TAPI UML Model

Version 2.5.0

ONF Document Type: Technical Recommendation

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Document History

Version	Date	Description of Change
2.3	May 27, 2021	Model Dump *Gendoc generates documentation from Eclipse Modeling Framework (EMF) models using document templates in formats such as OpenOffice Writer (.odt), Microsoft Word (.docx), Microsoft Excel (.xlsx) and Microsoft Powerpoint (.pptx).*
2.4.0	December 2022	See high level diff document in Github
2.4.1	March 2023	See high level diff document in Github
2.5.0	October 2023	See high level diff document in Github

1 Connectivity Model

TapiConnectivity: This module contains TAPI Connectivity Model definitions. Source: TapiConnectivity.uml

1.1 Diagrams

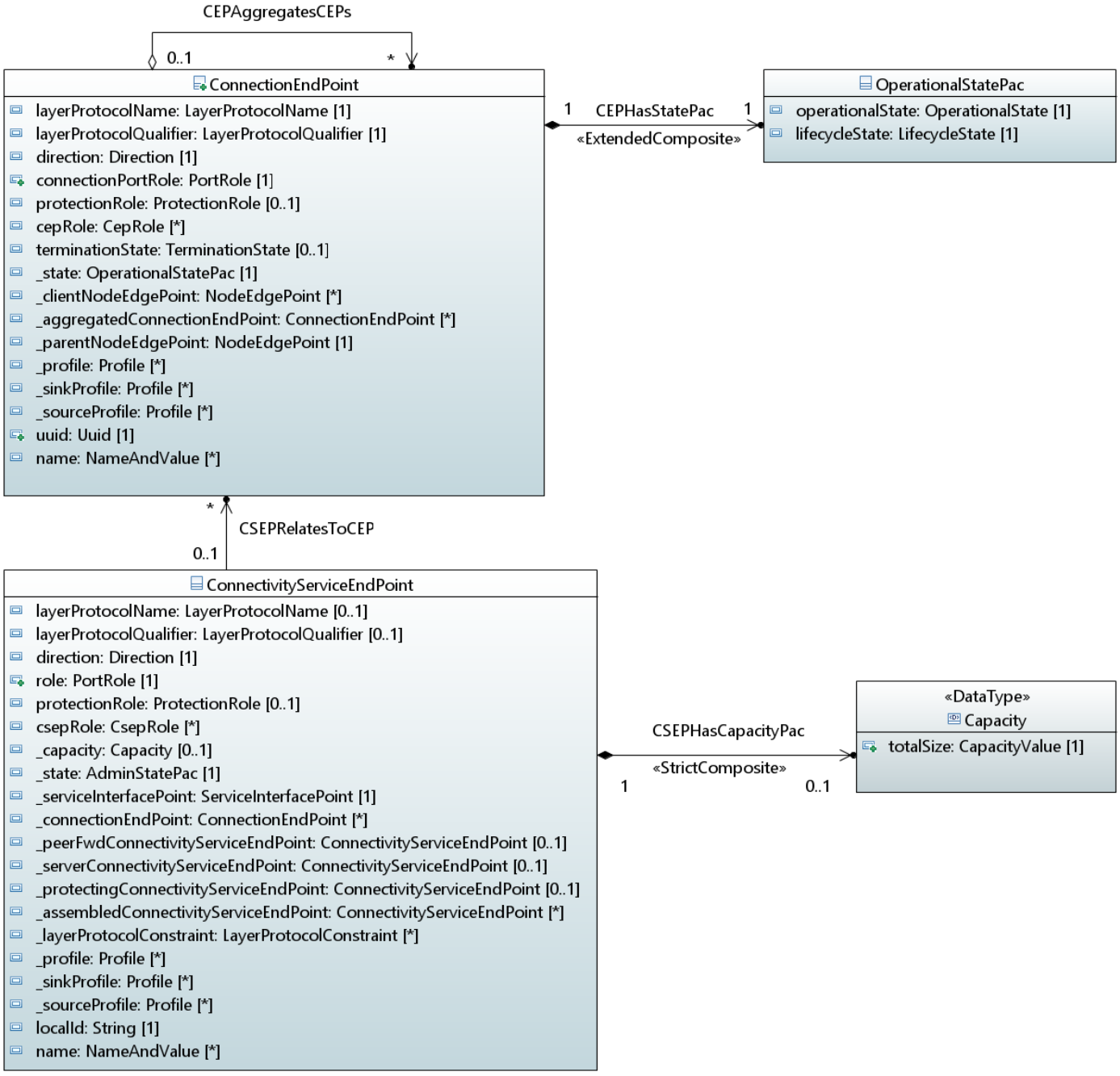

Figure 1 – Diagram *ConnectionEndPointDetails*

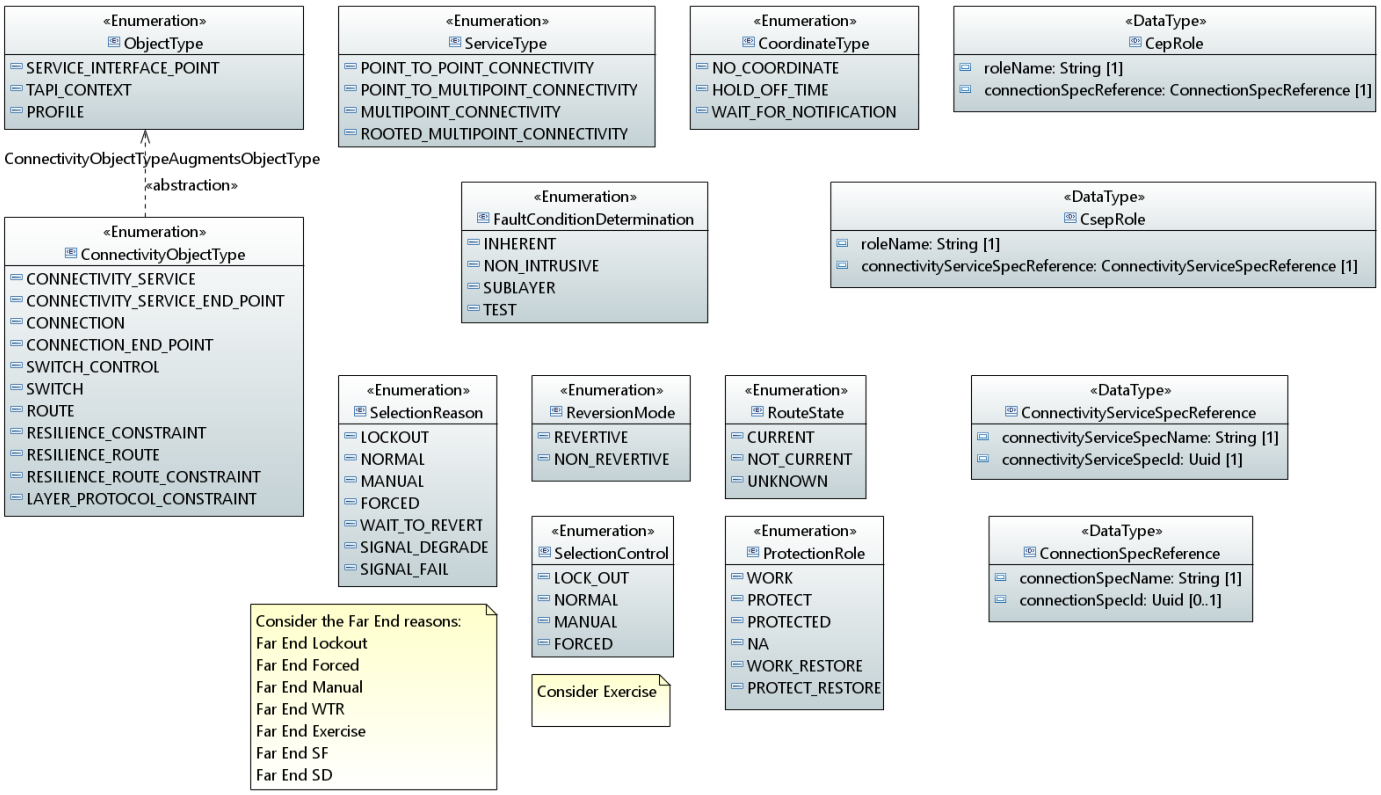

Figure 2 – Diagram *ConnectivityDataTypes*

Figure 3 – Diagram *ConnectivityNotifAndStream*

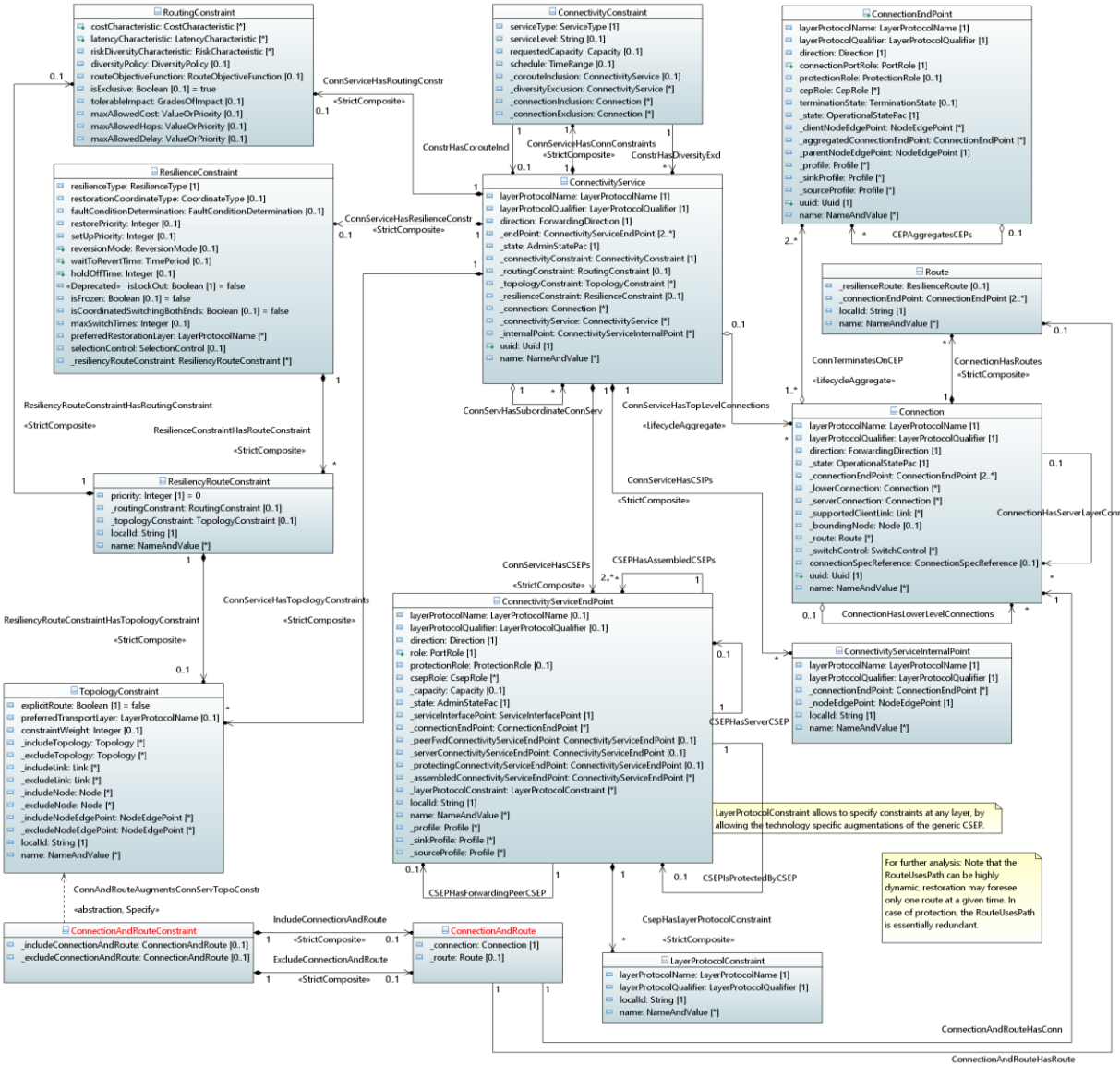

Figure 4 – Diagram *ConnectivityServiceDetails*

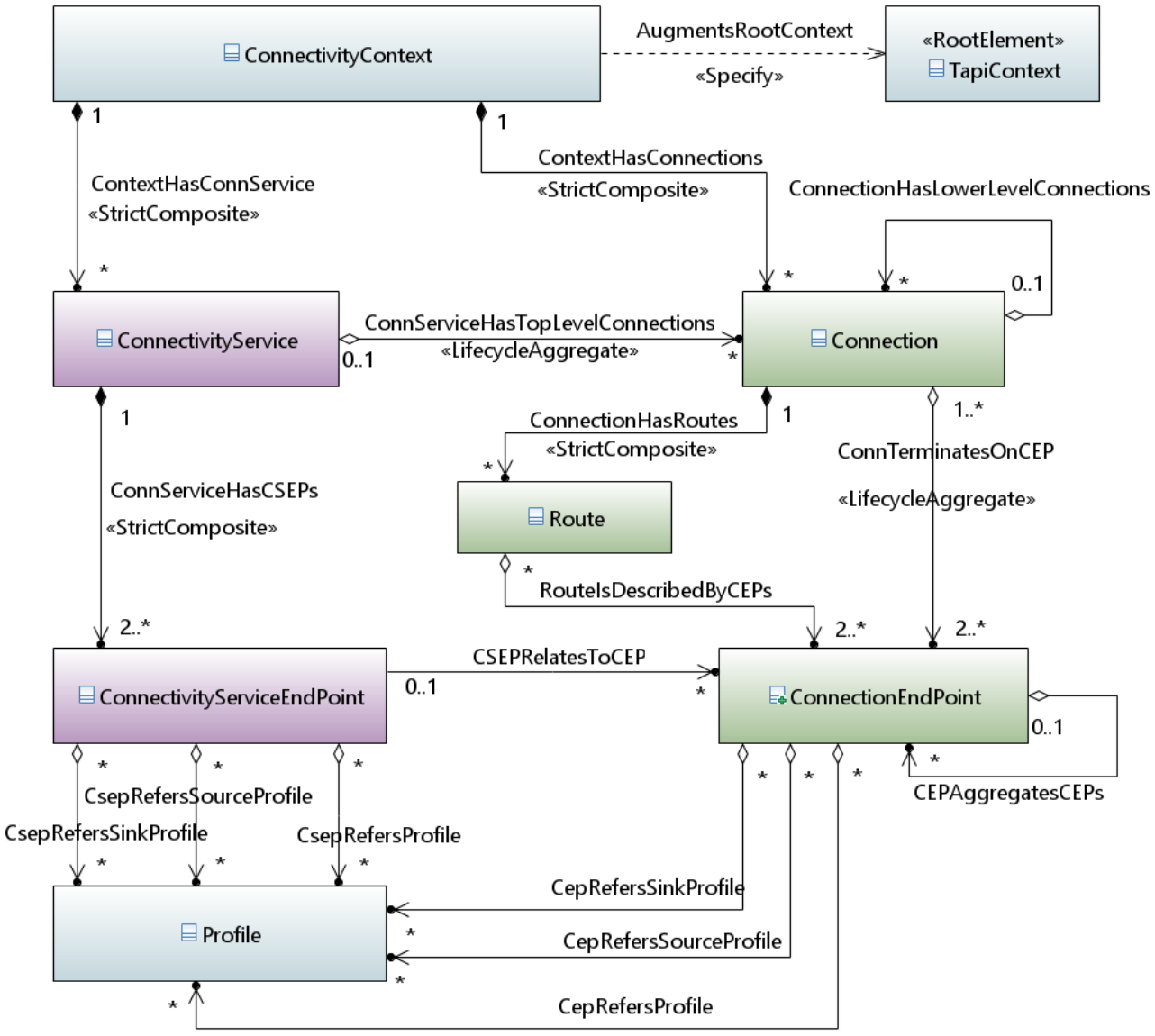

Figure 5 – Diagram *ConnectivityServiceSkeleton*

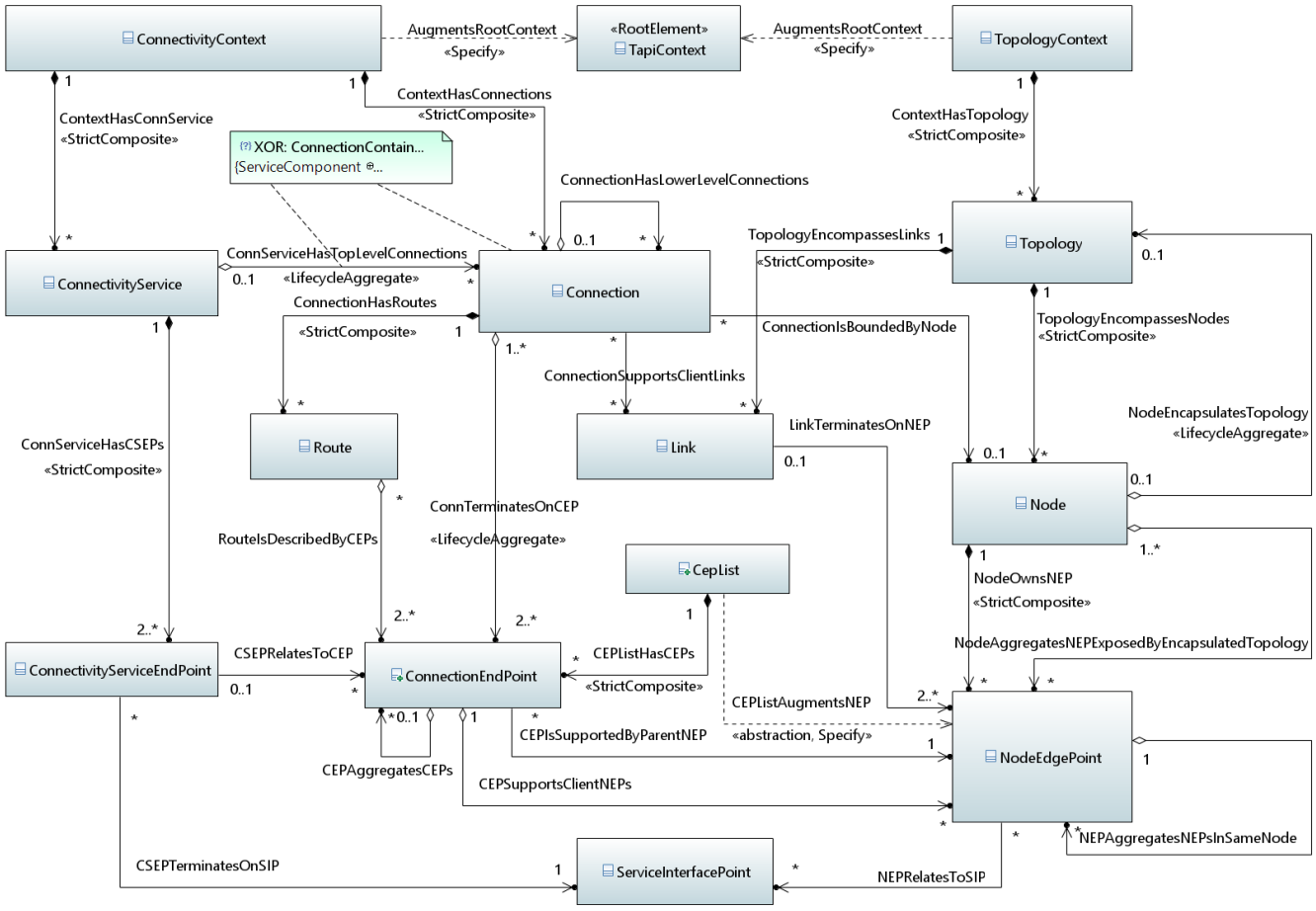

Figure 6 – Diagram *ConnectivityTopologySkeleton*

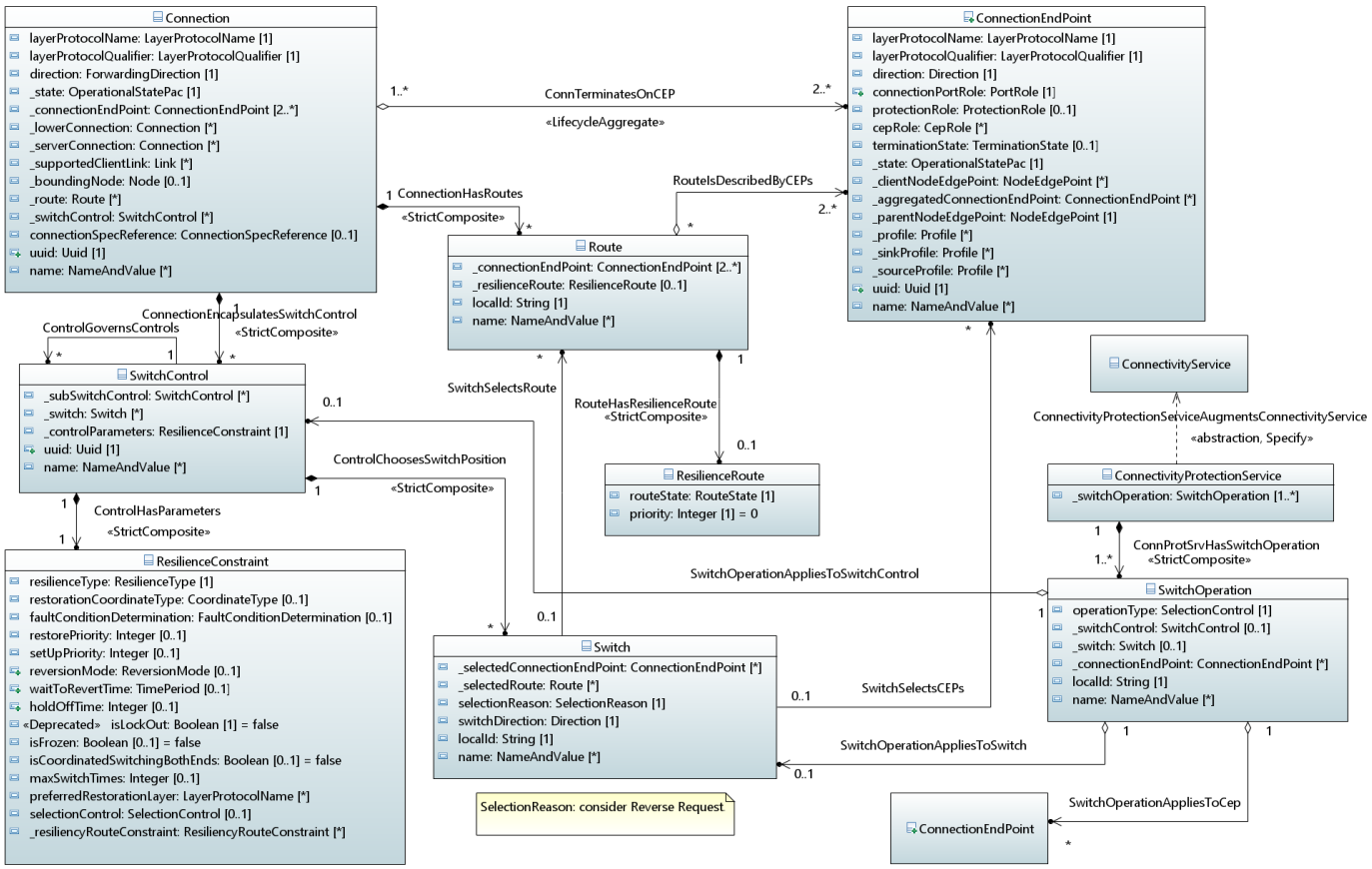

Figure 7 – Diagram *Resilience*

1.2 Classes

1.2.1 CepList

Description:

- This class provides the linkage between the NodeEdgePoint (NEP) instance and its supported ConnectionEndPoint CEP instances. The NEP class, which is defined in TapiTopology module, cannot directly include the reference to its CEPs, because CEP class is defined in another module, TapiConnectivity.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_connectionEndPoint *Navigable association end of:* *CEPListHasCEPs*	ConnectionEndPoint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The list of supported ConnectionEndPoint (CEP) instances.			

Table 1 – Attributes for class *CepList*

1.2.2 Connection

Description:

- A Connection represents an enabled (provisioned) potential for forwarding (of transport characteristic information including all circuit/packet forms) between two or more ConnectionEndPoint instances. The bounding Node of a Connection may be explicit or be conceptually implicit. The Connection is a container for provisioned connectivity that tracks the state of the allocated resources and is distinct from the ConnectivityService. At the lowest level of recursion, a Connection may represent a cross-connection in a switch matrix (i.e., a fabric) in an equipment.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol of the Connection.			
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Attribute Name	Type	Mult.	Access	Stereotypes
direction	TapiCommon::TypeDefinitions::ForwardingDirection	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The forwarding direction of the Connection.			
_state *Navigable association end of:* *ConnectionHasStatePac*	TapiCommon::ObjectClasses::OperationalStatePac	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The Connection status information.			
_connectionEndPoint *Navigable association end of:* *ConnTerminatesOnCEP*	ConnectionEndPoint	2..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectionEndPoint (CEP) instances of the Connection.			
_lowerConnection *Navigable association end of:* *ConnectionHasLowerLevelConnections*	Connection	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: A Connection supports a recursive aggregation relationship such that the internal construction of a Connection can be exposed as multiple lower level Connection objects (partitioning). Aggregation is used as for the Node/Topology to allow changes in hierarchy. Connection aggregation reflects Node/Topology aggregation. Note that a cross-connection in a switch matrix (i.e., a fabric) is not necessarily the lowest level of Connection partitioning.			
_serverConnection *Navigable association end of:* *ConnectionHasServerLayerConnections*	Connection	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The server layer Connections supporting this Connection.			

Attribute Name	Type	Mult.	Access	Stereotypes
_supportedClientLink *Navigable association end of:* *ConnectionSupportsClientLinks*	TapiTopology::ObjectClasses::Link	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: A Connection instance supports one or more Link instances. G.800: "The links in a client layer network are supported by trails in a server layer network".			
_boundingNode *Navigable association end of:* *ConnectionIsBoundedByNode*	TapiTopology::ObjectClasses::Node	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: A Connection may or may not be bounded by a Node, which defines the forwarding scope.			
_route *Navigable association end of:* *ConnectionHasRoutes*	Route	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The Route instances of the Connection.			
_switchControl *Navigable association end of:* *ConnectionEncapsulatesSwitchControl*	SwitchControl	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The SwitchControl instances associated to the Connection.			
connectionSpecReference	ConnectionSpecReference	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: Provides the reference to the spec that defines the connection type and cepRoles.			

Attribute Name	Type	Mult.	Access	Stereotypes
uuid Inherited: *TapiCommon::ObjectClasses::GlobalClass::uuid*	TapiCommon::TypeDefinitions::Uuid	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: UUID: An identifier that is universally unique within an identifier space, where the identifier space is itself globally unique, and immutable. An UUID carries no semantics with respect to the purpose or state of the entity. UUID here uses string representation as defined in RFC 4122. The canonical representation uses lowercase characters. Pattern: [0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-' + '[0-9a-fA-F]{4}-[0-9a-fA-F]{12} Example of a UUID in string representation: f81d4fae-7dec-11d0-a765-00a0c91e6bf6			
name Inherited: *TapiCommon::ObjectClasses::GlobalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 2 – Attributes for class *Connection*

1.2.3 ConnectionAndRoute

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_connection *Navigable association end of:* *ConnectionAndRouteHasConn*	Connection	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Attribute Name	Type	Mult.	Access	Stereotypes
_route *Navigable association end of:* *ConnectionAndRouteHasRoute*	Route	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Table 3 – Attributes for class *ConnectionAndRoute*

1.2.4 ConnectionAndRouteConstraint

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_includeConnectionAndRoute *Navigable association end of:* *IncludeConnectionAndRoute*	ConnectionAndRoute	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_excludeConnectionAndRoute *Navigable association end of:* *ExcludeConnectionAndRoute*	ConnectionAndRoute	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Table 4 – Attributes for class *ConnectionAndRouteConstraint*

1.2.5 ConnectionEndPoint

Description:

- The ConnectionEndPoint (CEP) encapsulates information related to a Connection at the ingress/egress points of every Node that the Connection traverses in a Topology. The CEP includes the termination and adaptation functions of one or more transport layers (circuit and packet forms) plus the information of the (conceptual) port of associated Connection.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol of the ConnectionEndPoint (CEP).			
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol qualifier of the ConnectionEndPoint (CEP).			
direction	TapiCommon::TypeDefinitions::Direction	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The CEP direction.			
connectionPortRole	TapiCommon::TypeDefinitions::PortRole	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The role of the (conceptual) port of the associated Connection.			

Attribute Name	Type	Mult.	Access	Stereotypes
protectionRole	ProtectionRole	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The protection role of the (conceptual) port of the associated Connection. It is recommended the alignment with the priority of ResilienceRoute.			
cepRole	CepRole	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Defines the role of the CEP in the context of the Connection spec. There may be many CEP role - Connection spec combinations for a particular CEP where each corresponds to a specific Connection associated with the CEP.			
terminationState	TapiCommon::TypeDefinitions::TerminationState	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_state *Navigable association end of:* *CEPHasStatePac*	TapiCommon::ObjectClasses::OperationalStatePac	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectionEndPoint (CEP) status information.			
_clientNodeEdgePoint *Navigable association end of:* *CEPSupportsClientNEPs*	TapiTopology::ObjectClasses::NodeEdgePoint	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The supported NodeEdgePoint instance(s).			

Attribute Name	Type	Mult.	Access	Stereotypes
_aggregatedConnectionEndPoint *Navigable association end of:* *CEPAggregatesCEPs*	ConnectionEndPoint	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: A ConnectionEndPoint (CEP) instance may aggregate one or more other CEP instances for e.g. pooling purposes, when a set of CEP instances are equivalent for usage.			
_parentNodeEdgePoint *Navigable association end of:* *CEPIsSupportedByParentNEP*	TapiTopology::ObjectClasses::NodeEdgePoint	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The supporting NodeEdgePoint (NEP) instance.			
_profile *Navigable association end of:* *CepRefersProfile*	TapiCommon::ObjectClasses::Profile	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_sinkProfile *Navigable association end of:* *CepRefersSinkProfile*	TapiCommon::ObjectClasses::Profile	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_sourceProfile *Navigable association end of:* *CepRefersSourceProfile*	TapiCommon::ObjectClasses::Profile	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Attribute Name	Type	Mult.	Access	Stereotypes
uuid Inherited: *TapiCommon::ObjectClasses::GlobalClass::uuid*	TapiCommon::TypeDefinitions::Uuid	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: UUID: An identifier that is universally unique within an identifier space, where the identifier space is itself globally unique, and immutable. An UUID carries no semantics with respect to the purpose or state of the entity. UUID here uses string representation as defined in RFC 4122. The canonical representation uses lowercase characters. Pattern: [0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-' + '[0-9a-fA-F]{4}-[0-9a-fA-F]{12} Example of a UUID in string representation: f81d4fae-7dec-11d0-a765-00a0c91e6bf6			
name Inherited: *TapiCommon::ObjectClasses::GlobalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 5 – Attributes for class *ConnectionEndPoint*

1.2.6 ConnectivityConstraint

Description:

- The connectivity constraints associated to a ConnectivityService instance.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
serviceType	ServiceType	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityService type.			

Attribute Name	Type	Mult.	Access	Stereotypes
serviceLevel	PrimitiveTypes::String	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Class of Service Name. An abstract value the meaning of which is mutually agreed - typically represents metrics such as - Class of service, priority, resiliency, availability.			
requestedCapacity	TapiCommon::TypeDefinitions::Capacity	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityService capacity.			
schedule	TapiCommon::TypeDefinitions::TimeRange	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityService timing.			
_corouteInclusion *Navigable association end of:* *ConstrHasCorouteIncl*	ConnectivityService	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The reference to another ConnectivityService instance for corouting purposes.			
_diversityExclusion *Navigable association end of:* *ConstrHasDiversityExcl*	ConnectivityService	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The references to other ConnectivityService instances for routing diversity purposes.			

Attribute Name	Type	Mult.	Access	Stereotypes
_connectionInclusion *Navigable association end of:* *ConnectionInclusion*	Connection	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: A ConnectivityService may use one or more existing Connections. A common traditional strategy is to set up 'stranded' connectivity in the core of the network as "express channels" (this is essentially a serial compound link, but can be treated as simple connections). A Connection inclusion capability allows for adoption of discovered Connections, i.e. will allow discovered Connections with no stated intent to be associated with an intent via the ConnectivityService. A ConnectivityService is requested with a Connection inclusion constraint that identifies a Connection (or chain of Connections) that is bounded by CEPs that each belong to a NEP that references a SIP that is referenced by a CSEP of the ConnectivityService such that all CSEPs are satisfied by CEPs of the existing Connection. The type is generic UUID given read/write constraints, the Connection is a readonly node.			
_connectionExclusion *Navigable association end of:* *ConnectionExclusion*	Connection	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The list of Connection instances which shall not be used to implement the ConnectivityService. The type is generic UUID given read/write constraints, the Connection is a readonly node.			

Table 6 – Attributes for class *ConnectivityConstraint*

1.2.7 ConnectivityContext

Description:

- This object class represents the scope of control that a particular SDN controller has with respect to a particular network, specifically regarding the connectivity description. An instance of this class includes its ConnectivityService and Connection object instances.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_connectivityService *Navigable association end of:* *ContextHasConnService*	ConnectivityService	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The included ConnectivityService instances.			
_connection *Navigable association end of:* *ContextHasConnections*	Connection	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The included Connection instances.			

Table 7 – Attributes for class *ConnectivityContext*

1.2.8 ConnectivityProtectionService

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_switchOperation *Navigable association end of:* *ConnProtSrvHasSwitchOperation*	SwitchOperation	1..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Table 8 – Attributes for class *ConnectivityProtectionService*

1.2.9 ConnectivityService

Description:

- A ConnectivityService represents an intent-like request for connectivity between two or more ConnectivityServiceEndPoint (CSEP) instances. The ConnectivityService is a container for connectivity request details and is distinct from the Connection(s) that realize the request.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	1	RW	OpenInterfaceModelAttribute • AVC: NA • Protobuf Index: 23 OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol of the CS.			
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol qualifier of the CS.			
direction	TapiCommon::TypeDefinitions::ForwardingDirection	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The forwarding direction of the ConnectivityService.			
_endPoint *Navigable association end of:* *ConnServiceHasCSEPs*	ConnectivityServiceEndPoint	2..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityServiceEndPoint (CSEP) instances of the ConnectivityService.			
_state *Navigable association end of:* *ConnServiceHasStatePac*	TapiCommon::ObjectClasses::AdminStatePac	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityService status information.			

Attribute Name	Type	Mult.	Access	Stereotypes
_connectivityConstraint *Navigable association end of:* *ConnServiceHasConnConstraints*	ConnectivityConstraint	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated connectivity constraints.			
_routingConstraint *Navigable association end of:* *ConnServiceHasRoutingConstr*	TapiPathComputation::ObjectClasses ::RoutingConstraint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated routing constraints.			
_topologyConstraint *Navigable association end of:* *ConnServiceHasTopologyConstraints*	TapiPathComputation::ObjectClasses ::TopologyConstraint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated topology constraints. Different instances of TopologyConstraints may be used to specify constraints at different layer networks.			
_resilienceConstraint *Navigable association end of:* *ConnServiceHasResilienceConstr*	ResilienceConstraint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated resilience constraints.			
_connection *Navigable association end of:* *ConnServiceHasTopLevelConnections*	Connection	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The Connection instance(s) tracking the state of the allocated resources for the support of the ConnectivityService.			

Attribute Name	Type	Mult.	Access	Stereotypes
_connectivityService *Navigable association end of:* *ConnServHasSubordinateConnServ*	ConnectivityService	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Association to other ConnectivityService instances for complex connectivity provisioning.			
_internalPoint *Navigable association end of:* *ConnServiceHasCSIPs*	ConnectivityServiceInternalPoint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityServiceInternalPoint (CSIP) instances of the ConnectivityService.			
uuid Inherited: *TapiCommon::ObjectClasses::GlobalClass ::uuid*	TapiCommon::TypeDefinitions::Uuid	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: UUID: An identifier that is universally unique within an identifier space, where the identifier space is itself globally unique, and immutable. An UUID carries no semantics with respect to the purpose or state of the entity. UUID here uses string representation as defined in RFC 4122. The canonical representation uses lowercase characters. Pattern: [0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-' + '[0-9a-fA-F]{4}-[0-9a-fA-F]{12} Example of a UUID in string representation: f81d4fae-7dec-11d0-a765-00a0c91e6bf6			
name Inherited: *TapiCommon::ObjectClasses::GlobalClass ::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 9 – Attributes for class *ConnectivityService*

1.2.10 ConnectivityServiceEndPoint

Description:

- The ConnectivityServiceEndPoint (CSEP) encapsulates information related to a ConnectivityService at the ingress/egress points of that ConnectivityService.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol of the ConnectivityServiceEndPoint (CSEP).			
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol qualifier of the ConnectivityServiceEndPoint (CSEP).			
direction	TapiCommon::TypeDefinitions::Direction	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The CSEP direction. It is intended the "internal viewpoint", i.e. the source CSEP is sending to the network, the sink CSEP is sending from the network.			
role	TapiCommon::TypeDefinitions::PortRole	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The role of the (conceptual) port of the associated ConnectivityService.			
protectionRole	ProtectionRole	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The protection role of the (conceptual) port of the associated ConnectivityService. It is recommended the alignment with the priority of ResilienceRoute.			
csepRole	CsepRole	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Defines the role of the CSEP in the context of the Connectivity Service spec. There may be many CSEP role - CS spec combinations for a particular CSEP where each corresponds to a specific Connectivity Service associated with the CSEP.			
_capacity *Navigable association end of:* *CSEPHasCapacityPac*	TapiCommon::TypeDefinitions::Capacity	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityServiceEndPoint (CSEP) capacity.			
_state *Navigable association end of:* *CSEPHasStatePac*	TapiCommon::ObjectClasses::AdminStatePac	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectivityServiceEndPoint (CSEP) status information.			
_serviceInterfacePoint *Navigable association end of:* *CSEPTerminatesOnSIP*	TapiCommon::ObjectClasses::ServiceInterfacePoint	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The supporting ServiceInterfacePoint (SIP) instance.			
_connectionEndPoint *Navigable association end of:* *CSEPRelatesToCEP*	ConnectionEndPoint	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated ConnectionEndPoint (CEP) instances.			

Attribute Name	Type	Mult.	Access	Stereotypes
_peerFwdConnectivityServiceEndPoint *Navigable association end of:* *CSEPHasForwardingPeerCSEP*	ConnectivityServiceEndPoint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated ConnectivityServiceEndPoint (CSEP) instance from forwarding perspective.			
_serverConnectivityServiceEndPoint *Navigable association end of:* *CSEPHasServerCSEP*	ConnectivityServiceEndPoint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated ConnectivityServiceEndPoint (CSEP) instance at a server layer protocol (qualifier).			
_protectingConnectivityServiceEndPoint *Navigable association end of:* *CSEPIsProtectedByCSEP*	ConnectivityServiceEndPoint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated ConnectivityServiceEndPoint (CSEP) instance from resilience perspective.			
_assembledConnectivityServiceEndPoint *Navigable association end of:* *CSEPHasAssembledCSEPs*	ConnectivityServiceEndPoint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated ConnectivityServiceEndPoint (CSEP) instances from assembling perspective, e.g. in inverse multiplexing schemes.			
_layerProtocolConstraint *Navigable association end of:* *CsepHasLayerProtocolConstraint*	LayerProtocolConstraint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The constraints applicable at specific layers.			

Attribute Name	Type	Mult.	Access	Stereotypes
_profile *Navigable association end of:* *CsepRefersProfile*	TapiCommon::ObjectClasses::Profile	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_sinkProfile *Navigable association end of:* *CsepRefersSinkProfile*	TapiCommon::ObjectClasses::Profile	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_sourceProfile *Navigable association end of:* *CsepRefersSourceProfile*	TapiCommon::ObjectClasses::Profile	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 10 – Attributes for class *ConnectivityServiceEndPoint*

1.2.11 ConnectivityServiceInternalPoint

Description:

- Experimental class for complex/detailed provisioning schemes.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol of the ConnectivityServiceInternalPoint (CSIP).			
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The layer protocol qualifier of the ConnectivityServiceInternalPoint (CSIP).			
_connectionEndPoint *Navigable association end of:* *CSIPRelatesToCEP*	ConnectionEndPoint	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated ConnectionEndPoint (CEP) instances.			
_nodeEdgePoint *Navigable association end of:* *CSIPTerminatesOnNEP*	TapiTopology::ObjectClasses::NodeEdgePoint	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The supporting NodeEdgePoint (NEP) instance.			

Attribute Name	Type	Mult.	Access	Stereotypes
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 11 – Attributes for class *ConnectivityServiceInternalPoint*

1.2.12 LayerProtocolConstraint

Description:

- LayerProtocolConstraint allows to specify constraints at any layer, by allowing the technology specific augmentations of the generic CSEP.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolName	TapiCommon::TypeDefinitions::LayerProtocolName	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			

Attribute Name	Type	Mult.	Access	Stereotypes
layerProtocolQualifier	TapiCommon::TypeDefinitions::LayerProtocolQualifier	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 12 – Attributes for class *LayerProtocolConstraint*

1.2.13 ResilienceConstraint

Description:

- The parameters of a protection/restoration scheme of a ConnectivityService or Connection.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
resilienceType	TapiTopology::TypeDefinitions::ResilienceType	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The type of resiliency (protection/restoration).			
restorationCoordinateType	CoordinateType	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The coordination mechanism between protection/restoration operations across multiple layers.			
faultConditionDetermination	FaultConditionDetermination	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The types of the determinations of a fault condition on a serial compound link connection within the protected domain. Ref: G.808 Amendment 1 (03/2018)			
restorePriority	PrimitiveTypes::Integer	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: 0 highest priority, 1 lower, etc.			
setUpPriority	PrimitiveTypes::Integer	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The priority with respect to other possible concurrent requests. 0 highest priority, 1 lower, etc.			
reversionMode	ReversionMode	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Indicates whether the protection/restoration scheme is revertive or non-revertive.			

Attribute Name	Type	Mult.	Access	Stereotypes
waitToRevertTime	TapiCommon::TypeDefinitions::TimePeriod	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: If the protection/restoration scheme is revertive, this attribute specifies the time to wait after a fault clears on a higher priority (preferred) resource before reverting to the preferred resource.			
holdOffTime	PrimitiveTypes::Integer	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: This attribute indicates the time, in milliseconds, between declaration of signal degrade or signal fail, and the initialization of the protection/restoration switching algorithm.			
isLockOut	PrimitiveTypes::Boolean Default value: *false*	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY Deprecated
	Description: The resource is configured to temporarily not be available for use in the protection/restoration scheme(s) it is part of. This overrides all other control states including e.g. "forced". If the item is locked out then it cannot be used under any circumstances. Note: Only relevant when part of a protection/restoration scheme.			
isFrozen	PrimitiveTypes::Boolean Default value: *false*	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Temporarily prevents any switch action to be taken and, as such, freezes the current state of the protection/restoration scheme. Until the freeze is cleared, additional near-end external commands are rejected and fault condition changes and signalling (e,g, received APS messages) are ignored. All administrative controls of any aspect of the protection/restoration scheme are rejected.			
isCoordinatedSwitchingBothEnds	PrimitiveTypes::Boolean Default value: *false*	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: Is operating such that the switching at both ends of each flow across the resilient forwarding entity (e.g. ConnectivityService or Connection) is coordinated at both ingress and egress ends.			
maxSwitchTimes	PrimitiveTypes::Integer	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Used to limit the maximum switch times. When the impairment on preferred/intended resource disappears and traffic returns to the preferred/intended resource, switch counter reset.			
preferredRestorationLayer	TapiCommon::TypeDefinitions::LayerProtocolName	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Indicates which layer protocol this resilience parameters package is configured for.			
selectionControl	SelectionControl	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Degree of administrative control applied to the switch selection.			
_resiliencyRouteConstraint *Navigable association end of:* *ResilienceConstraintHasRouteConstraint*	ResiliencyRouteConstraint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated constraints related to resiliency routes.			

Table 13 – Attributes for class *ResilienceConstraint*

1.2.14 ResilienceRoute

Description:

- This object adds resilience and state attributes to the Route. When this object is not present, then the Route is intended as "current" Route of the Connection.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
routeState	RouteState	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Current information on the route selection.			
priority	PrimitiveTypes::Integer Default value: *0*	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Value of 0 (zero) means "unspecified priority". Highest priority is 1, sometimes referred as "preferred" or "main" or "intended" route. 2 has lower priority than 1, 3 has lower priority than 2, etc. It is recommended the alignment with the protectionRole of CEP/CSEP.			

Table 14 – Attributes for class *ResilienceRoute*

1.2.15 ResiliencyRouteConstraint

Description:

- The constraints related to the Resiliency route.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
priority	PrimitiveTypes::Integer Default value: *0*	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: Value of 0 (zero) means "unspecified priority". Highest priority is 1, sometimes referred as "preferred" or "main" or "intended" route. 2 has lower priority than 1, 3 has lower priority than 2, etc.			
_routingConstraint *Navigable association end of:* *ResiliencyRouteConstraintHasRoutingConstraint*	TapiPathComputation::ObjectClasses::RoutingConstraint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated routing constraints.			
_topologyConstraint *Navigable association end of:* *ResiliencyRouteConstraintHasTopologyConstraint*	TapiPathComputation::ObjectClasses::TopologyConstraint	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The associated topology constraints.			
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 15 – Attributes for class *ResiliencyRouteConstraint*

1.2.16 Route

Description:

- The Route of a Connection is modeled as a collection of ConnectionEndPoint (CEP) instances. The logical order of the ConnectionEndPoint (CEP) instances within the Route object can be inferred by the TAPI client by the knowledge of the topology information.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_resilienceRoute *Navigable association end of:* *RouteHasResilienceRoute*	ResilienceRoute	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Provides optional resilience and state attributes to the Route.			
_connectionEndPoint *Navigable association end of:* *RouteIsDescribedByCEPs*	ConnectionEndPoint	2..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectionEndPoint (CEP) instances composing the Route.			
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 16 – Attributes for class *Route*

1.2.17 Switch

Description:

- The class models the switched forwarding of traffic (traffic flow) between (conceptual) ports of resilient forwarding entities (e.g. resilient ConnectivityService, resilient Connection), these ports being mapped to ConnectionEndPoint (CEP) instances. A resilient forwarding entity may have two or more (conceptual) ports that provide alternative identical inputs/outputs, and one or more associated Switch instances to represent the alternative flow choices visible at the edge of the forwarding entity. The Switch instance represents and defines a protection switch structure conceptually encapsulated in the forwarding entity. The Switch instance essentially performs one of the functions of the Protection Group in a traditional model. It associates to 2 or more (conceptual) ports each playing the role of a Protection Unit. One or more protection, i.e. standby/backup, conceptual ports provide protection for one or more working (i.e. regular/main/preferred) ports where either protection or working can feed one or more protected port. The switch may be used in revertive or non-revertive (symmetric) mode. When in revertive mode it may define a waitToRestore time. It may be used in one of several modes including source switch, destination switched, source and destination switched, etc. (covering cases such as 1+1 and 1:1). It may be locked out (prevented from switching), force switched or manual switched. It will indicate switch state and change of state. The Switch can be switched away from all sources such that it becomes open and hence two coordinated switches can both feed the same (conceptual) port or CEP so long as at least one of the two is switched away from all sources (is "open"). The ability for a Switch to be "high impedance" allows bidirectional forwarding entities to be overlaid on the same bidirectional CEP where the appropriate control is enabled to prevent signal conflict. This ability allows multiple alternate routes to be present that otherwise would be in conflict.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_selectedConnectionEndPoint *Navigable association end of:* *SwitchSelectsCEPs*	ConnectionEndPoint	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The ConnectionEndPoint (CEP) instance(s) which is (are) currently selected for traffic flow.			
_selectedRoute *Navigable association end of:* *SwitchSelectsRoute*	Route	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The Route instance(s) which is (are) currently selected for traffic flow.			

Attribute Name	Type	Mult.	Access	Stereotypes
selectionReason	SelectionReason	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The reason for the current switch selection.			
switchDirection	TapiCommon::TypeDefinitions::Direction	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Sink direction is intended from the unreliable to reliable CEPs. Source direction is the reverse.			
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 17 – Attributes for class *Switch*

1.2.18 SwitchControl

Description:

- Represents the capability to control and coordinate Switch instances, to add/delete/modify Connections and to add/delete/modify CEPs so as to realize a protection scheme.

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA

- objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
_subSwitchControl *Navigable association end of:* *ControlGovernsControls*	SwitchControl	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: Recursive association to represents hierarchical schemes.			
_switch *Navigable association end of:* *ControlChoosesSwitchPosition*	Switch	0..*	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The Switch instances composing the protection scheme.			
_controlParameters *Navigable association end of:* *ControlHasParameters*	ResilienceConstraint	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The parameters of the protection scheme.			
uuid Inherited: *TapiCommon::ObjectClasses::GlobalClass::uuid*	TapiCommon::TypeDefinitions::Uuid	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: UUID: An identifier that is universally unique within an identifier space, where the identifier space is itself globally unique, and immutable. An UUID carries no semantics with respect to the purpose or state of the entity. UUID here uses string representation as defined in RFC 4122. The canonical representation uses lowercase characters. Pattern: [0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-' + '[0-9a-fA-F]{4}-[0-9a-fA-F]{12} Example of a UUID in string representation: f81d4fae-7dec-11d0-a765-00a0c91e6bf6			
name Inherited: *TapiCommon::ObjectClasses::GlobalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 18 – Attributes for class *SwitchControl*

1.2.19 SwitchOperation

Applied stereotypes:

- OpenModelClass
  - support: MANDATORY
- OpenInterfaceModelClass
  - objectCreationNotification: NA
  - objectDeletionNotification: NA

Attribute Name	Type	Mult.	Access	Stereotypes
operationType	SelectionControl	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_switchControl *Navigable association end of:* *SwitchOperationAppliesToSwitchControl*	SwitchControl	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_switch *Navigable association end of:* *SwitchOperationAppliesToSwitch*	Switch	0..1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description:			
_connectionEndPoint *Navigable association end of:* *SwitchOperationAppliesToCep*	ConnectionEndPoint	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description:			
localId Inherited: *TapiCommon::ObjectClasses::LocalClass::localId*	PrimitiveTypes::String	1	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: true • valueRange: no range constraint • support: MANDATORY
	Description: An identifier that is unique in the context of the GlobalClass from which it is inseparable.			
name Inherited: *TapiCommon::ObjectClasses::LocalClass::name*	TapiCommon::TypeDefinitions::NameAndValue	0..*	RW	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: List of names. This value is unique in some namespace but may change during the life of the entity. A name carries no semantics with respect to the purpose of the entity.			

Table 19 – Attributes for class *SwitchOperation*

1.3 Signals

1.4 Associations

1.4.1 CEPAggregatesCEPs

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
aggregatedConnectionEndPoint	shared	Yes	ConnectionEndPoint	0..*
connectionendpoint	none	No	ConnectionEndPoint	0..1

Table 20 – Member ends for association *CEPAggregatesCEPs*

1.4.2 CEPHasStatePac

Applied stereotype:

- ExtendedComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_state	composite	Yes	TapiCommon::ObjectClasses::OperationalStatePac	1
_connectionEndPoint	none	No	ConnectionEndPoint	1

Table 21 – Member ends for association *CEPHasStatePac*

1.4.3 CEPIsSupportedByParentNEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_parentNodeEdgePoint	none	Yes	TapiTopology::ObjectClasses::NodeEdgePoint	1
connectionendpoint	none	No	ConnectionEndPoint	0..*

Table 22 – Member ends for association *CEPIsSupportedByParentNEP*

1.4.4 CEPListHasCEPs

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionEndPoint	composite	Yes	ConnectionEndPoint	0..*
cepholder	none	No	CepList	1

Table 23 – Member ends for association *CEPListHasCEPs*

1.4.5 CEPSupportsClientNEPs

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_clientNodeEdgePoint	shared	Yes	TapiTopology::ObjectClasses::NodeEdgePoint	0..*
_connectionEndPoint	none	No	ConnectionEndPoint	1

Table 24 – Member ends for association *CEPSupportsClientNEPs*

1.4.6 CSEPHasAssembledCSEPs

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_assembledConnectivityServiceEndPoint	none	Yes	ConnectivityServiceEndPoint	0..*
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 25 – Member ends for association *CSEPHasAssembledCSEPs*

1.4.7 CSEPHasCapacityPac

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_capacity	composite	Yes	TapiCommon::TypeDefinitions::Capacity	0..1
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 26 – Member ends for association *CSEPHasCapacityPac*

1.4.8 CSEPHasForwardingPeerCSEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_peerFwdConnectivityServiceEndPoint	none	Yes	ConnectivityServiceEndPoint	0..1
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 27 – Member ends for association *CSEPHasForwardingPeerCSEP*

1.4.9 CSEPHasServerCSEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_serverConnectivityServiceEndPoint	none	Yes	ConnectivityServiceEndPoint	0..1
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 28 – Member ends for association *CSEPHasServerCSEP*

1.4.10 CSEPHasStatePac

Applied stereotype:

- ExtendedComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_state	composite	Yes	TapiCommon::ObjectClasses::AdminStatePac	1
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 29 – Member ends for association *CSEPHasStatePac*

1.4.11 CSEPIsProtectedByCSEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_protectingConnectivityServiceEndPoint	none	Yes	ConnectivityServiceEndPoint	0..1
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 30 – Member ends for association *CSEPIsProtectedByCSEP*

1.4.12 CSEPRelatesToCEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionEndPoint	none	Yes	ConnectionEndPoint	0..*
_connectivityServiceEndPoint	none	No	ConnectivityServiceEndPoint	0..1

Table 31 – Member ends for association *CSEPRelatesToCEP*

1.4.13 CSEPTerminatesOnSIP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_serviceInterfacePoint	none	Yes	TapiCommon::ObjectClasses::ServiceInterfacePoint	1
_connServicePort	none	No	ConnectivityServiceEndPoint	0..*

Table 32 – Member ends for association *CSEPTerminatesOnSIP*

1.4.14 CSIPRelatesToCEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionEndPoint	none	Yes	ConnectionEndPoint	0..*
connectivityserviceinternalpoint	none	No	ConnectivityServiceInternalPoint	1

Table 33 – Member ends for association *CSIPRelatesToCEP*

1.4.15 CSIPTerminatesOnNEP

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_nodeEdgePoint	none	Yes	TapiTopology::ObjectClasses::NodeEdgePoint	1
connectivityserviceinternalpoint	none	No	ConnectivityServiceInternalPoint	0..*

Table 34 – Member ends for association *CSIPTerminatesOnNEP*

1.4.16 CepRefersProfile

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_profile	shared	Yes	TapiCommon::ObjectClasses::Profile	0..*
connectionendpoint	none	No	ConnectionEndPoint	0..*

Table 35 – Member ends for association *CepRefersProfile*

1.4.17 CepRefersSinkProfile

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_sinkProfile	shared	Yes	TapiCommon::ObjectClasses::Profile	0..*
connectionendpoint	none	No	ConnectionEndPoint	0..*

Table 36 – Member ends for association *CepRefersSinkProfile*

1.4.18 CepRefersSourceProfile

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_sourceProfile	shared	Yes	TapiCommon::ObjectClasses::Profile	0..*
connectionendpoint	none	No	ConnectionEndPoint	0..*

Table 37 – Member ends for association *CepRefersSourceProfile*

1.4.19 ConnProtSrvHasSwitchOperation

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_switchOperation	composite	Yes	SwitchOperation	1..*
connectivityprotectionservice	none	No	ConnectivityProtectionService	1

Table 38 – Member ends for association *ConnProtSrvHasSwitchOperation*

1.4.20 ConnServHasSubordinateConnServ

Description:

- Useful to specify constraints for subordinate Connectivity Services, e.g. in case of a protection scheme which does not span the whole parent Connectivity Service.

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectivityService	shared	Yes	ConnectivityService	0..*
connectivityservice	none	No	ConnectivityService	1

Table 39 – Member ends for association *ConnServHasSubordinateConnServ*

1.4.21 ConnServiceHasCSEPs

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_endPoint	composite	Yes	ConnectivityServiceEndPoint	2..*
_service	none	No	ConnectivityService	1

Table 40 – Member ends for association *ConnServiceHasCSEPs*

1.4.22 ConnServiceHasCSIPs

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_internalPoint	composite	Yes	ConnectivityServiceInternalPoint	0..*
connectivityservice	none	No	ConnectivityService	1

Table 41 – Member ends for association *ConnServiceHasCSIPs*

1.4.23 ConnServiceHasConnConstraints

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectivityConstraint	composite	Yes	ConnectivityConstraint	1
_service	none	No	ConnectivityService	1

Table 42 – Member ends for association *ConnServiceHasConnConstraints*

1.4.24 ConnServiceHasResilienceConstr

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_resilienceConstraint	composite	Yes	ResilienceConstraint	0..1
connectivityservice	none	No	ConnectivityService	1

Table 43 – Member ends for association *ConnServiceHasResilienceConstr*

1.4.25 ConnServiceHasRoutingConstr

Description:

- Test comment

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_routingConstraint	composite	Yes	TapiPathComputation::ObjectClasses::RoutingConstraint	0..1
connectivityservice	none	No	ConnectivityService	1

Table 44 – Member ends for association *ConnServiceHasRoutingConstr*

1.4.26 ConnServiceHasStatePac

Applied stereotype:

- ExtendedComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_state	composite	Yes	TapiCommon::ObjectClasses::AdminStatePac	1
_service	none	No	ConnectivityService	1

Table 45 – Member ends for association *ConnServiceHasStatePac*

1.4.27 ConnServiceHasTopLevelConnections

Applied stereotype:

- LifecycleAggregate

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connection	shared	Yes	Connection	0..*
_service	none	No	ConnectivityService	0..1

Table 46 – Member ends for association *ConnServiceHasTopLevelConnections*

1.4.28 ConnServiceHasTopologyConstraints

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_topologyConstraint	composite	Yes	TapiPathComputation::ObjectClasses::TopologyConstraint	0..*
connectivityservice	none	No	ConnectivityService	1

Table 47 – Member ends for association *ConnServiceHasTopologyConstraints*

1.4.29 ConnTerminatesOnCEP

Applied stereotype:

- LifecycleAggregate

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionEndPoint	shared	Yes	ConnectionEndPoint	2..*
_connPort	none	No	Connection	1..*

Table 48 – Member ends for association *ConnTerminatesOnCEP*

1.4.30 ConnectionAndRouteHasConn

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connection	none	Yes	Connection	1
connectionandroute	none	No	ConnectionAndRoute	1

Table 49 – Member ends for association *ConnectionAndRouteHasConn*

1.4.31 ConnectionAndRouteHasRoute

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_route	none	Yes	Route	0..1
connectionandroute	none	No	ConnectionAndRoute	1

Table 50 – Member ends for association *ConnectionAndRouteHasRoute*

1.4.32 ConnectionEncapsulatesSwitchControl

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_switchControl	composite	Yes	SwitchControl	0..*
connection	none	No	Connection	1

Table 51 – Member ends for association *ConnectionEncapsulatesSwitchControl*

1.4.33 ConnectionExclusion

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionExclusion	none	Yes	Connection	0..*
connectivityconstraint	none	No	ConnectivityConstraint	1

Table 52 – Member ends for association *ConnectionExclusion*

1.4.34 ConnectionHasLowerLevelConnections

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_lowerConnection	shared	Yes	Connection	0..*
connection	none	No	Connection	0..1

Table 53 – Member ends for association *ConnectionHasLowerLevelConnections*

1.4.35 ConnectionHasRoutes

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
route	composite	Yes	Route	0..*
_connection	none	No	Connection	1

Table 54 – Member ends for association *ConnectionHasRoutes*

1.4.36 ConnectionHasServerLayerConnections

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_serverConnection	none	Yes	Connection	0..*
connection	none	No	Connection	0..1

Table 55 – Member ends for association *ConnectionHasServerLayerConnections*

1.4.37 ConnectionHasStatePac

Applied stereotype:

- ExtendedComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_state	composite	Yes	TapiCommon::ObjectClasses::OperationalStatePac	1
_connection	none	No	Connection	1

Table 56 – Member ends for association *ConnectionHasStatePac*

1.4.38 ConnectionInclusion

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionInclusion	none	Yes	Connection	0..*
connectivityconstraint	none	No	ConnectivityConstraint	1

Table 57 – Member ends for association *ConnectionInclusion*

1.4.39 ConnectionIsBoundedByNode

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_boundingNode	none	Yes	TapiTopology::ObjectClasses::Node	0..1
connection	none	No	Connection	0..*

Table 58 – Member ends for association *ConnectionIsBoundedByNode*

1.4.40 ConnectionSupportsClientLinks

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_supportedClientLink	none	Yes	TapiTopology::ObjectClasses::Link	0..*
_supportingConnection	none	No	Connection	0..*

Table 59 – Member ends for association *ConnectionSupportsClientLinks*

1.4.41 ConstrHasCorouteIncl

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_corouteInclusion	none	Yes	ConnectivityService	0..1
_connectivityConstraint	none	No	ConnectivityConstraint	1

Table 60 – Member ends for association *ConstrHasCorouteIncl*

1.4.42 ConstrHasDiversityExcl

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_diversityExclusion	none	Yes	ConnectivityService	0..*
_connectivityConstraint	none	No	ConnectivityConstraint	1

Table 61 – Member ends for association *ConstrHasDiversityExcl*

1.4.43 ContextHasConnService

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectivityService	composite	Yes	ConnectivityService	0..*
connectivitycontext	none	No	ConnectivityContext	1

Table 62 – Member ends for association *ContextHasConnService*

1.4.44 ContextHasConnections

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connection	composite	Yes	Connection	0..*
connectivitycontext	none	No	ConnectivityContext	1

Table 63 – Member ends for association *ContextHasConnections*

1.4.45 ControlChoosesSwitchPosition

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_switch	composite	Yes	Switch	0..*
switchcontrol	none	No	SwitchControl	1

Table 64 – Member ends for association *ControlChoosesSwitchPosition*

1.4.46 ControlGovernsControls

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_subSwitchControl	none	Yes	SwitchControl	0..*
switchcontrol	none	No	SwitchControl	1

Table 65 – Member ends for association *ControlGovernsControls*

1.4.47 ControlHasParameters

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_controlParameters	composite	Yes	ResilienceConstraint	1
switchcontrol	none	No	SwitchControl	1

Table 66 – Member ends for association *ControlHasParameters*

1.4.48 CsepHasLayerProtocolConstraint

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_layerProtocolConstraint	composite	Yes	LayerProtocolConstraint	0..*
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	1

Table 67 – Member ends for association *CsepHasLayerProtocolConstraint*

1.4.49 CsepRefersProfile

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_profile	shared	Yes	TapiCommon::ObjectClasses::Profile	0..*
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	0..*

Table 68 – Member ends for association *CsepRefersProfile*

1.4.50 CsepRefersSinkProfile

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_sinkProfile	shared	Yes	TapiCommon::ObjectClasses::Profile	0..*
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	0..*

Table 69 – Member ends for association *CsepRefersSinkProfile*

1.4.51 CsepRefersSourceProfile

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_sourceProfile	shared	Yes	TapiCommon::ObjectClasses::Profile	0..*
connectivityserviceendpoint	none	No	ConnectivityServiceEndPoint	0..*

Table 70 – Member ends for association *CsepRefersSourceProfile*

1.4.52 ExcludeConnectionAndRoute

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_excludeConnectionAndRoute	composite	Yes	ConnectionAndRoute	0..1
connectionandrouteconstraint	none	No	ConnectionAndRouteConstraint	1

Table 71 – Member ends for association *ExcludeConnectionAndRoute*

1.4.53 IncludeConnectionAndRoute

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_includeConnectionAndRoute	composite	Yes	ConnectionAndRoute	0..1
connectionandrouteconstraint	none	No	ConnectionAndRouteConstraint	1

Table 72 – Member ends for association *IncludeConnectionAndRoute*

1.4.54 ResilienceConstraintHasRouteConstraint

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_resiliencyRouteConstraint	composite	Yes	ResiliencyRouteConstraint	0..*
resilienceconstraint	none	No	ResilienceConstraint	1

Table 73 – Member ends for association *ResilienceConstraintHasRouteConstraint*

1.4.55 ResiliencyRouteConstraintHasRoutingConstraint

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_routingConstraint	composite	Yes	TapiPathComputation::ObjectClasses::RoutingConstraint	0..1
resiliencyrouteconstraint	none	No	ResiliencyRouteConstraint	1

Table 74 – Member ends for association *ResiliencyRouteConstraintHasRoutingConstraint*

1.4.56 ResiliencyRouteConstraintHasTopologyConstraint

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_topologyConstraint	composite	Yes	TapiPathComputation::ObjectClasses::TopologyConstraint	0..1
resiliencyrouteconstraint	none	No	ResiliencyRouteConstraint	1

Table 75 – Member ends for association *ResiliencyRouteConstraintHasTopologyConstraint*

1.4.57 RouteHasResilienceRoute

Applied stereotype:

- StrictComposite

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_resilienceRoute	composite	Yes	ResilienceRoute	0..1
route	none	No	Route	1

Table 76 – Member ends for association *RouteHasResilienceRoute*

1.4.58 RouteIsDescribedByCEPs

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionEndPoint	shared	Yes	ConnectionEndPoint	2..*
route	none	No	Route	0..*

Table 77 – Member ends for association *RouteIsDescribedByCEPs*

1.4.59 SwitchOperationAppliesToCep

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_connectionEndPoint	shared	Yes	ConnectionEndPoint	0..*
switchoperation	none	No	SwitchOperation	1

Table 78 – Member ends for association *SwitchOperationAppliesToCep*

1.4.60 SwitchOperationAppliesToSwitch

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_switch	shared	Yes	Switch	0..1
switchoperation	none	No	SwitchOperation	1

Table 79 – Member ends for association *SwitchOperationAppliesToSwitch*

1.4.61 SwitchOperationAppliesToSwitchControl

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_switchControl	shared	Yes	SwitchControl	0..1
switchoperation	none	No	SwitchOperation	1

Table 80 – Member ends for association *SwitchOperationAppliesToSwitchControl*

1.4.62 SwitchSelectsCEPs

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_selectedConnectionEndPoint	none	Yes	ConnectionEndPoint	0..*
switchgroup	none	No	Switch	0..1

Table 81 – Member ends for association *SwitchSelectsCEPs*

1.4.63 SwitchSelectsRoute

Association end role name	Aggreg. type	Navigable	Target Class	Mult.
_selectedRoute	none	Yes	Route	0..*
switch	none	No	Switch	0..1

Table 82 – Member ends for association *SwitchSelectsRoute*

1.5 Abstractions

1.5.1 AugmentsRootContext

Augmenting Class	Augmented Class	Comment
ConnectivityContext	TapiCommon::ObjectClasses::TapiContext	Augments the base TAPI Context with ConnectivityContext model.
target: "/TapiCommon:Context:_context"		

Table 83 – Member ends for class abstraction *AugmentsRootContext*

1.5.2 CEPListAugmentsNEP

Augmenting Class	Augmented Class	Comment
CepList	TapiTopology::ObjectClasses::NodeEdgePoint	This augment allows NEP to refer to its CEPs despite TapiTopology model does not import TapiConnectivity model.
target: "/TapiCommon:Context:_context/TapiTopology:TopologyContext:_topologyContext/TapiTopology:TopologyContext:_topology/TapiTopology:Topology:_node/TapiTopology:Node:_ownedNodeEdgePoint"		

Table 84 – Member ends for class abstraction *CEPListAugmentsNEP*

1.5.3 CepAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
ConnectionEndPoint	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 85 – Member ends for class abstraction *CepAugmentsEventNotif*

1.5.4 CepAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
ConnectionEndPoint	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 86 – Member ends for class abstraction *CepAugmentsEventNotifSignal*

1.5.5 ConnAndRouteAugmentsConnServTopoConstr

Augmenting Class	Augmented Class	Comment
ConnectionAndRouteConstraint	TapiPathComputation::ObjectClasses::TopologyConstraint	
target: "/TapiCommon:Context:_context/TapiConnectivity:ConnectivityContext:_ConnectivityContext/TapiConnectivity:ConnectivityContext:_ConnectivityService/TapiConnectivity:ConnectivityService:_topologyConstraint"		

Table 87 – Member ends for class abstraction *ConnAndRouteAugmentsConnServTopoConstr*

1.5.6 ConnectionAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
Connection	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 88 – Member ends for class abstraction *ConnectionAugmentsEventNotif*

1.5.7 ConnectionAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
Connection	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 89 – Member ends for class abstraction *ConnectionAugmentsEventNotifSignal*

1.5.8 ConnectionAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
Connection	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord: streamRecord/TapiStreaming:StreamRecord: logRecord/TapiStreaming:LogRecord: logRecordBody"		

Table 90 – Member ends for class abstraction *ConnectionAugmentsLogRecordBody*

1.5.9 ConnectionEndPointAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
ConnectionEndPoint	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord:_streamRecord/TapiStreaming:StreamRecord:_logRecord/TapiStreaming:LogRecord:_logRecordBody"		

Table 91 – Member ends for class abstraction *ConnectionEndPointAugmentsLogRecordBody*

1.5.10 ConnectivityObjectTypeAugmentsObjectType

Augmenting Enumeration	Augmented Enumeration
ConnectivityObjectType - CONNECTION - CONNECTION_END_POINT - CONNECTIVITY_SERVICE - CONNECTIVITY_SERVICE_END_POINT - LAYER_PROTOCOL_CONSTRAINT - RESILIENCE_CONSTRAINT - RESILIENCE_ROUTE - RESILIENCE_ROUTE_CONSTRAINT - ROUTE - SWITCH - SWITCH_CONTROL	ObjectType - PROFILE - SERVICE_INTERFACE_POINT - TAPI_CONTEXT
Comment Enumeration Augment.	

Table 92 – Member ends for enum abstraction *ConnectivityObjectTypeAugmentsObjectType*

1.5.11 ConnectivityProtectionServiceAugmentsConnectivityService

Augmenting Class	Augmented Class	Comment
ConnectivityProtectionService	TapiConnectivity::ObjectClasses::ConnectivityService	
target: "/TapiCommon:Context:_context/TapiConnectivity:ConnectivityContext:_connectivityContext/TapiConnectivity:ConnectivityContext:_connectivityService"		

Table 93 – Member ends for class abstraction *ConnectivityProtectionServiceAugmentsConnectivityService*

1.5.12 ConnectivityServiceAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
ConnectivityService	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 94 – Member ends for class abstraction *ConnectivityServiceAugmentsEventNotif*

1.5.13 ConnectivityServiceAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
ConnectivityService	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 95 – Member ends for class abstraction *ConnectivityServiceAugmentsEventNotifSignal*

1.5.14 ConnectivityServiceAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
ConnectivityService	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord:_streamRecord/TapiStreaming:StreamRecord:_logRecord/TapiStreaming:LogRecord:_logRecordBody"		

Table 96 – Member ends for class abstraction *ConnectivityServiceAugmentsLogRecordBody*

1.5.15 ConnectivityServiceEndPointAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
ConnectivityServiceEndPoint	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord:_streamRecord/TapiStreaming:StreamRecord:_logRecord/TapiStreaming:LogRecord:_logRecordBody"		

Table 97 – Member ends for class abstraction *ConnectivityServiceEndPointAugmentsLogRecordBody*

1.5.16 CsepAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
ConnectivityServiceEndPoint	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context: context/TapiNotification:NotificationContext: notificationContext/TapiNotification:NotificationContext: eventNotification"		

Table 98 – Member ends for class abstraction *CsepAugmentsEventNotif*

1.5.17 CsepAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
ConnectivityServiceEndPoint	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 99 – Member ends for class abstraction *CsepAugmentsEventNotifSignal*

1.5.18 RouteAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
Route	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 100 – Member ends for class abstraction *RouteAugmentsEventNotif*

1.5.19 RouteAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
Route	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 101 – Member ends for class abstraction *RouteAugmentsEventNotifSignal*

1.5.20 RouteAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
Route	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord:_streamRecord/TapiStreaming:StreamRecord:_logRecord/TapiStreaming:LogRecord:_logRecordBody"		

Table 102 – Member ends for class abstraction *RouteAugmentsLogRecordBody*

1.5.21 SwitchAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
Switch	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 103 – Member ends for class abstraction *SwitchAugmentsEventNotif*

1.5.22 SwitchAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
Switch	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 104 – Member ends for class abstraction *SwitchAugmentsEventNotifSignal*

1.5.23 SwitchAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
Switch	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord:_streamRecord/TapiStreaming:StreamRecord:_logRecord/TapiStreaming:LogRecord:_logRecordBody"		

Table 105 – Member ends for class abstraction *SwitchAugmentsLogRecordBody*

1.5.24 SwitchControlAugmentsEventNotif

Augmenting Class	Augmented Class	Comment
SwitchControl	TapiNotification::Notifications::EventNotification	
target: "/TapiCommon:Context:_context/TapiNotification:NotificationContext:_notificationContext/TapiNotification:NotificationContext:_eventNotification"		

Table 106 – Member ends for class abstraction *SwitchControlAugmentsEventNotif*

1.5.25 SwitchControlAugmentsEventNotifSignal

Augmenting Class	Augmented Class	Comment
SwitchControl	TapiNotification::Notifications::EventNotification	
target: "/TapiNotification:Notifications:EventNotification"		

Table 107 – Member ends for class abstraction *SwitchControlAugmentsEventNotifSignal*

1.5.26 SwitchControlAugmentsLogRecordBody

Augmenting Class	Augmented Class	Comment
SwitchControl	TapiStreaming::ObjectClasses::LogRecordBody	
target: "/TapiStreaming:StreamRecord: streamRecord/TapiStreaming:StreamRecord: logRecord/TapiStreaming:LogRecord: logRecordBody"		

Table 108 – Member ends for class abstraction *SwitchControlAugmentsLogRecordBody*

1.6 Data Types

1.6.1 CepRole

Description:

- The role of the CEP in the context of the Connection spec.

Attribute Name	Type	Mult.	Access	Stereotypes
roleName	PrimitiveTypes::String	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey: yes – part: 1 • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The name of the CEP role in the context of the referenced spec.			
connectionSpecReference	ConnectionSpecReference	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey:No • isInvariant: false • valueRange: no range constraint • support: MANDATORY

Attribute Name	Type	Mult.	Access	Stereotypes
	Description: The reference to the spec that defines the CEP role.			

Table 109 – Attributes for data type *CepRole*

1.6.2 ConnectionSpecReference

Description:

- The reference to a spec for a type of Connection.

Attribute Name	Type	Mult.	Access	Stereotypes
connectionSpecName	PrimitiveTypes::String	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey:No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The name of the Connection spec. This can be used alone (with no spec reference) where there is only a paper spec.			
connectionSpecId	TapiCommon::TypeDefinitions::Uuid	0..1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey:No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The reference to a formal spec. This reference need not be provided (e.g., where there is no formal machine interpretable spec for the type of Connection).			

Table 110 – Attributes for data type *ConnectionSpecReference*

1.6.3 ConnectivityServiceSpecReference

Description:

- The reference to a spec for a type of Connectivity Service

Attribute Name	Type	Mult.	Access	Stereotypes
connectivityServiceSpecName	PrimitiveTypes::String	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey:No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The name of the Connectivity Service spec. This can be used alone (with no spec reference) where there is only a paper spec.			

Attribute Name	Type	Mult.	Access	Stereotypes
connectivityServiceSpecId	TapiCommon::TypeDefinitions::Uuid	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey:No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The reference to a formal spec. This reference need not be provided (e.g., where there is no formal machine interpretable spec for the type of Connectivity Service).			

Table 111 – Attributes for data type *ConnectivityServiceSpecReference*

1.6.4 CsepRole

Description:

- The role of the CSEP in the context of the Connectivity Service spec.

Attribute Name	Type	Mult.	Access	Stereotypes
roleName	PrimitiveTypes::String	1	R	OpenInterfaceModelAttribute • AVC: NA • Protobuf Index: 24 OpenModelAttribute • isKey: yes – part: 1 • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The name of the CSEP role in the context of the referenced spec.			
connectivityServiceSpecReference	ConnectivityServiceSpecReference	1	R	OpenInterfaceModelAttribute • AVC: NA OpenModelAttribute • isKey:No • isInvariant: false • valueRange: no range constraint • support: MANDATORY
	Description: The reference to the spec that defines the CSEP role.			

Table 112 – Attributes for data type *CsepRole*

1.7 Enumerations

1.7.1 ConnectivityObjectType

Description:

- The list of TAPI Connectivity Global Object Class types on which Notification signals can be raised.

Contains Enumeration Literals:

- CONNECTIVITY_SERVICE
  - The ConnectivityService class.

- CONNECTIVITY_SERVICE_END_POINT
  - The ConnectivityServiceEndPoint (CSEP) class.
- CONNECTION
  - The Connection class.
- CONNECTION_END_POINT
  - The ConnectionEndPoint (CEP) class.
- SWITCH_CONTROL
  - The SwitchControl class.
- SWITCH
  - The Switch class.
- ROUTE
  - The Route class.
- RESILIENCE_CONSTRAINT
  - The ResilienceConstraint class.
- RESILIENCE_ROUTE
  - The ResilienceRoute class.
- RESILIENCE_ROUTE_CONSTRAINT
  - The ResilienceRouteConstraint class.
- LAYER_PROTOCOL_CONSTRAINT
  - The ServerConstraint class.

1.7.2 CoordinateType

Description:

- The types of coordination mechanisms between protection/restoration operations across multiple layers.

Contains Enumeration Literals:

- NO_COORDINATE
  - No coordination, i.e. each layer network restores independently.
- HOLD_OFF_TIME
  - The client layer network protection/restoration process is suspended for a certain time to possibly allow server layer network to protect/restore, avoiding useless multi-layer protection/restoration. It is assumed that the server layer network successful protection/restoration operation will inherently cancel the protection/restoration trigger at client layer.
- WAIT_FOR_NOTIFICATION
  - The client layer network protection/restoration process is suspended until a notification is received from the server layer protection/restoration process. The notification should inform about the success or failure of the protection/restoration process at server layer.

1.7.3 FaultConditionDetermination

Description:

- ITU-T G.808 Amendment 1 (03/2018) - 3.2.6.8 subnetwork connection protection: "Transport entity protection for the case where the transport entity is a subnetwork connection. The serial compound link connection within the subnetwork connection is protected by adding bridges and selectors in the connection functions at the edges of the protected domain and an additional serial compound link connection between these connection functions. The determination of a fault condition on a serial

compound link connection within the protected domain can be performed as follows: (see enumeration entries)."

Contains Enumeration Literals:

- INHERENT
  - Inherent monitored (/I): The fault condition status of each link connection is derived from the status of the underlying server layer trail.
- NON_INTRUSIVE
  - Non-intrusive monitored (/N): Each serial compound link connection is extended with a non-intrusive monitoring termination sink function to derive the fault condition status from the traffic signal that is present.
- SUBLAYER
  - Sublayer monitored (/S): Each serial compound link connection is extended with tandem connection monitoring or segment termination/adaptation functions to derive the fault condition status independent of the traffic signal present.
- TEST
  - Test monitored (/T): Each serial compound link connection's fault condition status is derived from an additional monitored serial compound link connection transported via the same serial compound link.

1.7.4 ProtectionRole

Description:

- The protection role of a (conceptual) port of a forwarding entity, e.g. Link, ConnectivityService, Connection, PathComputationService, Path, VirtualNetworkService.

Contains Enumeration Literals:

- WORK
  - The unreliable/unprotected resource is assumed to be the preferred/intended/nominal/highest priority for usage.
- PROTECT
  - The unreliable/unprotected resource is assumed to be the spare/protection of a higher priority resource.
- PROTECTED
  - The resource which is reliable/protected/resilient by the protection/restoration scheme.
- NA
  - Protection role not applicable to the resource.
- WORK_RESTORE
  - The unreliable/unprotected resource is assumed to be the preferred/intended/nominal/highest priority for usage. Revertive behavior.
- PROTECT_RESTORE
  - The unreliable/unprotected resource is assumed to be the spare/protection of a higher priority resource. Revertive behavior.

1.7.5 ReversionMode

Description:

- The reversion mode associated with protection scheme.

Contains Enumeration Literals:

- REVERTIVE
  - A Connection switched to a lower priority (non-preferred/spare/protection) resource will revert to a higher priority (preferred/intended/nominal) resource when that recovers (potentially after some wait-to-revert-time).
- NON_REVERTIVE
  - A Connection switched to a lower priority (non-preferred/spare/protection) resource will not revert to a higher priority (preferred/intended/nominal) resource when that recovers. This mode is typically applied when there is no ranking between the redundant resources.

1.7.6 RouteState

Description:

- Potential Route states concerning the service support.

Contains Enumeration Literals:

- CURRENT
  - The Route instance identified is the current Route, i.e., is the one that is active and selected to support service.

    - Applied stereotype:
      - OpenInterfaceEnumerationLiteral
      - protobufEnumeration: 25
- NOT_CURRENT
  - The Route instance is not the one supporting the service.
- UNKNOWN
  - The Route state is unknown.

1.7.7 SelectionControl

Description:

- Possible degrees of administrative control applied to the Route selection.

Contains Enumeration Literals:

- LOCK_OUT
  - The resource is configured to temporarily not be available for use in the protection/restoration scheme(s) it is part of. This overrides all other protection/restoration control states including "forced". The effect is that the resource is either kept or switched to work role. If the item is locked out then it cannot be used under any circumstances. Note: Only relevant when part of a protection/restoration scheme.
- NORMAL
  - Remove of any previous administrative command (CLEAR) or no administrative command currently applied.
- MANUAL
  - The traffic is temporarily switched to the spare/protection resource, unless and until it is in a fault condition state. Note: Only relevant when part of a protection/restoration scheme.
- FORCED

    - The traffic is temporarily switched to the spare/protection resource, regardless its fault condition state, current or future. Note: Only relevant when part of a protection/restoration scheme.
- MANUAL_TO_WORK
    - The traffic is temporarily switched to the main/working resource, unless and until it is in a fault condition state. Note: Only relevant when part of a protection/restoration scheme.
- FORCED_TO_WORK
    - The traffic is temporarily switched to the main/working resource, regardless its fault condition state, current or future. Note: Only relevant when part of a protection/restoration scheme.

1.7.8 SelectionReason

Description:

- The cause of the current Route selection.

Contains Enumeration Literals:

- LOCKOUT
    - A "lockout" administrative command has been issued.
- NORMAL
    - No reason to affect the selection.
- MANUAL
    - A "manual" administrative command has been issued.
- FORCED
    - A "forced" administrative command has been issued.
- WAIT_TO_REVERT
    - The scheme is waiting for reversion to preferred/intended/nominal resource.
- SIGNAL_DEGRADE
    - A "signal degrade" condition is active.
- SIGNAL_FAIL
    - A "signal fail" condition is active.

1.7.9 ServiceType

Description:

- List of simple connectivity types.

Contains Enumeration Literals:

- POINT_TO_POINT_CONNECTIVITY
    - Point to point.
- POINT_TO_MULTIPOINT_CONNECTIVITY
    - Point to multipoint.
- MULTIPOINT_CONNECTIVITY
    - Multipoint to multipoint.
- ROOTED_MULTIPOINT_CONNECTIVITY
    - Rooted multipoint.

1.8 Primitives