

YANG Data Model for Composite Delivery of VPN Service

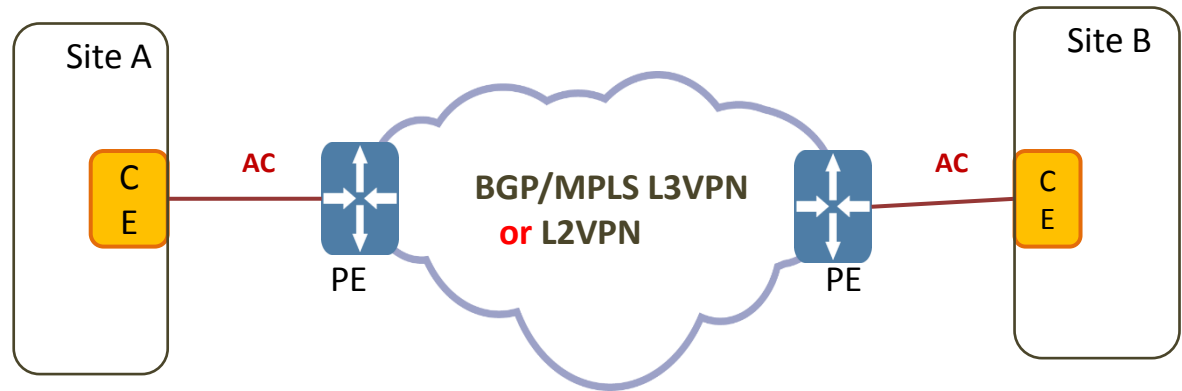
draft-chen-opsawg-composite-vpn-dm-00

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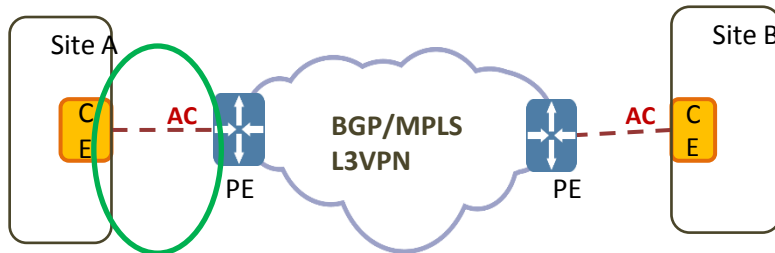
Tuesday(15th, Nov) Afternoon session II, OPSAWG
IETF97, Seoul

Background

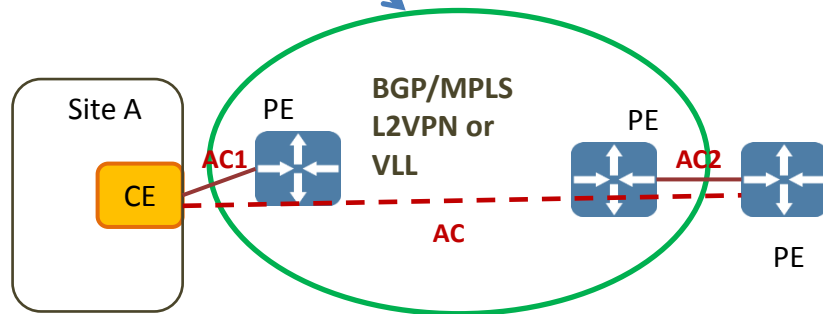
- L3VPN or L2VPN Base case
- Defined in IETF RFC (provide reference)



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



and



- 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)

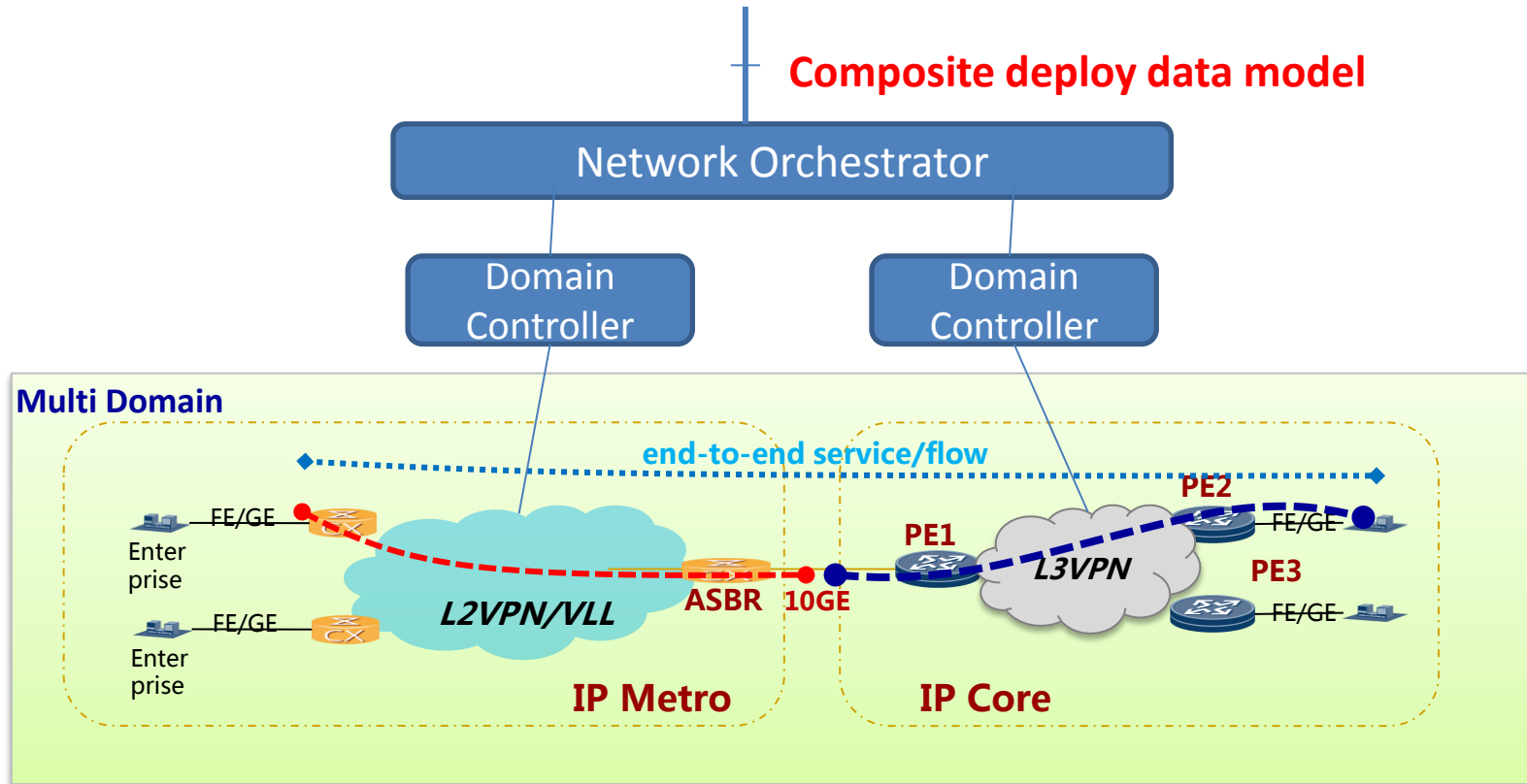
Operators want to operate and maintain that composite network in agile way

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

Motivation

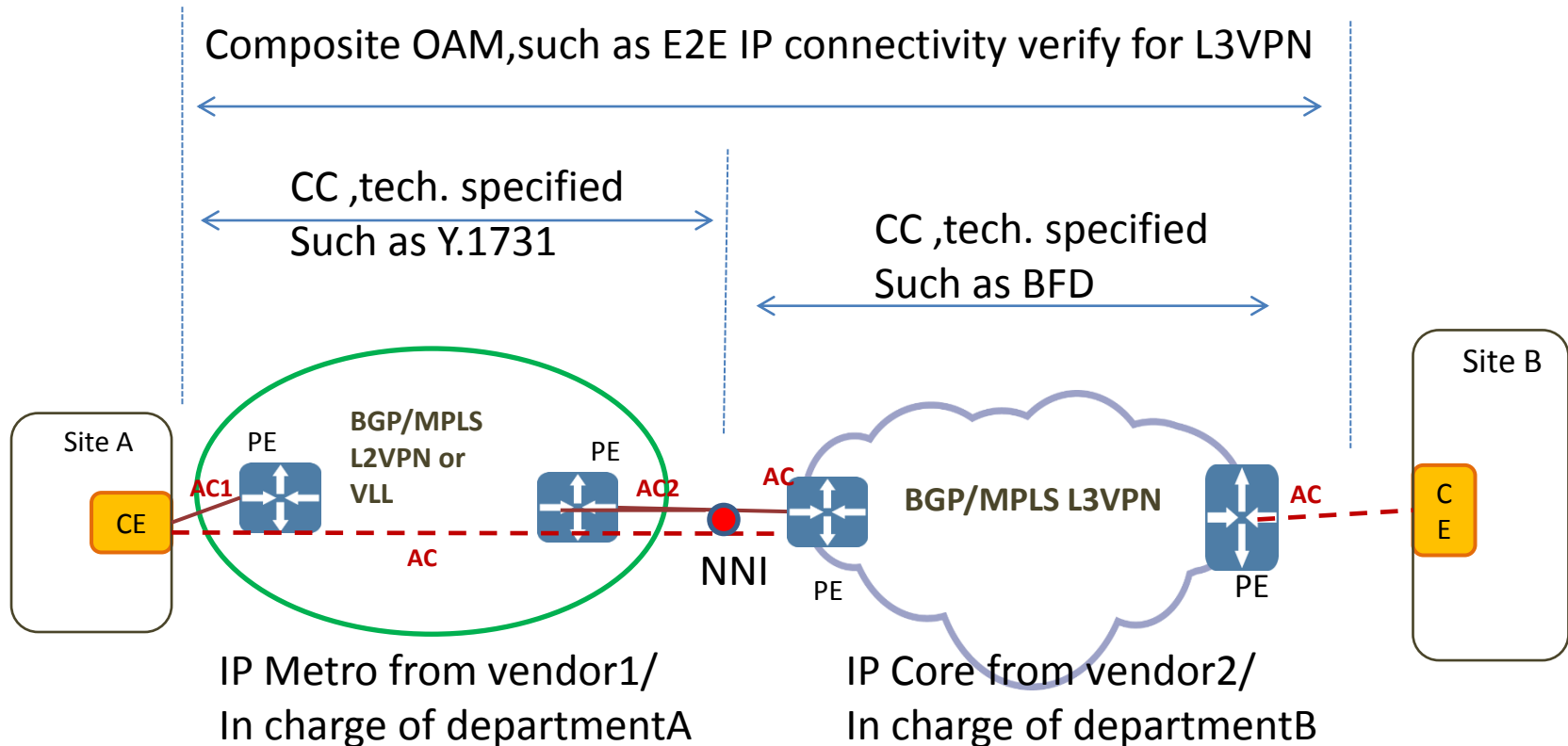
- Develop a **Composite deploy data model for VPN service**
 - Agile delivery VPN service on a multi-tech/multi-domain network infrastructure
 - Simplify the operation and maintenance by using an end-to-end service view
 - Coordinate the diagnosis and optimization based on a whole network view
 - Directly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

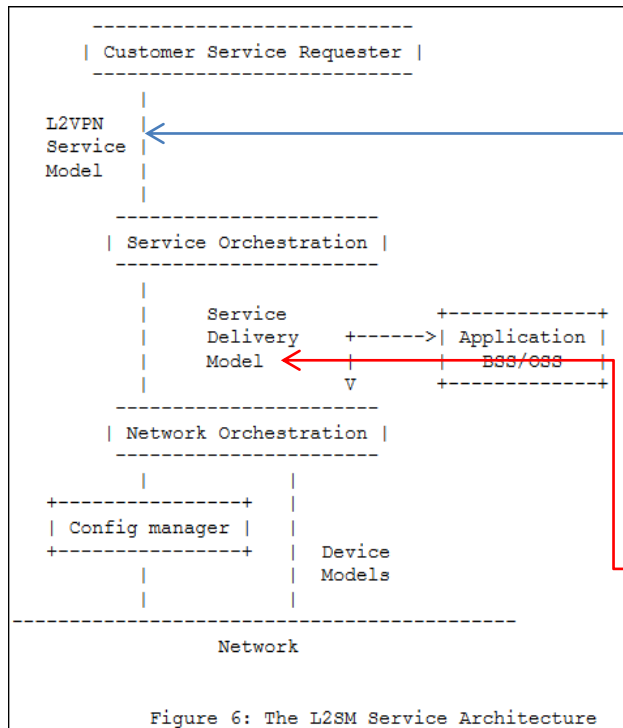
- Need composite OAM tools/concept to support customer's experience while customer may don't care how to do, but operator do care according to network deployment
- The detailed domain/technologies information is necessary for this composite OAM function, as similar OAM intent need different technologies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



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>



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

Customer side

Operator side

Service requestor /App

L3SM/
L2SM

Service Orchestrator

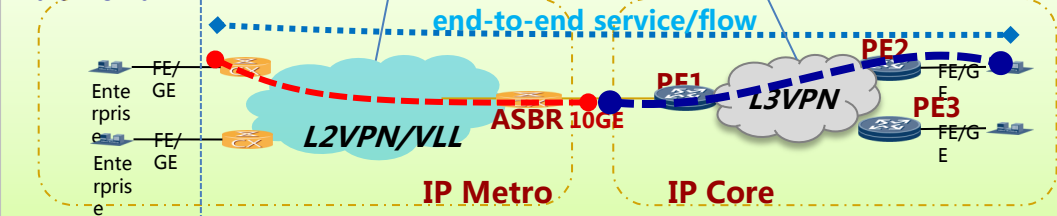
Composite deploy data model

Network Orchestrator

Domain Controller

Domain Controller

Multi Domain



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

Model Requirements

The model should:

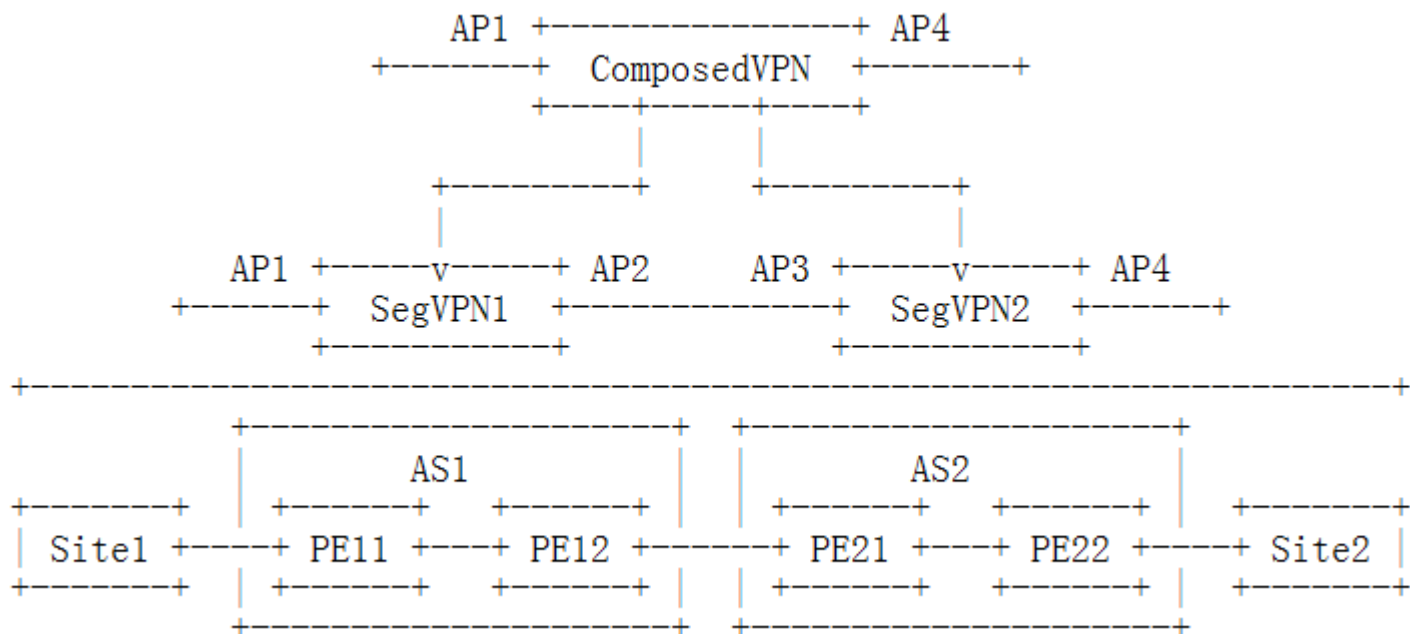
- Focus on the operator's view for delivering VPN, in stead of the customer's view.
- Allow that the operator to quickly find detailed information related to VPN service of a particular customer according to operation needs.
- Must be able to express various composition of connectivity services spanning 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.

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

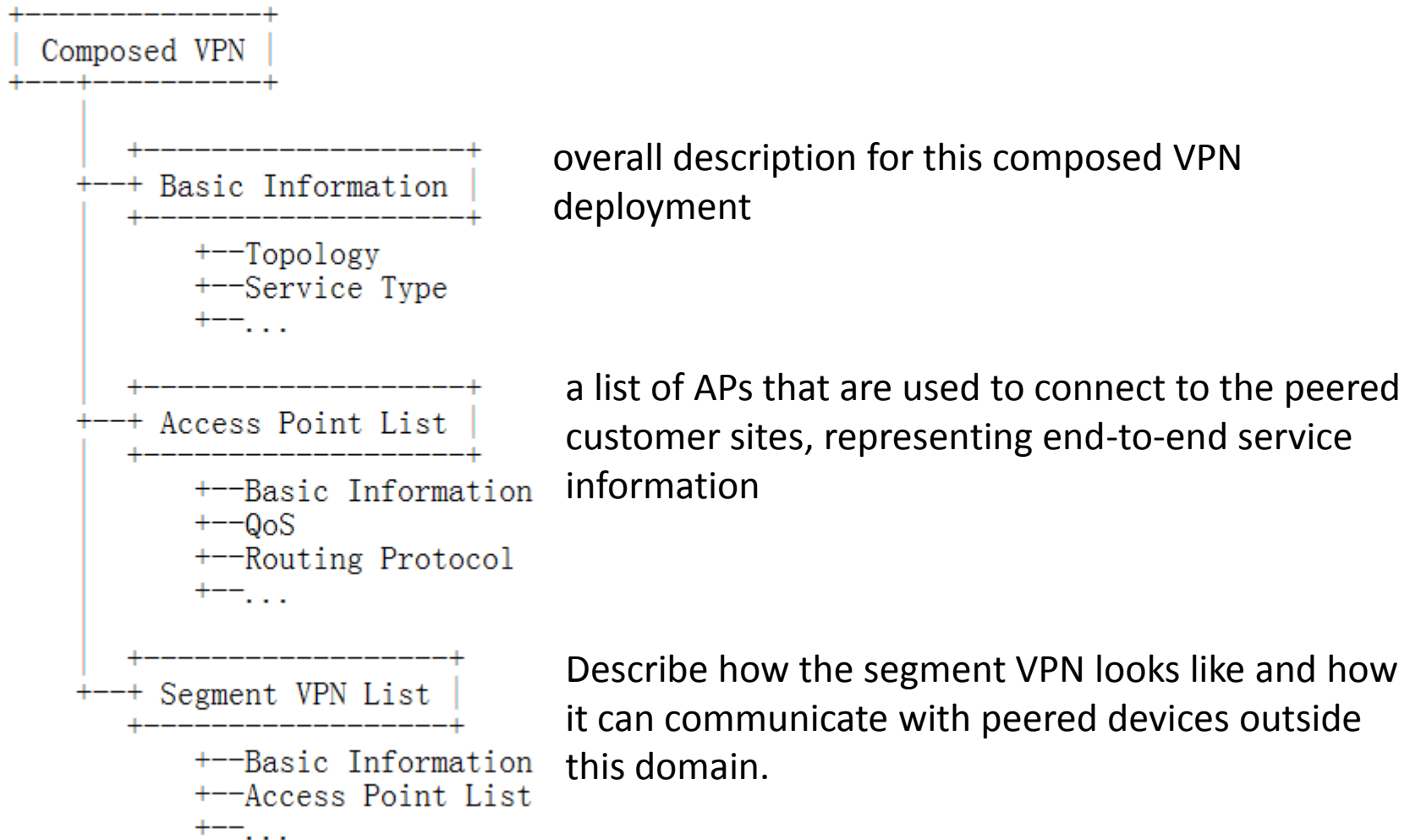


AP: Access point that are used as service access or point to connect service segments between domains

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



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.

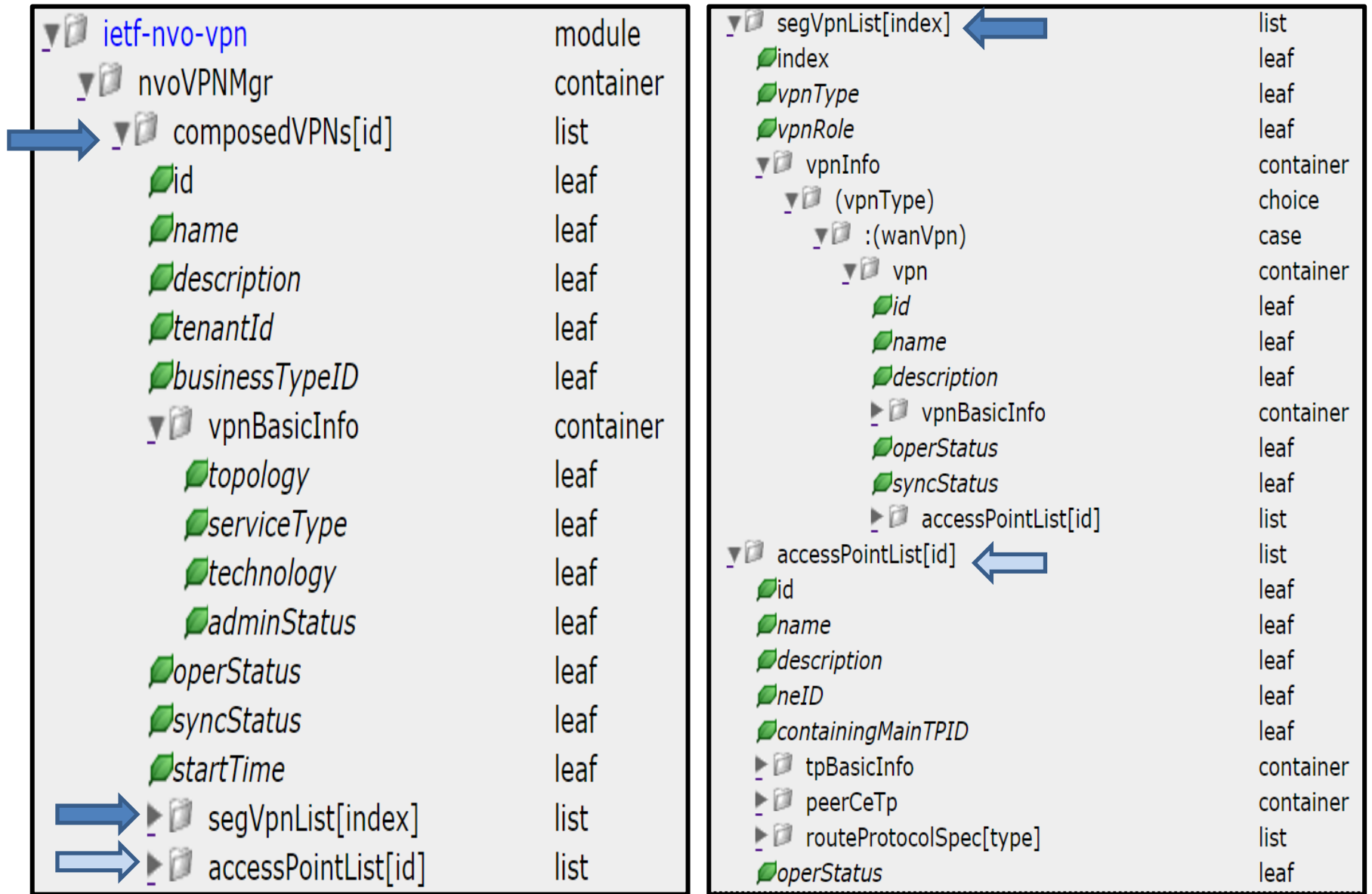
Thank You and Comments

Termination Point

▼ ietf-nvo-tp	module
▼ nvoTPMgr	container
▼ tps[id]	list
id	leaf
name	leaf
description	leaf
neID	leaf
containingMainTPID	leaf
▼ tpBasicInfo	container
edgePointRole	leaf
topologyRole	leaf
Type	leaf
workingLayer	leaf
typeSpecList[layerRate]st	
adminStatus	leaf
tpQosNode	container
flowServices	container
additionalInfo[name]	list
peerCeTp	container
routeProtocolSpec[type]	list
operStatus	leaf

▼ ietf-nvo-tp	module
▼ nvoTPMgr	container
▼ tps[id]	list
id	leaf
name	leaf
description	leaf
neID	leaf
containingMainTPID	leaf
tpBasicInfo	container
▼ peerCeTp	container
ceID	leaf
ceDirectNeID	leaf
ceDirectTPID	leaf
ceIfmasterIp	leaf
location	leaf
routeProtocolSpec[type]	list
operStatus	leaf

Composed VPN



accessPointList[id]

accessPointList[id]	list	
id	leaf	yang:uuid
name	leaf	string
description	leaf	string
neID	leaf	yang:uuid
containingMainTPID	leaf	yang:uuid
tpBasicInfo	container	
peerCeTp	container	
routeProtocolSpec[type]	list	
type	leaf	CommonTypes:RouteProtocolType
(para)	choice	
:(staticRouting)	case	
staticRouteItems[index]	list	
index	leaf	uint32
destinationCidr	leaf	string
egressTP	leaf	yang:uuid
routePreference	leaf	string
nextHopIp	leaf	string
:(bgp)	case	
bgpProtocols[index]	list	
index	leaf	uint32
peerAsNumber	leaf	uint64
bgpMaxPrefix	leaf	int32
bgpMaxPrefixAlarm	leaf	uint32
peerIp	leaf	string
operStatus	leaf	CommonTypes:OperStatus