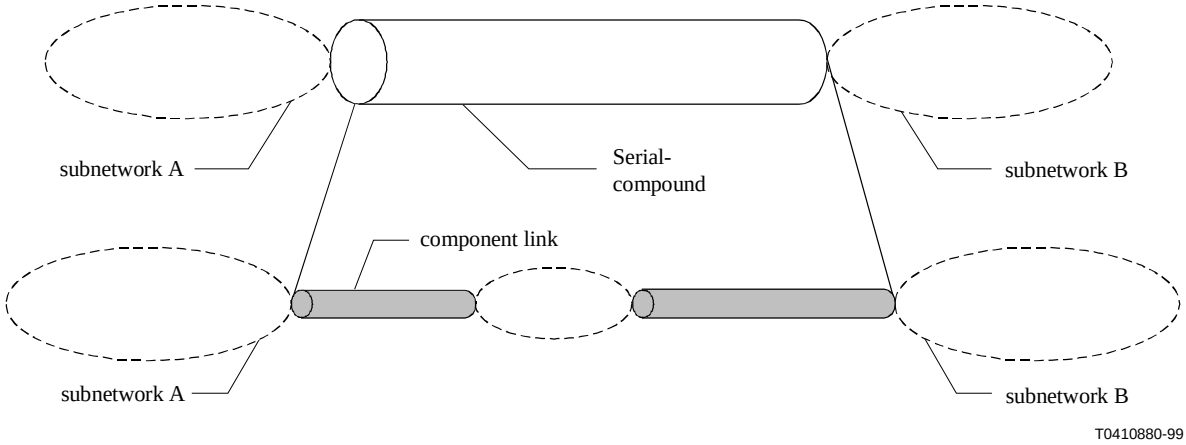
8.7 concatenatedLinkHasLinks

This relationship type is related to the following enterprise entity:

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

DEFINITION

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



"

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 *serial*Link must participate in the relationship."

inv_serieRoleCardinality

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

inv_signalIdentification

"The *serial*Link and the *serie*Link must contain the same signalIdentification information."

inv_directionality

"The *serial*Link and the *serie*Link must have a compatible linkDirectionality."

inv_contiguityAend

"One and only one *serie*Link must have a a_end equal to the a_end of the *serial*Link."

inv_contiguityZend

"One and only one *serie*Link must have a z_end equal to the z_end of the *serial*Link."

inv_capacity

"The capacity of the *serial*Link must be lower or equal than the lowest capacity of the *serie*Link."

inv_roles

"In an instance of the relationship, an instance can not play both roles: *serial*Link and *serie*Link."

8.8 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 *container*Equipment must participate in the relationship."

inv_elementEquipmentRoleCardinality

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

8.9 equipmentIsMadeOfEquipments

This relationship type is related to the following enterprise entity:
<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 *container*Equipment must participate in the relationship."

inv_elementRoleCardinality

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

8.10 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 *transport*PhysMed must participate in the relationship."

inv_aendRoleCardinality

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

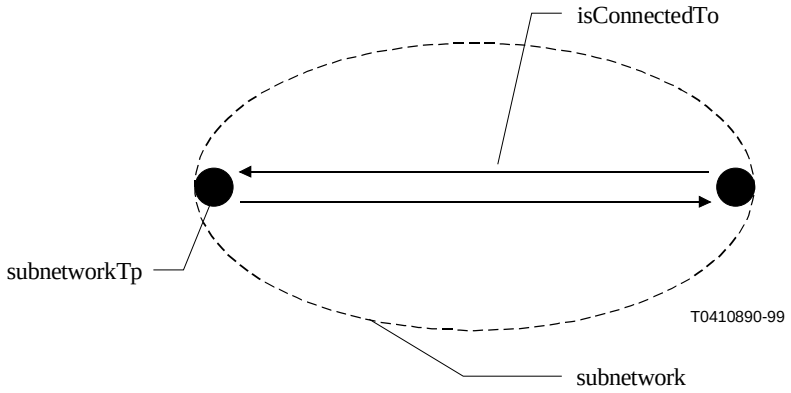
inv_zendRoleCardinality

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

8.11 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 layerNetworkDomainCanServeLnds

This relationship type is related to the following enterprise entity:
<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_signaIdentification

"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 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

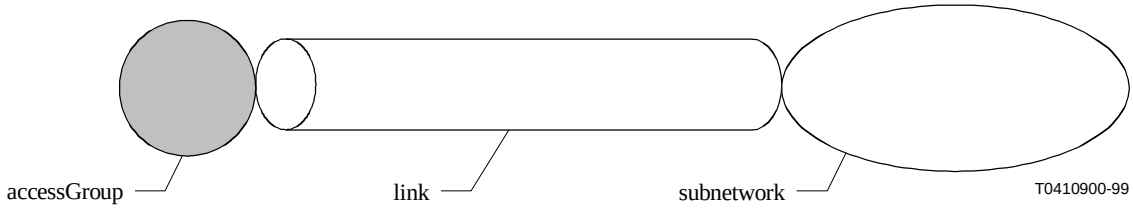
"The *containerLND* and the *element* must contain the same signalIdentification information."

8.14 linkBinds

This relationship type is related to the following enterprise entity:
<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_end*Topological must participate in the relationship."

inv_zendRoleCardinality

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

inv_signalIdentification

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

inv_directionality

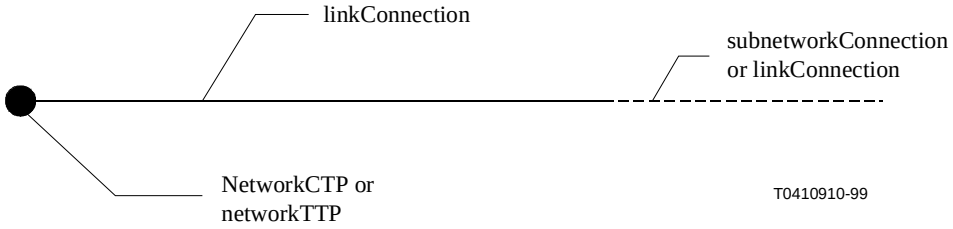
"If the role *a_enTopological* or z*_enTopological* is played by an accessGroup, then the objects involved in the relationship must have a compatible directionality."

8.15 linkConnectionIsBoundTo

This relationship type is related to the following enterprise entity:
<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."

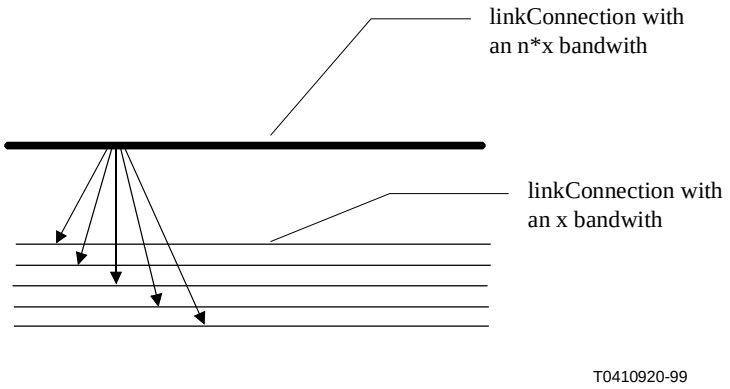
inv_signalIdentification

"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 linkConnectionIsBundleOfLinkConnections

This relationship type is related to the following enterprise entity:
<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.



"

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."

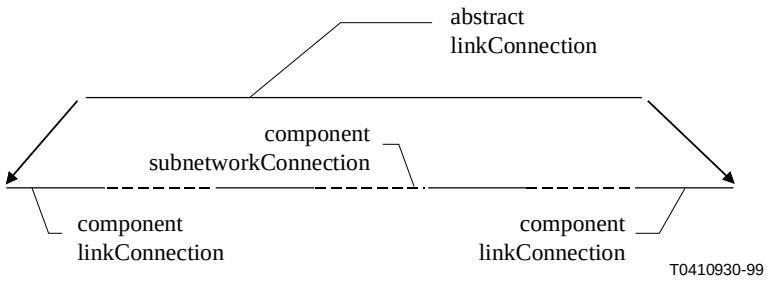
inv_roles

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

8.17 linkConnectionIsMadeOfTransportEntities

This relationship type is related to the following enterprise entity:
<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

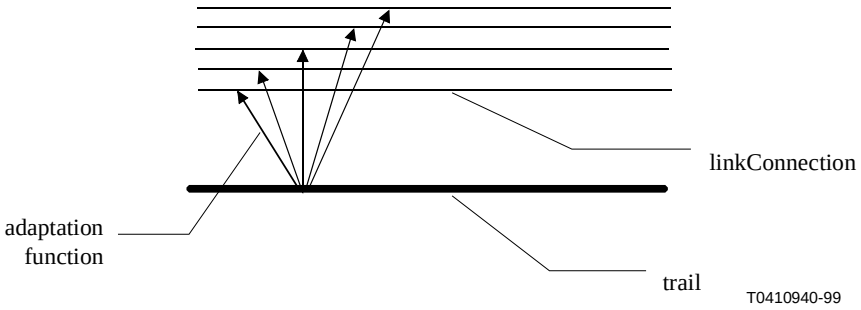
"In an instance of the relationship, an instance can not play both roles: *compositeLC* and *componentTEntity*."

8.18 linkConnectionIsSupportedByTrail

This relationship type is related to the following enterprise entities:
<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."

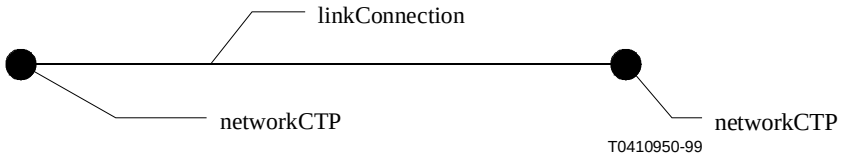
inv_signaIdentification

"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 linkConnectionIsTerminatedByPointToPoint

This relationship type is related to the following enterprise entity:
<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."

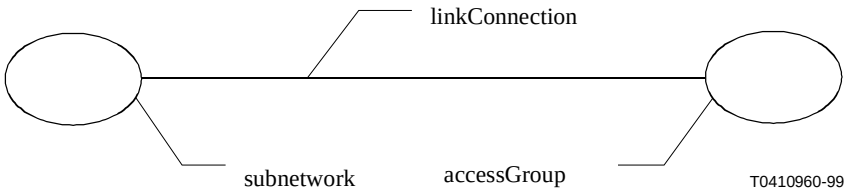
inv_signalIdentification

"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 linkConnectionIsTerminatedByTopologicalEntities

This relationship type is related to the following enterprise entity:
<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 linkEndIsBoundTo

This relationship type is related to the following enterprise entity:
<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 linkEndHasNetworkCTPs

This relationship type is related to the following enterprise entity:
<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

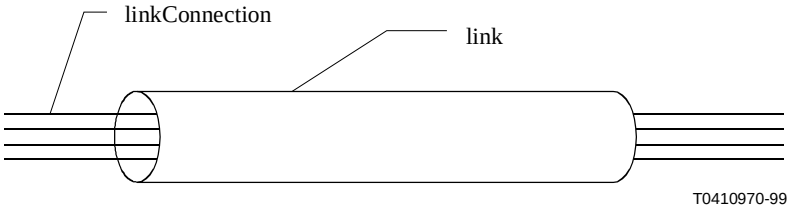
"

8.23 linkHasLinkConnections

This relationship type is related to the following enterprise entity:
<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 linkIsTerminatedByLinkEnds

This relationship type is related to the following enterprise entity:
<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 networkCTPIsBundleOfNetworkCTPs

This relationship type is related to the following enterprise entity:
<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

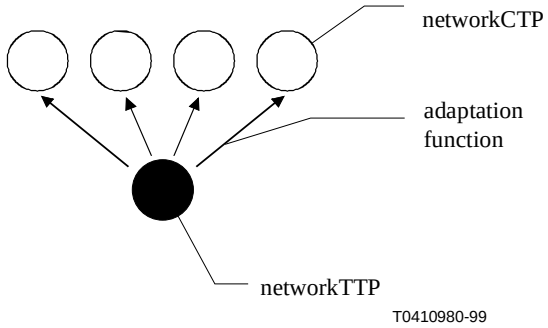
"In an instance of the relationship, an instance can not play both roles: *bundleCTP* and *bundledCTP*."

8.26 networkTTPAdaptsNetworkCTP

This relationship type is related to the following enterprise entities:
<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.



"

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 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

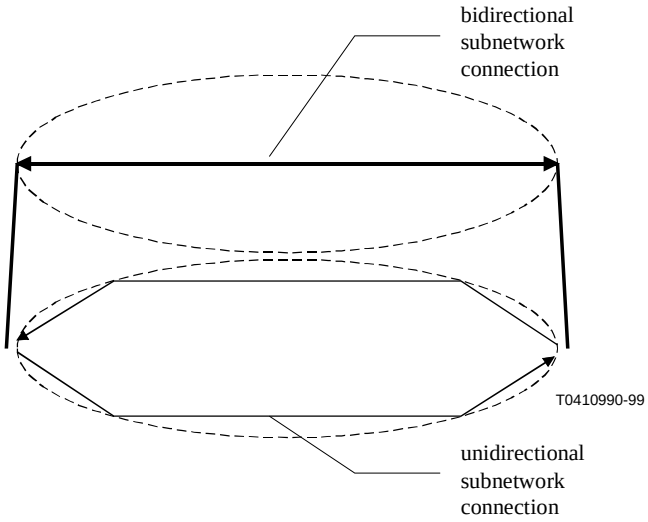
"At least two instances of the role *resourceInfo* must participate in the relationship."

8.28 sncBidIsSupportedByUnis

This relationship type is related to the following enterprise entity:
<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 *uni1*SNC must participate in the relationship."

inv_uni2RoleCardinality

"One and only one instance of the role *uni2*SNC must participate in the relationship."

inv_bidRoleCardinality

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

inv_directionality

"The instance of the role *uni1*SNC and the instance of the role *uni2*SNC 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 *bid*SNC, *uni1*SNC and *uni2*SNC must have all the same signalIdentification value."

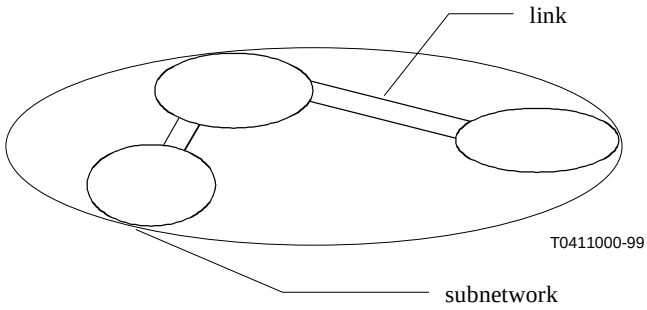
inv_roles

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

8.29 snIsPartitionedByLinks

This relationship type is related to the following enterprise entity:
<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."

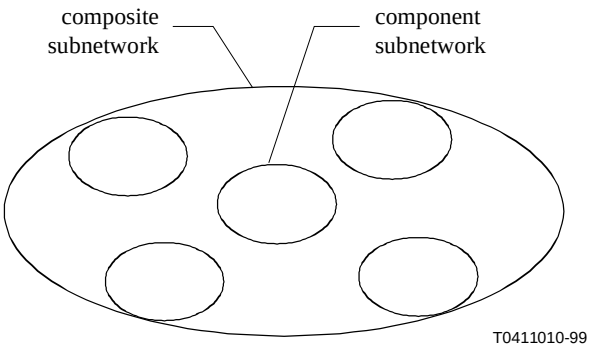
inv_signalIdentification

"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 snIsPartitionedBySn

This relationship type is related to the following enterprise entity:
<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_signalIdentifcation

"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

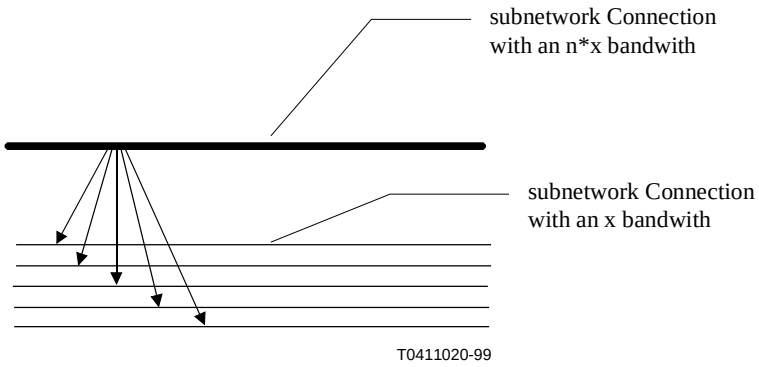
"In an instance of the relationship, an instance can not play both roles: *compositeSN* and *componentSN*."

8.31 subnetworkConnectionIsBundleOfSubnetworkConnections

This relationship type is related to the following enterprise entity:
<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 *bundle*SNC must participate in the relationship."

inv_bundledRoleCardinality

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

inv_signalIdentification

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

inv_directionality

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

inv_roles

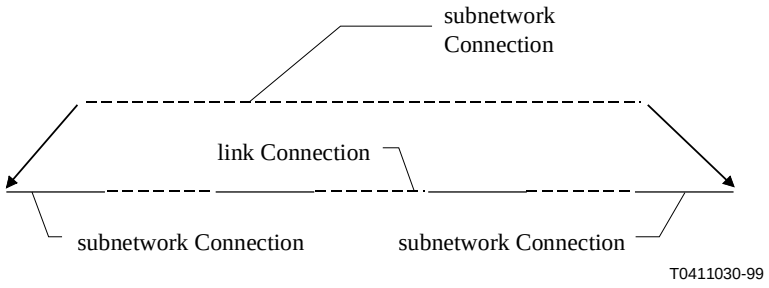
"In an instance of the relationship, an instance can not play both roles: *bundle*SNC and *bundled*SNC."

8.32 subnetworkConnectionIsMadeOfTransportEntities

This relationship type is related to the following enterprise entity:
<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 *component*TEntity 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 *component*TEntitymust be bidirectional."

inv_signalIdentification

"In a given relationship instance of subnetworkConnectionIsMadeOfTransportEntities, the information objects playing the role *compositeSNC* and *component*TEntity 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."

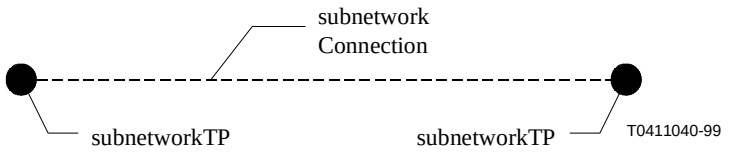
inv_roles

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

8.33 subnetworkConnectionIsTerminatedByPointToPoint

This relationship type is related to the following enterprise entity:
<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."

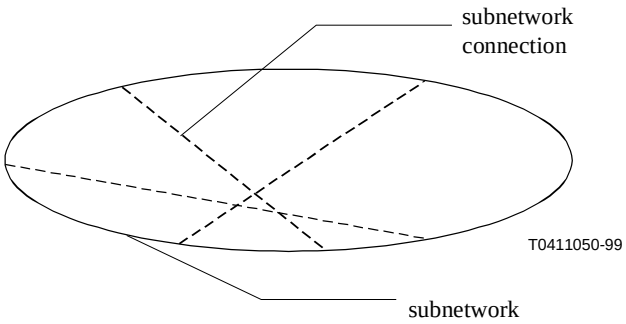
inv_signalIdentification

"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 subnetworkHasSubnetworkConnections

This relationship type is related to the following enterprise entity:
<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

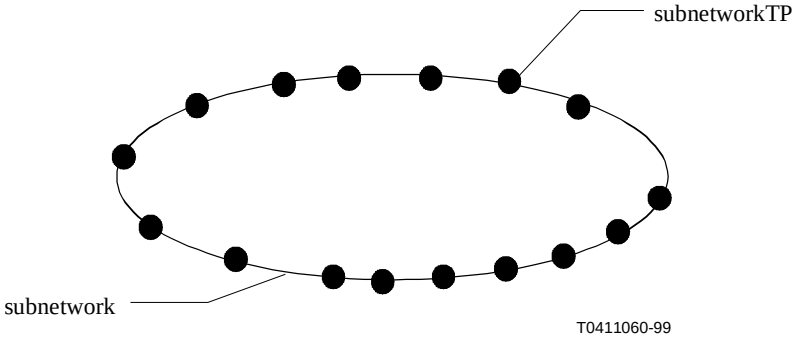
"In a given relationship instance of subnetworkHasSubnetworkConnections, the information objects playing the role *containerSNC* and *elementSNC* must have all the same signalIdentification value."

8.35 subnetworkIsDelimitedBy

This relationship type is related to the following enterprise entity:
<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."

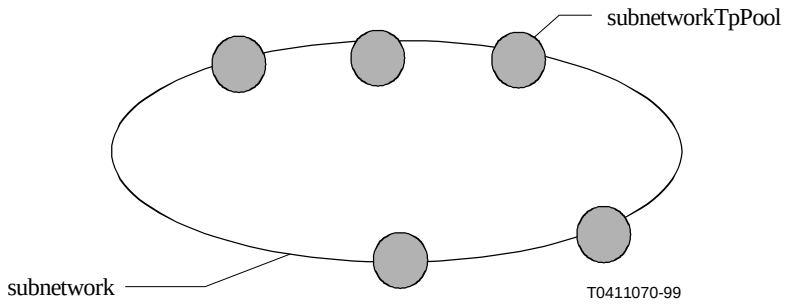
inv_signalIdentification

"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 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."

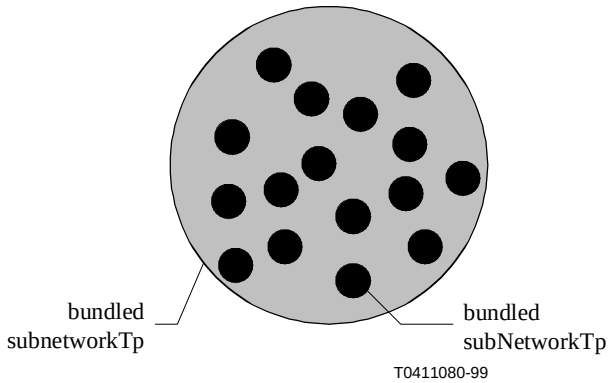
inv_signalIdentification

"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 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."

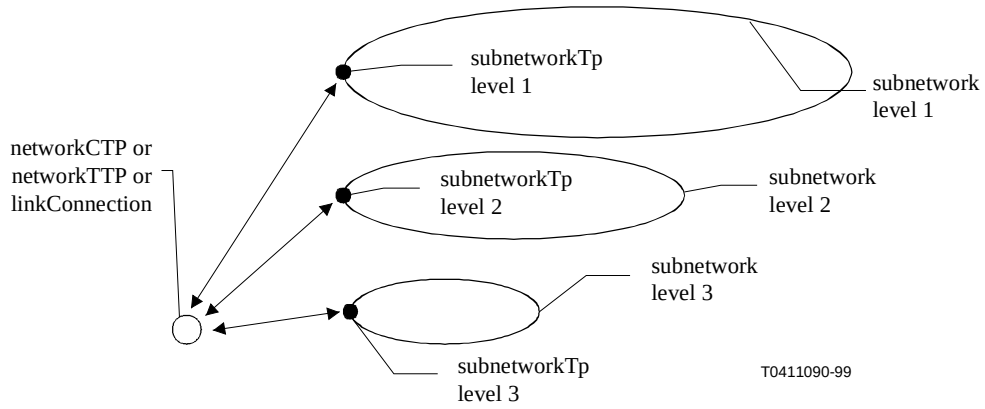
inv_roles

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

8.38 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

"

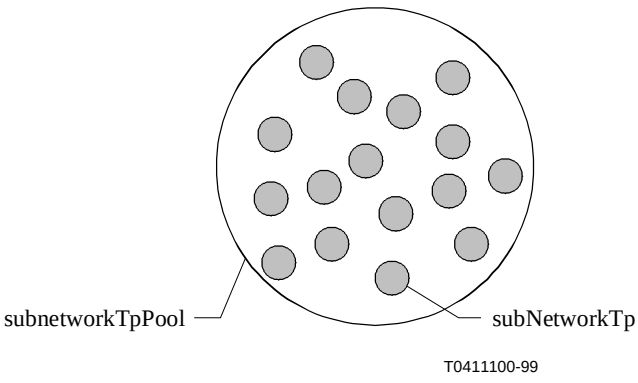
inv_signalIdentification

"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 subnetworkTPPoolIsMadeOfSubnetworkTP

DEFINITION

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



"

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."

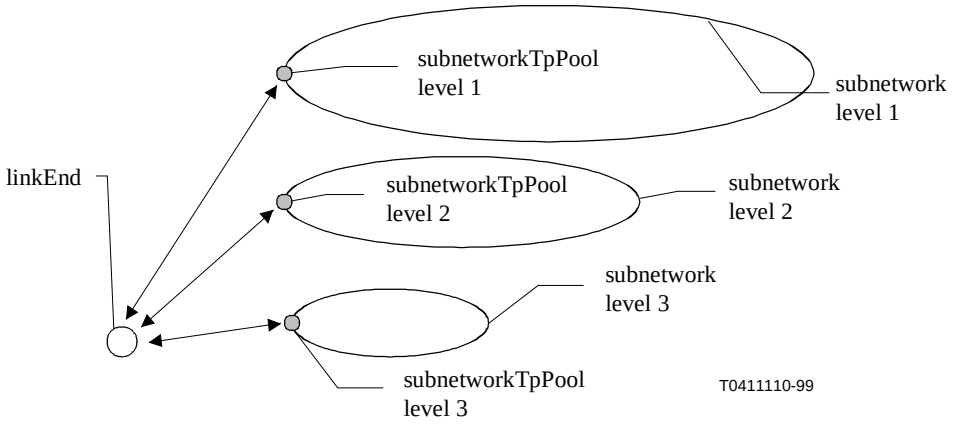
inv_signalIdentification

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

8.40 subnetworkTPPoolIsRelatedToExtremity

DEFINITION

"The subnetworkTPPoolIsRelatedToExtremity 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 *abstraction*SNTPPool 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 *abstraction*SNTPPool must be bidirectional."

inv_signalIdentification

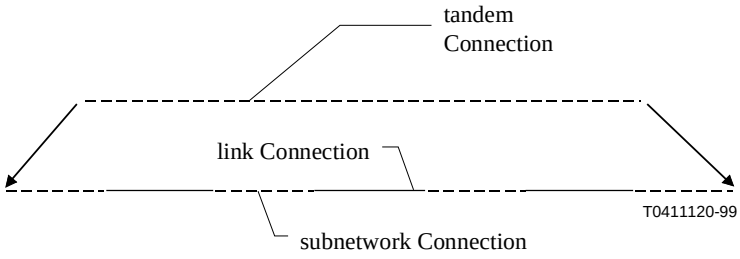
"In a given relationship instance of subnetworkTPPoolIsRelatedToExtremity, the information objects playing the role *extremityGroup* and *abstraction*SNTPPool must have all the same signalIdentification value."

8.41 tandemConnectionIsMadeOfTransportEntities

This relationship type is related to the following enterprise entity:
<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 *componentT*ransport*C* 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 *componentT*ransport*C* must be bidirectional."

inv_signalIdentification

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

8.42 topologicalLinkEndIsSupportedByNetworkTTP

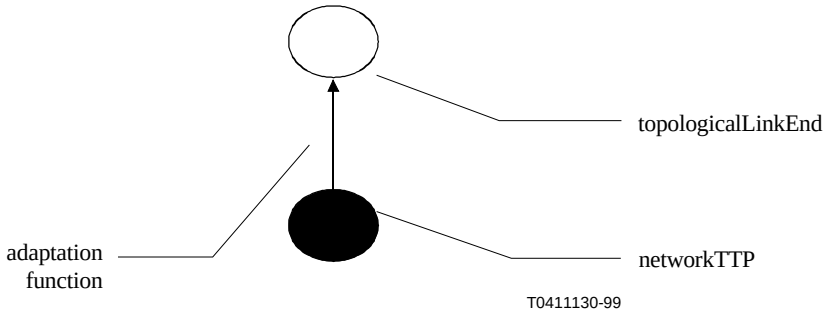
This relationship type is related to the following enterprise entities:

<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."

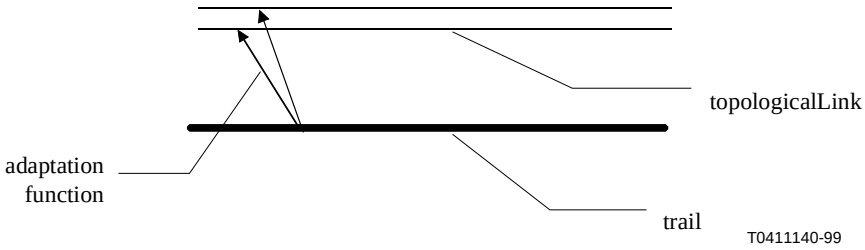
inv_signalIdentification

"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 topologicalLinkIsSupportedByTrail

This relationship type is related to the following enterprise entity:
<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."

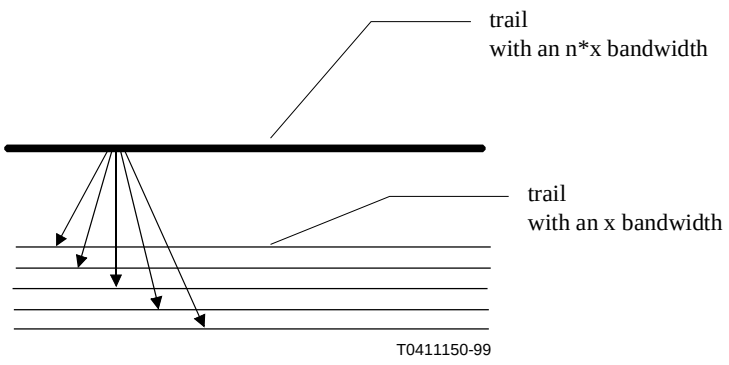
inv_signalIdentification

"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 trailIsBundleOfTrails

This relationship type is related to the following enterprise entity:
<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 *bundle*Trail container must participate in the relationship."

inv_bundledRoleCardinality

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

inv_signalIdentification

"In a given relationship instance of trailIsBundleOfTrails, the information objects playing the role *bundle*Trail and *bundled*Trail 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: *bundle*Trail and *bundled*Trail."

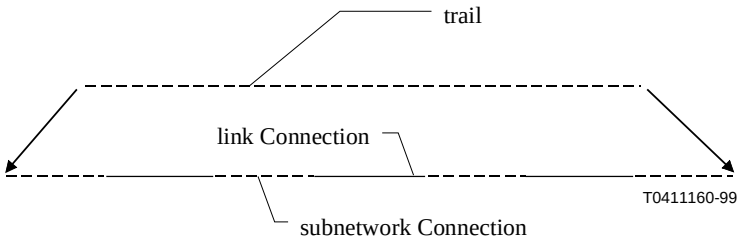
8.45 trailIsMadeOfTransportEntities

This relationship type is related to the following enterprise entity:

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

DEFINITION

"The trailIsMadeOfTransportEntities 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 *componentT*ransportC 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 *componentT*ransportC must be bidirectional."

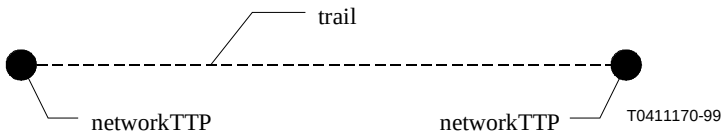
inv_signalIdentification

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

8.46 trailIsTerminatedByPointToPoint

This relationship type is related to the following enterprise entity:
<COMMUNITY:tem, ROLE:trail, PROPERTY:extremities>
DEFINITION

"The trailIsTerminatedByPointToPoint 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."

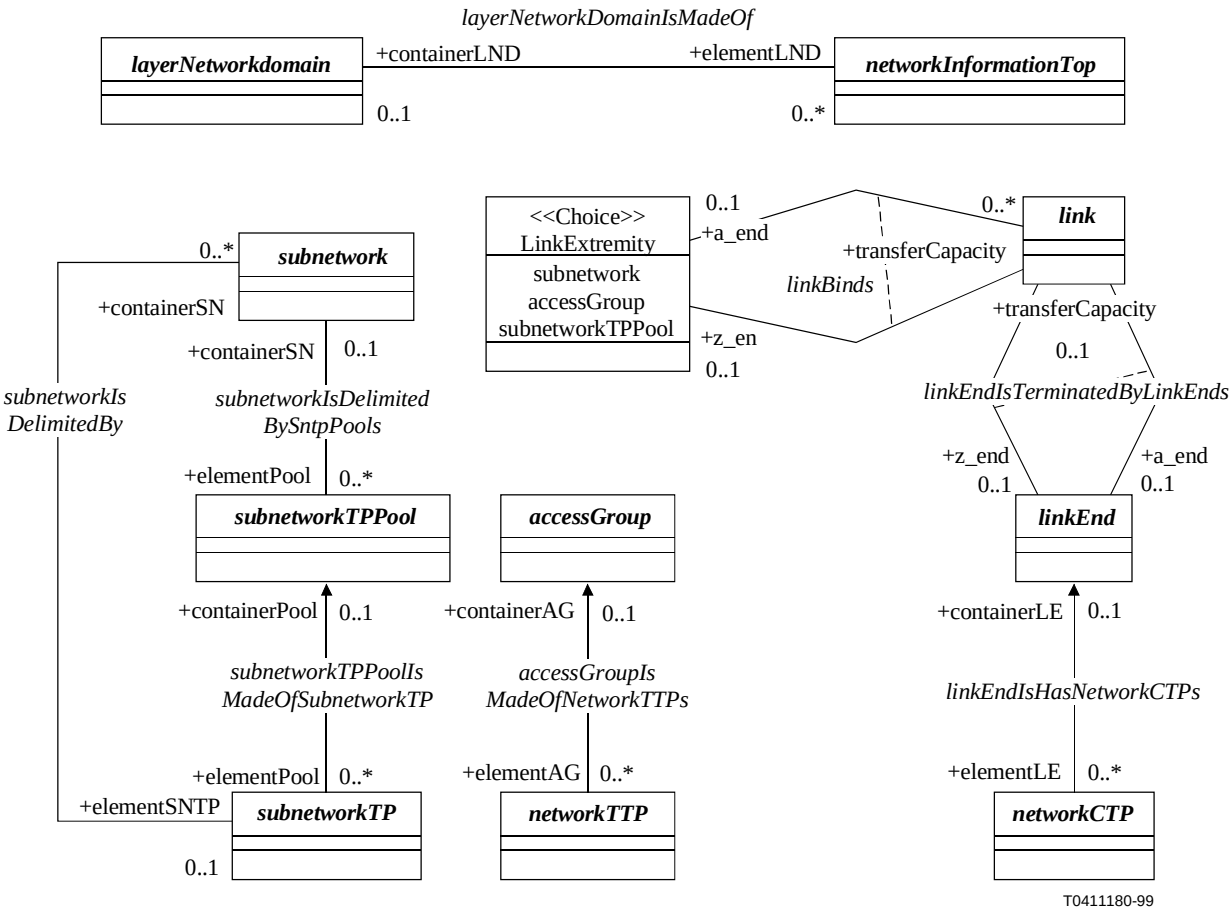
inv_signalIdentification

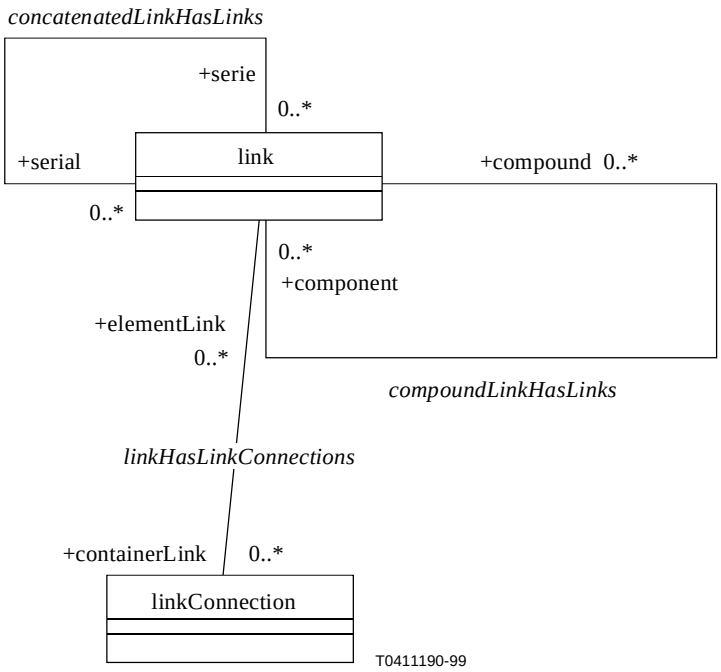
"In a given relationship instance of trailIsTerminatedByPointToPoint, the information objects playing the role *transportEntityTrail*, *a_endNTTP* and *z_endNTTP* must have all the same signalIdentification value."

ANNEX A

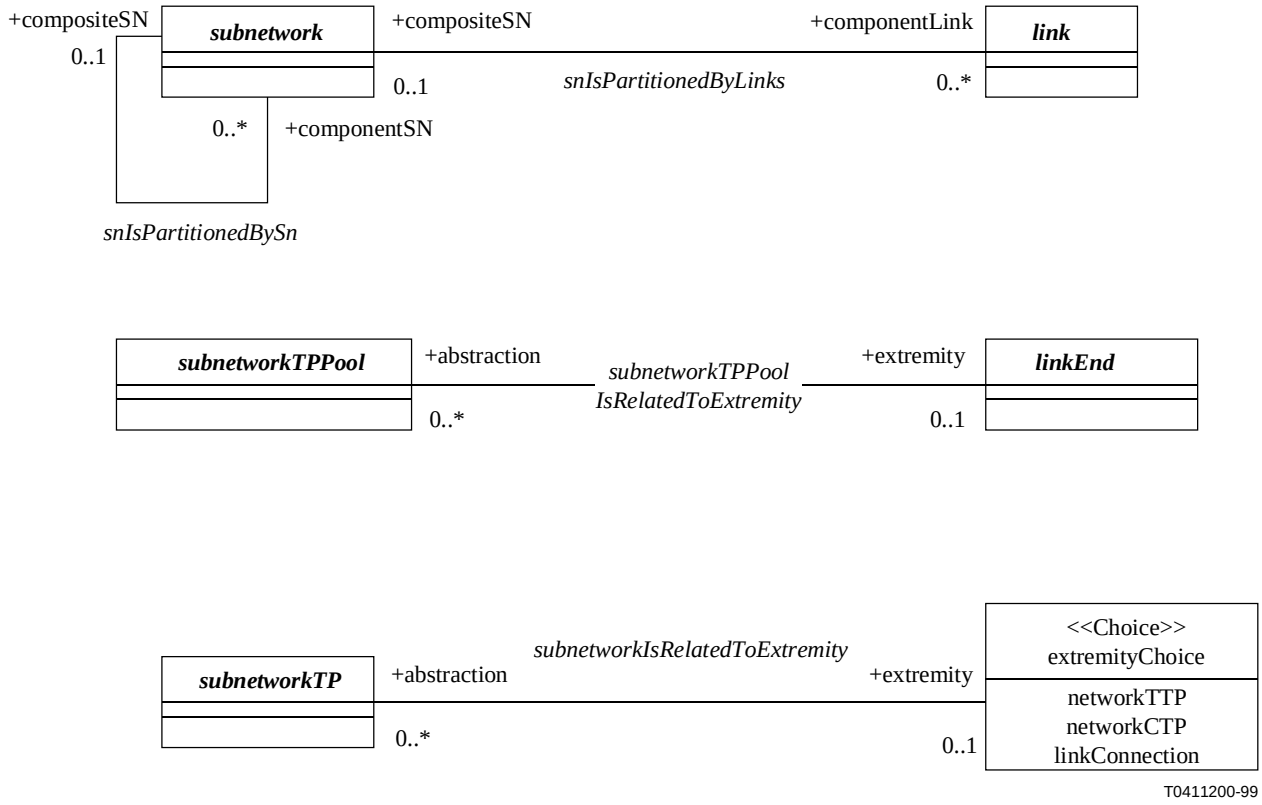
UML relationships diagrams

A.1 Topology

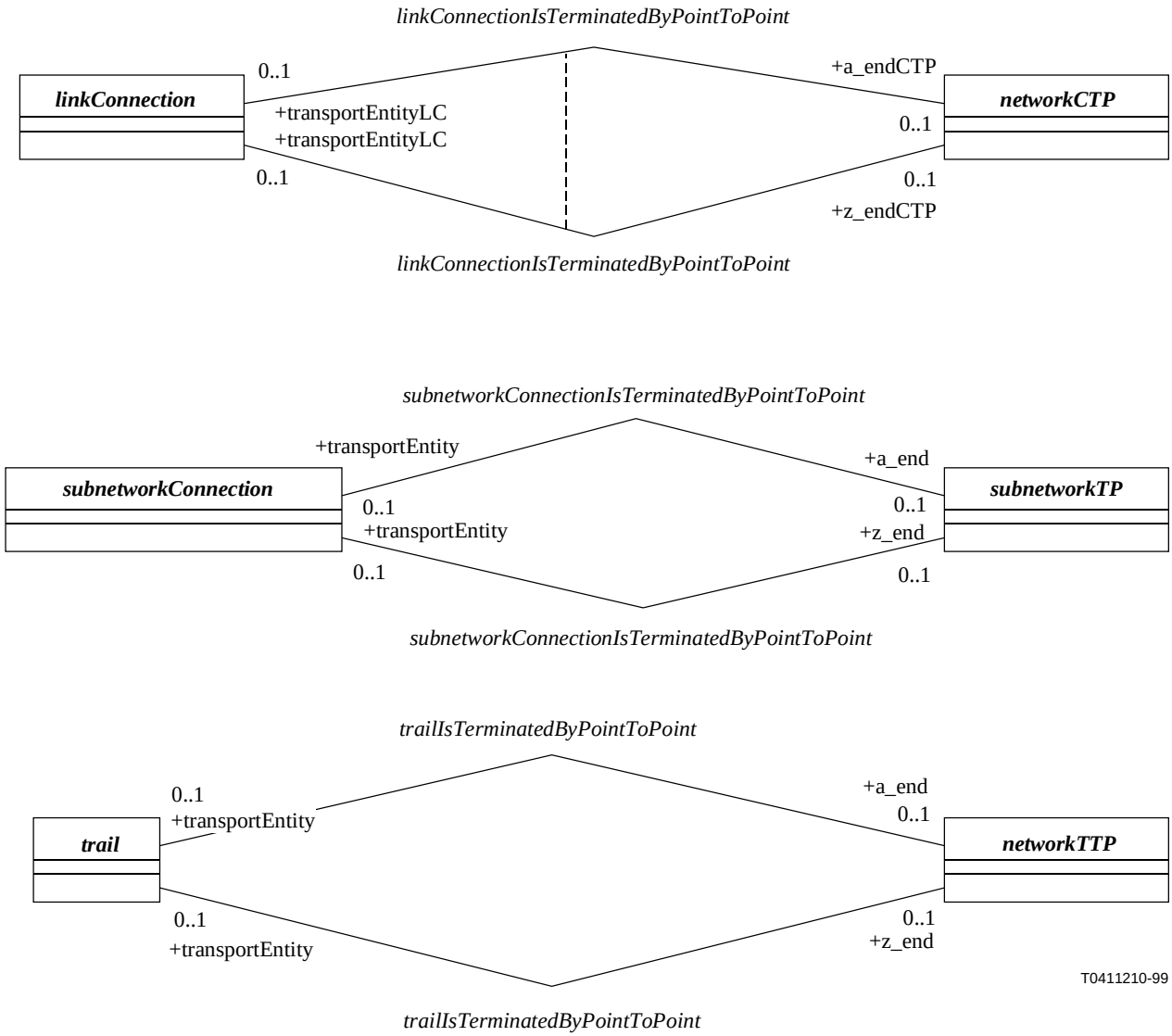




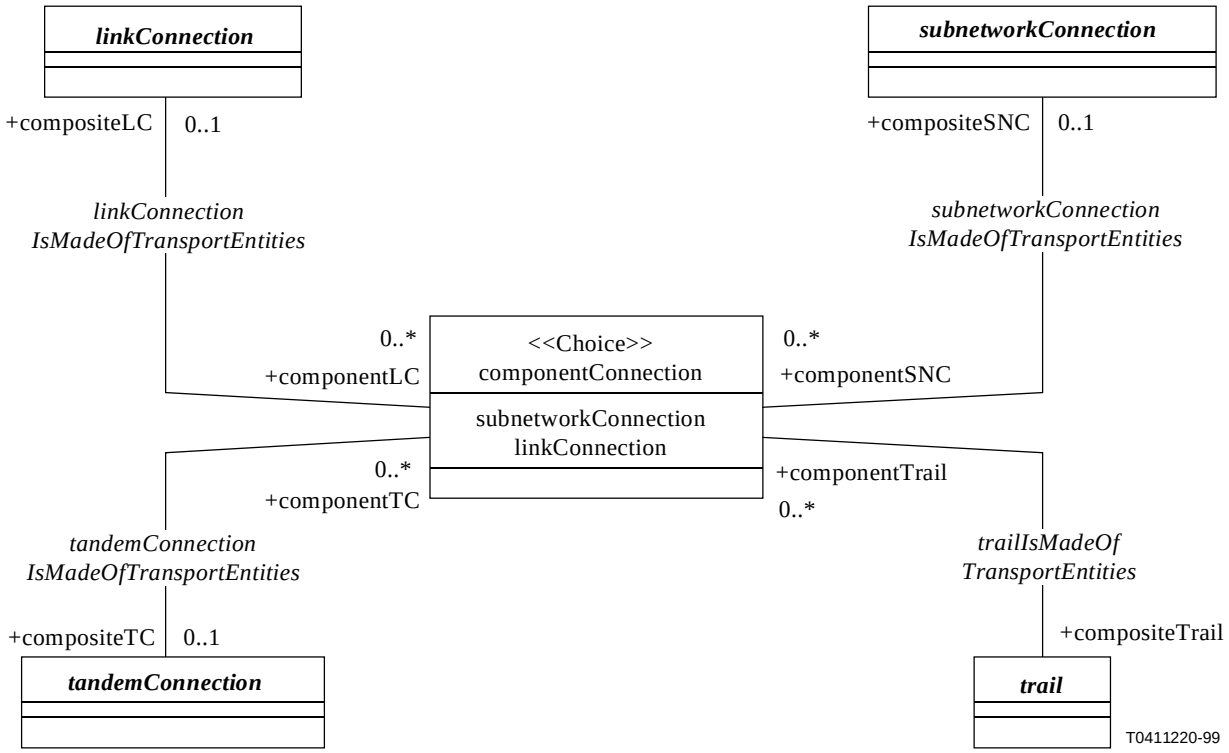
A.2 Partitioning relationships



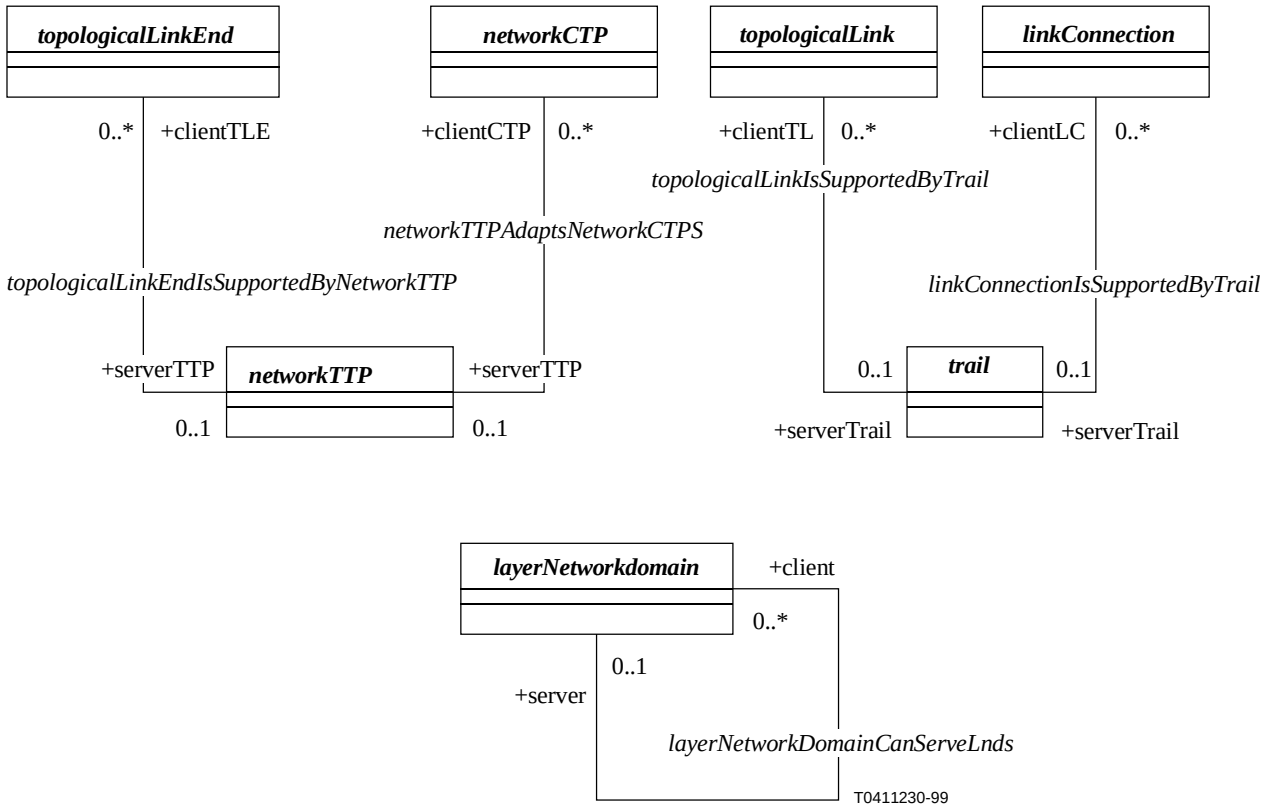
A.3 Connection extremities



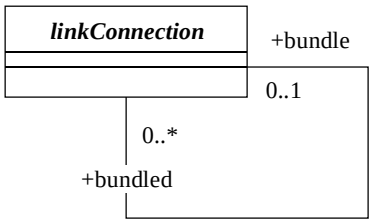
A.4 Connection composition



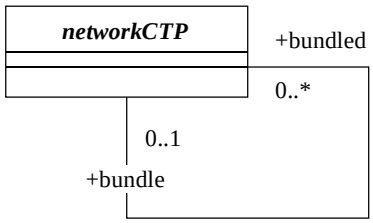
A.5 Inter-layering relationships



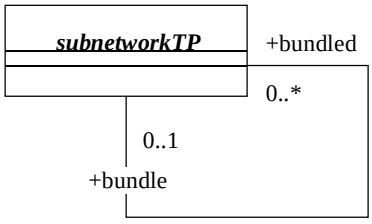
A.6 Bundle relationships



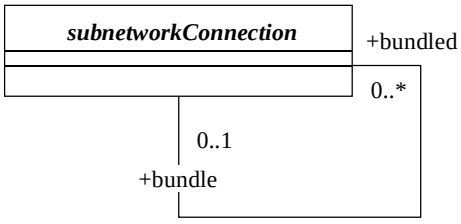
linkConnectionIsBundleOfLinkConnections



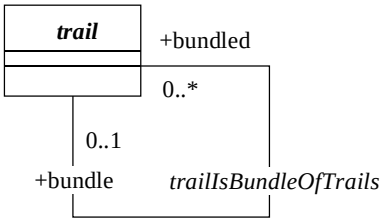
networkCTPIsBundledOfNetworkCTPs



subnetworkTPIsBundleOfSubnetworkTPs



subnetworkConnectionIsBundleOfSubnetworkConnections



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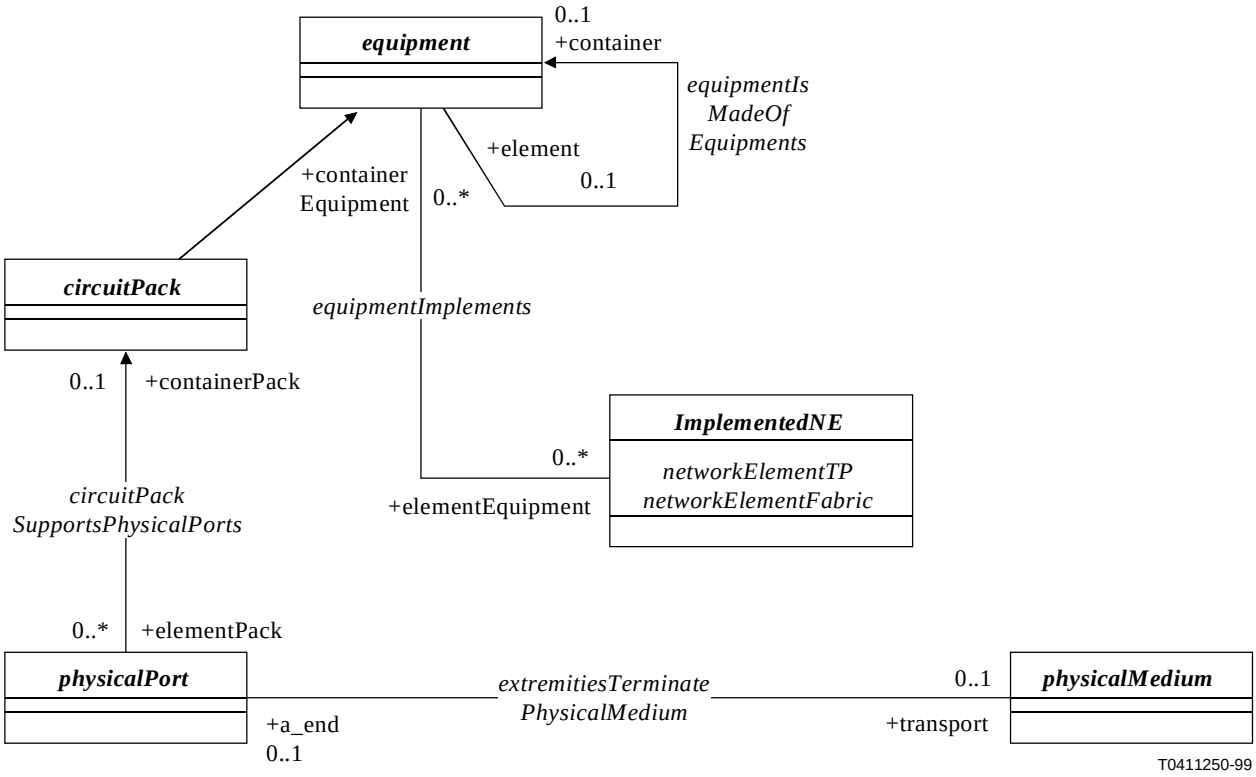
A.7 Physical entities relationships



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