Adaptive VLAN Assignment for Data Center RBridges

draft-zhang-trill-vlan-assign-00

Mingui Zhang
mingui@huawei.com
DCNs Support Virtualization

• TRILL VLANs are naturally used for VPN segregation

• Virtualization causes resource multiplex
  – Bandwidth
  – CPU
  – MAC-table memory
VPN’s Volatility

- VMs spawned/destroyed/active/inactive/migrate
  - Brings volatility to the size of VPNs (or VLANs)
  - Causes surge of network resource consuming
    - Some RBridge nodes get crowded
      - MAC table are used up
    - Some links are congested
Multiple Points Attachment

• Unlike STP, TRILL allows multi-access to Local Link

• MPA is common in DCN
  – High east-west capacity
  – Reliability
  – Flexibility
Ugly Casual Appointment

Balanced #VLAN doesn’t mean balanced MAC entries
Ugly Casual Appointment

Balanced #VLAN doesn’t mean balanced traffic bit rate
DRB Need Feedback

• The size of VLANs
  – How many active MAC addresses

• The throughput of VLANs
  – How much Traffic Demand
MAC Entries Report sub-TLV

- Type, Length
  - Values
    - DRB Nickname
    - Maximum #MAC
    - Available #MAC
    - #MAC of each VLAN

- #MAC Entries
  - IEEE float format
Traffic Bit Rate Report sub-TLV

- **Type, Length**
  - DRB Nickname
  - Max Link Bandwidth
  - Available Link Bandwidth
  - Traffic Bit Rate of each VLAN

- **Bandwidth & Traffic Bit Rate**
  - IEEE Float Format
  - Unit is bytes/s, not bits/s

- **Work with ISIS-TE (RFC 5305)**
  - Bandwidth usage of links
  - Bandwidth usage of nodes

Where each Load of VLAN is of the form:

```
<table>
<thead>
<tr>
<th>RESV</th>
<th>ULAN ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Bit Rate</td>
<td></td>
</tr>
</tbody>
</table>
```

(1 byte)

(2 bytes)
Future Work

• To refine the fields of sub-TLVs
• To define the reassignment mechanism
• To design TRILL-TE
Thanks!
Backup Slides
Load Splitting among Ports Group

- Appoint forwarder will choose one port per VLAN as the forwarding port.

- Load splitting among its ports for appointed VLANs is a local matter!
Similar Existing Practice

- SNMP to get CAM entries


---

[user@server ~]# snmpwalk -v 2c -c abc123 10.10.10.1 ipNetToMediaPhysAddress
IP-MIB::ipNetToMediaPhysAddress.8.10.10.1 = STRING: 0:1b:2b:cd:60:3a
IP-MIB::ipNetToMediaPhysAddress.8.10.10.100 = STRING: 0:1d:93:0:49:1a
IP-MIB::ipNetToMediaPhysAddress.8.10.10.150 = STRING: 8:0:27:4:34:cd
IP-MIB::ipNetToMediaPhysAddress.10.10.10.1 = STRING: 0:1b:54:48:91:10
IP-MIB::ipNetToMediaPhysAddress 10 10 10 20 100 = STRING: 0:21:e9:df:e8:73
[user@server ~]#

http://community.brocade.com/thread/4446