

# 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 in Fibre Channel End-Host mode managed by Intersight and a MDS 9148 with FC 16 Gb transceivers.

## Prerequisites

### Requirements

- Fabric Interconnect 64108 managed by Intersight
- MDS 9148S 16G
- Fabric Interconnect 64108 In Fibre Channel End-Host Mode connected to a MDS 9148.

### Components

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

- Fabric Interconnect 64108 in Fibre Channel End-Host Mode 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.

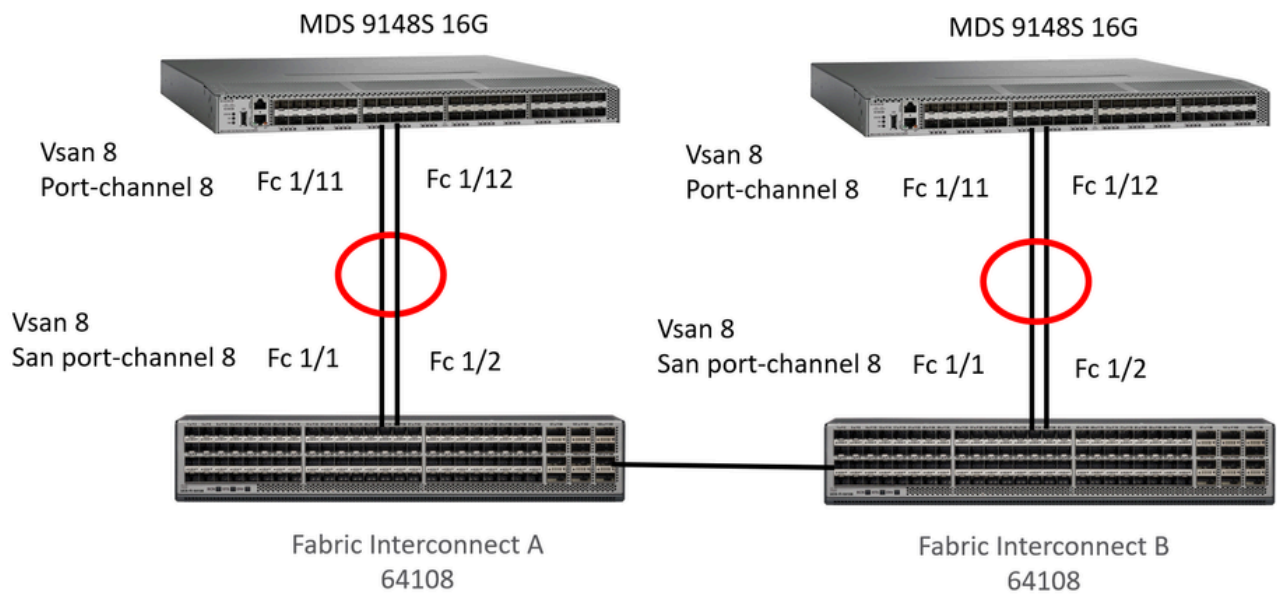
### Vsan

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

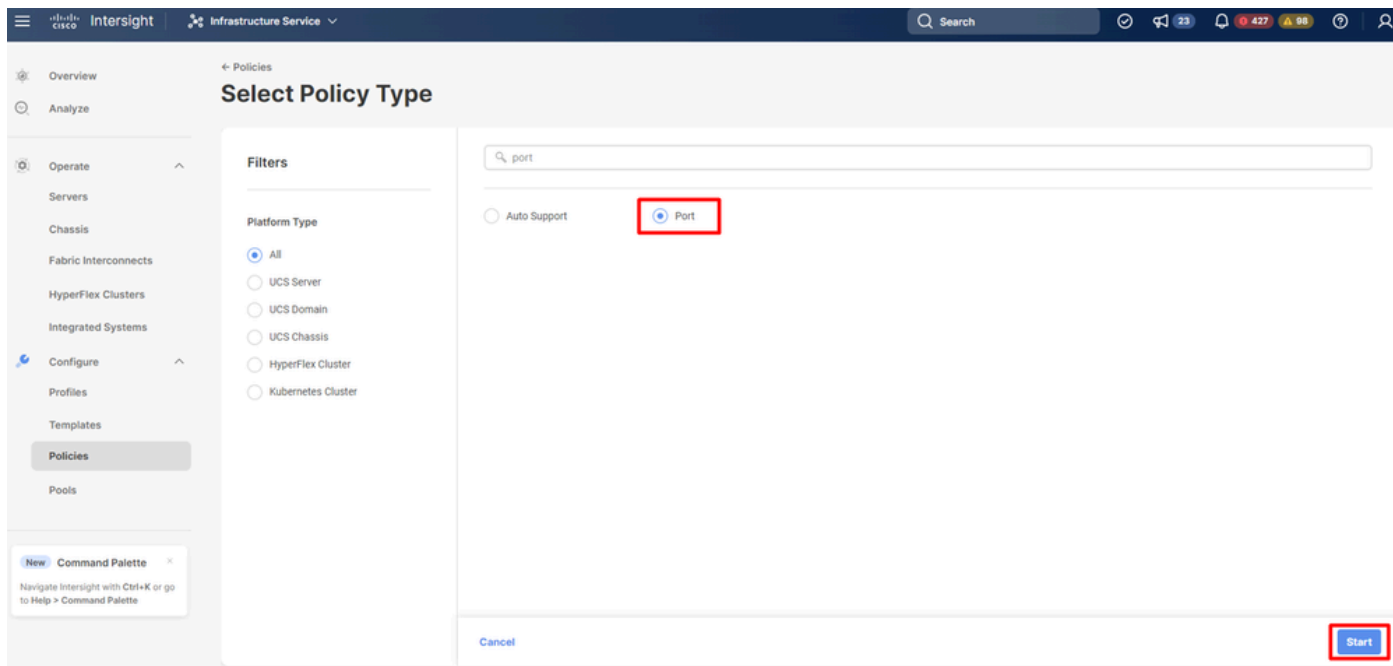
Step 1. Create a Port Policy.

The screenshot shows the Cisco Intersight Policies page. The page displays a list of policies for various platform types. The 'Create Policy' button is highlighted in the top right corner.

Name	Platform Type	Type	Usage	Last Update
.27-adapter-config-policy	UCS Server	Adapter Configura...	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	LAN Connectivity	0	Oct 31, 2022 3:11 PM
.27-network-connectivity-policy	UCS Server, UCS ...	Network Connecti...	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

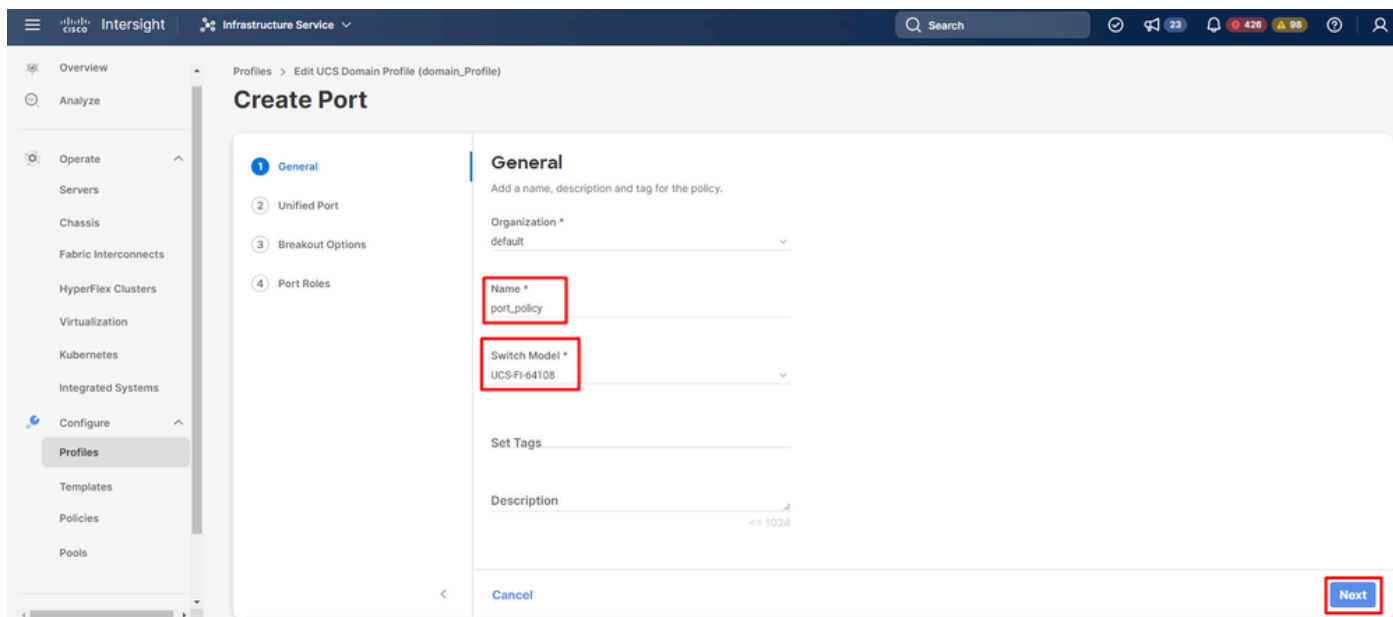
Create Port Policy

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



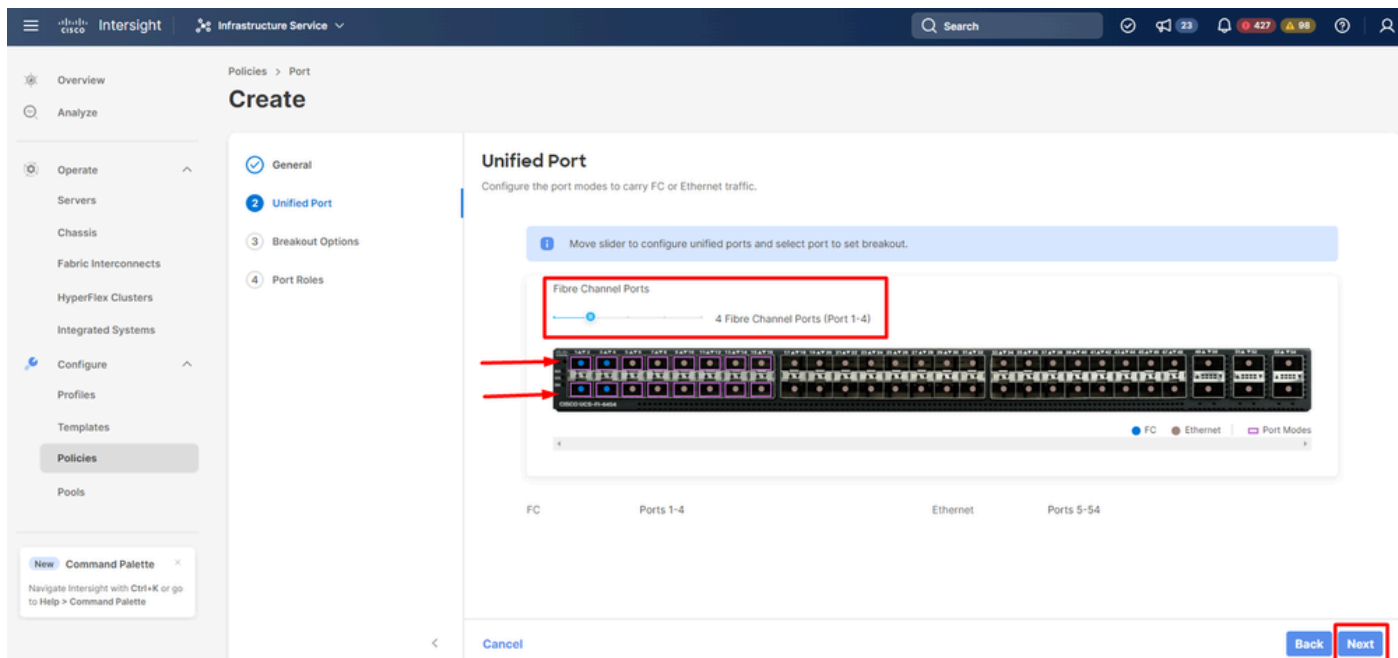
*Select port policy*

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



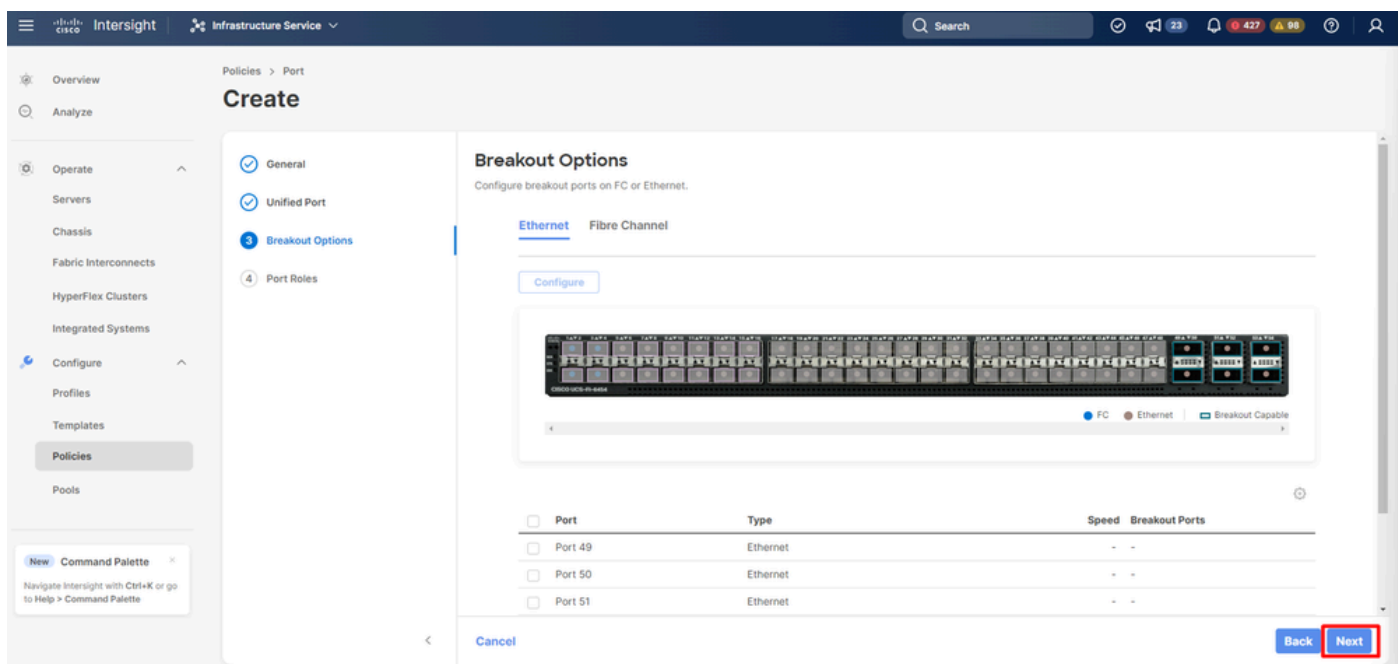
*Define port policy name and Fabric Interconnect model*

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.



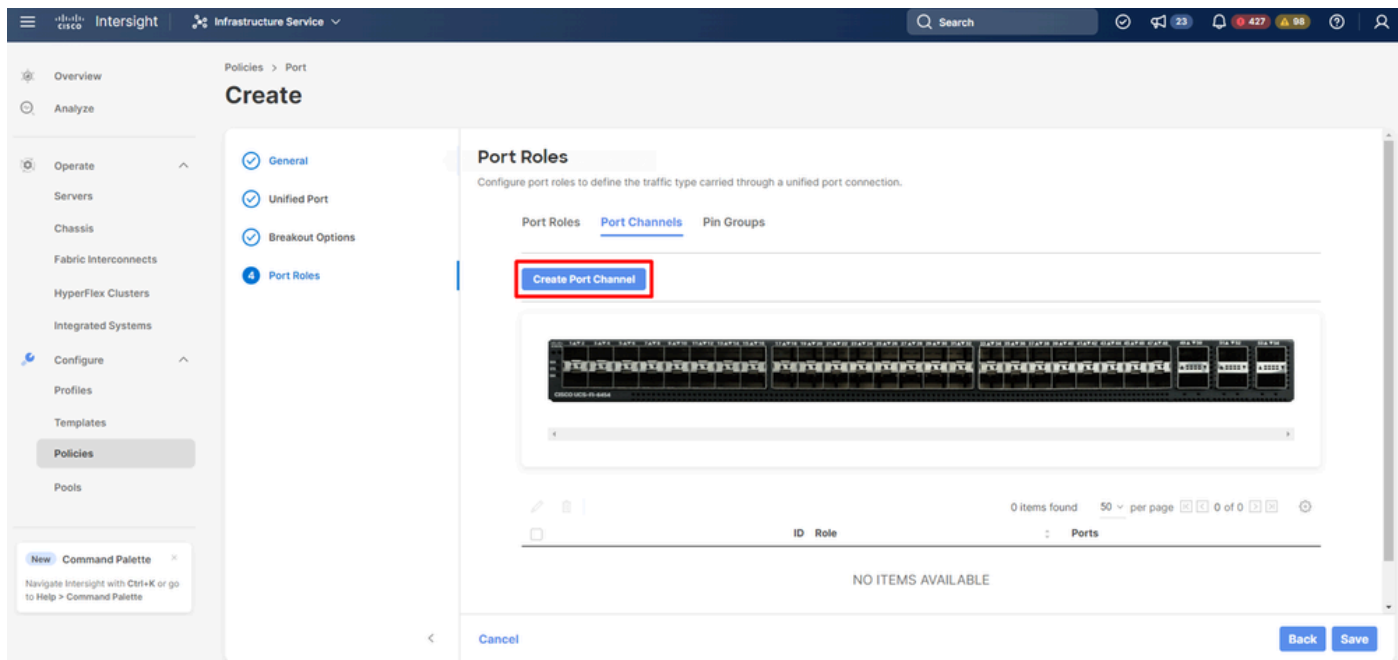
Ports selection

Step 5. Click in Next button.



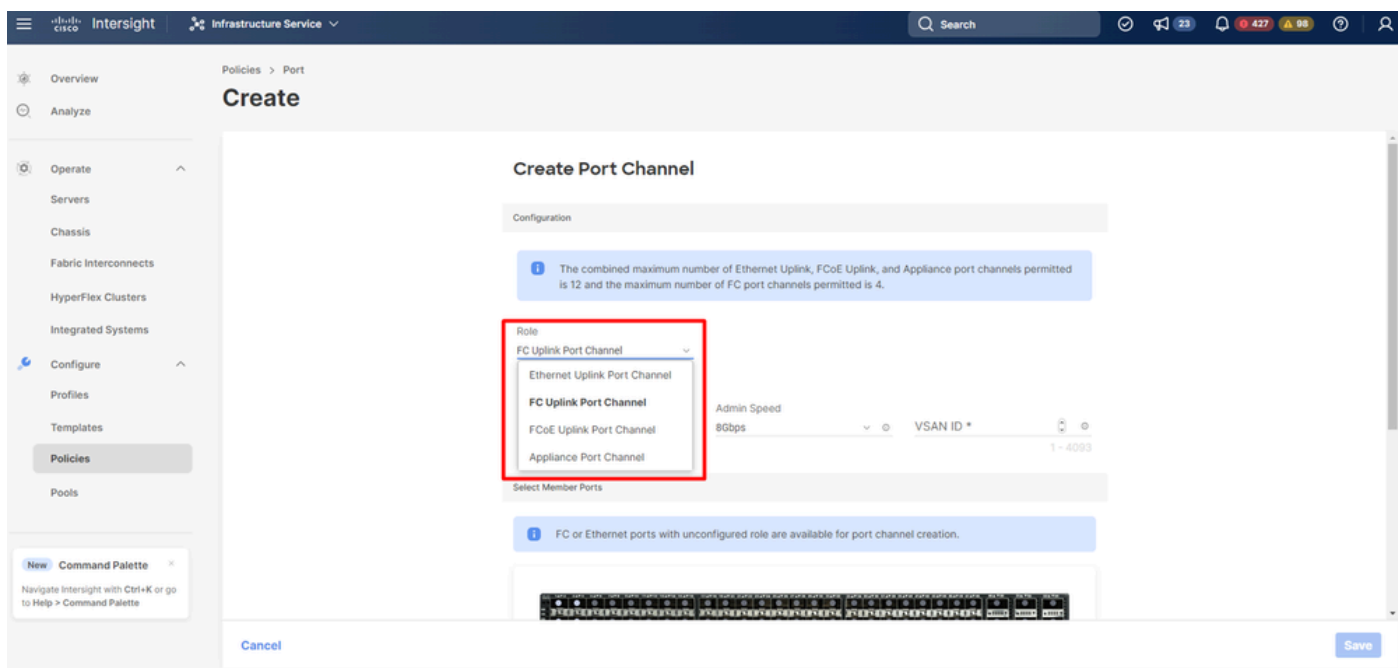
Next button

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



Create port channel

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



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 80Gbps

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.

**Create**

Select Member Ports

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

Name	Type	Role	Mode
<input checked="" type="checkbox"/> port 1	FC	Unconfigured	
<input checked="" type="checkbox"/> port 2	FC	Unconfigured	
<input type="checkbox"/> port 3	FC	Unconfigured	
<input type="checkbox"/> 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:

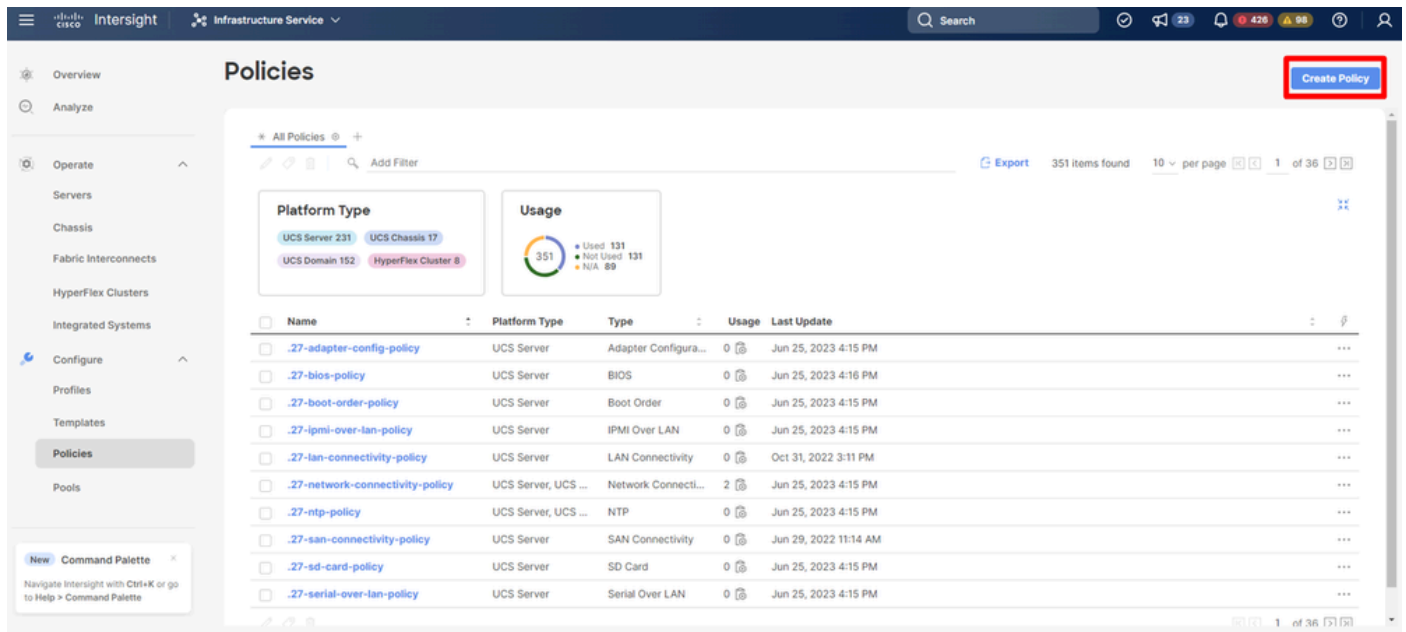
- FC Uplink—FC traffic passes through the FC uplink port. To specify the role of an FC port as an FC Uplink port the VSAN scope of the port must have been created as Storage and Uplink, or as Uplink in the VSAN Configuration policy.
- FC Storage—FC port acts as a storage port. To specify the role of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

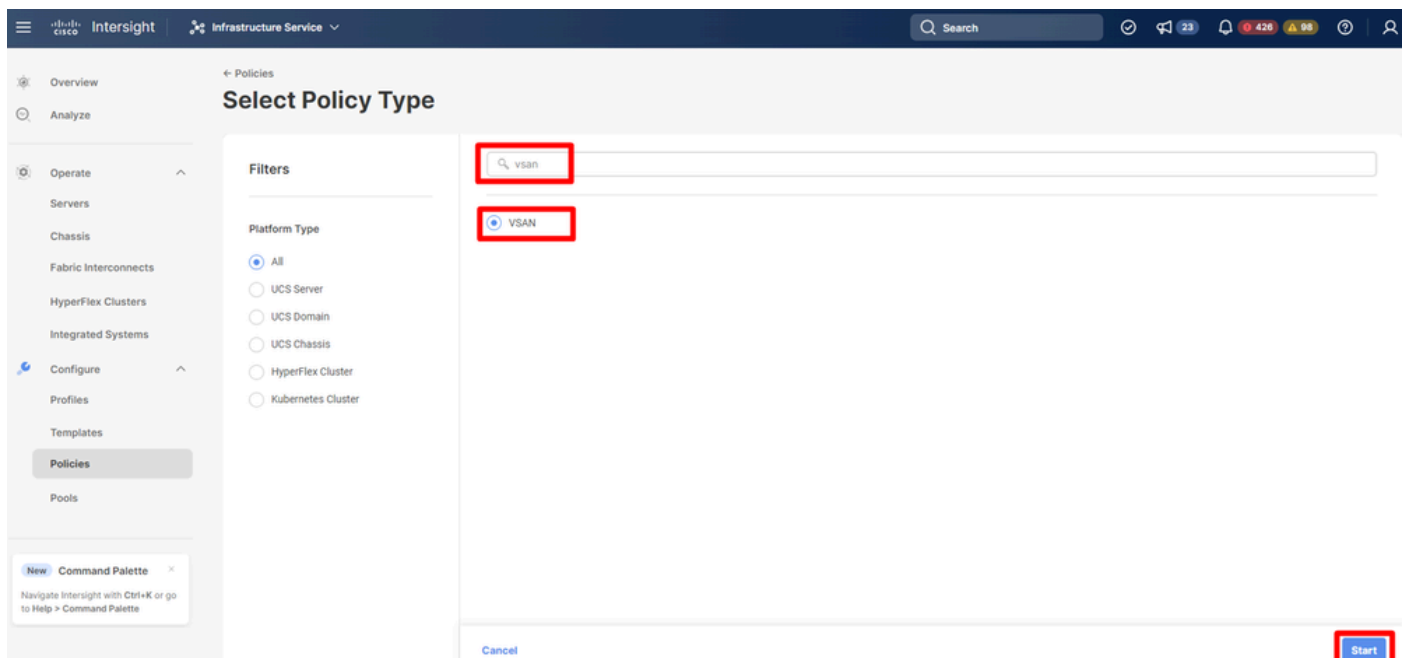
## Vsan Policy

Step 1. Select Create Policy.



Create policy

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



Select vsan

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



**Create**

1 General

2 Policy Details

**General**

Add a name, description and tag for the policy.

Organization \*  
default

Name \*  
vsan\_policy

Set Tags

Description  
≤ 1024

Cancel Next

Define vsan policy name

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

**Create**

1 General

2 Policy Details

**Policy Details**

Add policy details

This policy is applicable only for UCS Domains

Uplink Trunking

Add VSAN

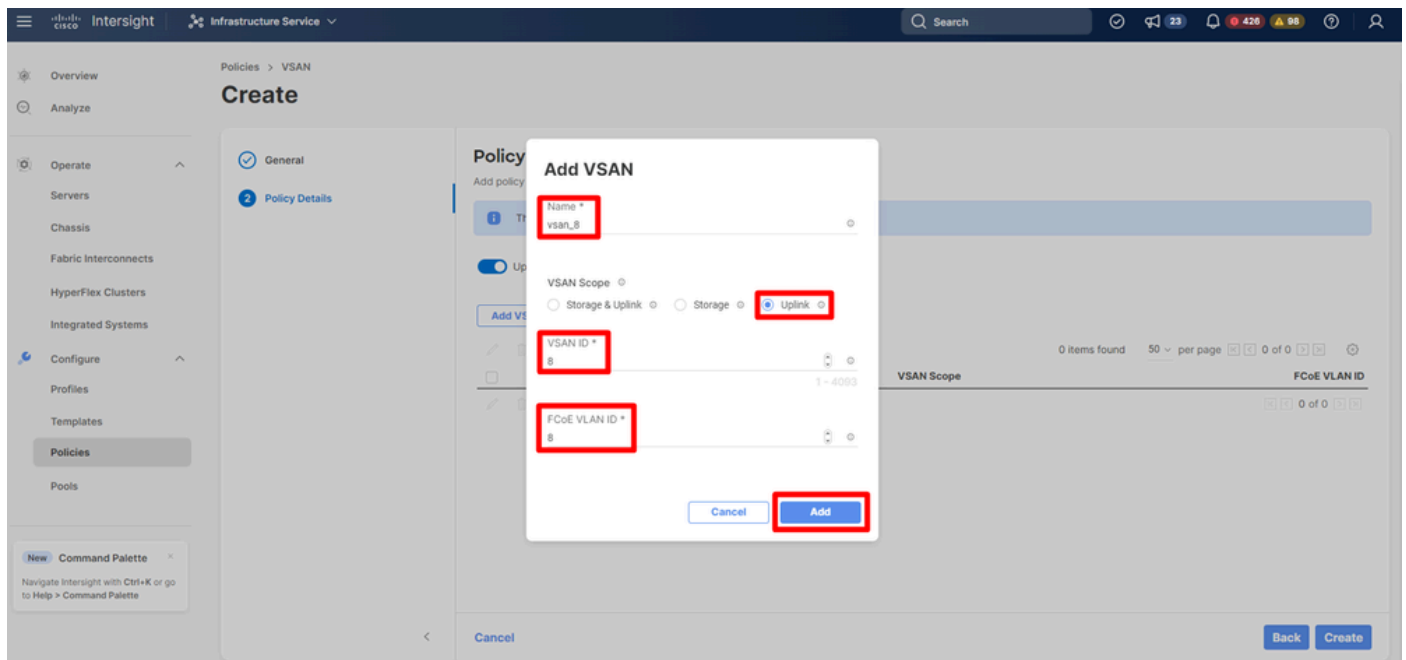
VSAN ID	Name	VSAN Scope	FCoE VLAN ID

0 items found 50 per page 0 of 0

Cancel Back Create

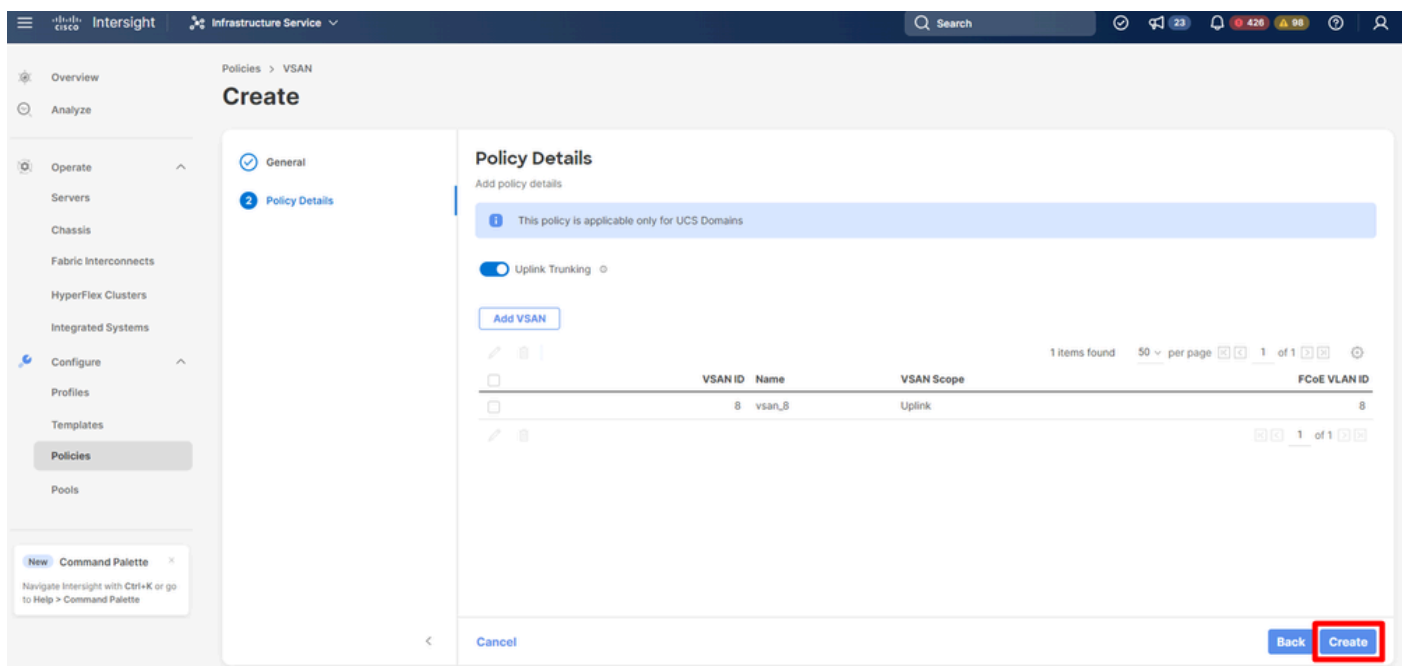
Enable trunking and add vsan

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.



Create vsan policy

## UCS Domain Policy

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

**Profiles**

HyperFlex Cluster Profiles   UCS Chassis Profiles   **UCS Domain Profiles**   UCS Server Profiles

\* All UCS Domain Pr... +

Export   39 items found   15 per page   3 of 3

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

3 of 3

Create UCS Domain Profile

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

**Create UCS Domain Profile**

1 General   2 UCS Domain Assignment   3 VLAN & VSAN Configuration   4 Ports Configuration   5 UCS Domain Configuration   6 Summary

**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.



**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.

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**Create UCS Domain Profile**

1 General  
**2 UCS Domain Assignment**  
 3 VLAN & VSAN Configuration  
 4 Ports Configuration  
 5 UCS Domain Configuration  
 6 Summary

**UCS Domain Assignment**  
 Choose to assign a fabric interconnect pair to the profile now or later.

[Assign Now](#) [Assign 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

1 items found 10 per page 1 of 1

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 [Show Selected](#) [Unselect All](#)

[Back](#) [Next](#)

Select Domain name

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

**Create UCS Domain Profile**

1 General  
 2 UCS Domain Assignment  
**3 VLAN & VSAN Configuration**  
 4 Ports Configuration  
 5 UCS Domain Configuration  
 6 Summary

**VLAN & VSAN Configuration**  
 Create or select a policy for the fabric interconnect pair.

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

VLAN Configuration [Select Policy](#)

VSAN Configuration [Select Policy](#)

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

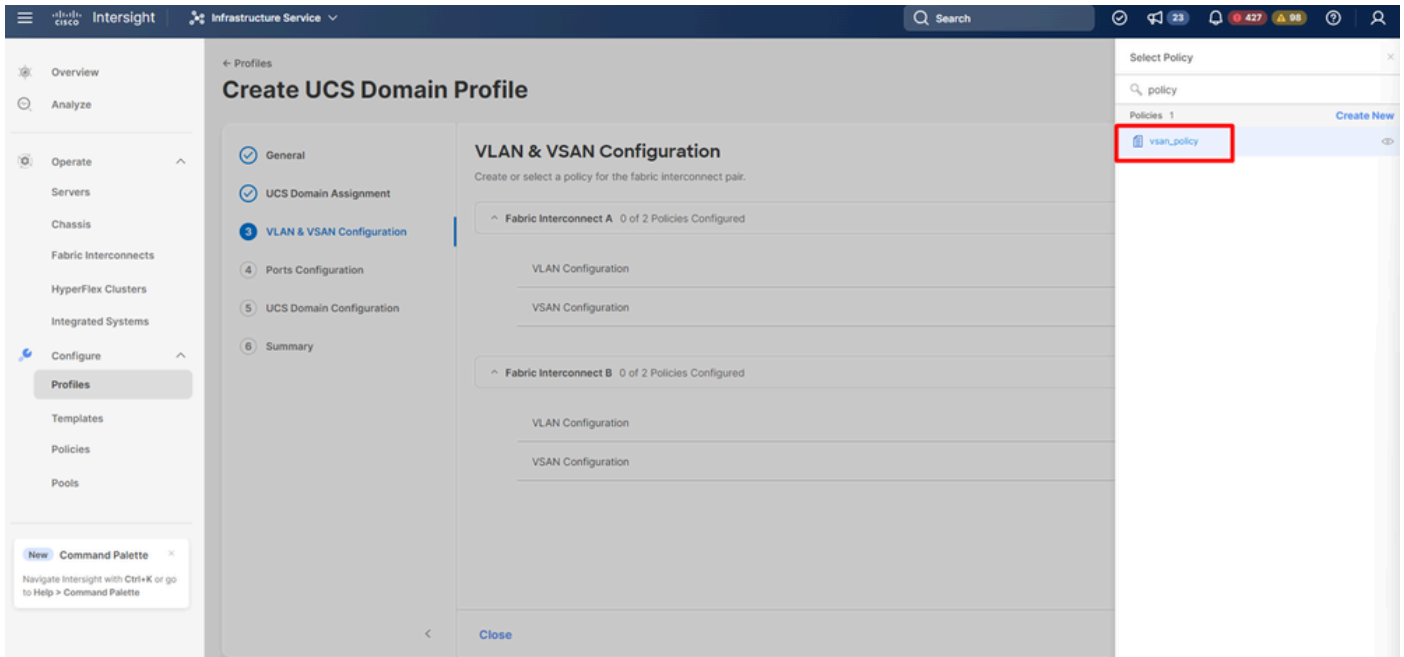
VLAN Configuration [Select Policy](#)

VSAN Configuration [Select Policy](#)

[Back](#) [Next](#)

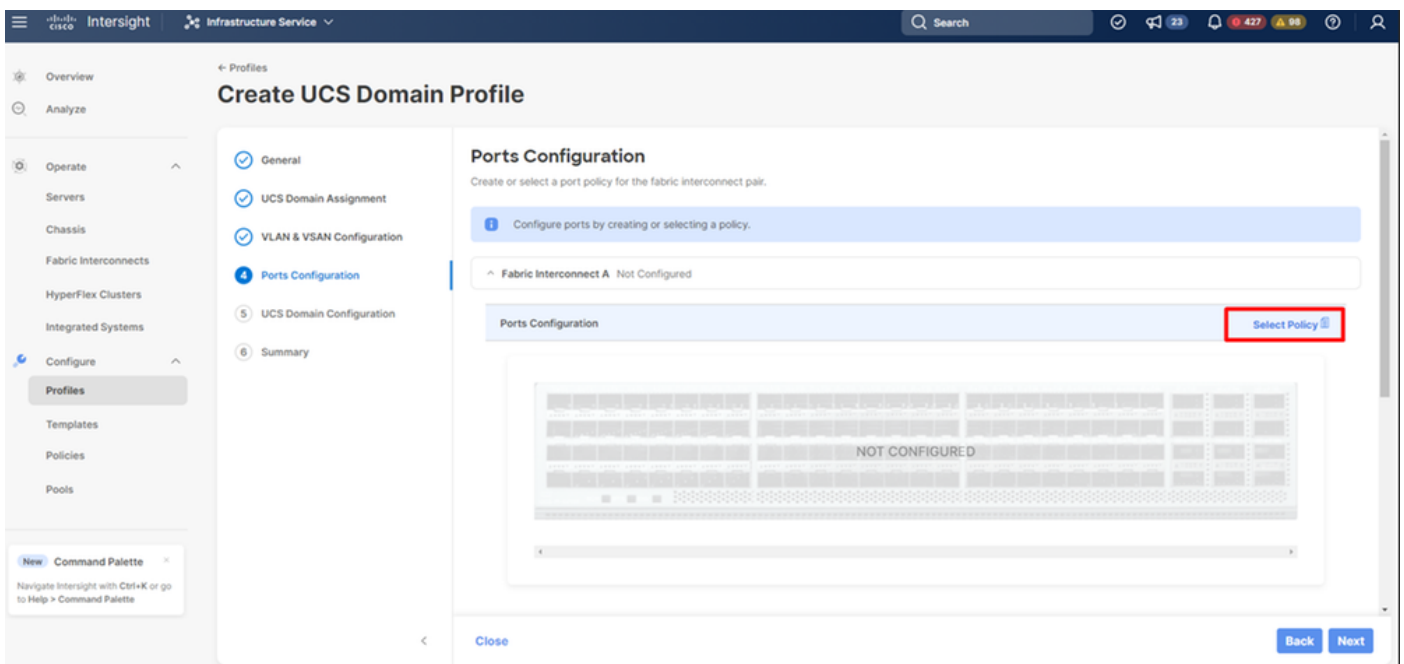
Select vsan policy

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



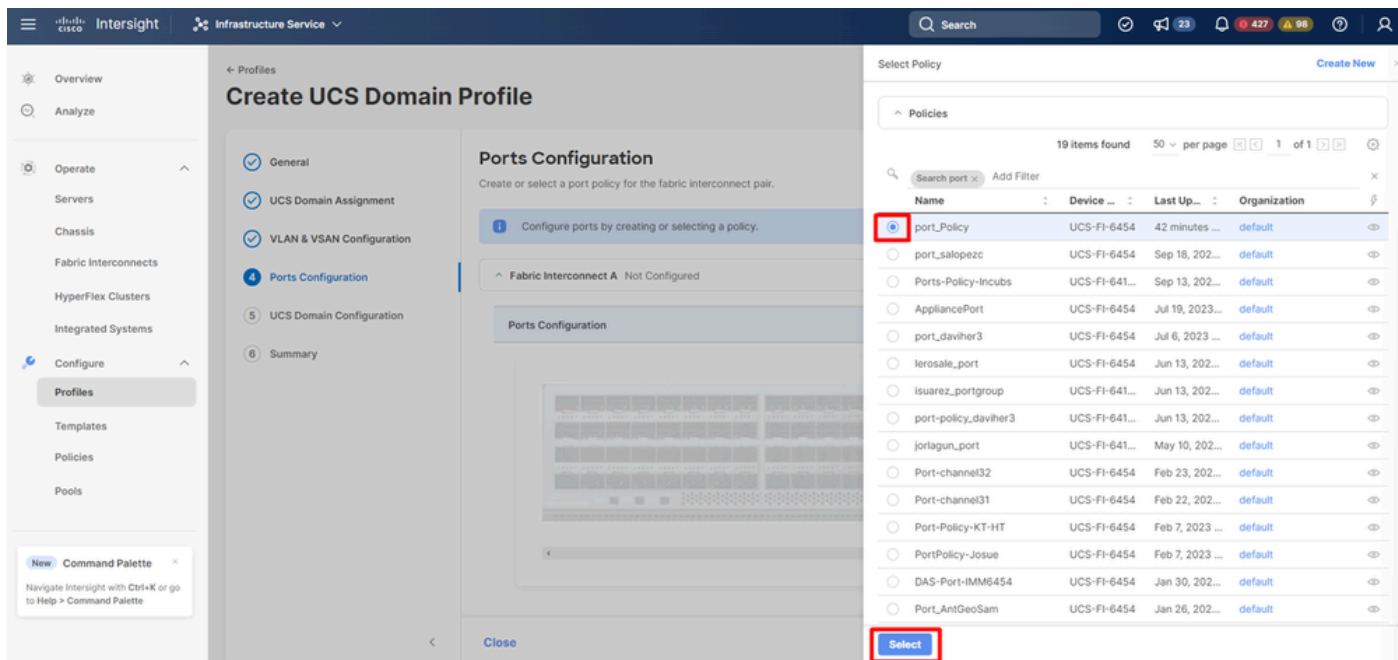
Select vsan policy created

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



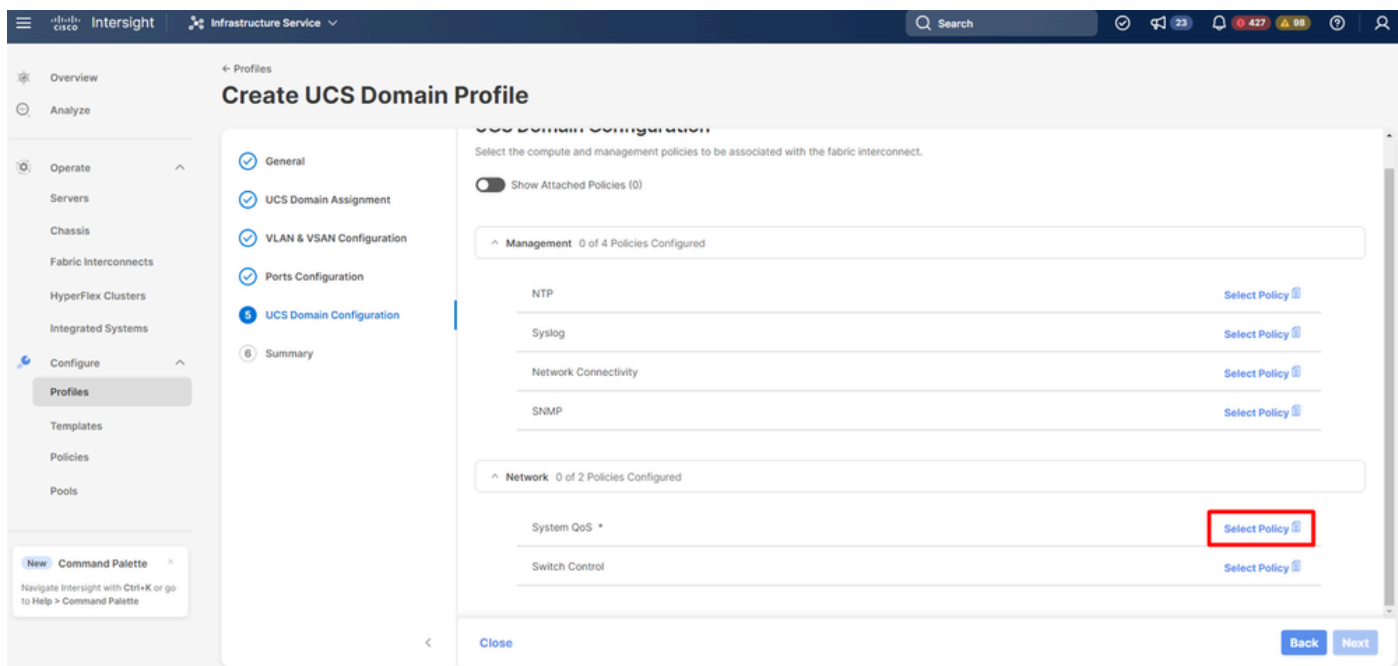
Select port policy created

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



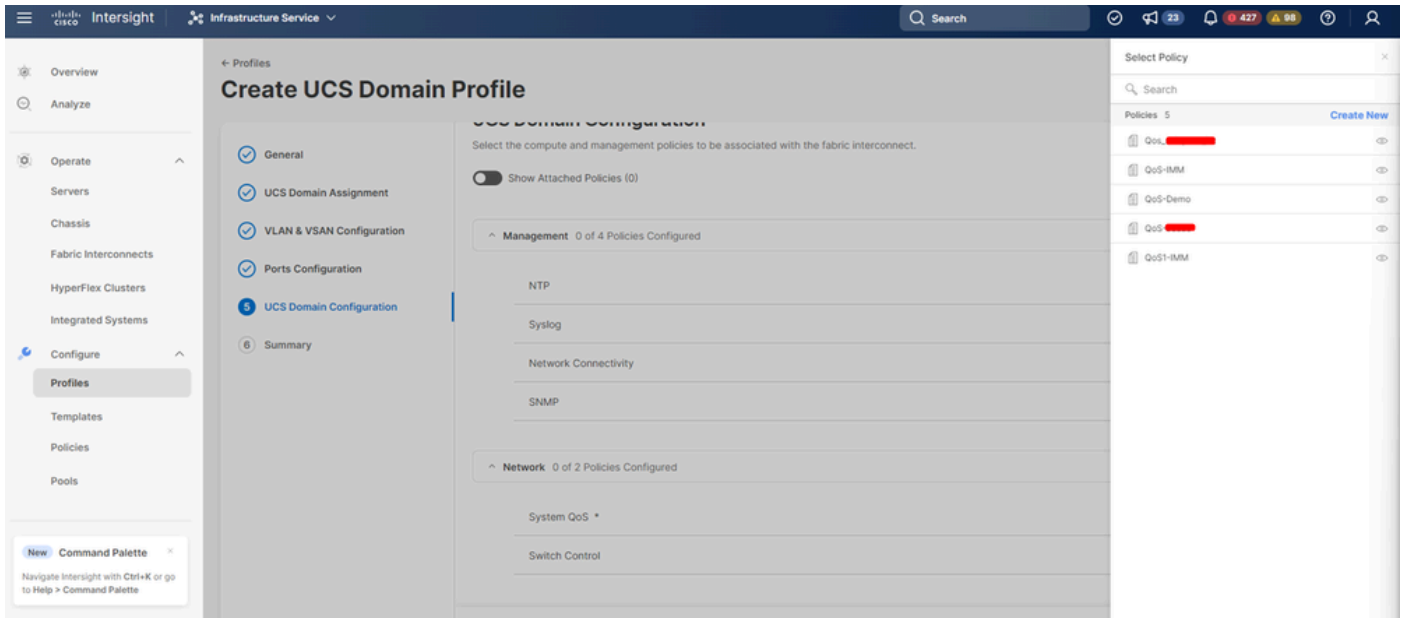
Select port policy created

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



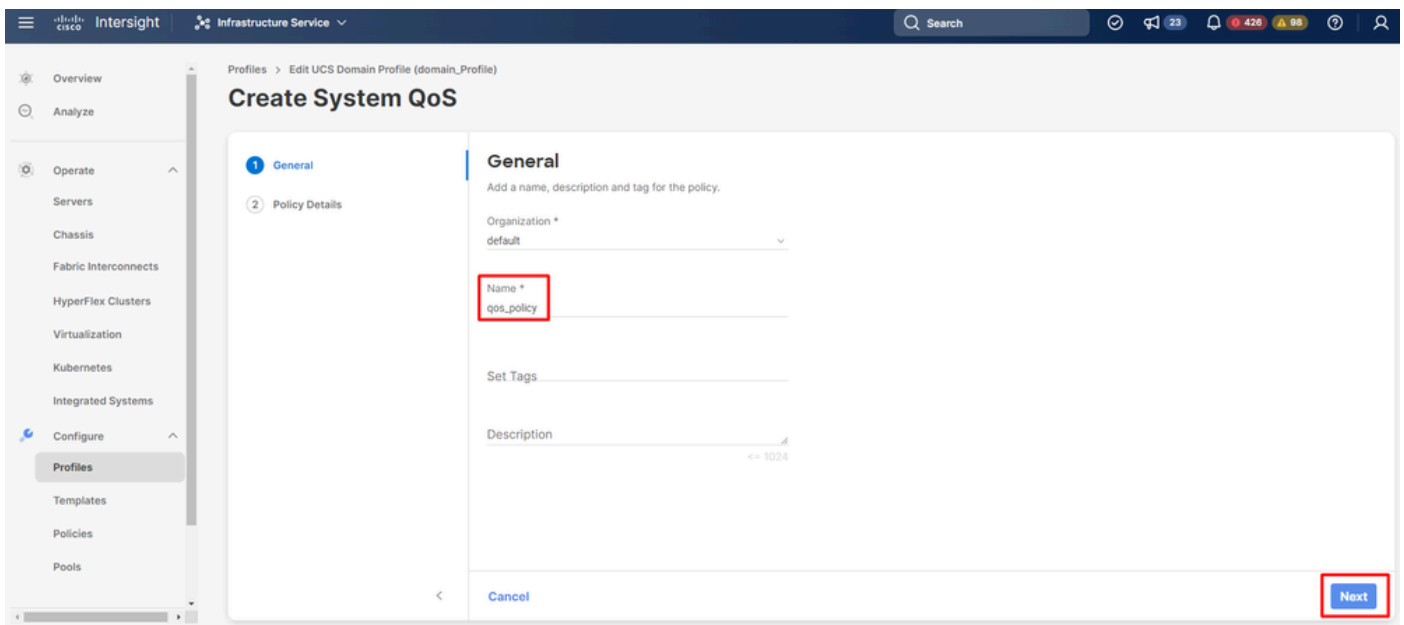
Select QoS policy

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**

Add policy details

This policy is applicable only for UCS Domains

**Configure Priorities**

- ☐ Platinum
- ☐ Gold
- ☐ Silver
- ☐ Bronze

Policy	CoS	Weight	Allow Packet Drops	MTU
Best Effort	Any	5	<input checked="" type="checkbox"/>	1500
Fibre Channel	3	5	<input type="checkbox"/>	2240

Cancel Back Create

Modify MTU and policy details

Step 12. Click Next.

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

Management: 0 of 4 Policies Configured

- NTP
- Syslog
- Network Connectivity
- SNMP

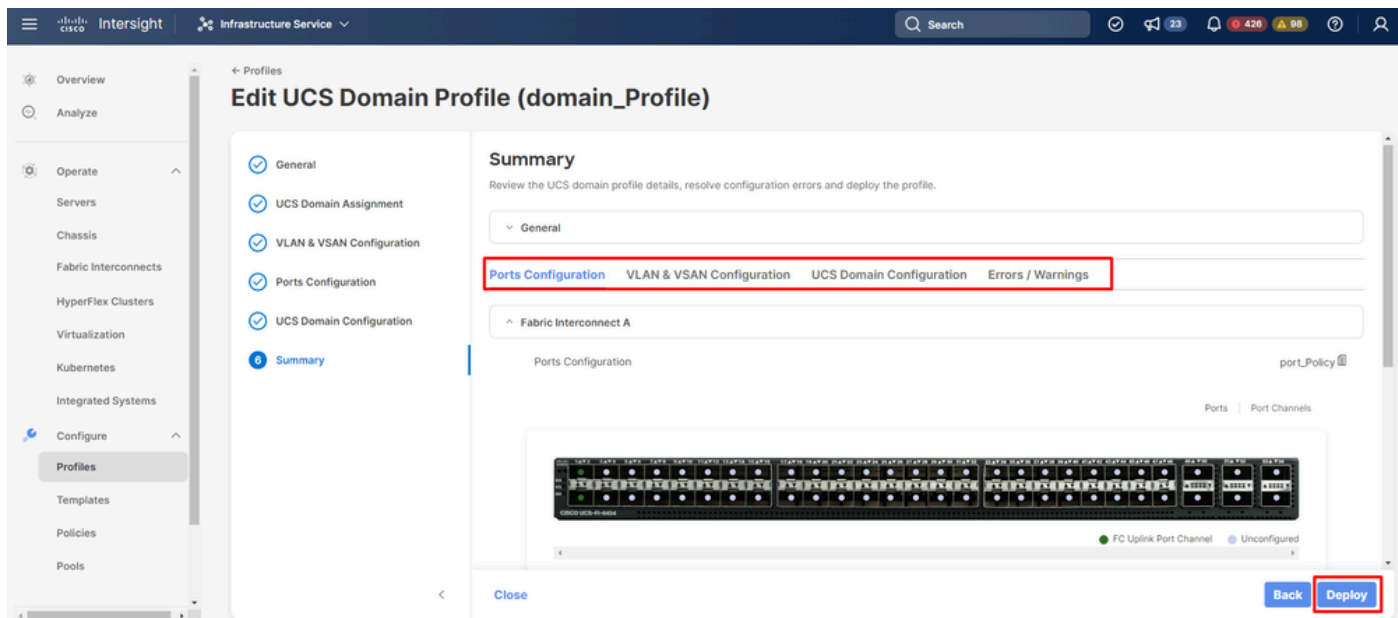
Network: 1 of 2 Policies Configured

- System QoS
- Switch Control

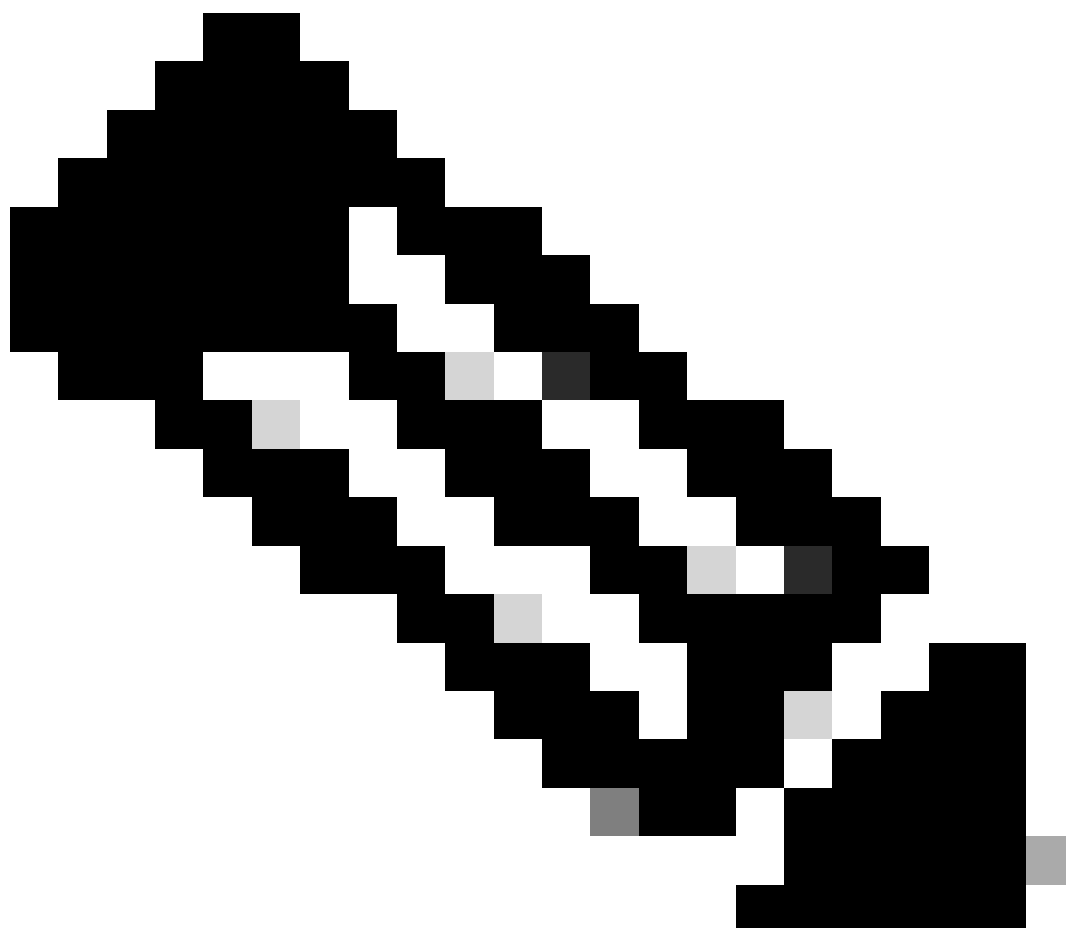
Close Back Next

Select next

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



*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)# feature npiv
MDS(config)# 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
```

## 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](#)