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.
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.
- **RFC 8388**: 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.
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:

```python
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].

```plaintext
+--rw vpn-network-accesses
    +--rw vpn-network-access* [id]
      ...
      +--rw connection
        | +--rw 12-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)