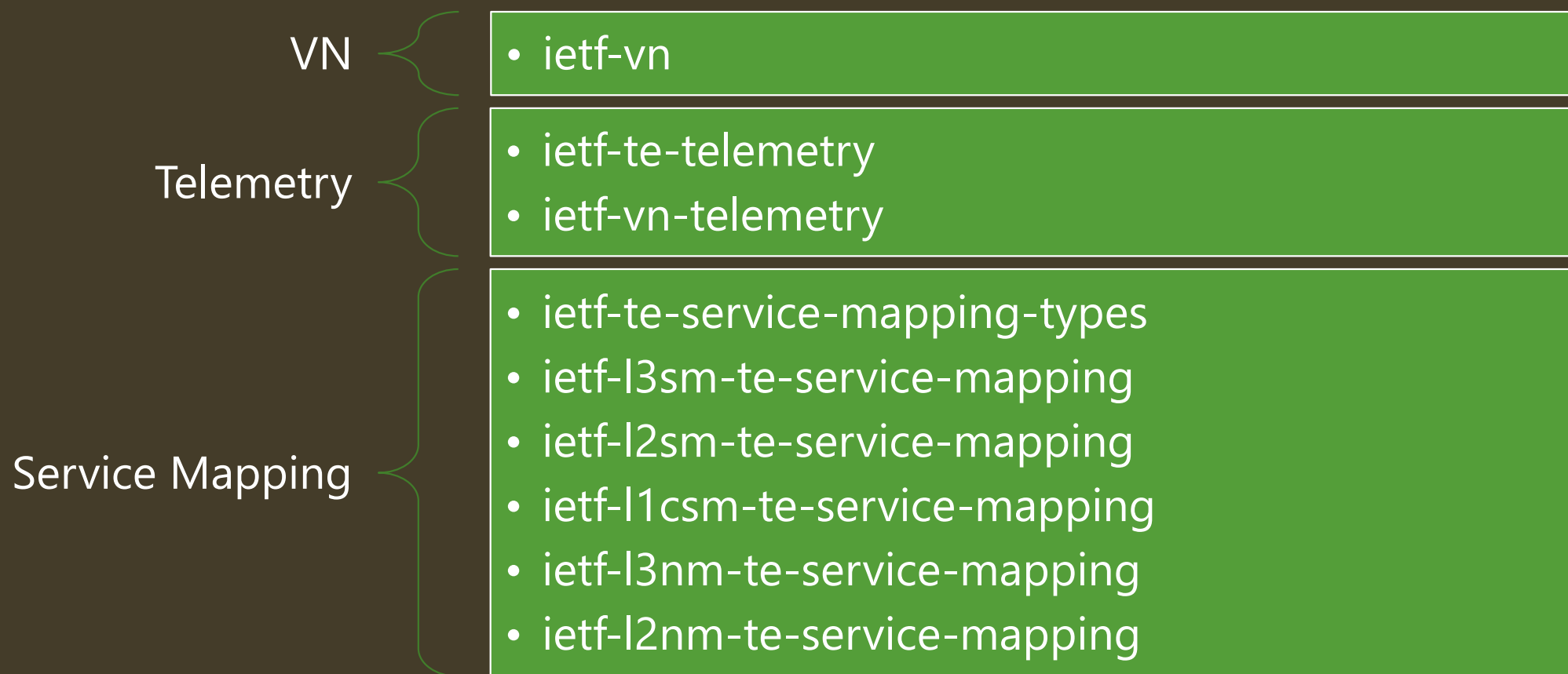


# ACTN/VN YANG Models

draft-ietf-teas-actn-vn-yang-13  
draft-ietf-teas-actn-pm-telemetry-autonomics-07  
draft-ietf-teas-te-service-mapping-yang-09

Dhruv Dhody, Young Lee, Daniele Ceccarelli, Igor Bryskin, Bin  
Yeong Yoon, Satish Karunanithi, Ricard Vilalta, Daniel King,  
Giuseppe Fioccola, Qin Wu, Jeff Tantsura

# YANG model overview

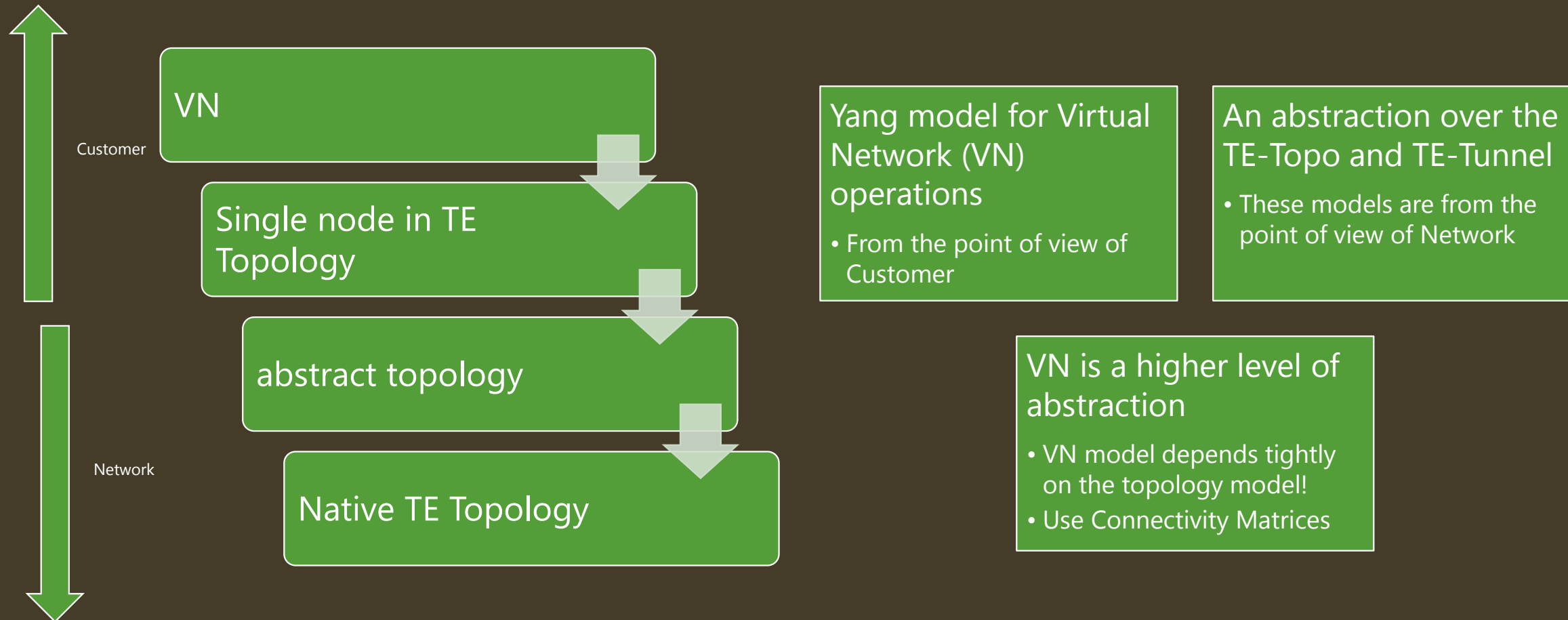


# VN YANG

draft-ietf-teas-actn-vn-yang-13

ietf-vn

# VN Yang



# Recent Changes

Resolved the naming issues

Empty container for underlay

- Note that the YANG model is tightly coupled with the TE Topology model [[RFC8795](#)]. Any underlay technology not supported by [[RFC8795](#)] is also not supported by this model. The model does include an empty container called "underlay" that can be augmented. For example the SR-policy information can be augmented for the SR underlay by a future model.

Updated description for vn-compute-status

Kenichi asked for adding "cos" as additional constraint

Updated JSON example

# Next Steps

- Are the recent changes acceptable?
- Any other open issues?
  
- In pipeline for WG LC...

# Telemetry YANG models

draft-ietf-teas-actn-pm-telemetry-autonomics-07

ietf-te-telemetry

ietf-vn-telemetry

# YANG models for VN/TE Telemetry & Network Autonomics

YANG data models that support: Performance Monitoring (PM) Telemetry and scaling intent mechanism for TE-Tunnels and VNs to allow customers to subscribe to certain performance related parameters.

- ietf-te-telemetry
- ietf-vn-te-telemetry

Customer to subscribe and monitor performance parameters of interest on a particular TE tunnel or a VN.

Customer could also program autonomic scaling intent



# Recent Changes

## Adrian's Comments

- Removed "KPI" from the model name
- Updated figures to depict the model relationships
- Scaling Example in XML added
- Many other nits and useful suggestions

## Greg's Comments

- Avoided the term "proactive" to describe the re-optimization
- Reference to OPSAWG's VPN Service PM YANG draft

## Others

- Updated Security Considerations

# Next Steps

- Review by OPSAWG
  - Should the authors request it or should that come from the chairs?
- Any other open issues?

# TE Service mapping YANG models

draft-ietf-teas-te-service-mapping-yang-09

[ietf-te-service-mapping-types](#)

[ietf-l3sm-te-service-mapping](#)

[ietf-l2sm-te-service-mapping](#)

[ietf-l1csm-te-service-mapping](#)

[ietf-l3nm-te-service-mapping](#)

[ietf-l2nm-te-service-mapping](#)

# TE Service Mapping Model

The role of TE-service Mapping model is to create a mapping relationship between

- Services
  - L3SM, L2SM, L1CSM, etc.
- Or, Network
  - L3NM, L2NM, with
- TE topo, TE tunnel, or VN

This mapping facilitates a seamless service operation with underlay-TE network visibility and control

Allow monitoring and diagnostics on how the service request are mapped to underlying TE resources

Support for various map-types

# Recent Changes

## Input from Adrian, Oscar, & Kenichi

- Added a clear section on the Purpose of the Service Mapping
- This mapping is exposed if there is an understanding of VN/Tunnels (otherwise it is an internal model)
- Scheduling is marked out of scope
- Mechanism to map traffic is also out of scope
  - One early stage attempt at [I-D.dhody-teas-te-traffic-yang]

# Next Steps

- Should this model be used to map to IETF network slice (or better to keep that for a future update)?
- Planning to add some more examples in the Appendix
- Any other open issues?

Thank You!

# Backup



# VN

```
module: ietf-vn
+--rw access-point
|   +--rw ap* [ap-id]
|       +--rw ap-id          ap-id
|       +--rw pe?
|           |   -> /nw:networks/network/node/tet:te-node-id
+--rw max-bandwidth?   te-types:te-bandwidth
+--rw avl-bandwidth?  te-types:te-bandwidth
+--rw vn-ap* [vn-ap-id]
|   +--rw vn-ap-id          ap-id
|   +--rw vn?              -> /virtual-network/vn/vn-id
|   +--rw abstract-node?
|       |   -> /nw:networks/network/node/tet:te-node-id
+--rw ltp?              leafref
+--ro max-bandwidth?   te-types:te-bandwidth
+--rw virtual-network
+--rw vn* [vn-id]
|   +--rw vn-id            vn-id
|   +--rw vn-topology-id? te-types:te-topology-id
|   +--rw abstract-node?
|       |   -> /nw:networks/network/node/tet:te-node-id
+--rw vn-member* [vnm-id]
|   +--rw vnm-id          vnm-id
|   +--rw src
|       |   +--rw src?          -> /access-point/ap/ap-id
|       |   +--rw src-vn-ap-id?
|       |       |   -> /access-point/ap/vn-ap/vn-ap-id
|       |   +--rw multi-src?    boolean {multi-src-dest}?
+--rw dest
|   |   +--rw dest?            -> /access-point/ap/ap-id
|   |   +--rw dest-vn-ap-id?
|   |       |   -> /access-point/ap/vn-ap/vn-ap-id
|   |   +--rw multi-dest?      boolean {multi-src-dest}?
+--rw connectivity-matrix-id? leafref
+--rw underlay
|   +--ro oper-status?          te-types:te-oper-status
+--ro if-selected?            boolean {multi-src-dest}?
+--rw admin-status?          te-types:te-admin-status
+--ro oper-status?           te-types:te-oper-status
+--rw vn-level-diversity?    te-types:te-path-disjointness
```

# Scaling Examples

The example in [Figure 8](#) shows the way to configure a TE tunnel with the scaling-out intent to re-optimize when the the scaling condition of two-way-delay crossing 100 milliseconds (100000 microseconds) for a threshold of 1 min (60000 milliseconds).

```
<edit-config xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <target>
    <running/>
  </target>
  <config>
    <te xmlns="urn:ietf:params:xml:ns:yang:ietf-te">
      <tunnels>
        <tunnel>
          <name>Tunnel1</name>
          <te-scaling-intent
            xmlns="urn:ietf:params:xml:ns:yang:
              ietf-te-telemetry">
            <scale-out-intent>
              <threshold-time>
                60000
              </threshold-time>
              <scaling-condition>
                <performance-type>
                  two-way-delay
                </performance-type>
                <threshold-value>
                  100000
                </threshold-value>
                <scale-out-op>
                  re-optimize
                </scale-out-op>
              </scaling-condition>
            </scale-out-intent>
          </te-scaling-intent>
        </tunnel>
      </tunnels>
    </te>
  </config>
</edit-config>
```

The example in [Figure 9](#) shows the way to configure a VN with the scaling-in intent to reduce bandwidth when the the scaling condition of two-way-delay crossing 100 milliseconds (100000 microseconds) for a threshold of 1 min (60000 milliseconds).

```
<edit-config xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <target>
    <running/>
  </target>
  <config>
    <virtual-network xmlns="urn:ietf:params:xml:ns:yang:ietf-vn">
      <vn>
        <vn-id>VN1</vn-id>
        <vn-scaling-intent
          xmlns="urn:ietf:params:xml:ns:yang:
            ietf-vn-telemetry">
          <scale-in-intent>
            <threshold-time>60000</threshold-time>
            <scaling-condition>
              <performance-type>
                utilized-percentage
              </performance-type>
              <threshold-value>
                50
              </threshold-value>
              <scale-in-op>
                scale-capacity-down
              </scale-in-op>
            </scaling-condition>
          </scale-in-intent>
        </vn-scaling-intent>
      </vn>
    </virtual-network>
  </config>
</edit-config>
```

# Purpose of the TE service mapping

## 1.1. Purpose of TE Service Mapping for Service Model

The TE service mapping for the LxSM supports:

- A mapping of the LxSM with the underlying TE resources. The TE resources could be in a form of VN, set of TE tunnels, TE abstract topology etc. This mapping can be populated by the network at the time of realization of the service. It is also possible to configure the mapping provided one is aware of VN/tunnels. This mapping model is used only when there is an awareness of VN or TE by the consumer of the model. Otherwise this mapping information is internal and used for monitoring and diagnostics purpose such as telemetry, auto-scaling, closed-loop automation.
- Possibility to request creation of a new VN/Tunnel to be binded to LxSM .
- Indication to share the VN/Tunnel sharing (with or without modification) for the LxSM.
- Support for configuration of underlying TE properties (as apposed to existing VN or tunnels).
- Provide some additional service characteristics for the LxSM models