



UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

UIT-T

SECTOR DE NORMALIZACIÓN
DE LAS TELECOMUNICACIONES
DE LA UIT

G.854.6

(03/99)

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

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

**Punto de vista computacional para la gestión de
caminos**

Recomendación UIT-T G.854.6

(Anteriormente Recomendación del CCITT)

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RECOMENDACIÓN UIT-T G.854.6

PUNTO DE VISTA COMPUTACIONAL PARA LA GESTIÓN DE CAMINOS

Resumen

Esta especificación trata las siguientes acciones de la comunidad de empresa:

- establecer camino punto a punto;
- modificar camino;
- suprimir camino;
- crear punto de terminación de camino;
- suprimir punto de terminación de camino;
- asociar punto de terminación de camino con grupo de acceso;
- disociar punto de terminación de camino de grupo de acceso;
- asociar punto de terminación de camino con subred;
- disociar punto de terminación de camino de subred;
- informar establecimiento de camino;
- informar liberación de camino;
- informar modificación de camino;
- informar creación de punto de terminación de camino;
- informar supresión de punto de terminación de camino;
- informar asociación de punto de terminación de camino con grupo de acceso;
- informar disociación de punto de terminación de camino de grupo de acceso;
- informar asociación de punto de terminación de camino con subred;
- informar disociación de punto de terminación de camino de subred;

Orígenes

La Recomendación UIT-T G.854.6 ha sido preparada por la Comisión de Estudio 4 (1997-2000) del UIT-T y fue aprobada por el procedimiento de la Resolución N.º 1 de la CMNT el 26 de marzo de 1999.

PREFACIO

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

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

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

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

NOTA

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

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Recomendación G.854.6

PUNTO DE VISTA COMPUTACIONAL PARA LA GESTIÓN DE CAMINOS

(Ginebra, 1999)

1 Alcance

Esta especificación del punto de vista computacional está relacionada con la especificación de empresa de gestión de camino definida en la Recomendación G.852.6 y con la especificación de información de gestión de camino definida en la Recomendación G.853.6.

2 Referencias

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

- [1] Recomendación UIT-T G.851.1 (1996), *Gestión de la red de transporte – Aplicación del marco del modelo de referencia de procesamiento distribuido abierto*.
- [2] Recomendación UIT-T G.853.1 (1999), *Elementos comunes del punto de vista de la información para la gestión de una red de transporte*.
- [3] Recomendación UIT-T G.852.6 (1999), *Punto de vista de la empresa para la gestión de camino*.
- [4] Recomendación UIT-T G.853.6 (1999), *Punto de vista de la información para la gestión de camino*.

3 Definiciones

Ninguna.

4 Abreviaturas

En esta Recomendación se utilizan las siguientes siglas.

ASN.1	Notación de sintaxis abstracta uno (<i>abstract syntax notation No. 1</i>)
Id	Identificador
Ifce	Interfaz (<i>interface</i>)
inv	invariante
layerND	Dominio capa de red (<i>layernetwork domain</i>)
LC	Conexión de enlace (<i>linkconnection</i>)
ND	Dominio de red (<i>network domain</i>)

RM-ODP	Modelo de referencia de procesamiento distribuido abierto (<i>reference model for open distributed processing</i>)
tm	Gestión de camino (<i>trail management</i>)
TTP	Punto de terminación de camino (<i>trail termination point</i>)
UIT	Unión Internacional de Telecomunicaciones

5 Convenios

Para facilitar la comprensión del comportamiento de las operaciones:

- los parámetros se escriben en **negrita**;
- los elementos definidos en la especificación del punto de vista de la información se escriben en *cursiva*.

6 Referencias de etiquetas

Referencia de etiqueta completa	Referencia de etiqueta local
<"Rec. G.853.6", INFORMATION_OBJECT: tmAccessGroup>	tmAccessGroup
<"Rec. G.853.6", INFORMATION_OBJECT: tmLayerNetworkDomain>	tmLayerNetworkDomain
<"Rec. G.853.6", INFORMATION_OBJECT: tmNetworkTTP>	tmNetworkTTP
<"Rec. G.853.6", INFORMATION_OBJECT: tmSubnetwork>	tmSubnetwork
<"Rec. G.853.6", INFORMATION_OBJECT: tmSubnetworkConnection>	tmSubnetworkConnection
<"Rec. G.853.6", INFORMATION_OBJECT: tmSubnetworkTP>	tmSubnetworkTP
<"Rec. G.853.6", INFORMATION_OBJECT: tmTrafficDescriptor>	tmTrafficDescriptor
<"Rec. G.853.6", INFORMATION_OBJECT: tmTrail>	tmTrail
<"Rec. G.853.6", INFORMATION_OBJECT: tmTrailServiceCharacteristics>	tmTrailServiceCharacteristics
<"Rec.G.853.1", INFORMATION_RELATIONSHIP: accessGroupIsMadeOfNetworkTTPs>	accessGroupIsMadeOfNetworkTTPs
<"Rec. G.853.1", INFORMATION_RELATIONSHIP: layerNetworkDomainIsMadeOf>	layerNetworkDomainIs MadeOf
<"Rec.G.853.1", INFORMATION_RELATIONSHIP: subnetworkConnectionIsTerminatedByPointToPoint>	subnetworkConnectionIsTerminatedByPointToPoint
<"Rec.G.853.1", INFORMATION_RELATIONSHIP: subnetworkIsDelimitedBy>	subnetworkIsDelimitedBy
<"Rec.G.853.1", INFORMATION_RELATIONSHIP: subnetworkTPIsRelatedToExtremity>	subnetworkTPIsRelatedToExtremity
<"Rec. G.853.6", INFORMATION_RELATIONSHIP: tmTrailHasImmediateTrafficDescriptor>	tmTrailHasImmediateTrafficDescriptor
<"Rec.G.853.6", INFORMATION_RELATIONSHIP: tmTrailHasTSC>	tmTrailHasTSC
<"Rec.G.853.1", INFORMATION_RELATIONSHIP: trailIsTerminatedByPointToPoint>	trailIsTerminatedByPointToPoint
<"Rec. G.853.1", INFORMATION_ATTRIBUTE: directionality>	directionality
<"Rec. G.853.1", INFORMATION_ATTRIBUTE: resourceId>	resourceId
<"Rec.G.853.1", INFORMATION_ATTRIBUTE: signalIdentification>	signalIdentification
<"Rec.G.853.1", INFORMATION_ATTRIBUTE: userLabel>	userLabel
<"Rec. G.854.3", INTERFACE: commonReportResourceIdChangeIfce>	commonReportResourceIdChangeIfce
<"Rec. G.854.3", INTERFACE: commonResourceIfce>	commonResourceIfce

Referencia de producción ASN.1 completa	Referencia de etiqueta local
<"Rec. X.721: 1992: Attribute-ASN.1 Module": SimpleNameType>	SimpleNameType
<"Rec. X.680: 1997: GraphicString">	GraphicString

7 Interfaces

Esta especificación no define operaciones que cambian la userLabel de los recursos ni informan de este cambio al receptor de la notificación, porque tales operaciones no cambian el estado del sistema. Su firma exacta será desarrollada como parte de la especificación del punto de vista de la ingeniería, con la tecnología pertinente.

7.1 Interfaces de indagación

Esta especificación hace referencia a interfaces que permiten ganar acceso a la identificación y propiedades de recursos que entran en juego en la comunidad de "gestión de camino". Puesto que la invocación de operaciones contenidas no modifica ningún estado, no hay interés en desarrollarlas explícitamente. Su firma exacta será desarrollada como parte del punto de vista de la ingeniería, con la tecnología en cuestión. Estas interfaces se indican en el cuadro 1 con la información a que dan acceso.

Cuadro 1/G.854.6 – Interfaces de indagación

Nombre de interfaz	Objeto de información	Atributos y relaciones
tmAccessGroupQueryIfce	<tmAccessGroup>	<resourceId> <signalIdentification> <topologicalEndDirection> <layerNetworkDomainIsMadeOf, ROLE: containerLND> <accessGroupIsMadeOfNetworkTTPs, ROLE: elementTTP>
tmLayerNetworkDomainQueryIfce	<tmLayerNetworkDomain>	<resourceId> <signalIdentification> <layerNetworkDomainIsMadeOf, ROLE: element>
tmNetworkTTPQueryIfce	<tmNetworkTTP>	<resourceId> <signalIdentification> <userLabel> <pointDirectionality> <accessGroupIsMadeOfNetworkTTPs, ROLE: containerAG> <trailIsTerminatedByPointToPoint, ROLE: transportEntityTrail> <subnetworkTTPsRelatedToExtremity, ROLE: abstractionSNTP> <layerNetworkDomainIsMadeOf, ROLE: containerLND>
tmSubnetworkConnectionQueryIfce	<tmSubnetworkConnection>	<resourceId> <signalIdentification> <directionality> <subnetworkConnectionIsTerminatedBy PointToPoint, ROLE: a_endSNTP, ROLE: z_endSNTP> <layerNetworkDomainIsMadeOf, ROLE: containerLND>

Cuadro 1/G.854.6 – Interfaces de indagación (fin)

Nombre de interfaz	Objeto de información	Atributos y relaciones
tmSubnetworkQueryIfce	<tmSubnetwork>	<resourceId> <signalIdentification> <layerNetworkDomainIsMadeOf, ROLE: containerLND> <subnetworkIsDelimitedBy, ROLE: elementSNTP>
tmSubnetworkTPQueryIfce	<tmSubnetworkTP>	<resourceId> <signalIdentification> <pointDirectionality> <subnetworkTPIsRelatedToExtremity, ROLE: extremity> <layerNetworkDomainIsMadeOf, ROLE: ContainerLND> <subnetworkIsDelimitedBy, ROLE: containerSN> <subnetworkConnectionIsTerminatedBy PointToPoint, ROLE: transportEntitySNC>
tmTrafficDescriptorQueryIfce	<tmTrafficDescriptor>	<signalIdentification> <tmTrailHasImmediateTrafficDescriptor, ROLE: trailTD>
tmTrailQueryIfce	<tmTrail>	<resourceId> <signalIdentification> <userLabel> <directionality> <trailIsTerminatedByPointToPoint, ROLE: a_endNTP, ROLE: z_endNTP> <tmTrailHasTSC, ROLE: transportQualifierTSC> <tmTrailHasImmediateTrafficDescriptor, ROLE: immediateTrafficDescriptorTrail> <layerNetworkDomainIsMadeOf, ROLE: containerLND>
tmTrailServiceCharacteristicsQueryIfce	<tmTrailServiceCharacteristics>	<resourceId> <signalIdentification> <tmTrailHasTSC, ROLE: transportQualifiedTrail>

7.2 Interfaces operacionales

7.2.1 Interfaz de provisión de camino

La interfaz de provisión de camino gestiona el establecimiento, liberación y modificación inmediatos de caminos punto a punto, así como la creación y la supresión de TTP de red, y la asociación y disociación de TTP con, respectivamente de, grupos de acceso y subredes. La interfaz deberá satisfacer los requisitos de empresa indicados en:

<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: setup point-to-point trail>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: release trail>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: modify trail>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: create trail termination point>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: delete trail termination point>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: associate trail termination point with access group>,

```

<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: disassociate trail termination point
from access group>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: associate trail termination point with
subnetwork>,
<"Recommendation G.852.6, "COMMUNITY trail management, ACTION: disassociate trail termination point
from subnetwork>

```

Al heredar las propiedades de la interfaz `commonResourceIfce`, la interfaz `trailProvisioningIfce` proporciona la capacidad para cambiar el identificador (de recurso) de los recursos que intervienen.

```

COMPUTATIONAL INTERFACE trailProvisioning Ifce{
  DERIVED FROM <commonResourceIfce>
  OPERATION {
    <setupPointToPointTrail >;
    <releaseTrail>;
    <modifyTrail>;
    <createNetworkTTP>;
    <deleteNetworkTTP>
    <associateNetworkTTPWithAccessGroup>;
    <disassociateNetworkTTPFromAccessGroup>;
    <associateNetworkTTPWithSubnetwork>;
    <disassociateNetworkTTPFromSubnetwork>;
  }
}

```

7.2.1.1 Establecer camino punto a punto (set-up point-to-point trail)

```

<COMMUNITY: trail management, ACTION: setup point-to-point trail>
OPERATION setupPointToPointTrail {
  INPUT_PARAMETERS
    aEnd: AEndChoice ::= CHOICE {
      networkTTP NetworkTTPChoice,
      accessGroup AccessGroupChoice};
    zEnd: ZEndChoice ::= CHOICE {
      networkTTP NetworkTTPChoice,
      accessGroup AccessGroupChoice};
    layerND: LayerNetworkDomainChoice;
    dir: Directionality;
    suppliedUserIdentifier: UserIdentifier;
      -- zero length string or 0 implies none supplied.
    serviceCharacteristics: TrailServiceCharacteristicsId;
      -- reference can be used to determine any QOS or routing characteristics;
    trafficDescriptor: ImmediateTrafficDescriptorId;
    suppliedUserLabel : GraphicString;
      --zero length string implies none supplied

  OUTPUT_PARAMETERS
    newTrail: TrailChoice;
    connectedAEndNetworkTTP: NetworkTTPChoice;
    connectedZEndNetwrkTTP: NetworkTTPChoice;

  RAISED_EXCEPTIONS
    networkTTPsNotPartOfLayerND: SequenceOf NetworkTTPChoice;
      --the list contains one element when only one point is incorrect, i.e., is not part of the
      --layerNetworkDomain.
    aEndNetworkTTPConnected :NetworkTTPChoice;
    networkTTPsInAEndAccessGroupConnected: AccessGroupChoice;
    zEndNetworkTTPConnected : NetworkTTPChoice;
    networkTTPsInZEndAccessGroupConnected: AccessGroupChoice;

```

userIdentifierNotUnique: UserIdentifier;
 failureToSetUserIdentifier: NULL;
 failureToCreateTrail: NULL;
 invalidTransportServiceCharacteristics: NULL;
 invalidTrafficDescriptor: NULL;

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;
 accessGroup: <INFORMATION OBJECT: tmAccessGroup>;
 layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
 dir: <INFORMATION ATTRIBUTE: Directionality>;
 suppliedUserIdentifier: <INFORMATION ATTRIBUTE: resourceId>;
 serviceCharacteristics: <INFORMATION OBJECT: tmTrailServiceCharacteristics>;
 trafficDescriptor: <INFORMATION OBJECT: tmTrafficDescriptor>;
 suppliedUserLabel: <INFORMATION ATTRIBUTE: userLabel>;
 newTrail: <INFORMATION OBJECT: tmTrail>;
 connectedAEndNetworkTTP: <INFORMATION OBJECT: tmNetworkTTP>;
 connectedZEndNetworkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

PRE_CONDITIONS

inv_layerNDContainment

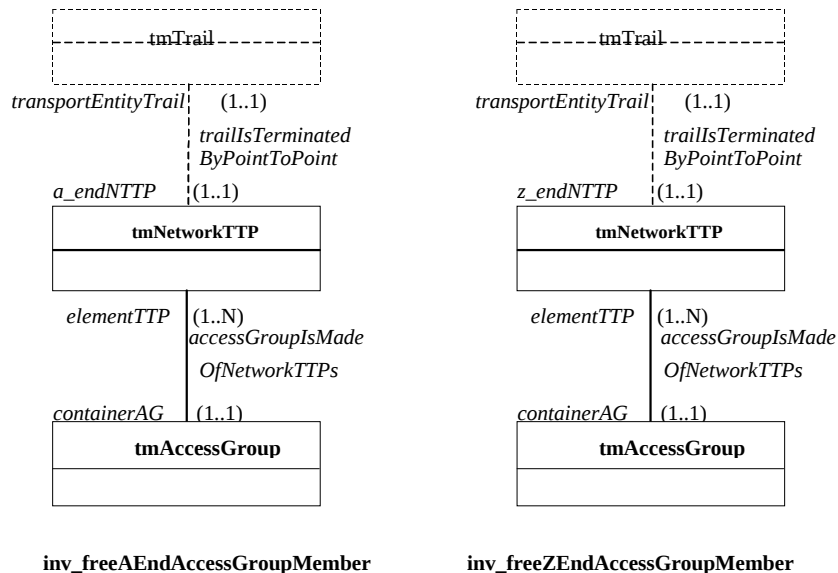
"**aEnd** and **zEnd** are referring to element in a <layerNetworkDomainIsMadeOf> relationship where **layerND** refers to *containerLND*."

inv_freeAEndNetworkTTP

"If **aEnd** is a networkTTP, this networkTTP must not refer to *a_endNTTP* or *z_endNTTP* in any <trailsTerminatedByPointToPoint> relationship."

inv_freeAEndAccessGroupMember

"If **aEnd** is an accessGroup, at least one networkTTP referring to *elementTTP* in an <accessGroupIsMadeOfNetworkTTPs> relationship where this accessGroup refers to *containerAG*, must not refer to *a_endNTTP* or *z_endNTTP* in any <trailsTerminatedByPointToPoint> relationship."



inv_freeZEndNetworkTTP

"If **zEnd** is a networkTTP, this networkTTP must not refer to *a_endNTTP* or *z_endNTTP* in any <trailsTerminatedByPointToPoint> relationship."

inv_freeZEndAccessGroupMember

"If **zEnd** is an accessGroup, at least one networkTTP referring to *elementTTP* in an *<accessGroupIsMadeOfNetworkTTPs>* relationship where this accessGroup refers to *containerAG*, must not refer to *a_endNTTP* or *z_endNTTP* in any *<trailIsTerminatedByPointToPoint>* relationship."

inv_uniqueUserIdentifier

"**suppliedUserIdentifier** shall not be equal to *<resourceId>* of any element in the *<layerNetworkDomainIsMadeOf>* relationship where **layerND** refers to *containerLND*."

POST_CONDITIONS

inv_agreedUserIdentifier

"*<resourceId>* of *<tmTrail>* referred to by **newTrail** is equal to **suppliedUserIdentifier**, if it is supplied."

inv_connectedTrail

"**connectedAEndNetworkTTP**, **connectedZEndNetworkTTP** and **newTrail** must respectively refer to *a_endNTTP*, *z_endNTTP* and *transportEntityTrail* in a *<trailIsTerminatedByPointToPoint>* relationship."

inv_transportServiceCharacteristics

"**newTrail** and **serviceCharacteristics** must refer to *transportQualifiedTrail* and *transportQualifierTSC* in a *<tmTrailHasTSC>* relationship."

inv_trafficDescriptor

"**newTrail** and **trafficDescriptor** must refer to *trailTD* and *immediateTrafficDescriptorTrail* in a *<tmTrailHasImmediateTrafficDescriptor>* relationship."

EXCEPTIONS

```
IF PRE_CONDITION inv_layerNDContainment NOT_VERIFIED RAISE_EXCEPTION
    networkTTPsNotPartOfLayerND;
IF PRE_CONDITION inv_freeAEndNetworkTTP NOT_VERIFIED RAISE_EXCEPTION
    aEndNetworkTTPConnected ;
IF PRE_CONDITION inv_freeAEndAccessGroupMember NOT_VERIFIED
    RAISE_EXCEPTION networkTTPsInAEndAccessGroupConnected ;
IF PRE_CONDITION inv_freeZEndNetworkTTP NOT_VERIFIED RAISE_EXCEPTION
    zEndNetworkTTPConnected ;
IF PRE_CONDITION inv_freeZEndAccessGroupMember NOT_VERIFIED
    RAISE_EXCEPTION networkTTPsInZEndAccessGroupConnected ;
IF PRE_CONDITION inv_uniqueUserIdentifier NOT_VERIFIED RAISE_EXCEPTION
    userIdentifierNotUnique;
IF POST_CONDITION inv_agreedUserIdentifier NOT VERIFIED RAISE_EXCEPTION
    failureToSetUserIdentifier;
IF POST_CONDITION inv_connectedTrail NOT_VERIFIED RAISE_EXCEPTION
    failureToCreateTrail;
IF POST_CONDITION inv_transportServiceCharacteristics NOT_VERIFIED
    RAISE_EXCEPTION invalidTransportServiceCharacteristics;
IF POST_CONDITION inv_trafficDescriptor NOT_VERIFIED RAISE_EXCEPTION
    invalidTrafficDescriptor;
```

}

7.2.1.2 Liberar camino (release trail)

<COMMUNITY: trail management, ACTION: release trail>

OPERATION releaseTrail {

INPUT_PARAMETERS

trail: TrailChoice;
layerND: LayerNetworkDomainChoice;

OUTPUT_PARAMETERS

trail: TrailChoice;

```

RAISED_EXCEPTIONS
    unknownTrail: TrailChoice;
    trailConnected: NULL;
    failureToReleaseTrail: NULL;

```

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

```

    trail: <INFORMATION OBJECT: tmTrail>;
    layerND: <INFOMATION OBJECT: tmLayerNetworkDomain>;

```

PRE_CONDITIONS

inv_existingTrail

"**trail** must refer to *element* in the <layerNetworkDomainIsMadeOf> relationship where **layerND** refers to *containerLND*."

inv_trailConnected

"**trail** must not refer to *transportEntityTrail* in a <trailIsTerminatedByPointToPoint > relationship."

POST_CONDITIONS

inv_trailReleased

"**trail** must not refer to any *element* in a <layerNetworkDomainIsMadeOf> relationship."

EXCEPTIONS

IF PRE_CONDITION inv_existingTrail NOT_VERIFIED RAISE_EXCEPTION

unknownTrail;

IF PRE_CONDITION inv_trailConnected NOT_VERIFIED RAISE_EXCEPTION

trailConnected;

IF POST_CONDITION inv_trailReleased NOT_VERIFIED RAISE_EXCEPTION failureToReleaseTrail;

}

7.2.1.3 Modificar camino (modify trail)

<COMMUNITY: trail management, ACTION: modify trail>

OPERATION modifyTrail {

INPUT_PARAMETERS

```

    trail: TrailChoice;
    layerND: LayerNetworkDomainChoice;
    newTrafficDescriptor: ImmediateTrafficDescriptorId;
    newServiceCharacteristics: TrailServiceCharacteristicsId;

```

OUTPUT_PARAMETERS

```

    agreedTrafficDescriptor: ImmediateTrafficDescriptorId;
    -- The old trafficDescriptor is maintained if the new one cannot be supported
    agreedServiceCharacteristics: TrailServiceCharacteristicsId;
    -- The old serviceCharacteristics is maintained if the new one cannot be supported

```

RAISED_EXCEPTIONS

```

    unknownTrail: TrailChoice;
    invalidServiceCharacteristicsRequested: NULL;
    invalidTrafficDescriptorRequested: NULL;

```

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

```

    trail: <INFORMATION OBJECT: tmTrail>;
    layerND: <INFOMATION OBJECT: tmLayerNetworkDomain>;
    newTrafficDescriptor: <INFORMATION OBJECT: tmTrafficDescriptor>;
    newServiceCharacteristics: <INFORMATION OBJECT: tmTrailServiceCharacteristics>;
    agreedTrafficDescriptor: <INFORMATION OBJECT: tmTrafficDescriptor>;
    agreedServiceCharacteristics: <INFORMATION OBJECT: tmTrailServiceCharacteristics>;

```

PRE_CONDITIONS

inv_existingTrail

"**trail** must refer to element in a <layerNetworkDomainIsMadeOf > relationship where **layerND** being the containerLND."

POST_CONDITIONS

inv_agreedServiceCharacteristics

"**trail** and **agreedServiceCharacteristics** must be involved as *transportQualifiedTrail* and *transportQualifierTSC* in a <tmTrailHasTSC> relationship."

inv_agreedTrafficDescriptor

"**trail** and **agreedTrafficDescriptor** must be involved as *trailTD* and *immediateTrafficDescriptorTrail* in a <tmTrailHasImmediateTrafficDescriptor> relationship."

EXCEPTIONS

IF PRE_CONDITION inv_existingTrail NOT_VERIFIED RAISE_EXCEPTION
unknownTrail;

IF POST_CONDITION inv_agreedServiceCharacteristics NOT_VERIFIED RAISE_EXCEPTION
invalidServiceCharacteristicsRequested;

IF POST_CONDITION inv_agreedTrafficDescriptor NOT_VERIFIED RAISE_EXCEPTION
invalidTrafficDescriptorRequested;

}

7.2.1.4 Crear TTP de red (create networkTTP)

<COMMUNITY: trail management, ACTION: create trail termination point>

OPERATION createNetworkTTP {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;

pointDir: PointDirectionality;

suppliedUserIdentifier: UserIdentifier;

-- zero length string or 0 implies none supplied.

suppliedUserLabel: GraphicString;

--zero length implies none supplied.

OUTPUT_PARAMETERS

networkTTP: NetworkTTPChoice;

RAISED_EXCEPTIONS

userIdentifierNotUnique: UserIdentifier;

failureToCreateNetworkTTP: NULL;

failureToSetUserIdentifier:NULL;

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

layerND: INFORMATION OBJECT: tmLayerNetworkDomain>;

suppliedUserIdentifier: <INFORMATION ATTRIBUTE: resourceId>;

pointDir: <INFORMATION ATTRIBUTE: pointDirectionality>;

networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

suppliedUserLabel : <INFORMATION ATTRIBUTE: userLabel>;

PRE_CONDITIONS

inv_uniqueUserIdentifier

"**suppliedUserIdentifier** shall not be equal to *resourceId* of any *element* in a <layerNetworkDomainIsMadeOf > relationship where **layerND** refers to *containerLND*."

POST_CONDITIONS

inv_existingNetworkTTP

"**networkTTP** and **layerND** must respectively refer to *element* and *containerLND* in a *<layerNetworkDomainIsMadeOf>* relationship."

inv_agreedUserIdentifier

"*resourceId* of *tmNetworkTTP* referenced by **networkTTP** is equal to **suppliedUserIdentifier**, if it is supplied."

EXCEPTIONS

IF PRE_CONDITION inv_uniqueUserIdentifier NOT_VERIFIED RAISE_EXCEPTION
userIdentifierNotUnique;

IF POST_CONDITION inv_existingNetworkTTP NOT_VERIFIED RAISE_EXCEPTION
failureToCreateNetworkTTP;

IF POST_CONDITION inv_agreedUserIdentifier NOT_VERIFIED RAISE_EXCEPTION
failureToSetUserIdentifier;

}

7.2.1.5 Suprimir TTP de red (delete networkTTP)

<COMMUNITY: trail management, ACTION: delete trail termination point>

OPERATION deleteNetworkTTP {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;
networkTTP: NetworkTTPChoice;

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

invalidNetworkTTP: NetworkTTPChoice;
networkTTPTerminatesTrail: NetworkTTPChoice;
networkTTPAssociatedWithSubnetwork: NetworkTTPChoice;
networkTTPAssociatedWithAccessGroup: NetworkTTPChoice;
failureToDeleteNetworkTTP: NULL;

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

PRE_CONDITIONS

inv_existingNetworkTTP

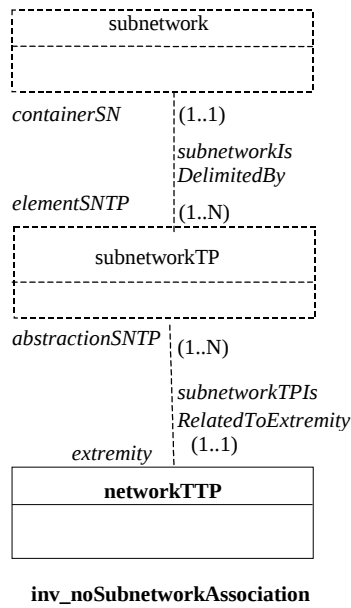
"**networkTTP** must refer to *element* in a *<layerNetworkDomainIsMadeOf>* relationship where **layerND** refers to *containerLND*."

inv_noTrailTermination

"**networkTTP** may not refer to *a_endNTTP* or *z_endNTTP* in any *<trailIsTerminatedByPointToPoint>* relationship."

inv_noSubnetworkAssociation

"The **networkTTP** shall not refer to *extremity* of a *<subnetworkTPIsRelatedToExtremity>* relationship where *abstractionSNTP* references *elementSNTP* of a *<subnetworkIsDelimitedBy>* relationship."



inv_noAccessGroupAssociation
 "networkTTP may not refer to elementTTP in an <accessGroupIsMadeOfNetworkTTPs> relationship."

POST_CONDITIONS

inv_noNetworkTTP
 "networkTTP does not refer to element in any <layerNetworkDomainIsMadeOf> relationship."

EXCEPTIONS

```

IF PRE_CONDITION inv_existingNetworkTTP NOT_VERIFIED RAISE_EXCEPTION
    invalidNetworkTTP;
IF PRE_CONDITION inv_noTrailTermination NOT_VERIFIED RAISE_EXCEPTION
    networkTTPTerminatesTrail;
IF PRE_CONDITION inv_noSubnetworkAssociation NOT_VERIFIED RAISE_EXCEPTION
    networkTTPAssociatedWithSubnetwork;
IF PRE_CONDITION inv_noAccessGroupAssociation NOT_VERIFIED RAISE_EXCEPTION
    networkTTPAssociatedWithAccessGroup;
IF POST_CONDITION inv_noNetworkTTP NOT_VERIFIED RAISE_EXCEPTION
    failureToDeleteNetworkTTP;

```

}

7.2.1.6 Asociar TTP de red con grupo de acceso (associate networkTTP with access group)

<COMMUNITY: trail management, ACTION: associate trail termination point with access group>

OPERATION associateNetworkTTPWithAccessGroup{

INPUT_PARAMETERS

```

    layerND: LayerNetworkDomainChoice;
    accessGroup: AccessGroupChoice;
    networkTTP: NetworkTTPChoice;

```

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

```

    networkTTPAndAccessGroupNotCompatible : NULL;
    networkTTPAlreadyAssociated: NULL;
    failureToAssociateNetworkTTP: NULL;

```

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

layerND : <INFORMATION OBJECT: tmLayerNetworkDomain>;
accessGroup : <INFORMATION OBJECT: tmAccessGroup>;
networkTTP : <INFORMATION OBJECT: tmNetworkTTP>;

PRE_CONDITIONS

inv_networkTTPAndAccessGroupExistingAndCompatible

"**networkTTP** and **accessGroup** shall refer to *element* of the same <layerNetworkDomainIsMadeOf> relationship where **layerND** refers to *containerLND*."

inv_networkTTPNotAlreadyAssociated

"**networkTTP** shall not refer to *elementTTP* in any <accessGroupIsMadeOfNetworkTTPs> relationship."

POST_CONDITIONS

inv_networkTTPAssociated

"**networkTTP** refers to *elementTTP* in an <accessGroupIsMadeOfNetworkTTPs> relationship where **accessGroup** refers to *containerAG*."

EXCEPTIONS

IF PRE_CONDITION inv_networkTTPAndAccessGroupExistingAndCompatible NOT_VERIFIED
RAISE EXCEPTION

networkTTPAndAccessGroupNotCompatible;

IF PRE_CONDITION inv_networkTTPNotAlreadyAssociated NOT_VERIFIED_RAISE_EXCEPTION
networkTTPAlreadyAssociated;

IF POST_CONDITION inv_networkTTPAssociated NOT_VERIFIED RAISE_EXCEPTION
failureToAssociateNetworkTTP;

}

7.2.1.7 Disociar TTP de red de grupo de acceso (disassociate networkTTP from access group)

<COMMUNITY: trail management, ACTION: disassociate trail termination point from access group>

OPERATION disassociateNetworkTTPfromAccessGroup {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;
accessGroup: AccessGroupChoice;
networkTTP: NetworkTTPChoice;

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

networkTTPAndAccessGroupNotCompatible: NULL;
networkTTPNotAssociated: NULL;
failureToDisassociate: NULL;

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
accessGroup: <INFORMATION OBJECT: tmAccessGroup>;
networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

PRE_CONDITIONS

inv_networkTTPAssociated

"**networkTTP** refers to *elementTTP* of <accessGroupIsMadeOfNetworkTTPs> relationship where **accessGroup** refers to *containerAG*."

```

POST_CONDITIONS
inv_networkTTPDisassociated
    "networkTTP shall not refer to elementTTP in an <accessGroupIsMadeOfNetworkTTPs> relationship
    where accessGroup refers to containerTTP."

EXCEPTIONS
    IF PRE_CONDITION inv_networkTTPAndAccessGroupExistingAndCompatible NOT_VERIFIED
        RAISE_EXCEPTION
            networkTTPAndAccessGroupNotCompatible;
    IF PRE_CONDITION inv_networkTTPAssociated NOT_VERIFIED RAISE_EXCEPTION
        networkTTPNotAssociated;
    IF POST_CONDITION inv_networkTTPDisassociated NOT_VERIFIED RAISE_EXCEPTION
        failureToDisassociate;
}

```

7.2.1.8 Asociar TTP de red con subred (associate networkTTP with subnetwork)

```

<COMMUNITY: trail management, ACTION: associate trail termination point with subnetwork>
OPERATION associateNetworkTTPWithSubnetwork {
    INPUT_PARAMETERS
        layerND: LayerNetworkDomainChoice;
        subnetwork: SubnetworkChoice;
        networkTTP: NetworkTTPChoice;

    OUTPUT_PARAMETERS
        -- none

    RAISED_EXCEPTIONS
        networkTTPAndSubnetworkNotCompatible: NULL;
        networkTTPAssociated: NetworkTTPChoice;
        failureToAssociateNetworkTTP: NULL;

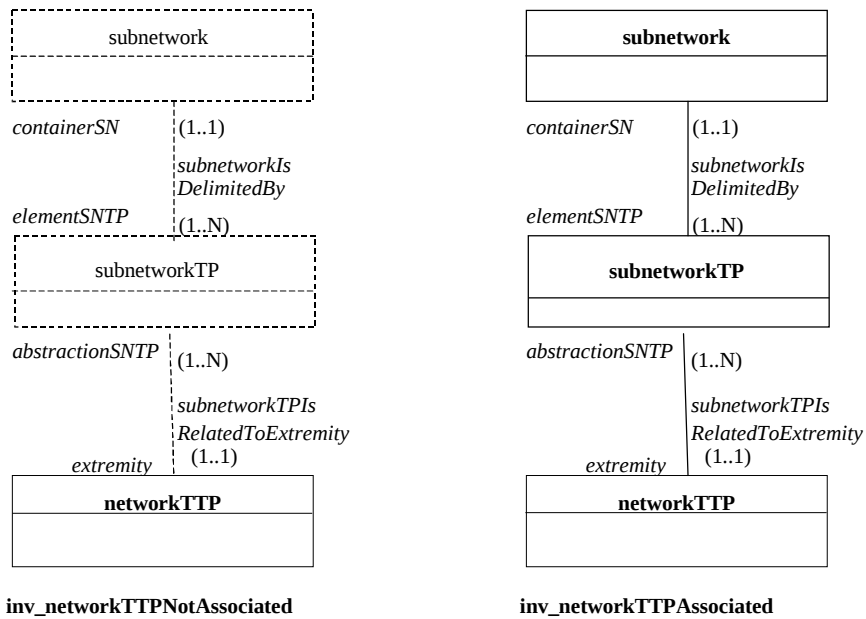
    BEHAVIOUR
    SEMI_FORMAL
        PARAMETER_MATCHING
            layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
            subnetwork: <INFORMATION OBJECT: tmSubnetwork >;
            networkTTP: <INFORMATION OBJECT: tmNetworkTTP >;

        PRE_CONDITIONS
            inv_networkTTPAndSubnetworkExistingAndCompatible
                "networkTTP and subnetwork shall refer to element of the same <layerNetworkDomainIsMadeOf>
                relationship where layerND refers to containerLND."

            inv_networkTTPNotAssociated
                "The networkTTP shall not refer to extremity of a <subnetworkTTPsRelatedToExtremity> relationship
                where abstractionSNTP references elementSNTP of a <subnetworkIsDelimitedBy > relationship."

        POST_CONDITIONS
            inv_networkTTPAssociated
                "networkTTP refers to extremity of a <subnetworkTTPsRelatedToExtremity> relationship where
                abstractionSNTP, which is a subnetworkTP, is also referencing elementSNTP of a
                <subnetworkIsDelimitedBy> relationship where subnetwork refers to containerSN."

```



EXCEPTIONS

```

IF PRE_CONDITION inv_networkTTPAndSubnetworkExistingAndCompatible NOT_VERIFIED
RAISE_EXCEPTION
    networkTTPAndSubnetworkNotCompatible;
IF PRE_CONDITION inv_networkTTPNotAssociated NOT_VERIFIED_RAISE_EXCEPTION
    networkTTPAssociated;
IF POST_CONDITION inv_networkTTPAssociated NOT_VERIFIED RAISE_EXCEPTION
    failureToAssociateNetworkTTP;

```

}

7.2.1.9 Disociar TTP de red de subred (disassociate networkTTP from subnetwork)

<COMMUNITY: trail management, ACTION: disassociate trail termination point from subnetwork>

OPERATION disassociateNetworkTTPfromSubnetwork {

INPUT_PARAMETERS

```

layerND: LayerNetworkDomainChoice;
subnetwork: SubnetworkChoice;
networkTTP: NetworkTTPChoice;

```

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

```

networkTTPAndSubnetworkNotCompatible: NULL;
networkTTPNotAssociated: NTTPIId
networkTTPConnected: NULL;
failureToDisassociate: NULL;

```

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

```

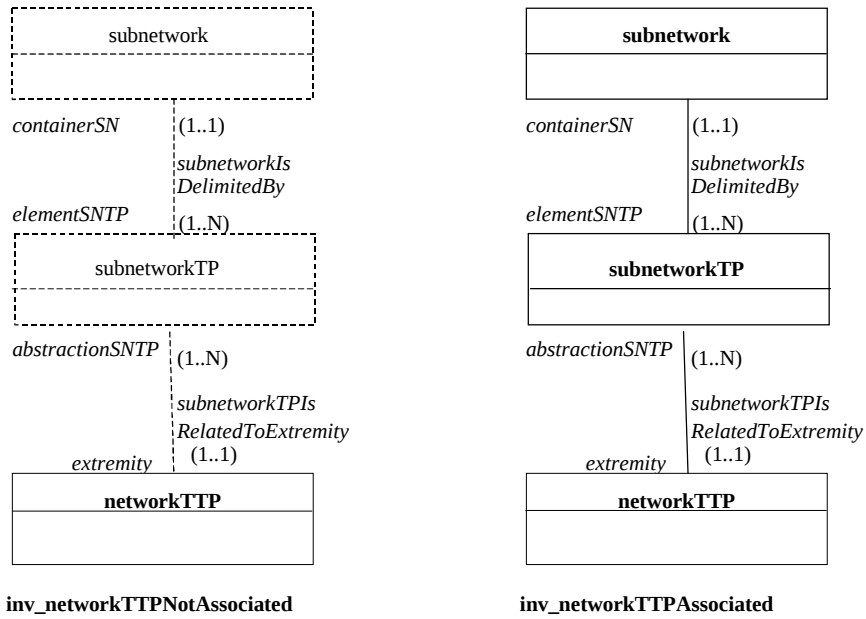
layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
subnetwork: <INFORMATION OBJECT: tmSubnetwork>
networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

```

PRE_CONDITIONS

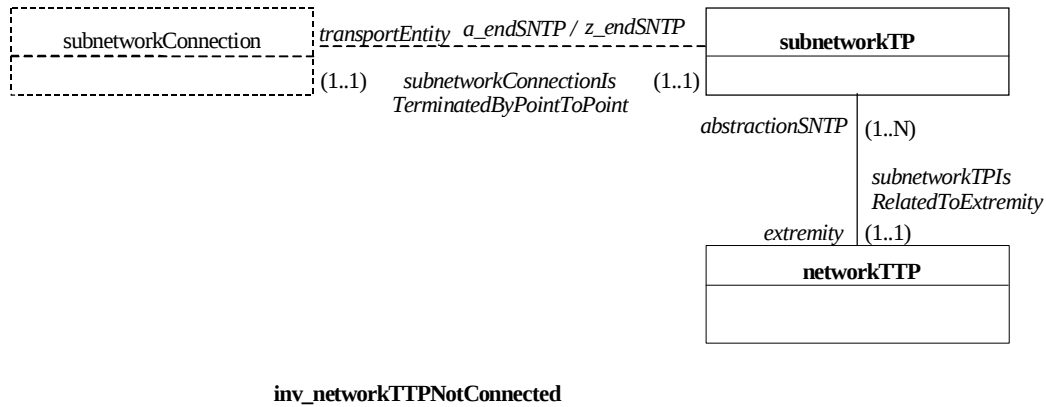
inv_networkTTPAssociated

"**networkTTP** refers to *extremity* of a <subnetworkTTPsRelatedToExtremity> relationship where *abstractionSNTP*, which is a **subnetworkTP**, is also *elementSNTP* of a <subnetworkIsDelimitedBy> relationship where **subnetwork** refers to *containerSN*.



inv_networkTTPNotAssociated

"*abstractionSNTP* (which is a **subnetworkTP**) of a <subnetworkTTPsRelatedToExtremity> relationship where **networkTTP** refers to *extremity*, shall not reference *a_endSNTP* or *z_endSNTP* of a <subnetworkConnectionIsTerminatedByPointToPoint> relationship.



POST_CONDITIONS

inv_networkTTPNotAssociated

<"**networkTTP** shall not refer to *extremity* of a <subnetworkTTPsRelatedToExtremity> relationship where *abstractionSNTP* references *elementSNTP* of a <subnetworkIsDelimitedBy> relationship."

EXCEPTIONS

```
IF PRE_CONDITION inv_networkTTPAndSubnetworkExistingAndCompatible NOT_VERIFIED
RAISE_EXCEPTION
    networkTTPAndSubnetworkNotCompatible;
IF PRE_CONDITION inv_networkTTPAssociated NOT_VERIFIED RAISE_EXCEPTION
    networkTTPNotAssociated;
IF PRE_CONDITION inv_networkTTPNotConnected NOT_VERIFIED RAISE_EXCEPTION
    networkTTPConnected;
IF POST_CONDITION inv_networkTTPNotAssociated NOT_VERIFIED RAISE_EXCEPTION
    failureToDisassociate;
```

```
}
```

7.3 Interfaces de informes

7.3.1 Interfaz de informes de provisión de camino

La interfaz de informes de provisión de camino informa el establecimiento, liberación y modificación inmediatos de caminos punto a punto, así como la creación y supresión de TTP de red y la asociación y disociación de TTP de red con, respectivamente de, grupos de acceso y subredes. La interfaz deberá satisfacer los requisitos de empresa indicados en:

```
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report trail setup >,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report trail release>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report trail modification>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report trail termination point
creation>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report trail termination point
deletion>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report association of trail termination
point with access group>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report disassociation of trail
termination point from access group>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report association of trail termination
point with subnetwork>,
<"Recommendation G.852.6,"COMMUNITY trail management, ACTION: report disassociation of trail
termination point from subnetwork>.
```

Al heredar las propiedades de la interfaz <commonReportResourceIdChangeIfce>, la interfaz trailProvisioningReportingIfce proporciona la capacidad de informar el cambio del identificador de recurso de los recursos que intervienen.

```
COMPUTATIONAL INTERFACE trailProvisioningReportingIfce {
    DERIVED FROM          <commonReportResourceIdChangeIfce>
    OPERATION {
        <reportPointToPointTrailSet_up>;
        <reportTrailRelease>;
        <reportTrailModification>;
        <reportNetworkTTPCreation>;
        <report networkTTPDeletion>;
        <reportAssociationOfNetworkTTPWithAccessGroup>;
        <reportDisassociationOfNetworkTTPFromAccessGroup>;
        <reportAssociationOfNetworkTTPWithSubnetwork>;
        <reportDisassociationOfNetworkTTPFromSubnetwork>;
    }
}
```

7.3.1.1 Informar establecimiento de camino punto a punto (report point-to-point trail set-up)

<COMMUNITY: trail management, ACTION: report trail setup>

OPERATION reportPointToPointTrailSet_up{

INPUT_PARAMETERS

newTrail: TrailChoice;

connectedAEndNetworkTTP: NetworkTTPChoice;

connectedZEndNetworkTTP: NetworkTTPChoice;

layerND: LayerNetworkDomainChoice;

OUTPUT_PARAMETERS

--none

RAISED EXCEPTIONS

--none

BEHAVIOUR

SEMI_FORMAL

PARAMETER_MATCHING

newTrail: <INFORMATION OBJECT: tmTrail>;

connectedAEndNetworkTTP: < INFORMATION OBJECT: tmNetworkTTP>;

connectedZEndNetworkTTP: < INFORMATION OBJECT: tmNetworkTTP>;

layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;

TRIGGERING CONDITIONS

PRE_CONDITIONS

inv_layerNDContainment

"**connectedAEndNetworkTTP** and **connectedZEndNetworkTTP** are referencing *element* in a
<layerNetworkDomainIsMadeOf> relationship where **layerND** is referencing *containerLND*."

POST_CONDITIONS

inv_connectedTrail

"**connectedAEndNetworkTTP**, **connectedZEndNetworkTTP** and **newTrail** respectively reference
a *_endNTTP*, *z_endNTTP* and *transportEntityTrail* in a <trailIsTerminatedByPointToPoint>
relationship."

EXCEPTIONS

-- none

}

7.3.1.2 Informar liberación de camino (report trail release)

<COMMUNITY: trail management, ACTION: report trail release>

OPERATION reportTrailRelease {

INPUT_PARAMETERS

trail: TrailChoice;

layerND: LayerNetworkDomainChoice;

OUTPUT_PARAMETERS

--none

RAISED EXCEPTIONS

--none

```

BEHAVIOUR
SEMI_FORMAL
    PARAMETER_MATCHING
        trail: <INFORMATION OBJECT: tmTrail>;
        layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;

    TRIGGERING CONDITIONS
        PRE_ CONDITIONS
            inv_connectedTrail
                "trail must refer to transportEntityTrail in a <trailsTerminatedByPointToPoint> relationship."

        POST_ CONDITIONS
            inv_disconnectedTrail
                "trail is not allowed participating in a <trailsTerminatedByPointToPoint> relationship referencing transportEntityTrail."

    EXCEPTIONS
        --none
}

```

7.3.1.3 Informar modificación de camino (report trail modification)

```

<COMMUNITY: trail management, ACTION: report trail modification>
OPERATION reportTrailModification {
    INPUT_PARAMETERS
        trail: TrailChoice;
        layerND: LayerNetworkDomainChoice;
        newTrafficDescriptor: ImmediateTrafficDescriptorId ;
        newServiceCharacteristics: TrailServiceCharacteristicsId;
        agreedTrafficDescriptor: ImmediateTrafficDescriptorId ;
        agreedServiceCharacteristics: TrailServiceCharacteristicsId;

    OUTPUT_PARAMETERS
        -- none

    RAISED EXCEPTIONS
        --none
}

```

```

BEHAVIOUR
SEMI_FORMAL
    PARAMETER_MATCHING
        trail: <INFORMATION OBJECT: tmTrail>;
        layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
        newTrafficDescriptor: <INFORMATION OBJECT: tmTrafficDescriptor>;
        newServiceCharacteristics: <INFORMATION OBJECT: tmTrailServiceCharacteristics>;
        agreedTrafficDescriptor: <INFORMATION OBJECT: tmTrafficDescriptor>;
        agreedServiceCharacteristics: <INFORMATION OBJECT: tmTrailServiceCharacteristics>;

    TRIGGERING CONDITIONS
        PRE_ CONDITIONS
            inv_newServiceCharacteristics
                "trail and newServiceCharacteristics must not be involved as transportQualifiedTrail and transportQualifierTSC in a <tmTrailHasTSC> relationship."

            inv_newTrafficDescriptor
                "trail and newTrafficDescriptor must not be involved as trailTD and immediateTrafficDescriptorTrail in a <tmTrailHasImmediateTrafficDescriptor> relationship."

```

```

    POST_CONDITIONS
        inv_agreedServiceCharacteristics
            "trail and agreedServiceCharacteristics must be involved as transportQualifiedTrail and
            transportQualifierTSC in a <tmTrailHasTSC> relationship."

        inv_agreedTrafficDescriptor
            "trail and agreedTrafficDescriptor must be involved as trailTD and
            immediateTrafficDescriptorTrail in a <tmTrailHasImmediateTrafficDescriptor> relationship."

    EXCEPTIONS
        --none
}

```

7.3.1.4 Informar creación de TTP de red (report networkTTP creation)

```

<COMMUNITY: trail management, ACTION: report trail termination point creation>
OPERATION reportNetworkTTPCreation {
    INPUT_PARAMETERS
        networkTTP: NetworkTTPChoice;
        layerND: LayerNetworkDomainChoice;
        pointDir: PointDirectionality;

    OUTPUT_PARAMETERS
        -- none

    RAISED_EXEPTIONS
        -- none

    BEHAVIOUR
    SEMI-FORMAL
    PARAMETER_MATCHING
        networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;
        layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
        pointDir: <INFORMATION ATTRIBUTE: pointDirectionality>;

    TRIGGERING_CONDITIONS
    PRE_CONDITIONS
        -- none

    POST_CONDITIONS
        inv_existingNetworkTTP
            "networkTTP must refer to element in a <layerNetworkDomainIsMadeOf> relationship where
            layerND refers to containerLND."

    EXCEPTIONS
        -- none
}

```

7.3.1.5 Informar supresión de TTP de red (report networkTTP deletion)

```

<COMMUNITY: trail management, ACTION: report trail termination point deletion>
OPERATION reportNetworkTTPDeletion {
    INPUT_PARAMETERS
        networkTTP: NetworkTTPChoice;
        layerND: LayerNetworkDomainChoice;

    OUTPUT_PARAMETERS
        -- none
}

```

RAISED_EXCEPTIONS

-- none

BEHAVIOUR

SEMI-FORMAL

PARAMETER_MATCHING

networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;

TRIGGERING_CONDITIONS

PRE_CONDITIONS

inv_existingNetworkTTP

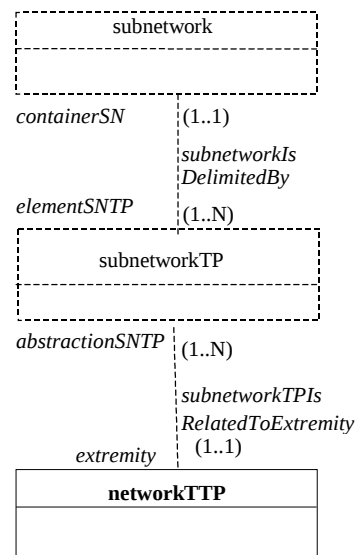
"**networkTTP** must refer to *element* in a <layerNetworkDomainIsMadeOf> relationship where **layerND** refers to *containerLND*."

inv_noTrailTermination

"**networkTTP** may not refer to *a_endNTTP* or *z_endNTTP* in any <trailIsTerminatedByPointToPoint> relationship."

inv_noSubnetworkAssociation

"**networkTTP** shall not refer to *extremity* of a <subnetworkTPIsRelatedToExtremity> relationship where *abstractionSNTP* references *elementSNTP* of a <subnetworkIsDelimitedBy> relationship."



inv_noSubnetworkAssociation

"

inv_noAccessGroupAssociation

"**networkTTP** may not refer to *elementTTP* in an <accessGroupIsMadeOfNetworkTTPs> relationship."

POST_CONDITIONS

inv_noNetworkTTP

"**networkTTP** does not refer to *element* in a <layerNetworkDomainIsMadeOf> relationship."

EXCEPTIONS

--none

}

7.3.1.6 Informar asociación de TTP de red con grupo de acceso (report association of networkTTP with access group)

<COMMUNITY: trail management, ACTION: report association of trail termination point with access group>

OPERATION reportAssociationOfNetworkTTPWithAccessGroup {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;
accessGroup: AccessGroupChoice;
networkTTP: NetworkTTPChoice;

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

-- none

BEHAVIOUR

SEMI-FORMAL

PARAMETER_MATCHING

layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
accessGroup: <INFORMATION OBJECT: tmAccessGroup>;
networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

TRIGGERING_CONDITIONS

PRE_CONDITIONS

inv_networkTTPAndAccessGroupExistingAndCompatible
"networkTTP and accessGroup shall refer to *element* of the same
<layerNetworkDomainIsMadeOf> relationship where layerND refers to *containerLND*."

inv_networkTTPNotAlreadyAssociated
"networkTTP shall not refer to *elementTTP* in any <accessGroupIsMadeOfNetworkTTPs> relationship."

POST_CONDITIONS

inv_networkTTPAssociated
"networkTTP refers to *elementTTP* of an <accessGroupIsMadeOfNetworkTTPs> relationship
where accessGroup refers to *containerAG*."

EXCEPTIONS

-- none

}

7.3.1.7 Informar disociación de TTP de red de grupo de acceso (report disassociation of networkTTP from access group)

<COMMUNITY: trail management, ACTION: report disassociation of trail termination point from accessGroup>

OPERATION reportDisassociationOfNetworkTTPFromAccessGroup {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;
accessGroup: AccessGroupChoice;
networkTTP: NetworkTTPChoice;

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

-- none

BEHAVIOUR
SEMI-FORMAL

PARAMETER_MATCHING

layerND: <INFORMATION OBJECT: tmLayerNetworkDomain>;
accessGroup: <INFORMATION OBJECT: tmAccessGroup>;
networkTTP: <INFORMATION OBJECT: tmNetworkTTP>;

TRIGGERING_CONDITIONS

PRE_CONDITIONS

inv_networkTTPAssociated

"**networkTTP** refers to *elementTTP* of an <accessGroupIsMadeOfNetworkTTPs> relationship where **accessGroup** refers to *containerAG*."

POST_CONDITIONS

inv_networkTTPDisassociated

"**networkTTP** shall not refer to *elementTTP* in an <accessGroupIsMadeOfNetworkTTPs> relationship where **accessGroup** refers to *containerAG*."

EXCEPTIONS

-- none

}

7.3.1.8 Informar asociación de TTP de red con subred (report association of networkTTP with subnetwork)

<COMMUNITY: trail management, ACTION: report association of trail termination point with subnetwork>

OPERATION reportAssociationOfNetworkTTPWithSubnetwork {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;
subnetwork: SubnetworkChoice;
networkTTP: NetworkTTPChoice;

OUTPUT PARAMETERS

-- none

RAISED EXCEPTIONS

-- none

BEHAVIOUR
SEMI-FORMAL

PARAMETER_MATCHING

layerND: <INFORMATION OBJECT tmLayerNetworkDomain>;
subnetwork: <INFORMATION OBJECT tmSubnetwork>;
networkTTP: <INFORMATION OBJECT tmNetworkTTP>;

TRIGGERING_CONDITIONS

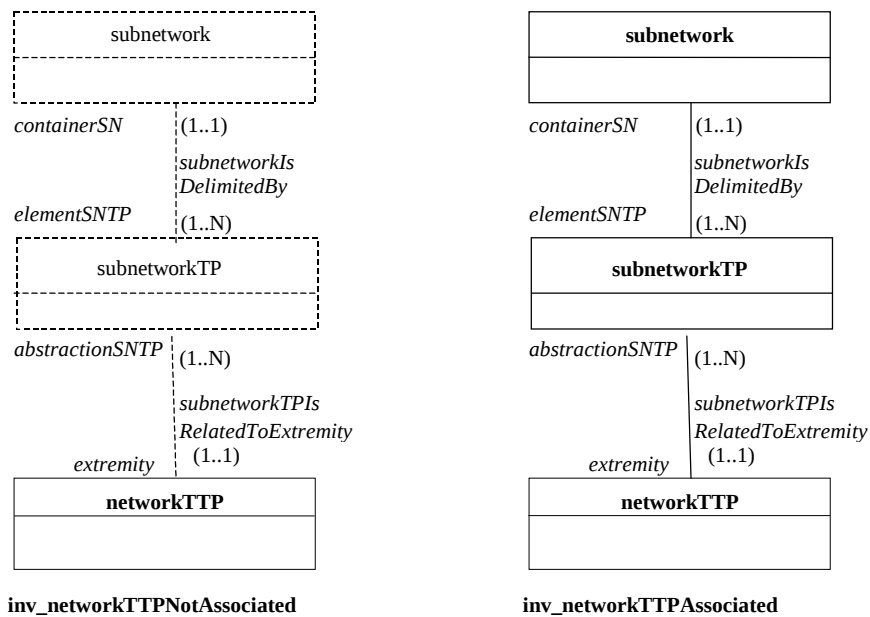
PRE_CONDITIONS

inv_networkTTPAndSubnetworkExistingAndCompatible

"**networkTTP** and **subnetwork** shall refer to *element* of the same <layerNetworkDomainIsMadeOf> relationship where **layerND** refers to *containerLND*."

inv_networkTTPNotAssociated

"**networkTTP** shall not refer to *extremity* of a <subnetworkTTPIsRelatedToExtremity> relationship where *abstractionSNTP* references *elementSNTP* of a <subnetworkIsDelimitedBy> relationship."



POST_CONDITIONS

inv_networkTTPAssociated

"**networkTTP** refers to *extremity* of a <*subnetworkTPIsRelatedToExtremity*> relationship where *abstractionSNTP*, which is a **subnetworkTP**, is also *elementSNTP* of a <*subnetworkIsDelimitedBy*> relationship where **subnetwork** refers to *containerSN*."

EXCEPTIONS

-- none

}

7.3.1.9 Informar disociación de TTP de red de subred (report disassociation of networkTTP from subnetwork)

<COMMUNITY: trail management, ACTION: report disassociation of trail termination point from subnetwork>

OPERATION reportDisassociationOfNetworkTTPFromSubnetwork {

INPUT_PARAMETERS

layerND: LayerNetworkDomainChoice;
subnetwork: SubnetworkChoice;
networkTTP: NetworkTTPChoice;

OUTPUT_PARAMETERS

-- none

RAISED_EXCEPTIONS

-- none

BEHAVIOUR

SEMI-FORMAL

PARAMETER_MATCHING

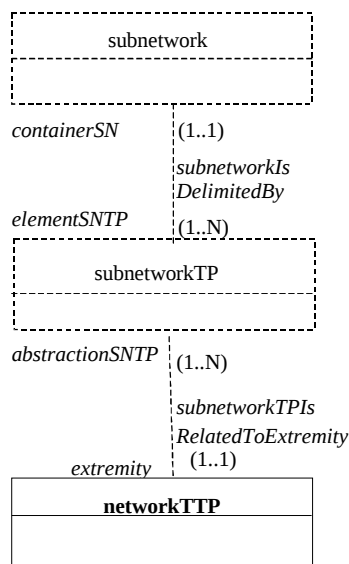
layerND: <INFORMATION OBJECT tmLayerNetworkDomain>;
subnetwork: <INFORMATION OBJECT tmSubnetwork>;
networkTTP: <INFORMATION OBJECT tmNetworkTTP>;

TRIGGERING_CONDITIONS

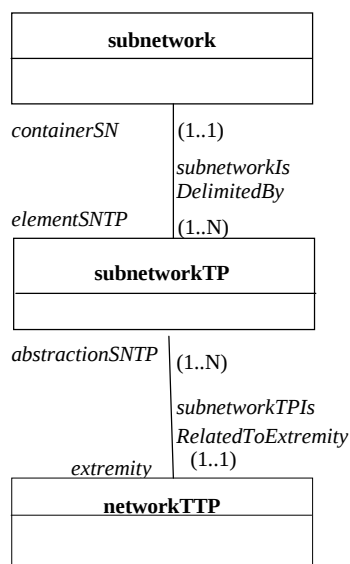
PRE_CONDITIONS

inv_networkTTPAssociated

"**networkTTP** refers to *extremity* of a <subnetworkTPIsRelatedToExtremity> relationship where *abstractionSNTP*, which is a **subnetworkTP**, is also *elementSNTP* of a <subnetworkIsDelimitedBy> relationship where **subnetwork** refers to *containerSN*.



inv_networkTTPNoAssociated

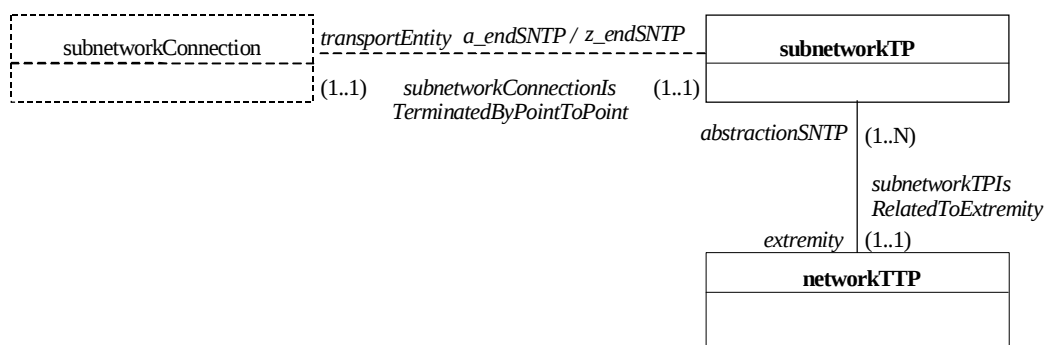


inv_networkTTPAssociated

"

inv_networkTTPNotConnected

"*abstractionSNTP* (which is a **subnetworkTP**) of a <subnetworkTPIsRelatedToExtremity> relationship where **networkTTP** refers to *extremity*, shall not reference a *_endSNTP* or *z_endSNTP* of a <subnetworkConnectionIsTerminatedByPointToPoint> relationship.



inv_networkTTPNotConnected

"

POST_CONDITIONS

inv_networkTTPNotAssociated

"**networkTTP** shall not refer to *extremity* of a <subnetworkTPIsRelatedToExtremity> relationship where *abstractionSNTP* references *elementSNTP* of a <subnetworkIsDelimitedBy> relationship."

EXCEPTIONS

-- none

}

7.4 Producciones de soporte ASN.1

En esta especificación, cuando se utiliza un nombre de interfaz dentro de una producción ASN.1, se utilizará la misma etiqueta, con la letra inicial mayúscula. La definición de tipo ASN.1 completa para esta interfaz de indagación (por ejemplo, uso de ObjectIdentifier, INTEGER,) se desarrollará como parte del punto de vista de la ingeniería, con la tecnología pertinente.

```
AccessGroupChoice ::= CHOICE {  
    tmAccessGroupQueryIfce      TmAccessGroupQueryIfce,  
    userIdentifier              UserIdentifier } ;
```

```
ImmediateTrafficDescriptorId ::= TmTrafficDescriptorQueryIfce;
```

```
LayerNetworkDomainChoice ::= CHOICE {  
    tmLayerNetworkDomainQueryIfce TmLayerNetworkDomainQueryIfce,  
    userIdentifier                 UserIdentifier };
```

```
NetworkTTPChoice ::= CHOICE {  
    tmNetworkTTPQueryIfce      TmNetworkTTPQueryIfce,  
    userIdentifier              UserIdentifier};
```

```
SequenceOfNetworkTTPChoice ::= SEQUENCE OF {  
    a_endNetworkTTP      NetworkTTPChoice,  
    z_endNetworkTTP      NetworkTTPChoice };
```

```
SubnetworkChoice ::= CHOICE {  
    tmSubnetworkQueryIfce      TmSubnetworkQueryIfce,  
    userIdentifier              UserIdentifier};
```

```
TrailChoice ::= CHOICE {  
    tmTrailQueryIfce TmTrailQueryIfce,  
    userIdentifier   UserIdentifier};
```

```
TrailServiceCharacteristicsId ::= TmTrailServiceCharcteristisQueryIfce;
```

```
UserIdentifier ::= SimpleNameType;
```


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