

# Configure SAN Port-Channel between UCS IMM and MDS

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## Introduction

This document describes the SAN port channel configuration between Fabric Interconnect 64108 managed by Intersight and a MDS 9148 16 G.

## Prerequisites

### Requirements

- Fabric Interconnect 64108 managed by Intersight
- MDS 9148S 16G
- Fabric Interconnect 64108 connected to a MDS

## Components

The information in this document is based on these software and hardware versions:

- Fabric Interconnect 64108 Version: 4.3(2a)
- MDS model: MDS 9148S 16G Version: 9.3(2)

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.

## Background

### SAN port channel

SAN port channels refer to the aggregation of multiple physical interfaces into one logical interface to provide higher aggregated bandwidth, load balancing, and link redundancy.

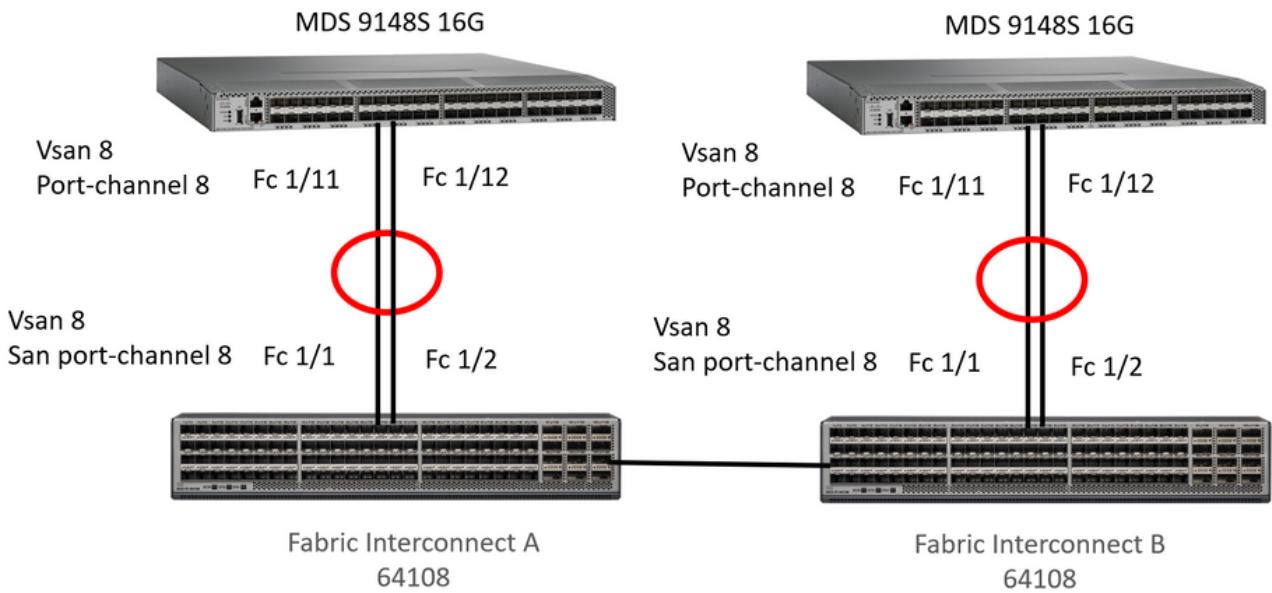
### Vsan

A VSAN is a virtual storage area network (SAN). A SAN is a dedicated network that interconnects hosts and storage devices primarily to exchange SCSI traffic. In SANs you use the physical links to make these interconnections. A set of protocols run over the SAN to handle routing, naming, and zoning. You can design multiple SANs with different topologies.

### Advantages

- Traffic isolation—Traffic is contained within VSAN boundaries and devices reside only in one VSAN ensuring absolute separation between user groups, if desired.
- Scalability—VSANs are overlaid on top of a single physical fabric. The ability to create several logical VSAN layers increases the scalability of the SAN.
- Per VSAN fabric services—Replication of fabric services on a per VSAN basis provides increased scalability and availability.
- Redundancy—Several VSANs created on the same physical SAN ensure redundancy. If one VSAN fails, redundant protection (to another VSAN in the same physical SAN) is configured using a backup path between the host and the device.
- Ease of configuration—Users can be added, moved, or changed between VSANs without changing the physical structure of a SAN. Moving a device from one VSAN to another only requires configuration at the port level, not at a physical level

## Topology



This example shows san port channel configuration between FI managed by Intersight and MDS. Used fc1/1 and fc1/2 interfaces for Fabric Interconnect and fc1/11 and fc1/12 for MDS.

# Configure

Before start with configuration.

Login into SSH session of the MDS device and login into Intersight account.

## Intersight configuration

### Port Policy

Step 1. Create a Port Policy.

The screenshot shows the Cisco Intersight interface with the 'Policies' tab selected. The left sidebar includes sections for Overview, Analyze, Operate, Servers, Chassis, Fabric Interconnects, HyperFlex Clusters, Virtualization, Kubernetes, Integrated Systems, Configure (Profiles, Templates), and Policies (selected). The top navigation bar includes Intersight, Infrastructure Service, Search, and various status indicators.

**Policies**

All Policies

**Platform Type**

- UCS Server 231
- UCS Chassis 17
- UCS Domain 151
- HyperFlex Cluster 8

**Usage**

- Used 131
- Not Used 130
- N/A 89

Name	Platform Type	Type	Usage	Last Update
.27-adapter-config-policy	UCS Server	Adapter Configuration	0	Jun 25, 2023 4:15 PM
.27-bios-policy	UCS Server	BIOS	0	Jun 25, 2023 4:16 PM
.27-boot-order-policy	UCS Server	Boot Order	0	Jun 25, 2023 4:15 PM
.27-ipmi-over-lan-policy	UCS Server	IPMI Over LAN	0	Jun 25, 2023 4:15 PM
.27-lan-connectivity-policy	UCS Server, UCS ...	LAN Connectivity	0	Oct 31, 2022 3:11 PM
.27-network-connectivity-policy	UCS Server, UCS ...	Network Connectivity	23	4:15 PM
.27-ntp-policy	UCS Server, UCS ...	NTP	0	Jun 25, 2023 4:15 PM
.27-san-connectivity-policy	UCS Server	SAN Connectivity	0	Jun 29, 2022 11:14 AM
.27-sd-card-policy	UCS Server	SD Card	0	Jun 25, 2023 4:15 PM
.27-serial-over-lan-policy	UCS Server	Serial Over LAN	0	Jun 25, 2023 4:15 PM

**Create Policy**

Create Port Policy

Step 2. In the search field, look for port, select Port and click Start button.

The screenshot shows the 'Select Policy Type' page in Cisco Intersight. On the left, there's a navigation sidebar with sections like Overview, Analyze, Operate, Configure, Profiles, Templates, Policies (which is selected), and Pools. A command palette is open on the left. The main area has a search bar with 'port' typed in. Below it, under 'Platform Type', the 'Port' radio button is selected (highlighted with a red box). At the bottom right, there's a 'Start' button (also highlighted with a red box).

Select port policy

Step 3. In the name field, write the port policy name and select switch model (Fabric Interconnect model) and click in Next button.

The screenshot shows the 'Create Port' page in Cisco Intersight. The left sidebar shows 'Profiles' is selected. The main form has a 'General' tab active. In the 'General' section, the 'Name' field contains 'port\_policy' (highlighted with a red box) and the 'Switch Model' dropdown is set to 'UCS-FI-64108' (highlighted with a red box). At the bottom right, there's a 'Next' button (highlighted with a red box).

Define port policy name and Fabric Interconnect model

Step 4. Select the amount of port to carry Fiber Channel (FC) traffic. You can see blue circle once you select the FC ports and click Next button.

The screenshot shows the Cisco Intersight interface for creating a unified port. On the left, a navigation sidebar includes sections like Overview, Analyze, Operate, Configure, and Policies, with Policies currently selected. The main content area is titled 'Create' and shows the 'Unified Port' configuration step. A sub-step 'Fibre Channel Ports' is highlighted with a red box. Below it, a diagram of a server blade with 48 ports is shown, with four ports at the top labeled '4 Fibre Channel Ports (Port 1-4)' and two arrows pointing to them. At the bottom of the diagram, there are buttons for 'FC', 'Ports 1-4', 'Ethernet', and 'Ports 5-54'. The right side of the screen has 'Back' and 'Next' buttons, with 'Next' being highlighted with a red box.

Ports selection

Step 5. Click in Next button.

The screenshot shows the Cisco Intersight interface for configuring breakout options. The left sidebar shows the 'Policies' section selected. The main content area is titled 'Create' and shows the 'Breakout Options' step. It includes tabs for 'Ethernet' and 'Fibre Channel', with 'Ethernet' selected. Below the tabs is a 'Configure' button and a diagram of a server blade with 48 ports. A table below lists three ports: Port 49 (Ethernet), Port 50 (Ethernet), and Port 51 (Ethernet). The right side of the screen has 'Back' and 'Next' buttons, with 'Next' being highlighted with a red box.

Next button

Step 6. Find Port Channels tab and then click in Create Port Channel button.

The screenshot shows the 'Create' screen for 'Port Roles' in the Cisco Intersight interface. The 'Port Channels' tab is active. A prominent red box surrounds the 'Create Port Channel' button. To the right is a detailed port map for a Cisco UCS 41404 chassis. Below the map is a table with columns 'ID' and 'Role'. The table displays the message 'NO ITEMS AVAILABLE'. At the bottom right are 'Back' and 'Save' buttons.

Create port channel

Step 7. Select FC Uplink Port Channel option in Role field.

The screenshot shows the 'Create Port Channel' dialog box. The 'Role' dropdown is open, displaying five options: 'FC Uplink Port Channel' (selected), 'Ethernet Uplink Port Channel', 'FC Uplink Port Channel', 'FCoE Uplink Port Channel', and 'Appliance Port Channel'. A red box highlights the 'FC Uplink Port Channel' option. To the right, there are fields for 'Admin Speed' (set to '8Gbps') and 'VSAN ID' (set to '1 - 4093'). Below the dialog is a port map diagram. At the bottom right are 'Cancel' and 'Save' buttons.

Select FC Uplink Port Channel role

Step 8. In the Port Channel ID, write the port channel identifier, in VSAN ID write vsan identifier and select Admin Speed.

**Create Port Channel**

**Configuration**

The combined maximum number of Ethernet Uplink, FCoE Uplink, and Appliance port channels permitted is 12 and the maximum number of FC port channels permitted is 4.

**Role**: FC Uplink Port Channel

**Port Channel ID \***: 8

**Admin Speed**: 8Gbps

**VSAN ID \***: 8

**Select Member Ports**

FC or Ethernet ports with unconfigured role are available for port channel creation.

**Cancel** **Save**

Select admin speed , portchannel ID and vsan ID

Step 9. Select the port(s) connected to the MDS to create the port channel configuration and select Save button.

**Select Member Ports**

FC or Ethernet ports with unconfigured role are available for port channel creation.

Name	Type	Role	Mode
port 1	FC	Unconfigured	
port 2	FC	Unconfigured	
port 3	FC	Unconfigured	
port 4	FC	Unconfigured	

Selected 2 of 4 **Show Selected** **Unselect All**

**Cancel** **Save**

Select the port(s) connected to the MDS

## VSAN scope

The roles for an FC port are:

- FC Uplink—FC traffic passes through the FC uplink port. To specify the role of an FC port as an FC Uplink port the VSAN scope of the port must have been created as Storage and Uplink, or as Uplink in the VSAN Configuration policy.
- FC Storage—FC port acts as a storage port. To specify the role of an FC port as an FC Storage port the VSAN scope of the port must have been created as Storage and Uplink, or as Storage in the VSAN

Configuration policy. Moreover, the FC has to be in the switching mode.

- Unconfigured—Unconfigured is the default role of the port.

## Vsan Policy

Step 1. Select Create Policy.

The screenshot shows the Cisco Intersight interface under the 'Policies' section. On the right, there is a large table of existing policies. In the top right corner of the table area, there is a red rectangular box highlighting a blue 'Create Policy' button. On the left side, there is a sidebar with various navigation options like Overview, Analyze, Operate, Configure, and Policies, with 'Policies' being the selected tab. At the bottom left, there is a 'Command Palette' section.

Create policy

Step 2. In the search field, write vsan, select vsan and click in Start button.

The screenshot shows a 'Select Policy Type' dialog box. On the right, there is a search bar containing 'vsan' and a list of policy types. The 'VSAN' option is selected with a blue radio button and highlighted with a red box. On the far right, there is a red box highlighting a blue 'Start' button. On the left, there is a sidebar with various navigation options like Overview, Analyze, Operate, Configure, and Policies, with 'Policies' being the selected tab. At the bottom left, there is a 'Command Palette' section.

Select vsan

Step 3. In field name, write the vsan policy name and click in Next button.

The screenshot shows the Cisco Intersight interface for creating a new policy. The left sidebar has sections for Overview, Analyze, Operate (Servers, Chassis, Fabric Interconnects, HyperFlex Clusters, Integrated Systems), Configure (Profiles, Templates, Policies - selected), and Pools. The main area shows 'Policies > VSAN'. The 'Create' dialog is open, with the 'General' tab selected. The 'Name' field contains 'vsan\_policy' and is highlighted with a red box. Below it is a 'Set Tags' field and a 'Description' field with a character limit of 1024. At the bottom right of the dialog is a 'Next' button, which is also highlighted with a red box.

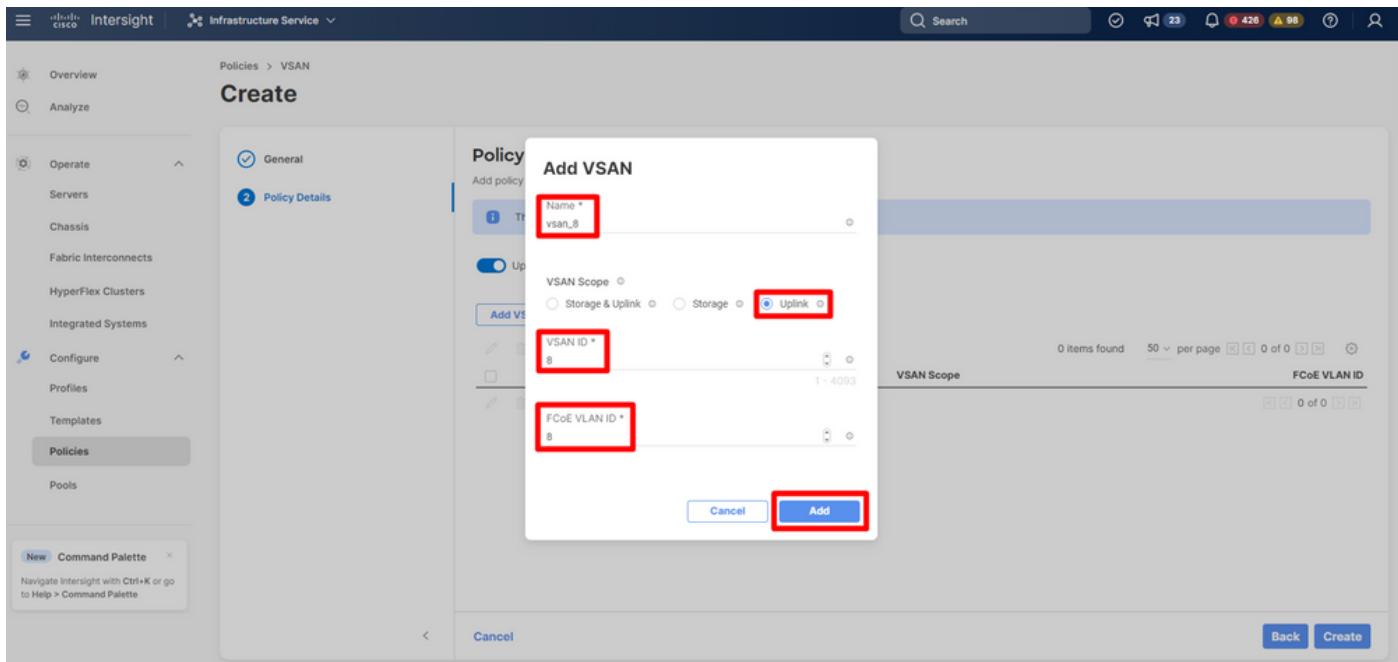
Define vsan policy name

Step 4. Enable Uplink trunking option and select Add VSAN.

The screenshot shows the 'Policy Details' tab of the 'Create' dialog. It includes a note that the policy is applicable only for UCS Domains. The 'Uplink Trunking' toggle switch is turned on and highlighted with a red box. Below it is a 'Add VSAN' button, also highlighted with a red box. To the right is a table with columns for VSAN ID, Name, VSAN Scope, and FCoE VLAN ID. The table is currently empty. At the bottom right of the dialog are 'Back' and 'Create' buttons.

Enable trunking and add vsan

Step 5. In the field name, write the VSAN name, in VSAN scope select uplink option and write the VSAN ID and FCoE vlan ID. Then, select Add button.



Add VSAN

Step 6. Select Create button.

The screenshot shows the 'Policy Details' page. It displays a table with one item: VSAN ID 8, Name vSAN\_8, and VSAN Scope Uplink. The 'Create' button at the bottom right is highlighted with a red box.

	VSAN ID	Name	VSAN Scope	FCoE VLAN ID
	8	vSAN_8	Uplink	8

Create vsan policy

## UCS Domain Policy

Step 1. Select Profiles, look for UCS Domain Profiles and select Create UCS Domain Profile.

The screenshot shows the Cisco Intersight interface with the 'Profiles' section selected. The left sidebar has 'Profiles' highlighted. The main area displays a table of UCS Domain Profiles. A red box highlights the 'Create UCS Domain Profile' button in the top right corner of the table header.

Name	Status	UCS Domain	Last Update
IMM-Domain-[REDACTED]	Not Assigned	Fabric Interconnect	Jul 13, 2023 12:47 PM
IMM-Domain	Not Assigned	Fabric Interconnect	Aug 29, 2023 4:08 PM
DomainProfile-[REDACTED]	Not Assigned	Fabric Interconnect	May 10, 2023 10:46 AM
DomainProfile-[REDACTED]	Not Assigned	Fabric Interconnect	Jun 23, 2023 8:26 AM
DomProf-[REDACTED]	Not Assigned	Fabric Interconnect	Jan 5, 2023 3:30 PM
DomProf-[REDACTED]	Not Assigned	Fabric Interconnect	Feb 17, 2023 4:09 PM
DAS-Domain-Profile-IMM6454	Not Assigned	Fabric Interconnect	Jul 13, 2023 10:17 AM
[REDACTED]-JMM_Networking	Not Assigned	Fabric Interconnect	Mar 7, 2023 12:27 PM
[REDACTED]-Domain_Test	Not Assigned	Fabric Interconnect	Jul 13, 2023 10:17 AM

### Create UCS Domain Profile

Step 2. In the field name, write the Domain Profile name and click Next button.

The screenshot shows the 'Create UCS Domain Profile' wizard. The left sidebar has 'Profiles' selected. The main screen shows step 1: General. A red box highlights the 'Name' field where 'domain\_Profile' is entered. The 'Next' button is also highlighted with a red box.

General  
Add a name, description and tag for the UCS domain profile.

Organization \*  
default

Name \*  
domain\_Profile

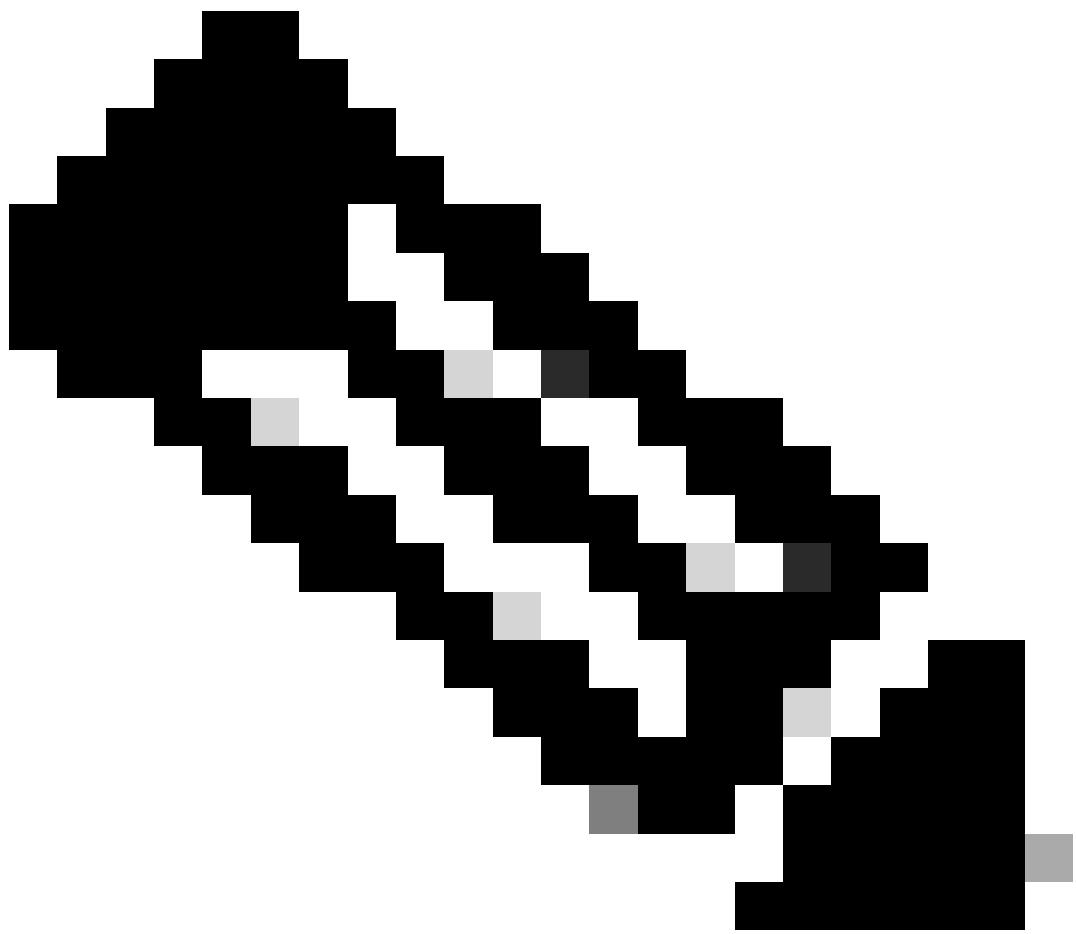
Set Tags

Description

Close Back Next

### Define UCS domain profile

Step 3. Select the Domain Name to assign the UCS Domain Profile. Then, select Next button.



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**Note:** Is important that Fabric Interconnect does not have a Domain Profile assigned. If is the case, you need to unassigned the UCS Domain Profile first.

**UCS Domain Assignment**

Choose to assign a fabric interconnect pair to the profile now or later.

Choose to assign a fabric interconnect pair now or later. If you choose Assign Now, select a pair that you want to assign and click Next. If you choose Assign Later, click Next to proceed to policy selection.

Show Assigned

Domain Name	Fabric Interconnect A	Fabric Interconnect B				
Model	Serial	Bundle Version	Model	Serial	Bundle Version	
UCS-TS-MXC-P25-Was-M6-64108	UCS-FI-64108	FDO23360XX5	4.2(3e)	UCS-FI-64108	FDO23360XXY	4.2(3e)

Selected 1 of 1

Select Domain name

Step 4. In VSAN configuration of Fabric Interconnect A, click Select Policy.

**VLAN & VSAN Configuration**

Create or select a policy for the fabric interconnect pair.

**Fabric Interconnect A** 0 of 2 Policies Configured

VLAN Configuration

VSAN Configuration

**Fabric Interconnect B** 0 of 2 Policies Configured

VLAN Configuration

VSAN Configuration

Select vsan policy

Step 5. Find the VSAN policy created, select it and click Next button.

The screenshot shows the 'Create UCS Domain Profile' wizard. The left sidebar has sections for Overview, Analyze, Operate (Servers, Chassis, Fabric Interconnects, HyperFlex Clusters, Integrated Systems), Configure (Profiles, Templates, Policies, Pools), and a Command Palette. The main area shows steps 1-6. Step 3 is 'VLAN & VSAN Configuration'. On the right, under 'Fabric Interconnect A', there's a 'Select Policy' dropdown with 'vsan\_policy' selected. A red box highlights this selection.

Select vsan policy created

Step 6. Click in Select Policy in ports configuration tab.

The screenshot shows the 'Create UCS Domain Profile' wizard. The left sidebar has sections for Overview, Analyze, Operate (Servers, Chassis, Fabric Interconnects, HyperFlex Clusters, Integrated Systems), Configure (Profiles, Templates, Policies, Pools), and a Command Palette. The main area shows steps 1-6. Step 4 is 'Ports Configuration'. On the right, under 'Fabric Interconnect A', there's a 'Ports Configuration' section with a 'Select Policy' button. A red box highlights this button.

Select port policy created

Step 7. Select the port policy configured and click Select button.

**Create UCS Domain Profile**

**Ports Configuration**

Create or select a port policy for the fabric interconnect pair.

Configure ports by creating or selecting a policy.

Fabric Interconnect A Not Configured

Ports Configuration

Select Policy

Name	Device ...	Last Up...
port_Policy	UCS-FI-6454	42 minute
port_salopezc	UCS-FI-6454	Sep 18, 20
Ports-Policy-Incubs	UCS-FI-641...	Sep 13, 20
AppliancePort	UCS-FI-6454	Jul 19, 20
port_daviher3	UCS-FI-6454	Jul 6, 202
lerosale_port	UCS-FI-6454	Jun 13, 20
isuarez_portgroup	UCS-FI-641...	Jun 13, 20
port-policy_daviher3	UCS-FI-641...	Jun 13, 20
jorlagun_port	UCS-FI-641...	May 10, 20
Port-channel32	UCS-FI-6454	Feb 23, 20
Port-channel31	UCS-FI-6454	Feb 22, 20
Port-Policy-KT-HT	UCS-FI-6454	Feb 7, 202
PortPolicy-Josue	UCS-FI-6454	Feb 7, 202
DAS-Port-IMM6454	UCS-FI-6454	Jan 30, 20
Port_AntGeoSam	UCS-FI-6454	Jan 26, 20

**Select**

Select port policy created

Step 8. In network section, find the System QoS and click Select Policy.

**Create UCS Domain Profile**

**UCS Domain Configuration**

Select the compute and management policies to be associated with the fabric interconnect.

Show Attached Policies (0)

**Management** 0 of 4 Policies Configured

- NTP **Select Policy**
- Syslog **Select Policy**
- Network Connectivity **Select Policy**
- SNMP **Select Policy**

**Network** 0 of 2 Policies Configured

- System QoS \* **Select Policy**
- Switch Control **Select Policy**

**Select**

Select QoS policy

Step 9. Select Create New.

Create new QoS

Step 10. In name field, write the QoS policy name and select Next button.

Define QoS policy name

Step 11. Modify the MTU values, select the QoS priority, and select Create.

**Create System QoS**

**Policy Details**

This policy is applicable only for UCS Domains

**Configure Priorities**

- Platinum (selected)
- Gold
- Silver
- Bronze

Traffic Type	CoS	Weight	MTU
Best Effort	Any	5	1500 - 9216
Fibre Channel	3	5	2240

**Create**

Modify MTU and policy details

Step 12. Click Next.

**Edit UCS Domain Profile (domain\_Profile)**

**UCS Domain Configuration**

**Management** 0 of 4 Policies Configured

- NTP
- Syslog
- Network Connectivity
- SNMP

**Network** 1 of 2 Policies Configured

- System QoS \*
- Switch Control

**Next**

Select next

Step 13. You can find a quick summary of the UCS Domain Profile configuration. Click Deploy button.

Screenshot of the Cisco Intersight Infrastructure Service interface showing the 'Edit UCS Domain Profile (domain\_Profile)' page.

The left sidebar shows navigation categories: Overview, Analyze, Operate, Servers, Chassis, Fabric Interconnects, HyperFlex Clusters, Virtualization, Kubernetes, Integrated Systems, Configure, Profiles (selected), Templates, Policies, and Pools.

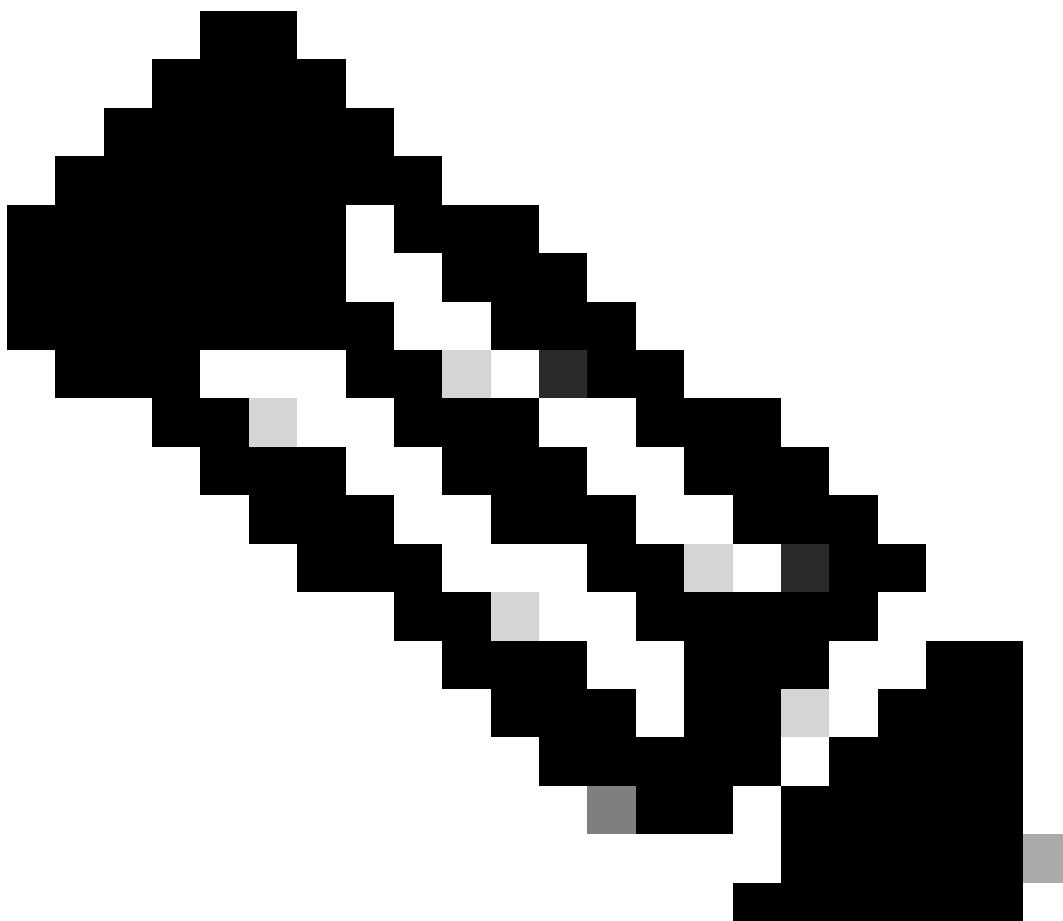
The main content area has a title 'Edit UCS Domain Profile (domain\_Profile)'. A left sidebar under 'Profiles' lists: General, UCS Domain Assignment, VLAN & VSAN Configuration, Ports Configuration, UCS Domain Configuration, and Summary.

The right panel has a 'Summary' section with a note: 'Review the UCS domain profile details, resolve configuration errors and deploy the profile.' It includes tabs: General, Ports Configuration (selected), VLAN & VSAN Configuration, UCS Domain Configuration, and Errors / Warnings.

Under 'Ports Configuration', it shows 'Fabric Interconnect A' with a 'Ports Configuration' table. The table has columns: Port, Status, Type, and State. A legend indicates: FC Uplink Port Channel (green dot) and Unconfigured (blue dot).

At the bottom right of the main panel are 'Back' and 'Deploy' buttons, with 'Deploy' being highlighted with a red box.

Deploy UCS Domain Profile



**Note:** UCS Domain Profile deployment requires the Fabric Interconnect in the domain to be

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rebooted and can result in a traffic disruption through that fabric path.

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## MDS configuration

Open an SSH session to MDS and login as a local user.

```
MDS# configure terminal
MDS(config-if)#vsan database
MDS(config-vsan-db)#vsan 8
MDS(config-vsan-db)#vsan 8 interface fc1/11-12
MDS(config)#interface fc1/11-12
MDS(config-if)#channel-group 8
MDS(config-if)#no shutdown
MDS(config-if)#exit
MDS(config)#interface port-channel 8
MDS(config-if)#switchport trunk mode on
MDS(config-if)#switchport trunk allowed vsan 8
switchport trunk allowed vsan add 1
MDS(config-if)#exit
MDS(config-if)#npv enable
```

## Verify in MDS

Useful commands:

```
MDS# show npiv status
MDS# show interface brief
MDS# show fcdomain domain-list
MDS# show flogi database
MDS# show interface port-channel <id>
MDS# show flogi database
MDS# show port-channel summary
MDS# show vsan usage
MDS# show port-channel internal event-history errors
MDS# show port-channel database
```

## Verify in UCS

Useful commands:

```
UCS# connect nxos
UCS(nx-os)# show interface brief
UCS(nx-os)# show san-portchannel summary
UCS(nx-os)# show vsan membership
UCS(nx-os)# show interface san-port-channel <id>
UCS(nx-os)# show interface fc <id>
UCS(nx-os)# show npv flogi-table
```

```
UCS(nx-os)# show vsan usage
UCS(nx-os)# show san-port-channel internal event-history errors
UCS(nx-os)# show san-port-channel database
```

## Troubleshooting

- Verify vsan allowed in both sides match
- Check fc interfaces are up
- Verify port channel status in both sides
- Make sure vsan are created in both sides
- Check port channel interfaces are configured as trunk
- Review npiv is enable
- Verify vsan membership
- Make sure interfaces are associated to a port channel
- Review which fc interfaces connected between Fabric Interconnect and MDS

## Related info

[Intersight VSAN Domain Policy configuration](#)

[Configuring Fibre Channel Interfaces](#)

[Configuring UCS Domain Profiles](#)

[Configuring Port Channels](#)