Ethernet VPN Virtual Private Wire Services Gateway Solution

draft-sr-bess-evpn-vpws-gateway-00

Jorge Rabadan (Nokia)
Senthil Sathappan (Nokia)
Vinod Prabhu (Nokia)
Wen Lin (Juniper)
Patrice Brissette (Cisco)

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Agenda

1. EVPN VPWS Interconnect and why Service Interworking
2. EVPN VPWS Gateway procedures
3. Next steps
EVPN VPWS Interconnect and why Service Interworking
Requirements and options

**EVPN VPWS Interconnect requirements**
- EVPN VPWS needs to be deployed in high scale multi-domain networks
- Each domain can use a different transport technology (MPLS, VXLAN or Segment Routing with MPLS or IPv6 SIDs)
- EVPN Multi-Homing including mass-withdraw
- Potentially translation of RD/RTs, Ethernet Tag IDs, Layer-2 capabilities (CW, Flow Label, MTU) on Border Routers

**EVPN VPWS Interconnect options**
1. Service Interworking Solution
2. Inter-domain ‘Option-B’ Solution
3. Transport Interworking Solution
EVPN VPWS Interconnect and why Service Interworking

Options described

1. Option A Interworking Solution
   - SR-MPLS DOMAIN-1
   - VPWS1
   - BR-1
   - CE1
   - VPWS1
   - BR-2
   - CE2
   - E-PE
   - VXLAN DOMAIN-3

   - A-D per EVI
   - RD2 tag2 L22
   - RD3 tag3 SID33
   - RD4 tag4 vni44

2. Option-B Solution
   - SR-MPLS DOMAIN-1
   - VPWS1
   - BR-1
   - CE1
   - VPWS1
   - BR-2
   - CE2
   - E-PE
   - VXLAN DOMAIN-3

   - NHSelf L22<--L33
   - NHSelf L33<--L44
   - RD4 tag4 vni44

3. Transport Interworking Solution
   - SR-MPLS DOMAIN-1
   - VPWS1
   - BR-1
   - CE1
   - VPWS1
   - BR-2
   - CE2
   - E-PE
   - VXLAN DOMAIN-3

   - A-D per EVI
   - RD2 tag2 L22
   - RD3 tag3 SID33
   - RD4 tag4 vni44
# EVPN VPWS Interconnect and why Service Interworking

When is the Service Interworking Solution Required for EVPN VPWS

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Service Interworking</th>
<th>Inter-Domain Option-B</th>
<th>Transport Interworking</th>
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</thead>
<tbody>
<tr>
<td>Per-Domain EVPN Multi-Homing</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Per-Domain Mass Withdrawal</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Per-Domain RD/RTs</td>
<td>Yes</td>
<td>Yes*</td>
<td>No</td>
</tr>
<tr>
<td>Per-Domain Ethernet Tag IDs</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>L2 attributes per Domain (CW, FAT, MTU)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Heterogeneous Encapsulation</td>
<td>Yes</td>
<td>No</td>
<td>Yes**</td>
</tr>
<tr>
<td>Per-Domain EVPN Service OAM</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Service Interworking Procedures for EVPN VPWS
Redistribution of EVPN Routes Across Domains

“Redistribution”
All the procedures in the Gateway that involve
a) reception and process of the (source domain) EVPN route
b) programming of the forwarding path
c) readvertisement of the route to a different domain (the next destination domain)

Reception and Process
Follows RFC8214 and I-D.sr-bess-evpn-dpath

Forwarding state programming
Using received Label/VNI/SID
Allocation of the Label/VNI/SID of the next destination domain and switching operation

Re-advertised routes rules
Different RDs
Same or different RTs, Ethernet Tag IDs
ESI=0 unless I-ES is defined
L2 Attributes and encapsulation regenerated
P/B flags not propagated but set based on I-ES
Communities, non-evpn extended communities, large communities propagated
D-PATH updated
Service Interworking Procedures for EVPN VPWS
Service Gateway Redundancy

Anycast Gateways
Each anycast pair advertise the same Tag ESI=0
D-PATH is used to avoid loops if the same tag is used across domains

EVPN Multi-Homing with I-ESI
I-ESI as in RFC9014 is used for EVPN VPWS
All-active or single-active
Mass withdrawal
Next Steps

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Request more feedback from the Working Group
Thank you