YANG Data Model for Composite Delivery of VPN Service

draft-chen-opsawg-composite-vpn-dm-00

Rui Chen, Lucy Yong, Hui Deng from Huawei
Liang Geng from China Mobile
Chongfeng Xie from China Telecom

Tuesday (15th, Nov) Afternoon session II, OPSAWG
IETF97, Seoul
Background

L3VPN or L2VPN Base case
- Defined in IETF RFC (provide reference)

In real world, the two VPNs could be deployed as a composite network

- Attachment Circuit (AC in L3VPN) can be realized via a L2VPN
- Two VPN deployed at Metro and Core (spans multiple domain)
- From L2VPN perspective, there are ACs, i.e. AC1 & AC2
- From L3VPN perspective, there is a AC between CE and L3 PE.
- The case can apply to AC in site B and interface
L3VPN service is composed by L2VPN and L3VPN backbone networks (abbr. L2+L3)

Operators want to operate and maintain that composite network in agile way

<draft-deng-opsawg-composed-vpn-sm-requirements-01>
https://tools.ietf.org/id/draft-deng-opsawg-composed-vpn-sm-requirements-01.txt
Motivation

- Develop a **Composite deploy data model for VPN service**
  - Agile delivery VPN service on a multi-tech/multi-domain network infrastructure
  - Simplify the operation and maintenance by using an end-to-end service view
  - Coordinate the diagnosis and optimization based on a whole network view
  - Directly map the customers’ service to end-to-end network assets/resource

To reduce the operations and management cost while maintaining the necessary insight to their network.
OAM needs on composite network

- Need composite OAM tools/concept to support customer’s experience while customer may don’t care how to do, but operator do care according to network deployment.
- The detailed domain/technologies information is necessary for this composite OAM function, as similar OAM intent need different technologies.
- It’s meaningful to standardize the composite OAM concept concerning different vendor’s of domains, also for facing different department monitoring.

Composite OAM, such as E2E IP connectivity verify for L3VPN

CC ,tech. specified
Such as Y.1731

CC ,tech. specified
Such as BFD

IP Metro from vendor1/
In charge of departmentA

IP Core from vendor2/
In charge of departmentB
What we believe how it coordinated with L3SM/L2SM

According to <draft-wu-opsawg-service-model-explained-03>
https://tools.ietf.org/id/draft-wu-opsawg-service-model-explained-03.txt

L3SM/L2SM: Customer facing, focus on service agreement with Operator

Composite-delivery model: Operator facing, focused on how to map service request to diverse networks and be able to operate the service holistically.
Model Requirements

The model should:

- Focus on the operator's view for delivering VPN, in stead of the customer's view.
- Allow that the operator to quickly find detailed information related to VPN service of a particular customer according to operation needs.
- Must be able to express various composition of connectivity services spanning multiple network domain with various VPN technologies.
- Include basic information about end-to-end composite VPN service.
- Allow to define one or more VPN service information for each domain across customer’s sites.
- Facilitate operators to know the Access Point (AP) information for both end-to-end VPN service and domain VPN.
- Describe various QoS requirements which are supported.
- Able to model OAM requirements for end-to-end VPN service and domain VPN.

We call for more operators and vendors to get involved and provide their use cases and requirements.

Reference: draft-deng-opsawg-composed-vpn-sm-requirements-01
Frequently Asked Questions in offline discussion

• Is this a new VPN service?
  – Obviously not. It won’t define new VPN service or customer facing model, but it would define a model/pattern used by operator’s OSS to deploy VPN service into multi-domain/technologies networks.

• If the model not used among multiple operators, why standardize it (or publish a RFC)?
  – Operator’s OSS/BSS is a complicated ecosystem, involving many kinds system/software. Having a standard model will decrease the integration cost, especially in cases where solutions comes from different vendors for different network domains.

• If separate VPN model exists for each domain, why do we need a composite model above them?
  – To satisfy the customer’s end-to-end SLA requirements, operators need tools/models to manage their network services in more abstract holistic end-to-end manner and not through fragmented information from different technologies.
**Initial view of Model**

**AP:** Access point that are used as service access or point to connect service segments between domains

**Segment VPN:** The VPN deployment information for one domain

**Composed VPN:** The VPN information across one or more segments/domain, could be mapped from service model with extra operation needs.
Basic framework of Yang model

Composed VPN

--- Basic Information
  --- Topology
  --- Service Type
  --- ...

--- Access Point List
  --- Basic Information
  --- QoS
  --- Routing Protocol
  --- ...

--- Segment VPN List
  --- Basic Information
  --- Access Point List
  --- ...

Overall description for this composed VPN deployment

A list of APs that are used to connect to the peered customer sites, representing end-to-end service information

Describe how the segment VPN looks like and how it can communicate with peered devices outside this domain.

Initial ideas until now, we call for more experts to get involved to provide more requirements and provide implementable design.
Summary

• Proposal
  – To work on a composite service data model for VPN service in a multi-domain multi-technologies network

• Scope
  – Define network topology using different VPN technologies
  – The abstraction of end-to-end VPN deployment covering multi-domain network
  – Define the mechanism of how end-to-end service model could be mapped to multiple domain information
  – Initial focus on service fulfillment, then QOS, OAM, fault and performance management
  – Implement a YANG model supporting above functions.

• Motive
  – OPSAWG approved as a WG draft, or suggest the home WG.
  – Call for more operators involvement to introduce requirements
  – Call for more experts to contribute and provide comments.
Thank You and Comments
Termination Point

Ref: draft-chen-opsawg-composite-vpn-dm-00.txt (ietf-nvo-tp.yang)
Composed VPN

Ref: draft-chen-opsawg-composite-vpn-dm-00.txt (ietf-nvo-vpn.yang)