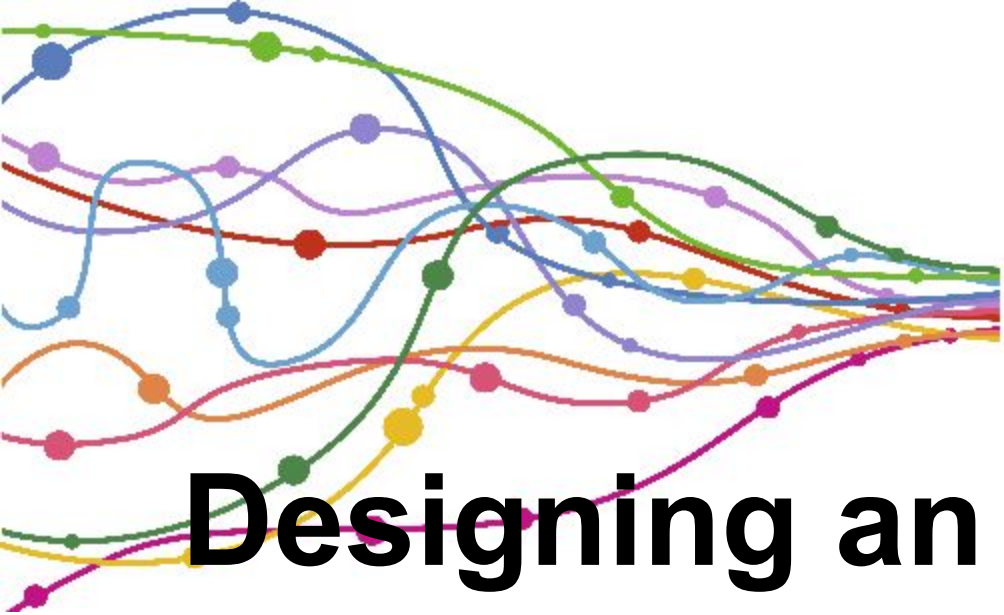

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18 Settembre 2013, MILANO

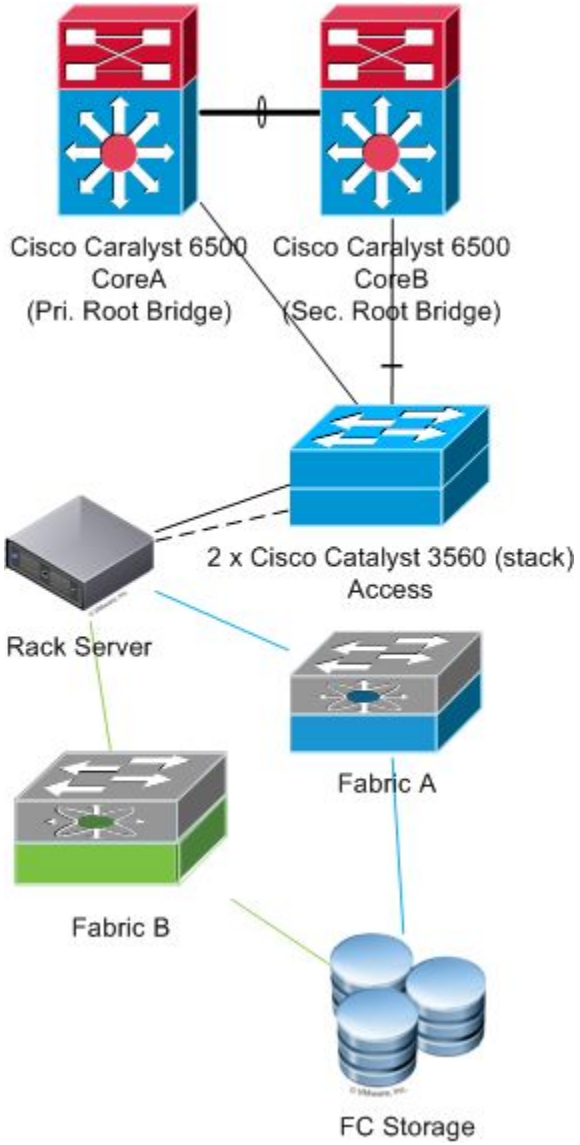
Designing an Hybrid Data Center Infrastructure

A "What-if" analysis

Andrea Dainese - Data Center Engineer

CISCO CERTIFIED CCIE ROUTING AND SWITCHING
CISCO CERTIFIED SPECIALIST
CISCO CERTIFIED CCNA VOICE
CISCO CERTIFIED CCDA
NetApp Certified Implementation Engineer — SAN
NetApp Certified Data Management Administrator
redhat. CERTIFIED ENGINEER
vmware CERTIFIED PROFESSIONAL 4

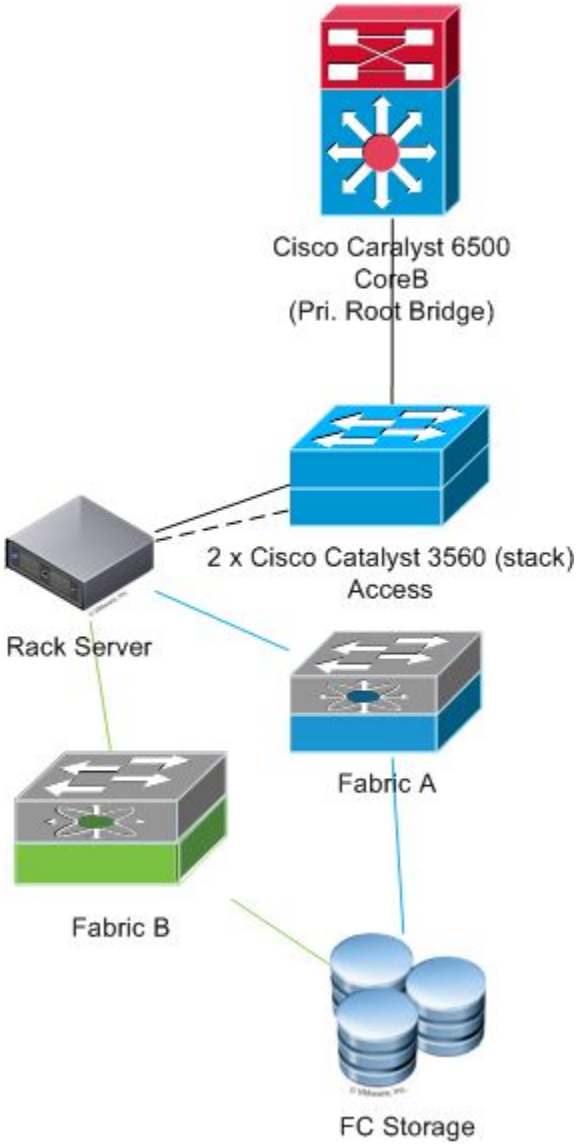
Data Center topology (8 years ago)



Devices

- Cisco Catalyst 6500 (core)
- Cisco Catalyst 3560 (access)
- Physical servers
- FC Storage

Data Center topology (8 years ago)



What-if

- **a core switch power down? ←**
- an access switch power down?
- a fiber became unidirectional?

Problems

- L2 Loops
- **FHRP ←**
- **black hole caused by STP convergence ←**

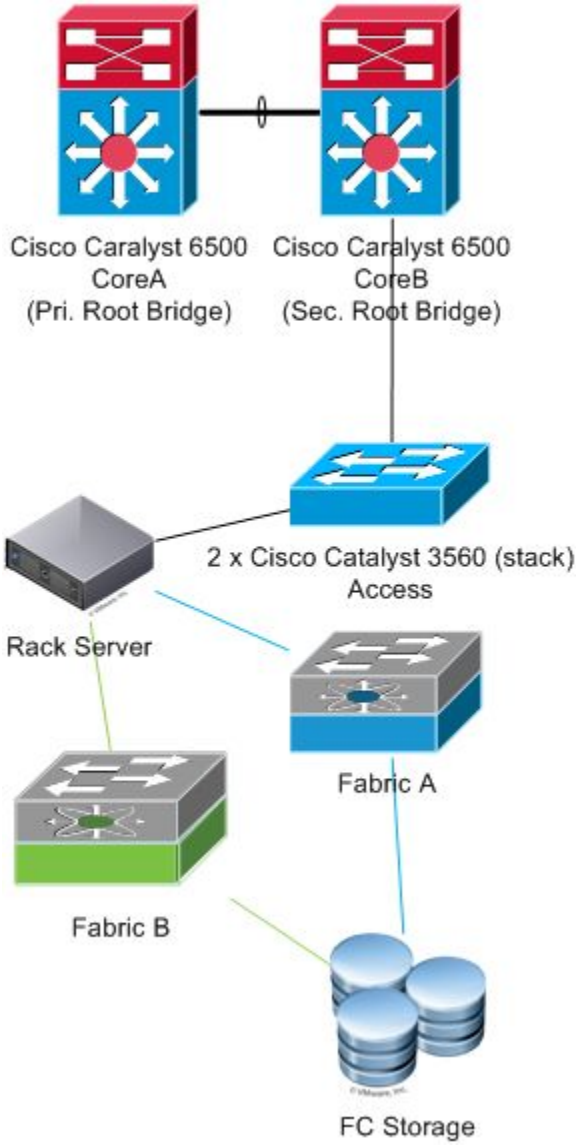
Solutions

- **HSRP/GLBP ←**
- UDLD
- **RPVST ←**
- Storm Control
- **VSS + PortChannel ←**

Conclusions

- **lossy network ←**

Data Center topology (8 years ago)



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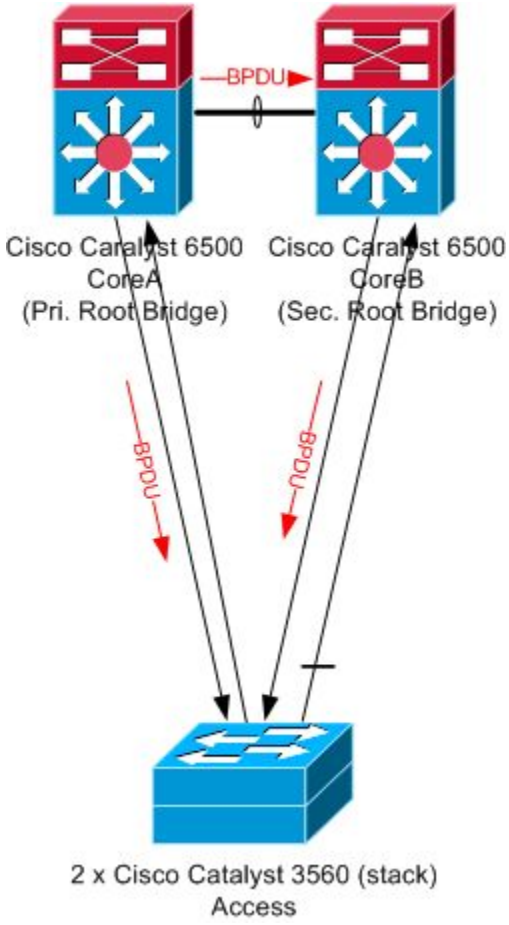

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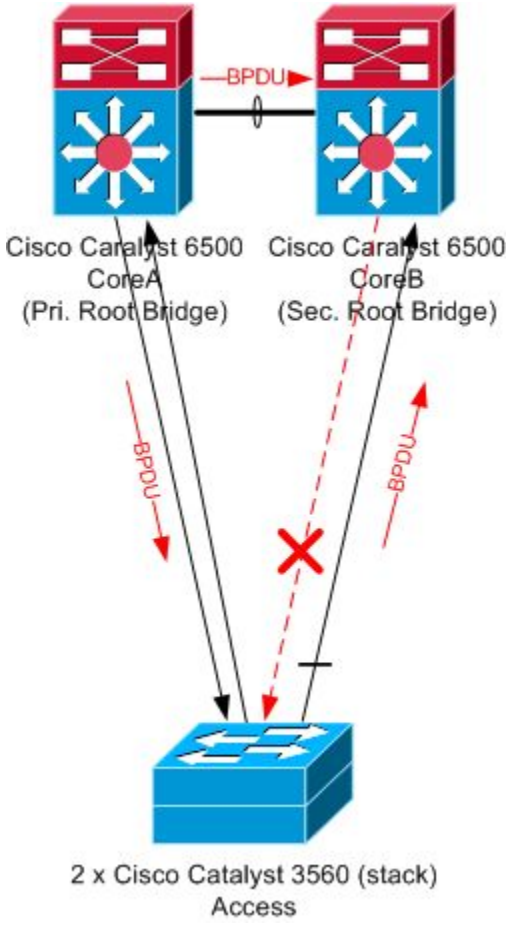

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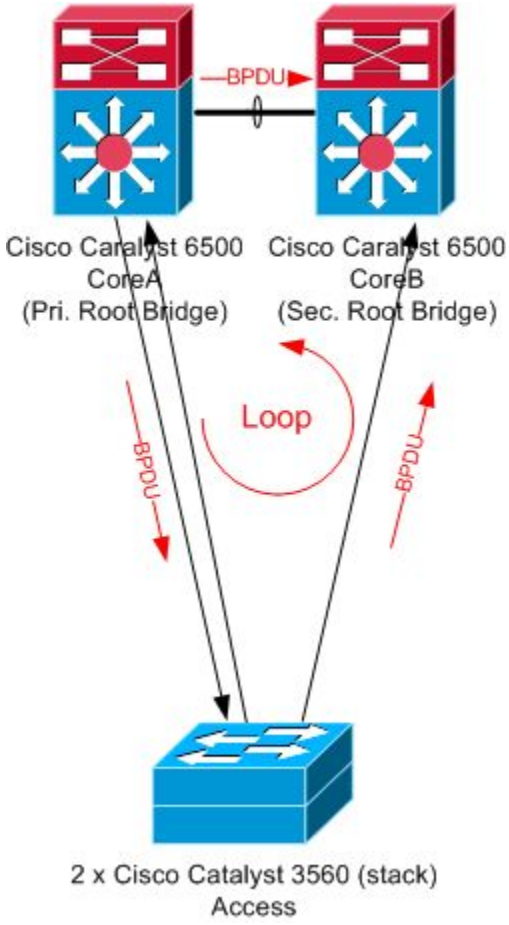

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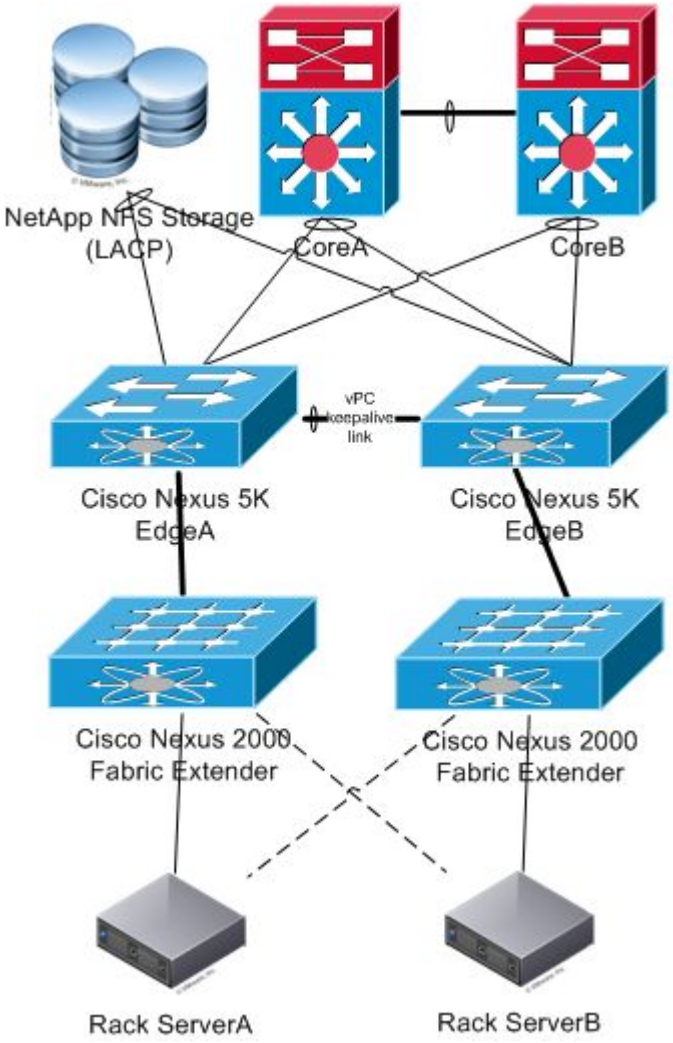
Data Center topology (4 years ago)



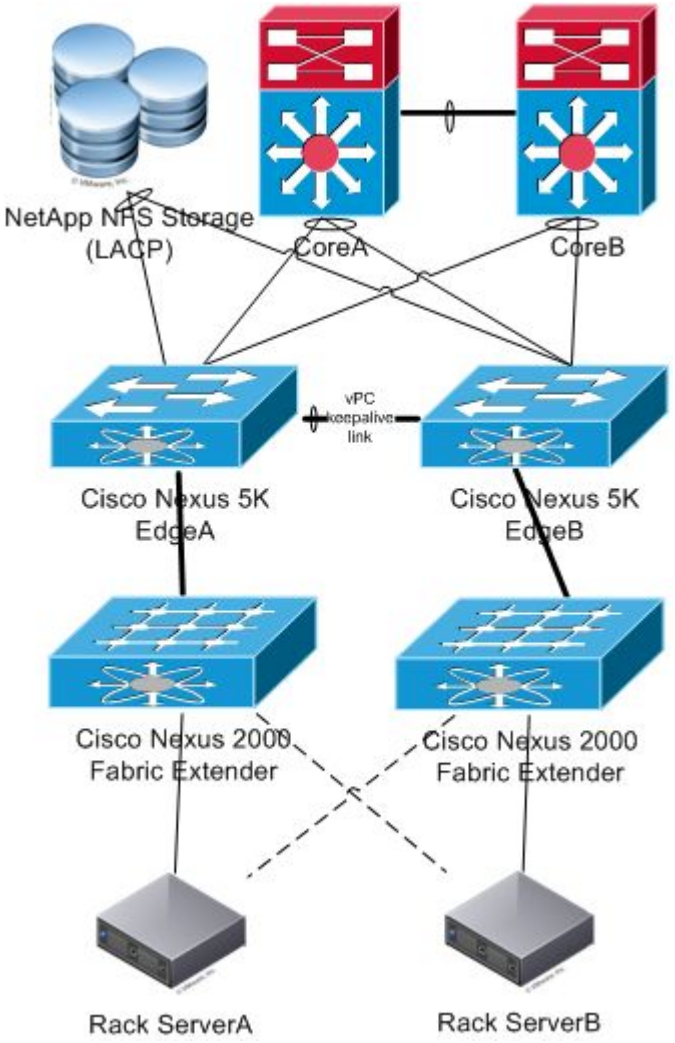
Evolutions

- needing a cheaper/easier storage network
- needing a faster Ethernet network
- 50% physical - 50% virtual servers

Devices

- Cisco Nexus 5000 (10 GbE core)
- Cisco Nexus 2000 (10 GbE access)
- Virtual servers
- NetApp storage (iSCSI/NFS)

Data Center topology (4 years ago)



What-if

- a SCSI transmission is lost/delayed?
- a cluster heartbeat is lost/delayed?

Problems

- SCSI over a lossy network
- Cluster heartbeat over a lossy network

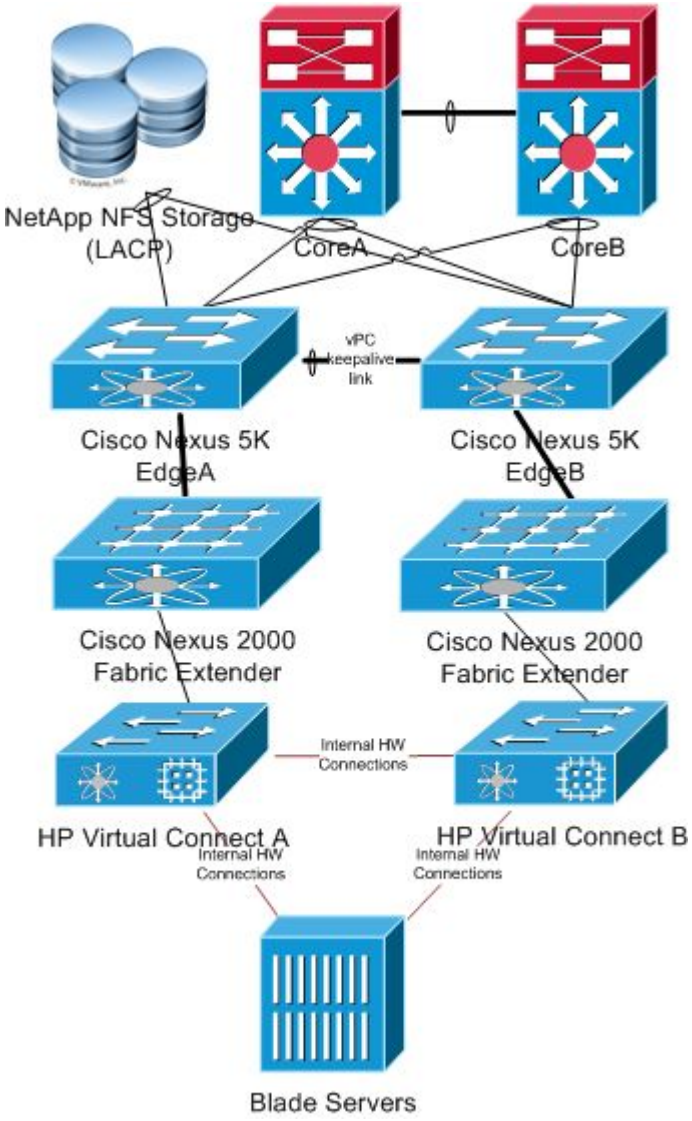
Solutions

- VMware Tools
- Timeouts

Conclusions

- SCSI doesn't like lossy networks

Data Center topology (today)



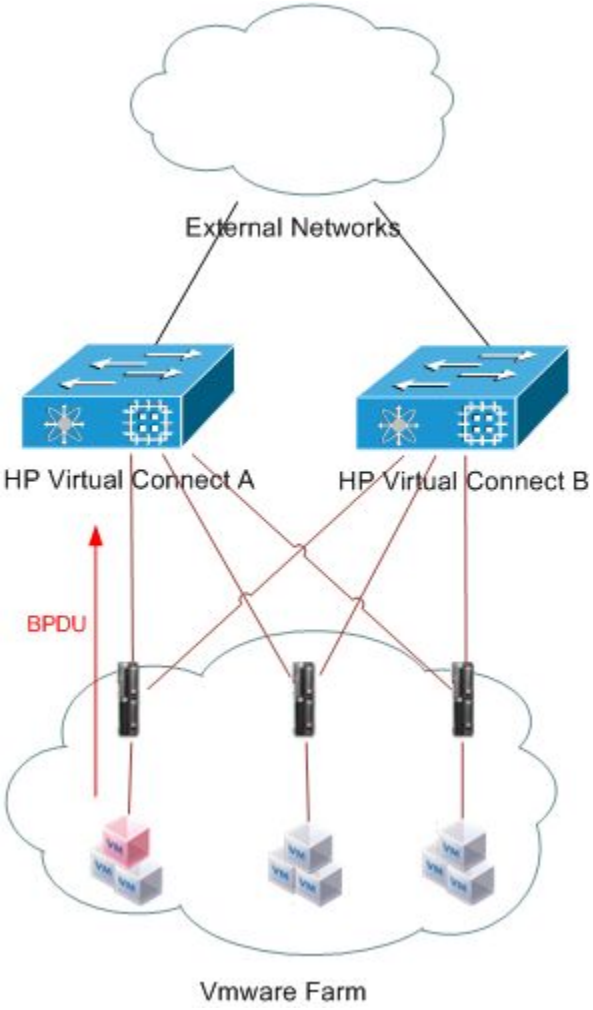
Evolutions

- needing an unified cabling
- 10% physical - 90% virtual servers

Devices

- Blade Servers
- Virtual Appliance
- Unified Cabling (2 fibers bring everything)

Data Center topology (today)



What-if

- a BPDU is transmitted by a VM?

Problems

- BPDUs shut down all VMware servers

Solutions

- Knows your devices

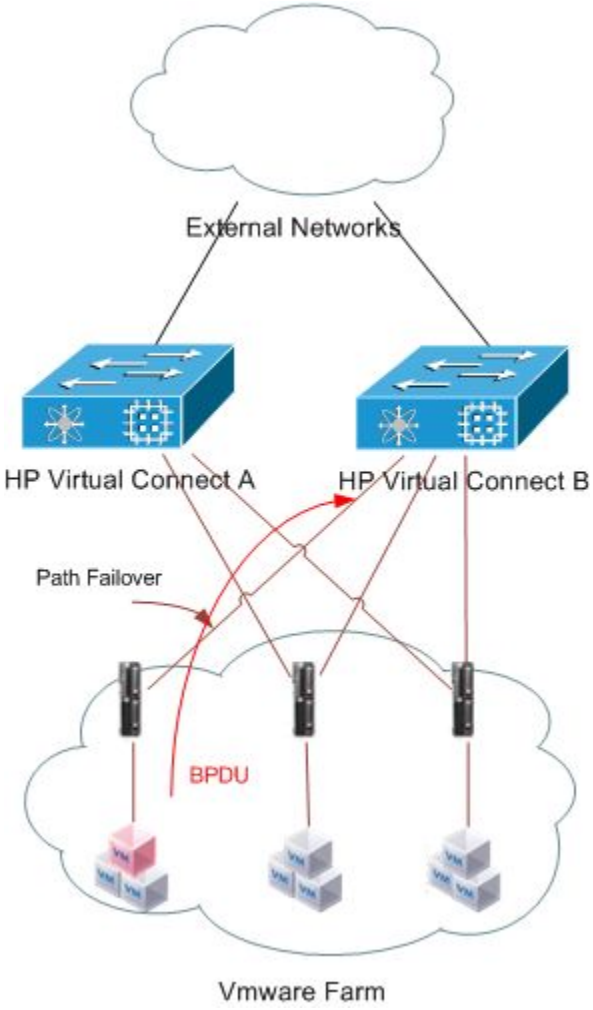
Conclusions

- Hybrid devices behave unexpectedly

Notes

- Nexus 1000v or vSphere 5.1 can filter BPDUs
- Reject “Forged Transmit” is not a solution

Data Center topology (today)



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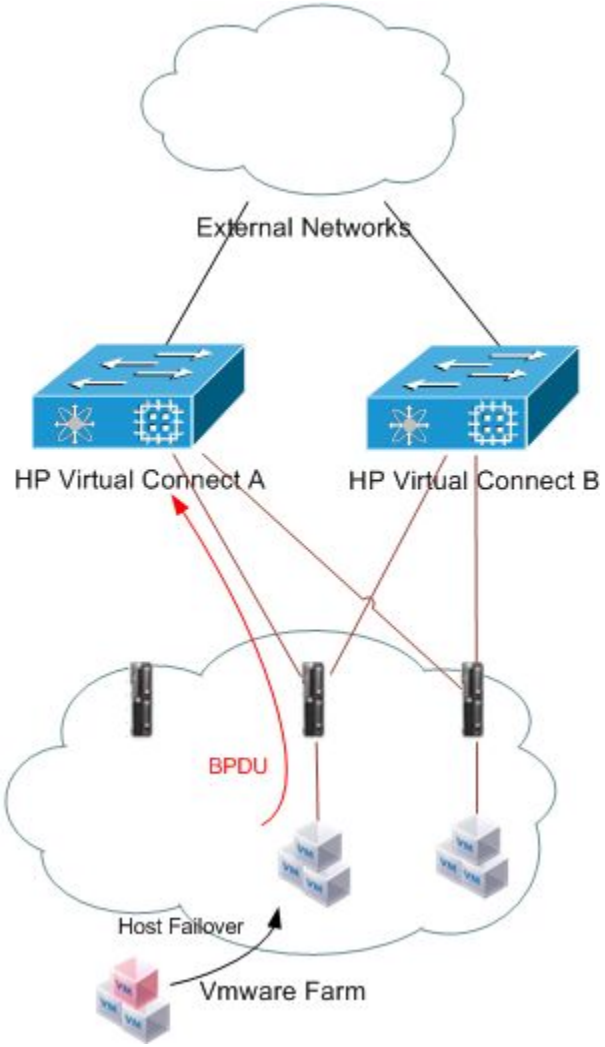

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Conclusions

I. Ethernet is a lossy network
   Be sure your software can tolerate connection reset, packet loss/delay.

II. Software/Hardware integration can behave unexpectedly
   Be aware of what your are including in your data-center and how to best configure it.

Thanks


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