A Yang Data Model for VN Operation
draft-ietf-teas-actn-vn-yang-04

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## Recent Changes

<table>
<thead>
<tr>
<th>Removed the tight coupling with ‘ACTN’</th>
<th>Now applicable to any type of VN operations</th>
<th>ACTN is <em>still</em> the primary example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Removed the prefix “actn”</td>
<td>ietf-actn-vn -&gt; ietf-vn</td>
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<tr>
<td></td>
<td>Removed the actn container in the yang module</td>
<td></td>
</tr>
</tbody>
</table>
VN Yang

- VN
  - Single node in TE Topology
    - abstract topology
    - Native TE Topology

Yang model for Virtual Network (VN) operations
  - From the point of view of Customer

An abstraction over the TE-Topo and TE-Tunnel
  - These models are from the point of view of Network

VN is a higher level of abstraction
  - VN model depends tightly on the topology model!
  - Use Connectivity Matrices
Related Yang Models

Service Models

- L3SM
- L2SM
- L1CSM

Augmented with underlying TE

VN

TE Models

- TE Topology
- TE Tunnel
Next Steps

Describe the usage of model and especially clarify its interactions with the TE topology model.

- Folks have raised questions related on how the VN parameters (bandwidth, delay etc.) is specified
- Relationship to connectivity matrices needs to be clarified.

Interaction with Services

- Maybe borrow some text from service mapping?
- Add references

How this VN model could also be base for Netslicing/VPN+

- Briefly describe and add references
Thanks!
BACKUP!
For both VN Type 1 or Type 2 VN Yang model rely on a single node in the abstract TE Topology.

The abstract node has:

- connectivity-matrices
- connectivity-matrix [id]

The attributes directly under container connectivity-matrices are the default attributes for all connectivity-matrix entries when the per entry corresponding attribute is not specified. When a per entry attribute is specified, it overrides the corresponding attribute directly under the container connectivity-matrices.
VN Type 1

• VN 1
  • VN-Member 1  L1-L4
  • VN-Member 2  L1-L7
  • VN-Member 3  L2-L4
  • VN-Member 4  L3-L8
  • This VN has following properties
    • Bandwidth 500
    • Optimize by delay

• VN is seen as edge to edge links (VN-members) setup as tunnels across underlying networks!
VN Type 2

- VN is seems as a topology of virtual nodes and links
- To ease mapping between VN Yang Model and TE models, an abstract single node topology is created with VN topology as the underlay!
- The same mapping as VN Type 1 is reused.
- VN 2
  - VN-Member 1: L1-L8 via S3, S67110, S11
    - Set via the underlay path in connectivity-matrix[id]
# How: Reference to TE Topology Yang Model

| Access | • AP/ VNAP -> LTP  
|        | • Ltp of type te-types:te-tp-id  
| Customer’s Virtual Network | • VN -> Abstract Node  
|                          | • vn-topology-id of type te-types:te-topology-id  
|                          | • abstract-node -> /nw:networks/network/node/tet:te-node-id (reference)  
| Customer Site to Site connection | • VN-Member -> Entry in the connectivity matrix of the abstract node  

All parameters which are can be set as global attributes to VN are set in the connectivity-matrices (such as bandwidth) and an attribute for a particular VN-member is set in the connectivity-matrix [id] (such as explicit path)! Duplicate parameters in VN Yang model are removed!