YANG Data Model for Composed VPN Service Delivery

draft-evenwu-opsawg-yang-composed-vpn-01

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Recap

• Service model in RFC8309 describes a service and the parameters of the service independent of the equipment and operating environment.

• The service model may be divided into the two following categories:
  – Customer Service model (e.g., L3SM, L2SM):
    • Used to describe a connectivity service as offered or delivered to a customer by a network operator
    • Abstract service from customer view
    • Not directly configure network devices, protocols, or functions
    • Have no visibility to the network topology in the operator domain.

  – Service Delivery model:
    • Used by a network operator to define and manage how a connectivity service is engineered in the network.
    • Has visibility to the network topology in each network domain
    • Technology specific model including a set of parameters common across a network technology
Motivation

• None of the currently defined customer service models and service delivery model discusses
  – How to decompose end to end VPN service across multiple-domain environment into segmented tunnel or segmented VPN service in each domain;
  – Or compose segmented VPN service into one end to end VPN service.

• Composed VPN requirements have been briefly discussed and cooked in draft-deng-opsawg-composed-vpn-sm-requirements.
  https://www.ietf.org/mail-archive/web/opsawg/current/msg04610.html
  – Automate a VPN service delivery across multiple Operators is not practical since the segment VPN information may not be available using a single management system.
**Typical Use Case:** Two VPNs deployed at Metro and Core domain and are managed by different department.

- **Issue:** Order L3VPN service and L2VPN service from different service portal requires coordination between two departments.

- **Limitation:** In multi domain VPN deployment case, Customer service model (e.g., L3SM) doesn't have network visibility to network topo in operator domain and can *not provide service decomposition in different domain through a unified interface.*

- **Proposal:** Define composed VPN model between multiple domain orchestrator and domain controller for a single operator.
  - Customer can order L2VPN and L3VPN service separately, but operator with network visibility of end to end network topology have capability to manage the end to end service in a unified way.
Model Design

- **Access point (AP):** used as service access point for connectivity service segment between any two domains

- **Segment VPN:** The VPN deployment information in each domain

- **Composed VPN:**
  - End to end VPN deployment information across multiple domains
  - and can be mapped from L3SM/L2SM with additional operational cost.
Model Overview

**Composed VPN Model Structure**

```
+--rw composed-vpns
   +--rw composed-vpn* [vpn-id]
      +--rw vpn-id          yang:uuid
      +--rw vpn-name?       string
      +--rw customer-name?  yang:uuid
      +--rw topo?           svpn:topology
      +--rw service-type?   svpn:service-type
      +--rw technology?     svpn:tunnel-type
      +--rw admin-state?    svpn:admin-state
      +--ro oper-State?     svpn:oper-state
      +--ro sync-state?     svpn:sync-state
      +--rw start-time?     yang:date-and-time
      +--rw seg-vpns* [index]
      | ...
      +--rw access-points* [tp-id]
         +--rw tp-basic
         +--rw peer-ce-node
         +--rw route-protocol* [type]
```

**Segment VPN Model Structure**

```
+--rw segment-vpns
   +--rw segment-vpn* [index]
      +--rw index          uint32
      +--rw protect-role?   protection-role
      +--rw vpn-info
         +--rw (vpn-type)?
            +--rw vpn
               +--rw vpn-id?          yang:uuid
               +--rw vpn-name?        string
               +--rw topo?            Topology
               +--rw service-type?    service-type
               +--rw technology?      tunnel-type
               +--rw admin-state?     admin-state
               +--ro oper-state?      oper-state
               +--ro sync-state?      sync-state
               +--rw access-point* [tp-id]
                  ...
```

- Composed VPN is divided into two modules
  - "ietf-composed-vpn-svc" : global parameters and the essential components of a composed VPN that are used to provide end to end connectivity spanning across multiple domains.
  - "ietf-segmented-vpn" : per domain segmented vpn parameters and associated access point list parameters that are used to connect to the peer device or domain.

- **Relation between composed VPN, segmented VPN and access point:**
  - A composed-vpn is composed of at least one access points and at least one segmented vpns.
  - A segmented vpn under "segmented-vpn" list is composed of at least one access point.
• XML snippet describes the overall simplified service configuration of this composed VPN.
Next Step

- Create milestone for composed VPN
- Adopt the draft as the initial document.