Fair Share AF Load Share

draft-kvk-trill-fair-share-af-load-share-02

Kesava Vijaya Krupakaran

Janardhanan Pathangi Narasimhan
An Appointed Forwarder (AF) is responsible for encapsulating and decapsulating native traffic from/to a LAN.

The DRB on the shared access LAN can choose to be the AF for all VLANs or load share the AF responsibility among Rbridges on the LAN.

The load sharing algorithm is undefined in RFC 6325 / RFC 6439.

Round Robin AF scheduling among of VLANs has limits with respect to resource utilization:
- Volume of traffic is not equal on each VLAN
- It is desirable to have more traffic handled by more capable systems.
**Shares**

- Each Rbridge on the shared access LAN is configured with a certain amount of ‘shares’
- Indicates the relative number of VLANs for which that Rbridge would become the AF
- Allows for Rbridges with greater data-plane capability to become AF for majority of VLANs on LAN
- Shares are advertised in IS-IS Hellos using the Fair Share Sub-TLV in Multi-Topology-Aware Port Capability TLV
Sample Topology

TRILL Campus

A

B

C (DRB)

Bridged LAN
VLANS = \{11, 12, 13, \ldots 20\}
Sample Scenario with Shares

TRILL Campus

A
S(A) = 2

{11, 12, 13, 14, 15}

B
S(B) = 1

{16, 17, 18}

C (DRB)
S(C) = 1

{19, 20}

Bridged LAN
VLANs = \{11, 12, 13, .. 20\}

H1

H2

H3
AF Distribution Using Shares

- VLANs in the segment = \{11, \ldots, 20\}
- Rbridges = A, B and C, C is DRB
- A is allocated $\frac{2}{4}$ (50%) of VLANs, B with $\frac{1}{4}$ (25%) and C with $\frac{1}{4}$ (25%) of VLANs
- Note that if VLANs \{16, \ldots, 20\} have a heavy traffic load, share based scheduling alone will be insufficient

<table>
<thead>
<tr>
<th>X</th>
<th>S(X)</th>
<th>AF(X)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>{11, 12, 13, 14, 15}</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>{16, 17, 18}</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>{19, 20}</td>
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</tbody>
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AF Affinity VLAN Set

• Share based distribution of AF among Rbridges distributes relative amount of VLANs based on shares configured
• Works well if native traffic load is equally distributed among all VLANs
• If certain VLANs are loaded with heavy traffic compared to others, share based scheduling does not allow more capable Rbridges to become the AF for those VLANs
• AF Affinity VLAN set is a set of VLANs configured in an Rbridge for which that Rbridge has AF affinity
• AF Affinity VLAN set is advertised in IS-IS Hellos using AF Affinity VLAN Set Sub-TLV in the Multi-Topology-Aware Port Capability TLV.
Shares and AF Affinity VLAN Set

TRILL Campus

A
S(A) = 2
V(A) = [16, 20]

B
S(B) = 1
V(B) = [11, 14]

C (DRB)
S(C) = 1
V(C) = [12, 14]

H1

{16, 17, 18, 19, 20}

H2

{11, 12, 13}

H3

{14, 15}

Bridged LAN
VLANs = {11, 12, 13, .. 20}
AF Distribution using AF Affinity VLAN set and Shares

- VLANs in the segment = \{11, \ldots, 20\}
- Heavily loaded VLANs = \{16, \ldots, 20\}
- Rbridges = A, B and C, C is DRB
- A is allocated \(\frac{2}{4}\) (50\%) of VLANs, B with \(\frac{1}{4}\) (25\%) and C with \(\frac{1}{4}\) (25\%) of VLANs
- A is configured to have greater AF affinity to the heavily loaded VLANs \{16, \ldots, 20\}

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<tr>
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<td>{16, 17, 18, 19, 20}</td>
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</tr>
<tr>
<td>B</td>
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<td>{11, 12, 13, 14}</td>
<td>{11, 12, 13}</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>{12, 13, 14}</td>
<td>{14, 15}</td>
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Thank You