draft-sajassi-bess-evpn-vpws-fxc-00.txt

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Problem Statement

- EVPN-VPWS currently covers the following services interfaces (per section 2)
  - VLAN-based
  - VLAN-bundle
  - Port-based

- This draft defines a special type of VLAN-aware bundle service interface called Flexible Cross Connect (FXC)
Current Situation with EVPN VPWS

- Provides P2P connectivity between two Attachment Circuits (ACs) on two different PEs
  - AC can be defined as <port> or <port, VLAN> or <port, VLAN group>
- Cannot aggregate ACs across different ports on the same PE
- Each AC is signaled via BGP to other PEs
  - Remote PE with the right service-id creates cross-connect between its local AC and the one received via BGP signaling
- Upon failure (AC or port or PE), the EVPN route associated with the AC is withdrawn
What’s more needed?

1. Significantly reduce number of PWs by muxing VLANs across many interfaces
2. Reduce BGP signaling as much as possible (e.g., not to signal every VLAN/AC)
3. Support All-Active (LAG) and Single-Active multi-homing

Note: some of the above requirements conflict w/ each other – ie, to support multi-homing and use a single PW to mux VLANs on multiple interfaces, requires per-VLAN signaling
Flex XC VLAN Unaware: Single-homed CEs

Service Tunnel Characteristics

- One single service tunnel between a pair of VID tables
- A single service-id represents the service tunnel
- Normalized VIDs are unique in context of VID table
- VLAN unaware - VLAN failure is NOT signaled over BGP
- Muxes many VLANs across several interfaces on the PE
- Because of muxing, VID table is needed at disposition
- C-VIDs are normalized into double-tag S-VIDs and then sent over service tunnel
- When all VLANs (across all interfaces) for a service tunnel are failed, then the PE withdraws the route for that PW

<table>
<thead>
<tr>
<th>A-Leaf 1 Eth A-D Route</th>
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<tbody>
<tr>
<td>RD = 5500</td>
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<tr>
<td>ESI = 0</td>
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<tr>
<td>Eth.Tag ID = 10,000</td>
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<tr>
<td>Label = 123432</td>
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</table>

<table>
<thead>
<tr>
<th>RT ext. community</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT = 100</td>
</tr>
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</table>
Flex XC VLAN Aware: Multi-homed CEs

Service Tunnel Characteristics

- One single service tunnel between a pair of VID tables
- Many service-ids (normalized VIDs) represent the tunnel
- Each EVI represents a single normalized VID space in this option
- Automatic cross-checking of normalized VIDs on PEs
- VLAN aware – VLAN failure is signaled over BGP
- Muxes many VLANs across several interfaces into a single service tunnel
Flex XC VLAN Unaware: Multi-homed CEs

Service Tunnel Characteristics

- One single service tunnel for vlan bundles between two PEs
- A single service-id represents the service tunnel
- VLAN unaware - VLAN failure is NOT signaled over BGP
- Muxes group of VLANs on a single interface on the PE
- VID table may not be used at disposition PE
- C-VIDs are normalized into double-tag S-VIDs and then sent over service tunnel
- When Ether1 on PE1 fails, then it is signaled via BGP to remote PEs so that they remove PE1 from their path list – e.g., traffic for black VLAN is sent to only PE2
BGP Extension

<table>
<thead>
<tr>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>B,P,C</td>
<td>per definition in [EVPN-VPWS]</td>
</tr>
<tr>
<td>M</td>
<td>00 mode of operation as defined in [EVPN-VPWS]</td>
</tr>
<tr>
<td></td>
<td>01 VLAN-aware FXC</td>
</tr>
<tr>
<td></td>
<td>10 VLAN-unaware FXC</td>
</tr>
<tr>
<td>V</td>
<td>00 operating per [EVPN-VPWS]</td>
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<tr>
<td></td>
<td>01 single-VID normalization</td>
</tr>
<tr>
<td></td>
<td>10 double-VID normalization</td>
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</table>
Next Step

- Questions?
- Discussions on the mailing list