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## Overview

The Cisco Unified Computing System™ (Cisco UCS®) provides the option to connect to both Cisco and Brocade Fibre Channel storage area networks (SAN). This guide reviews Cisco UCS to Brocade SAN connectivity and traffic engineering capabilities. The guide is organized into three primary sections. The first section is a general overview of the technologies and standards that enable Cisco UCS to Brocade SAN connectivity. The second section provides details for bringing up the Fibre Channel uplinks between the Cisco UCS fabric interconnects and the Brocade SAN switches. The last section reviews various traffic engineering capabilities employed within Cisco UCS for fine-tuning Fibre Channel uplink utilization and resiliency to the northbound Brocade SAN switches.

## Audience

This document is intended for Cisco systems engineers and customers involved in Cisco UCS to Brocade Fibre Channel SAN connectivity, architecture, and administration. It assumes advanced knowledge and understanding of Fibre Channel, Cisco UCS, and Brocade SAN switches and technologies.

## Test Environment

### **Cisco UCS**

Cisco UCS Manager 2.1.2a

(2) Cisco UCS 6248UP 48-Port Fabric Interconnects

(2) Cisco UCS 2208XP I/O modules

(1) Cisco UCS 5108 Blade Server Chassis

(5) Cisco UCS B200 M3 Blade Server with Cisco UCS Virtual Interface Card (VIC) 1240 modular LAN on motherboard (mLOM)

### **Brocade**

(1) Brocade 300, FoS 7.0.2

(1) Brocade 5100, FoS 7.0.2

Fixed-port Brocade Fibre Channel switches were used in the test environment of this guide. Note that Brocade command syntax is different between fixed-port and director-class blade chassis to take into account the blade number. Refer to the Brocade command references for additional command and syntax information.

Review the Cisco UCS hardware and software interoperability guides at the following link to verify Cisco UCS to Brocade FoS version compatibility: [www.cisco.com/en/US/products/ps10477/prod\\_technical\\_reference\\_list.html](http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html)

## Technology Overview

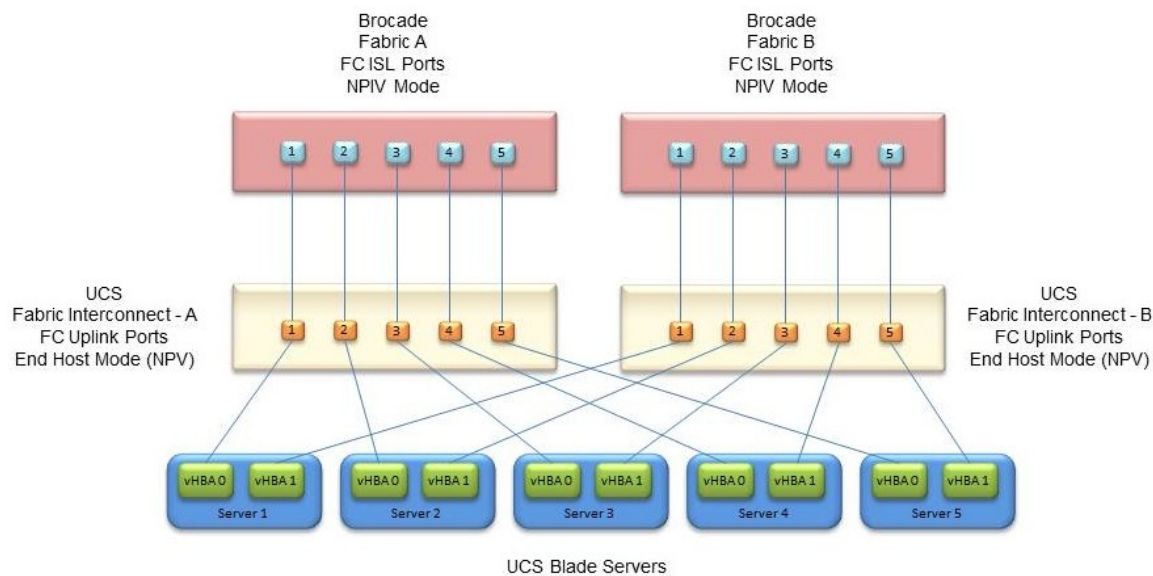
The Cisco Unified Computing System consists of a number of components that work together to provide a feature- and performance-rich computing, networking, and storage environment. Cisco UCS consists of blade servers, VICs, blade chassis, I/O modules, and fabric interconnects. This guide focuses on the fabric interconnects and VICs from a Cisco UCS to Brocade Fibre Channel connectivity perspective.

There are two fabric interconnects in a UCS system, Fabric Interconnect A and Fabric Interconnect B, which correspond to Fibre Channel Fabric A and B respectively. Cisco UCS Manager runs on the fabric interconnects and provides the GUI for configuring and monitoring the UCS system. The fabric interconnects house the southbound-facing ports which provide the internal connectivity to the blades, chassis, and I/O modules, and the northbound-facing ports, which provide the external connectivity to the Ethernet and Fibre Channel networks and other optional direct connect devices. There are different types

of fabric interconnect ports that serve different functions; this guide will focus on the Fibre Channel (FC) uplink ports. Physical connectivity is achieved by connecting a Cisco UCS FC uplink port to a Brocade FC port (Figure 1). Technologies such as N\_Port ID Virtualization (NPIV) and N\_Port Virtualization (NPV) and modes of operation such as Switch mode and End-Host mode enable Cisco UCS to Brocade Fibre Channel switch connectivity; these technologies are expanded upon later in this guide.

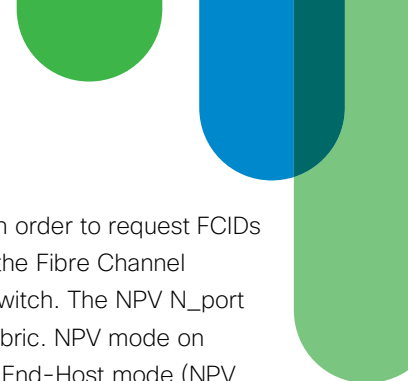
The VIC is a converged network adapter that is installed on a Cisco UCS blade server, and provides the ability to create virtual Ethernet adapters (vEth) and virtual host bus adapters (vHBA). vEths and vHBAs are recognized by operating systems as standard PCI devices. vHBAs are discussed further in the “Cisco UCS to Brocade Traffic Engineering” section of this guide.

**Figure 1.** Cisco UCS to Brocade Fibre Channel Connectivity



## NPIV and NPV

**NPIV**, or N\_Port ID Virtualization (T11 FC-LS), allows an N\_port to have multiple FCIDs assigned to it, rather than the traditional one-N\_port-to-one-FCID relationship within a switch that does not have NPIV enabled. To enable Cisco UCS to Brocade Fibre Channel switch connectivity, NPIV is enabled on a per-port basis on the Brocade Fibre Channel switch (This topic is discussed in detail in the next section).



**NPV**, or N\_Port Virtualization, allows an N\_port to proxy other N\_ports on the NPV-enabled switch in order to request FCIDs from the connected NPIV-enabled switch. When the Fibre Channel switch is running in NPV mode, the Fibre Channel services are running remotely on the NPIV-enabled switch rather than locally on the NPV-enabled switch. The NPV N\_port looks like a host to the NPIV-enabled switch, rather than another switch in the Fibre Channel SAN fabric. NPV mode on Cisco UCS is called End-Host mode. For Cisco UCS to connect to a Brocade Fibre Channel switch, End-Host mode (NPV mode) is required on the Cisco UCS fabric interconnects.

In brief, to enable Cisco UCS to Brocade Fibre Channel switch connectivity, NPIV mode must be enabled on the Brocade Fibre Channel switch, while End-Host mode (NPV mode) must be enabled on the Cisco UCS fabric interconnects.

### **Link Aggregation**

Link aggregation is a general term describing the act of combining multiple, individual physical links into a single, logical link with the goal of increasing bandwidth and redundancy between switches. Cisco's term for Fibre Channel link aggregation is *Port Channeling*. Brocade's term for Fibre Channel link aggregation is *Port Trunking*.

Cisco Fibre Channel Port Channeling and Brocade Fibre Channel Port Trunking are incompatible technologies. It is not possible to create port channels or port trunks between Cisco and Brocade Fibre Channel switches. Connecting Cisco Fibre Channel switches to Brocade Fibre Channel switches is limited to single Interswitch Linking (ISL) connections. Multiple physical Fibre Channel ISL connections can be provisioned between Cisco and Brocade Fibre Channel switches. However, these individual Fibre Channel links can't be combined into single logical connections.

There currently is no Fibre Channel standard covering Fibre Channel link aggregation. The T11 (FC-SW-5) standard did not standardize Fibre Channel link aggregation, and nothing is currently included or planned for inclusion in the T11 (FC-SW-6) standard. As of this writing, both Cisco's and Brocade's Fibre Channel link aggregation technologies are proprietary.

### **Cisco UCS to Brocade Connectivity**

This section reviews the required configurations on both the Cisco UCS fabric interconnects and the Brocade Fibre Channel switches to enable Fibre Channel ISL connectivity between the devices.

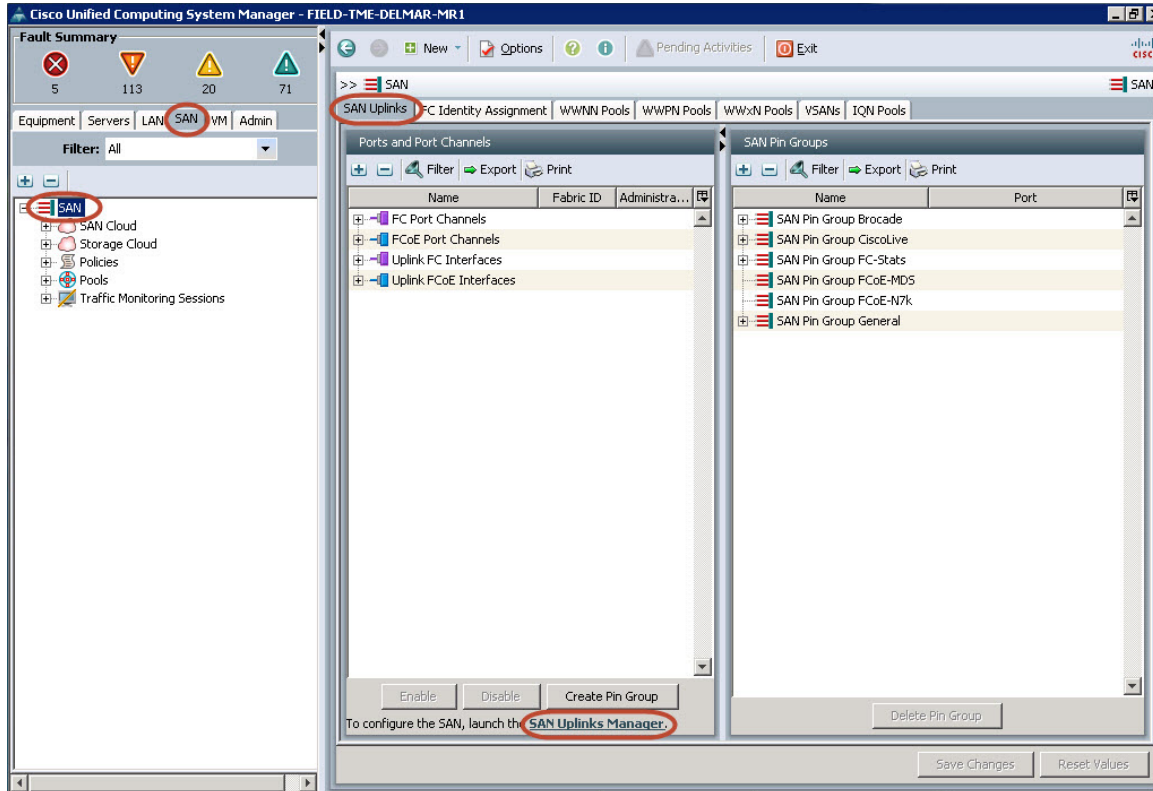
#### **Summary of Configurations**

1. Enable Cisco UCS End-Host mode (NPV).
2. Enable Brocade per-port NPIV mode.
3. Configure Cisco UCS and Brocade 8-Gbps Fibre Channel fill pattern.
4. Enable Cisco UCS to Brocade Fibre Channel uplinks.

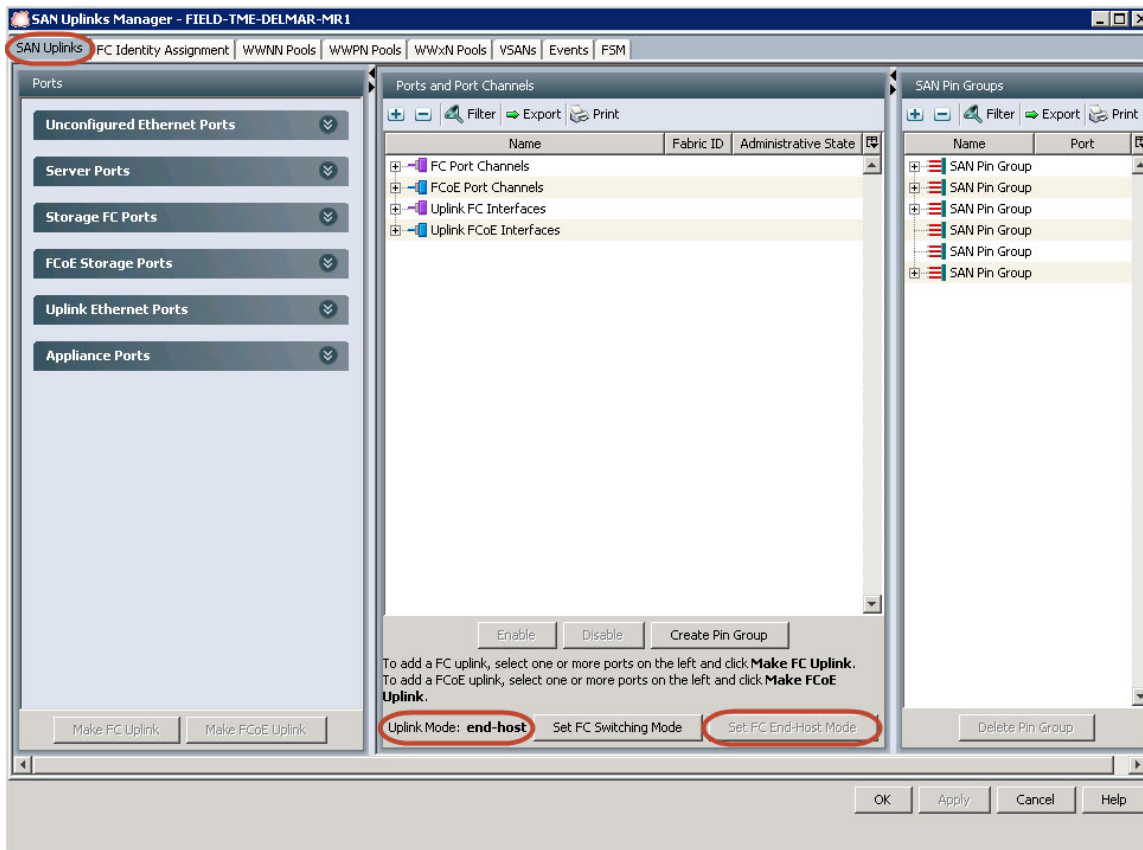
## Enable Cisco UCS End-Host Mode (NPV)

In Cisco UCS Manager, navigate to the SAN tab. In the navigation tree, click the top-level SAN object.

In the Cisco UCS Manager main window, on the SAN Uplinks tab, Port and Port Channels section, click the SAN Uplinks Manager link located at the bottom of the section.



The SAN Uplinks Manager window appears.



In the SAN Uplinks Manager window, SAN Uplinks tab, Ports and Port Channels section, confirm that the uplink mode is set to “end-host” and that the Set FC End-Host Mode button is dimmed, indicating that the UCS fabric interconnects are in End-Host mode. If the uplink mode is currently set to Switch mode, the UCS fabric interconnects will need to be set to End-Host mode in order to successfully connect to the upstream Brocade NPIV switch.

**Note:** Modifying the uplink mode of the UCS fabric interconnects is disruptive and will result in both fabric interconnects rebooting simultaneously.

### Enable Brocade per-Port NPIV Mode

Please refer to the [Brocade Fabric OS Administrators Guide](#) in the Reference section for detailed information on Brocade’s implementation and configuration of NPIV. The information that follows is provided as a reference only.

The Brocade NPIV feature is enabled by default for most if not all Brocade Fibre Channel switches, and is configurable on a per-port basis.

To display the NPIV status for all switch ports, issue the **portcfgshow** command from the Brocade command-line interface (CLI):

```

Brocade-A:admin> portcfgshow

Ports of Slot 0    0    1    2    3    4    5    6    7    8    9   10  11  12  13  14  15
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
Speed              AN  AN  AN  AN  AN  AN  AN  AN  AN  AN  AN  AN  AN  AN  AN  AN
Fill Word          3  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
(On Active)
Fill Word          3  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
(Current)
AL_PA Offset 13   ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
Trunk Port         ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON
Long Distance     ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
VC Link Init      ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
Locked L_Port     ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
Locked G_Port     ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
Disabled E_Port   ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
Locked E_Port     ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
ISL R_RDY Mode    ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
RSCN Suppressed   ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
Persistent Disable ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
LOS TOV enable    ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
NPIV capability   ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON  ON
NPIV PP Limit     126 126 126 126 126 126 126 126 126 126 126 126 126 126 126 126

```

The “NPIV capability” parameter will display as ON if the NPIV feature is enabled per port. The “NPIV PP Limit” parameter displays the maximum virtual N\_port IDs that can be configured on a per-port basis. The default is 126, and this value can be set to from 1 to 255 per port.

### Configure Cisco UCS and Brocade 8-Gbps Fibre Channel Fill Pattern

The following configurations are applicable when the Cisco UCS to Brocade FC connections are set to 8 Gbps. Failure to set the correct Fibre Channel fill pattern can result in interoperability issues between the Cisco UCS fabric interconnects and Brocade Fibre Channel switches. For additional information, refer to the *Brocade Fabric OS Command Reference Manual*.

#### Configuring the Brocade Fibre Channel Fill Pattern

To display the current Brocade Fibre Channel fill pattern, use the portcfgshow command:

The default setting is mode 0, -idle-idle.

```

Brocade-A:admin> portcfgshow 0
Area Number:      0
Speed Level      AUTO(HW)
Fill Word(On Active) 0(Idle-Idle)
Fill Word(Current) 0(Idle-Idle)
.
.

```



Change the Brocade portcfgfillword mode to mode 2, **-idle-arbff** to match the Cisco UCS configuration:

Syntax: **portCfgFillword [slot/]port, mode**

**Note:** The Brocade 16-Gbps platform (Condor 3 ASIC used in DCX 8510 and 65xx Fibre Channel switches) does not support the portCfgFillword command, as this platform automatically detects and sets the correct Fibre Channel fill pattern.

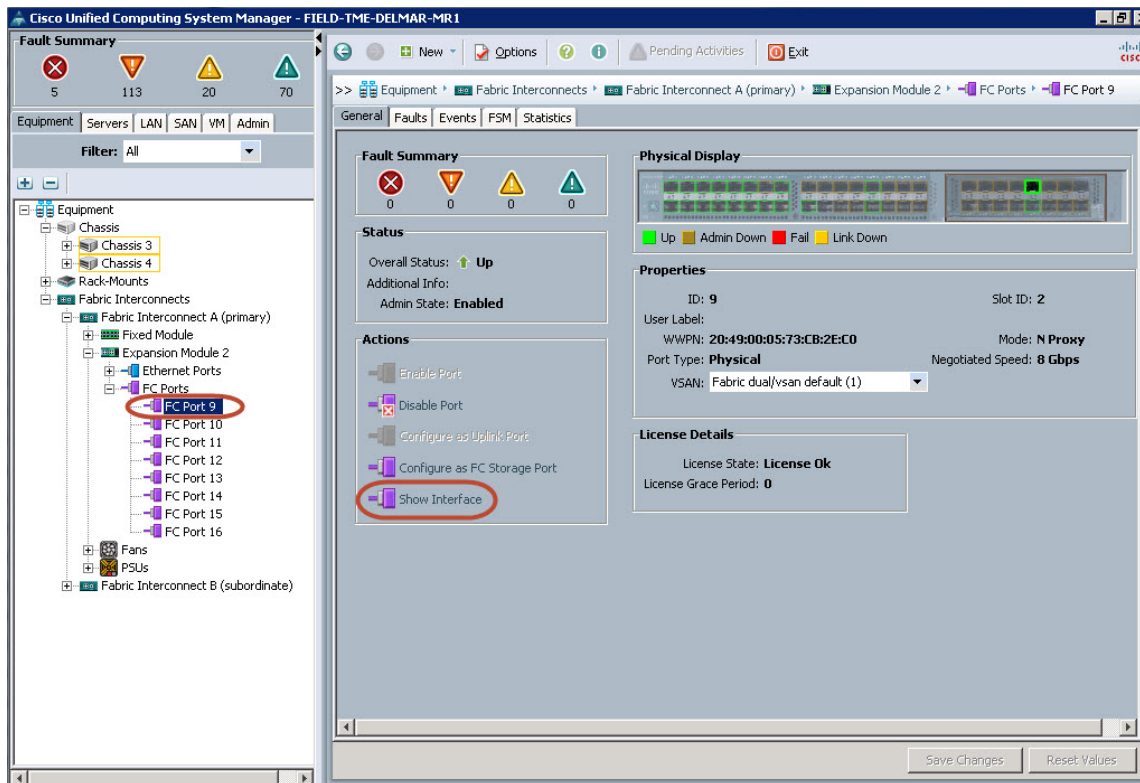
```
Brocade-A:admin> portcfgfillword 0,2
```

```
Brocade-A:admin> portcfgshow 0
Area Number:          0
Speed Level:          AUTO(HW)
Fill Word(On Active)  2(SW Idle-Arbff)
Fill Word(Current)    2(SW Idle-Arbff)
.
.
```

### Configuring the Cisco UCS Fibre Channel Fill Pattern

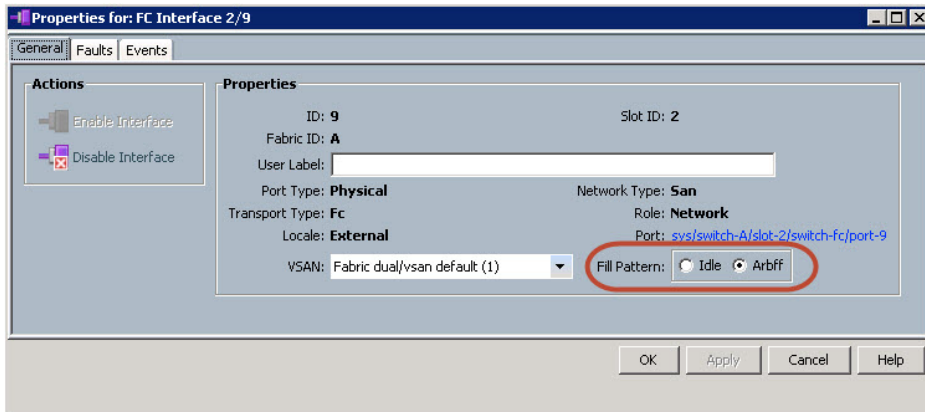
In Cisco UCS Manager, navigate to the Equipment tab. In the navigation tree, expand Fabric Interconnects > Fabric Interconnect A > the module where the FC ports connected to the Brocade switch exist > FC Ports. Highlight the FC port connected to the Brocade switch.

In the Cisco UCS Manager main window, on the General tab, Actions section, click Show Interface.





The Properties for: FC Interface x/x window will appear. In the Fill Pattern section, confirm that the Arbff radio button is chosen.



Click OK.

Repeat for all FC ports connected between the fabric interconnects and the Brocade switches.

## Enable Cisco UCS to Brocade Fibre Channel Uplinks

### Brocade

All licensed Brocade ports are enabled by default. For this example the port has been explicitly disabled to demonstrate the enabling of the port.

The state of a Brocade port can be viewed with the **portshow** command:

```
Brocade-A:admin> portshow 0
portIndex: 0
portName: port0
portHealth: No Fabric Watch License

Authentication: None
portDisableReason: None
portCFlags: 0x0
portFlags: 0x21 PRESENT U_PORT DISABLED
LocalSwcFlags: 0x0
portType: 18.0
POD Port: Port is licensed
portState: 2 Offline
.
.
```

The Brocade port state can also be viewed with the **switchShow** command:

```
Brocade-A:admin> switchshow
switchName: Brocade-A
switchType: 71.2
switchState: Online
switchMode: Native
switchRole: Principal
switchDomain: 1
switchId: fffc01
switchWwn: 10:00:00:12:34:56:78:2b
zoning: ON (zoning_cfg)
switchBeacon: OFF
```

```
Index  Port  Address  Media  Speed  State      Proto
=====
0      0      010000   id     N8     No_Light   FC  Disabled
1      1      010100   id     N8     No_Light   FC
.
.
```

To enable a Brocade port, use the **portEnable** command:

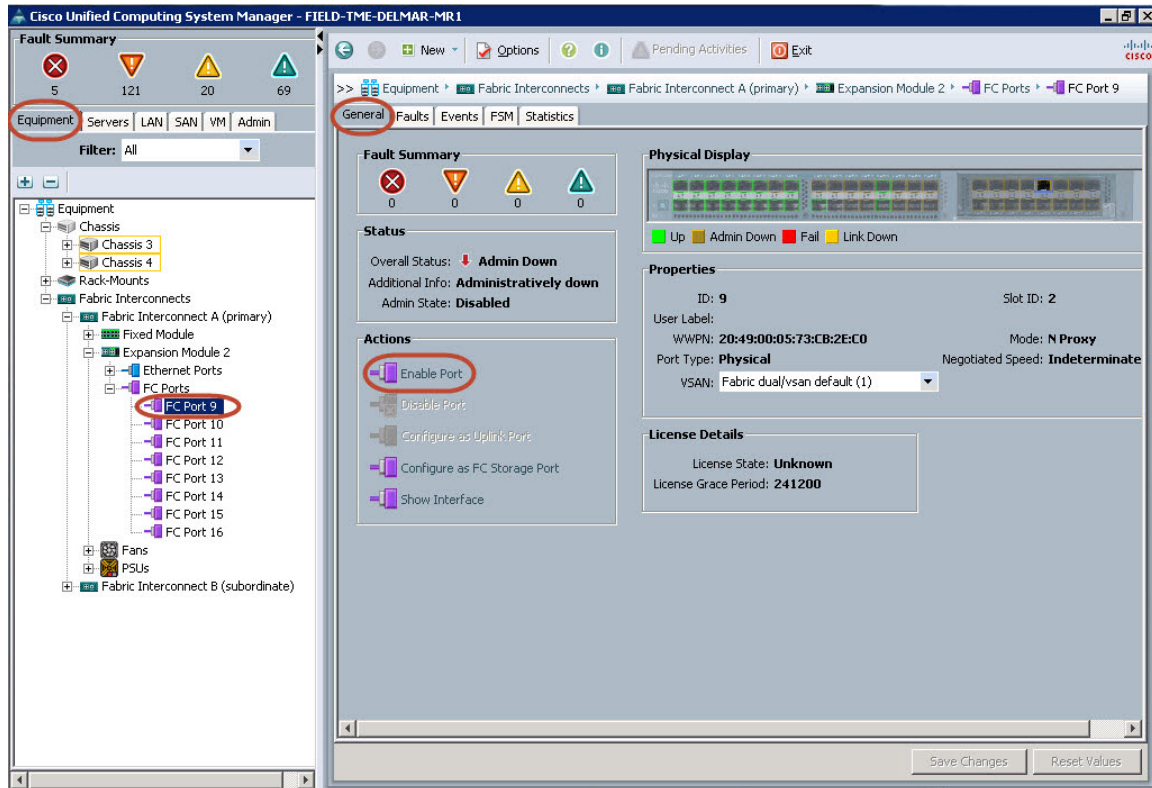
```
Brocade-A:admin> portenable 0
```

The highlighted **Disabled** status will disappear from the **portShow** and **switchShow** output after the port has been enabled using the **portEnable** command.

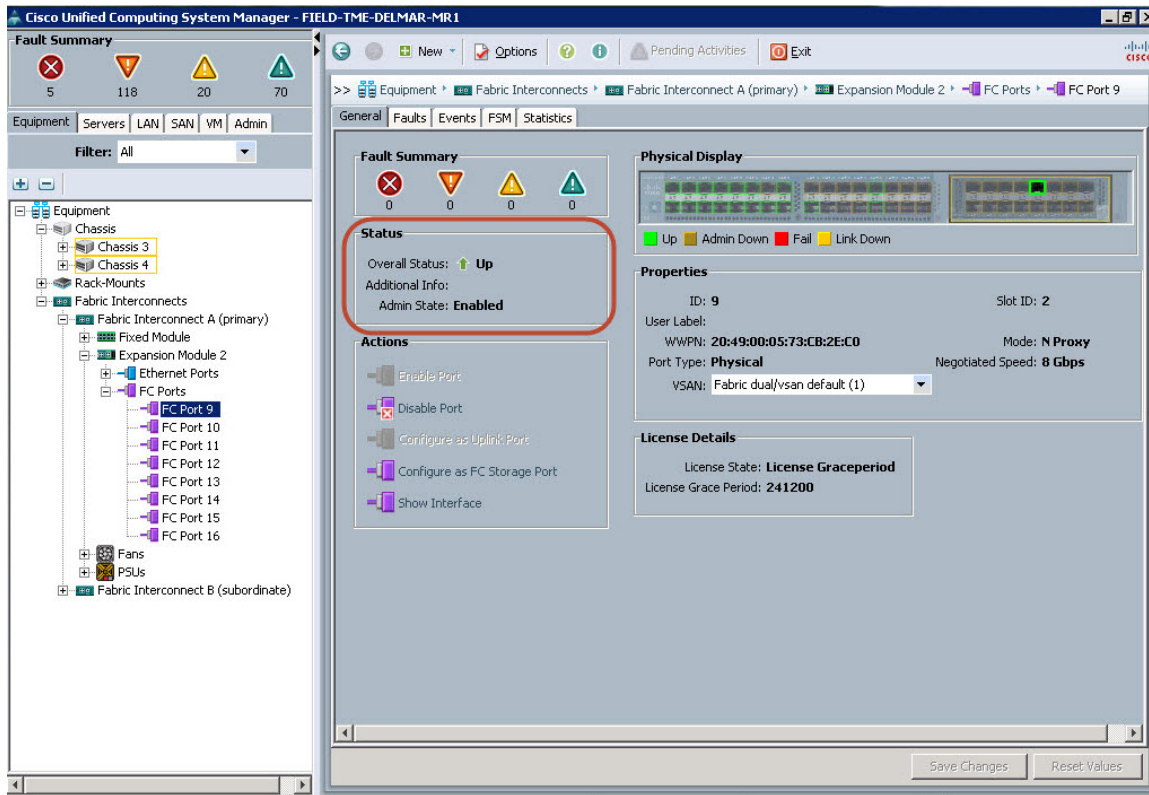
## Cisco UCS

In Cisco UCS Manager, navigate to the Equipment tab. In the navigation tree, expand Fabric Interconnects > Fabric Interconnect A > the module where the FC ports connected to the Brocade switch exist. Highlight the FC port connected to the Brocade switch.

**Note:** VSANs will be discussed later in this guide and can be left at Fabric dual/vsan default(1).



In the Cisco UCS Manager main window, on the General tab, Actions section, click Enable Port. An Enable Port dialog box will appear. Click Yes. If the UCS fabric interconnect cabling is in place and the above steps have been followed, the Overall Status of the port will change to Up, the Admin State will show Enabled, and the Physical Display of the port will change to green.



Repeat for all FC ports connected between the fabric interconnects and the Brocade switches.

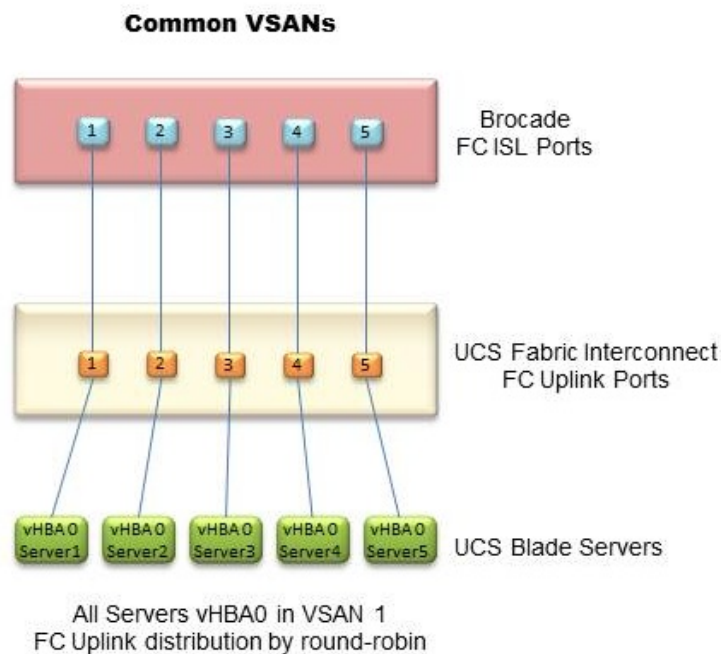
## Cisco UCS to Brocade Traffic Engineering

Cisco UCS to Brocade FC uplink traffic engineering can be accomplished through three different methods: common virtual SANs (VSANs), pin groups, and unique VSANs. Each method has its own advantages and disadvantages, depending on the customer's environment and technical and business requirements. Therefore, this guide will discuss each method rather than presenting a best practice.

### Common VSANs

Common VSANs can be used to dynamically assign an FC uplink port out of a pool of all available FC uplinks to a service profile vHBA. Common VSANs is the simplest method for Cisco to Brocade FC traffic engineering, as all FC uplinks in each UCS fabric are available to all service profile vHBAs within that fabric (Figure 2).

Figure 2. Using Common VSANs to Dynamically Assign FC Uplink Ports



With common VSANs, a single VSAN is used within each UCS Fabric A and B.

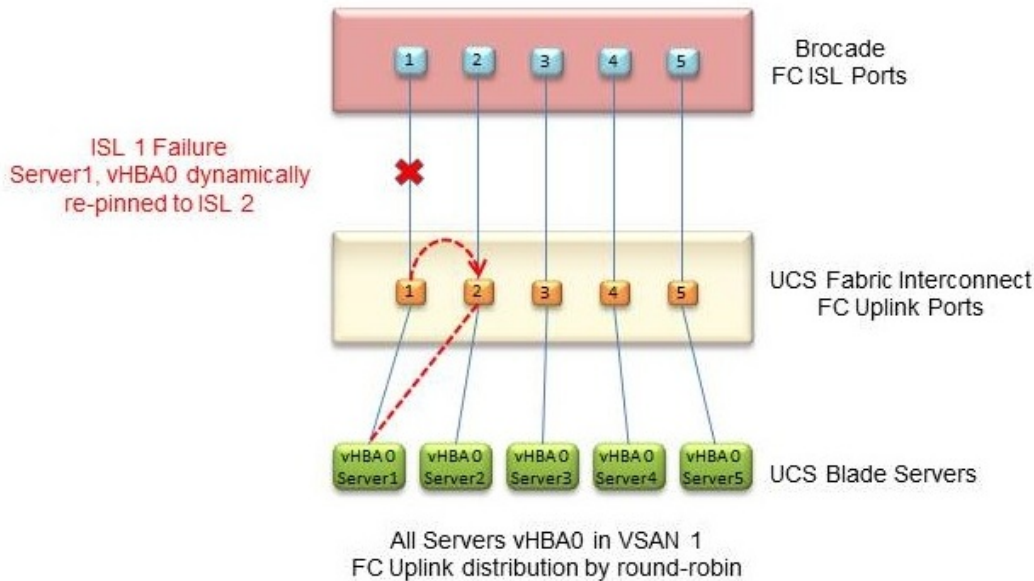
When a server is booted, the service profile vHBAs are dynamically assigned to an FC uplink via a round-robin algorithm.

When an FC uplink failure occurs, all vHBAs currently assigned to the failed FC uplink will dynamically be moved via a round-robin algorithm to the remaining functional FC uplinks (Figure 3).

When a failed FC uplink is re-enabled, vHBAs previously dynamically assigned to this FC uplink and dynamically redistributed to functional FC uplinks are not dynamically moved back to the re-enabled FC uplink. FC uplink rebalancing does not occur automatically.

If the common VSAN method of traffic engineering is used in parallel with SAN pin groups, the FC uplinks assigned to the SAN pin groups are available to the common VSAN uplink pool and can be used by service profile vHBAs, which do not have assigned SAN pin groups.

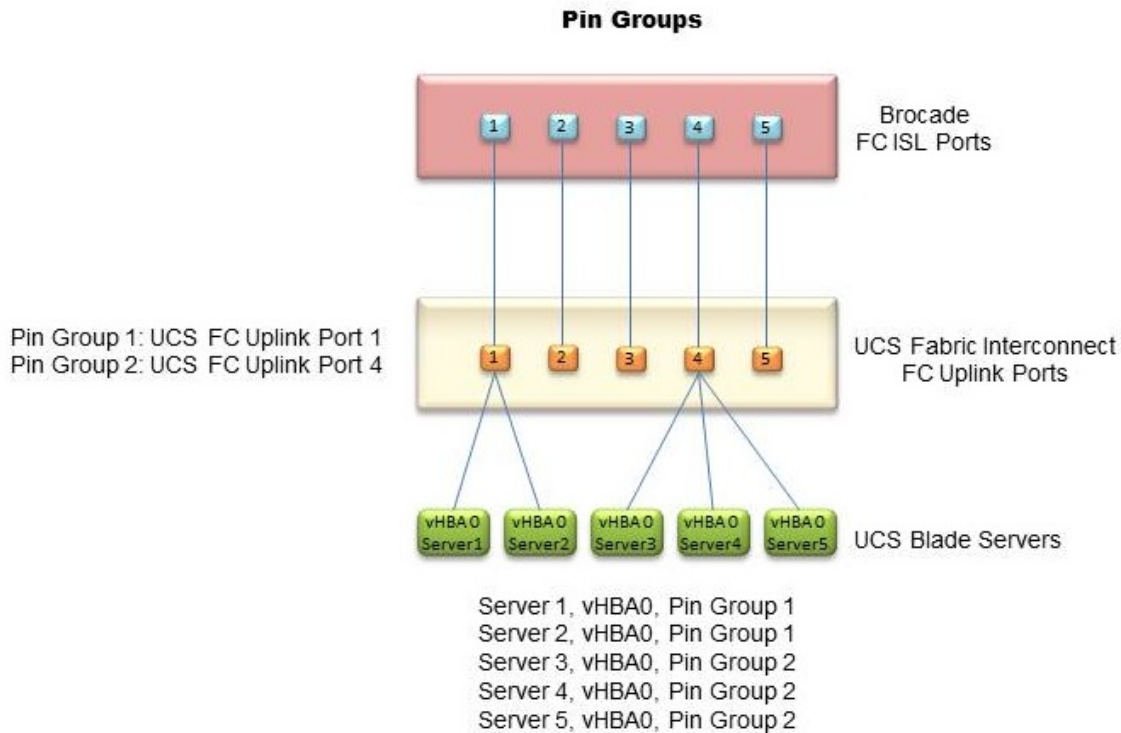
**Figure 3.** Failure Scenario in the Common VSANs Method



## SAN Pin Groups

SAN pin groups can be used to statically assign an FC uplink port to a service profile vHBA, which provides the ability to specify which FC uplink a service profile's Fibre Channel traffic will traverse (Figure 4).

Figure 4. Using SAN Pin Groups to Statically Assign FC Uplink Ports



Multiple SAN pin groups can be defined between a Cisco UCS fabric interconnect and Brocade SAN switch.

A SAN pin group used for connecting to a Brocade switch can have two statically configured FC uplink ports, one on Fabric A, and one on Fabric B.

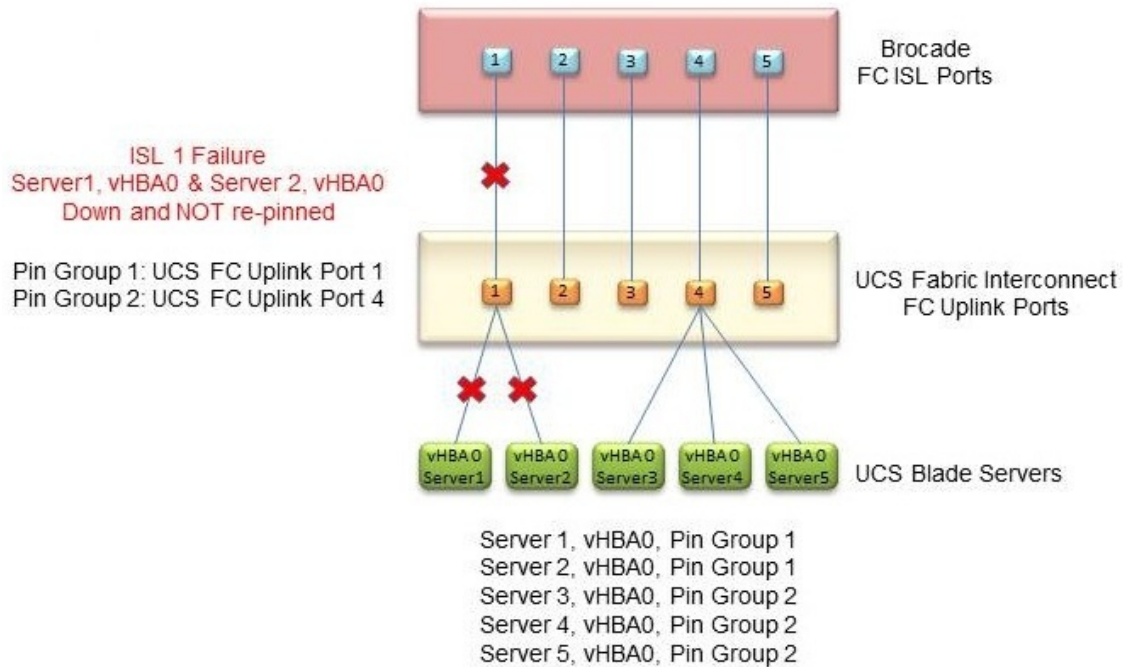
SAN pin groups are normally configured with matching Fabric A and Fabric B FC uplinks (for example, port 2/1 on Fabric A and port 2/1 on Fabric B could both belong to Pin Group 1).

The same SAN pin group can be assigned to individual or multiple vHBAs within a single service profile, and to individual or multiple vHBAs within different service profiles.

If SAN pin groups are assigned to some service profile vHBAs but not all service profile vHBAs, the vHBAs not assigned to SAN pin groups will be dynamically assigned to the same FC uplinks used within the SAN pin groups, using a round-robin algorithm.

If an FC uplink within a SAN pin group fails, the service profile vHBAs assigned to that SAN pin group will remain down until the FC uplink is restored and will not be dynamically repinned to another FC uplink (Figure 5).

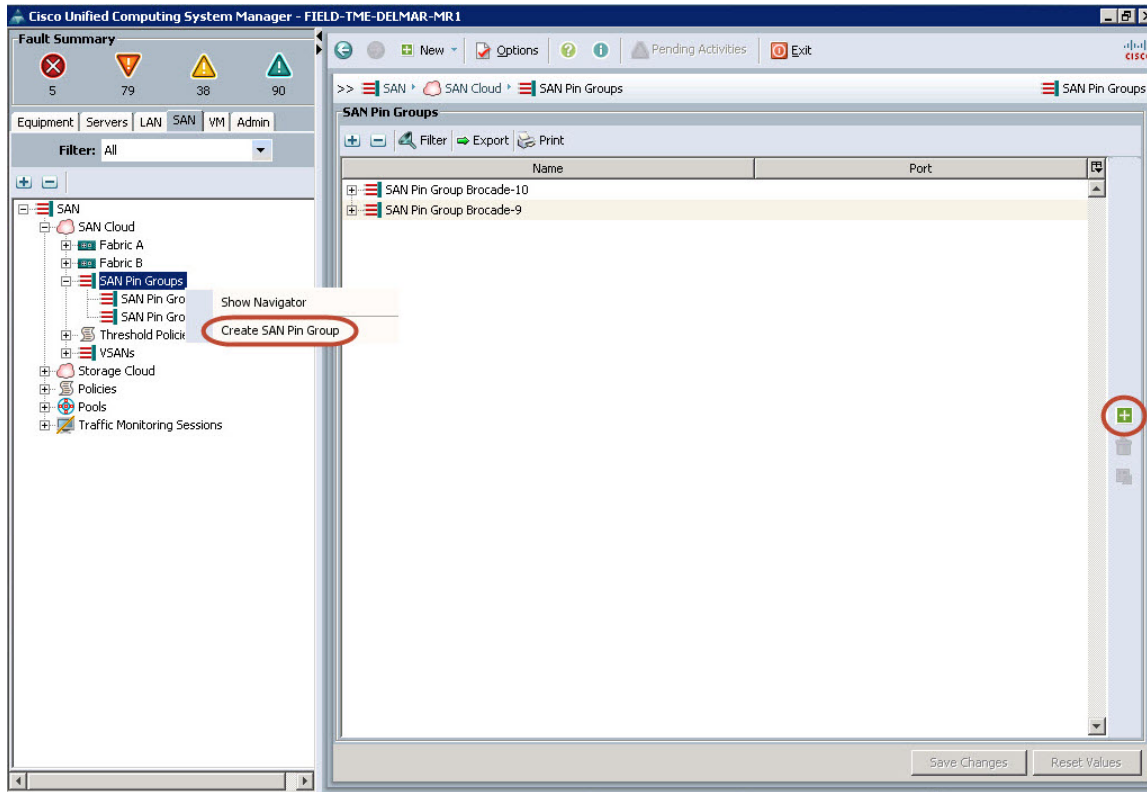
**Figure 5.** Failure Scenario in the SAN Pin Groups Method





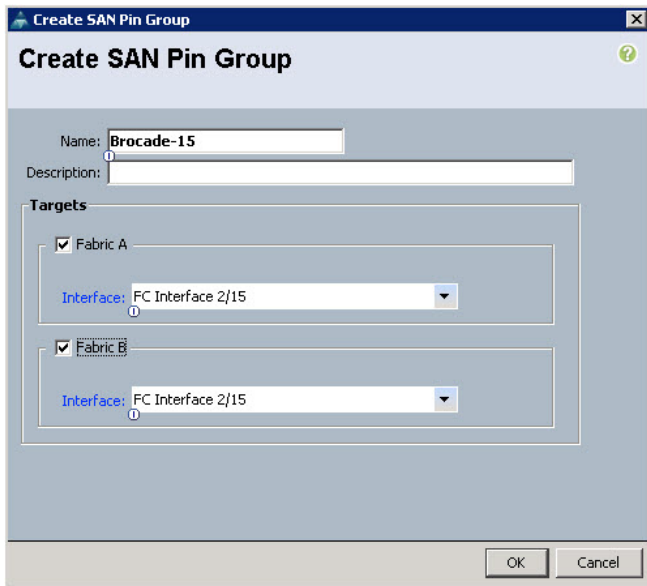
## Configuring a Pin Group

In Cisco UCS Manager, navigate to the SAN tab. In the navigation tree, expand SAN > SAN Cloud > SAN Pin Groups. Right-click SAN Pin Groups and choose Create SAN Pin Group, or click the green + icon in the UCS Manager main window.

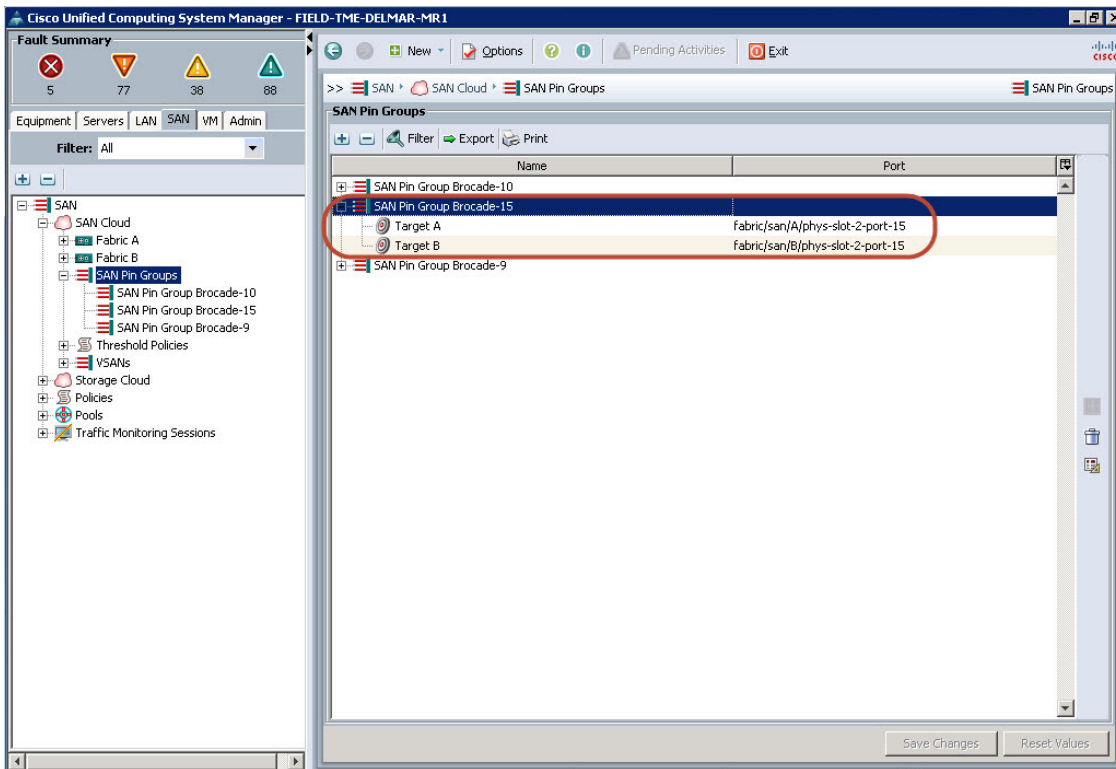


The Create SAN Pin Group window will appear.

Provide the SAN pin group with a name. In this example, the device name and FC uplink port number have been specified within the name. In the Targets section, choose both Fabric A and Fabric B. The Interface drop-down menu will activate. Navigate this menu to choose the Fabric A and B FC uplinks for this pin group.

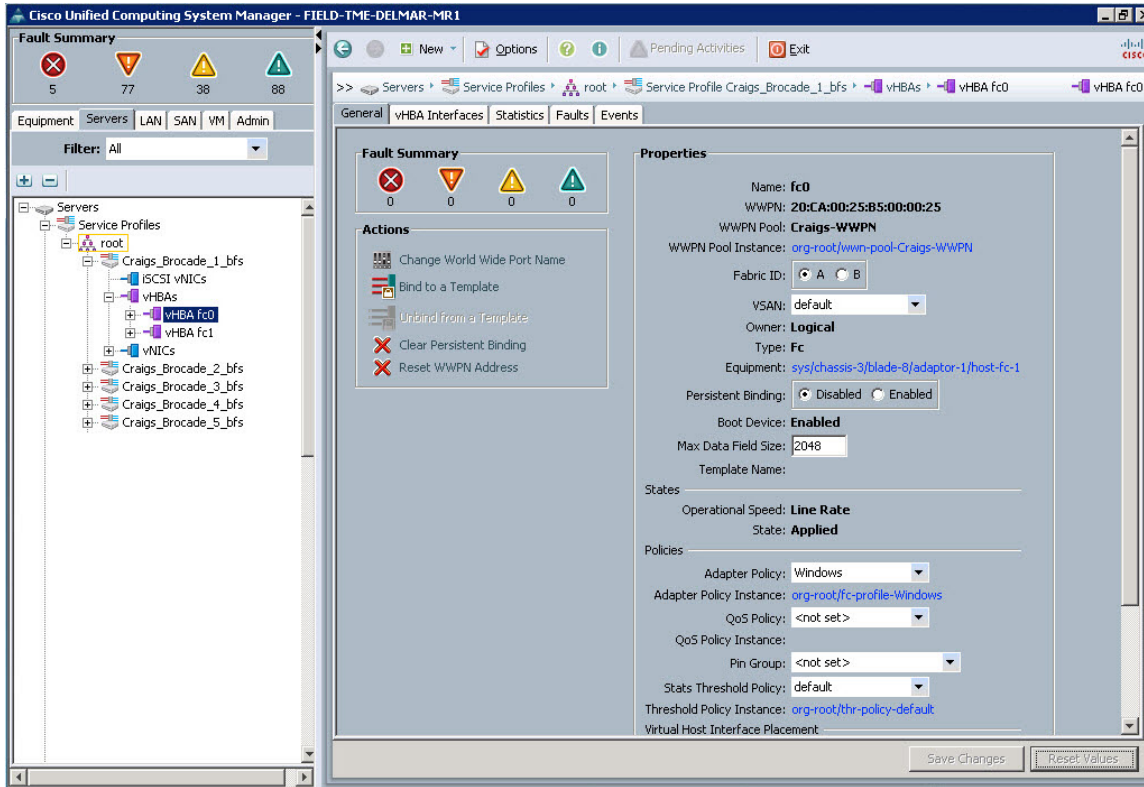


When finished, click OK, then click OK in the Create SAN Pin Group success window. The new SAN pin group will now display in the UCS Manager main window. Click the + sign next to the SAN pin group to expand the object and display the FC uplink ports within the SAN pin group.



## Assigning a Pin Group in Service Profile

In Cisco UCS Manager, navigate to the Servers tab. In the navigation tree, expand Servers > Service Profiles > root > (sub-org if one exists) and highlight the service profile to reconfigure. (This assumes that the service profile has already been created. If assigning a SAN pin group during service profile creation, the SAN Pin Group assignment field is configured in the Create vHBA screen.) Expand the service profile, then expand the vHBAs and select one of the vHBAs. The vHBA properties will display in the General tab in the UCS Manager main window.



In the UCS Manager main window for the selected vHBA, click the Pin Group drop-down menu and select the SAN pin group to assign to this vHBA.

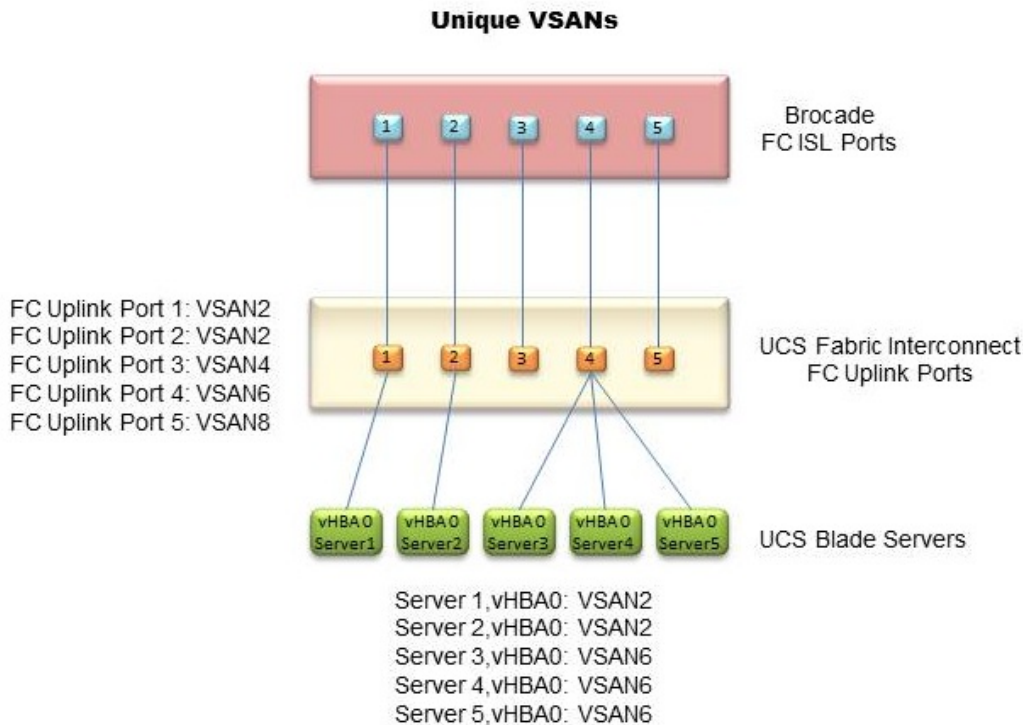
Click Save Changes, and then click OK.

Repeat for all of the vHBAs within this service profile and all other service profiles to be configured with SAN pin groups.

## Unique VSANs

UCS VSANs can be used to assign individual service profile vHBAs to specific FC uplinks, providing the ability to specify which FC uplinks a service profile's Fibre Channel traffic will traverse (Figure 6). VSANs are unique to Cisco devices and therefore apply only to the uplink engineering component of Cisco to Brocade connectivity. The VSAN tag is recognized internally within Cisco UCS and can be assigned to vHBAs and FC uplinks; however this tag will be ignored by the Brocade devices.

Figure 6. Using Unique VSANs to Assign Service Profile vHBAs to Specific FC Uplinks



The following example illustrates how VSANs can be used for FC uplink traffic engineering:

1. VSAN 2 is created on UCS Fabric A, and VSAN 3 is created on UCS Fabric B.
2. Service profile Brocade\_1 vHBA fc0 is assigned to VSAN 2 on Fabric A, and service profile Brocade\_1 vHBA fc1 is assigned to VSAN 3 on Fabric B.
3. Cisco Fabric Interconnect A FC uplink port x/x is assigned to VSAN 2 on Fabric A and is connected to Brocade Device A/Fabric A, and Cisco Fabric Interconnect B FC uplink port x/x is assigned to VSAN 3 on Fabric B and is connected to Brocade Device B/Fabric B.
4. Traffic originating from service profile Brocade\_1 vHBA fc0 assigned to VSAN 2 in Fabric A will traverse FC uplink port x/x assigned to VSAN 2 in Fabric A. Traffic originating from service profile Brocade\_1 vHBA fc1 assigned to VSAN 3 in Fabric B will traverse FC uplink port x/x assigned to VSAN 3 in Fabric B.
5. Other service profile vHBAs assigned to VSANs will traverse FC uplinks with matching VSAN assignments.

Multiple VSANs can be defined in Cisco UCS Manager.

VSAN IDs can be the same or different between UCS Fabric A and Fabric B. Although the VSAN tags are used only internally within UCS for FC uplink engineering purposes, best practices for VSAN Fabric A and B uniqueness commonly found in end-to-end Cisco fabrics should also apply to UCS to Brocade connectivity. Unique VSAN IDs can assist with UCS SAN fabric management and can also help avoid simultaneous Fabric A and B disruption if the UCS Fibre Channel over Ethernet (FCoE) internal VLAN ID associated with a dual VSAN configuration were to be modified.

The same VSAN can be assigned to individual or multiple FC uplinks.

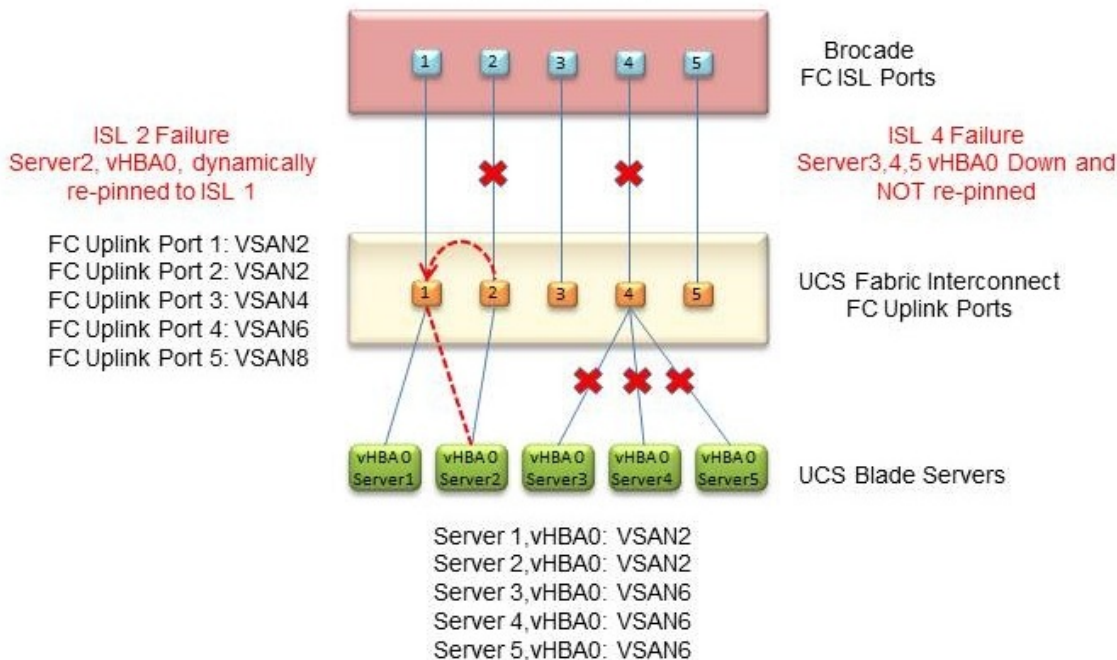
The same or different VSANs can be assigned to individual or multiple vHBAs within a single service profile, and to individual or multiple vHBAs within different service profiles.

Only vHBAs with matching VSANs to the FC uplinks can traverse those FC uplinks.

vHBAs assigned to default VSAN 1 cannot traverse FC uplinks assigned to nondefault VSANs.

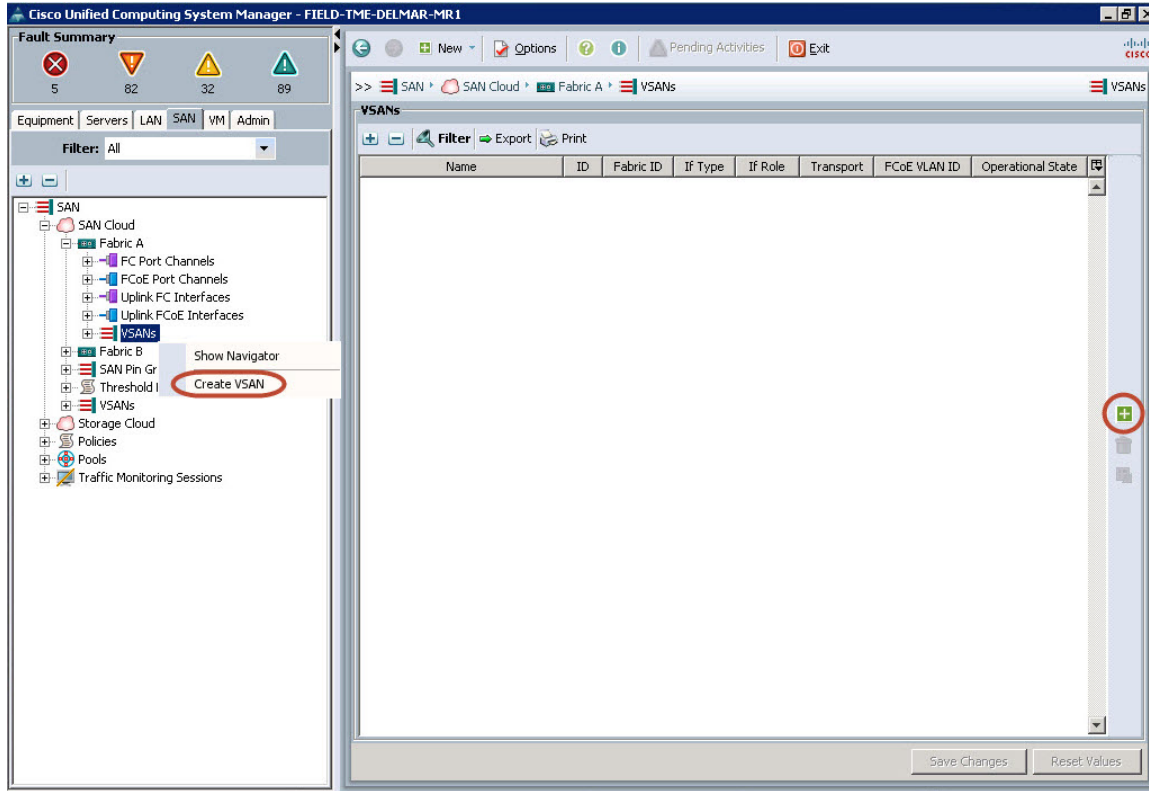
If an FC uplink fails, the service profiles' vHBAs assigned to the matching VSAN of that FC uplink will dynamically move to another FC uplink assigned to the same VSANs. If multiple FC uplinks assigned to matching VSANs remain functional, the server profiles' vHBAs will be distributed among these remaining functional FC uplinks via a round-robin algorithm. If no FC uplinks with matching VSANs exist or are functional, the vHBAs will stay down until an FC uplink with a matching VSAN becomes functional (Figure 7).

Figure 7. Failure Scenarios in the Unique VSANs Method



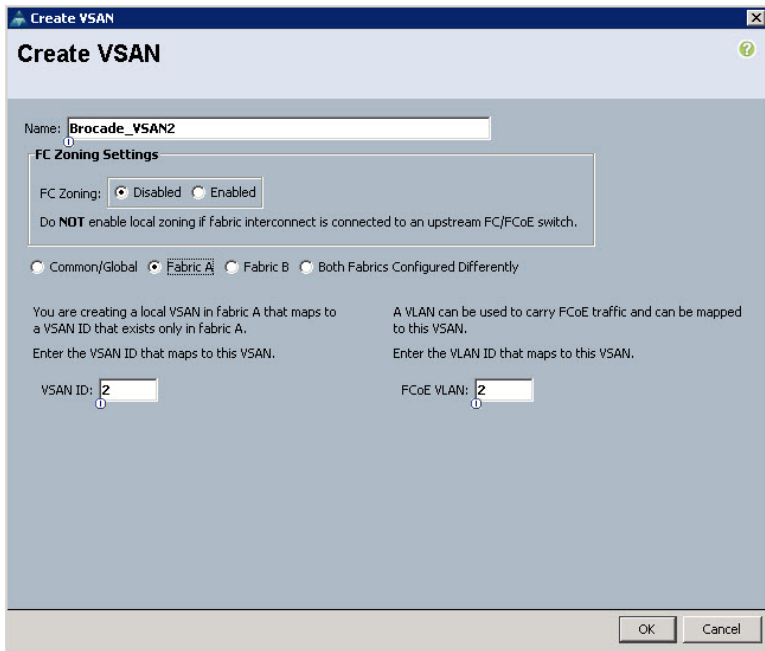
## Configuring VSANs

In Cisco UCS Manager, navigate to the SAN tab. In the navigation tree, expand SAN > SAN Cloud > Fabric A > VSANs. Right-click VSANs in the navigation tree, and then click Create VSAN, or left-click the green + icon in the UCS Manager main VSANs window and then click Create VSAN.

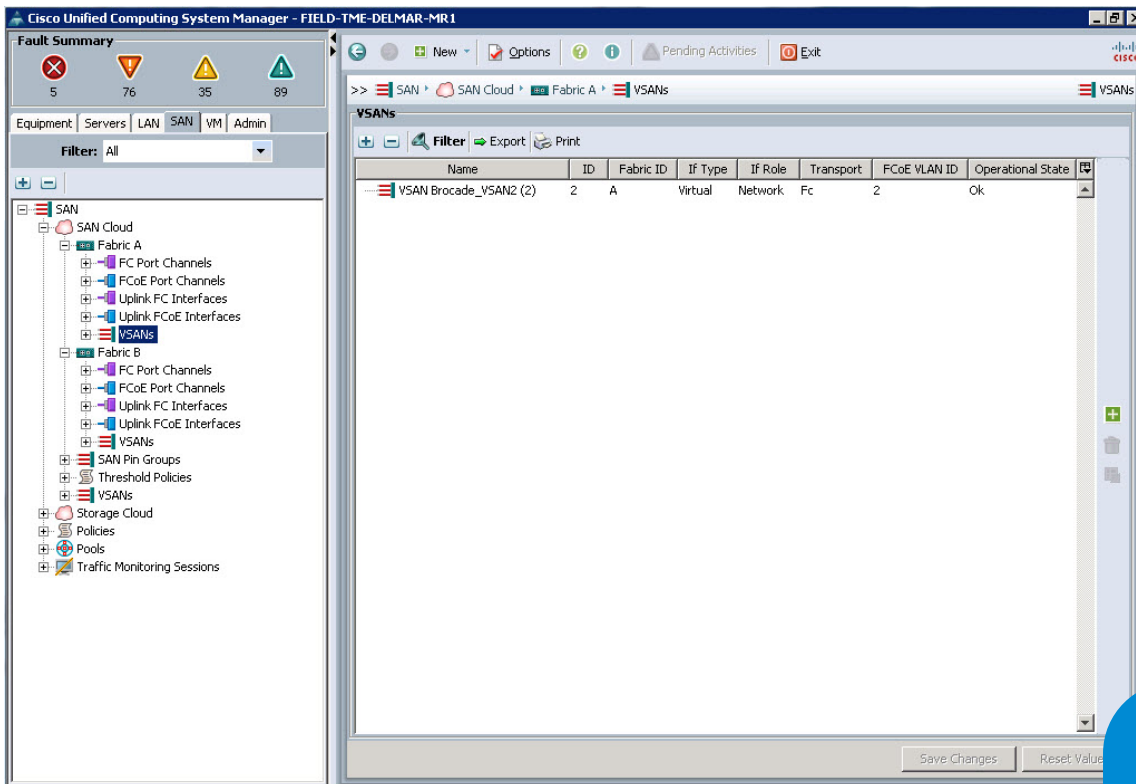


The Create VSAN window will appear.

Enter a name for the VSAN in the Name field. The FC Zoning setting should remain Disabled. Click the Fabric A radio button. Enter the VSAN ID and FCoE VLAN ID in their respective fields. Matching the VSAN ID and FCoE VLAN ID assists with tracking and management; however, it is not a requirement.



When complete, click OK, then click OK in the success window. The newly created VSAN will appear in the UCS Manager main VSANs window.





Repeat the operation to create a VSAN for Fabric B, and for any other Fabric A/B VSANs that need to be created to meet the FC uplink traffic engineering requirements of the implementation.

In this example, three VSANs have been created on both Fabric A (2, 4, 6) and Fabric B (3, 5, 7).

Fabric A:

The screenshot displays the Cisco Unified Computing System Manager interface. The left-hand navigation pane shows a tree view under 'SAN' > 'SAN Cloud' > 'Fabric A' > 'VSANs'. The main pane shows a table of VSANs for Fabric A.

Name	ID	Fabric ID	If Type	If Role	Transport	FCoE VLAN ID	Operational State
VSAN Brocade_VSAN2 (2)	2	A	Virtual	Network	Fc	2	Ok
VSAN Brocade_VSAN4 (4)	4	A	Virtual	Network	Fc	4	Ok
VSAN Brocade_VSAN6 (6)	6	A	Virtual	Network	Fc	6	Ok



Fabric B:

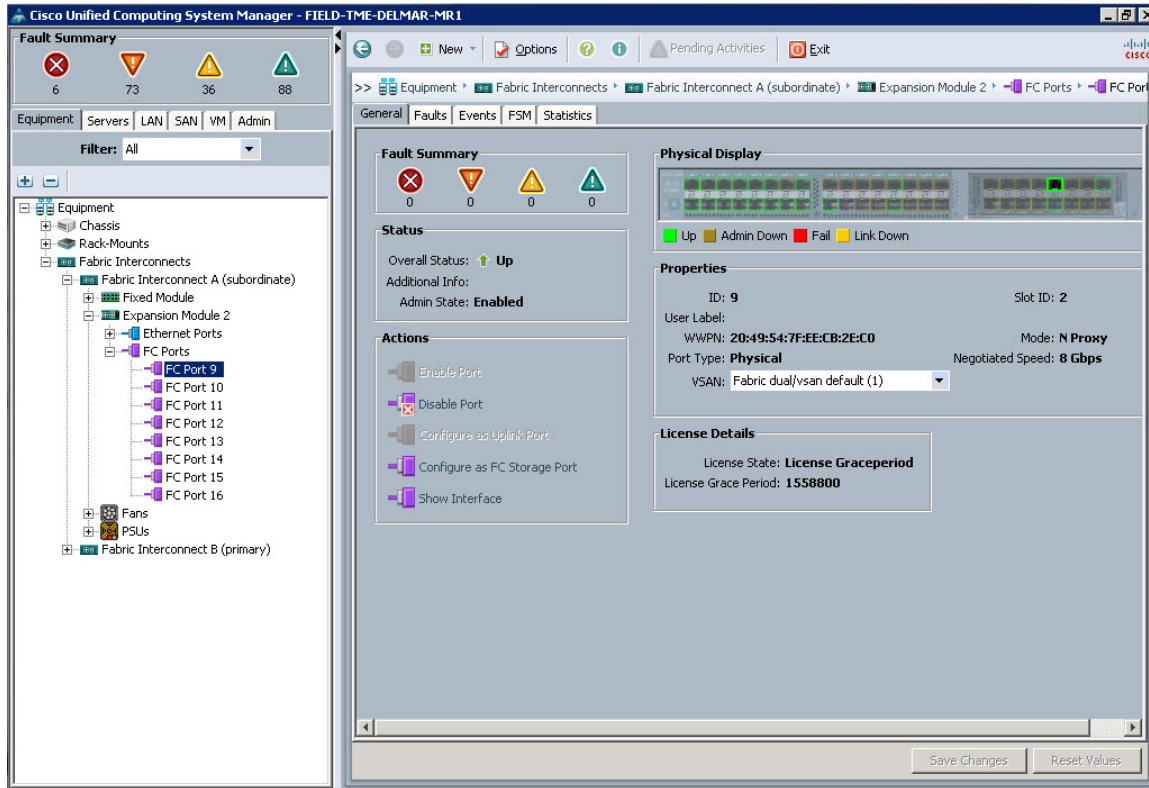
The screenshot displays the Cisco Unified Computing System Manager interface for Fabric B. The left-hand navigation pane shows a tree structure under 'SAN' with 'Fabric B' selected, and 'VSANS' highlighted. The main pane shows a table of VSAN configurations for Fabric B. The table has columns for Name, ID, Fabric ID, If Type, If Role, Transport, FCoE VLAN ID, and Operational State. Three rows are visible, all with an 'Ok' operational state.

Name	ID	Fabric ID	If Type	If Role	Transport	FCoE VLAN ID	Operational State
VSAN Brocade_VSAN3 (3)	3	B	Virtual	Network	Fc	3	Ok
VSAN Brocade_VSAN5 (5)	5	B	Virtual	Network	Fc	5	Ok
VSAN Brocade_VSAN7 (7)	7	B	Virtual	Network	Fc	7	Ok

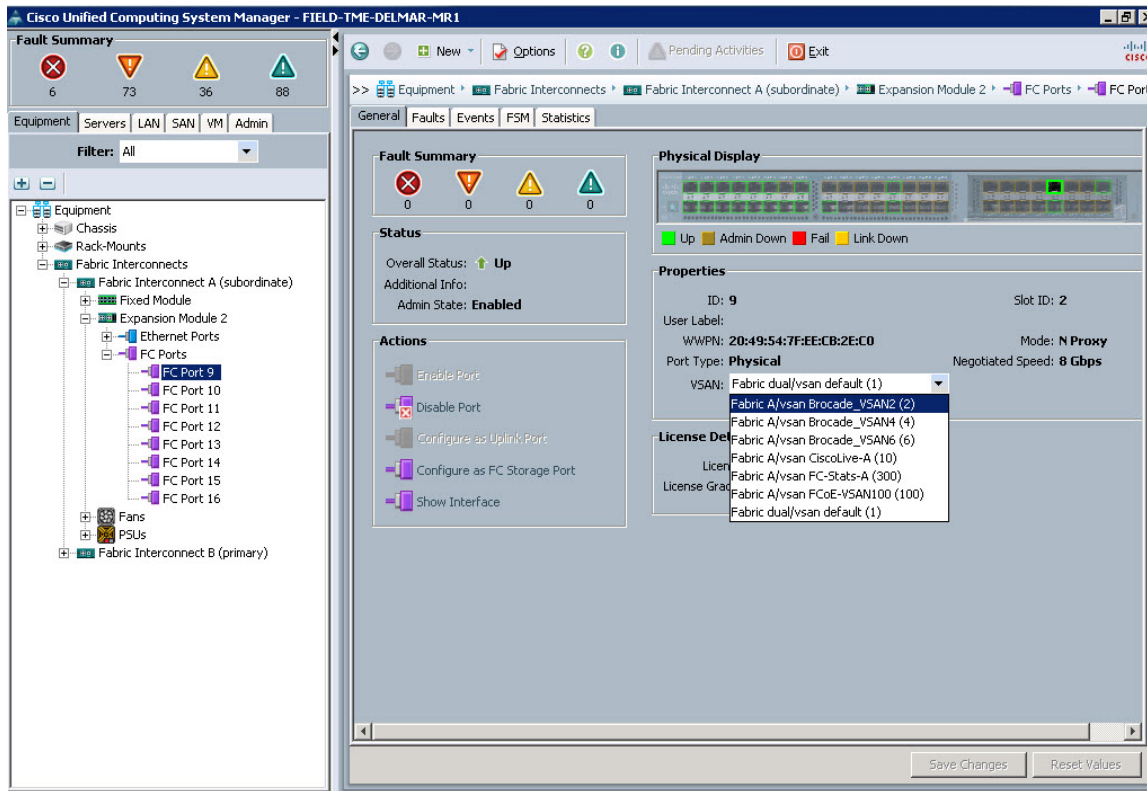
## Assigning VSANs to FC Uplinks

In Cisco UCS Manager, navigate to the Equipment tab. In the navigation tree, expand Fabric Interconnects > Fabric Interconnect A > the module where the FC ports connected to the Brocade switch exist > FC Ports. Highlight the FC port connected to the Brocade switch.

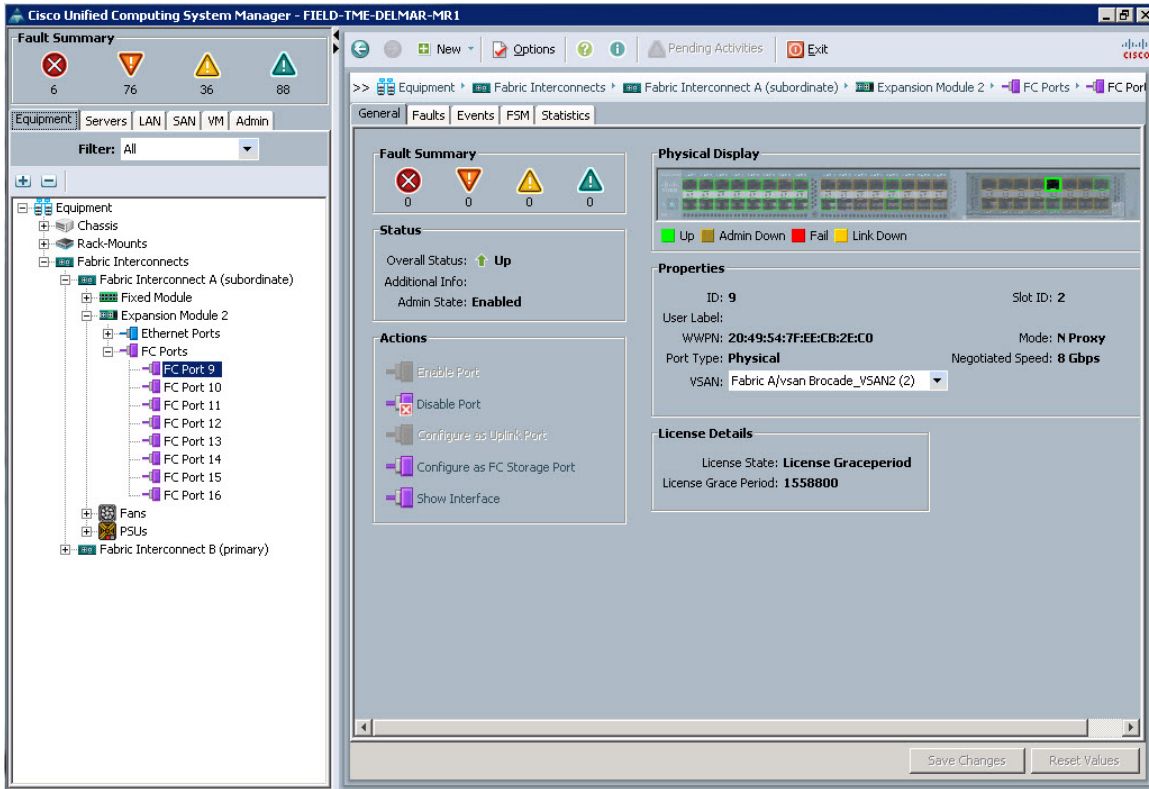
The FC uplink interface information will display on the General tab of the UCS Manager main window.



In the Properties section, click the VSAN drop-down menu to set the VSAN of the FC uplink port connected to the Brocade switch to one of the VSANs previously created.



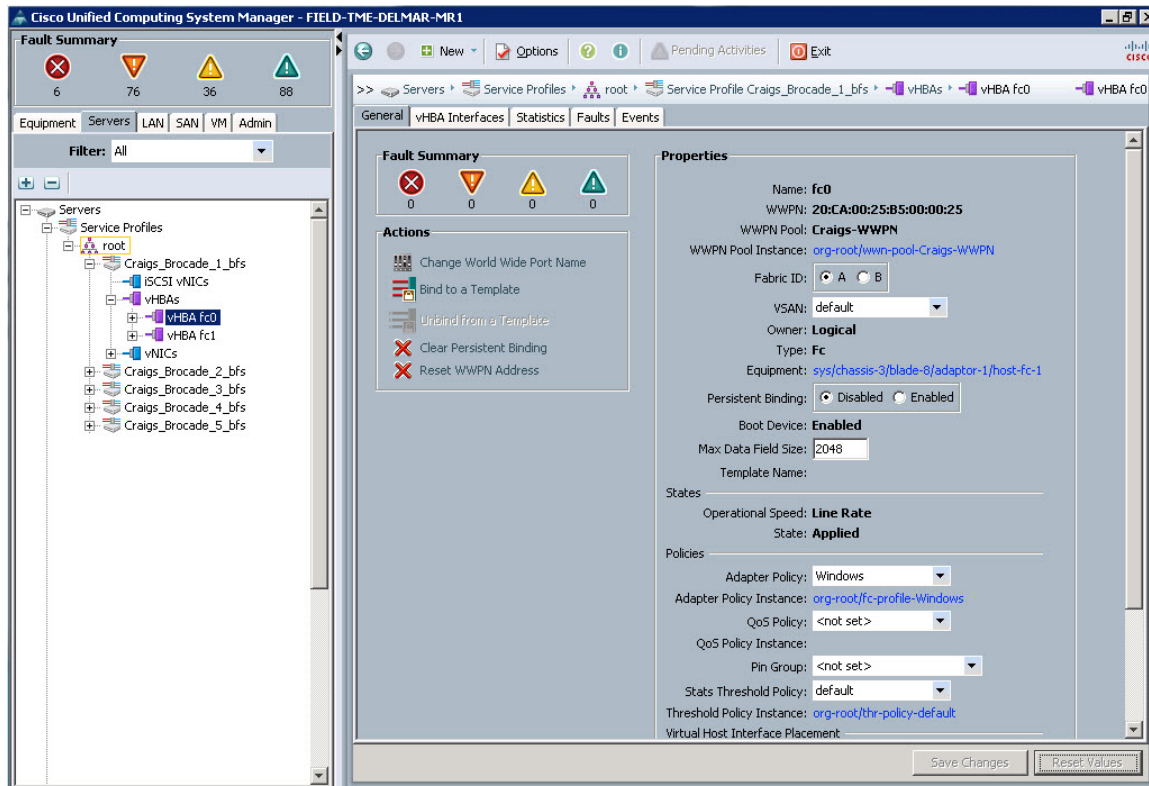
In this example, FC uplink 2/9 will be set to VSAN 2. Highlight VSAN 2, click Save Changes, and then click OK in the confirmation window.



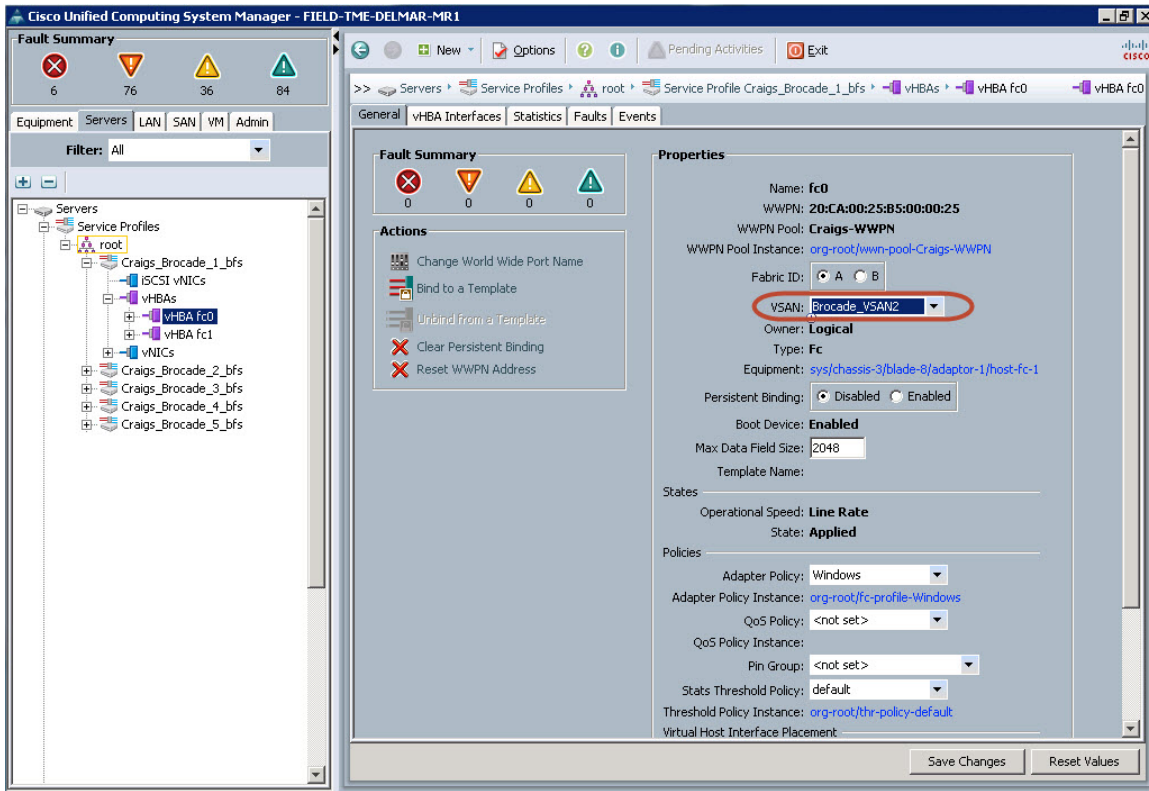
Repeat and assign VSANs to all FC uplinks in both UCS Fabric A and Fabric B.

## Assigning VSANs to Service Profile vHBAs

In Cisco UCS Manager, navigate to the Servers tab. In the navigation tree, expand Servers > Service Profiles > root > (sub-org if one exists), and highlight the service profile to reconfigure. (This assumes that the service profile has already been created. If assigning a VSAN during service profile creation, the VSAN assignment field is configured in the Create vHBA screen.) Expand the service profile, then expand the vHBAs and select one of the vHBAs. The vHBA properties will display on the General tab in the UCS Manager main window.



In the UCS Manager main window for the selected vHBA, click the VSAN drop-down menu and select the VSAN to assign to this vHBA. The VSAN ID chosen here will result in the SAN traffic from this vHBA traversing the FC uplinks with a matching VSAN ID.



Click Save Changes, and then click OK.

Repeat for all vHBAs within this service profile and all other service profiles.

## Confirming Server Fabric Login (FLOGI)

Whether an implementation is using common VSANs, pin groups, or unique VSANs, it is helpful to be able to identify which Fibre Channel ports and uplinks on the Cisco UCS fabric interconnects and Brocade Fibre Channel switches the Cisco UCS server's vHBAs are logged into.

### Brocade CLI

Use the **switchShow** command to display which FC ports have NPIV logins:

```
Brocade-A:admin> switchshow
switchName: Brocade-A
switchType: 71.2
switchState: Online
switchMode: Native
switchRole: Principal
switchDomain: 1
switchId: fffc01
switchWwn: 10:00:00:12:34:56:78:2b
zoning: ON (zoning_cfg)
switchBeacon: OFF
```

Index	Port	Address	Media	Speed	State	Proto
0	0	010000	id	N8	Online	FC F-Port 1 N Port + 2 NPIV public
1	1	010100	id	N8	Online	FC F-Port 1 N Port + 2 NPIV public
2	2	010200	id	N8	Online	FC F-Port 1 N Port + 1 NPIV public
3	3	010300	id	N8	No_Light	FC
4	4	010400	id	N8	No_Light	FC
5	5	010500	id	N8	No_Light	FC
6	6	010600	id	N8	Online	FC F-Port 50:06:01:6f:08:60:08:12
7	7	010700	id	N8	Online	FC F-Port 50:06:01:66:08:60:08:12

Port 0 has two NPIV logins, port 1 has two NPIV logins, and port 2 has one NPIV login.



Next, use the **portShow** command on port 0, 1, or 2 to identify the worldwide port names (WWPNs) of the Cisco UCS server vHBAs logged into the Brocade F-port:

```
Brocade-A:admin> portshow 0
portIndex: 0
portName: port0
portHealth: No Fabric Watch License

<snip>

portId: 010000
portIfId: 43020017
portWwn: 20:00:00:27:f8:07:d4:2b
portWwn of device(s) connected:
  20:ca:00:25:b5:00:00:22 ← WWPN of UCS server vHBA
  20:ca:00:25:b5:00:00:25 ← WWPN of UCS server vHBA
  20:49:54:7f:ee:cb:2e:c0 ← WWPN of UCS fabric interconnect FC uplink port
<snip>
.
```

UCS server vHBAs with WWPNs of 20:ca:00:25:b5:00:00:22 and 20:ca:00:25:b5:00:00:25 are logged into Brocade FC port 0.

### Cisco UCS CLI

Use the **show npv flogi-table** command to identify which Cisco UCS FC uplinks the server vHBAs are dynamically or statically assigned to:

```
FIELD-TME-DELMAR-MR1-A# connect nxos
.
.
FIELD-TME-DELMAR-MR1-A(nxos)# show npv flogi-table
-----
SERVER                                                                 EXTERNAL
INTERFACE VSAN FCID      PORT NAME                NODE NAME                INTERFACE
-----
vfc6035   1      0x010001  20:ca:00:25:b5:00:00:25  20:ca:00:25:b5:00:00:19  fc2/9
vfc6039   1      0x010201  20:ca:00:25:b5:00:00:24  20:ca:00:25:b5:00:00:15  fc2/15
vfc6043   1      0x010003  20:ca:00:25:b5:00:00:22  20:ca:00:25:b5:00:00:13  fc2/9
vfc6059   1      0x010103  20:ca:00:25:b5:00:00:31  20:ca:00:25:b5:00:00:12  fc2/10
vfc6063   1      0x010104  20:ca:00:25:b5:00:00:01  20:ca:00:25:b5:00:00:21  fc2/10

Total number of flogi = 5.
```

UCS server vHBA WWPNs 20:ca:00:25:b5:00:00:25 and 20:ca:00:25:b5:00:00:22 are both logged into UCS FC uplink port fc2/9.



## References

The following is a list of relevant Brocade commands: Please see the *Brocade Fabric OS Command Reference Manual* at the link given below for complete command usage and syntax.

```
PortCfgfillword  
PortCfgNPiVPort  
PortCfgShow  
PortEnable <port #>  
PortShow <port #>  
SwitchShow
```

[Cisco UCS hardware and software interoperability guides](#)

[Cisco UCS Manager command references](#)

[Brocade Fabric OS Administrator's Guide \(Fabric OS v7.0.0\)](#)

[Brocade Fabric OS Command Reference Manual \(Fabric OS v7.0.0\)](#)



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