

Configure Disjoint Layer 2 in UCS Manager

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Introduction

This document describes the configuration for Disjoint Layer 2 in the Unified Computing System Manager Domain (UCSM).

Prerequisites

- 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 guide to configure them on UCSM: [Using the LAN Uplinks Manager](#)
- The VLANs to be used must be created on UCSM already. If they are not, check this guide: [Creating a Named VLAN with the LAN Uplinks Manager](#)
- The VLANs to be used must be created on the upstream switch already.
- The VLANs to be used cannot exist on any other virtual Network Interface Cards (vNIC) on the Service Profiles.

Requirements

Cisco recommends that you have knowledge of these topics:

- Unified Computing System Manager Domain (UCSM).
- Basic understanding of Disjoint Layer 2 networks.
- Networking configuration.
- vNIC Configuration.

Components used

- UCS Manager.
- Firmware version 4.2(3e).
- 6454 Fabric Interconnect.
- Cisco B200 M5.
- Nexus 5672UP 16G-FC Chassis.
- Catalyst WS-C3650-12X48UR-E.

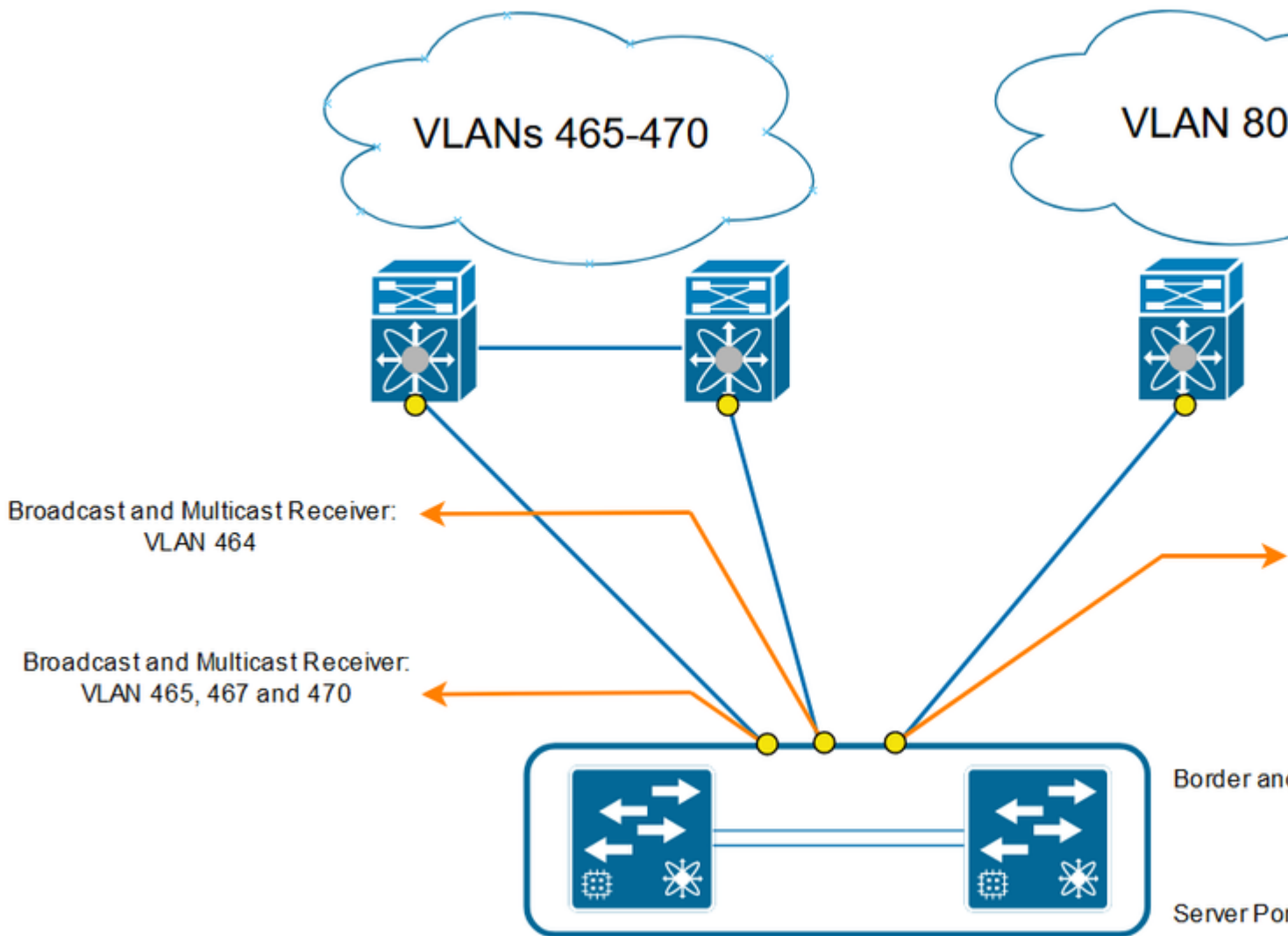
Background Information

Disjoint Layer 2 (DL2)

Disjoint layer-2 networks are required if you have two or more Ethernet clouds that never connect, but must be accessed by servers or virtual machines located in the same Cisco UCS domain.

They are also required in a multi-tenant environment if servers or virtual machines for more than one client are located in the same Cisco UCS domain and they need to access the L2 networks for both clients.

Network Diagram



Configure

Log into Cisco UCS Manager GUI as an administrative user.

Create the uplinks in the Fabric Interconnects.

Step 1. Navigate to **Equipment tab > Fabric interconnects > Fabric Interconnect A or B.**

Step 2. Right-click on the desired port and select Configure as an uplink port. This uplink port is used to connect to the Disjoint network (in this example VLAN 80).

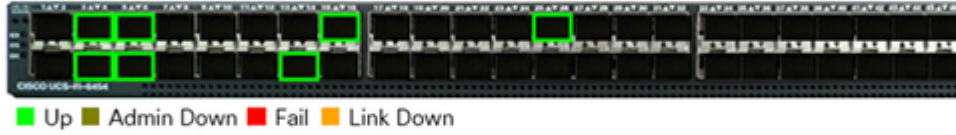
Equipment / Fabric Interconnects / Fabric Interconnect A (primary)

- General
- Physical Ports
- Fans
- PSUs
- Physical Display
- FSM
- Neighbors
- Faults
- Events
- Statistics

Fault Summary



Physical Display



■ Up ■ Admin Down ■ Fail ■ Link Down

Status

Overall Status : ↑ Operable
Thermal : ↑ OK
Ethernet Mode : End Host
FC Mode : End Host
Admin Evac Mode : Off

Properties

Name : A
Product Name : Cisco UCS 6454
Vendor : Cisco Systems, Inc. PID :
Revision : 0 Serial :

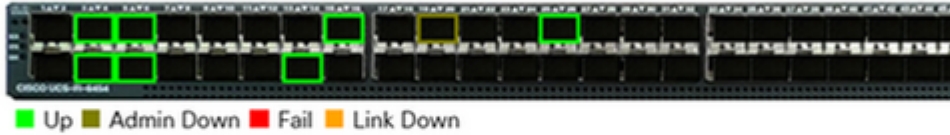
Equipment / Fabric Interconnects / Fabric Interconnect B (subordinate)

- General
- Physical Ports
- Fans
- PSUs
- Physical Display
- FSM
- Neighbors
- Faults
- Events
- Statistics

Fault Summary



Physical Display



■ Up ■ Admin Down ■ Fail ■ Link Down

Status

Overall Status : ↑ Operable
Thermal : ↑ OK
Ethernet Mode : End Host
FC Mode : End Host
Admin Evac Mode : Off

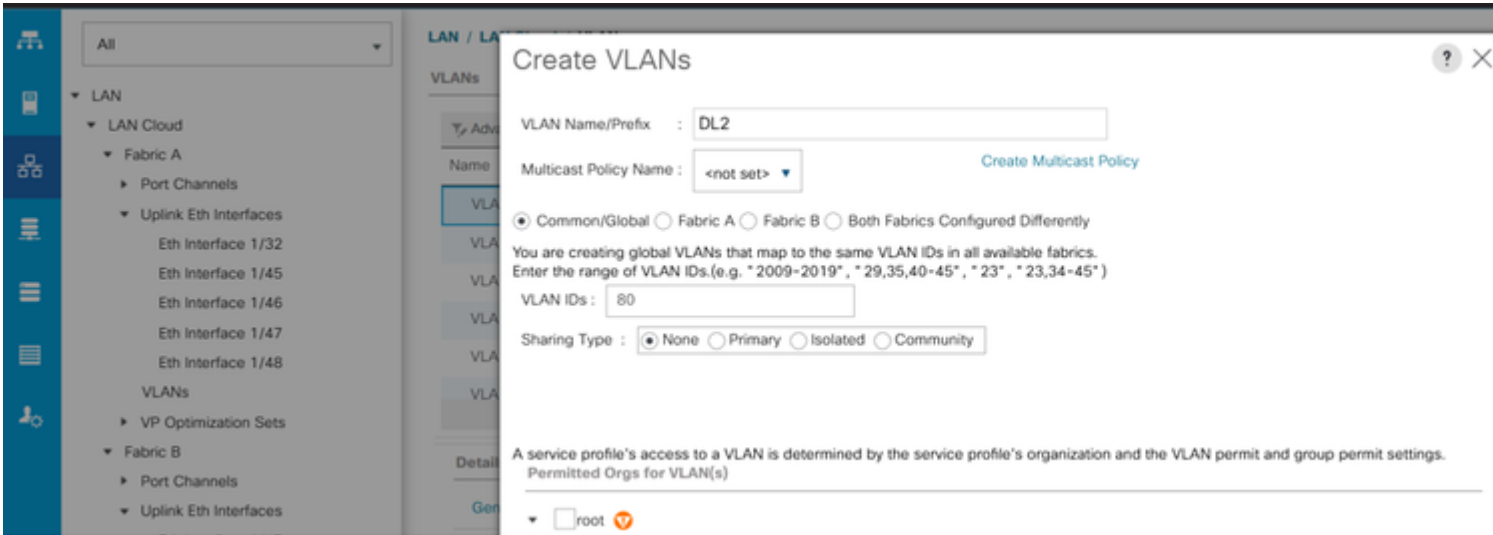
Properties

Name : B
Product Name : Cisco UCS 6454
Vendor : Cisco Systems, Inc. PID :
Revision : 0 Serial :

Assign VLANs

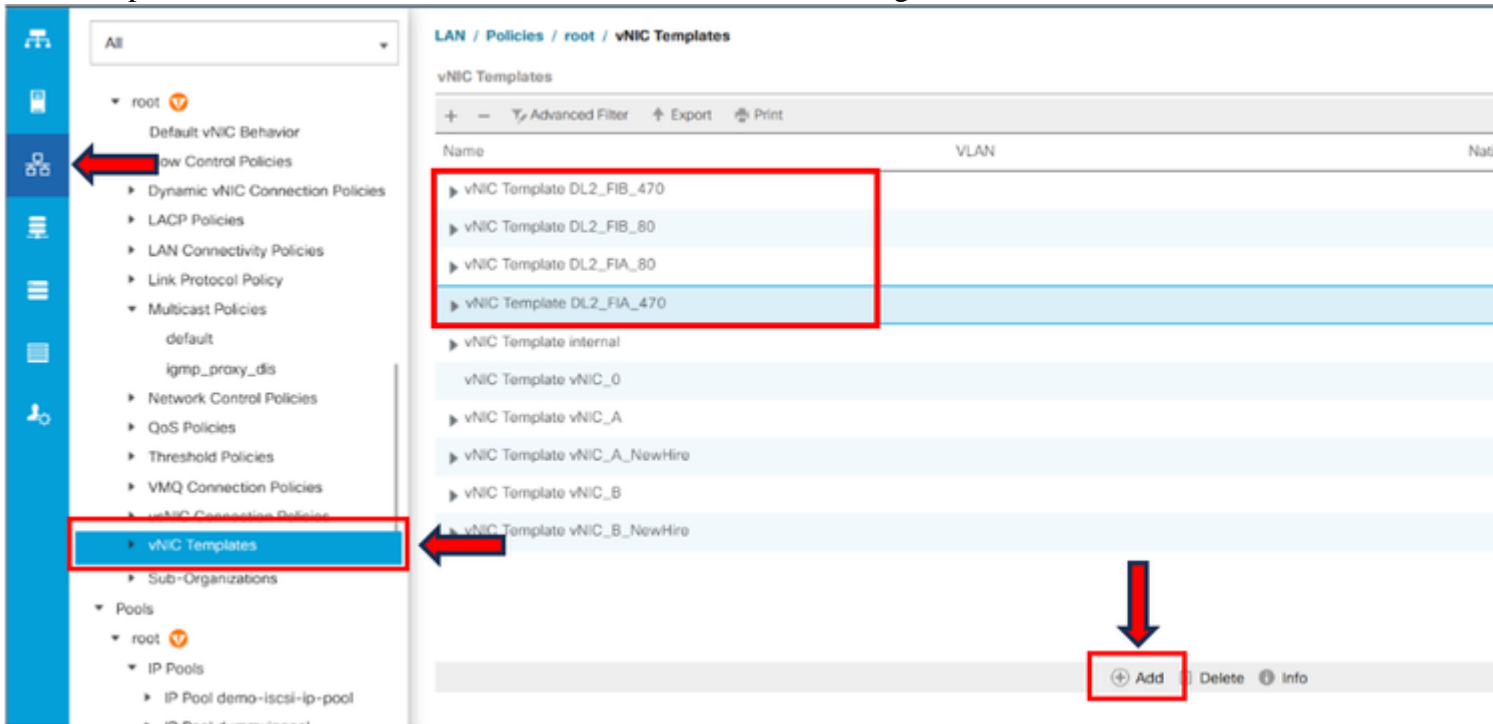
In order to recreate, VLAN 80 was created.

Step 1. In order to add the VLAN 80 navigate to **LAN tab > LAN Cloud > VLANs** click on add and complete the fields.



Create vNIC Template

Step 1. Navigate to LAN tab > Policies > root > vNIC Template and click Add. Select the vNIC template. Configure the name and select the appropriate Fabric ID. As a best practice, it is recommended to have a redundant vNIC configuration.



Select the VLANs to be configured accordingly. In this example, the base VLAN is **VLAN 470**, and the disjoint VLAN is **VLAN 80**.

- All
- ▶ Link Profile
- ▶ Threshold Policies
- ▶ UDLD Link Policy
- ▼ root
 - Default vNIC Behavior
 - ▶ Flow Control Policies
 - ▶ Dynamic vNIC Connection Policies
 - ▶ LACP Policies
 - ▶ LAN Connectivity Policies
 - ▶ Link Protocol Policy
 - ▼ Multicast Policies
 - default
 - igmp_proxy_dis
 - ▶ Network Control Policies
 - ▶ QoS Policies
 - ▶ Threshold Policies
 - ▶ VMQ Connection Policies
 - ▶ usNIC Connection Policies
 - ▶ vNIC Templates
 - ▶ Sub-Organizations
- ▼ Pools
 - ▼ root
 - ▼ IP Pools
 - ▶ IP Pool demo-iscsi-ip-pool
 - ▶ IP Pool dummyippool
 - ▶ IP Pool ext-mgmt
 - ▶ IP Pool iscsi-initiator-pool

vNIC Templates

Modify vNIC Template

Name : **DL2_FIA_80**

Description :

Fabric ID : Fabric A Fabric B Enable Failover

Target : **Adapter**

Template Type : Initial Template Updating Template

VLANs | VLAN Groups

Advanced Filter | Export | Print

| Select | Name | Native VLAN | VLAN ID |
|-------------------------------------|---------|-----------------------|---------|
| <input type="checkbox"/> | 125 | <input type="radio"/> | 125 |
| <input type="checkbox"/> | 480 | <input type="radio"/> | 480 |
| <input type="checkbox"/> | default | <input type="radio"/> | 1 |
| <input checked="" type="checkbox"/> | DL2 | <input type="radio"/> | 80 |

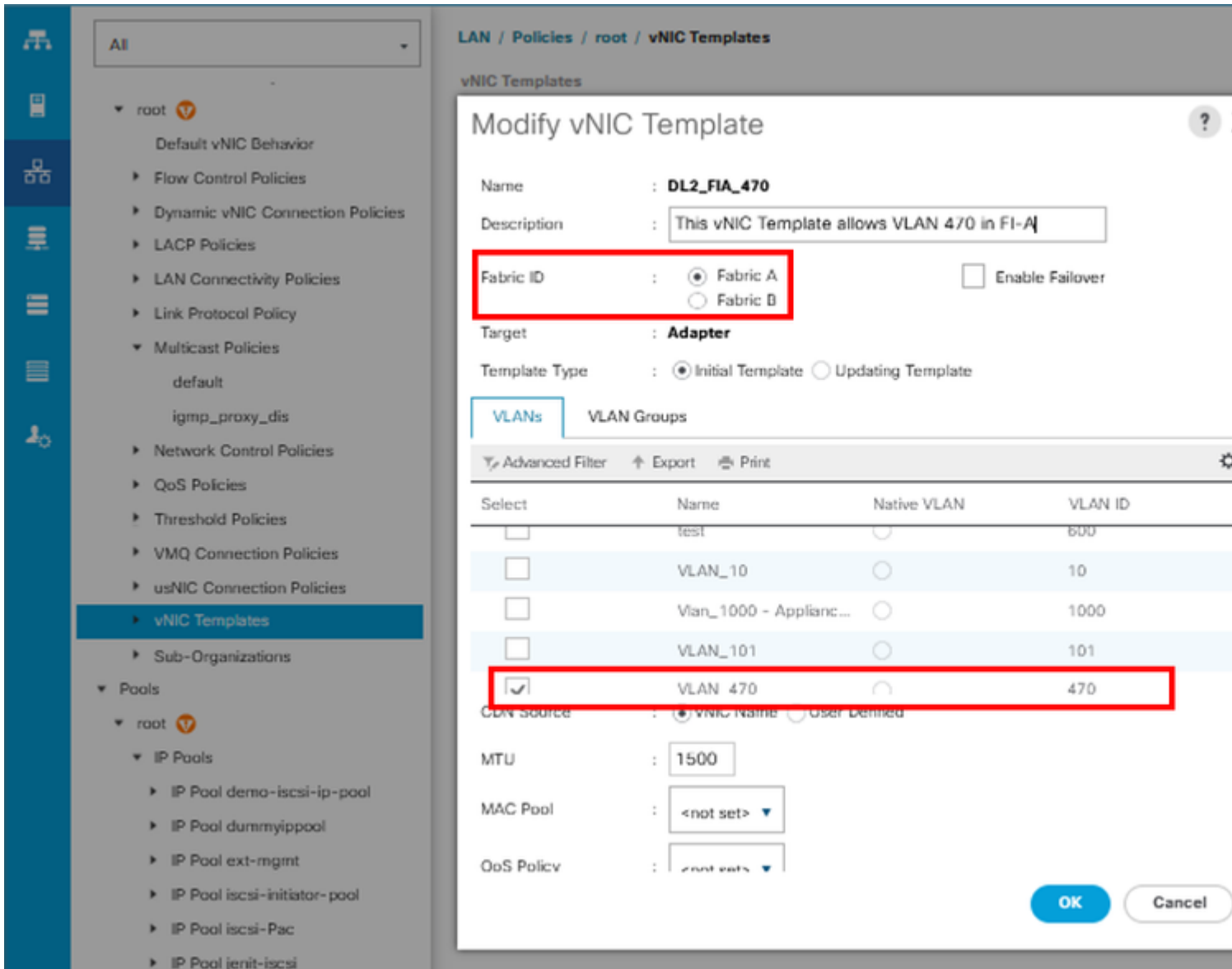
CDN Source : vNIC Name User Defined

MTU :

MAC Pool :

QoS Policy :

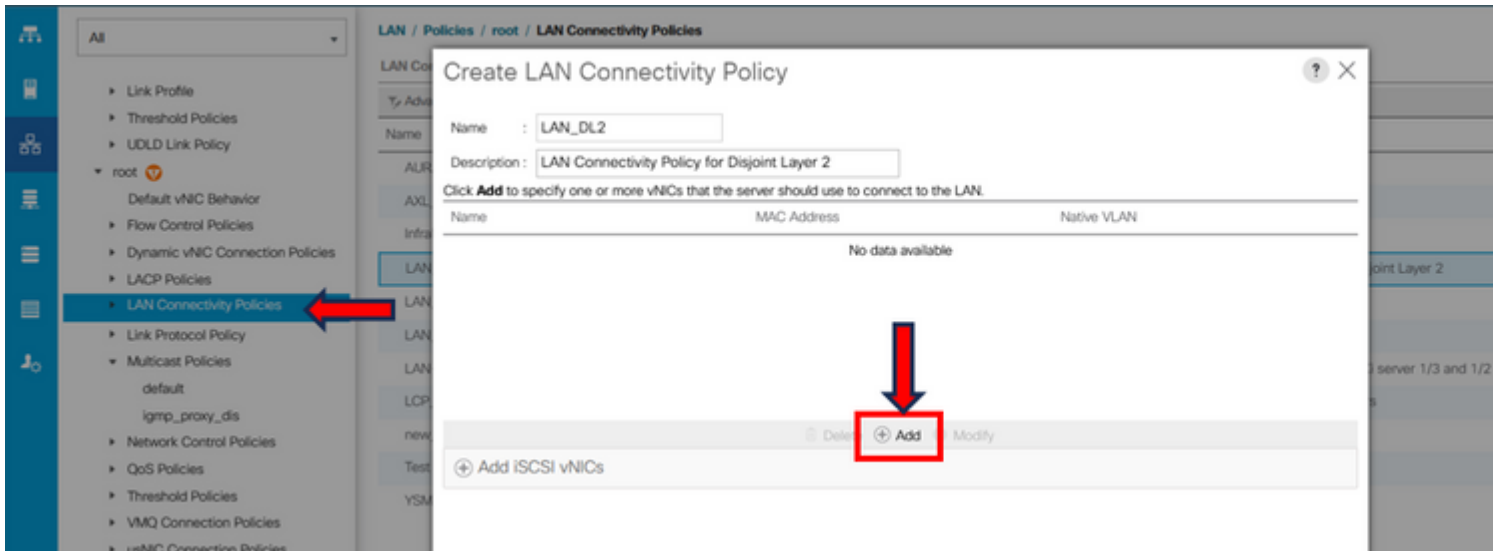
OK | Cancel



Repeat the same steps for Fabric B.

Step 2. Navigate to **LAN tab > Policies > root > LAN Connectivity Policies** and create the new policy, click in **Add**, and create the vNICs.

Write the name for the vNIC, select the **MAC pool**, and mark the check box **Use vNIC Template**.



Create vNIC

Name :

MAC Address

MAC Address Assignment:

[Create MAC Pool](#)

The MAC address will be automatically assigned from the selected pool.

The MAC address assignment change will be effective only after server reboot.

Use vNIC Template :

Fabric ID : Fabric A

Fabric B

Enable Failover

VLAN in LAN cloud will take the precedence over the Appliance Cloud when there is a name clash.

[VLANs](#)

[VLAN Groups](#)

Advanced Filter Export Print

| Select | Name | Native VLAN | VLAN ID |
|--------------------------|---------|-----------------------|---------|
| <input type="checkbox"/> | 125 | <input type="radio"/> | 125 |
| <input type="checkbox"/> | 480 | <input type="radio"/> | 480 |
| <input type="checkbox"/> | default | <input type="radio"/> | 1 |
| <input type="checkbox"/> | DL2 | <input type="radio"/> | 80 |

CDN Source : vNIC Name User Defined

MTU :

Pin Group :

[Create LAN Pin Group](#)

[Operational Parameters](#)

OK

Cancel

Step 3. Use the **vNIC Template** previously configured, select the desired **Adapter Policy**, and click **OK**. Repeat the same procedure to Fabric Interconnect B.

Create vNIC

Name :

Use vNIC Template :

Redundancy Pair :

vNIC Template :

Peer Name :

[Create vNIC Template](#)

Adapter Performance Profile

Adapter Policy :

[Create Ethernet Adapter Policy](#)

Create vNIC

Name :

Use vNIC Template :

Redundancy Pair :

vNIC Template :

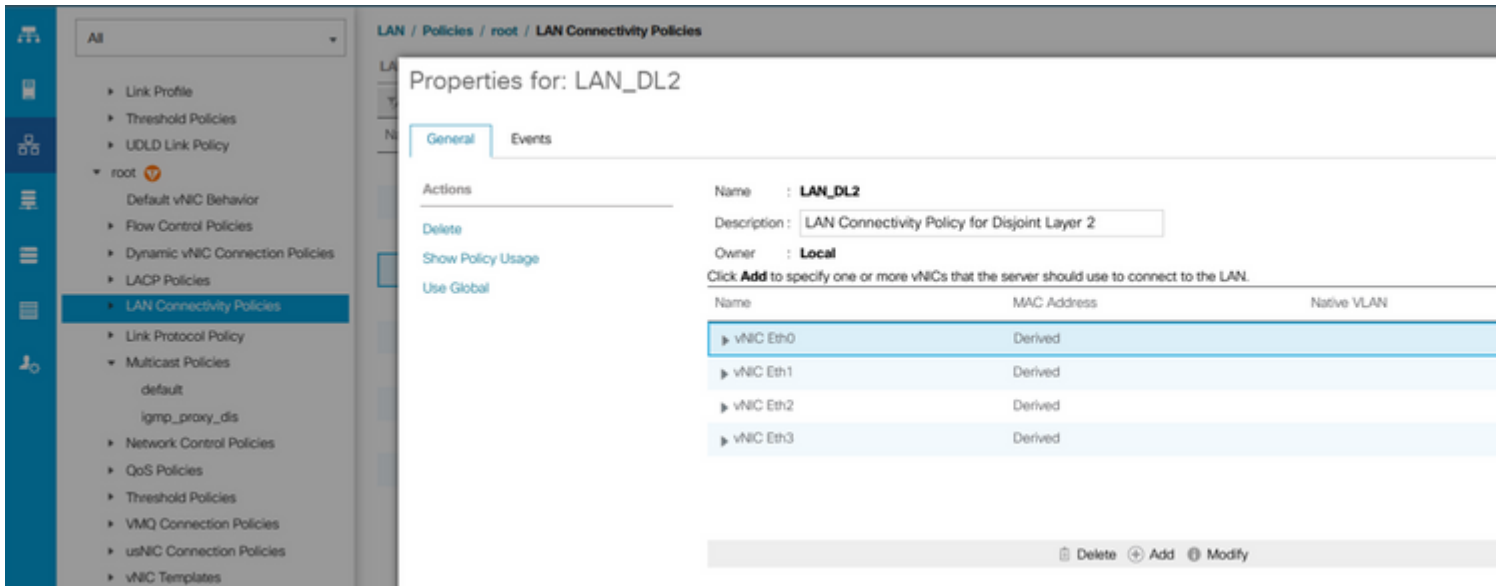
Peer Name :

[Create vNIC Template](#)

Adapter Performance Profile

Adapter Policy :

[Create Ethernet Adapter Policy](#)



Step 4. Go back to the **Service profile** and select the **LAN Connectivity Policy**.

Reboot the Server

Step 1. To apply the previously configured changes, reboot the server.

Note: From vCenter, ensure the node is in maintenance mode.

Step 2. Once the server finishes boot up, verify if the vNIC is present. Navigate to **Server > Service Profiles > root > Name of your Service Profile > Network tab**.

vNICs

Advanced Filter Export Print

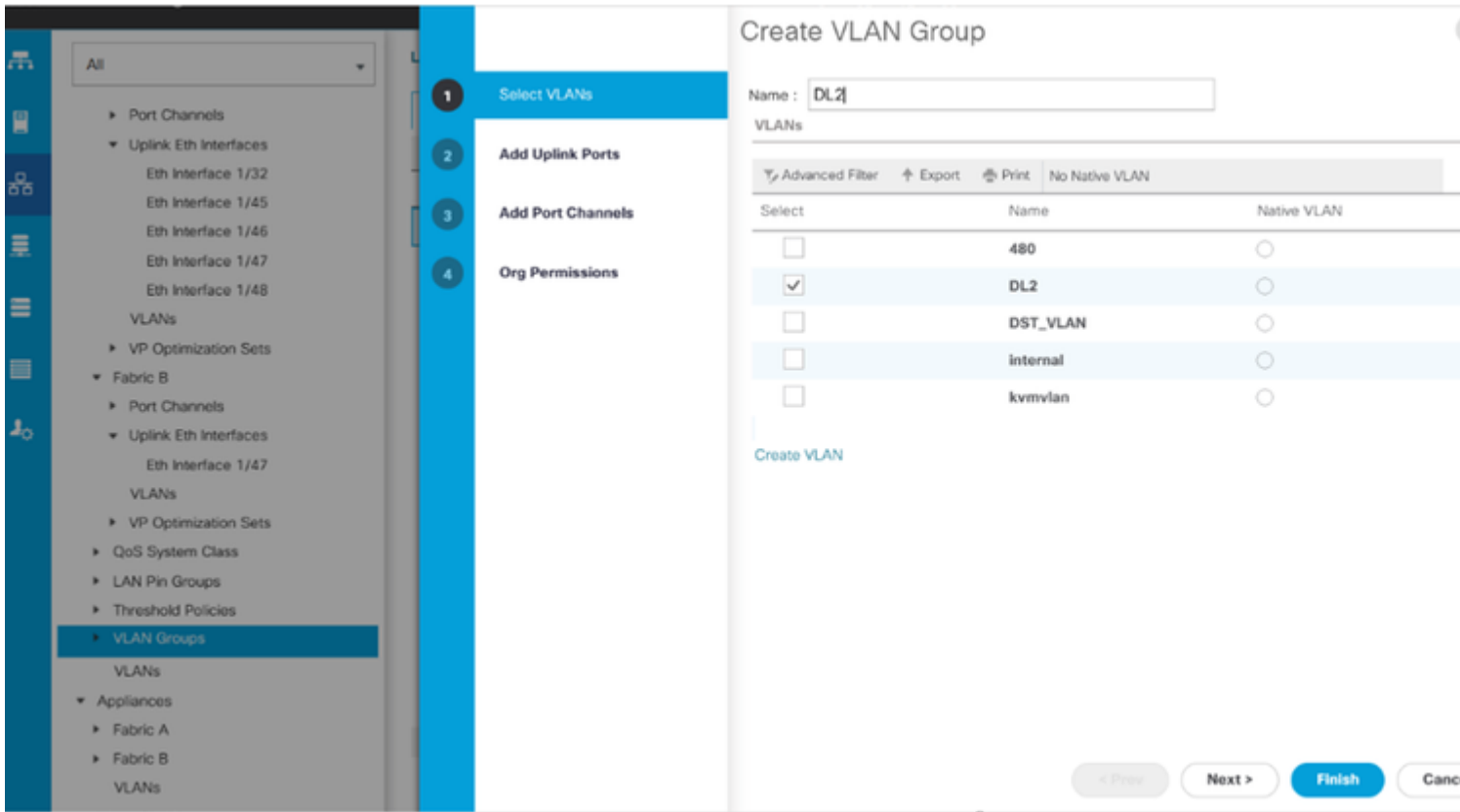
| Name | MAC Address | Desired Order | Actual Order | Fabric ID | Desired Placement | Actual Placement |
|-----------|-------------------|---------------|--------------|-----------|-------------------|------------------|
| vNIC Eth0 | 00:25:B5:FA:00:07 | 1 | 1 | A | Any | 1 |
| vNIC Eth1 | 00:25:B5:FB:00:1F | 2 | 2 | B | Any | 1 |
| vNIC Eth2 | 00:25:B5:FA:00:08 | 5 | 3 | A | Any | 1 |
| vNIC Eth3 | 00:25:B5:FB:00:6E | 6 | 4 | B | Any | 1 |

Delete Add Modify

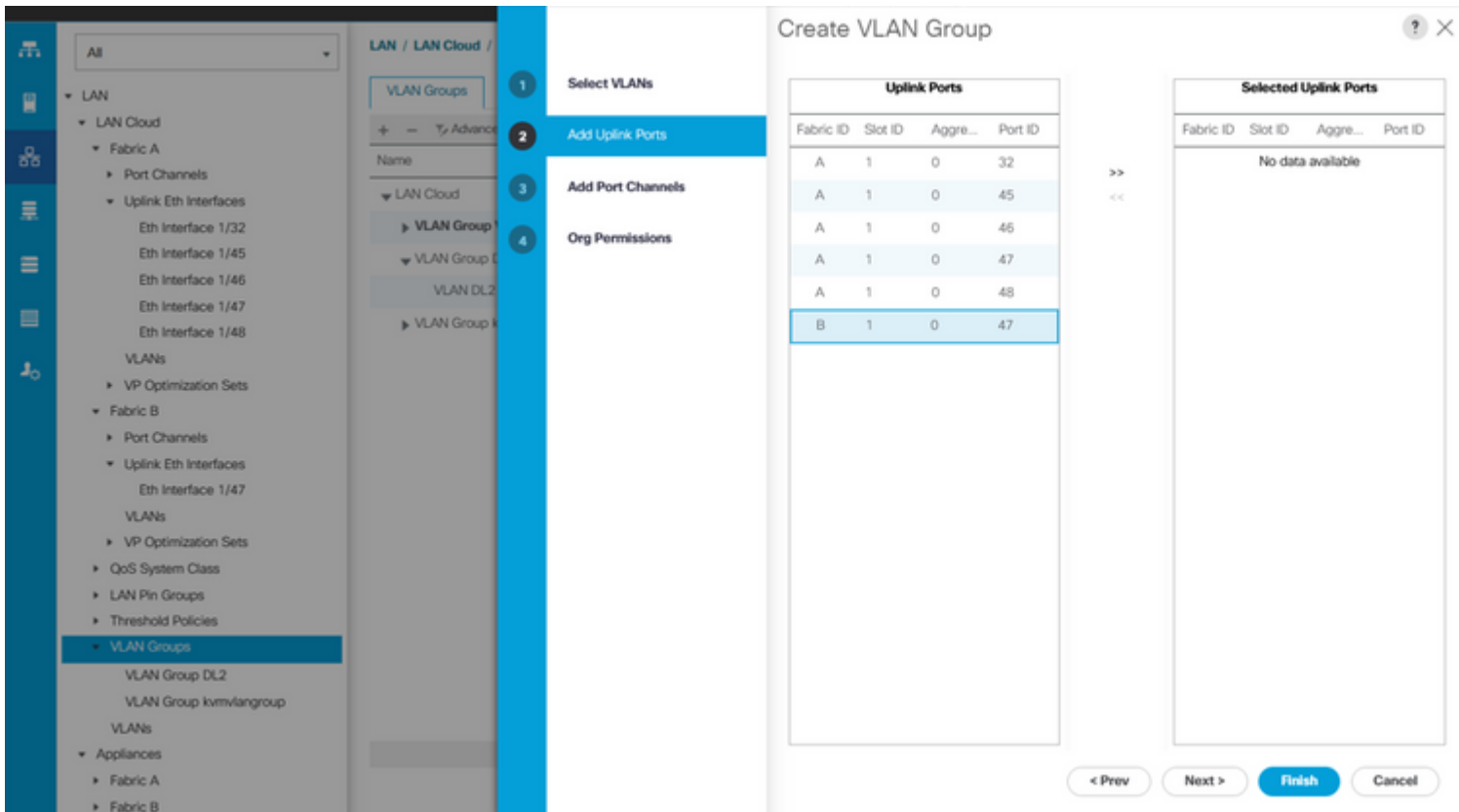
Create VLAN Group

Step 1. Navigate to **LAN > LAN Cloud > VLAN Groups > Create VLAN Groups**.

Step 2. Select the name for the **VLAN Group** and choose the required VLAN, finally, add single Uplinks in **step 2**.

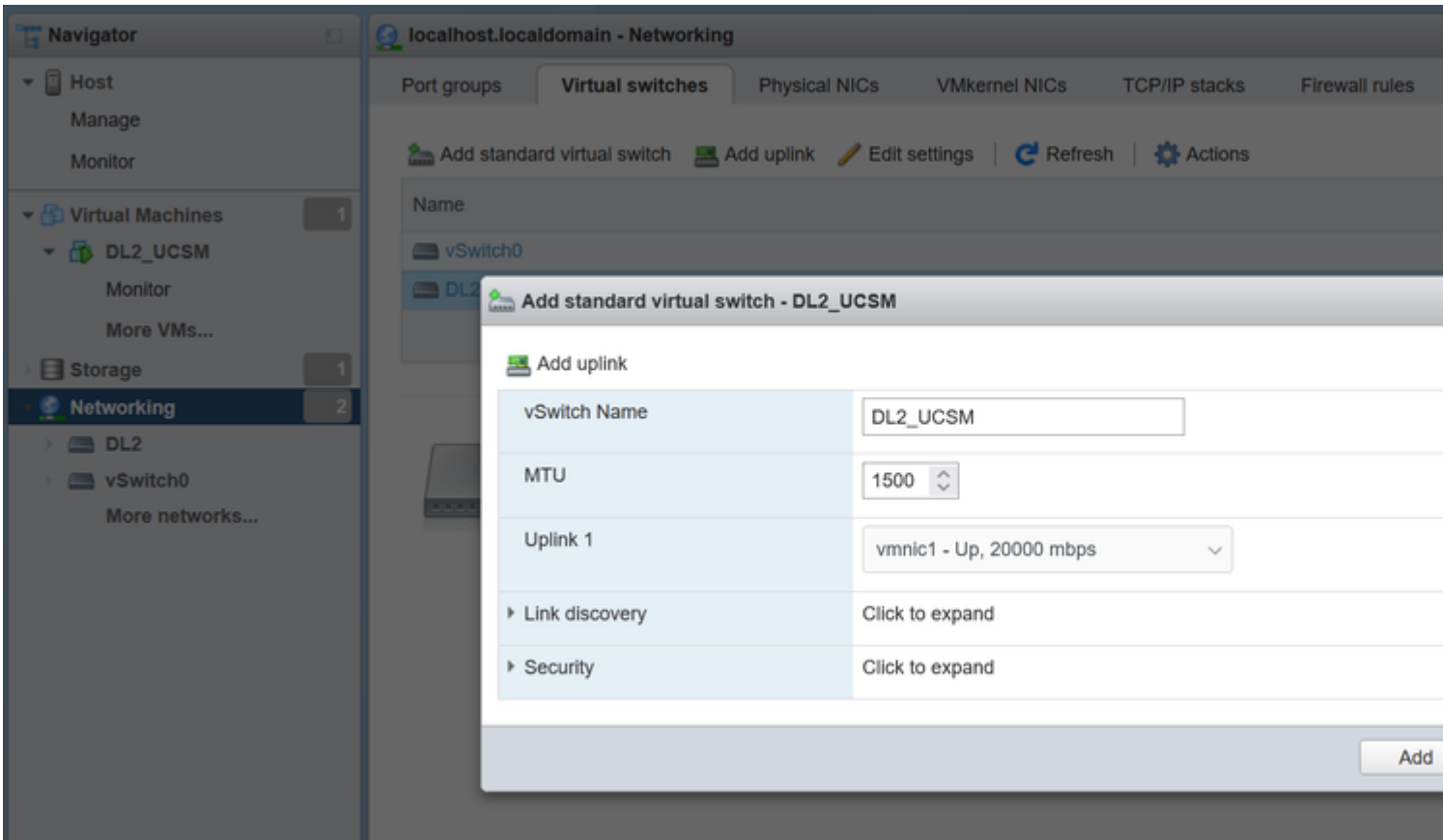


Step 3. Optionally move to step 3 in the **VLAN group** steps if you need to add Port Channels.

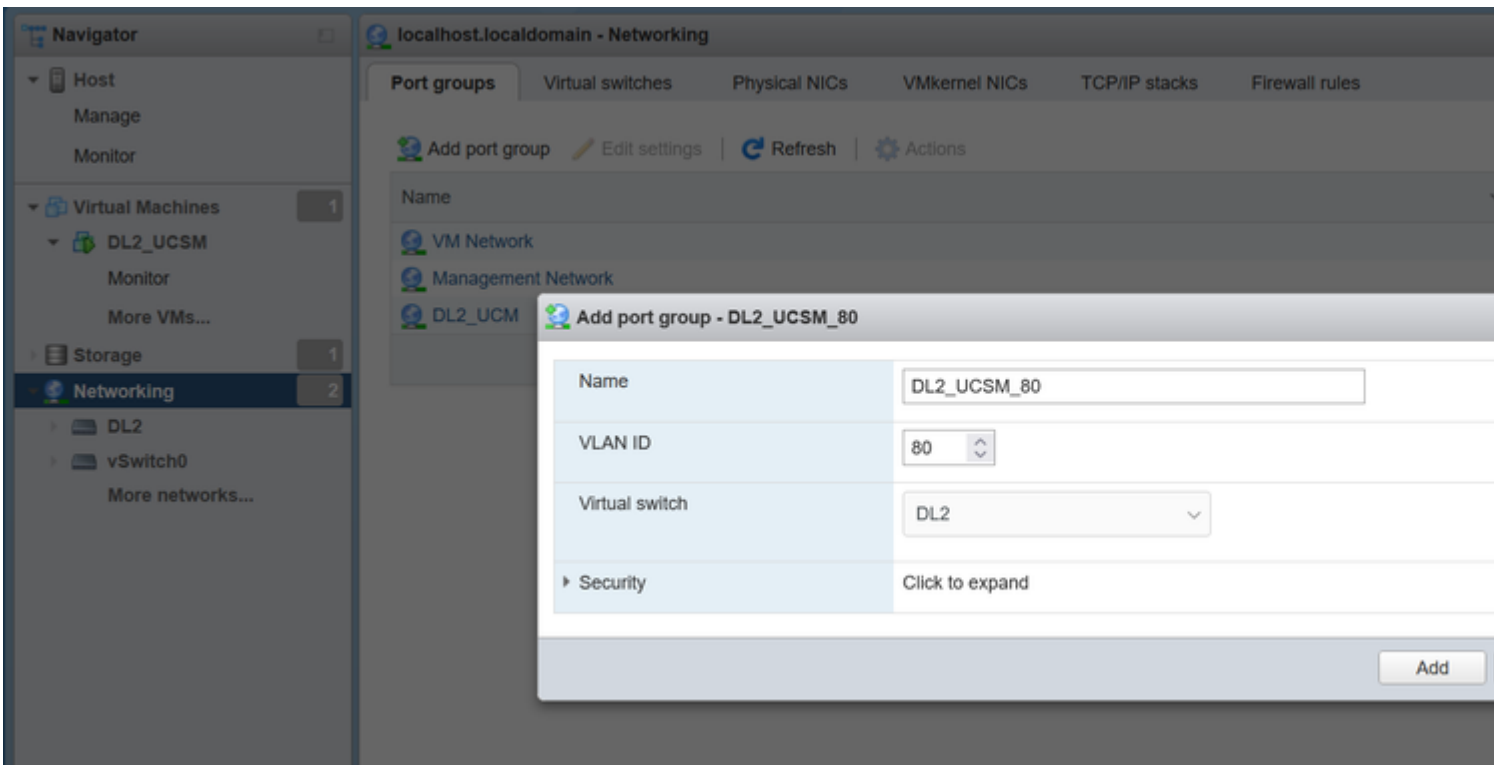


ESXi Configuration

Step 1. Log in to the ESXi host and navigate to the **Networking tab > Virtual Switches** and click **Add standard virtual Switch**, name the virtual switch, and select the uplink.



Step 2. Navigate to **Networking > Port Group > Add Port Group**. Name your port group, select the desired VLAN, and use the virtual switch previously configured.






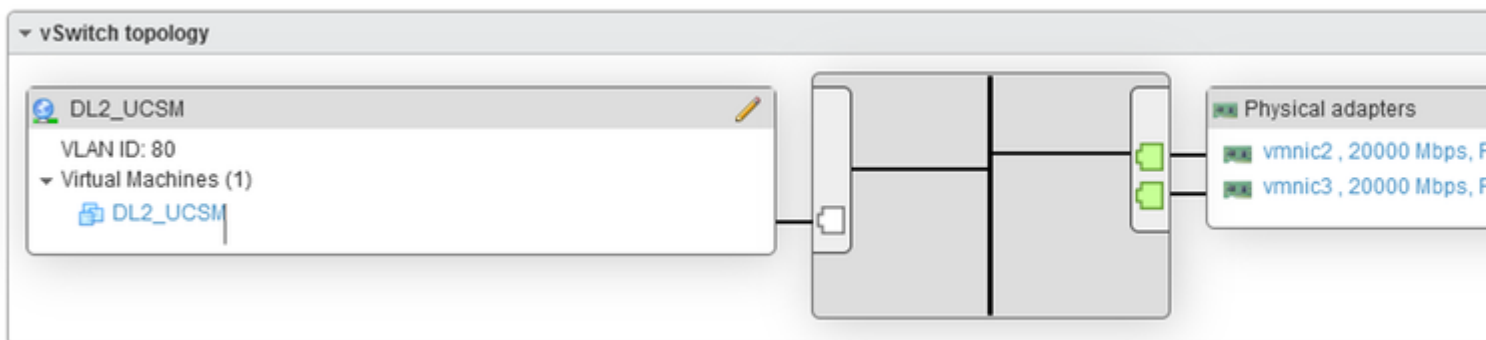
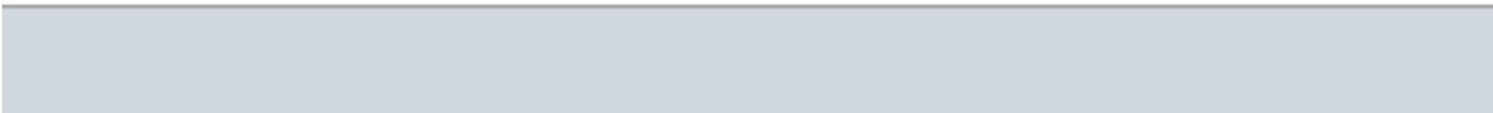
Step 3. Navigate to Networking, select the vSwitch previously configured, and click on add uplink. In order to have redundancy add a new uplink that includes the VLAN used for the Disjoint Layer 2.

In this case, VLAN 80 was allowed in VNIC Eth2 (Fabric Interconnect A) and VNIC Eth3 (Fabric

Interconnect B).

Add uplink

| | |
|-------------------|---|
| MTU | 1500  |
| Uplink 1 | vmnic3 - Up, 20000 mbps  |
| Uplink 2 | vmnic2 - Up, 20000 mbps  |
| ▶ Link discovery | Click to expand |
| ▶ Security | Click to expand |
| ▶ NIC teaming | Click to expand |
| ▶ Traffic shaping | Click to expand |



Verify in UCSM

Verify the VLAN in the CLI

Open an SSH session to the Fabric Interconnects and run the command.

```
FI-A(nx-os)# show vlan brief
```

This command displays the information for the VLANs created and you can confirm the VLAN created for the Disjoint Layer 2.

| VLAN Name | Status | Ports |
|--------------|--------|---|
| 1 default | active | Po1, Eth1/5, Eth1/6, Eth1/8 Eth1/9, Eth1/10, Eth1/11 Eth1/12, Eth1/13, Eth1/16 Eth1/17, Eth1/18, Eth1/19 Eth1/20, Eth1/21, Eth1/22 Eth1/23, Eth1/24, Eth1/26 Eth1/27, Eth1/28, Eth1/29 Eth1/30, Eth1/31, Eth1/32 Eth1/33, Eth1/34, Eth1/35 Eth1/36, Eth1/37, Eth1/38 Eth1/39, Eth1/40, Eth1/41 Eth1/42, Eth1/43, Eth1/44 Eth1/45, Eth1/46, Eth1/47 Eth1/48, Eth1/49, Eth1/50 Veth876, Veth877, Veth1084 Veth1119, Veth1120, Veth1122 Eth1/1/10, Eth1/1/12, Eth1/1/13 Eth1/1/15, Eth1/1/18, Eth1/1/20 Eth1/1/22, Eth1/1/24, Eth1/1/26 Eth1/1/28, Eth1/1/29, Eth1/1/30 Eth1/1/31, Eth1/1/32 |
| 80 VLAN0080 | active | Eth1/47 |
| 470 VLAN0470 | active | Po1, Eth1/5, Eth1/6, Eth1/32 Eth1/45, Eth1/46, Eth1/48 Veth1084, Veth1090, Veth1092 Veth1094, Veth1108, Veth1119 Veth1120, Veth1122, Veth1131 Veth1133 |

Verify the Virtual Interface (VIF) Path

Navigate to the SSH session and use the command:

```
FI-A# show service-profile circuit <server number>
```

```
Server: 1/6
```

```
Fabric ID: A
```

```
Path ID: 1
```

| VIF | vNIC | Link State | Oper State | Prot State | Prot Role | Admin Pin | Oper Pin |
|------|------|------------|------------|---------------|-------------|-----------|----------|
| 1131 | Eth0 | Up | Active | No Protection | Unprotected | 0/0/0 | 0/0/1 |
| 1133 | Eth2 | Up | Active | No Protection | Unprotected | 0/0/0 | 1/0/47 |
| 1135 | fc0 | Up | Active | No Protection | Unprotected | 0/0/0 | 1/0/3 |
| 9327 | | Up | Active | No Protection | Unprotected | 0/0/0 | 0/0/0 |

```
Fabric ID: B
```

```
Path ID: 1
```

| VIF | vNIC | Link State | Oper State | Prot State | Prot Role | Admin Pin | Oper Pin |
|-----|------|------------|------------|------------|-----------|-----------|----------|
|-----|------|------------|------------|------------|-----------|-----------|----------|

| VIF ID | Interface | Status | Mode | Protection | Uplink | Downlink |
|--------|-----------|--------|--------|---------------|-------------|--------------|
| 1132 | Eth1 | Up | Active | No Protection | Unprotected | 0/0/0 0/0/2 |
| 1134 | Eth3 | Up | Active | No Protection | Unprotected | 0/0/0 1/0/47 |
| 1136 | fc1 | Up | Active | No Protection | Unprotected | 0/0/0 1/0/3 |
| 9328 | | Up | Active | No Protection | Unprotected | 0/0/0 0/0/0 |

This command displays the VIF Paths, the interface that is pinned, and the corresponding vNICs.

In the output obtained, it can be seen that the corresponding VIF is **VIF 1134** which corresponds to the **vNIC Eth3** and is pinned to interface **1/0/47** in Fabric Interconnect B.

Also, **VIF 1133** corresponds to **vNIC Eth2** and is pinned to **1/0/47** in Fabric Interconnect A.

Verify the pinning border interfaces.

Run the command to verify the pinning to the Uplink Ports.

```
UCS-AS-MXC-P25-02-A(nx-os)# show pinning border-interfaces
```

| Border Interface | Status | SIFs |
|------------------|--------|--|
| Po1 | Active | Veth1084 Veth1090 Veth1092 Veth1094 Veth1108 Veth1119 Veth1120 Veth1131 |
| Eth1/32 | Down | |
| Eth1/45 | Down | |
| Eth1/46 | Down | |
| Eth1/47 | Active | sup-eth1 Veth1133 |
| Eth1/48 | Down | |
| Eth1/51 | Down | |
| Eth1/52 | Down | |
| Eth1/53 | Down | |
| Eth1/54 | Down | |

Verify the Designated Receiver

Run this command to verify the port that receives the multicast traffic for the VLAN.

```
FI-A(nx-os)# show platform software enm internal info vlandb id <VLAN-ID>
vlan_id 80
-----
Designated receiver: Eth1/47
Membership:
Eth1/47
```

This output shows the correct uplink.

Verify the upstream Switch

Open an SSH session to the upstream switch and run the command.

```
NEXUS-01# show vlan brief
```

| VLAN | Name | Status | Ports |
|------|----------|--------|--|
| 1 | default | active | Po1, Po2, Po4, Po5, Po6, Po7 Po8, Po9, Po50, Po100, Eth1/1 Eth1/2, Eth1/3, Eth1/4, Eth1/5 Eth1/6, Eth1/8, Eth1/9, Eth1/10 Eth1/12, Eth1/13, Eth1/14 Eth1/15, Eth1/18, Eth1/19 Eth1/20, Eth1/21, Eth1/22 Eth1/23, Eth1/24, Eth2/1, Eth2/2 Eth2/3, Eth2/4, Eth2/5, Eth2/6 Eth2/7, Eth2/8, Eth2/10, Eth2/11 Eth2/12, Eth2/13, Eth2/14 Eth2/15, Eth2/16, Eth2/17 Eth2/18, Eth2/19, Eth2/20 Eth2/21, Eth2/22, Eth2/23 Eth3/1, Eth3/2, Eth3/3, Eth3/4 Eth3/5, Eth3/6 Eth2/18 |
| 80 | DL2 | active | Po1, Po2, Po6, Po7, Po8, Po9 Po50, Po100, Eth1/1, Eth1/3 Eth1/4, Eth1/5, Eth1/6, Eth1/17 Eth1/19, Eth1/20, Eth1/21 Eth1/22, Eth1/23, Eth1/24 Eth2/1, Eth2/2, Eth2/3, Eth2/4 Eth2/5, Eth2/17, Eth2/18 |
| 470 | VLAN_470 | active | Po1, Po2, Po3, Po4, Po5, Po6 Po7, Po8, Po9, Po50, Po100 Eth1/1, Eth1/3, Eth1/4, Eth1/5 Eth1/6, Eth1/7, Eth1/9, Eth1/10 Eth1/16, Eth1/19, Eth1/20 Eth1/21, Eth1/22, Eth1/23 Eth1/24, Eth2/1, Eth2/2, Eth2/3 Eth2/4, Eth2/5, Eth2/9, Eth2/17 Eth2/18, Eth2/24 |

This output shows the port that is associated with **VLAN 80**. In this case, the desired port is the **Ethernet 1/17** which is associated with the uplink **1/47**.

On the other hand, you can verify the MAC address table to check what Virtual Machine (VM) shows.

```
NEXUS-01(config)# show mac address-table vlan 80
```

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 |
|------|-------------|------|-----|--------|------|---------------------|
|------|-------------|------|-----|--------|------|---------------------|

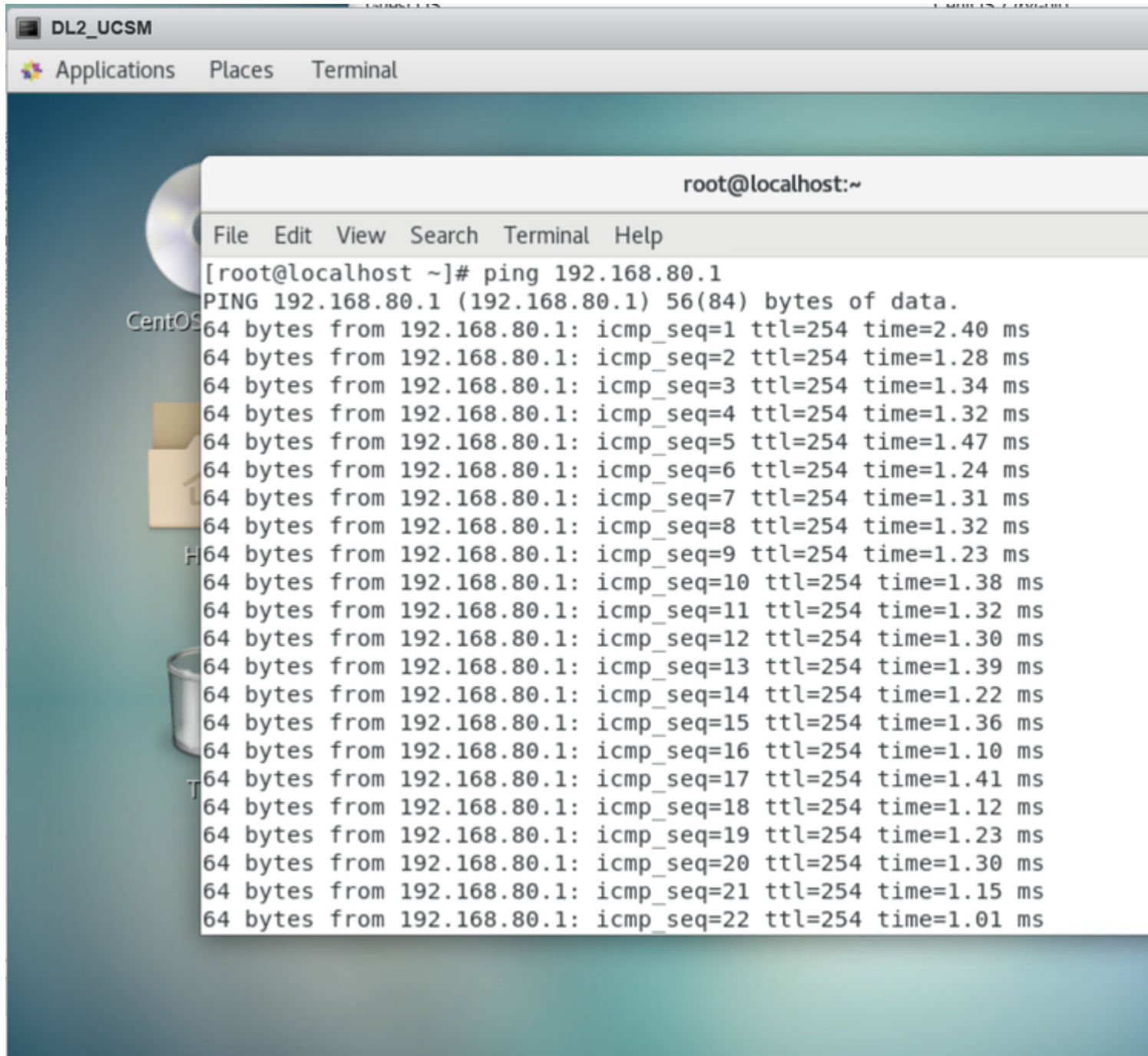

```

-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
* 80    000c.2937.2cc7    dynamic    150      F    F    Eth1/17

```

Verify the connection between the VLAN network in the ESXi

Open the Terminal in the Virtual Machine and ping to the default gateway of the VLAN network; you then see a successful ping.



Related Information

[Technical Support & Documentation - Cisco Systems](#)

[Disjoint Layer 2](#)

[Cisco UCS Manager Network Management Guide, Release 4.0](#)

[Using the LAN Uplinks Manager](#)