Layer 3 VPN Network model

draft-aguado-opsawg-l3sm-l3nm-01

A. Aguado (Nokia)

O. Gonzalez de Dios, V. Lopez, S. Barguil (Telefonica)

D. Voyer (Bell Canada)

L. Munoz (Vodafone)

D. King (ODC)
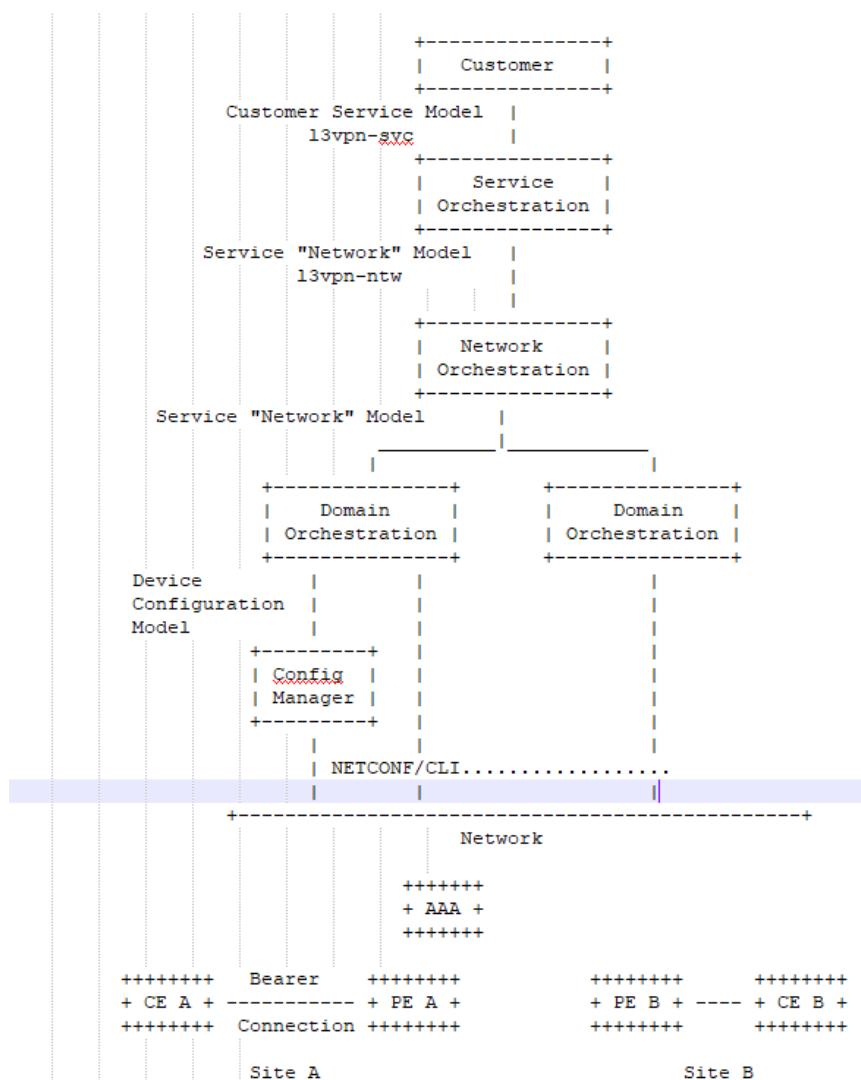
L. Jalil (Verizon)

Q. Wu (Huawei)

RTGW

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Why do we need a "network" model for VPN service?

- L3SM intro (service model): "This document defines a Layer 3 VPN service data model written in YANG. The model defines service configuration elements that **can be used in communication protocols between customers and network operators**. Those elements can also be used as input to automated control and configuration applications."

- Therefore, the focus of RFC8299 is on the interface between upper layer systems and the customer, leaving aside parametrization of network resources that are to be orchestration between the different layers within the map of business, operations and network systems (e.g. SDN controllers).

L3SM and L3NM: General Architecture

```
                        +----------------+
                        |    Customer    |
                        +----------------+
Customer Service Model  |
       l3vpn-svc        |
                        +----------------+
                        |    Service     |
                        | Orchestration  |
                        +----------------+
Service "Network" Model  |
       l3vpn-ntw         |
                         |
                        +----------------+
                        |    Network     |
                        | Orchestration  |
                        +----------------+
Service "Network" Model      |
                 _____|_____
                |                         |
         +----------------+      +----------------+
         |     Domain     |      |     Domain     |
         | Orchestration  |      | Orchestration  |
         +----------------+      +----------------+
Device            |        |          |
Configuration     |        |          |
Model             |        |          |
         +---------+       |          |
         | Config  |       |          |
         | Manager |       |          |
         +---------+       |          |
              |            |          |
              | NETCONF/CLI................|
              |            |             ||
         +-------------------------------------------+
                        Network

                        +++++++
                        + AAA +
                        +++++++

+++++++++   Bearer    ++++++++        ++++++++        ++++++++
+ CE A + ----------- + PE A +        + PE B + ---- + CE B +
+++++++++  Connection ++++++++        ++++++++        ++++++++

          Site A                                Site B
```

- Customer service model: is focused on the client/customer perspective. Is aimed at being used between customer and network operator.

- Should not care about particular network resources, nor internal routing details

- Service "Network" model: is focused describing the service in the network and aimed at input automated tools (provisioning, assurance...). It is used by network operators.

- It cares about topological details (e.g. PEs), particular network resources (RTs, RDs...).

- It does not detail how the service is transported, and does not detail the node configuration.

- The transport network routing is asumed to be already configured. The network orchestration layer will take care of how to provision the service (e.g. set up new LSPSs if needed, set up redundancies)

# L3SM and L3NM in the context of ACTN
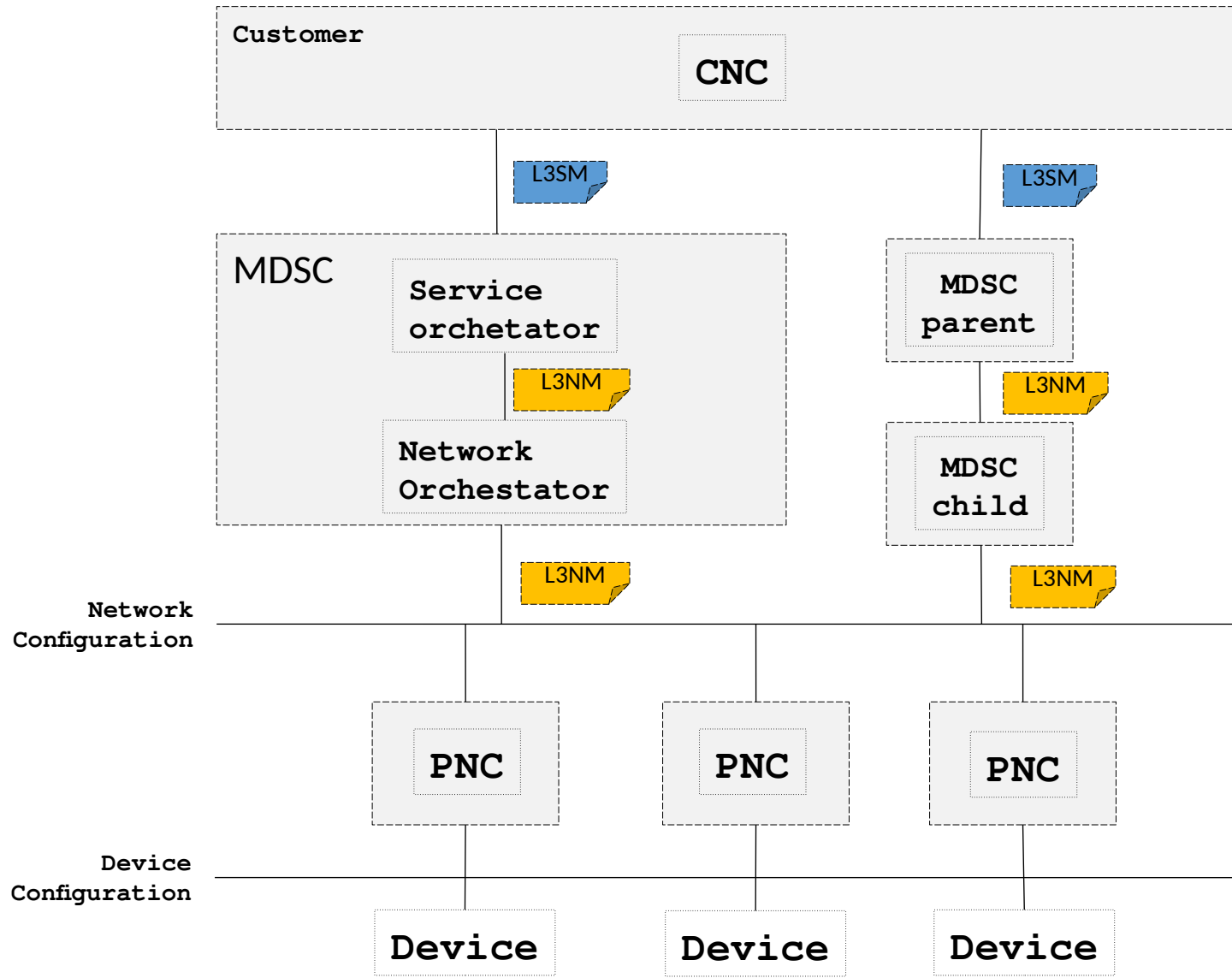
What is missing in the service model?

- So far, in the current version of the draft (01) we describe few scenarios where L3SM may not be sufficient for service deployment:
  - Provide Edge Identification Point.
  - Details about the "bearers" (physical connections to the PEs)
    - Bearer Ethernet Encapsulation
    - List of bearers per site (for inventory and management purposes).
  - Remote Far-End Configuration (pseudowire stitching to an L3VPNs).
  - Multi-Domain Resource Management
  - VPN node (VRF-related) configuration (related with multi-domain resource management).
  - Further routing protocols between CE and PE.

How?
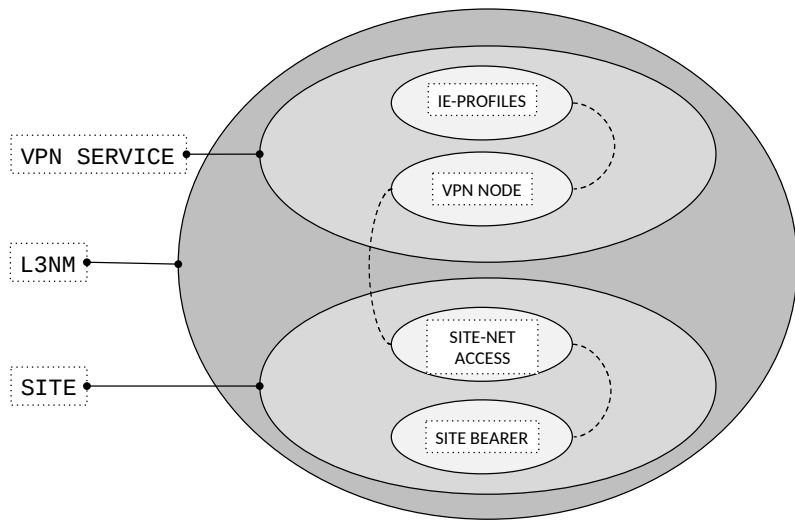
Does it map to network deployments?
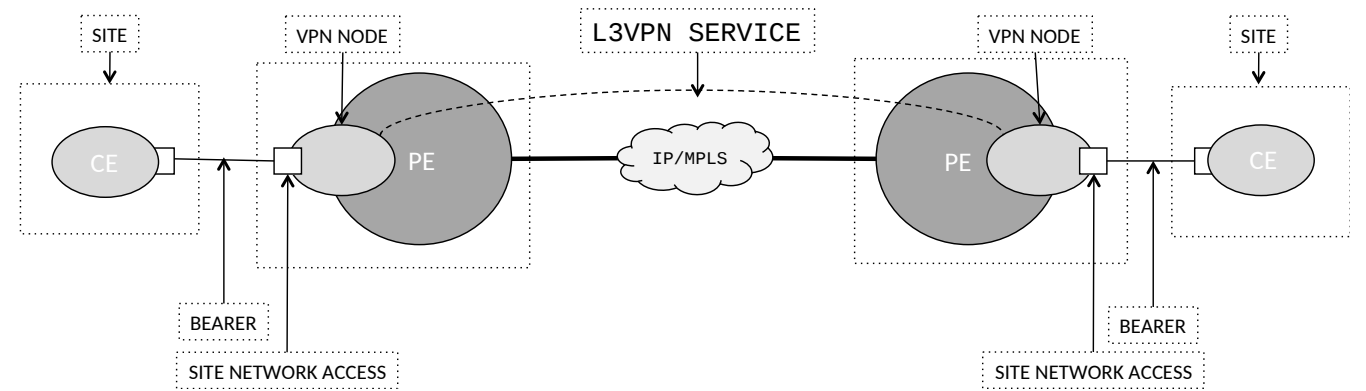
Prune and Extend approach to preserve the L3SM structure.

Open issues

- How to link Network Service Yang Module with other modules such as:
  - Topology (e.g. ietf-network topology in the network orchestrator/controller)
  - Traffic Engineering (draft-ietf-teas-te-service-mapping-yang-01)
  - Composed VPNs (draft-evenwu-opsawg-yang-composed-vpn-03)
- How to deal with hierarchy of controllers
  - Is the same model valid for several layers of hierarchy
  - Can the hierarchy be "recursive"?
- Modeling discussions
  - e.g. site attachments (separate container or part of site network access)
  - i-e profiles vs resources under vpn node

Feedback and Questions?

- Good feedback received in OPSAWG and L3SM mailing lists
- More feedback is requested ᴧ