Configure Disjoint Layer 2 in Hyperflex Clusters

Contents

Introduction Prerequisites **Requirements Components Used** Network Diagram Configurations Configure the new vNICs **Acknowledge Pending Activities** Configure the VLANs **ESXi** configuration Verify **UCSM** Verification **CLI** Verification Virtual Interface (VIF) Path Pinning in the Uplinks **Designated Receiver: Upstream Switches** Troubleshoot **UCSM** Configuration Errors **Possible Incorrect Behaviors Related Information**

Introduction

This document describes how to implement a Disjoint Layer 2 (DL2) configuration on a HX Cluster from the UCS Manager (UCSM) and ESXi perspectives.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Basic understanding of the DL2 configuration
- Basic knowledge of Hyperflex Cluster
- Recommended UCSM knowledge on vNICs, Service Profiles, and templates

Other requirements are:

- At least one available link on each Fabric Interconnect and two available links on your upstream switch.
- The links between the Fabric Interconnects and the upstream switch must be up, they must be configured as uplinks. If they are not, check this <u>System Configuration Configuring Ports</u> to configure them on UCSM.
- The VLANs to be used must be created on UCSM already. If they are not, do these steps Network

Configuration - Configuring Named VLAN.

- The VLANs to be used must be created on the upstream switch already.
- The VLANs to be used cannot exist on any other virtual NIC (vNIC) on the Service Profiles.

Components Used

This document is not restricted to specific software and hardware versions.

- 2x UCS-FI-6248UP
- 2x N5K-C5548UP
- UCSM version 4.2(1f)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Network Diagram



â€f

â€f

Configurations

DL2 configurations are used to segregate traffic on specific uplinks to the upstream devices, so the VLAN traffic does not mix.

Configure the new vNICs

Step 1. Log in to UCSM, and click on the LAN tab on the left panel.

Navigate to **Policies > root > Sub-organizations > Sub-organization name > vNIC templates.** Rightclick it and click **Create vNIC Template.**



Step 2. Name the template, leave **Fabric A** selected, scroll down, and select the appropriate VLANs for the new link. The remaining settings can be configured as desired.

Next, repeat the same process, but select Fabric B this time.

Step 3. From the LAN tab, navigate to **Policies > root > Sub-organizations > Sub-organization name > LAN Connectivity Policies > Hyperflex.**



â€f

Step 4. Click Add, name the vNIC, and select a MAC pool from the dropdown menu.

Check the **Use vNIC Template** and the **Redundancy Pair** boxes. From the **vNIC Template** dropdown, select the new template, and next to it, enter the **Peer Name**.

Select the desired Adapter Policy and click OK.

Create vNIC

Name :	DL2-A				
Use vNIC	C Templat	e: 🗹			
Redundancy Pair : 🗹				Peer Name :	DL-B
vNIC Template : vm-network-DL2-a 🔻		vork-DL2-a 🔻	Create vNIC Ter	mplate	
Adapte	r Perforn	nance Pro	ofile		
Adapte	er Policy	:	VMWare 🔻	Create Etherne	et Adapter Policy

Step 5. On the vNIC list, look for the Peer of the one just created, select it, and click Modify.

Click the **Use vNIC Template** box and select the other template that was created from the dropdown. Click **Save Changes** at the bottom, this triggers **Pending Activities** for the related servers.

Acknowledge Pending Activities

Step 1. Log in to HX Connect, navigate to **System Information > Nodes**, click one of the nodes, and then click **Enter HX Maintenance Mode**, then wait for the task to finish.

=	cisco HyperFlex Connect								
0	Dashboard	System Overview Nodes Disks							
MON	NITOR	⊕ Enter H)	Maintenance Mode	🖯 Exit HX Maintenan	ce Mode				
Q	Alarms	Node 个	Hypervisor	Hypervisor	Controller		Controller	Model	
ជ្	Events		Address	Status	Address		Status		
¢111	Activity		10.	Online	10.	1	Online	HX240C- M4SX	
ANA	LYZE		10.	Online	10.	1	Online	HX240C-	
lalı	Performance							M4SX	
PRO	тест		10.	Online	10.	1	Online	HX240C- M4SX	
Ċ	Replication								
MAN	NAGE	1 - 3 of 3							
E	System Information								
	Datastores								
R	iscsi 👻								
ADO	ut								

Step 2. From vCenter, ensure the node is in maintenance.

Step 3. Once the node is in maintenance, go back to UCSM, click the bell icon at the top right corner, and under **Reboot Now**.

Check the box that matches the server that is currently in maintenance, then click **OK**.

Pending Act	tivities			
User Acknowledge	d Activities Scheduled	d Activities		
Service Profiles	Fabric Interconnects	Servers Chase	sis Profiles	
Y Advanced Filter	🕈 Export 📑 Print 🔽 Si	how Current User's Act	ivities Acknowledge All	
Name	Overall Status	Server	Acknowledgment St	Config. Trigg
Service Profile ra.	Pending Reboot	sys/rack-unit-1	Waiting For User	Waiting For N
Service Profile ra.	Pending Reboot	sys/rack-unit-2	Waiting For User	Waiting For N
		(+) Add	п Delete 🚯 Info	
Acknowledge				
				OK

Step 4. After the server boots up, ensure the new vNICs are present by navigating to **Servers > Service Profiles > root > Sub-Organizations > Sub-organization name > Service Profile name**.

Click **Network**, scroll down and the new vNICs must be there.

General Storage	Network	iSCSI vNICs	vMedia Policy	Boot Order	Virtual Machines	FC Zones	Policies
			LAN Connectivity	Policy Instance :	org-root/org-hx-st	orage-west/lan	-conn-pol
			Create LAN Conn	ectivity Policy			
Advanced Filter 🔶 Expo	ort 🖷 Print	MAC Address		Desired	Order		Astual Ord
Advanced Filter + Expo lame	ort 🖶 Print	MAC Address	3:01	Desired	Order		Actual Ord
Advanced Filter According	ort 🖶 Print	MAC Address 00:25:85:A8:4	33:01	Desired 3	Order		Actual Ord
Advanced Filter Texpo lame VNIC storage-data-a VNIC storage-data-b	ort 🖷 Print	MAC Address 00:25:85:A8:A 00:25:85:A8:E	x3:01 84:01	Desired 3 4	Order		Actual Orc 2 6
Advanced Filter Advanced Filter Expo lame VNIC storage-data-a VNIC storage-data-b VNIC vm-network-a	ort 🖷 Print	MAC Address 00:25:85:A8:A 00:25:85:A8:E 00:25:85:A8:A	X3:01 84:01 X5:01	Desired 3 4 5	Order		Actual Ord 2 6 3
Advanced Filter Expo Lame VNIC storage-data-a VNIC storage-data-b VNIC vm-network-a VNIC vm-network-b	ort 🖷 Print	MAC Address 00:25:85:A8:A 00:25:85:A8:E 00:25:85:A8:E 00:25:85:A8:E	A3:01 34:01 A5:01 36:01	Desired 3 4 5 6	Order		Actual Orc 2 6 3 7
Advanced Filter Expo Iame VNIC storage-data-a VNIC storage-data-b VNIC vm-network-a VNIC vm-network-b VNIC vm-network-bL2-a	ort 🖶 Print	MAC Address 00:25:85:A8:A 00:25:85:A8:A 00:25:85:A8:A 00:25:85:A8:A 00:25:85:A8:A	A3:01 34:01 A5:01 36:01 A5:06	Desired 3 4 5 6 2	Order		Actual Ord 2 6 3 7 9

Step 5. Take the server out of the maintenance mode from the HX Connect UI.

Click Exit HX Maintenance Mode.

When the server gets out of maintenance, the Storage Controller Virtual Machine (SCVM) boots up and the cluster starts the healing process.

In order to monitor the healing process, SSH into the Hyperflex (HX) Cluster Manager IP and run the command:

sysmtool --ns cluster --cmd healthdetailâ€∢

Cluster Health Detail: ------: State: ONLINE HealthState: HEALTHY Policy Compliance: COMPLIANT Creation Time: Tue May 30 04:48:45 2023 Uptime: 7 weeks, 1 days, 15 hours, 50 mins, 17 secs Cluster Resiliency Detail: ------: Health State Reason: Storage cluster is healthy. # of nodes failure tolerable for cluster to be fully available: 1 # of node failures before cluster goes into readonly: NA # of node failures before cluster goes to be crticial and partially available: 3 # of node failures before cluster goes to enospace warn trying to move the existing data: NA
of persistent devices failures tolerable for cluster to be fully available: 2
of persistent devices failures before cluster goes into readonly: NA
of caching devices failures tolerable for cluster to be fully available: 2
of caching failures before cluster goes into readonly: NA
of caching failures before cluster goes to be critical and partially available: 3
of caching failures before cluster goes to be critical and partially available: 3
of caching failures before cluster goes to be critical and partially available: 3
Current ensemble size: 3
Minimum data copies available for some user data: 3
Minimum metadata copies available for cluster metadata: 3
Current healing status:
Time remaining before current healing operation finishes:
of unavailable nodes: 0

Step 6. Once the cluster is healthy, repeat steps 1-6. Do **NOT** proceed with the next step until all servers have the new vNICs present.

Configure the VLANs

Step 1. From UCSM, navigate to LAN > VLANs > VLAN Groups and click Add.



Step 2. Name the VLAN Group and select the appropriate VLANs below, click **Next**, and move to step 2 of the wizard to add single Uplinks Ports or to step 3 to add Port Channels.



Create VLAN Group

1	Select VLANs		Uplir	nk Ports			
2	Add Uplink Ports	Fabric ID	Slot ID	Aggreg	Port ID		Fabric
		A	1	0	14	>>	
3	Add Port Channels	A	1	0	15	<<	
		В	1	0	14		
						< Prev	Next

ESXi configuration

Step 1. Log in to the vSphere of the ESXi host, navigate to **Networking > Virtual Switches**, and click **Add standard virtual switch**.

Step 2. Name the vSwitch and one of the new vmnics is there already, click **Add uplink** to add the 2nd one. Click **Add**.

vm ESXi Host Client			root@10.31.123.200 -
☆ Navigator ≪ ✓ ■ Host Manage	Cdmx1.cisco.com - N Port groups Virtual st	etworking witches Physical NICs	VMkernel NICs TCP/IP s
Monitor Dirtual Machines Storage Constant of the second sec	+ Add standard v	irtual switch 🚡 🛆	dd uplink 🥜 Edit setting
Networking 7	Name	✓ Port groups	 Uplinks
	vmotion	1 d 3	2 2 2
+ Add standard vi	tual switch - vswitch	-hx-DL2	
Add uplink			
vSwitch Name	vswitch	-hx-DL2	
MTU	1500		
Uplink 1	vmnic8	- Up, 10000 Mbps	~
> Link discovery	Click to	expand	
> Security	Click to	expand	
			Α

Step 3. Navigate to Networking > Port groups and click Add port group

Step 4. Name the port group, enter the desired VLAN, and select the new Virtual switch from the dropdown.

vm	ESXi Host Client						root@10.31.1	23.200 👻
G	Navigator	«	⊘ cdmx1.cisc	cdmx1.cisco.com - Networking Port groups				
Ĭ	Manage		Port groups	Virtual Switch	es Filys	ical Nics	VMRemenvics	
	Monitor		⁺⁄ Add p	ort group	🖋 Edit se		C Refresh	🍄 Act
Ċ	🗊 Virtual Machines	2	Name	~	Active por	VLAN ID	Туре	~
(Storage	6	👲 vmotio	n-479	1	479	Standard port	group
	Networking		🛛 Storage	e Controlle	1	470	Standard port	group
			👲 Storag	e Controlle	1		Standard port	group
			🖉 Manag	ement Net	1	470	Standard port	group
			Storage	e Controlle	1	478	Standard port	group
			Name	t group - D	DL2-vm-network-		469 vm-network-469	
			VLAN ID			469		
			Virtual swite	h		vswitcl	h-hx-DL2	~
			> Security			Click to	expand	
						A	dd C	ANCEL

Step 5. Repeat step 4 for each VLAN flowing through the new links.

Step 6. Repeat steps 1-5 for each server that is part of the cluster.

Verify

UCSM Verification

Navigate to **Equipment > Rack-Mounts > Servers > Server # > VIF Paths** and expand **Path A** or **B**, under the vNIC column, look for the one that matches the DL2 vNIC and that Virtual Circuit must be pinned to the Fabric Interconnect (FI) Uplink or Port Channel that was recently configured.

-ili-ili- cisco	UCS Manager			8 👽 🙆	•				
黒	All	Equipment / Rack-P	Mounts / Servers /	Server 1 (CDMX1)					
2	• Equipment Chassis	< General Inv + - Ty Advance	entory Virtual Ma ed Filter 🛧 Export	echines Hybrid Display	Installed Firmware	SEL Logs	CIMC Sessions	VIF Path	15
욺	▼ Rack-Mounts	Name	Adapter Port	FEX Host Port	FEX Network Port	FI Server Port	vNIC		FL
	Enclosures	Path A/1	1/2			A/1/4			
	FEX	₩ Path B/1	1/1			B/1/4			
Ē	✓ Servers	Virtual Circuit.					hv-mgmt-b		B/F
_	Server 1	Virtual Circuit.					storage-data	a-b	B/F
=	Server 2	Virtual Circuit.					vm-network	-b	B/F
	 Server 3 	Virtual Circuit.					hy-ymotion-	b	B/F
	 Server 5 	Virtual Circuit					um-network	-DI 2-b	B/1
	 Server 6 	virtual circuit.					and heavork	012-0	5/1
20	 Fabric Interconnects 								

CLI Verification

Virtual Interface (VIF) Path

On an SSH session to the Fabric Interconnects, run the command:

show service-profile circuit server <server-number>

This command displays the VIF Paths, their corresponding vNICs, and the interface they are pinned to.

Fabi	ric ID: A Path ID: 1							
	VIF	vNIC	Link State	Oper State	Prot State	Prot Role	Admin Pin	Oper Pin
	966	hv-mamt-a	 Up	Active	No Protection	Unprotected	0/0/0	0/0/1
	967	storage-data-a	Up	Active	No Protection	Unprotected	0/0/0	0/0/1
	968	vm-network-a	Up	Active	No Protection	Unprotected	0/0/0	0/0/1
	969	hv-vmotion-a	Up	Active	No Protection	Unprotected	0/0/0	0/0/1
	990	network-DL2-a	Up	Active	No Protection	Unprotected	0/0/0	1/0/14

The **Oper Pin** column must display the recently configured FI Uplink or Port Channel under the same line as the DL2 vNIC.

On this output, the **VIF 990**, which corresponds to the **vm-network-DL2-b** vNIC, is pinned to interface 1/0/14.

Pinning in the Uplinks

Fabric-Interconnect-A(nxos)# show pinning border-interfaces

On this output, the Veth number must match the VIF number seen on the previous output and be on the same line as the correct uplink interface.

Designated Receiver:

```
Fabric-Interconnect-A# connect nx-os a
Fabric-Interconnect-A(nxos)# show platform software enm internal info vlandb id <VLAN-ID>
```

```
vlan_id 469
_-----
Designated receiver: Eth1/14
Membership:
Eth1/14
```

On this output, the correct uplink must be displayed.

Upstream Switches

On an SSH session to the upstream switches, the MAC address table can be checked and the MAC address of any Virtual Machine (VM) on this VLAN must be shown.

Nexus-5K# show mac address-table vlan 469 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/SWID.SSID.LID * 469 0000.0c07.ac45 static 0 F F Router * 469 002a.6a58.e3bc static 0 F F Po1 * 469 0050.569b.048c dynamic 50 F F Eth1/14 * 469 547f.ee6a.8041 static 0 F F Router

In this configuration example, VLAN 469 is the disjoint VLAN, MAC address **0050:569B:048C** belongs to a Linux VM assigned to the vSwitch **vswitch-hx-DL2** and the port group **DL2-vm-network-469**, it is correctly displayed on interface Ethernet **1/14**, which is the interface of the upstream switch connected to the Fabric Interconnect.

From the same session to the upstream switch, the VLAN configuration can be checked.

Nexus-5K# show vlan brief

VLAN	Name	Status	Ports
1	default	active	Eth1/5, Eth1/8, Eth1/9, Eth1/10 Eth1/11, Eth1/12, Eth1/13 Eth1/15, Eth1/16, Eth1/17 Eth1/19, Eth1/20, Eth1/21 Eth1/22, Eth1/23, Eth1/24 Eth1/25, Eth1/26
469	DMZ	active	Po1, Eth1/14, Eth1/31, Eth1/32

On this output, interface Ethernet 1/14 is correctly assigned to VLAN 469.

Troubleshoot

UCSM Configuration Errors

Error: "Failed to find any operational uplink port that carries all VLANs of the vNIC(s). The vNIC(s) will be shut down which will lead to traffic disruption on all existing VLANs on the vNIC(s)."

The error means that there are no new uplinks up to carry the new traffic, discard any layer 1 and layer 2 issues on the interfaces, and retry.

Error: "ENM source pinning failed"

The error is related to the associated VLANs of a vNIC not found on an uplink.

Possible Incorrect Behaviors

The previous uplinks stop the data flow because the new VLANs already exist on a vNIC and they get pinned to the new uplinks.

Remove any duplicate VLAN on the previous vNIC template. Navigate to **Policies > root > Sub-organizations > Sub-organization name > vNIC templates** and remove the VLAN from the **vm-network** vNIC template.

Related Information

- <u>Cisco Technical Support & Downloads</u>
- Deploy Layer 2 Disjoint Networks Upstream in End-Host Mode