

IETF-80 Prague, Czech Republic

Adaptive VLAN Assignment for Data Center RBridges

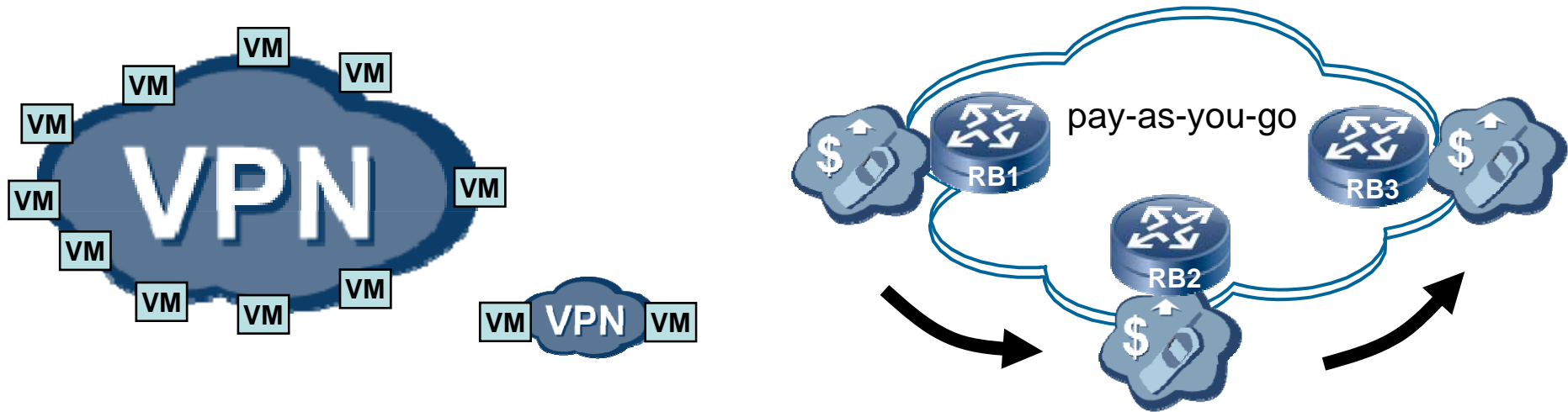
draft-zhang-trill-vlan-assign-00

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DCNs Support Virtualization

- TRILL VLANs are naturally used for VPN segregation
- Virtualization causes resource multiplex
 - Bandwidth
 - CPU
 - MAC-table memory

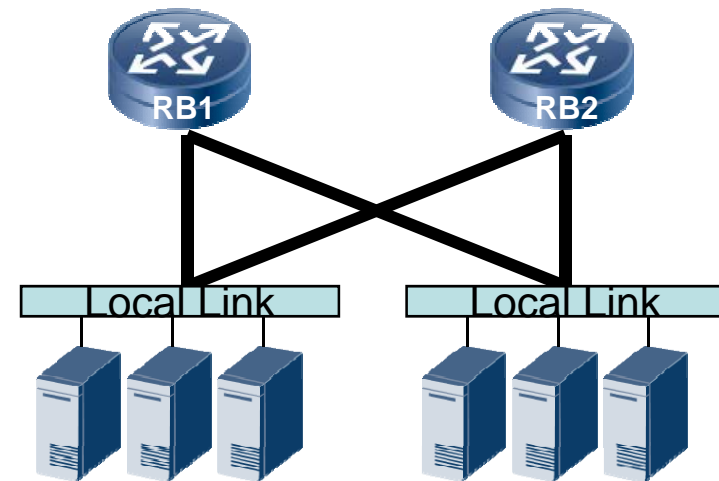
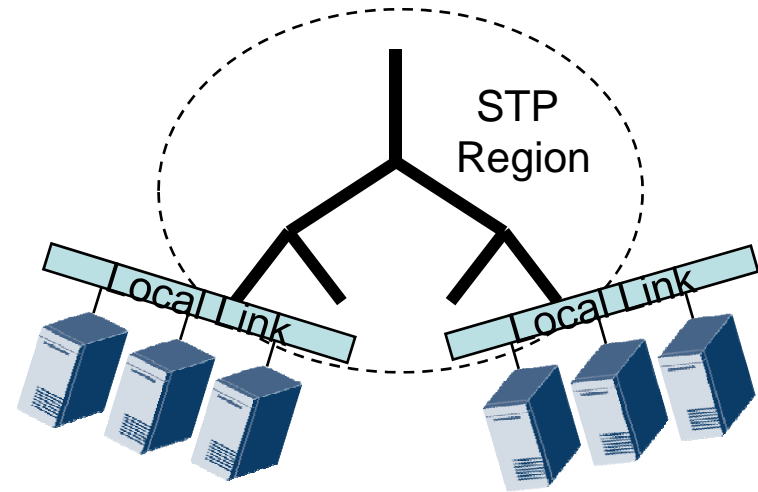
VPN's Volatility



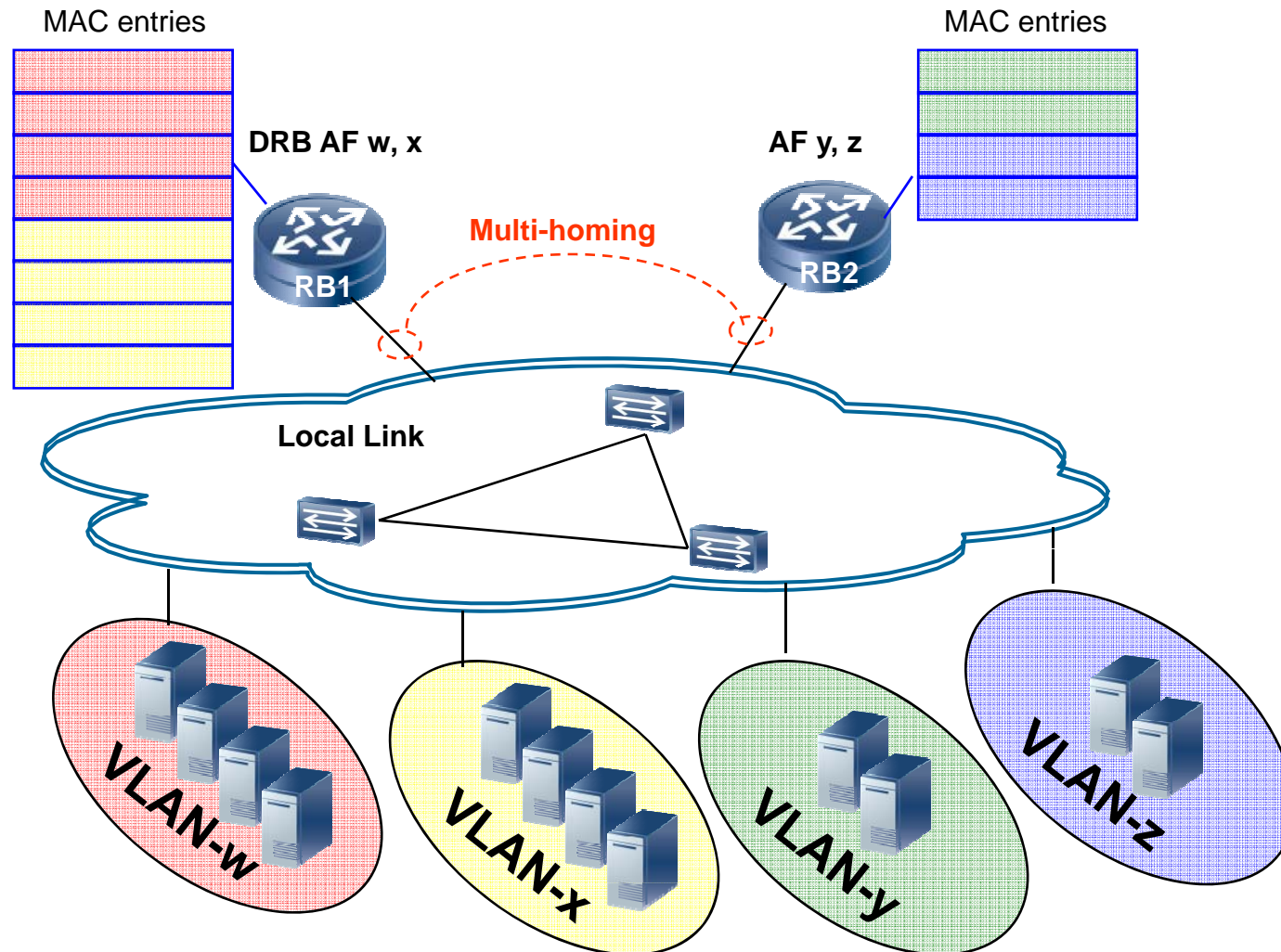
- VMs spawned/destroyed/active/inactive/migrate
 - Brings volatility to the size of VPNs (or VLANs)
 - Causes surge of network resource consuming
 - Some RBridge nodes get crowded
 - MAC table are used up
 - Some links are congested

Multiple Points Attachment

- Unlike STP, TRILL allows multi-access to Local Link
- MPA is common in DCN
 - High east-west capacity
 - Reliability
 - Flexibility

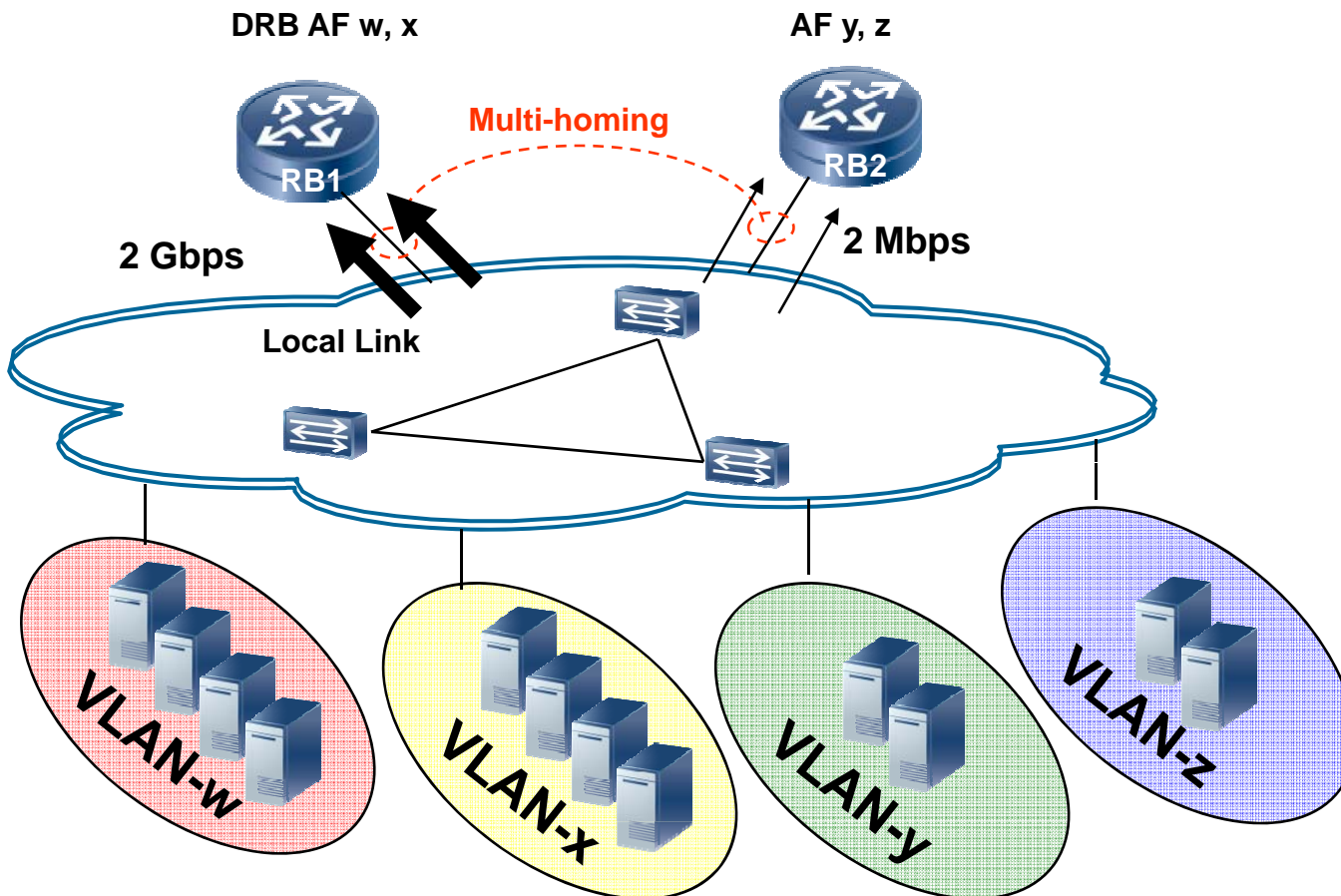


Ugly Casual Appointment



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

```

+++++++
|Type=MACetrRep | (1 byte)
+++++++
| Length | (1 byte)
+++++++
| DRB Nickname | (2 bytes)
+++++++
| Maximum MAC Entries | (2 bytes)
+++++++
| Available MAC Entries | (2 bytes)
+++++++
| MAC Entries of ULAN (1) | (4 bytes)
+++++++
| ..... | (4 bytes)
+++++++
| MAC Entries of ULAN (N) | (4 bytes)
+++++++

```

where each MAC Entries of ULAN is of the form:

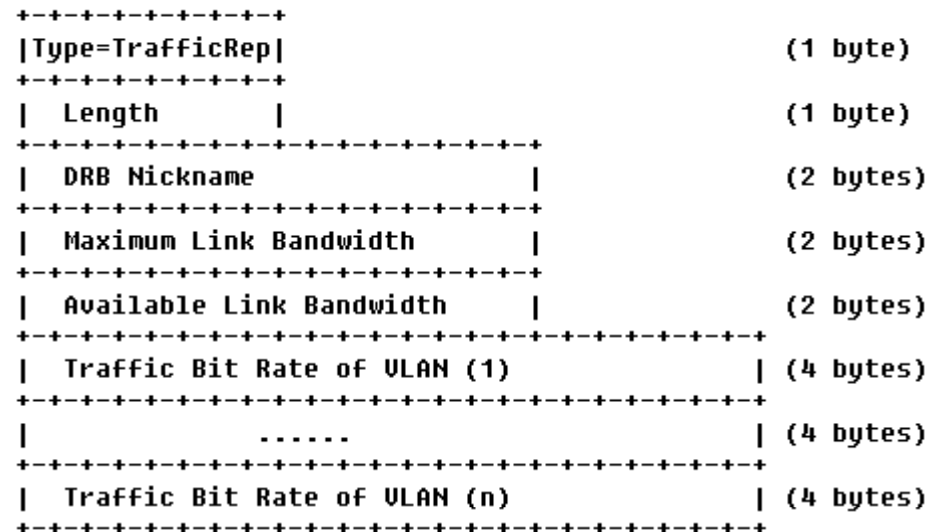
```

+++++++
| RESU | ULAN ID | (2 bytes)
+++++++
| The Number of MAC Entries | (2 bytes)
+++++++

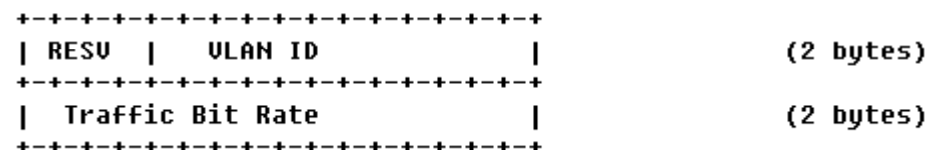
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Traffic Bit Rate Report sub-TLV

- Type, Length
- Value
 - 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:



Future Work

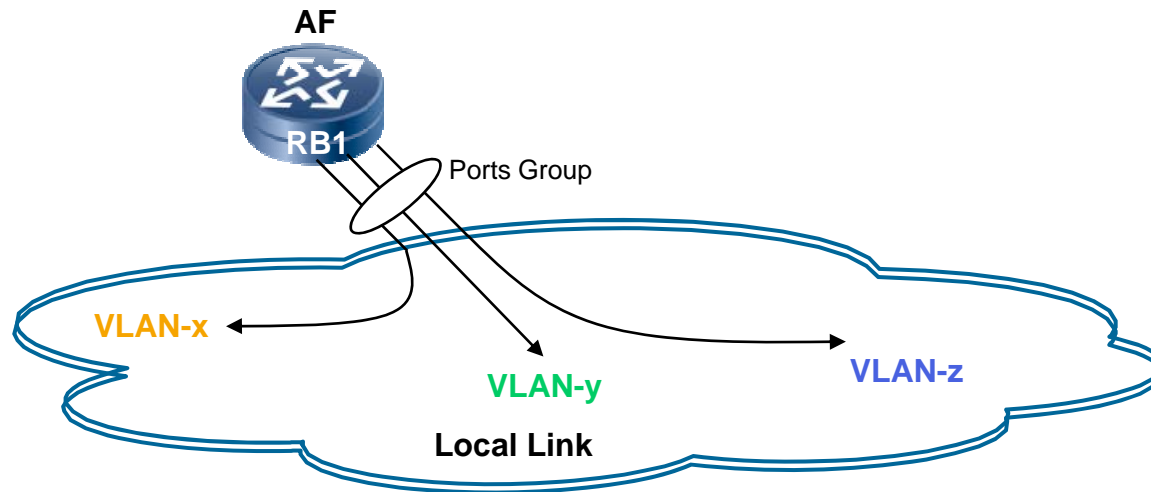
- To refine the fields of sub-TLVs
- To define the reassignment mechanism
- To design TRILL-TE

Thanks!

Backup Slides

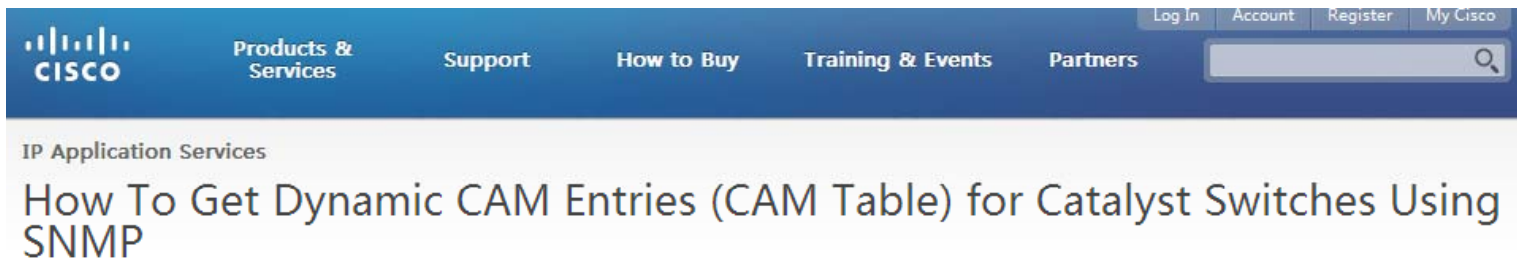
Load Splitting among Ports Group

- 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



http://www.cisco.com/en/US/tech/tk648/tk362/technologies_tech_note09186a0080094a9b.shtml

```
[user@server ~]#snmpwalk -v 2c -c abc123 10.10.10.1 ipNetToMediaPhysAddress
IP-MIB::ipNetToMediaPhysAddress.8.10.10.10.1 = STRING: 0:1b:2b:cd:60:3a
IP-MIB::ipNetToMediaPhysAddress.8.10.10.10.100 = STRING: 0:1d:9:30:49:1a
IP-MIB::ipNetToMediaPhysAddress.8.10.10.10.150 = STRING: 8:0:27:4:34:cd
IP-MIB::ipNetToMediaPhysAddress.10.10.10.20.1 = 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>