Layer 2 VPN (L2VPN) Service Model L2SM Working Group

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6:10pm Singapore Time

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http://tools.ietf.org/wg/l2sm/charters

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Administrativia

- Charter:
  - http://datatracker.ietf.org/wg/l2sm/charter/
- Mailing List:
  - https://www.ietf.org/mailman/listinfo/l2sm
- Jabber
  - xmpp:l2sm@jabber.ietf.org
- Minutes:
  - Any volunteers?
  - https://etherpad.tools.ietf.org/p/notes-ietf-100-l2sm
- Blue sheets

Agenda

- Administrivia and Agenda Bash (chairs, 5 mins)
- WG status and plans (chairs, 5 mins)
- YANG Data Model for L2VPN Service Delivery
  (Giuseppe, 45 mins)
  - draft-ietf-l2sm-l2vpn-service-model
  - Overview refresher
  - Recent changes
  - Open issues
  - Open discussion
- Any other business (All, 5 mins)

WG status and plans

WG Status

- 1st L2SM meeting (IETF97) in Seoul
- Adopted L2SM draft in Feb 21, 2017
- No face-to-face meeting at IETF 98 and 99
  - Design Team members had short meetings
- Two virtual interim meetings to advance the work
  - May 25, 2017
  - September 27, 2017

Plans

- The chairs have a plan
  - It's ambitious, but achievable
- Hold virtual interim in September (done)
- Confirm decisions made at interim by taking them to the mailing list in October (done)
- Post new revision before IETF 100 (done)
- Meet in Singapore (doing)
  - Raise any "final" issues
- Update to close all issues by mid December
- YANG Doctor review end December
- Update to address YANG Doctor review end January
- WG last call mid-February
- Pass to AD for IETF last call before end February
- IESG telechat before London IETF (101)

YANG Data Model for L2VPN Service Delivery

- Objectives
- Document Status
- Overview of Model
- Support for L2 Services
- Known open issues and work items
- New issues
  - <your issue here>
- Looking at the relationship to Layer One

Reminder - L2SM Objectives

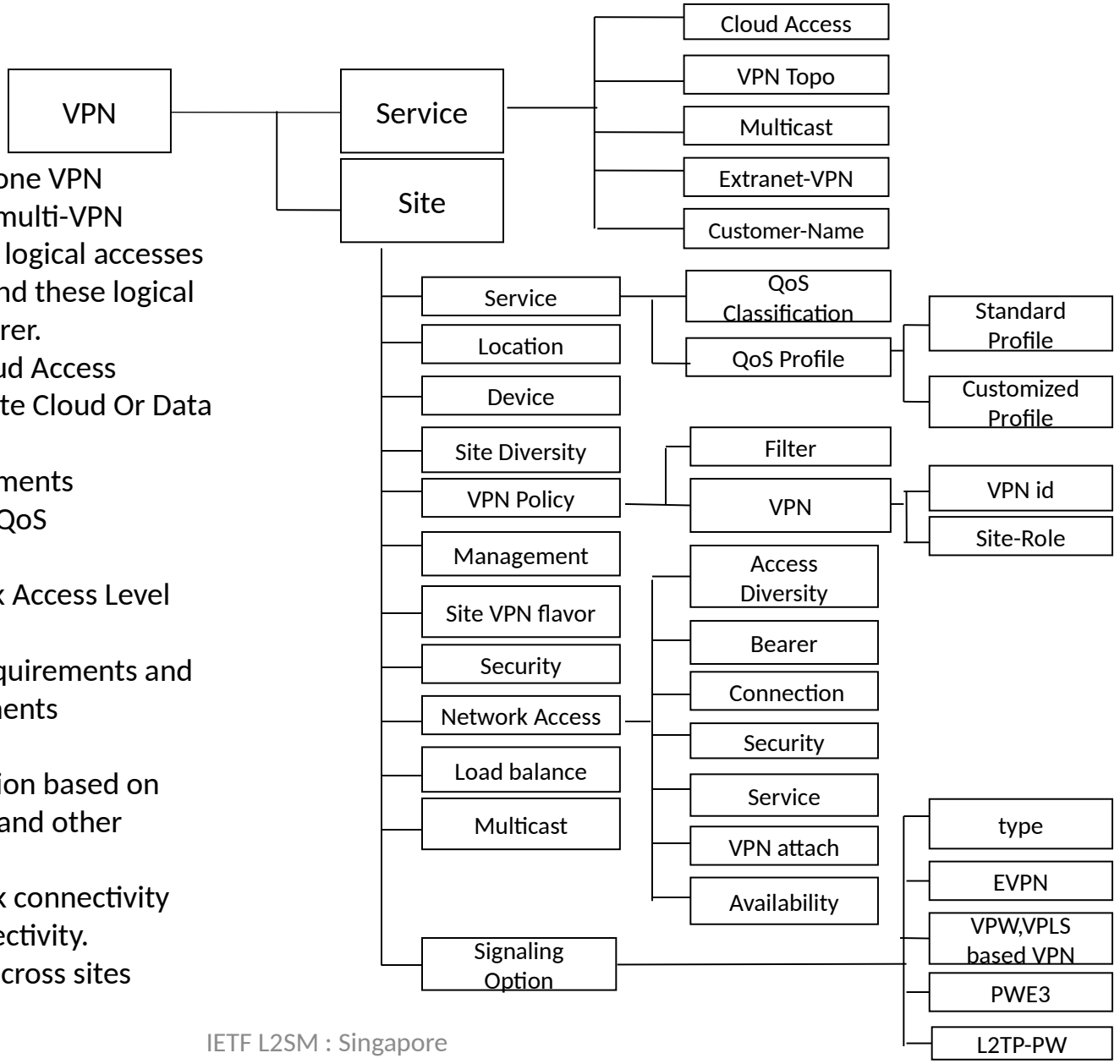
- Create a YANG data model that describes a L2VPN service
- Used for communication between customers and network operators
- Provide input to automated control and configuration applications
- Focus on IETF technologies
  - VPWS, LDP and BGP VPLS, EVPN
  - Other L2VPN service types may be included
- Not an L2VPN configuration model
  - Technology-specific parameters limited to access connections and end-to-end services
  - Operation of core network is not a customer concern

Document Status

- Now at -04 version
- Recent changes
  - Remove EVC and OVC related attributes.
  - Remove Metro-Network related attributes.
  - Remove Customer Account Number attributes.
  - Update L2VPN service Types.
  - Remove load balancing options since access-priority within availability can be used to support load balancing.
  - Remove service protection attribute since we have site diversity attributes.
  - Move SVC-MTU to service level.
  - Move CVLAN to Service Mapping to Network Access Level.
  - Add two new parameters under qos-classification-policy.
  - Remove Security Container.
  - Remove IPv4/IPv6 prefix filter from VPN policy.
  - Add Delivery mode support at service level.
  - Remove support for EVC
  - Remove load-balancing option
  - Remove service protection support

What is L2SM Service Model

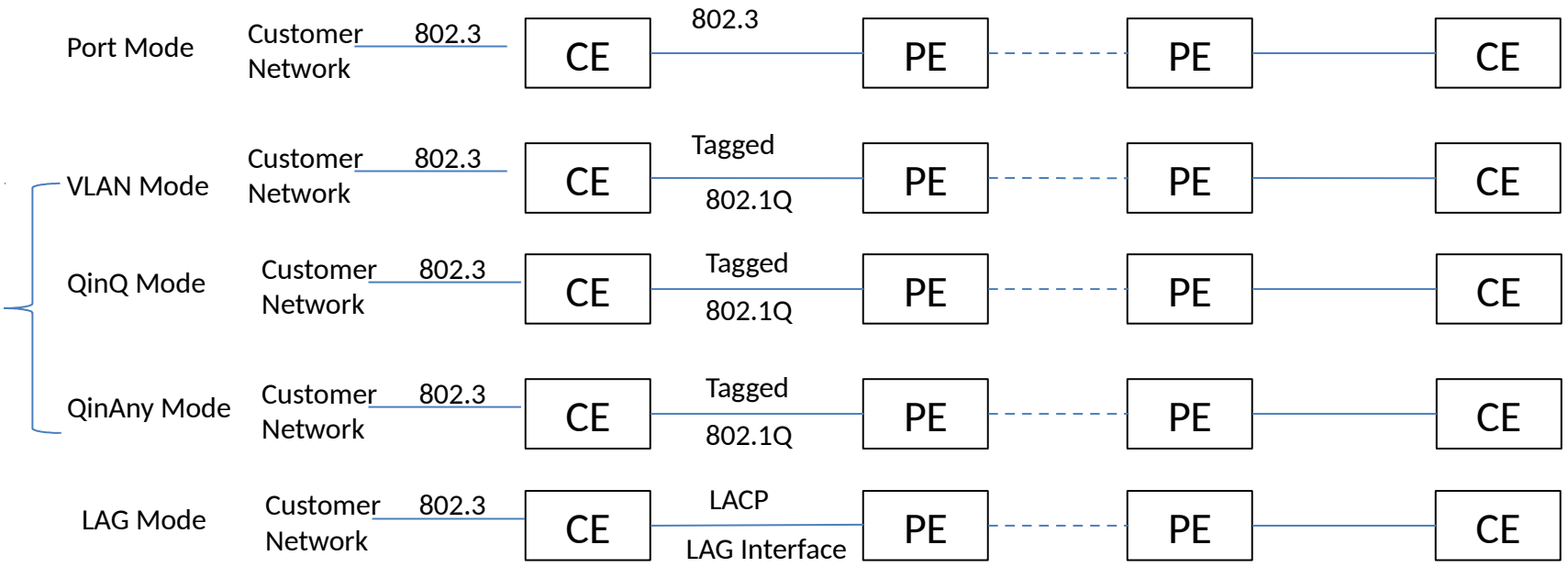
1. Support L2VPN creation
2. Support one site belonging to one VPN
3. Support one site belonging to multi-VPN
4. Support one Site with multiple logical accesses Connecting to multiple VPNs and these logical accesses Sharing the same bearer.
5. Provide L2VPN with Public Cloud Access
6. Support extend L2VPN to Private Cloud Or Data Center Network
7. Support Site-level QoS requirements
8. Support Network Access level QoS requirements
9. Support Site level and Network Access Level Security Requirements.
10. Support Site level Multicast requirements and global level Multicast requirements
11. Multi-AS support
12. Support Network Access Creation based on Service Placement constraints and other constraints parameters.
13. Support point to point network connectivity and multi-point network connectivity.
14. Support distribute VPN route across sites belonging to different VPNs



VPN Service Definition

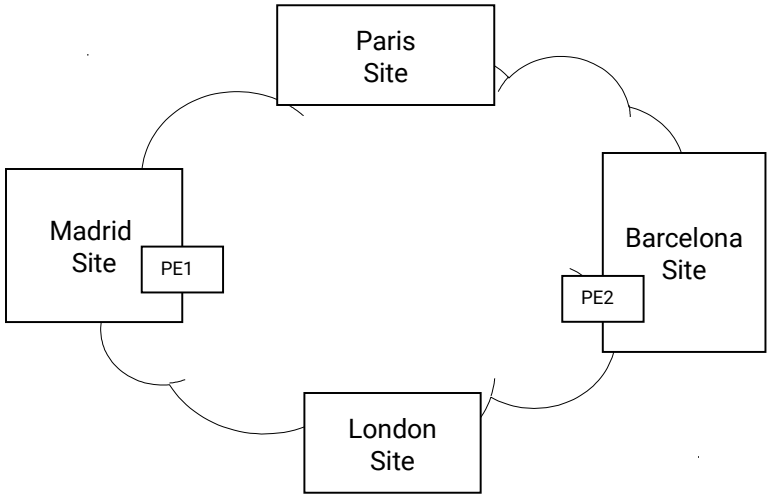
- Have a common base model that addresses multiple popular L2VPN service types.
- The working group will derive a single data model that includes support for the following:
  - Point-to-point Virtual Private Wire Services (VPWS) connecting two customer Sites;
  - Point-to-point or point-to-multipoint Virtual Private Wire Services (VPWS) connecting a set of customer sites
  - Multipoint Virtual Private LAN services (VPLS) connecting a set of customer sites;
  - Multipoint Virtual Private LAN services (VPLS) connecting one or more root sites and a set of leave sites, but preventing inter- leaf sites communication;
  - EVPN Service connecting a set of customer sites
  - Ethernet VPN VPWS between two customer sites or a set of customer sites specified in [RFC8214] and [RFC7432];
  - Other L2VPN service types may be included if there is consensus in the working group.

Connection Definition in L2SM model



- Under each Site Network Access, Ethernet connection in data plane supports several modes
  - Physical Interface Mode
  - Dot1q interface Mode
    - VLAN Mode:
    - QinQ Mode: Config both S-tag and C-tag on PE
    - QinAny Mode: Only Config S-tag on PE and PE doesn't know C-Tag
  - LAG Interface Mode
    - Need to specify LACP parameters.
  - In addition, optional L2CP parameters are specified between CE and PE
  - In addition, mapping between CVLAN tag and L2VPN service is specified
- Open question: Do we need to specify S-Tag or onlyDot1q interface mode within connection container defined in service model?
  - S-Tag in many cases is representing ISP VLAN and specified by Operators?
  - In case of NNI, S-Tag is needed.

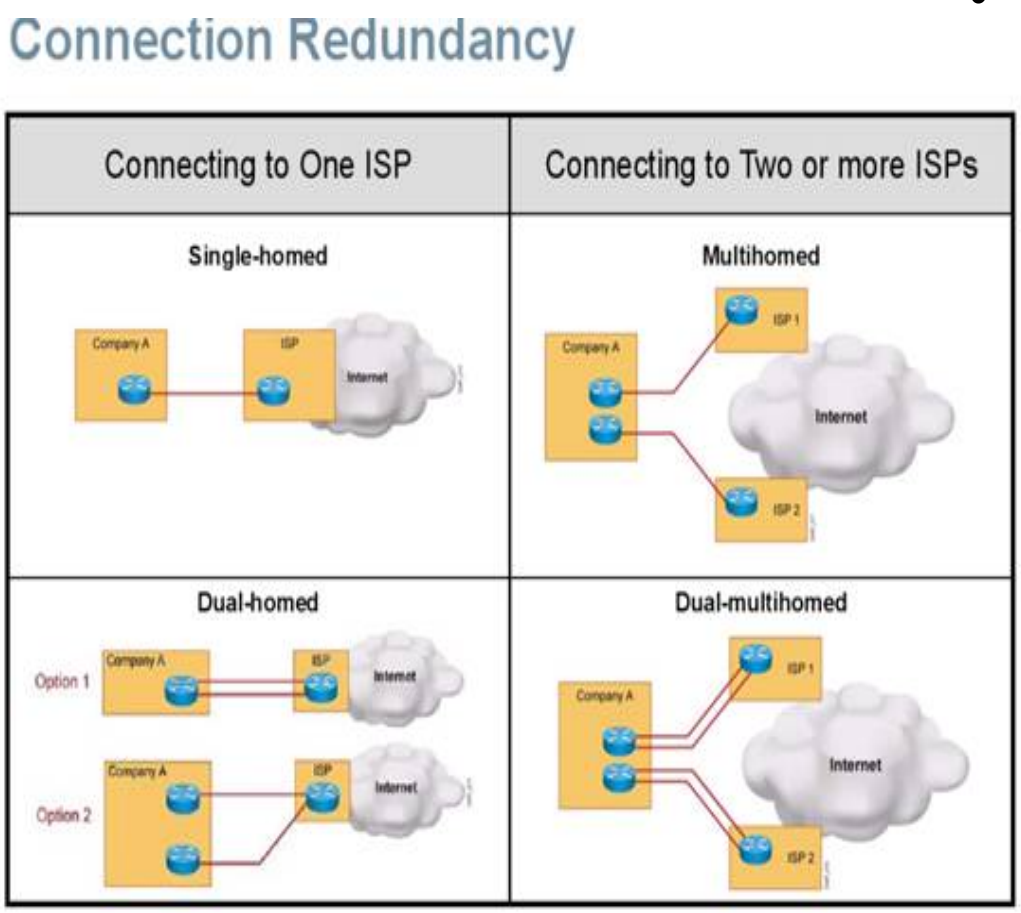
Multicast Unicast Broadcast Support




```
+--rw multicast-like {multicast-like}?
|  +--rw enabled?                          boolean
|  +--rw customer-tree-flavors
|  |  +--rw tree-flavor*   identityref
|  +--rw bum-frame-delivery-modes
|  |  +--rw bum-frame-delivery* [traffic-type]
|  |     +--rw traffic-type     identityref
|  |     +--rw delivery-mode?   identityref
|  +--rw multicast-gp-port-mapping?   identityref
```

- In case of multicast support, we need to describe multicast tree type, traffic type, delivery mode and group to port mapping type at a global level across different sites.
  - Support both ASM and SSM
  - Assume IGMP snooping is enabled in the bridge domain
- And Describe **MAC Multicast Group at site level:**
  - **VLAN ID** — Displays the VLAN ID of the Multicast group.
  - **MAC Address Group** — Displays the MAC address of the group.
  - **Ports/LAG** — Select to display the ports/LAGs belonging to the Multicast group.

Single homed, Dual Home and Multihoming Support

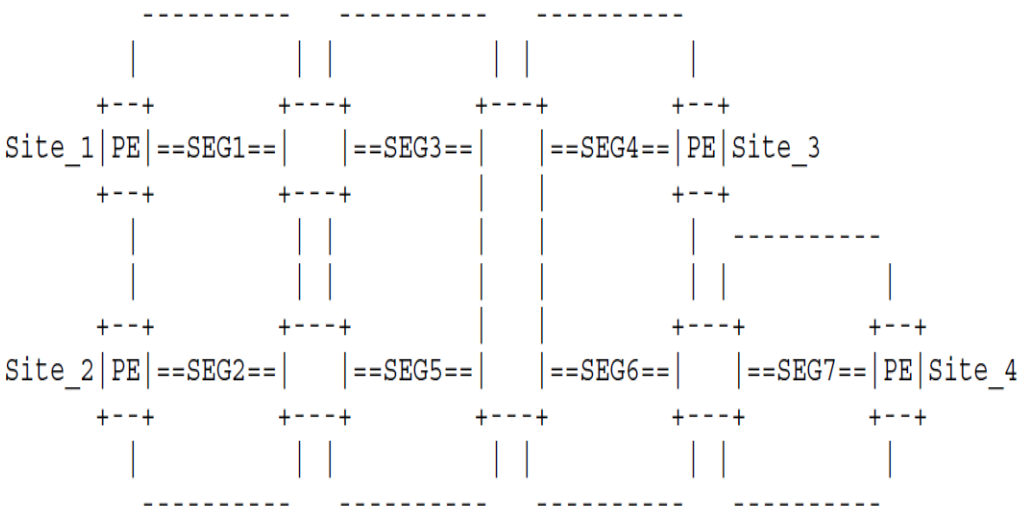


- The "site-type" defines the way the VPN multiplexing is done.
  - site-vpn-flavor-single: The site belongs to only one VPN.
  - set of site-vpn-flavor-multi: The site belongs to multiple VPNs, and all the logical accesses of the sites belong to the same VPNs.

In addition, we have site-network-access/access-diversity parameters (e.g., group-id, constraint-type), they can tell us which of network accesses belong to the same group, what constraint type is.

Applicability to Inter-Provider and Inter-Domain Case

- In addition to Inter-provider control connections to run only between the two border routers, we can also offer an end-to-end, multi-segment connectivity to be constructed out of several connectivity segments, without maintaining an end-to-end control connection.
  - End to end connectivity between site_1 and Site 3 spans across multiple domains and can be constructed by stitching network access connectivity within site_1 with SEG1, SEG3, SEG4 and network access connectivity within site3
  - The assumption is service orchestration layer in figure 5 should have visibility of the complete abstract topology and resource availability



Open issue: Signaling Option Parameters

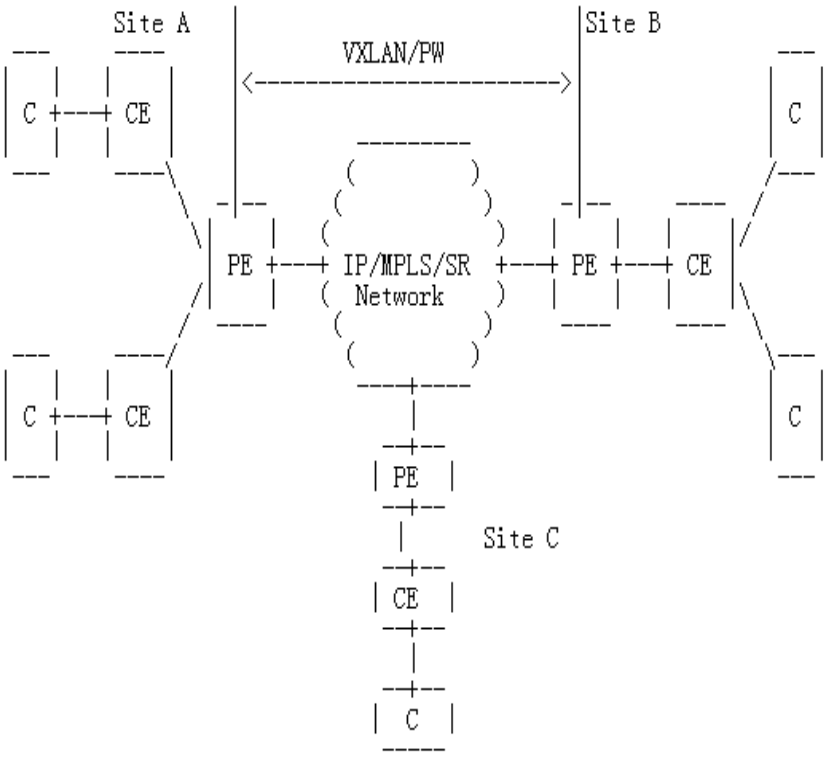


Figure 1: Reference Network for the Use of the L2VPN Service Model

- In L2SM, some parameters we defined for signaling option is for signaling and VPN auto-discovery such as control word, VC label which are used between Pes or between any two sites.
- Also we have some parameters used between CE and PE such as mac learning, arp suppression.
  - If mac-learning mode is set to control plane mode, mac-learning is used between Pes
  - If mac-learning mode is set to data plane mode, mac-learning is used between CE and PE
- Open Question, Do we need to specify signaling option parameters or signaling operation parameters should be specified by operator facing model?
- Does customer care these parameter used between PEs within operator network?

Any Other Issues?

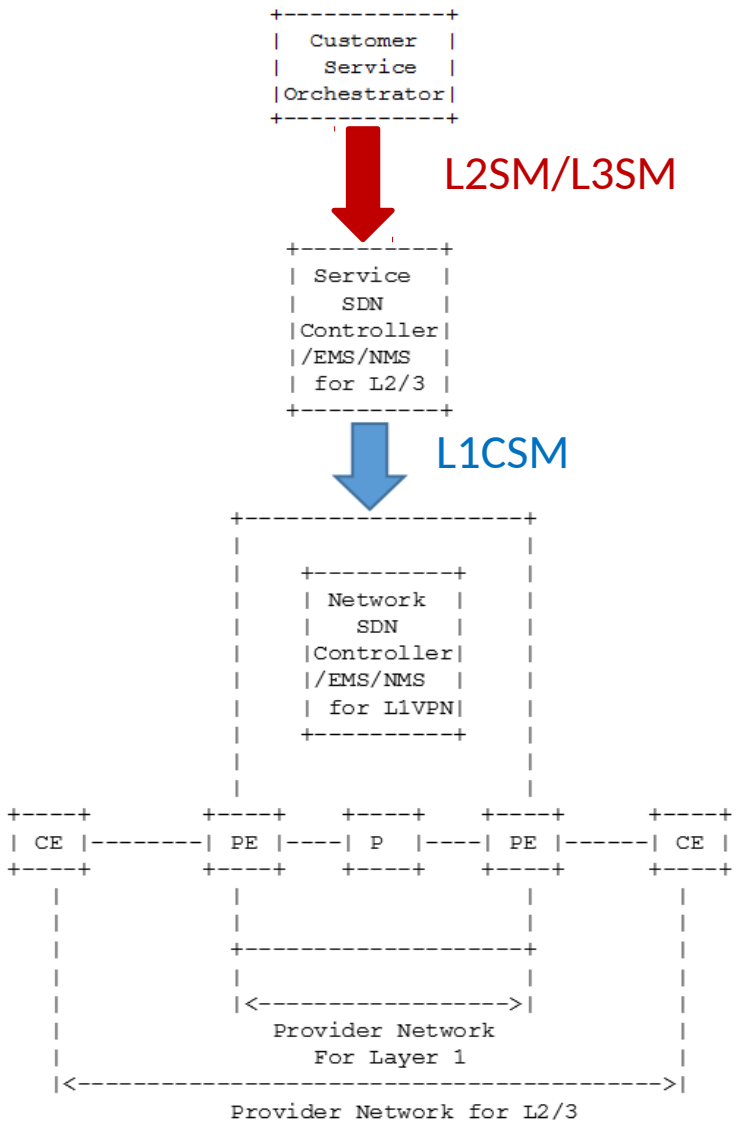
Connection with L1CSM

- A new work in CCAMP has been launched
- What is the boundary between L2SM/L3SM and L1CSM?

Deployment Scenario 1: L1VPN for External Customer

Deployment Scenario 2:
Multi-Service Backbone for Internal Customers

L1CSM and L2SM/L3SM
Multi-Service for Internal Customers



- L2SM and L3SM are Service Models
- L1CSM can be the southbound interface of the Service SDN Controller and can be used in same cases:
  - Multi-Service Backbone for Internal Customers: Only L1 connectivity is required and there is the need of an interface between two departments belonging to the same organization.
  - L1VPN for External Customer (less common for now)

Any Other Business