

# A YANG Model for Network and VPN Service Performance Monitoring

**draft-www-opsawg-yang-vpn-service-pm-02**

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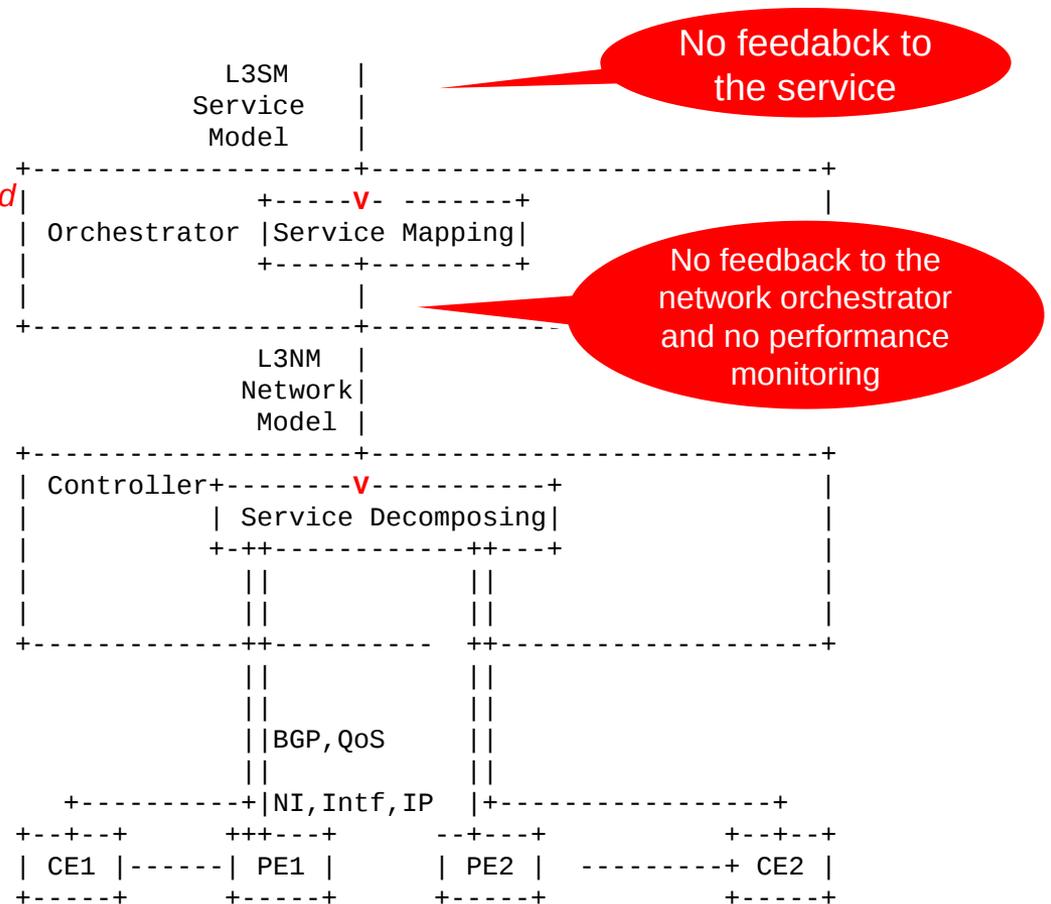
# The Problem Space: Network View

RFC4176:

*"The Provider Network Manager must monitor the devices' behavior to evaluate performance metrics associated with an SLS. Different measurement techniques may be necessary, depending on the service for which an SLA is provided. Example services are QoS, security, multicast, and temporary access. These techniques may be either intrusive or non-intrusive, depending on the parameters being monitored."*

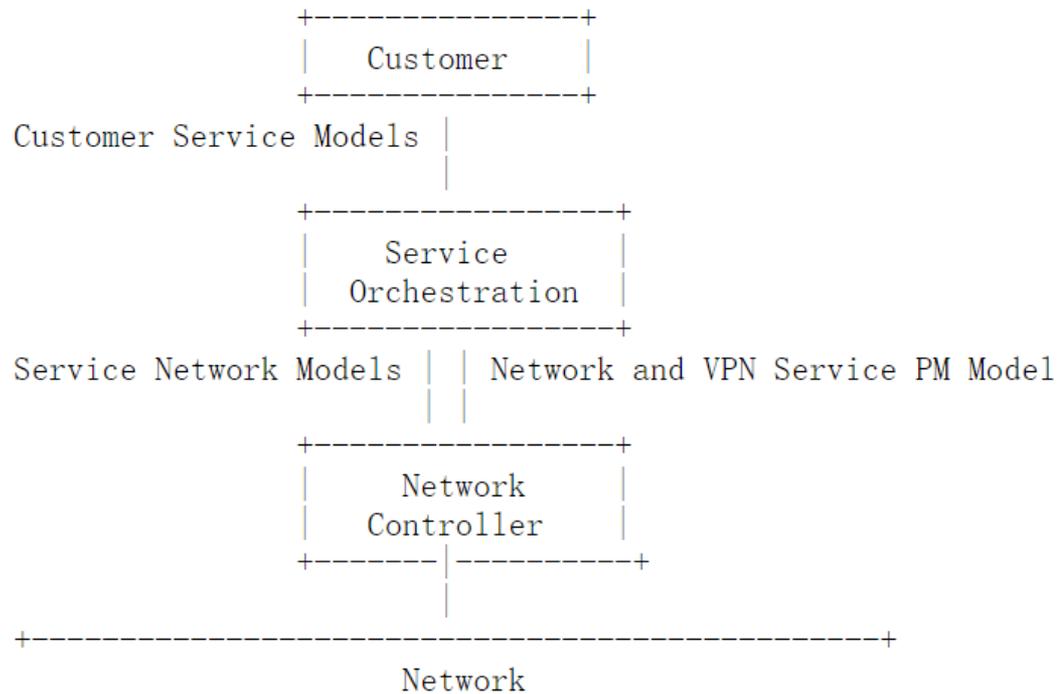
# The Problem Space: Gluing the Various Layers

- **draft-ietf-opsawg-model-automation-framework** describes a framework for service and network management automation
- LxNM models are used for service delivery automation process, *but performance monitoring and notifications is not supported by these models*
- **This draft fills this void**



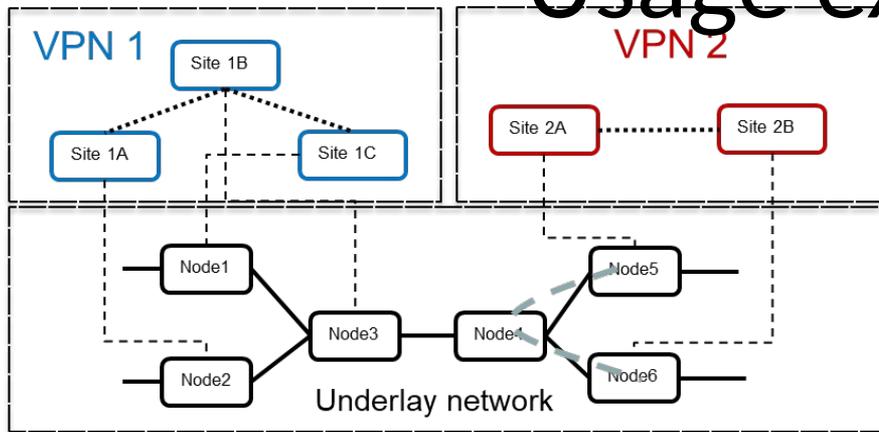
# The Proposed Approach

- **Augment** RFC8345 with the requirement VPN PM statistics



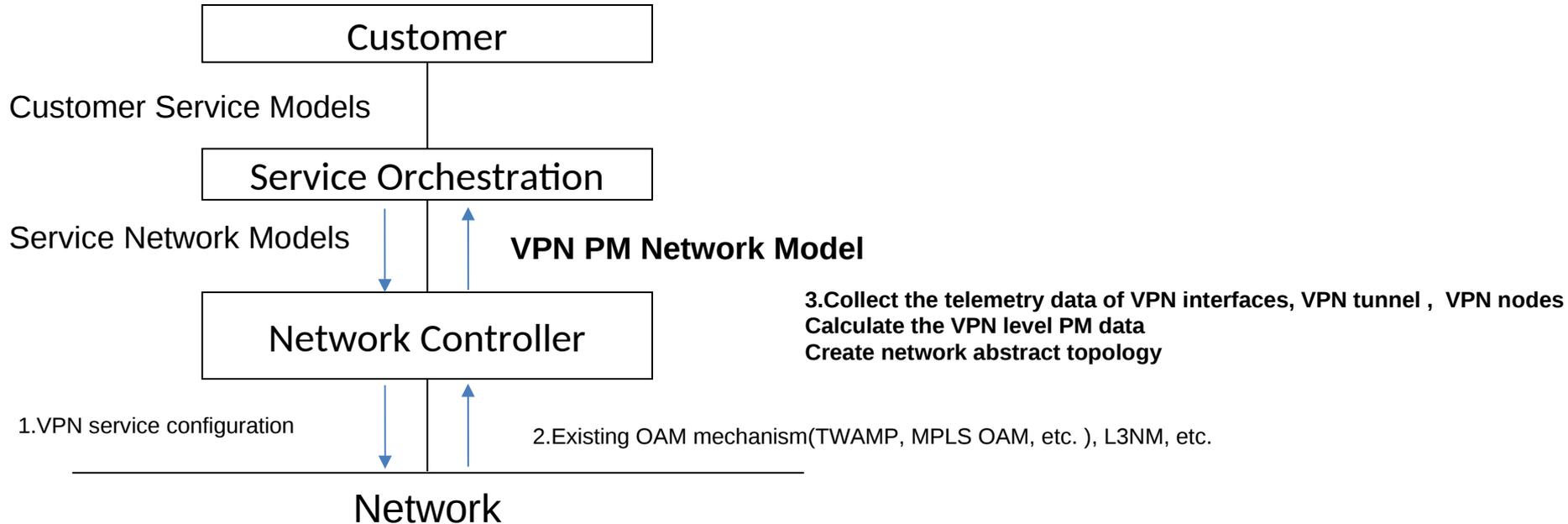
# VPN Performance Monitoring Model

## Usage example



### • VPN PM status

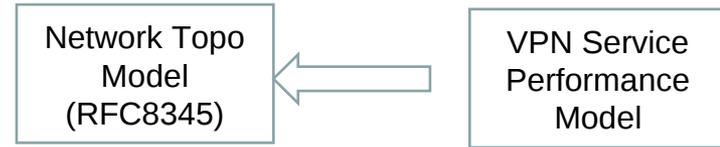
- Underlay overlay association
- VPN topology, LxNM association
- VPN node: site ID, VPN routes data
- VPN service OAM: Site to site delay, loss
- VPN interface: interface statistics, bandwidth utilization



# Model Design Overview

## module: ietf-network-vpn-pm

```
augment /nw:networks/nw:network/nw:network-types:
  +--rw network-service-type!
    +--rw network-service-type? identityref
augment /nw:networks/nw:network:
  +--rw vpn-topo-attributes
    +--rw l3nm-vpn-id? vpn-common:vpn-id
    +--rw vpn-topology? Identityref
augment /nw:networks/nw:network/nw:node:
  +--rw node-attributes
  | +--rw node-type? identityref
  | +--rw site-id? string
  | +--rw site-role? identityref
  +--rw vpn-summary-statistics
    +--rw ipv4
    | +--rw total-routes? uint32
    | +--rw total-active-routes? uint32
    +--rw ipv6
    +--rw total-routes? uint32
    +--rw total-active-routes? Uint32
augment /nw:networks/nw:network/nt:link:
  +--rw link-type? identityref
augment /nw:networks/nw:network/nt:link:
  +--rw low-percentile percentile
  +--rw high-percentile percentile
  +--rw middle-percentile percentile
  +--ro reference-time yang:date-and-time
  +--ro measurement-interval uint32
  +--ro link-telemetry-attributes
    +--ro loss-statistics
...
augment /nw:networks/nw:network/nw:node/nt:termination-point:
  +--ro tp-telemetry-attributes
    +--ro in-octets? uint32
    +--ro out-octets? uint32
    +--ro inbound-unicast? Uint32
...
```



- Augment Basic Network Topo model
  - with service topology parameters and vpn summary statistics info at network level
  - With site role of service topology parameters at node level
  - With performance attribute at link level and termination-point level
- The measurement interval and reference-time associated with these performance data usually depends on configuration parameters in [RFC8641] .

# Next Steps

- This draft provides one of the missing pieces to support the closed-loop YANG based system
  - It is proposed to be included to the VPN documents set
- The authors believe this draft is ready for WG adoption