

What You Make Possible



Troubleshooting the Cisco UCS Compute Deployment

BRKCOM-3001

Agenda

Troubleshooting Cisco UCS

- Overview
- Physical Setup
- Software Setup
- Configuration
- Path Tracing
- Maintenance
- Key Takeaways
- Q & A

Overview



UCS Building Blocks

UCS Manager

Embedded– manages entire system



UCS Fabric Interconnect

Nexus Switch



UCS Fabric Extender

Remote line card



UCS Blade Server Chassis

Flexible bay configurations



UCS Blade Server

Industry-standard architecture



UCS Virtual Adapters

Choice of multiple adapters

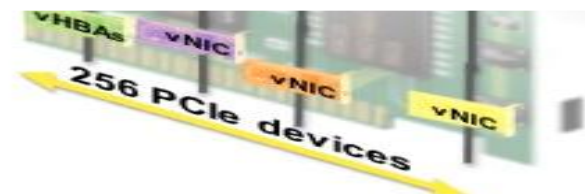


UCS Manager 2.0 Release

New and Updated Features

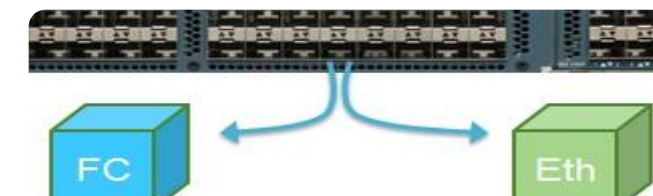
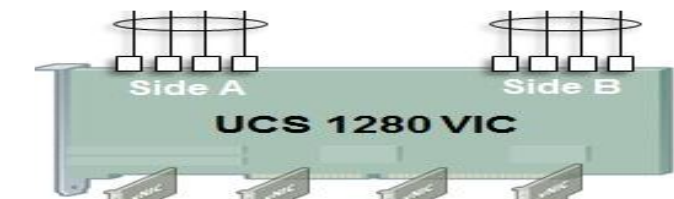
■ Hardware

- UCS 6248/96UP Fabric Interconnect
- UCS 2208XP IOM
- UCS 2204XP IOM
- UCS 1280 VIC
- UCS 1240 VIC (mLOM)



■ Features

- Unified Ports
- 80 Gb Host connectivity
- Fabric port-channelling
- L2 disjoint upstream in EHM
- VM-FEX for Red Hat KVM
- iSCSI Boot



UCS Manager 2.1 Release

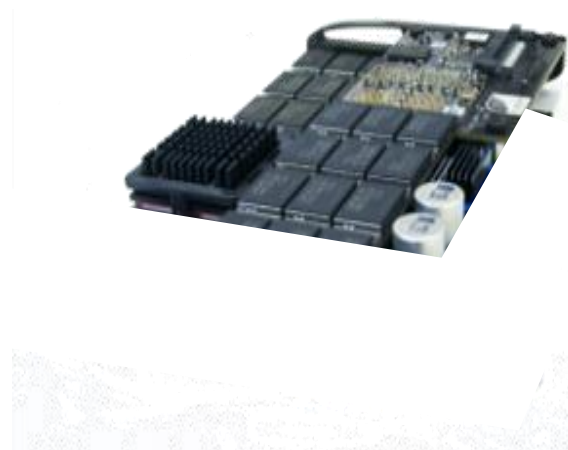
New and Updated Features

■ Hardware

- PCIe Flash
- C-Series Single Wire

■ Storage

- Multi-Hop FCoE
- Zoning Configuration
- Unified Appliance Ports

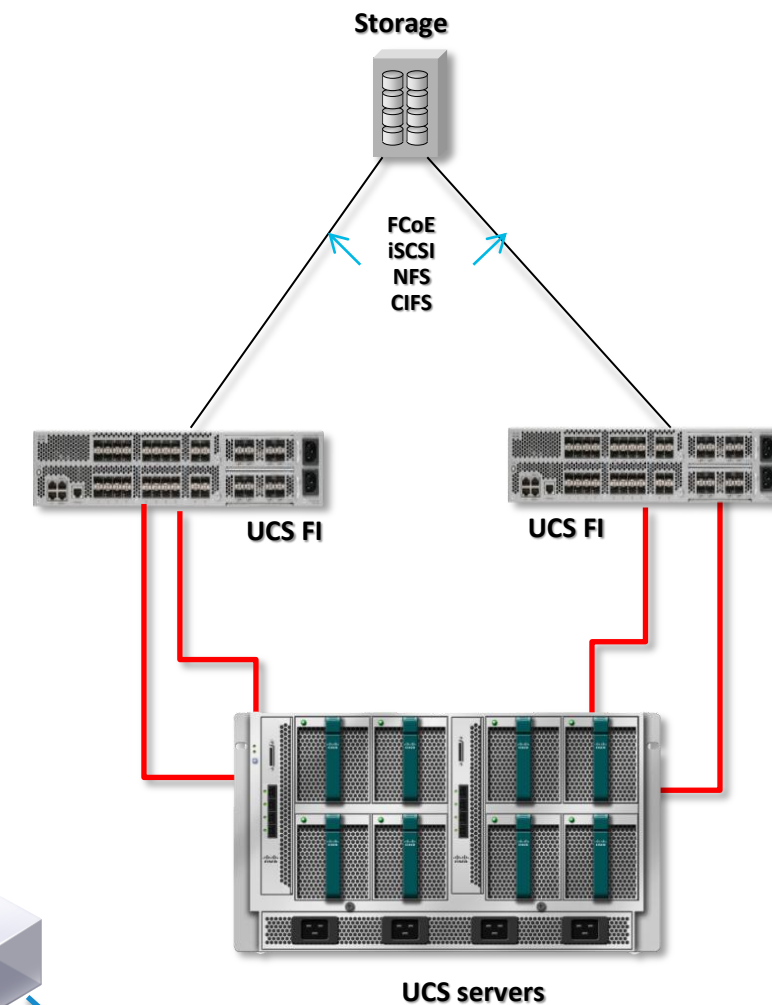
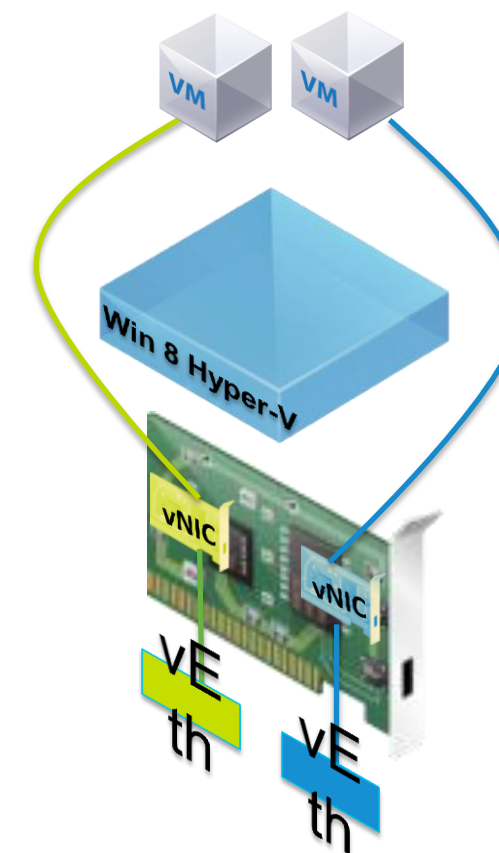


■ Operations

- Firmware Auto Install
- Fault Suppression
- UCS Central (MoM)
- Improved firmware compatibility

■ Networking

- VM-FEX for Windows
- VLAN Grouping
- IGMP Configuration
- Increased 'logical' ports



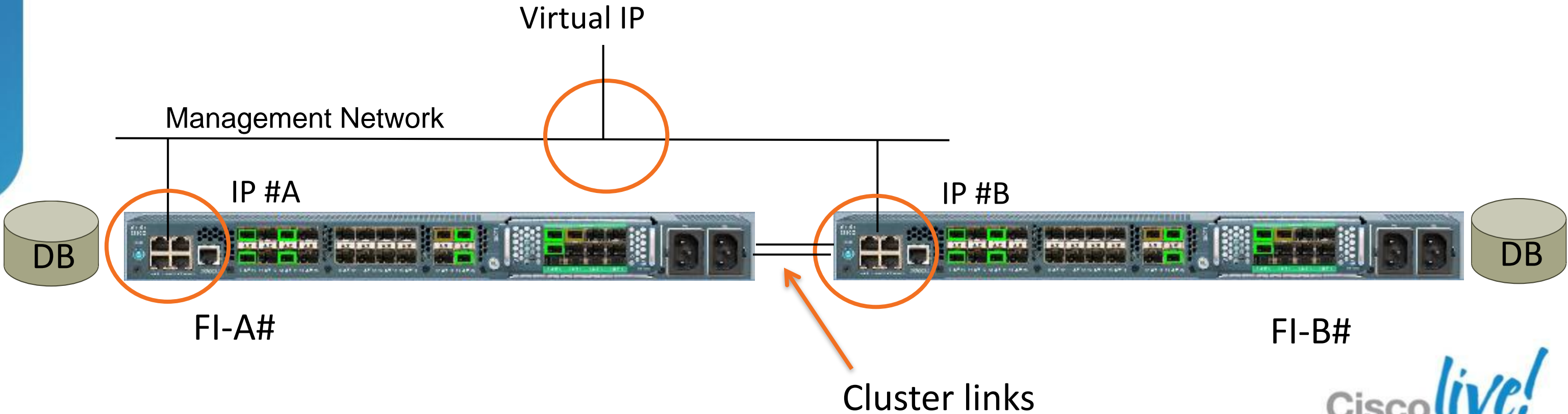
Physical Setup



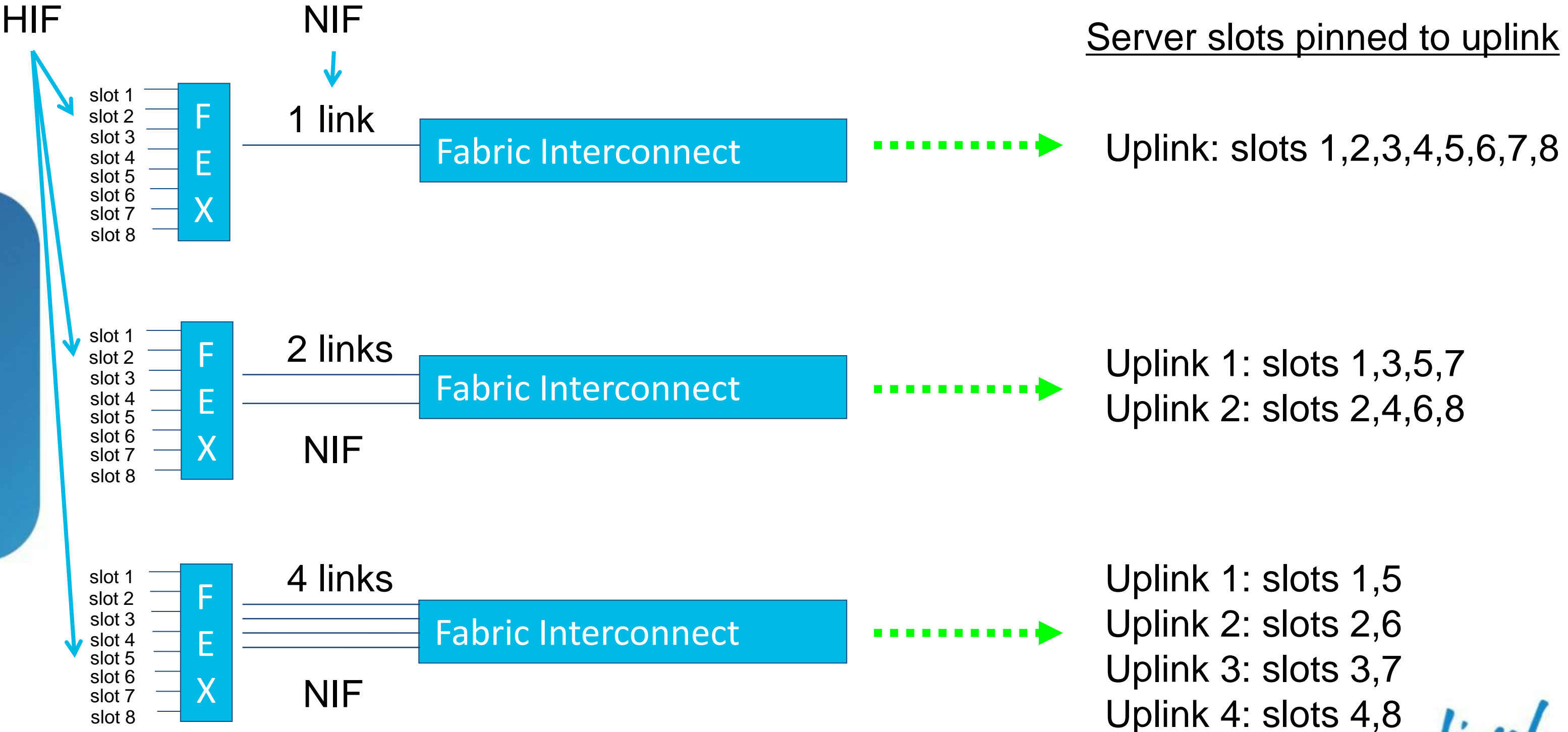
UCS Fabric Interconnect

6100, 6200 Hardware

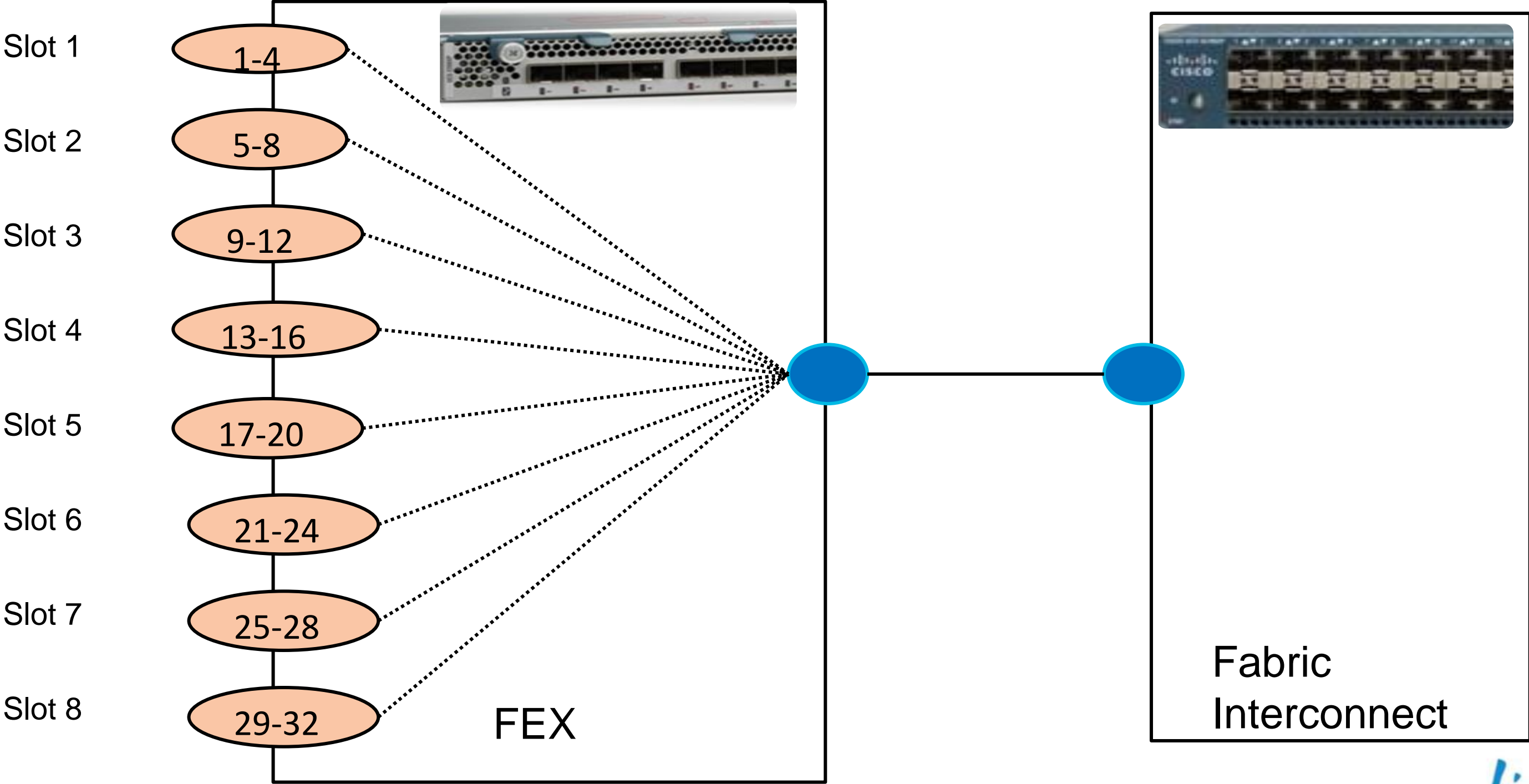
- Standalone or Clustered
 - Primary / Subordinate
 - Data Management Engine (DME)



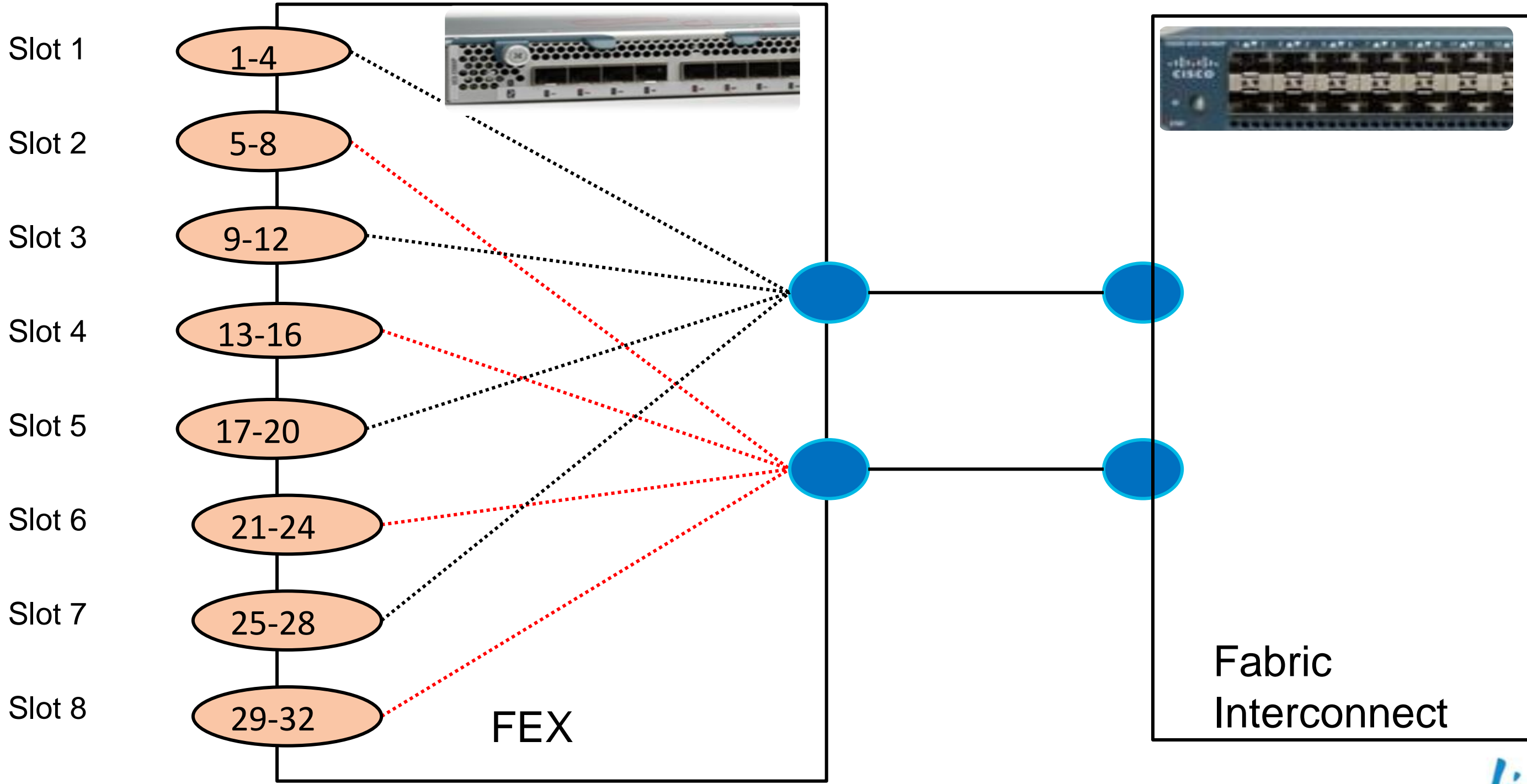
IO Module HIF to NIF Pinning (2104XP)



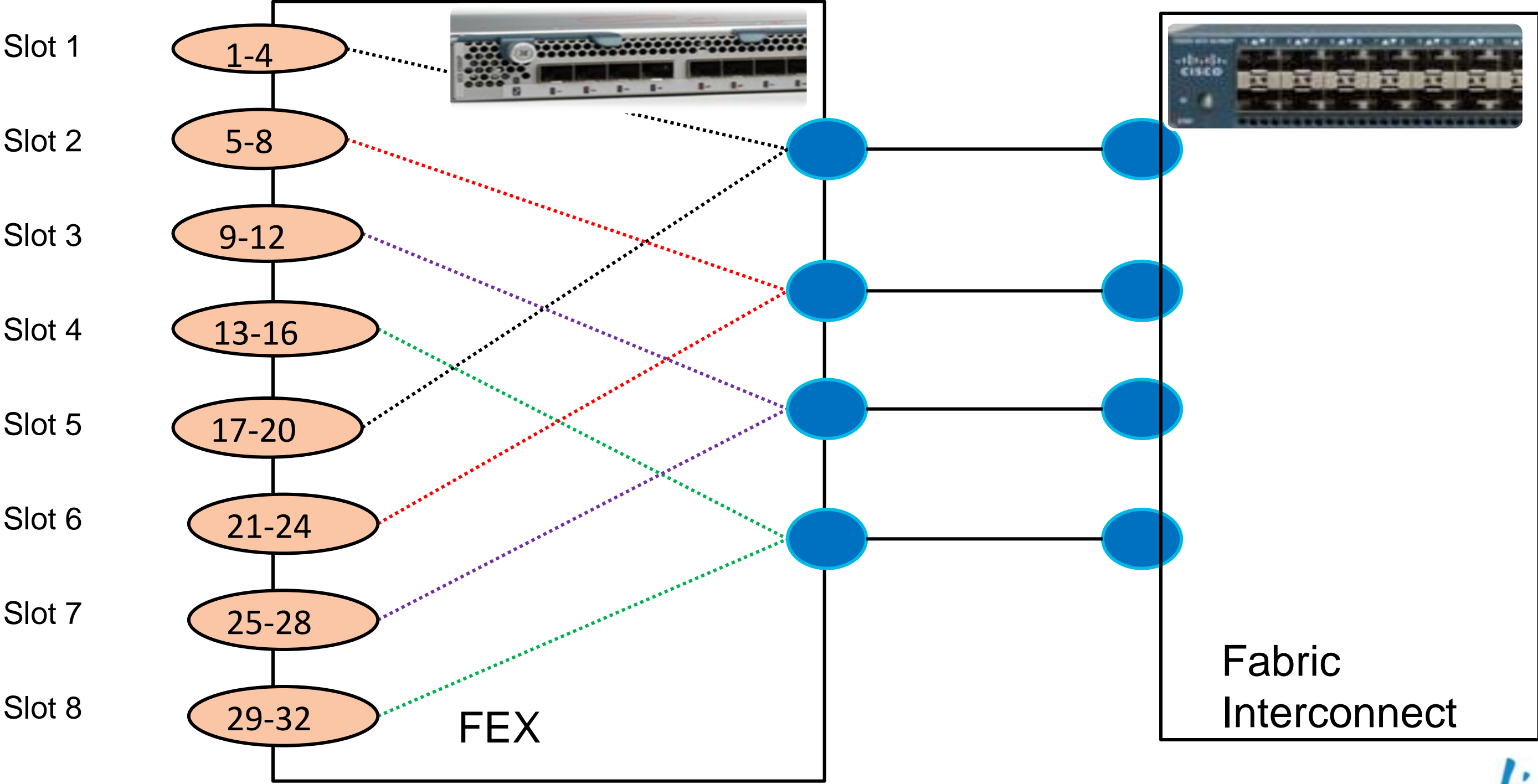
IO Module HIF to NIF Pinning (2208XP)



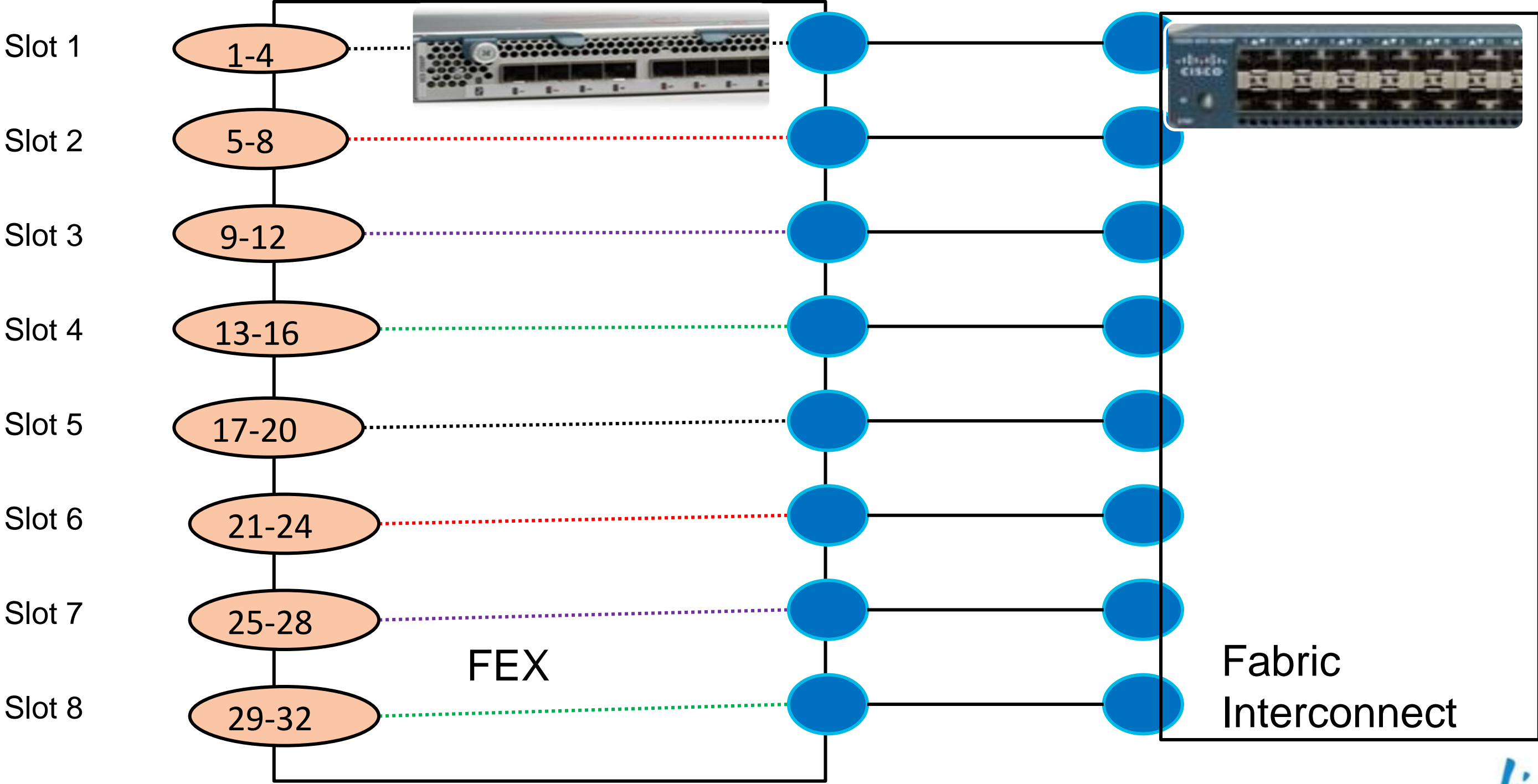
IO Module HIF to NIF Pinning (2208XP)



IO Module HIF to NIF Pinning (2208XP)

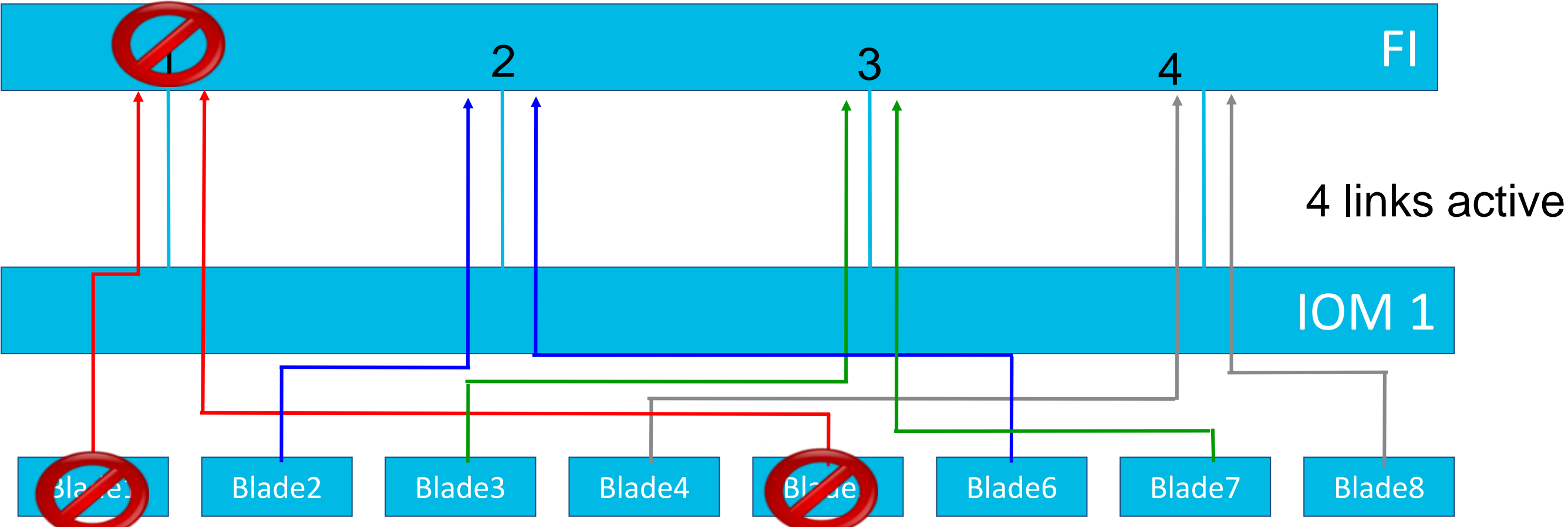


IO Module HIF to NIF Pinning (2208XP)



IO Module and Failover

Lose IOM link 1



Lose connectivity on mezzanine port mapped to IOM 1 for blades 1 and 5

If you can't know when the chassis, blades 1, 3, 5, 7 will use one uplink, and blades 2, 4, 6, 8 will use a different uplink

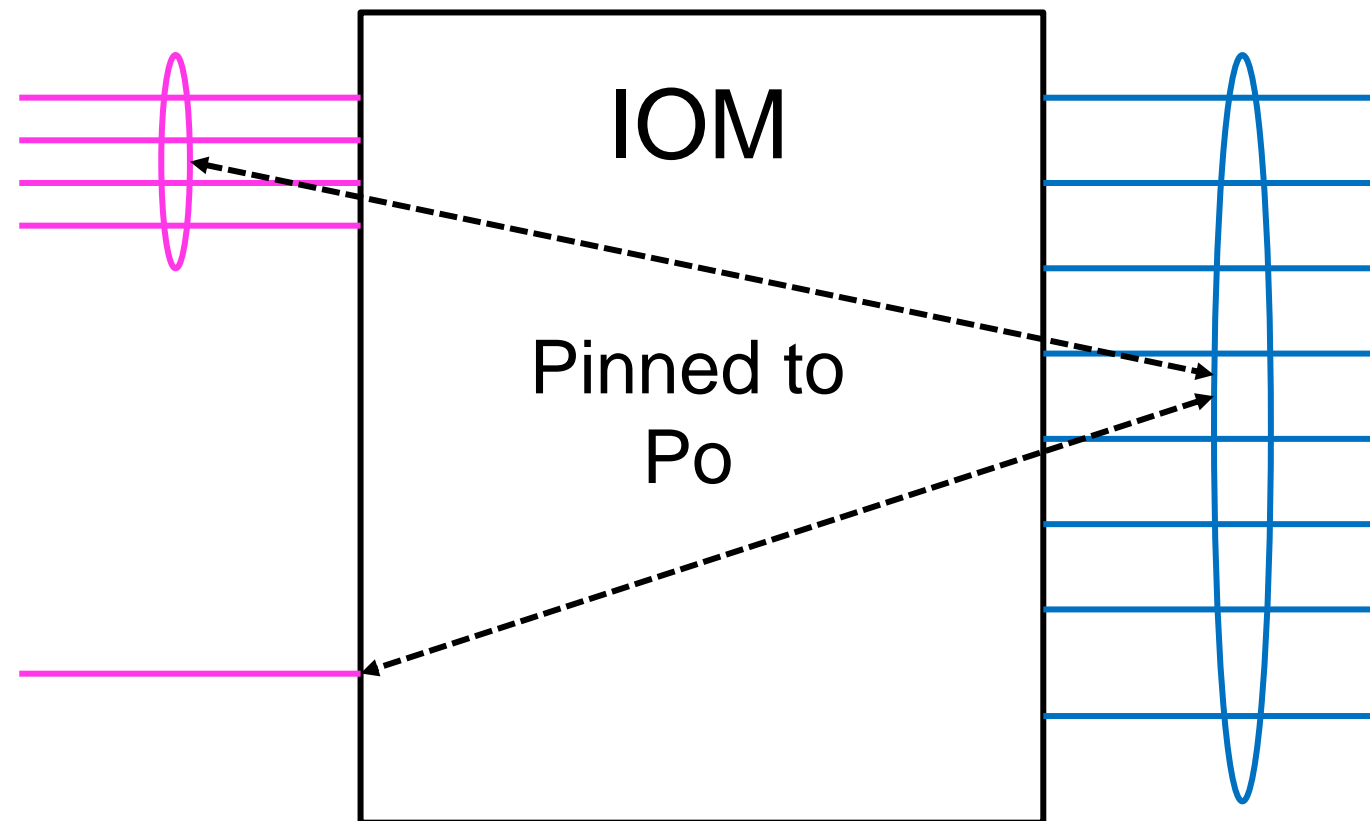


Port-Channel Pinning

- No slot based pinning
- No invalid link count for NIF ports

VIC1280
adaptor with
DCE links in
Port-Channel

Gen-1 adaptor
with single 10G
link



Chassis Discovery Policy

- Discovery policy only defines the minimum number of links necessary before a chassis can be discovered and NOT how many links will be utilised

Chassis Discovery Policy

Action: 2 Link

Link Grouping Preference: 2 Link

Rack Server Discovery

1 Link
2 Link
4 Link
8 Link
Platform Max

Chassis Discovery Policy

Action: 2 Link

Link Grouping Preference: None Port Channel

General Servers Services Profiles IO Modules

Installed Firmware SEL Logs Power Control Monitor Conn Policy

chassis-conn-policy-chassis-1-fabric-A

Chassis ID: 1
Fabric ID: A

Admin State: None Port Channel Global

Software Setup



Upgrades



Upgrade Considerations

Pre-Checks and Avoiding Issues

- Release Notes will cover pre-requisites and concerns in the upgrade process
- Schedule an outage window
 - FI and IOM will reboot during upgrade
 - Make sure network and storage fabric are redundant
- Highly recommended to backup UCSM configuration
- Upgrade process is not quick so be patient
- Follow the upgrade procedure for each version

Upgrade Process

Order of Operations

- Backup UCS Config (Full & All Config)
- Download firmware
- Update components (adapters, CIMC, IOMs)
- Activate components in order of:
 - Adapter cards – Set Startup Only
 - CIMC
 - UCSM
 - IOM – Set Startup Only
 - Fabric Interconnect
 - BIOS/Storage Controller/etc (through firmware package)

Upgrade Process

UCS 2.1 New Features

- **UCS 2.1 Firmware Auto Install**
- Reduces complexity
- Better troubleshooting
- Better compatibility
- Infrastructure and Blade/Racks

The screenshot displays the UCSM interface for configuring Firmware Auto Install. The top navigation bar includes tabs for Installed Firmware, Firmware Auto Install, Catalog Package, Download Tasks, Packages, Images, Upgrade Validation, and Faults. The main content area is divided into several sections:

- Status:** Firmware Installer: **Ready** (green up arrow), System Firmware: **Same Release** (green checkmark).
- Firmware Package Version:** Infrastructure: **2.1(0.290)A**, Blade: **2.1(0.290)B**, Rack: (empty).
- Actions:** Install Servers, Install Infrastructure.
- Install Infrastructure:** A detailed configuration panel with:
 - Firmware System Status:** Firmware Installer: **Ready**, System Firmware: **Same Release**.
 - Actions:** Cancel Infrastructure Upgrade.
 - Properties:** Name: **default**, Description: **Infrastructure Pack**, Version: **2.1(0.283)A**.
 - Infrastructure Schedule:** Admin State: **Untriggered**, Overall Status: **Triggered**, Policy Owner: **Local**, Start Time: **1969-12-31T19:00:00**.
 - One Time Occurrence Properties:** (Expanded section).
- UCSM:** Fabric Interconnect Kernel, Fabric Interconnect Software, IO Modules.
- Table:** Filter, Export, Print. The table below shows the installed firmware details.

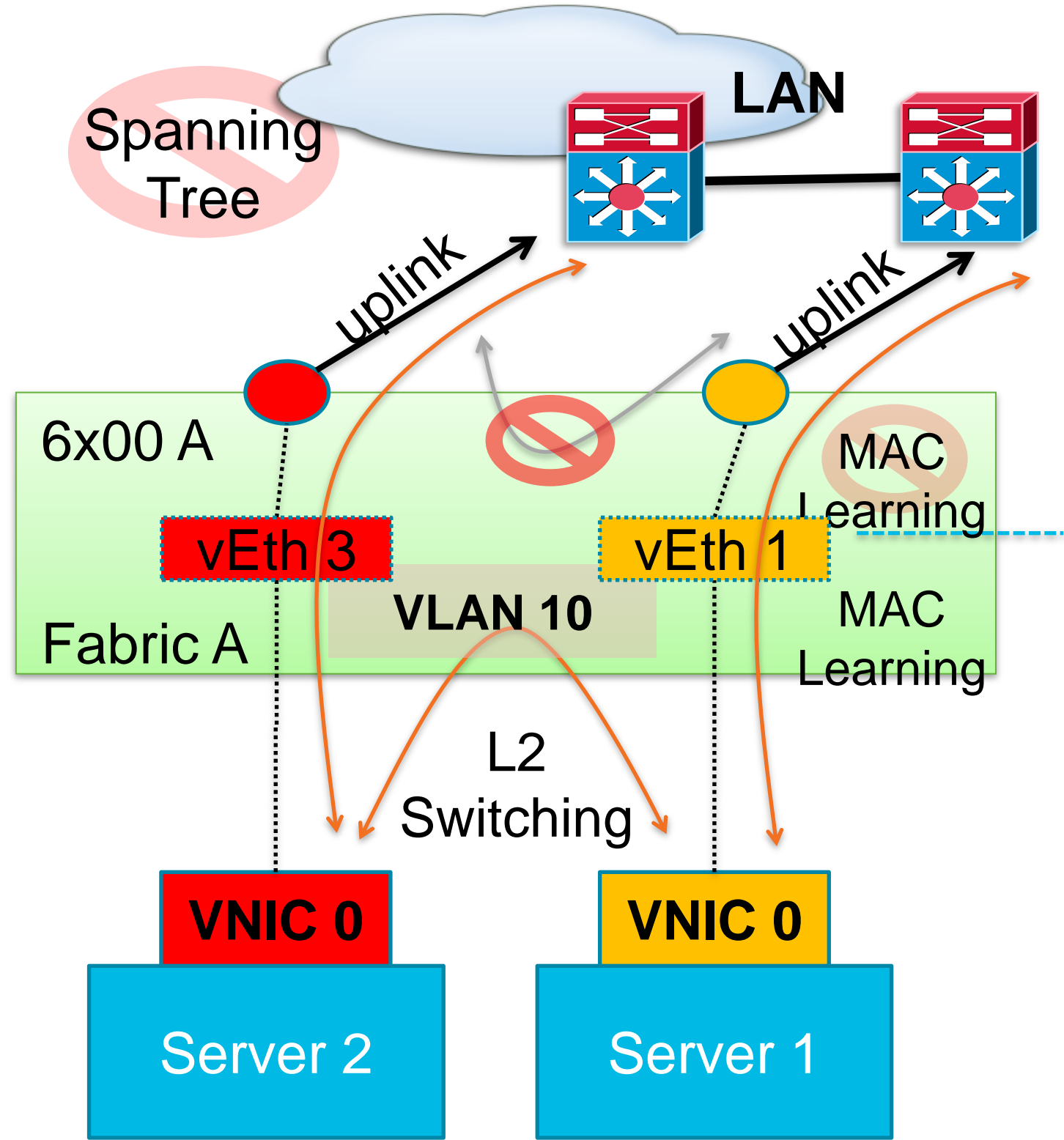
Vendor	Model	PID	Presence	Version
Cisco Systems		CAM-NSK	Present	2.1(0.283)

Buttons for OK and Apply are located at the bottom right of the configuration panel.

Fabric Interconnect Modes

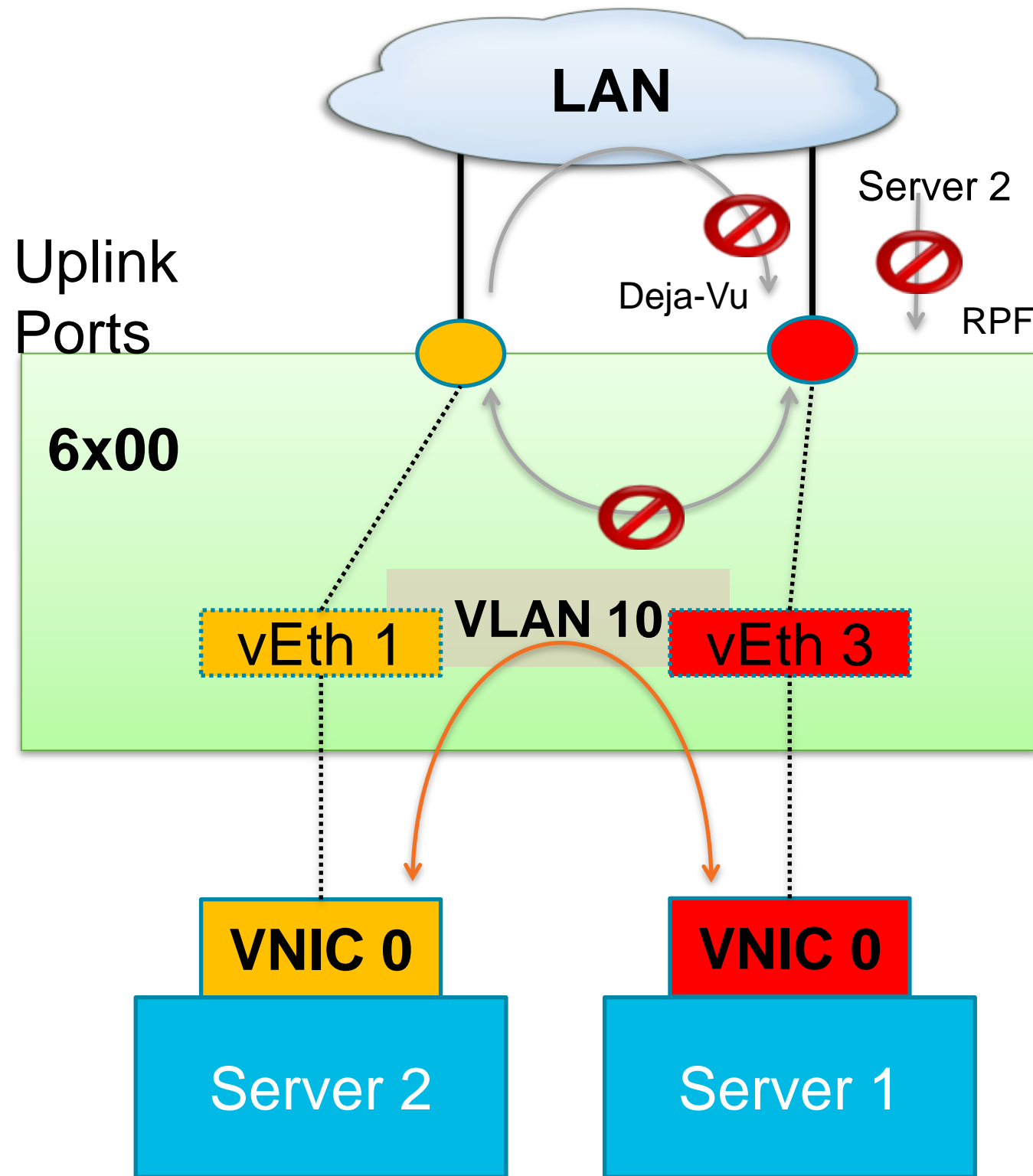


FI Ethernet Modes: End Host



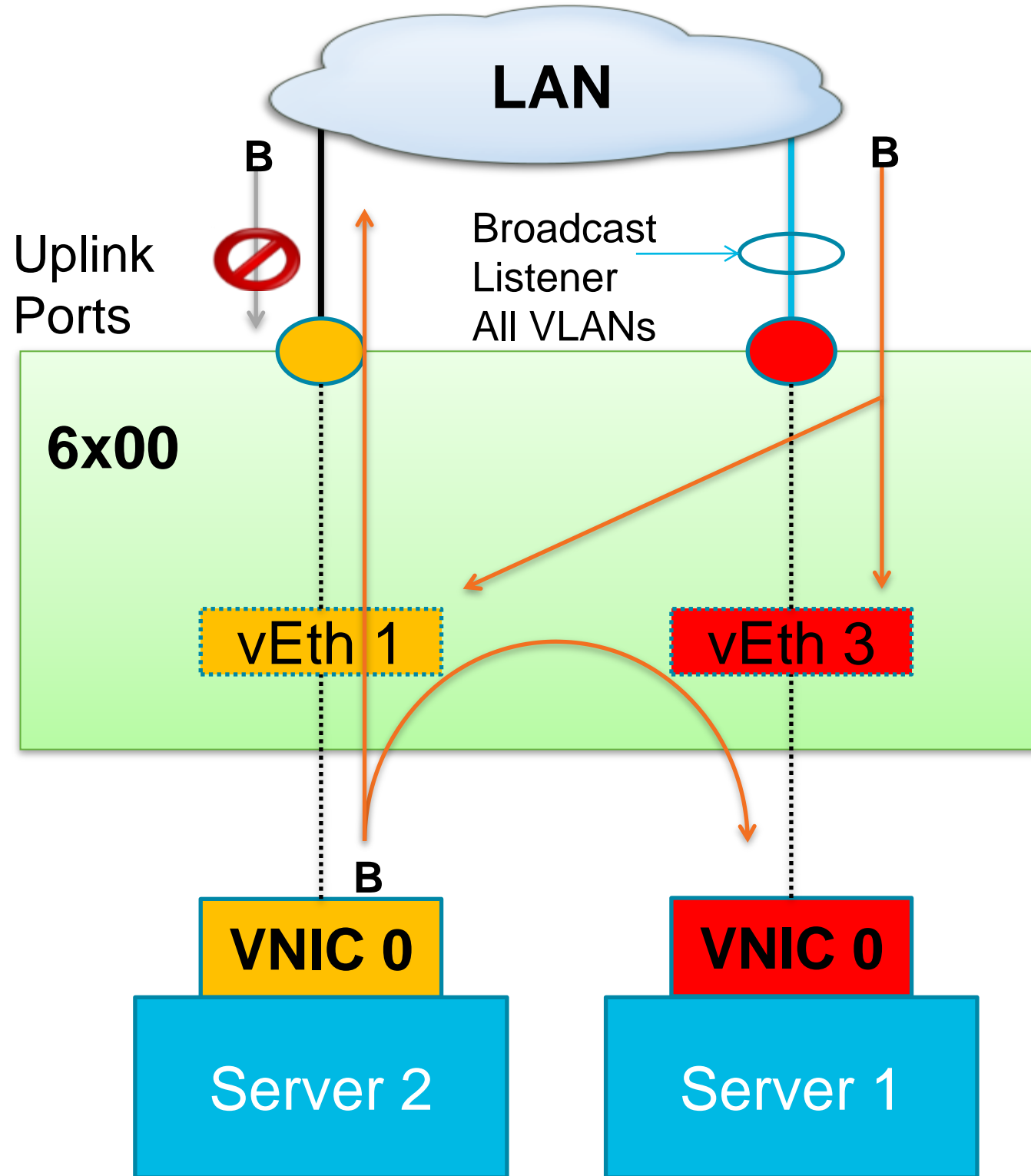
- No Spanning Tree Protocol
- Maintains MAC table for Servers only
- Allows Multiple Active Uplinks per VLAN
- Prevents Loops by preventing Uplink-to-Uplink switching

End Host Mode Unicast Forwarding



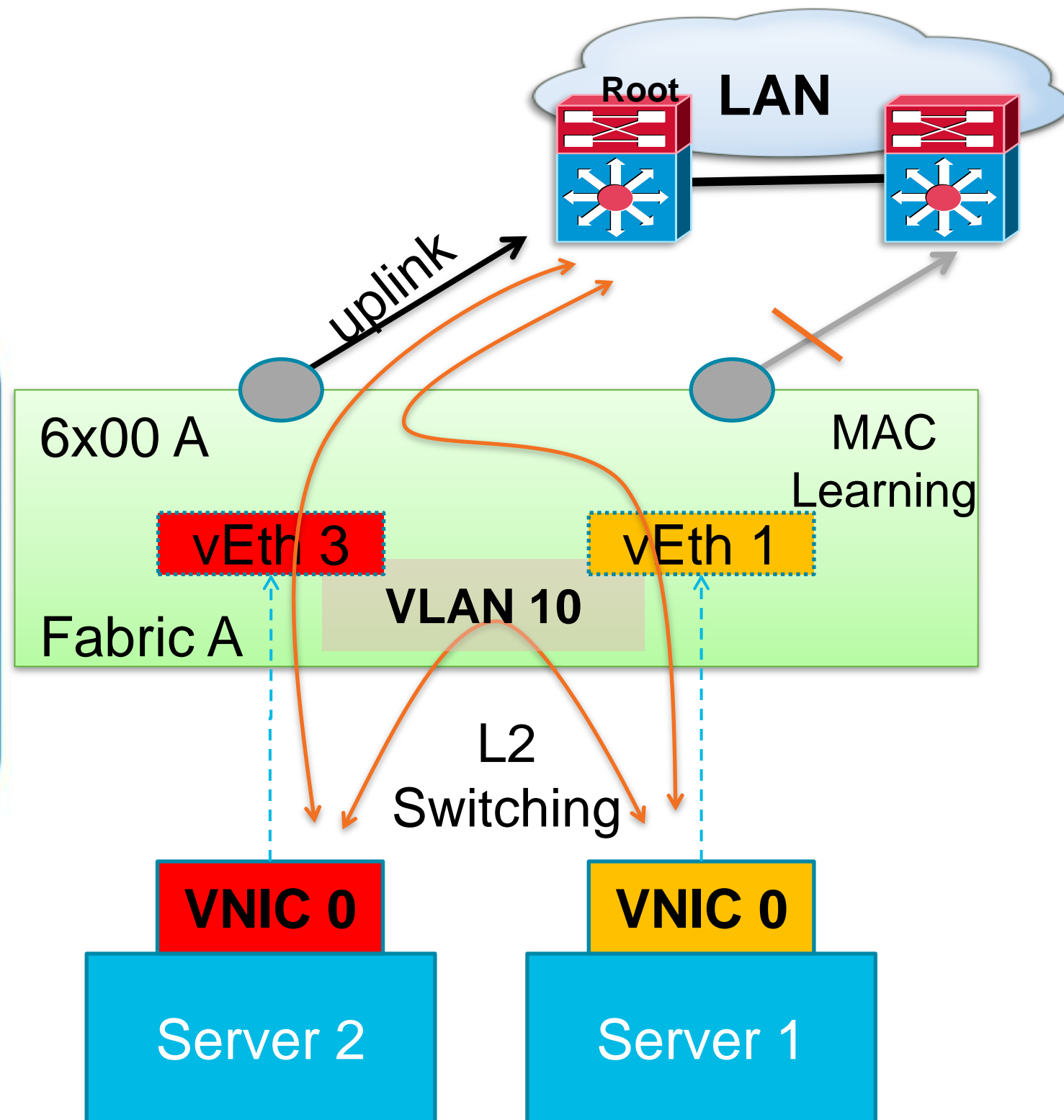
- Server to server traffic on the same VLAN is locally switched
- Each server link is pinned to an uplink port / port-channel
- Network to server unicast traffic is forwarded to server only if it arrives on pinned uplink port. This is termed as the Reverse Path Forwarding—(RPF) check
- Packet with source MAC belonging to a server received on an uplink port is dropped (Deja-Vu Check)
- Unknown unicast traffic is dropped

EHM Broadcast/Multicast Forwarding



- **Pre 2.0 - Broadcast traffic is pinned on exactly one uplink port** (or port-channel) i.e., it is dropped when received on other uplinks
- All multicast groups are pinned to same uplink port
- Server to server multicast traffic is locally switched
- RPF and deja-vu check also applies for multicast traffic

UCS Switch Mode

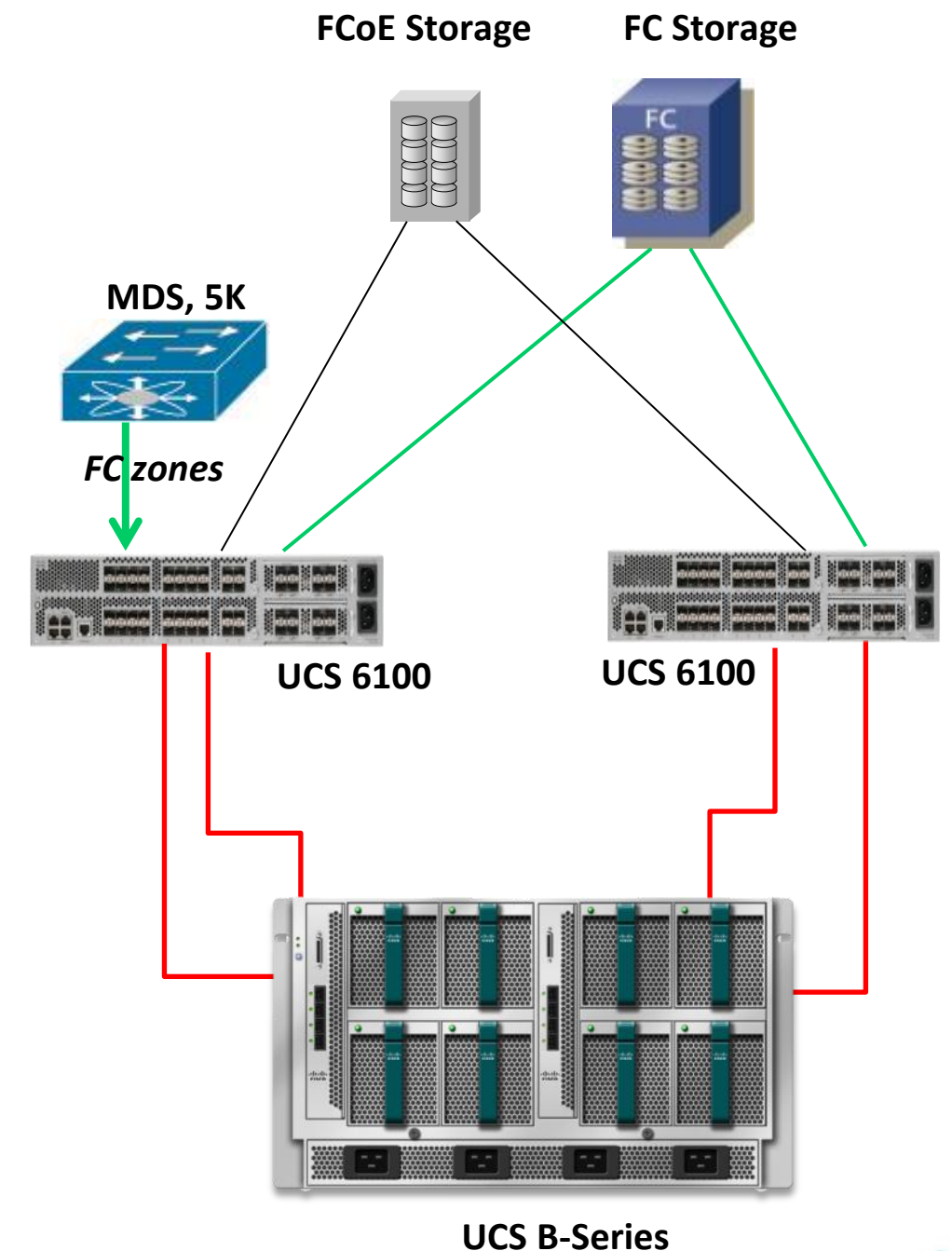


- FI acts as L2 switch
- Server vNIC traffic follows VLAN forwarding
- Rapid PVST+ is used
- Configuration of STP parameters (bridge priority, Hello Timers etc) or VTP is not supported
- MAC learning/aging happens on both the server and uplink ports like in a typical Layer 2 switch

UCS Direct Attach Storage

UCS 1.4 and 2.0

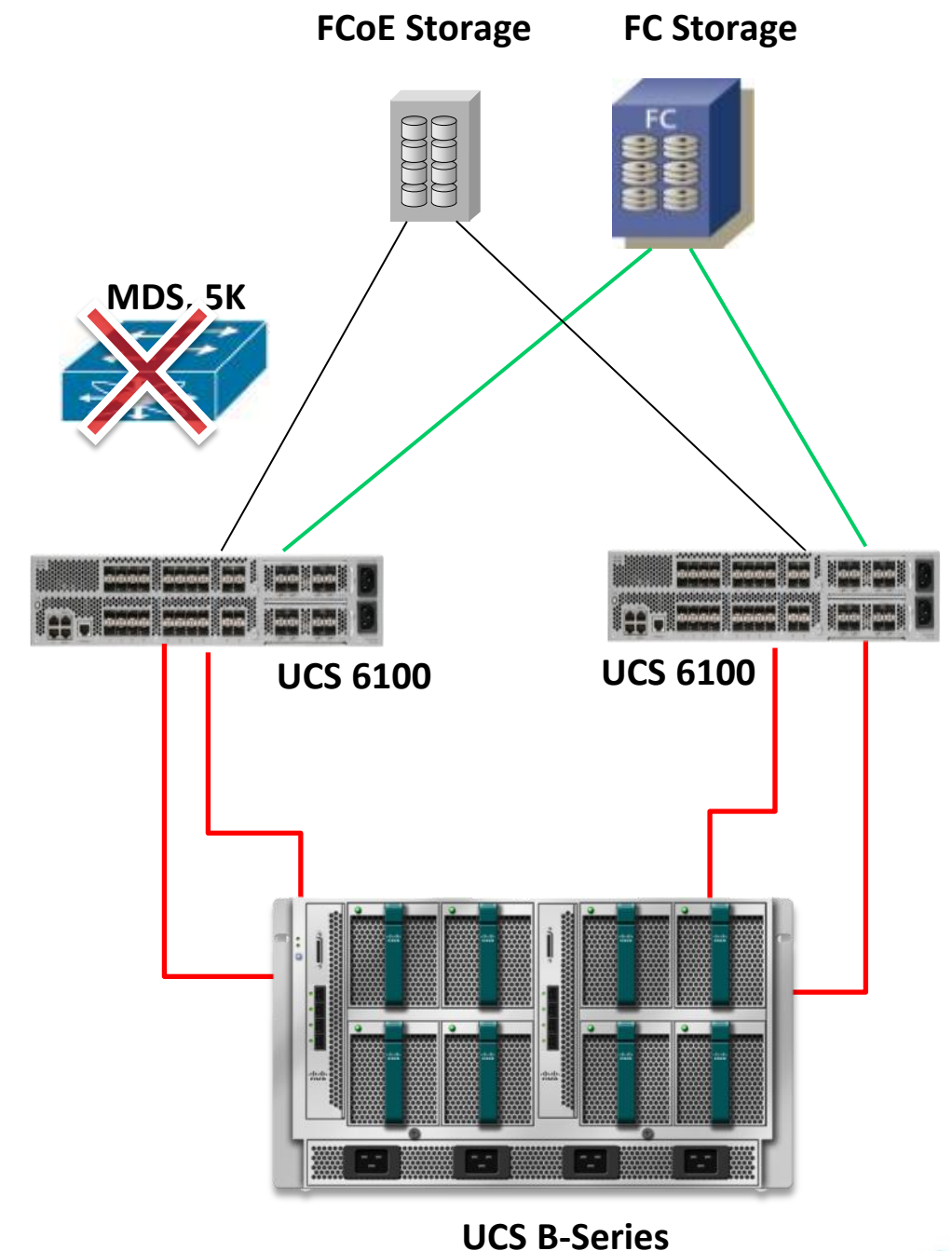
- Upstream MDS/5k for Zoning
 - Default Zoning
 - FC Switching Mode
 - Security via Zoneset Merge
 - Security via LUN Masking
- No Multi-Hop FCoE
- Individual FC and Appliance Ports



UCS Direct Attach Storage 2.1

UCSM Zoning

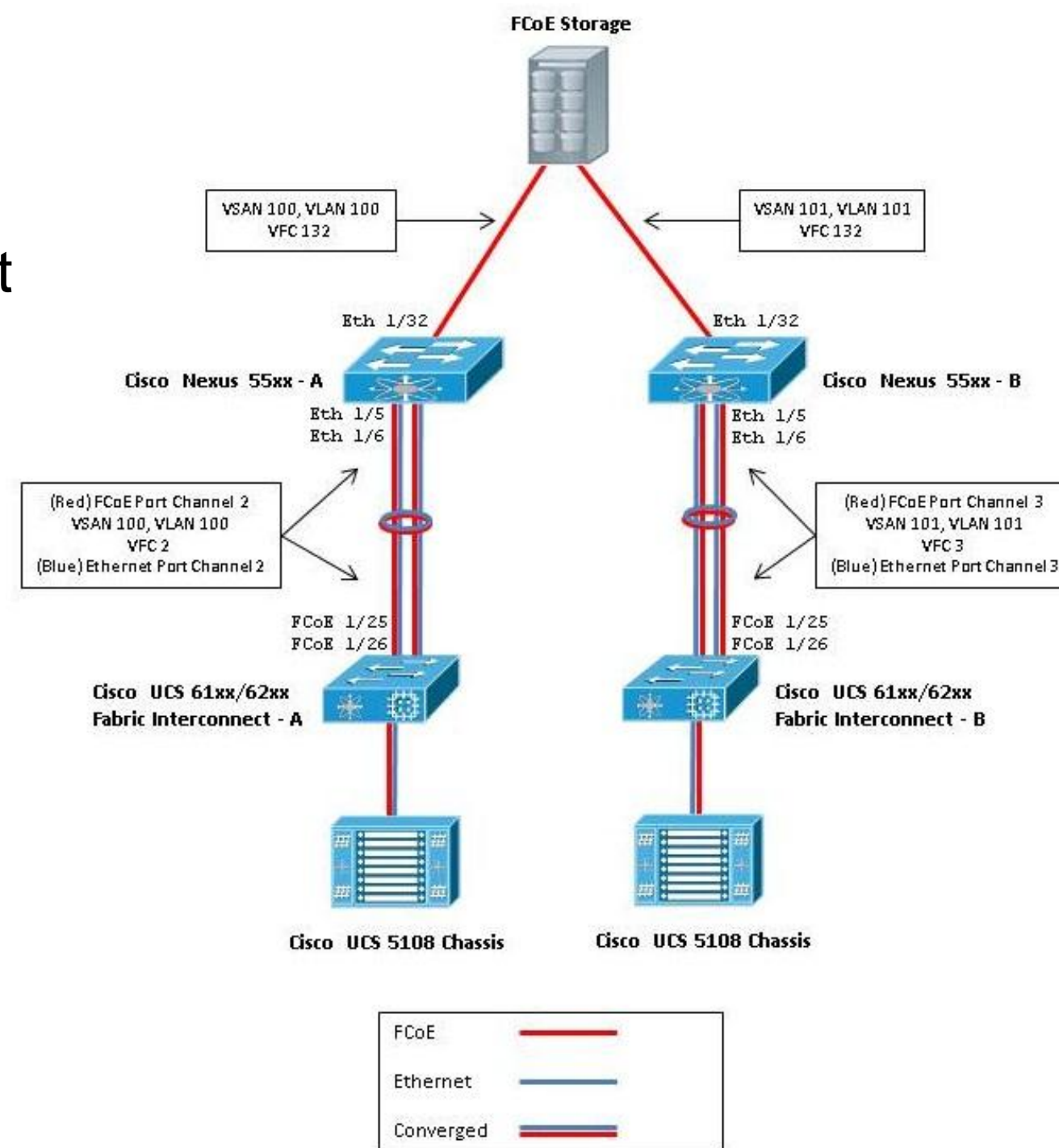
- Default Disabled
- Service Profile Configuration
- Storage Connection Policies
 - Enable per VSAN
 - Identify group of Service Profiles
 - Identify Targets via WWN
 - ‘Group’ Profiles to Targets
- Zones Automatically computed
- ‘Default Zoning’ deprecated



UCS Direct Attach Storage 2.1

Multi-Hop FCoE and Unified Uplinks

- FCoE Uplink Port
 - vfc created and bound to physical Ethernet
 - Logically the same as 'fc' ports
 - Port Channels Supported
- Unified Uplink Port
 - FCoE and Ethernet
 - 'Network Port' and FCoE Port
- Unified Storage Port
 - Appliance Port and FCoE DAS

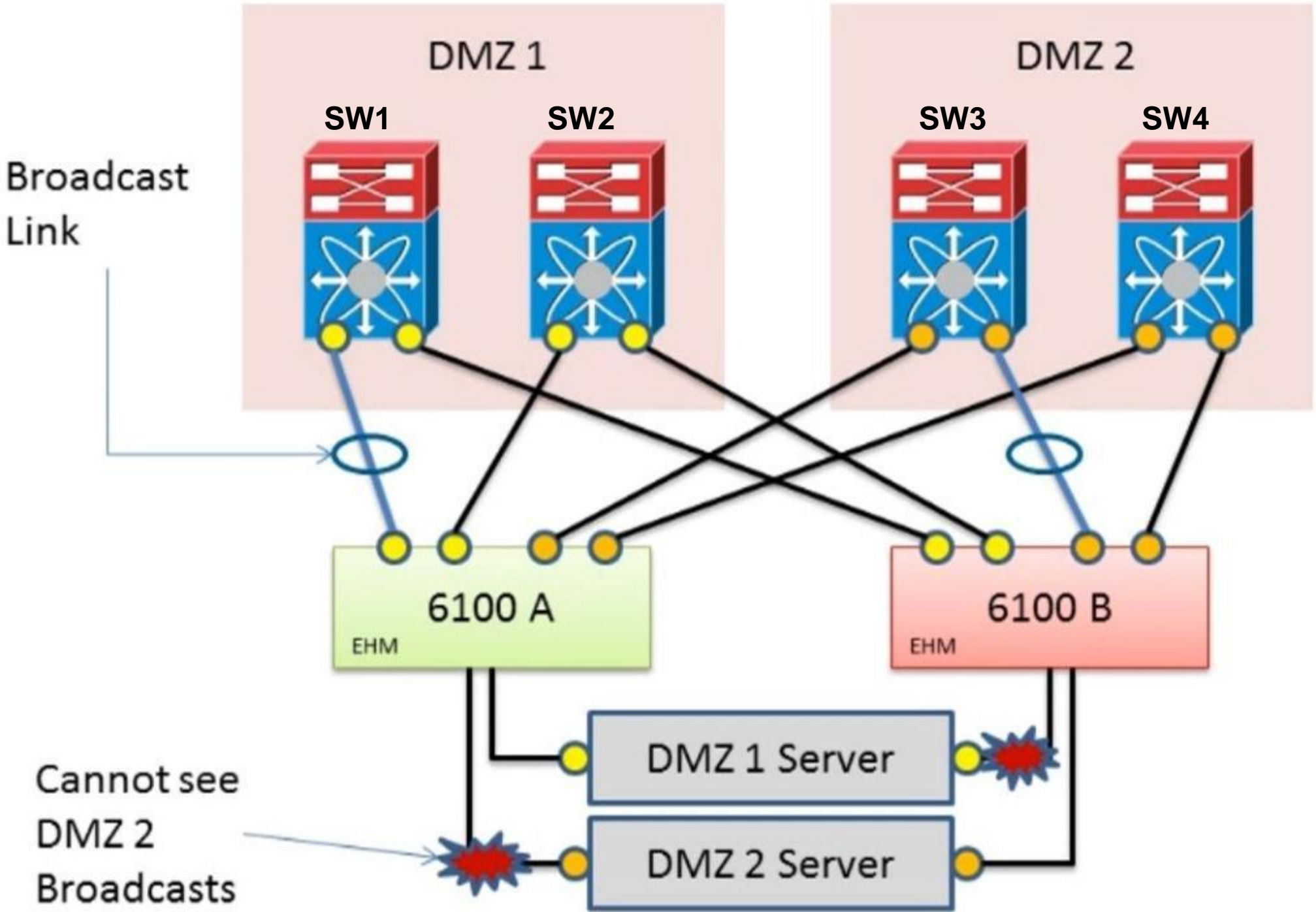


Disjoint L2 Mode



End Host Mode – Disjoint L2

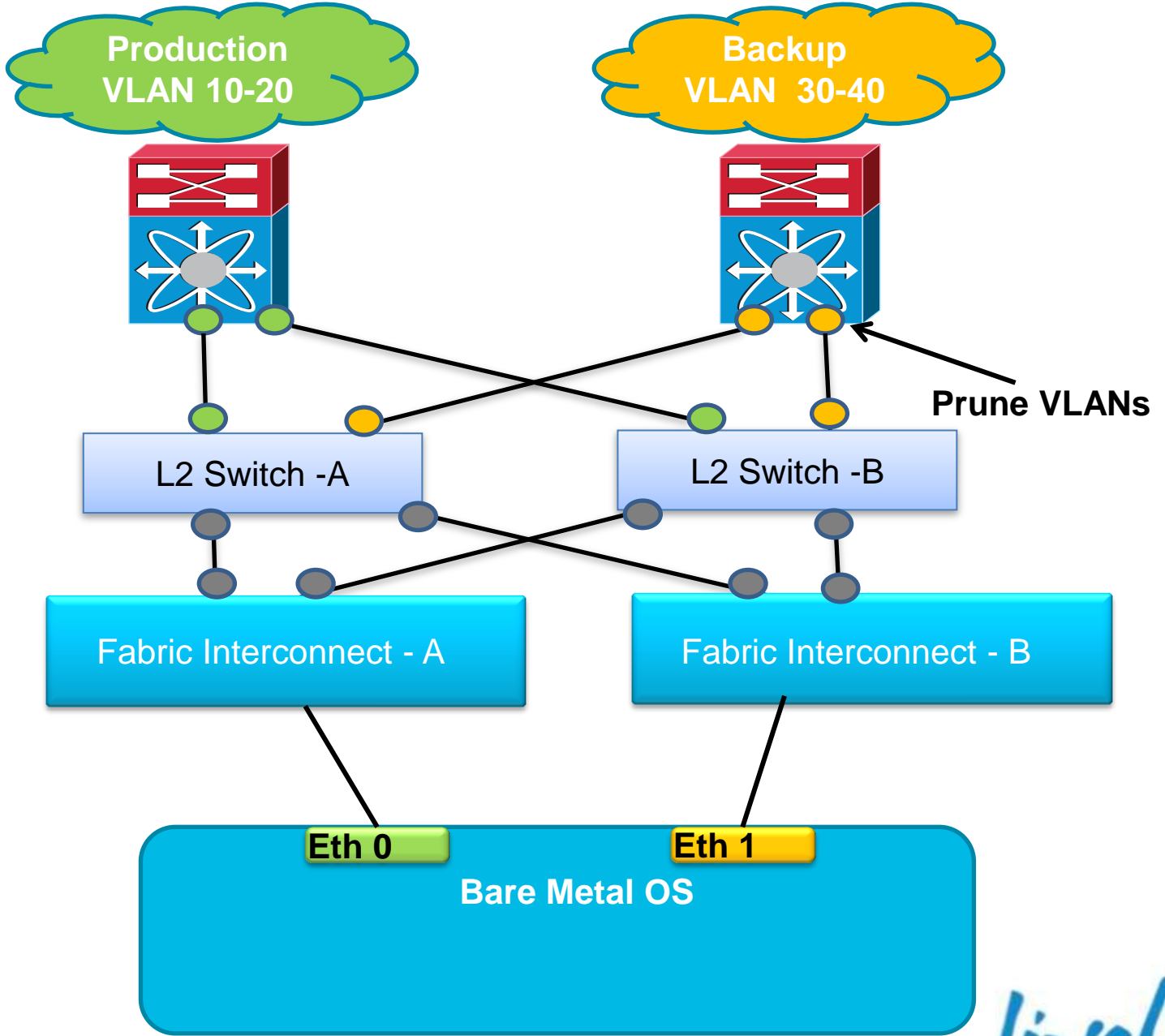
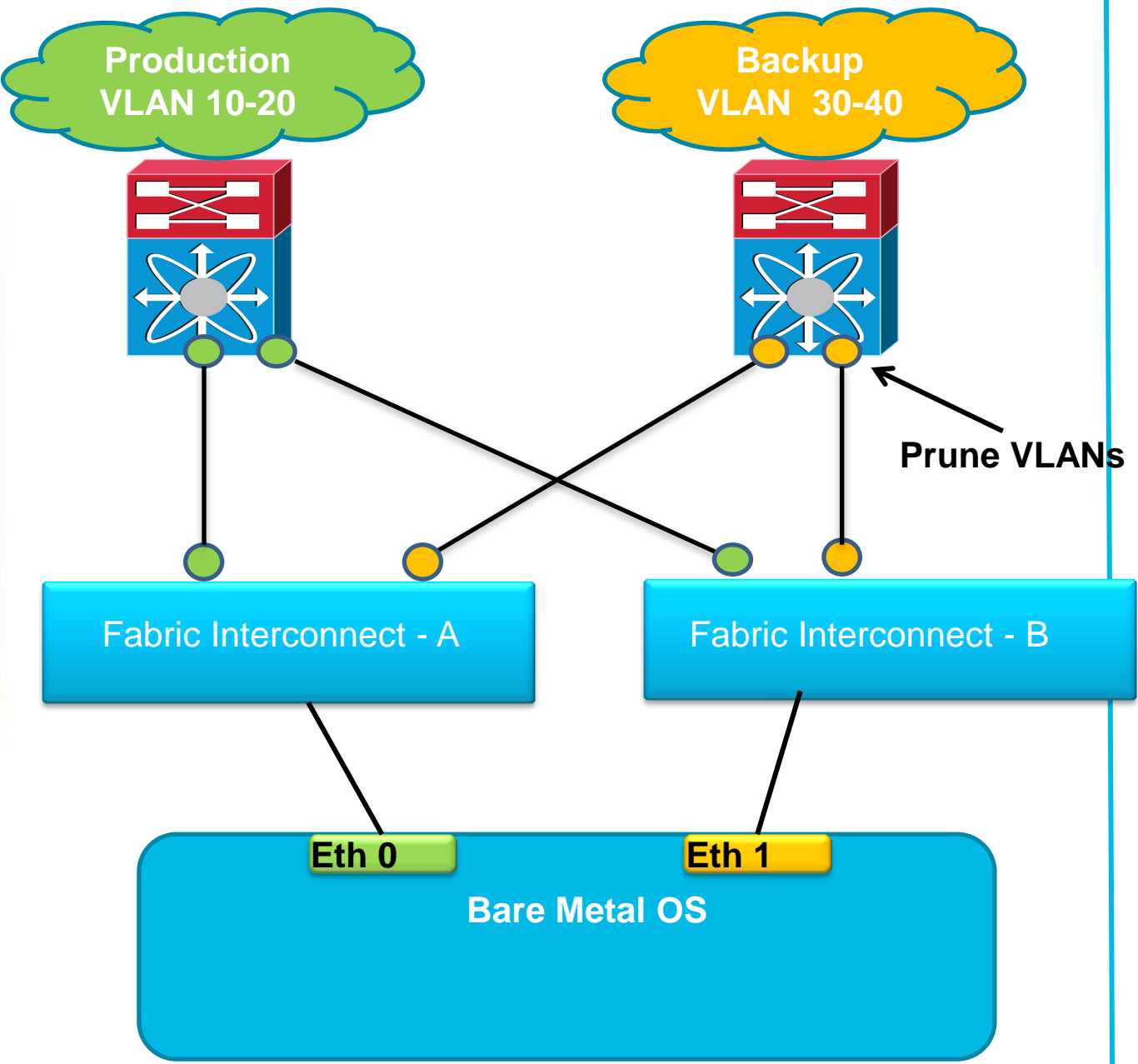
Each 6100 picks ONE uplink for Broadcast/Mcst Processing



Disjoint L2 – Pre 2.0 Workarounds

Switch Mode

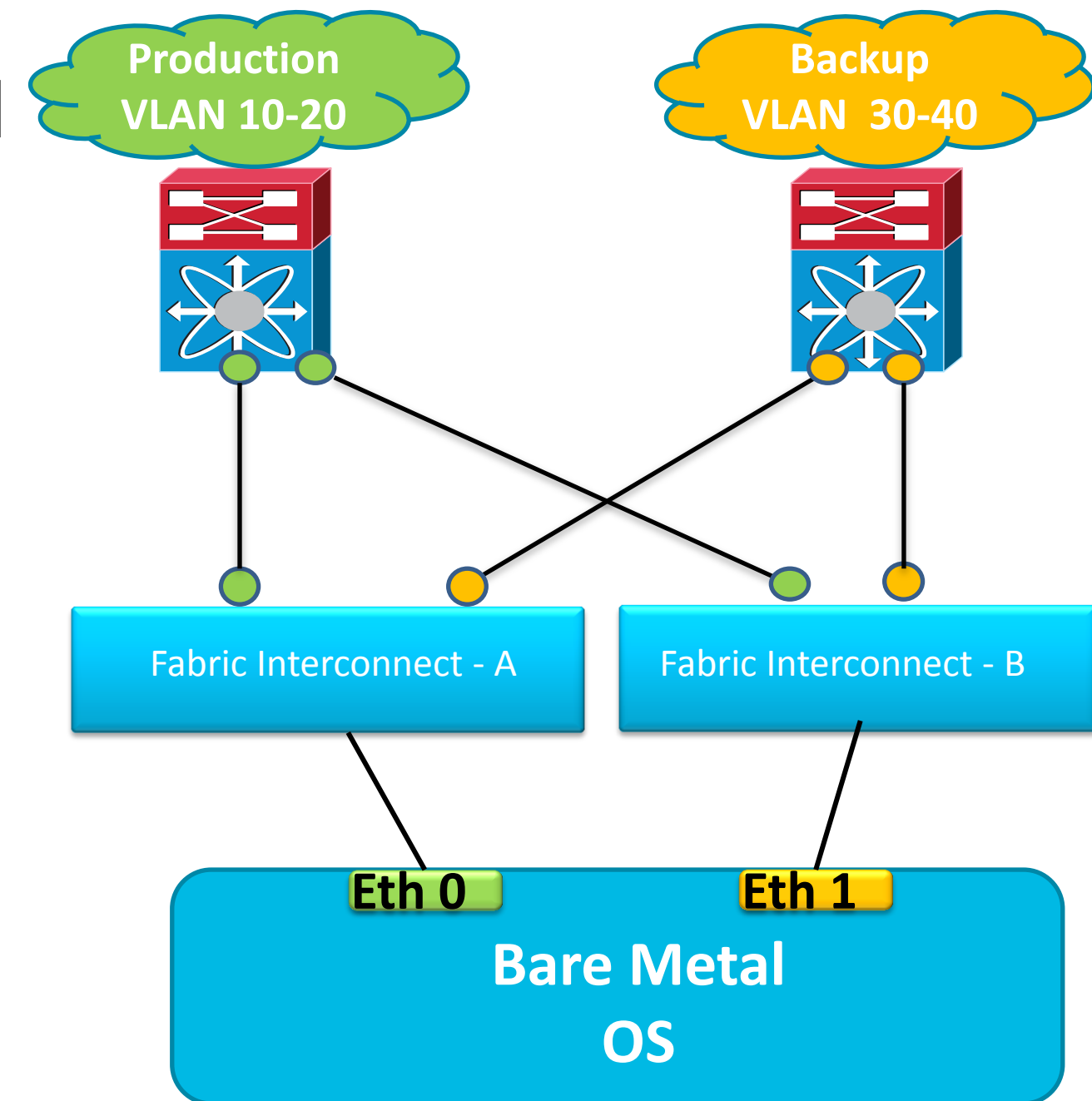
End Host Mode



EHM Disjoint L2 Upstream > 2.0

2.0 Changes

- Hardware independent: UCS 2.0 and above
- Selectively Assign VLANs to uplinks
- vNIC pinning decision based on VLAN membership on uplink ports
- Per VLAN Designated Receiver

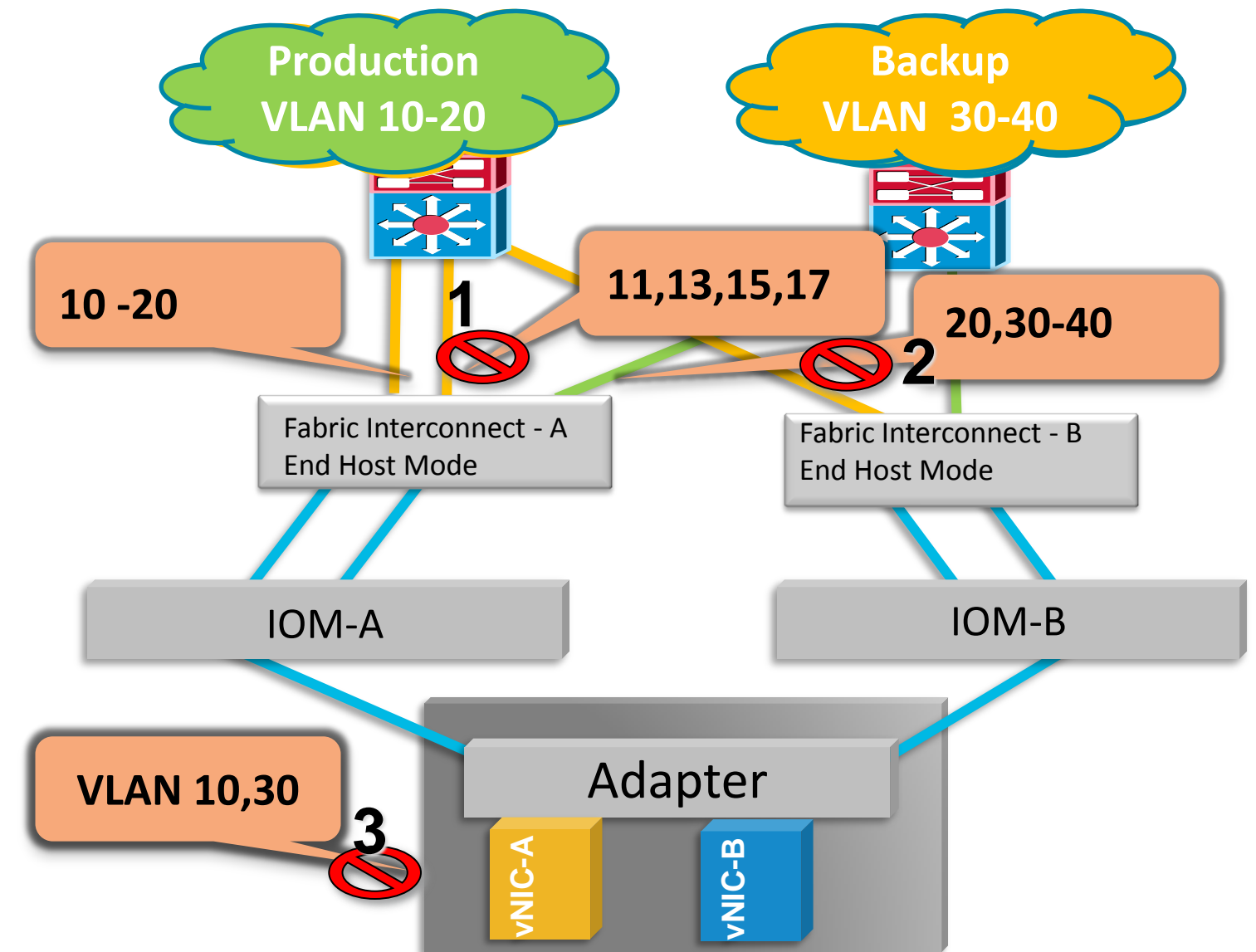


Disjoint L2

Unsupported/Non-Working

Do Not

1. Configure different range of VLANs across uplinks of a disjoint network
2. Overlap VLANs across L2 networks
3. Configure vNIC with VLANs across multiple L2 networks. vNIC does not get pinned if the uplink vlan membership is partial, vNIC stays down



EHM: Designated Receiver

Checking Per VLAN DR

- 2.0 = Connect nxos : show platform software enm internal info vlandb id <vlanID>

```
UCS-250-A(nxos)# show platform software enm internal info vlandb id 25  
  
vlan_id 25  
-----  
Designated receiver: Po1  
Membership:  
Po1  
UCS-250-A(nxos)#
```

- show interface trunk

```
UCS(nxos)# show interface trunk  
Port      Vlans Allowed on Trunk  
-----  
Eth1/16   1,5-7,1000,3000 ← Only Eth1/16 allows VLAN 5  
Eth1/17   1,6-7,1000,3000  
<snip>
```

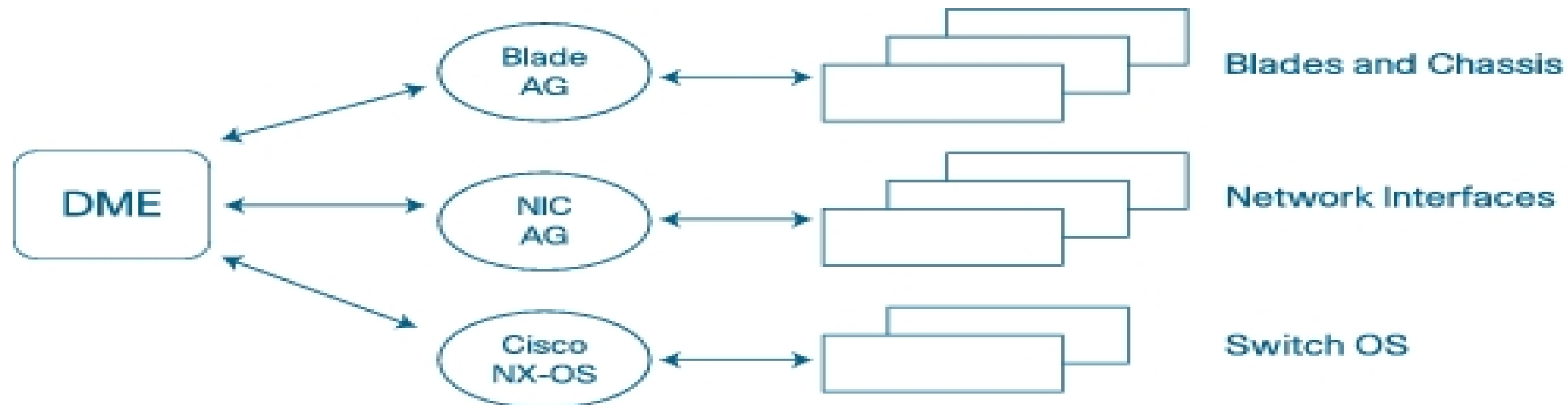
Blade Issues



Finite State Machine (FSM)

Monitoring Object Tasks

- FSM runs as a workflow
- Workflows are predefined. Stages can be skipped if:
 - Not Needed
 - FSM Flags (shallow discovery vs deep discovery)
- Each stage is an interaction between DME > Application Gateway > End Point



FSM Details

UCS 1.4 and 2.0

samc20

Equipment > Chassis > Chassis 1 > Servers > Server 6

General | Inventory | Installed Firmware | Faults | Events | **FSM** | Statistics

FSM Status: **DiscoverBiosPostCompletion**
Retry #: 2

Current Stage Description: **Waiting for BIOS POST completion from IBMC on server 1/6(FSM-STAGE:sam:dme:ComputeBladeDiscover:BiosPostCompletion)**

Description: **blade discovery 1/6(FSM:sam:dme:ComputeBladeDiscover)**

Time of Last Operation: **2006-01-26T23:08:59**
Status of Last Operation: **DiscoverBiosPostCompletion**

Remote Invocation Result: **end-point-unavailable**
Remote Invocation Error Code: **1002**
Remote Invocation Description: **Waiting for BIOS POST Completion information from IBMC**

Progress Status: 37%

Scheduled FSM Tasks

Completion	FSM Flags	Item
------------	-----------	------

Error Description for that stage

Operation (workflow)

Stage Description

FSM Details

UCS 2.1 New Features

- Improved Task Details
 - Complete rewrite of task descriptions
- Improved Step Visibility
 - All FSM steps listed including status
- Displays Scheduled Tasks

FSM Status: **In Progress**
Description:
Current FSM Name: **Associate**
Completed at:
Progress Status: **6%**
Remote Invocation Result:
Remote Invocation Error Code: **None**
Remote Invocation Description:

Step Sequence

Order	Name	Description	Status
1	Associate Config User Access	Configuring external user access(FSM-STAGE:sam:...	Success
2	Associate Blade Power Off	Power off server for configuration of service profil...	In Progress
3	Associate Power On		Pending
4	Associate Bmc Preconfig Pnu OS Local		Pending
5	Associate Bmc Preconfig Pnu OS Peer		Pending
6	Associate Sw Config Port Niv Local		Pending
7	Associate Sw Config Port Niv Peer		Pending
8	Associate Sw Config Pnu OS Local		Pending
9	Associate Sw Config Pnu OS Peer		Pending
10	Associate Nic Config Pnu OS Local		Pending

Name:
Status:
Description:
Order: **13**
Try:
Timestamp: **2013-01-16T04:53:54**

Scheduled FSM Tasks

Completion	FSM Flags	Item	ID
------------	-----------	------	----

Common Blade Issues

Hardware and Management Problems

- Blade Discovery failed
 - Typically Hardware
 - UCSM Logs/Faults
- KVM Connectivity
 - Duplicate IP
 - IP Requirements
- Hardware Problems
 - SEL
 - OS Logs
- Adapter Issues
 - Card Requirements



Configuration



Configuration Validation and Errors

Profile assignment and Policy Problems

- Blade/Profile Status
 - Provides overview of failure
- FSM
 - May display more details about problem.
- Faults
 - Service Profile fault will display configuration problems

General Storage Network Boot Order Virtual Machines Policies Server De

Fault Summary

0 1 3 2

Status

Overall Status: config-failure

Status Details

Desired Power State: up

Assoc State: unassociated

Assigned State: failed

Configuration Error: **connection-placement**
There are not enough resources overall
Not enough vNICs available

Configuration Boot Issues



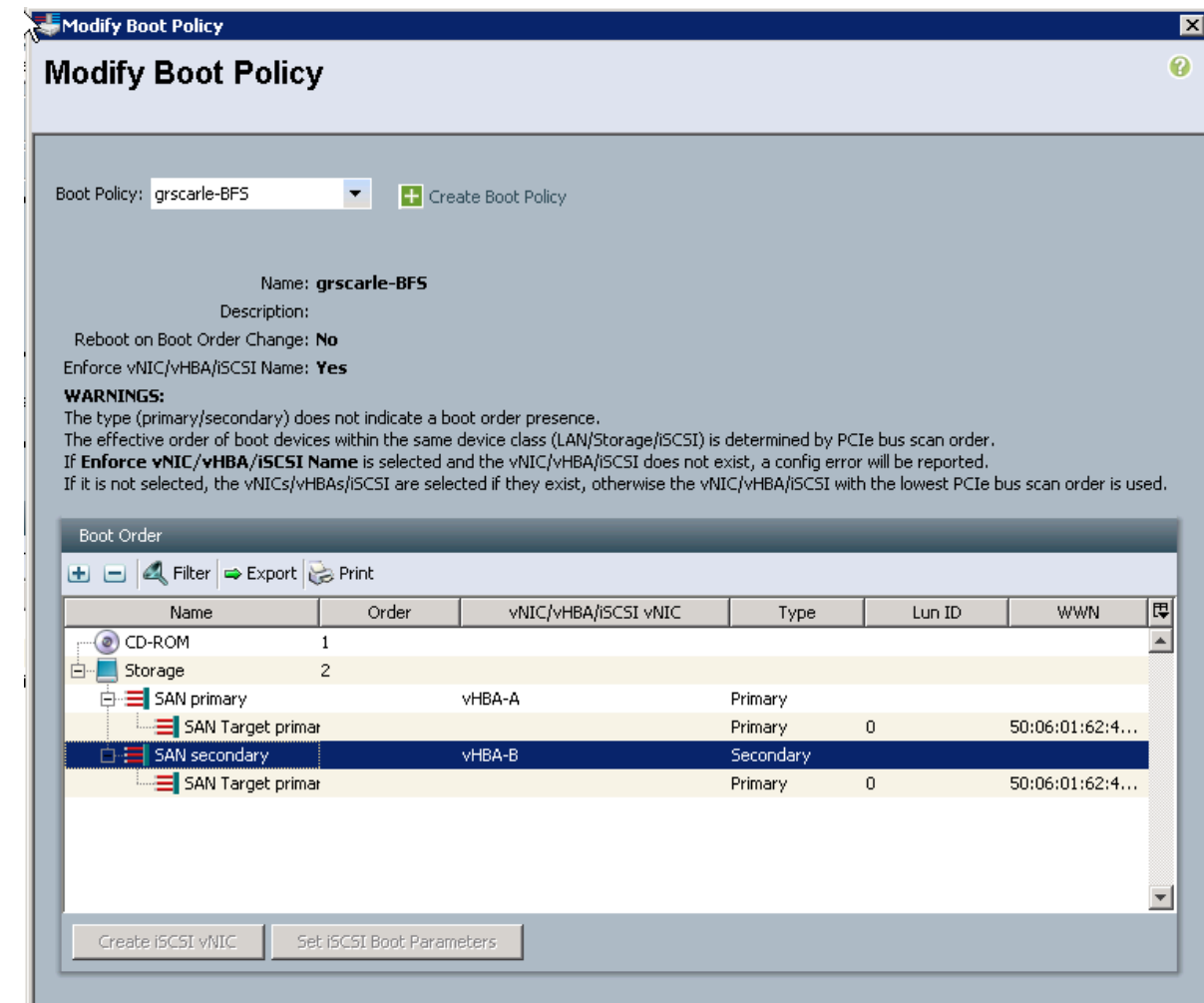
Boot from SAN



UCS SAN Boot

Configuration/Installation

- Defined in Service Profile Boot Policy
- SAN Boot and Local HDD boot are mutually exclusive
 - Local HDD Boot ROM is disabled in SAN Boot
- Check OS multipathing requirements
 - Some Operating Systems require additional configuration, or a single path
 - e.g. Windows 2008 single path. RHEL multipath driver



UCS SAN Boot

Checklists and Verification

- Zoning and Zoneset Active
 - Target Login (FLOGI)
 - LUN Masking
 - NPV/NPIV configuration
 - FC Uplinks
 - FC VSAN Membership
 - Service Profile
 - Boot Policy
- UCS Admin
- SAN+UCS Admin
- SAN Admin



UCS SAN Boot Policy

Configuration Example

Create Boot Policy

Name: **Boot-SAN**

Description:

Reboot on Boot Order Change:

Note: reconfiguration of boot devices will always cause a reboot on non-virtualized adapters.

Enforce vNIC/vHBA Name:

WARNINGS:
The type (primary/secondary) does not indicate a boot order presence.
The effective order of boot devices within the same device class (LAN/Storage) is determined by PCIe bus scan order.
If **Enforce vNIC/vHBA Name** is selected and the vNIC/vHBA does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs are selected if they exist, otherwise the vNIC/vHBA with the lowest PCIe bus scan order is used.

Local Devices

- Add Local Disk
- Add CD-ROM
- Add Floppy

vNICs

vHBAs

- Add SAN Boot
- Add SAN Boot Target

Boot Order

Name	Order	vNIC/vHBA	Type	Lun ID	WWN
Storage	1				
SAN primary		fc0	primary		
SAN Target primary			primary	0	50:0A:09:81:86:78:3B:98
SAN secondary		fc1	secondary		
SAN Target primary			primary	0	50:0A:09:83:86:78:3B:98
CD-ROM	2				
Floppy	3				

UCS SAN Boot Policy

Verification

- Verify Boot ROM is Active during Blade boot:

```
0 Virtual Drive(s) found on the host adapter.  
Adapter BIOS Disabled. No Logical Drive Handled by BIOS on HA - 0  
0 Virtual Drive(s) handled by BIOS  
Press <Ctrl><H> to Enable BIOS  
  
Cisco VIC FC, Boot Driver Version 2.1(1a)  
(C) 2010 Cisco Systems, Inc.  
DGC      50060162446044fa:000  
Option ROM installed successfully
```

Boot Order

Filter Export Print

Name	Order	vNIC/vHBA/iSCSI...	Type	Lun ID	WWN
CD-ROM	1				
Storage	2				
SAN primary		vHBA-A	Primary		
SAN Target primary			Primary	0	50:06:01:62:44:60:44:FA
SAN secondary		vHBA-B	Secondary		
SAN Target primary			Primary	0	50:06:01:62:44:60:44:FA

iSCSI Boot



UCS iSCSI Boot Support

Overview and Requirements

- iSCSI boot from UCSM 2.0
- Adapter Support
 - Cisco VIC (no offload)
 - Broadcom 57711 M51KR-B (Full Offload, iSCSI HBA)
- Operating System Support
 - ESXi 4.1U1,U2, 5.0
 - Windows 2008R2
 - RHEL 5.6,6.0,6.1
- Check Support Matrix

The screenshot shows the UCSM 2.0 interface for configuring iSCSI boot parameters. The main window is titled "Set iSCSI Boot Parameters" and is open over a "Global Boot Policy" configuration page. The boot policy is named "palo_iscsi". The "Set iSCSI Boot Parameters" dialog has the following fields and options:

- Name: **iscsi0**
- Initiator Name: **eui.abcd12345000000**
- Authentication Profile: **<not set>** (with a "+ Create iSCSI Authentication Profile" button)
- Initiator Address section:
 - Initiator IP Address Policy: **Pool**
 - IPv4 Address: **192.168.200.89**
 - Subnet Mask: **255.255.255.0**
 - Default Gateway: **192.168.200.3**
 - Primary DNS: **0.0.0.0**
 - Secondary DNS: **0.0.0.0**
- Interface selection: iSCSI Static Target Interface, iSCSI Auto Target Interface
- Warning: **Minimum one instance of iSCSI Static Target Interface and maximum two are allowed.**
- Table of iSCSI Static Target Interfaces:

Name	Priority	Port	Authentication Profile	iSCSI IPv4 Address	LUN Id
iqn.1992-08.co...	1	3260		192.168.200.3	0

Buttons for "OK" and "Cancel" are visible at the bottom right of the dialog.

UCS iSCSI Setup

Configuration Flow

- Create iSCSI vNIC and Boot Policy
- Configure Boot Information
 - Target IP, IQN
 - Initiator IP, IQN
- Modify Adapter Policy for install (Broadcom)
- Install OS
 - OS Media
 - OS Drivers
- Modify Adapter Policy for Boot (Broadcom)



UCS iSCSI Boot Policy

iSCSI vNIC

- Overlay vNIC
- iSCSI Adapter Policy
- Identify native VLAN
- MAC Address
 - VIC – Do not Set
 - Broadcom – Must be set

The screenshot shows the 'Create iSCSI vNIC' configuration window. The window title is 'Create iSCSI vNIC'. The main title is 'Create iSCSI vNIC'. The configuration fields are:

- Name: **iSCSI-vNIC0**
- Overlay vNIC: **vNIC0**
- iSCSI Adapter Policy: **default** (with a '+ Create iSCSI Adapter Policy' button)
- VLAN: **VLAN25 (native)**

The 'iSCSI MAC Address' section contains:

- MAC Address Assignment: **Select(None used by default)**
- (with a '+ Create MAC Pool' button)

At the bottom right, there are 'OK' and 'Cancel' buttons.

UCS iSCSI Boot Policy

iSCSI Boot Parameters

- Set iSCSI Parameters:

If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs/iSCSI are selected if they exist, otherwise the vNIC/vHBA/iSCSI with the lowest PCIe bus scan order is used.

Boot Order

+ - Filter Export Print

Name	Order	vNIC/vHBA/iSCSI vNIC	Type	Lun ID	WWN
CD-ROM	1				
iSCSI	2				
iSCSI		iSCSI-vNIC0	Primary		

Modify iSCSI vNIC Set iSCSI Boot Parameters

UCS iSCSI Boot Policy

iSCSI Boot Parameters

- Initiator name (eui or iqn)
- Initiator IP Address
- Target name
- Target IP and LUN
- Authentication
 - Initiator Auth – to array
 - Target Auth – from array

The screenshot displays the UCS iSCSI Boot Policy configuration interface. The main panel is titled "Set iSCSI Boot Parameters" and shows the following configuration:

- Name: iSCSI-vNIC0
- Initiator Name: eui1223456789abcdef
- Authentication Profile: <not set> (with a "+ Create Authentication Profile" button)
- Initiator Address section:
 - Initiator IP Address Policy: Pool
 - IPv4 Address: 0.0.0.0
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 0.0.0.0
 - Primary DNS: 0.0.0.0
 - Secondary DNS: 0.0.0.0
- Target configuration section:
 - Selected: iSCSI Static Target
 - Minimum one instance of iSCSI Static Target Inter
 - Table with columns: Name, Priority, Port

Name	Priority	Port
iqn.1992-08.c...	1	3260

An inset window titled "Create iSCSI Static Target" is also visible, showing the following configuration:

- Name: 2-08.com.netapp:sn.101202840
- Priority: 1
- Port: 3260
- Authentication Profile: <not set> (with a "+ Create" button)
- IPv4 Address: 10.29.177.51
- LUN Id: 0

UCS iSCSI Boot Verification

Cisco VIC M81 and 1280

```
UCS-250-B# connect adapter 1/7/1
adapter 1/7/1 # connect
adapter 1/7/1 (top):1# attach-mcp
adapter 1/7/1 (mcp):1# iscsi_get_config

vnic iSCSI Configuration:
-----

vnic_id: 5
  link_state: Up

  Initiator Cfg:
    initiator_state: ISCSI_INITIATOR_READY
    initiator_error_code: ISCSI_BOOT_NIC_NO_ERROR
    wlan: 0
    dhcp status: false
      IQN: iqn.1991-05.com.microsoft:wshv0011n00
      IP Addr: 192.168.200.88
      Subnet Mask: 255.255.255.0
      Gateway: 192.168.200.3

  Target Cfg:
    Target Idx: 0
    State: ISCSI_TARGET_READY
    Prev State: ISCSI_TARGET_DISABLED
    Target Error: ISCSI_TARGET_NO_ERROR
      IQN: iqn.1992-08.com.netapp:sn.151750471
      IP Addr: 192.168.200.3
      Port: 3260
      Boot Lun: 0
      Ping Stats: Success (9.524ms)

  Session Info:
    session_id: 0
    host_number: 0
    bus_number: 0
    target_id: 0
```

```
Cisco VIC iSCSI, Boot Driver Version 2.0(0.239)
(C) 2010 Cisco Systems, Inc.
0025b530300e iSCSI NETAPP :000
Option ROM installed successfully
```



UCS iSCSI Boot Verification

Broadcom M51KR-B

- Broadcom ROM

```
Copyright (C) 2000-2011 Broadcom Corporation
iSCSI Boot (IPv4) v6.2.6

Initializing interface (00:25:B5:30:30:1A) ... Succeeded

Connecting to iSCSI targets with interface (00:25:B5:30:30:1A) ... Succeeded

Initiator Name       : eui.1023456789abcdef
Host IP Address      : 10.29.177.65
MAC Address          : 00:25:B5:30:30:1A
Subnet Mask          : 255.255.255.0
Default Gateway      : 10.29.177.1
1st Target Name      : iqn.1992-08.com.netapp:sn.101202840
1st Target IP Addr   : 10.29.177.51
1st Target TCP Port  : 3260
1st Target Boot LUN  : 0
Logging in the 1st iSCSI Target ... Succeeded

SCSI Target Drive: NETAPP    LUN          (Rev: 7350)
```

Path Trace



Ethernet Troubleshooting and Tracing



UCS Network Troubleshooting

Blade communication problems

- Are vethernet and uplink interface up?
- Is VLAN tagging correct?
- Is MAC Address being learnt?
- L2/VLAN Connectivity?
- Default Gateway Connectivity?

```
[root@centos ~]# ping 4.2.2.2
PING 4.2.2.2 (4.2.2.2) 56(84) bytes of data.
^C
--- 4.2.2.2 ping statistics ---
 7 packets transmitted, 0 received, 100% packet loss
[root@centos ~]# _
```

The screenshot displays a network management interface with two main sections: Summary and Properties.

Summary:

- Severity: Major
- Last Transition: 2013-01-16T09:41:32

Actions:

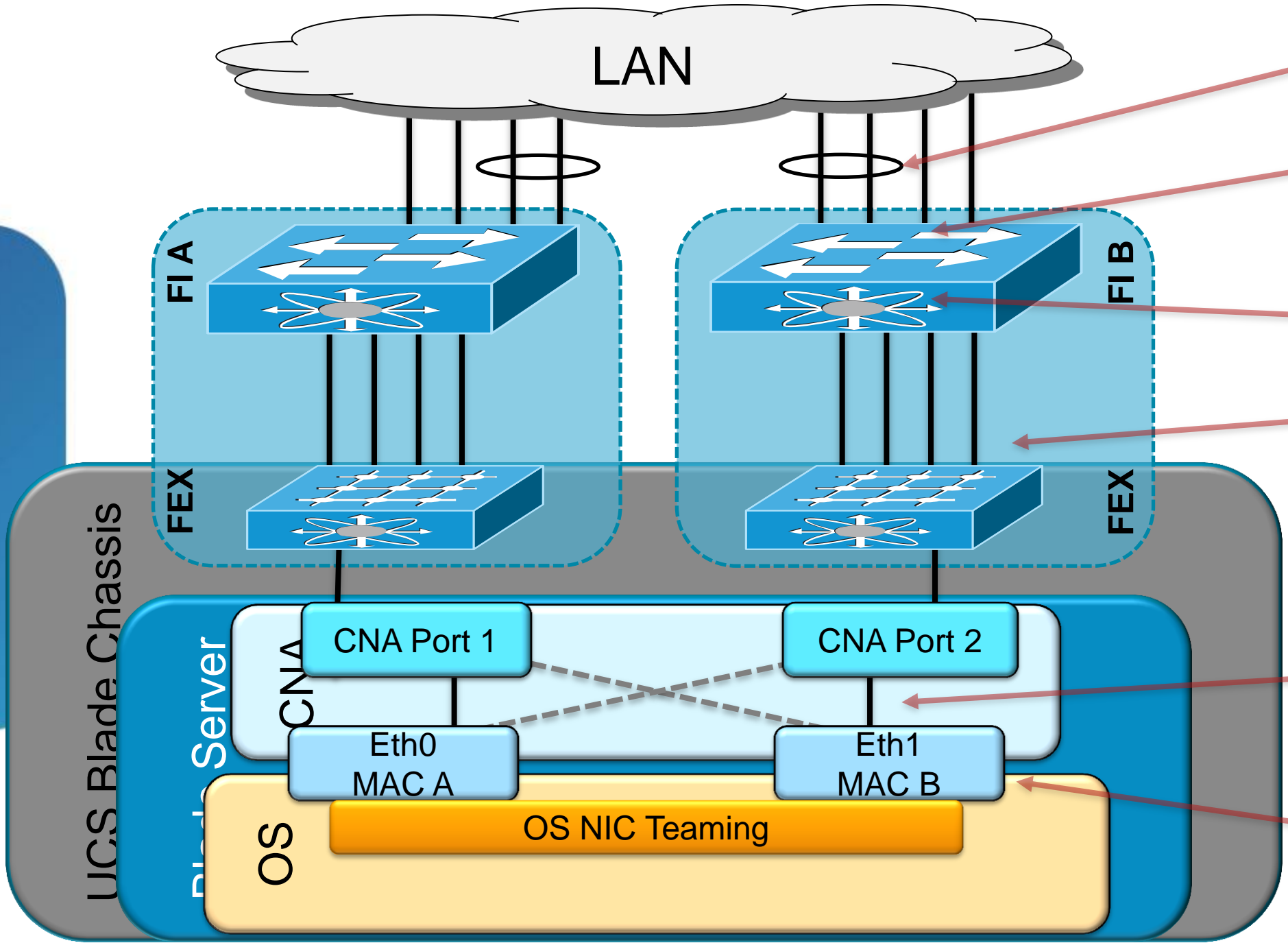
- Acknowledge Fault

Properties:

- Affected object: [sys/chassis-1/blade-5/adaptor-1/host-eth-4/vif-3567](#)
- Description: **Virtual interface 3567 link state is down**
- ID: 27040543
- Cause: **vif-down**
- Code: **F0479**
- Original severity: **Major**
- Previous severity: **Major**

UCS Network Troubleshooting

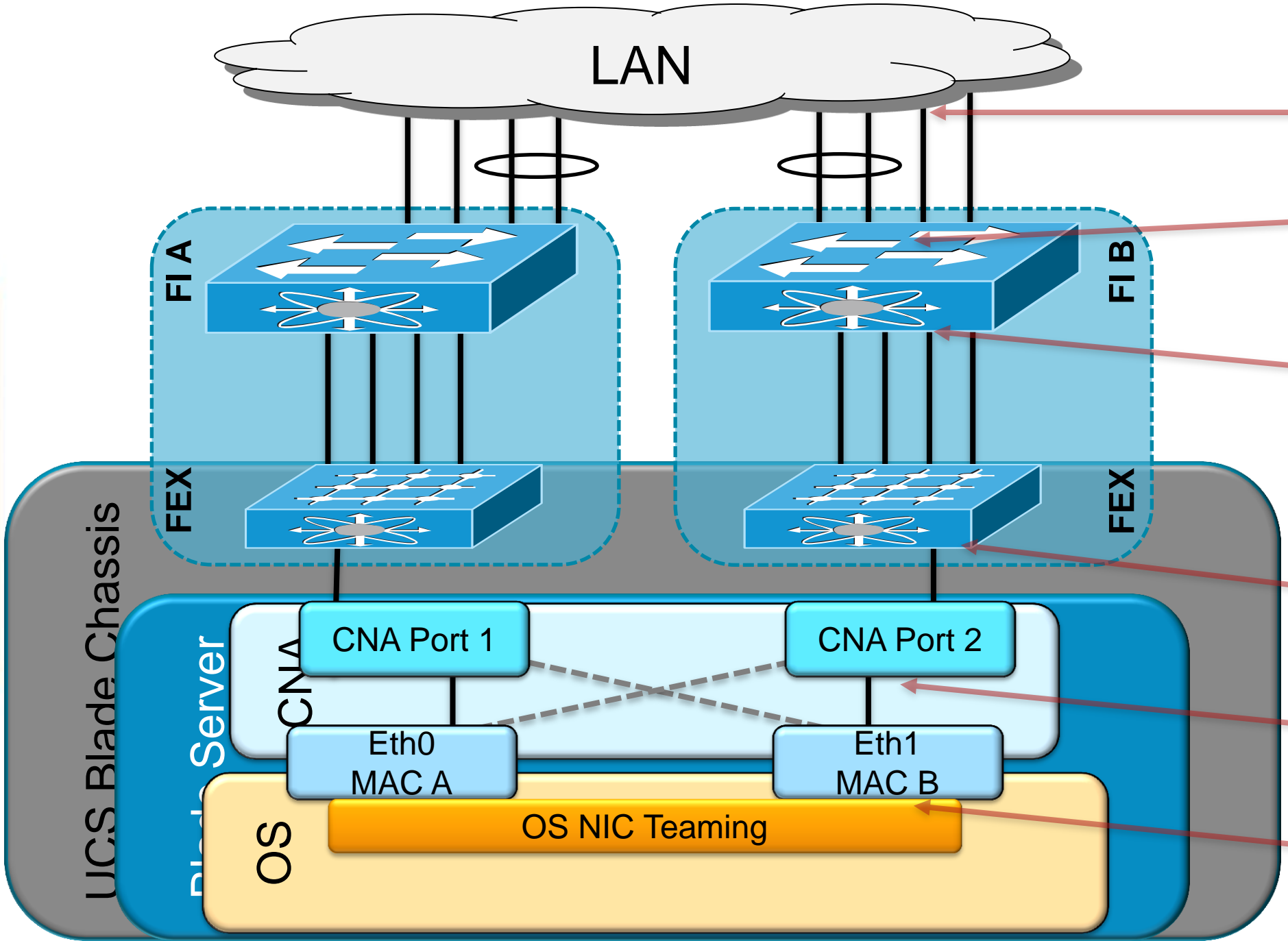
Frame Flow Decisions - Northbound



- Port Channelling Algorithm
- Border Port Pinning
- L2 Switching in FIs
- Fabric Port Pinning
- UCS Fabric Failover
- OS Routing Table or OS NIC Teaming

UCS Network Troubleshooting

Frame Flow Decisions - Southbound



- (Upstream Switch Decides) ?
- Déjà vu, RPF, border port pinning
- Fabric Port Pinning
- VNTag + Offset (MAC Learning on FIs)
- VNTag Identifier
- Dest. MAC and Ethertype binding



UCS Network Troubleshooting

Service Profile Interfaces

- `show service-profile circuit server <chassis#>/<slot#>`

```
UCS-250-B# show service-profile circuit server 1/5
Service Profile: Org-TAC/Org-mipetrin/CiscoLive
Server: 1/5
Fabric ID: A
  VIF          vNIC          Link State Overall Status Prot State  Prot Role  Admin Pin  Oper Pin  Transport
  -----
    11023          Up          Active    No Protection Unprotected 0/0        0/0        Ether
    2604          Error       Error
    2829 vNIC1         Up          Active    No Protection Unprotected 0/0        0/1        Ether
    2831 vHBH1        Up          Active    No Protection Unprotected 0/0        2/1        Fc
Fabric ID: B
  VIF          vNIC          Link State Overall Status Prot State  Prot Role  Admin Pin  Oper Pin  Transport
  -----
    11024          Up          Active    No Protection Unprotected 0/0        0/0        Ether
    2605          Error       Error
    2830 vNIC2         Up          Active    No Protection Unprotected 0/0        0/0        Ether
    2832 vHBH2        Up          Active    No Protection Unprotected 0/0        2/2        Fc
```

UCS Network Troubleshooting

VIF Identities

- show host-eth-if

```
UCS-250-B# scope server 1/5
UCS-250-B /chassis/server # scope adapter 1
UCS-250-B /chassis/server/adapter # show host-eth-if

Eth Interface:
  ID          Dynamic MAC Address Name      Operability
  -----
      1 00:25:B5:00:19:2F  vNIC1    Operable
      2 00:25:B5:00:19:7F  vNIC2    Operable
UCS-250-B /chassis/server/adapter #
```


UCS Network Troubleshooting

Port Information. Cisco VIC

- MCP Level - vnic

```
UCS-250-B# connect adapter 1/5/1
adapter 1/5/1 # connect
adapter 1/5/1 (top):1# attach-mcp
adapter 1/5/1 (mcp):1# vnic
```

```
vnic id      : internal id of vnic, use for other vnic cmds
vnic name/mac : ucsd provisioned name (-n) or mac address (-m)
vnic type    : enet=ethernet, enet_pt=dynamic ethernet, fc=fcoe
vnic bb:dd.f : host pci bus/device/function id
vnic state   : state of vnic
lif          : internal logical if id, use for other lif/vif cmds
lif state    : state of lif
vif uif      : bound uplink 0 or 1, =:primary, -:secondary, >:current
vif ucsd     : ucsd id for this vif
vif idx      : switch id for this vif
vif vlan     : default vlan for traffic
vif state    : state of vif
```

v n i c		l i f		v i f						
id	name	type	bb:dd.f state	lif	state	uif	ucsd	idx	vlan	state
5	vnic_1	enet	08:00.0 UP	2	UP	=>0	2829	977	25	UP
6	vnic_2	enet	08:00.1 UP	3	UP	=>1	2830	686	25	UP
7	vnic_3	fc	08:00.2 UP	4	UP	=>0	2831	976	4051	UP
8	vnic_4	fc	08:00.3 UP	5	UP	=>1	2832	685	2000	UP

UCS Network Troubleshooting

Port Information Cisco VIC

- Find vNIC's using 'vnicfind' command

```
adapter 1/5/1 (mcp):2# vnicfind 00:25:B5:00:19:2F
```

v n i c		l i f		v i f						
id	name	type	bb:dd.f	state	l i f	u i f	u c s m	i d x	v l a n	s t a t e
5	vnic_1	enet	08:00.0	UP	2	UP	=>0	2829	977	25 UP

UCS Network Troubleshooting

Port Information Cisco VIC

- MCP Level Statistics: `lifstats <lifid>`

```
adapter 1/5/1 (mcp):25# lifstats 2
      DELTA          TOTAL DESCRIPTION
      0            32123 Tx unicast frames without error
      0              7 Tx multicast frames without error
      0              8 Tx broadcast frames without error
      0          3276386 Tx unicast bytes without error
      0              606 Tx multicast bytes without error
      0              512 Tx broadcast bytes without error
      0            32125 Rx unicast frames without error
      1              27 Rx multicast frames without error
      472          24703 Rx broadcast frames without error
      0          3405164 Rx unicast bytes without error
      64           1728 Rx multicast bytes without error
      50128        2581925 Rx broadcast bytes without error
      1              27 Rx frames len == 64
      386          52565 Rx frames 64 < len <= 127
      69           3390 Rx frames 128 <= len <= 255
      3            188 Rx frames 256 <= len <= 511
      14           685 Rx frames 512 <= len <= 1023
      7,080kbps          Rx rate
```

UCS Network Troubleshooting

FEX/IOM Port Information

- Connect nxos: show fex <chassis#> detail

```
UCS-250-A(nxos)# show fex 1 detail
FEX: 1 Description: FEX0001 state: Online
FEX version: 5.0(3)N2(2.1s) [Switch version: 5.0(3)N2(2.1s)]
FEX Interim version: 5.0(3)N2(2.1s)
Switch Interim version: 5.0(3)N2(2.1s)
Chassis Model: N20-C6508, Chassis Serial: FOX1424G4LT
Extender Model: N20-I6584, Extender Serial: QCI1424A5AP
Part No: 73-11623-05
Card Id: 67, Mac Addr: c8:4c:75:ed:1c:ba, Num Macs: 10
Module Sw Gen: 21 [Switch Sw Gen: 21]
post level: complete
pinning-mode: static Max-links: 1
Fabric port for control traffic: Eth1/3
Fabric interface state:
  Eth1/1 - Interface Up, State: Active
  Eth1/2 - Interface Up, State: Active
  Eth1/3 - Interface Up, State: Active
  Eth1/4 - Interface Up, State: Active
Fex Port      State Fabric Port
  Eth1/1/1    Up    Eth1/1
  Eth1/1/2    Up    Eth1/2
  Eth1/1/3    Up    Eth1/3
  Eth1/1/4    Down  None
  Eth1/1/5    Up    Eth1/1
```

UCS Network Troubleshooting

FEX/IOM Port Information

- show system internal fex info satport ethernet <chassis#>/<adapter#>/<slot#>

```
UCS-250-A(nxos)# show system internal fex info satport ethernet 1/1/5
Interface-Name  ifindex  State Fabric-if  Pri-fabric  Expl-Pinned
                Eth1/1/5  0x1f000100  Up          Eth1/1      Eth1/3      Eth1/1
Port Phy Up, Port dn req: Not pending
SDB entry: ifindex(1f000100) fabric if(1a000000)
Dev: 0 Nif3 Hif3 (Nif:0x20000000 Hif:0x1f000100)
```

- Record nif (network) and hif (backplane)

UCS Network Troubleshooting

FEX/IOM Port Information

- Connect iom <chassis#>
- Show platform software <redwood|woodside> sts

```
UCS-250-B# connect iom 1
Attaching to FEX 1 ...
To exit type 'exit', to abort type '^.'
fex-1#
fex-1# show platform software redwood sts
Board Status Overview:
legend:
  ^ = no-connect
  X = Failed
  - = Disabled
  + = Dn
  | = Up
  ^ = SFP+ present
  v = Blade Present
```

```
Blade:
fex-1#
+---+---+---+---+
|[ $ ]|[ $ ]|[ $ ]|[ $ ]
+---+---+---+---+
|      |      |      |      |
+---+---+---+---+
| 0     1     2     3
| I     I     I     I
| N     N     N     N
|
|          ASIC 0
|
| H H H H H H H H
| I I I I I I I I
| 0 1 2 3 4 5 6 7
+---+---+---+---+
| | | | - - | |
+---+---+---+---+
|v|v|v|v|v|v|v|v|
+---+---+---+---+
| 8 7 6 5 4 3 2 1
```



UCS Network Troubleshooting

FEX/IOM Port Information

- show platform software <redwood|woodside> rate

```
fex-1# show platform software redwood rate
```

Port	Tx Packets	Tx Rate (pkts/s)	Tx Bit Rate	Rx Packets	Rx Rate (pkts/s)	Rx Bit Rate	Avg Pkt (Tx)	Avg Pkt (Rx)	Err
0-NI3	92	18	56.90Kbps	198	39	31.56Kbps	386	99	
0-NI2	1	0	1.71Kbps	1	0	1.03Kbps	1072	648	
0-NI1	2	0	3.42Kbps	1	0	1.03Kbps	1072	648	
0-NI0	1	0	1.71Kbps	105	21	21.82Kbps	1072	129	
0-HI7	119	23	15.99Kbps	15	3	24.05Kbps	83	1002	
0-HI3	18	3	3.80Kbps	17	3	28.68Kbps	132	1054	
0-HI0	107	21	19.62Kbps	0	0	0.00 bps	114	0	
0-BI	47	9	6.76Kbps	51	10	11.13Kbps	90	136	
0-CI	34	6	11.60Kbps	20	4	9.63Kbps	213	301	

UCS Network Troubleshooting

FEX/IOM Port Information

- show platform software <redwood|woodside> rmon 0 <interface>

```
fex-1# show platform software redwood rmon 0 hif3
HI3 RMON:
```

RMON TX	Current	Diff	RMON RX	Current	Diff
TX_PKT_LT64	0	0	RX_PKT_LT64	0	0
TX_PKT_64	181780	181780	RX_PKT_64	37944	37944
TX_PKT_65	962472	962472	RX_PKT_65	215061	215061
TX_PKT_128	107022	107022	RX_PKT_128	158795	158795
TX_PKT_256	158915	158915	RX_PKT_256	14472	14472
TX_PKT_512	30374	30374	RX_PKT_512	3039	3039
TX_PKT_1024	9607	9607	RX_PKT_1024	1748	1748
TX_PKT_1519	154008	154008	RX_PKT_1519	914	914
TX_PKT_2048	503704	503704	RX_PKT_2048	1821488	1821488
TX_PKT_4096	0	0	RX_PKT_4096	0	0
TX_PKT_8192	0	0	RX_PKT_8192	0	0
TX_PKT_GT9216	0	0	RX_PKT_GT9216	0	0
TX_PKTTOTAL	2107882	2107882	RX_PKTTOTAL	2253461	2253461
TX_OCTETS	1500548811	1500548811	RX_OCTETS	3923548829	3923548829
TX_PKTOK	2107882	2107882	RX_PKTOK	2253461	2253461
TX_UCAST	1011887	1011887	RX_UCAST	2118639	2118639
TX_MCAST	808102	808102	RX_MCAST	131308	131308
TX_BCST	0	0	RX_BCST	7514	7514

UCS Network Troubleshooting

VIF/Vethernet Information

- NXOS: show interface brief

```
UCS-250-A(nxos)# show interface brief | grep 2829
Veth2829      25      eth trunk up      none      auto
UCS-250-A(nxos)#
```

- show interface <id>

```
UCS-250-A(nxos)# show int vethernet 2829
Vethernet2829 is up
  Bound Interface is Ethernet1/1/5
  Hardware: Virtual, address: 000d.ecd3.5c00 (bia 000d.ecd3.5c00)
  Description: server 1/5, VNIC vNIC1
  Encapsulation ARPA
  Port mode is trunk
  EtherType is 0x8100
  Rx
    32124 unicast packets  7 multicast packets  8 broadcast packets
    32139 input packets  3277568 bytes
    0 input packet drops
  Tx
    32125 unicast packets  32 multicast packets  29318 broadcast packets
    61475 output packets  6473510 bytes
    0 flood packets
    0 output packet drops
```

UCS Network Troubleshooting

MAC Address Information

- show mac address-table

```
UCS-250-A(nxos)# show mac address-table
```

```
Legend:
```

```
* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC  
age - seconds since last seen, + - primary entry using vPC Peer-Link
```

VLAN	MAC Address	Type	age	Secure	NTFY	Ports
* 4051	0025.b5b0.19bf	dynamic	4020	F	F	Veth11023
* 3001	0050.5680.2efb	dynamic	0	F	F	Veth2529
* 200	0025.b500.282d	static	0	F	F	Veth2819
* 183	000c.29ce.e5a8	dynamic	0	F	F	Veth2640
* 183	0025.b500.330f	dynamic	10	F	F	Eth3/1/2
* 183	0025.b500.352f	dynamic	2240	F	F	Veth2640
* 25	0025.b500.050d	dynamic	0	F	F	Veth2719
* 25	0025.b500.050e	dynamic	0	F	F	Veth2724
* 25	0025.b500.192f	static	0	F	F	Veth2829
* 25	0025.b5de.fa0f	static	0	F	F	Veth2736

UCS Network Troubleshooting

VIF/Vethernet Pinning

- show pinning border-interface

```
UCS-250-A(nxos)# show pinning border-interfaces
```

Border Interface	Status	SIFs
Po1	Active	Eth1/1/1 Veth2529 Veth2532 Veth2640 Veth2717 Veth2719 Veth2724 Veth2727 Veth2736 Veth2739 Veth2742 Veth2769 Veth2772 Veth2819 Veth2829 Eth1/1/3 Eth1/1/8 Eth3/1/2
Po2	Down	
Eth1/5	Down	

Total Interfaces : 3

- show pinning server-interfaces

```
UCS-250-A(nxos)# show pinning server-interfaces | grep 2829
Veth2829          No          Po1          1:8:38
UCS-250-A(nxos)#
```

UCS Network Troubleshooting

Port Channel Information

- show port-channel summary

```
UCS-250-A(nxos)# show port-channel summary
Flags:  D - Down          P - Up in port-channel (members)
        I - Individual    H - Hot-standby (LACP only)
        s - Suspended     r - Module-removed
        S - Switched      R - Routed
        U - Up (port-channel)

-----
Group Port-          Type      Protocol  Member Ports
Channel
-----
1      Po1(SU)        Eth       LACP      Eth1/6(P)
2      Po2(SD)        Eth       LACP      Eth1/5(D)
3      Po3(SD)        Eth       NONE      --
```

UCS Network Troubleshooting

Port-Channel Information

- show port-channel load-balance forwarding path interface port-channel <#>

```
UCS-250-A(nxos)# show port-channel load-balance forwarding-path interface port-channel 1 vlan 25 src-mac 0025.b500.192f
Missing params will be substituted by 0's.
Load-balance Algorithm on switch: source-dest-ip
crc8_hash: Not Used      Outgoing port id: Ethernet1/6
Param(s) used to calculate load-balance (Unknown unicast, multicast and broadcast packets):
    dst-mac: 0000.0000.0000
    vlan id: 25
UCS-250-A(nxos)#
```

- Check Upstream for MAC Learning

UCS Network Troubleshooting

VLAN Designated Receiver

- show platform software enm internal info vlandb id <vlanID>

```
UCS-250-A(nxos)# show platform software enm internal info vlandb id 25  
  
vlan_id 25  
-----  
Designated receiver: Po1  
Membership:  
Po1  
UCS-250-A(nxos)#
```

SAN Troubleshooting and Tracing



UCS SAN Troubleshooting

Service Profile Interfaces

- show service-profile circuit server <chassis#>/<slot#>

```
UCS-250-B# show service-profile circuit server 1/5
Service Profile: Org-TAC/Org-mipetrin/CiscoLive
Server: 1/5
Fabric ID: A
VIF          vNIC          Link State Overall Status Prot State  Prot Role  Admin Pin  Oper Pin  Transport
-----
11023        2604          Up         Active       No Protection Unprotected 0/0        0/0        Ether
2604        2829 vNIC1        Error       Error       No Protection Unprotected 0/0        0/0        Unknown
2829        2831 vHBA1        Up         Active       No Protection Unprotected 0/0        2/1        Fc
Fabric ID: B
VIF          vNIC          Link State Overall Status Prot State  Prot Role  Admin Pin  Oper Pin  Transport
-----
11024        2605          Up         Active       No Protection Unprotected 0/0        0/0        Ether
2605        2830 vNIC2        Error       Error       No Protection Unprotected 0/0        0/0        Unknown
2830        2832 vHBA2        Up         Active       No Protection Unprotected 0/0        2/2        Fc
```


UCS SAN Troubleshooting

VIF/vHBA Identities

- show host-fc-if

```
UCS-250-B# scope server 1/5
UCS-250-B /chassis/server # scope adapter 1
UCS-250-B /chassis/server/adapter # show host-fc-if
```

FC Interface:

Id	Wwn	Model	Name	Operability
1	20:00:00:25:B5:B0:19:BF	N20-AC0002	vHBA1	Operable
2	20:00:00:25:B5:B0:19:EF	N20-AC0002	vHBA2	Operable

UCS SAN Troubleshooting

FC Interfaces – Cisco VIC

- Attach to **fls** for the ability to view SAN Boot Attributes
- The **vnic** command shows numbering of fc interfaces

```
UCS-250-B# connect adapter 1/5/1
adapter 1/5/1 # connect
adapter 1/5/1 (top):1# attach-fls
adapter 1/5/1 (fls):1# vnic
-----
vnic  ecpu  type  state  lif
-----
7     1     fc    active  4
8     2     fc    active  5
adapter 1/5/1 (fls):2#
```

UCS SAN Troubleshooting

FC Login Attributes – Cisco VIC

- Login Information (Target PWWN and FCID) can be obtain with **login <vnicID>** command
- Portname should match Boot Policy Configuration

```
adapter 1/5/1 (fls):20# login 7  
lifid: 4
```

ID	PORTNAME	NODENAME	FID
1:	50:06:01:6a:44:60:44:fa	00:00:00:00:00:00:00:00	0x5e01ef
0:	50:06:01:62:44:60:44:fa	00:00:00:00:00:00:00:00	0x5e00ef

```
adapter 1/5/1 (fls):21# login 8  
lifid: 5
```

ID	PORTNAME	NODENAME	FID
1:	50:06:01:68:44:60:44:fa	00:00:00:00:00:00:00:00	0x000000
0:	50:06:01:60:44:60:44:fa	00:00:00:00:00:00:00:00	0x000000

UCS SAN Troubleshooting

FC Login Information – Cisco VIC

- The lunmap command will confirm SAN Login

```
adapter 1/5/1 (fls):22# lunmap 7
lunmapid: 0 port_cnt: 1
  lif_id: 4
  PORTNAME          NODENAME          LUN          PLOGI
  50:06:01:62:44:60:44:fa 00:00:00:00:00:00:00:00 00000000000000000000 Y

lunmapid: 1 port_cnt: 1
  lif_id: 4
  PORTNAME          NODENAME          LUN          PLOGI
  50:06:01:6a:44:60:44:fa 00:00:00:00:00:00:00:00 00000000000000000000 Y

adapter 1/5/1 (fls):23#
adapter 1/5/1 (fls):23# lunmap 8
lunmapid: 0 port_cnt: 1
  lif_id: 5
  PORTNAME          NODENAME          LUN          PLOGI
  50:06:01:60:44:60:44:fa 00:00:00:00:00:00:00:00 00000000000000000000 N

lunmapid: 1 port_cnt: 1
  lif_id: 5
  PORTNAME          NODENAME          LUN          PLOGI
  50:06:01:68:44:60:44:fa 00:00:00:00:00:00:00:00 00000000000000000000 N
```

UCS SAN Troubleshooting

FC Login Information – Cisco VIC

- The `lunlist <vnicID>` command displays LUN level information learnt from Array.

Configured in Policy

```
adapter 1/5/1 (fls):7# lunlist 7
vnic : 7 lifid: 4
- FLOGI State : flogi est (fc_id 0x5e003c)
- PLOGI Sessions
- WWNN 50:06:01:6a:44:60:44:fa WWPN 50:06:01:6a:44:60:44:fa fc_id 0x5e01ef
- LUN's configured (SCST Type, Version, Vendor, Serial No.)
  LUN ID : 0x0000000000000000 (0x0, 0x4, DGC , FCNCX101500362)
- REPORT LUNs Query Response
  LUN ID : 0x0000000000000000
- Nameserver Query Response
- WWPN : 50:06:01:6a:44:60:44:fa
```

Learnt from Array

UCS SAN Troubleshooting

FC Interface Statistics

- show stats vnic-stats

```
UCS-250-B# scope server 1/5
UCS-250-B /chassis/server # scope adapter 1
UCS-250-B /chassis/server/adapter # scope host-fc-if 1
UCS-250-B /chassis/server/adapter/host-fc-if # show stats vnic-stats
```

```
Vnic Stats:
  Time Collected: 2012-02-12T02:54:11.471
  Monitored Object: sys/chassis-1/blade-5/adaptor-1/host-fc-1
  Suspect: No
  Bytes Rx (bytes): 37528
  Packets Rx (packets): 334
  Bytes Tx (bytes): 22932
  Packets Tx (packets): 226
  Errors Tx (errors): 0
  Errors Rx (errors): 0
  Dropped Tx (packets): 0
  Dropped Rx (packets): 0
  Thresholded: 0
```

UCS SAN Troubleshooting

FC Interface Statistics

- NXOS: show interface brief

```
UCS-250-A(nxos)# show interface brief | grep 2831
vfc2831    1000    F        on        trunking    --    TF        auto    --
UCS-250-A(nxos)#
```

- NXOS: show interface vfc <id>

```
UCS-250-A(nxos)# show interface vfc 2831
vfc2831 is trunking
  Bound interface is Vethernet11023
  Port description is server 1/5, VHBA vHBA1
  Hardware is Virtual Fibre Channel
  Port WWN is 2b:0e:00:0d:ec:d3:5c:3f
  Admin port mode is F, trunk mode is on
  snmp link state traps are enabled
  Port mode is TF
  Port vsan is 1000
  Trunk vsans (admin allowed and active) (1000)
  Trunk vsans (up) (1000)
  Trunk vsans (isolated) ()
  Trunk vsans (initializing) ()
  1 minute input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
  1 minute output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
  253 frames input, 25628 bytes
  3 discards, 0 errors
  360 frames output, 40952 bytes
  0 discards, 0 errors
  last clearing of "show interface" counters never
  Interface last changed at Sun Feb 12 02:58:03 2012
```

UCS SAN Troubleshooting

VFC Membership, Login and Pinning

- show vsan membership

```
UCS-250-A(nxos)# show vsan membership
vsan 1 interfaces:
  fc2/3          fc2/4          san-port-channel 12 vfc2718

vsan 1000 interfaces:
  fc2/1          vfc2533        vfc2642         vfc2689
  vfc2699        vfc2721        vfc2723         vfc2759
  vfc2773        vfc2823        vfc2831
```

- show npv flogi-table

```
UCS-250-A(nxos)# show npv flogi-table
-----
SERVER
INTERFACE VSAN FCID          PORT NAME          NODE NAME          EXTERNAL
INTERFACE                                     INTERFACE
-----
vfc2533    1000 0x5e0009 20:bb:0a:07:00:00:00:0f 20:aa:0a:07:00:00:00:0f fc2/1
vfc2642    1000 0x5e00a9 20:00:00:25:b5:b0:35:1e 20:00:00:25:b5:a0:35:1f fc2/1
vfc2689    1000 0x5e00ca 20:00:00:25:b5:b0:05:00 20:00:00:25:b5:a0:05:06 fc2/1
vfc2721    1000 0x5e00cb 20:00:00:25:b5:00:05:1f 20:00:00:25:b5:a0:05:05 fc2/1
vfc2759    1000 0x5e0006 20:bb:0a:07:00:00:00:1e 20:aa:0a:07:00:00:00:1f fc2/1
vfc2773    1000 0x5e0012 20:bb:0a:07:00:00:00:2f 20:aa:0a:07:00:00:00:2f fc2/1
vfc2831    1000 0x5e003c 20:00:00:25:b5:b0:19:bf 20:00:00:25:b5:a0:19:9f fc2/1
```


UCS SAN Troubleshooting

Northbound FC Switch

- show flogi database

```
SV-35-06-MDS9222i# show flogi database | grep -i 20:00:00:25:b5:b0:19:bf
fc1/17          1000 0x5e003c 20:00:00:25:b5:b0:19:bf 20:00:00:25:b5:a0:19:9f
SV-35-06-MDS9222i#
```

- show zoneset active

```
SV-35-06-MDS9222i# show zoneset active | grep -A 6 "mipetrin-cisco-live"
zone name mipetrin-cisco-live vsan 1000
* fcid 0x5e003c [pwwn 20:00:00:25:b5:b0:19:bf]
* fcid 0x5e00ef [pwwn 50:06:01:62:44:60:44:fa] [SPA2]
* fcid 0x5e01ef [pwwn 50:06:01:6a:44:60:44:fa] [SPB2]
SV-35-06-MDS9222i#
```

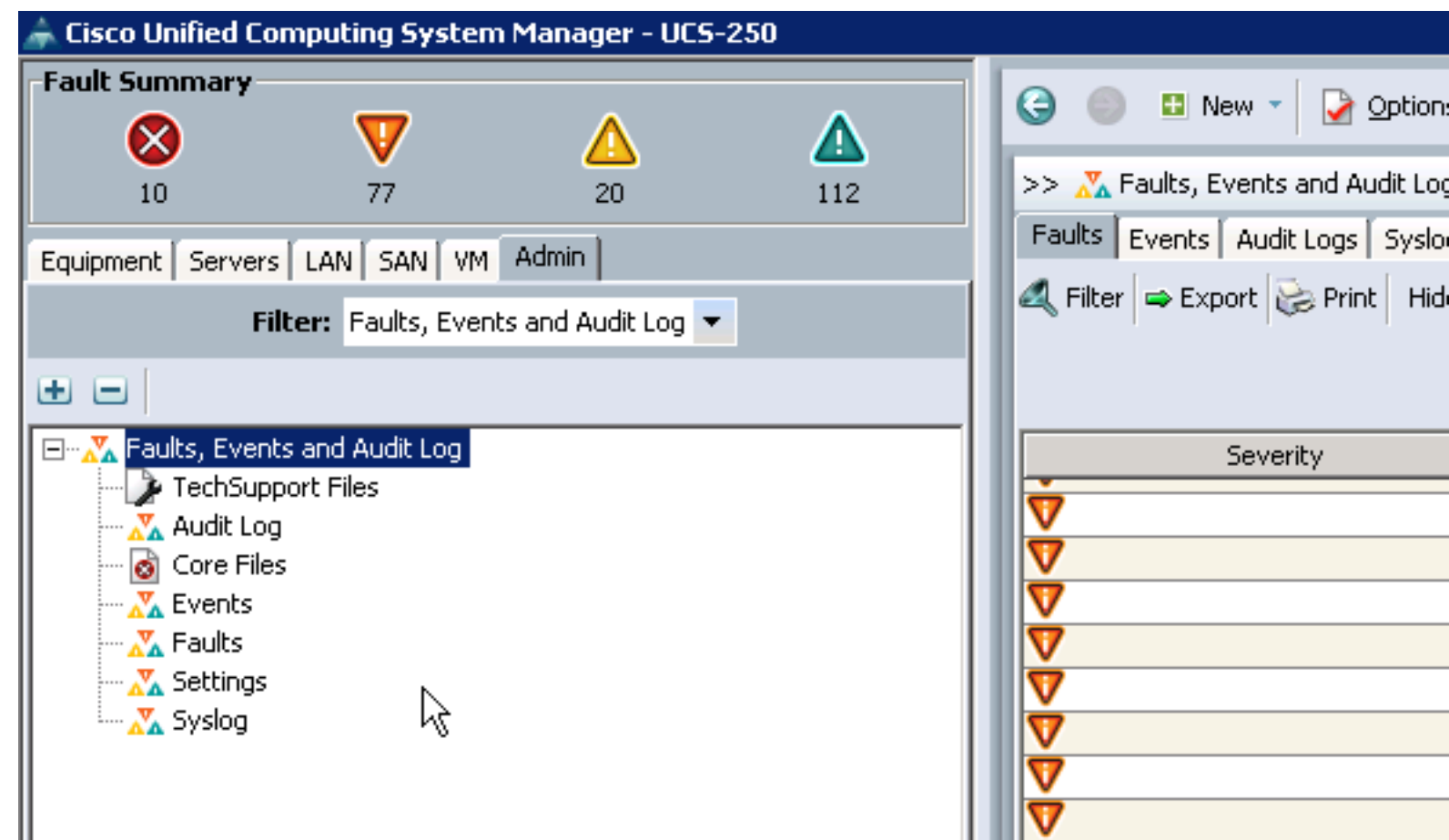
Maintenance



UCS Troubleshooting

Maintenance and Faults

- UCSM contains logs and faults
- Clearing and Log Gathering performed in UCSM



UCS Troubleshooting

System Event Logs - Viewing

- Chassis and Server level

The screenshot displays the Cisco Unified Computing System Manager (CiscoLive) interface. The top left shows a 'Fault Summary' with icons for errors, warnings, and information. The main area is divided into two panels. The top panel shows the 'Chassis 1' configuration page, with the 'SEL Logs' tab selected. A table lists SEL logs for various blades:

DN	ID	Type
sys/chassis-1/blade-1/mgmt/log-SEL-0	0	SEL
sys/chassis-1/blade-8/mgmt/log-SEL-0	0	SEL
sys/chassis-1/blade-7/mgmt/log-SEL-0	0	SEL
sys/chassis-1/blade-2/mgmt/log-SEL-0	0	SEL

The bottom panel shows the 'Server 8' configuration page, with the 'Management Logs' tab selected. A list of events is displayed:

ID	Timestamp	Entity	Event	Device	Status
1	07/06/2009 15:59:17	BMC	Entity presence MAIN_POWER #0x52	Device Present	Asserted
2	07/06/2009 15:59:18	BMC	Entity presence BIOS_POST_CMPLT #0x53	Device Absent	Asserted
3	07/06/2009 15:59:37	BIOS	System Event #0x83	Timestamp clock synch	SEL timestamp clock updated, event is first of pair Asserted
4	07/06/2009 15:59:37	BIOS	System Event #0x83	Timestamp clock synch	SEL timestamp clock updated, event is second of pair Asserted
5	07/06/2009 15:59:57	BMC	Entity presence MAIN_POWER #0x52	Device Absent	Asserted
6	07/06/2009 15:59:58	BMC	Entity presence BIOS_POST_CMPLT #0x53	Device Present	Asserted
7	07/06/2009 16:00:04	BMC	Entity presence MAIN_POWER #0x52	Device Present	Asserted
8	07/06/2009 16:00:04	BMC	Entity presence BIOS_POST_CMPLT #0x53	Device Absent	Asserted
9	07/06/2009 16:00:23	BIOS	System Event #0x83	Timestamp clock synch	SEL timestamp clock updated, event is first of pair Asserted
a	07/06/2009 16:00:24	BIOS	System Event #0x83	Timestamp clock synch	SEL timestamp clock updated, event is second of pair Asserted
b	07/06/2009 16:01:31	BIOS	System Event #0x83	OEM System Boot Event	Asserted
c	07/06/2009 16:01:32	BMC	Entity presence BIOS_POST_CMPLT #0x53	Device Present	Asserted
d	12/31/1969 18:00:28	BMC	Entity presence MEZZ_PR5 #0x41	Device Present	Asserted
e	12/31/1969 18:00:28	BMC	Entity presence HDD1_PR5 #0x43	Device Present	Asserted
f	12/31/1969 18:00:28	BMC	Entity presence P1_PRESENT #0x45	Device Present	Asserted

At the bottom of the Server 8 page, there are buttons for 'Copy', 'Print', 'Refresh', 'Backup', and 'Clear'. The word 'Server' is written in large text over the left side of the bottom panel.

UCS Troubleshooting

System Event Logs - Managing

- Administrators can define rules (policies) for backup and cleaning of SEL across all servers

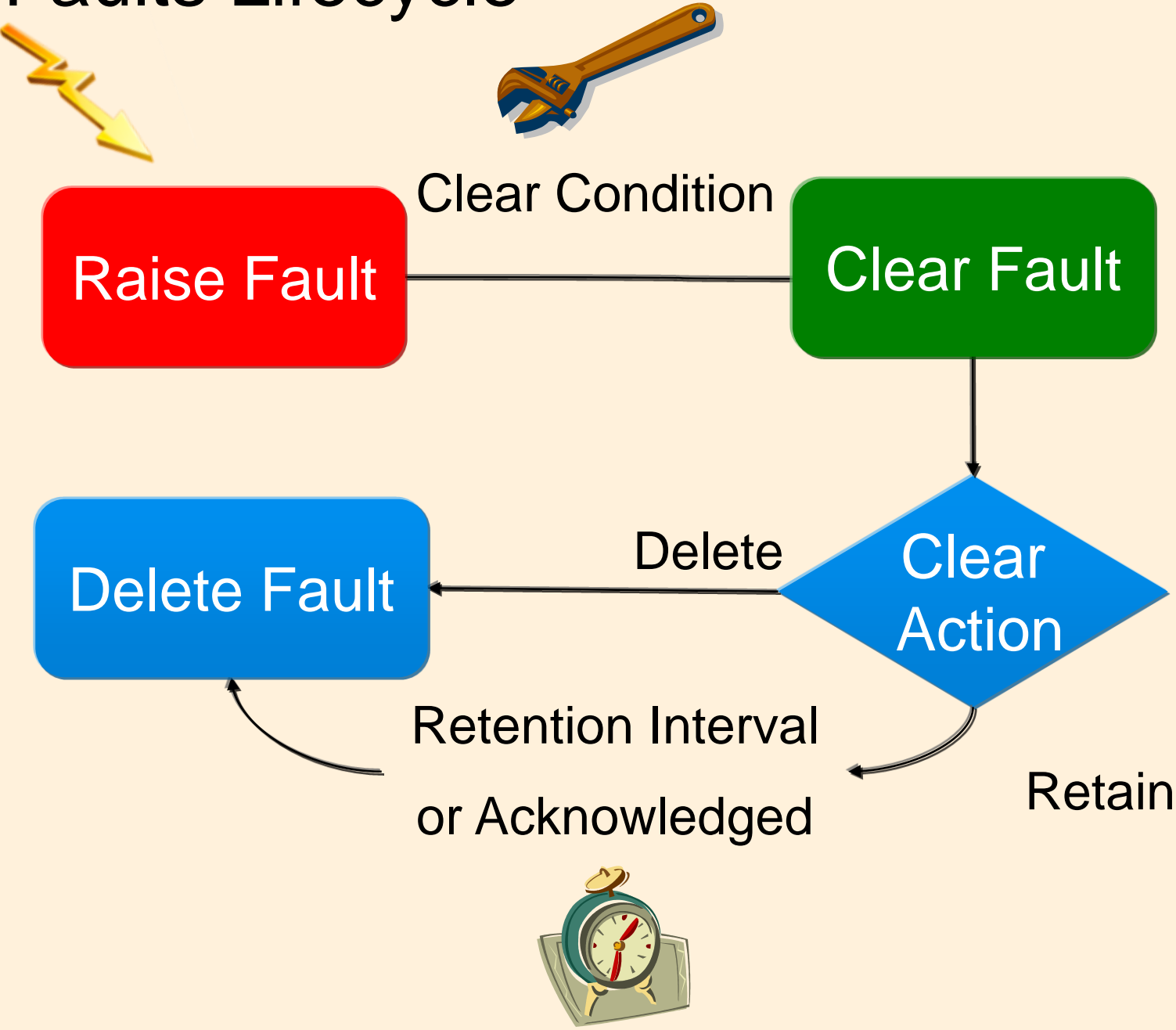
The screenshot displays the Cisco Unified Computing System Manager (UCS Manager) interface. The main window is titled "Cisco Unified Computing System Manager - FarNorth". The left sidebar shows a tree view of the system hierarchy, including "Equipment", "Chassis", "Chassis 1", "Chassis 2", and "Fabric Interconnects". The main content area is divided into several tabs: "Main Topology View", "Fabric Interconnects", "Servers", "Thermal", "Decommissioned", "Firmware Management", "Policies", and "Faults". The "Policies" tab is active, and the "SEL Policy" sub-tab is selected. The "SEL Policy" configuration page is shown, with the following details:

- General:**
 - Name: sel
 - Type: SEL
 - Description: Lab TFTP
- Backup Configuration:**
 - Protocol: FTP TFTP SCP SFTP
 - Hostname (or IP Address): 10.91.42.134
 - Remote Path: /
 - Backup Interval: 24 Hours
 - Format: ASCII Binary
 - Clear On Backup:
- Action:**
 - Log Full
 - On Change of Association
 - On Clear
 - Timer

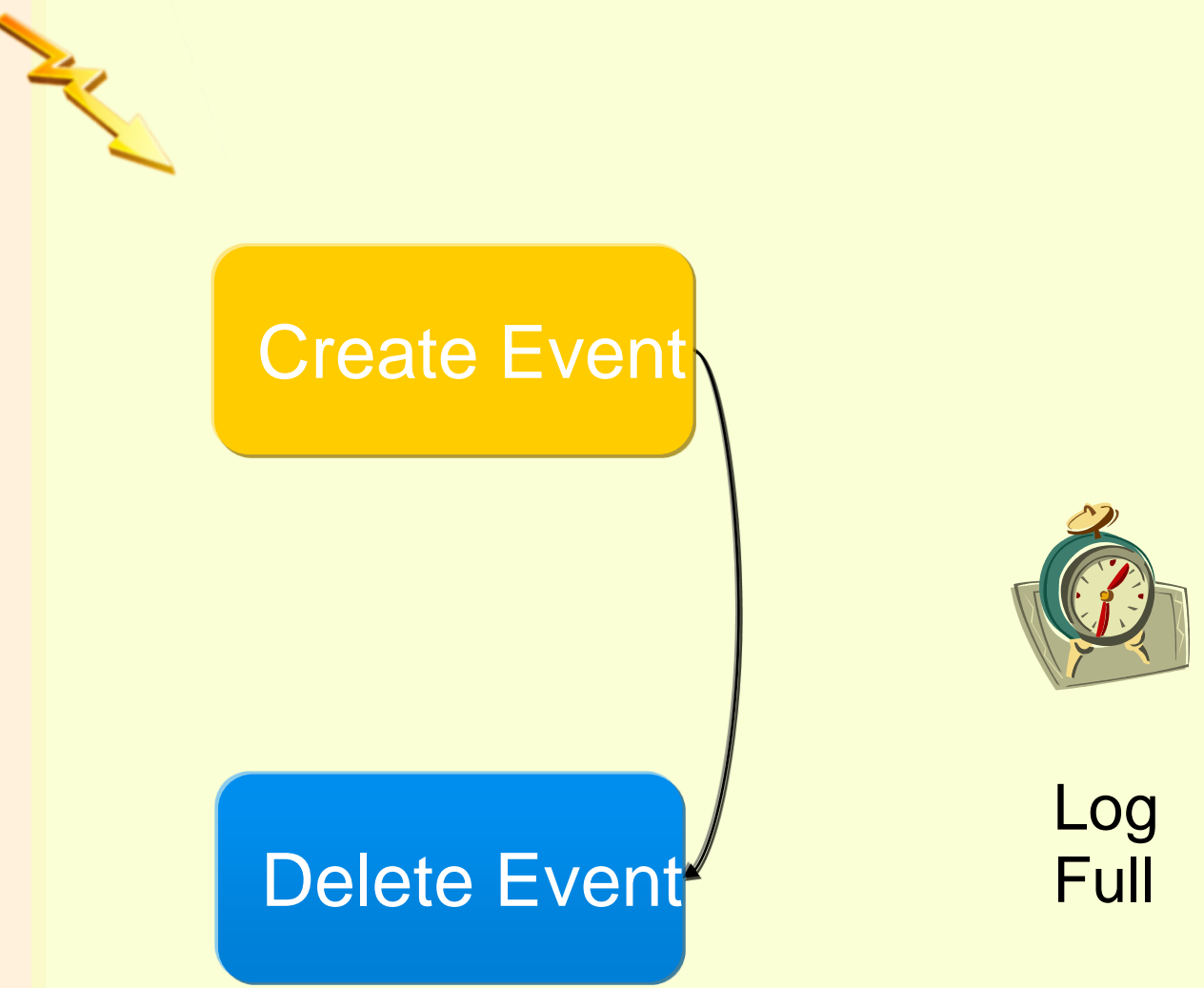
UCS Troubleshooting

Faults and Events Lifecycle

Faults Lifecycle



Events Lifecycle



UCS Faults

Examples

Severity	Code	ID	Affected object	Cause	Last Transition	Description
	F0395	5853574	sys/chassis-1/fan-module-1...	performance-problem	2011-09-13T16:27:47	Fan 2 in Fan Module 1/1-1 speed: upper-non-critical
	F0424	6194439	sys/chassis-1/blade-2/board	voltage-problem	2011-09-13T15:57:49	Possible loss of CMOS settings: CMOS battery voltage on server 1/2 is lower-critical
	F0395	6211801	sys/chassis-1/fan-module-1...	performance-problem	2011-09-13T15:56:21	Fan 2 in Fan Module 1/1-3 speed: upper-non-critical
	F0395	5853572	sys/chassis-1/fan-module-1...	performance-problem	2011-09-13T14:53:32	Fan 2 in Fan Module 1/1-5 speed: upper-non-critical
	F0461	5868205	sys/chassis-1/blade-2/mgmt...	log-capacity	2011-08-18T06:03:50	Log capacity on Management Controller on server 1/2 is very-low
	F0411	5853573	sys/chassis-1	thermal-problem	2011-08-17T10:27:40	Temperature on chassis 1 is upper-non-recoverable
	F0461	5579474	sys/chassis-1/blade-5/mgmt...	log-capacity	2011-08-01T12:23:24	Log capacity on Management Controller on server 1/5 is very-low
	F0283	5286292	sys/chassis-1/blade-2/fabri...	link-down	2011-07-19T09:35:59	fc VIF 1 / 2 A-3825 down, reason: None
	F0528	3590157	sys/chassis-1/psu-4	equipment-offline	2011-03-24T19:56:35	Power supply 4 in chassis 1 power: off
	F0528	3444409	sys/chassis-1/psu-3	equipment-offline	2011-02-16T11:49:54	Power supply 3 in chassis 1 power: off
	F0461	3278818	sys/chassis-1/blade-3/mgmt...	log-capacity	2011-01-28T17:41:28	Log capacity on Management Controller on server 1/3 is very-low

Properties for: fault

Summary

Severity: **major**

Last Transition: **2006-01-25T01:27:03**

Actions

Acknowledge Fault

Properties

Affected object: **sys/chassis-1/slot-1/host/port-4**

Description: **IOM dce interface 4 on chassis 1 oper state: link-down, reason: Link failure or not-connected**

ID: **28059** Type: **network**

Cause: **link-down** Created at: **2006-01-24T08:02:04**

Code: **F0457** Tags: **network,server**

Number of Occurrences: **91**

Properties for: fault

Summary

Severity: **info**

Last Transition: **2006-01-24T08:01:43**

Actions

Acknowledge Fault

Properties

Affected object: **sys/chassis-1/blade-5/mgmt/log-SEL-0**

Description: **Log capacity on Management Controller on server 1/5 is very-low**

ID: **27914** Type: **operational**

Cause: **log-capacity** Created at: **2006-01-24T08:01:43**

Code: **F0461** Tags: **server**

Number of Occurrences: **1**

UCS Support

Support Data Gathering – Show Tech

- Show Tech files for sending to TAC

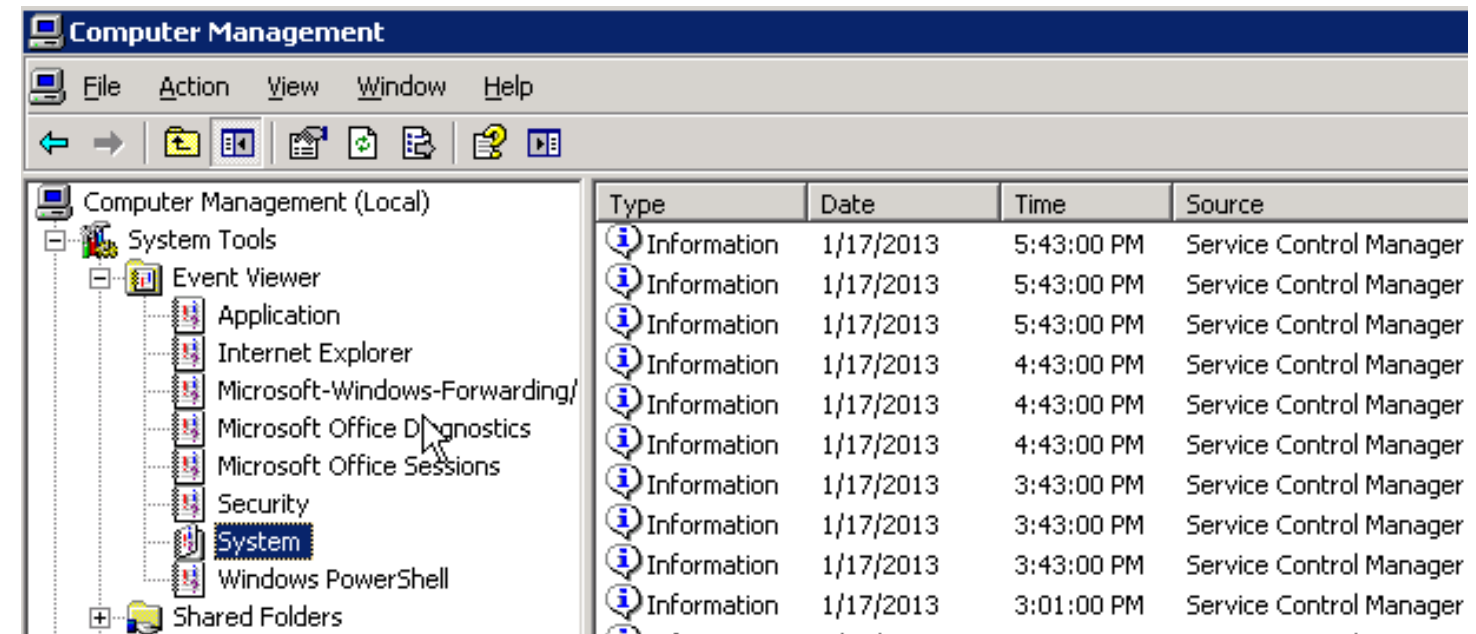
The screenshot displays the Cisco Unified Computing System Manager - CiscoLive interface. The main window shows the 'TechSupport Files' section with a table of files. A dialog box titled 'Download a Tech Support File' is open, showing the path 'C:\Users\mipetrin\Desktop'. Another dialog box titled 'Create a Tech Support File' is also visible, showing options for 'ucsm', 'chassis', 'fabric-extender', and 'rack-server'. The 'Download a Tech Support File' dialog box has a 'Path' field with the value 'C:\Users\mipetrin\Desktop' and a '...' button to the right. The 'Create a Tech Support File' dialog box has a title bar, a title, and an 'Options' section with radio buttons for 'ucsm', 'chassis', 'fabric-extender', and 'rack-server'. Below the options, it states 'Technical support data for the entire UCSM instance will be created.' The main interface shows a 'Fault Summary' at the top with icons for 1 error, 0 warnings, 5 alerts, and 8 info. Below that is a navigation tree with 'TechSupport Files' selected. The main content area shows a table with columns: Name, Overall Status, Size, Fabric ID, and URI. The table contains one row: '20110427090438_CiscoLive_UCSM.tar', 'available', '15073280', 'A', and 'techsupport/20110427090438_CiscoLive_UCSM...'. The interface also includes a 'Filter' dropdown set to 'All', 'Export', and 'Print' buttons, and a 'Save Changes' / 'Reset Values' button at the bottom right.

Name	Overall Status	Size	Fabric ID	URI
20110427090438_CiscoLive_UCSM.tar	available	15073280	A	techsupport/20110427090438_CiscoLive_UCSM...

UCS Support

OS Troubleshooting

- Ping, ARP
- esxcfg-nics, esxcfg-vmknic, ifconfig, ipconfig
- ethtool, lsmod, lspci
- top, esxtop (n option)
- tcpdump, Wireshark
- OS Logs
 - Event Viewer, VM-Support, sosreport
 - OS Core Files (PSOD, BSOD)



Key Takeaways



UCS Troubleshooting

Narrowing Down..

- Define the Problem
 - From which point to what point is the problem? (e.g. blade to blade)
 - Do we see the problem in one direction or both?
- Eliminate Variables
 - Is the problem seen on the same Fabric Interconnect?
 - Is just one blade having trouble, or all?
 - Are all Virtual Machines affected? Just one VLAN?
- Define the Topology
 - List all ports in the traffic path
 - VIF's, HIF's, NIF's, Server, Uplinks



UCS Troubleshooting

What Next?

- Cisco Support Community
 - <http://supportforums.cisco.com>
- Cisco Documentation
 - <http://www.cisco.com/go/ucs>
- TAC Case
 - <http://www.cisco.com/support/>



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