# A Layer 2 VPN Network YANG Model (L2NM) Updates

draft-ietf-opsawg-l2nm

IETF#111, July 2021

**Useful Pointers:**

https://github.com/IETF-OPSAWG-WG/lxnm
(All LxNM drafts and issues in the same git repository)

https://codimd.ietf.org/40Dw-yCkQoONcMsYp8e5XQ
(LxNM Meeting Notes)

# Changes Since IETF#110

- Received feedback from several people (WG participants and external).
- Feedback documented in git repository and summary sent weekly to mailing list.
- All pending issues have been fixed in two versions (-03 and -04):
  - Issues migrated from old repository: https://github.com/IETF-OPSAWG-WG/l2nm (**27**)
  - All issues are included in the common repository: https://github.com/IETF-OPSAWG-WG/lxnm (**63**)
- Two additional IANA-maintained Yang modules have been added:
  - They define a set of identities of BGP Layer 2 encapsulation types and pseudowire types.
  - Relying upon these IANA-maintained modules is meant to provide more flexibility in handling new types rather than be limited by a set of identities defined in the L2NM itself.
- Changes made in latest -04 version (submitted this week)
  - Reflect comments for the AD review of VPN-common that impacts the L2NM.
  - Address a comment raised by Moti about the position of Ethernet Segments in the hierarchy.

# EVPN support (1/2)

The EVPN support is aligned with current available procedures and RFCs:

- **RFC 7432**: BGP MPLS-Based Ethernet VPN
- **RFC 7623**: Provider Backbone Bridging Combined with Ethernet VPN (PBB-EVPN)
- **RFC 8214**: Virtual Private Wire Service Support in Ethernet VPN.
- **RFC8388**: Usage and Applicability of BGP MPLS-Based Ethernet VPN

- **Issue #305** RT auto-derivation in the L2NM:
  - The EVPN route MAY carry one or more Route Target (RT) attributes.
  - RTs may be configured (as in IP VPNs) or may be derived automatically.
- **Issue #236 EVPN**: Add support for dot1q push/pop/translate options
  - Translation included as part of the dot1q encapsulation management.

```
+--rw dot1q {vpn-common:dot1q}?
| | | +--rw tag-type?  identityref
| | | +--rw cvlan-id?  uint16
| | | +--rw rewrite
| | |   +--rw (tag-choice)?
| | |   | +--:(pop)
| | |   | | +--rw pop?     enumeration
| | |   | +--:(push)
| | |   | | +--rw push?    empty
| | |   | +--:(translate)
| | |   |   +--rw translate?  enumeration
| | |   +--rw cvlan-id?     uint16
| | |   +--rw direction?     enumeration
```

# EVPN support (2/2)

**Issue #327** Ethernet Segments as a Standalone entity:

- A single ESI entity is supposed to be used by multiple EVPN type services.

```
+--rw l2vpn-ntw
    +--rw vpn-profiles
    |  +--rw valid-provider-identifiers
    +--rw ethernet-segments
    |  +--rw ethernet-segment* [name]
    +--rw vpn-services
```

**Issue #204** EVPN Flavors

- Signaling options has been aligned to support several BGP-EVPN flavors:

```
identity evpn-vpws {
    base evpn-type;
    description
      "VPWS support in EVPN.";
  }

  identity evpn-pbb {
    base evpn-type;
    description
      "Provider Backbone Bridging Support in EVPN.";
  }
```

# Connection Container

**Issue #302**

- The connection container is used to configure the relevant properties of the interface to which the L2VPN instance is attached to (e.g., encapsulation type, lag interfaces, split- horizon).
- It was restructured in the L2NM (similar work as in L3NM) to make it clearer. With the new structure the L2NM supports tag manipulation operations (e.g., tag rewrite) [**Issue #236**].

```
+--rw vpn-network-accesses
   +--rw vpn-network-access* [id]
      ...
      +--rw connection
      |  +--rw l2-termination-point?
      |  +--rw local-bridge-reference?
      |  +--rw bearer-reference?         string
      |  +--rw encapsulation
      |  |  +--rw type?              identityref
      |  |  +--rw dot1q {vpn-common:dot1q}?
      |  |  +--rw priority-tagged
      |  |  +--rw qinq {vpn-common:qinq}?
      |  +--rw lag-interface
```

# Active Global Parameters

**Issue #324**

- The 'global-parameters-profile' introduced in **version -03** defines reusable parameters for the same L2VPN service instance ('vpn-service').
- Global parameters profile are defined at the VPN service level and then called at the VPN node and VPN network access levels. Each VPN instance profile is identified by 'profile-id'.

```
...
+--rw vpn-services
+--rw vpn-service* [vpn-id]
   ...
      +--rw global-parameters-profiles
      |  +--rw global-parameters-profile* [profile-id]
      |     +--rw profile-id                  string
      |     +--rw (rd-choice)?
      |     +--rw vpn-target* [id]
      |     +--rw vpn-policies
      |     +--rw local-autonomous-system?    inet:as-number
      |     +--rw svc-mtu?                    uint32
      |     +--rw ce-vlan-preservation?       boolean
      |     +--rw ce-vlan-cos-perservation?   boolean
      |     +--rw control-word-negotiation?   boolean
      |     +--rw mac-policies
```

# Other Relevant Closed Issues

- Issue #205 Diffserv Model Type
- Issue #203 Bridge domain Id Definition
- Issue #238 EVPN: Missing validation for dot1q
- Issue #298 bearer-reference
- Issue #305 RT auto-derivation in the L2NM
- Issue #328 The LAG Interface is a standalone object

# Appendix A. Examples

A new section with the model usability examples (most common cases for service provider implementations) is provided:

- BGP-based VPLS
- BGP-based VPWS with LDP Signaling
- LDP-based VPLS
- VPWS-EVPN Service Instance
- Automatic ESI Assignment
- VPN Network Access Precedence

# Next Steps

- All pending issues have been solved. Authors consider the -04 document is ready to for the WGLC.

- The model is prepared to support new functionalities based on the evolution of some of the IETF drafts.
  - EVPN multi-homing port-active load-balancing (draft-brissette-bess-evpn-mh-pa-04)
  - EVPN Multi-Homing Mechanism for Layer-2 Gateway Protocols (draft-ietf-bess-evpn-l2gw-proto-00)