A YANG Data Model for L2VPN Service Delivery

draft-wen-l2sm-l2vpn-service-model-03

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Traditional Service Delivery Workflow Limitations

- From customer order entry to actual service provisioning, the workflow process of traditional service delivery model typically involves inputting data sequentially into multiple OSS/BSS applications managed by different departments
- Many of these applications are custom built over the years and operating in silo mode
- Lacking of standard data input/output also causes lots of challenge in system integration and results in manual data entry
- Customer MACD(Move, Add, Change, Delete) will incur the same process in many cases
- Modernizing all these existing OSS/BSS systems requires tremendous effort in both manpower and capital spending

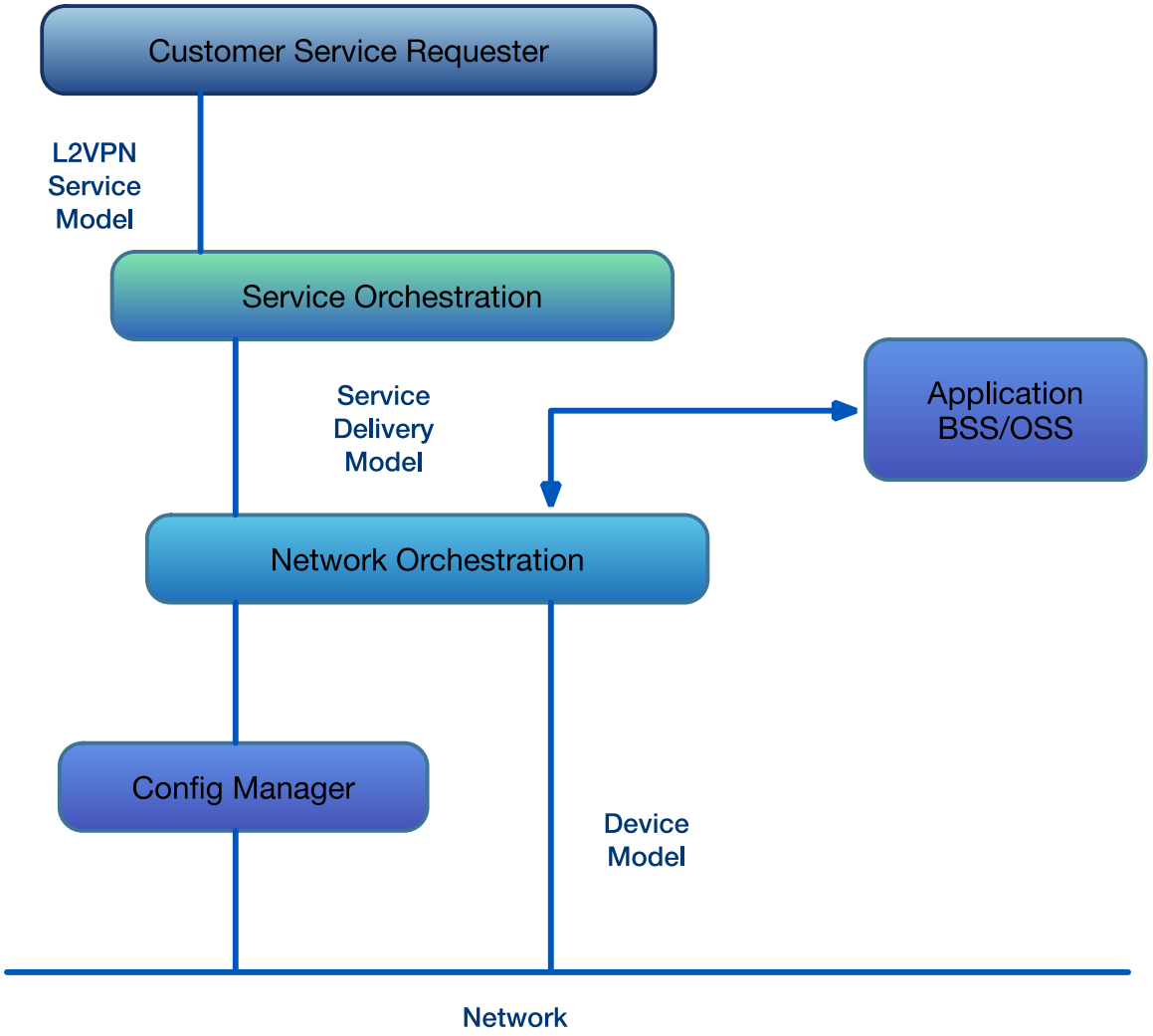
Motivation Behind a Standard Service Model

- Service delivery automation has demonstrated high potential of cost reduction and quick implementation to meet the surging customer demands

- As the industry is entering a new era of SDN, many providers are facing the challenge of how to protect and leverage existing investment in BSS/OSS tool while transforming into automated service delivery model

- Network automation offers many benefits in terms of improved scalability and reliability by replacing the high-touch manual provisioning model with a real-time, automated approach. However, there's still gap to be filled in order to present service information currently maintained in the traditional OSS/BSS model to the new management system such as network orchestrator.

Reference Architecture for the Use of the L2SM



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The IETF YANG Data Model for L2VPN Service

- The Layer 2 Service Model provides an abstracted interface to request, configure and manage the components of a L2VPN service
- This model is intended to be used by a subscriber to communicate with the provider on certain service attributes and inter-connect arrangements
- The L2SM data can be used as input for an orchestration layer that is responsible for configuring the network elements to enable the service
- The network orchestrator can also pass L2SM data back to existing OSS/BSS applications

Network Orchestrator vs Service Orchestrator

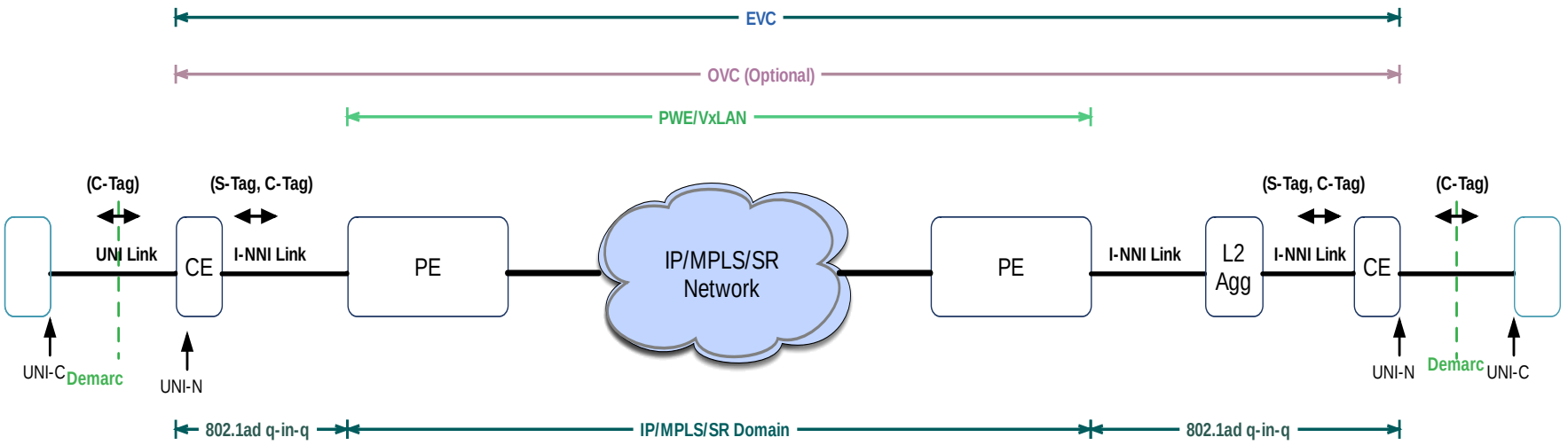
- The concept behind Network Service Orchestration is to decouple the customer services from actual network components, while automatically provisioning network elements to the service specifications
- In the past couple of years, the industry has seen lots of development in Network Orchestrator to control the network resources; However, very little attention has been paid to how to present the service attribute to the Network Orchestrator
- In order to overcome the bottleneck of traditional OSS/BSS practice and reduce revenue cycle, a new SDN component, Service Orchestrator, can be placed as far north as the interface between the service provider and the enterprise customers or partner providers.
- The Service Orchestrator consumes requests for services expressed in a standard form using YANG, applies operator policies, and generates instructions to the Network Orchestrator

Layer 2 VPN Service Types

- E-Line services: Point-to-Point Layer 2 connections.
  - EPL (Ethernet Private Line): EPL service provides delivering of all customer service frames between UNI-to-UNI interfaces using All-to-One Bundling. All unicast/broadcast/multicast packets are delivered unconditionally over the EVC. No service multiplexing is allowed on an EPL UNI interface.
  - EVPL (Ethernet Virtual Private Line): On the other hand, EVPL service supports multiplexing more than one Point-to-Point, or even other virtual private services, on the same UNI interface. Ingress service frames are conditionally transmitted through one of the EVCs based upon pre-agreed C-tag to EVC mapping. EVPL supports multiple C-tags to one EVC bundling.
- E-LAN services: Multipoint-to-Multipoint Layer 2 connections.
  - EP-LAN (Ethernet Private LAN Service): EP-LAN transparently connects multiple subscriber sites together with All-to-One Bundling. No service multiplexing is allowed on an EP-LAN UNI interface.
  - EVP-LAN (Ethernet Virtual Private LAN Service): EVP-LAN allows connecting to multiple EVCs from one or more of the UNI interfaces. Services frame disposition is based on C-tag to EVC mapping. EVP-LAN supports multiple C-tags to one EVC bundling.

L2SM Applicable Case 1: Single Provider EVC

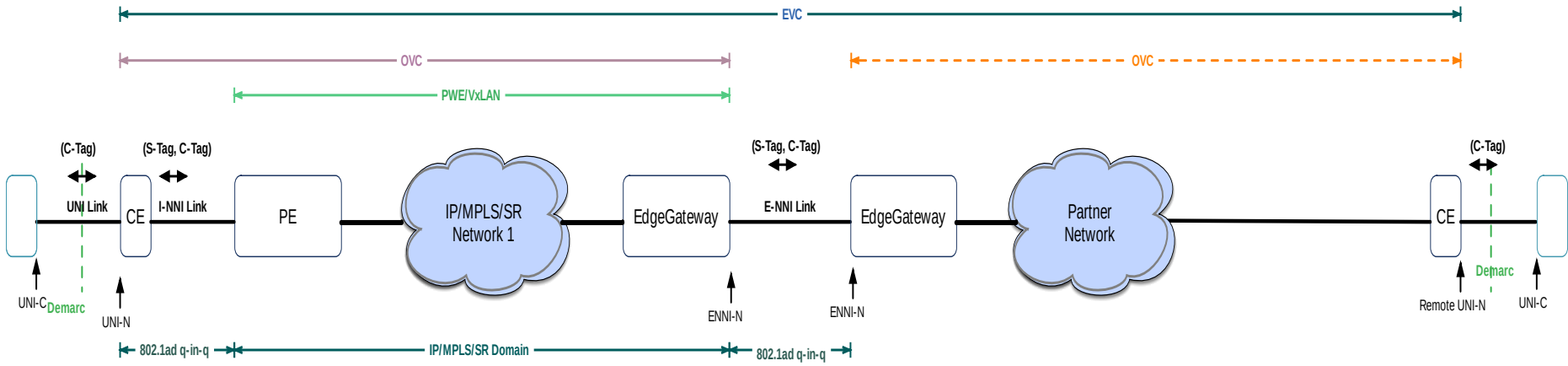
- A P-t-P or MP-t-MP Ethernet Virtual Circuit with two or more UNI inter-connect interfaces in a single provider's network



Baseline Scenario: Single Operator (EVC Owner) Single Metro Network

L2SM Applicable Case 2: Multi-Provider EVC

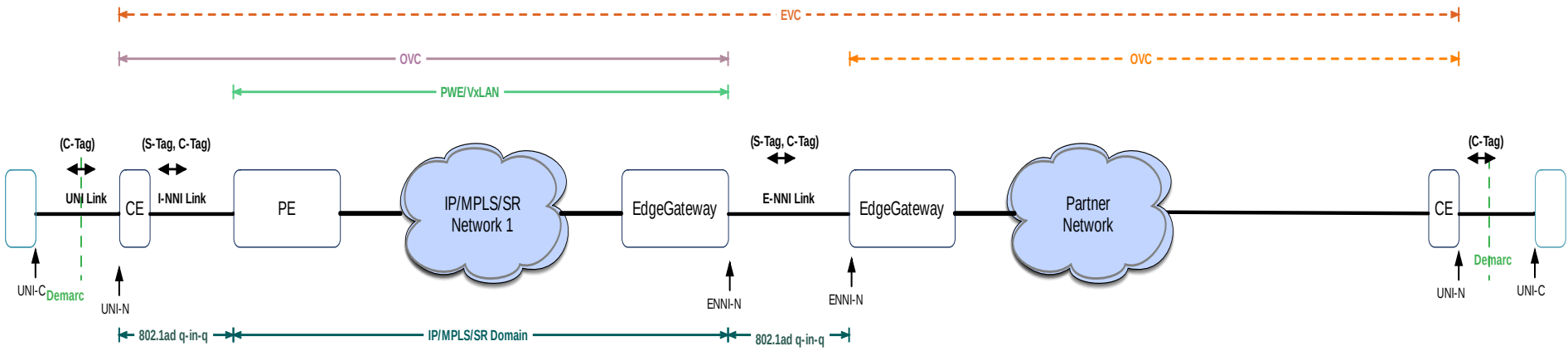
- A P-t-P or MP-t-MP Ethernet Virtual Circuit with off-net UNI interfaces across more than one provider's network; E-NNI connections between providers



Multiple Operator (EVC Owner) Multiple Metro Network - Option A Inter-connect

L2SM Applicable Case 3: E-Access OVC

- A P-t-P Operator Virtual Circuit between customer UNI interface and E-NNI inter-connect



Multiple Operator (E-Access Provider) Multiple Metro Network - Option A Inter-connect

Overview of the L2SM YANG Model

- The L2SM is centered around a subscriber and structured to support multiple circuits of various service types for the same subscriber
- The L2SM YANG module is divided into the following three main containers:
  - customer-info
  - vpn-services
  - site

The “customer-info” container

- The “customer-info” container has essential information to reference the subscriber for query purpose: customer-account-number, customer-name, customer-operation-center (customer-noc-street-address, customer-noc-phone-number)

The “vpn-services” container

- The “vpn-services” container is intended for service-wide attributes
- Each service is identified by a “svc-id”, which is unique in the entire network of the service provider; Based on the service-type, the “svc-id” is derived from either evc-id or ovc-id
- Multiple “vpn-svc” sub-containers can be placed under “vpn-services”
- Currently, the L2SM module supports the following signaling options: MP-BGP VPLS/VPWS, MP-BGP EVPN and T-LDP PWE
- There are also optional parameters for advanced features such as load-balancing and service protection

The “site” container

- All external facing interfaces associated with an Ethernet service are listed under “sites”, including both UNI and E-NNI types; Any other internal interface is out-of-scope from L2SM perspective
- The “site” container is intended for the provider to store information of detailed implementation arrangement with either the end customer or peer operators at each inter-connect location
- For each UNI or E-NNI site, there are sub-containers to maintain physical link attributes, service frame and Layer 2 control protocol frame disposition, Ethernet Service OAM attributes, and service bandwidth profile and priority level agreement
- In general, a site should inherit service attributes from the “vpn-services” container; nevertheless, certain site-specific options are allowed, signaling or load-balancing option for example

Design Team Discussion: Alignment with L3SM

- Add some discussion of relationship to L3SM
  - Initially this would be to say that the models are entirely independent.
  - Later work might share model structure especially around customer and site identification,
  - but for now the models simply share look and feel for these aspects.

Design Team Discussion: adding SLA targets

- SLA target: delay, jitter, frame loss, service availability, etc.
- Consider adding under service
  - Add a whole container for "MEF SLA target" Model on MEF work
- This issue was brought up on the list, author hasn’t decided how to address this issue.

Design Team Discussion

- Need example to explain
  - how these service parameters are used
  - How to map service parameter to input parameter of protocol configuration.
  - Solicit WG input on this

Design Team Discussion
protection-type” and “number of retries

- Protection type refers to the action the device will take when the limit is reached. So, currently, we either “shutdown” the service or trigger an alarm or trap.

- Number of retries refer to the restoration of service after an action (i.e. shutdown) has been taken.
- protection-type” and “number of retries" will be documented under “mac-loop-prevention

YANG Compilation error fixed

- Thank AD Benoit to make a sanitary check on the draft
- The YANG Compilation error has been fixed in v-(01)

http://www.claise.be/IETFYANGPageCompilation.html

MEF reference 23.1 update

- MEF 23.1 has been superseded by MEF 23.2.
- It was published in August this year after the reference was inserted.

Action: Fixed in the next update.

Next Step

- Prepare reply Liaison in response to MEF liaison and establish a collaboration with MEF
- Address Open issues raised and prepare a new revision
- Solicit broadly review from community