



Cisco UCS Director Tech Module

Cisco MDS & Nexus Data Center Switching (SAN)

Version: 1.0

September 2016

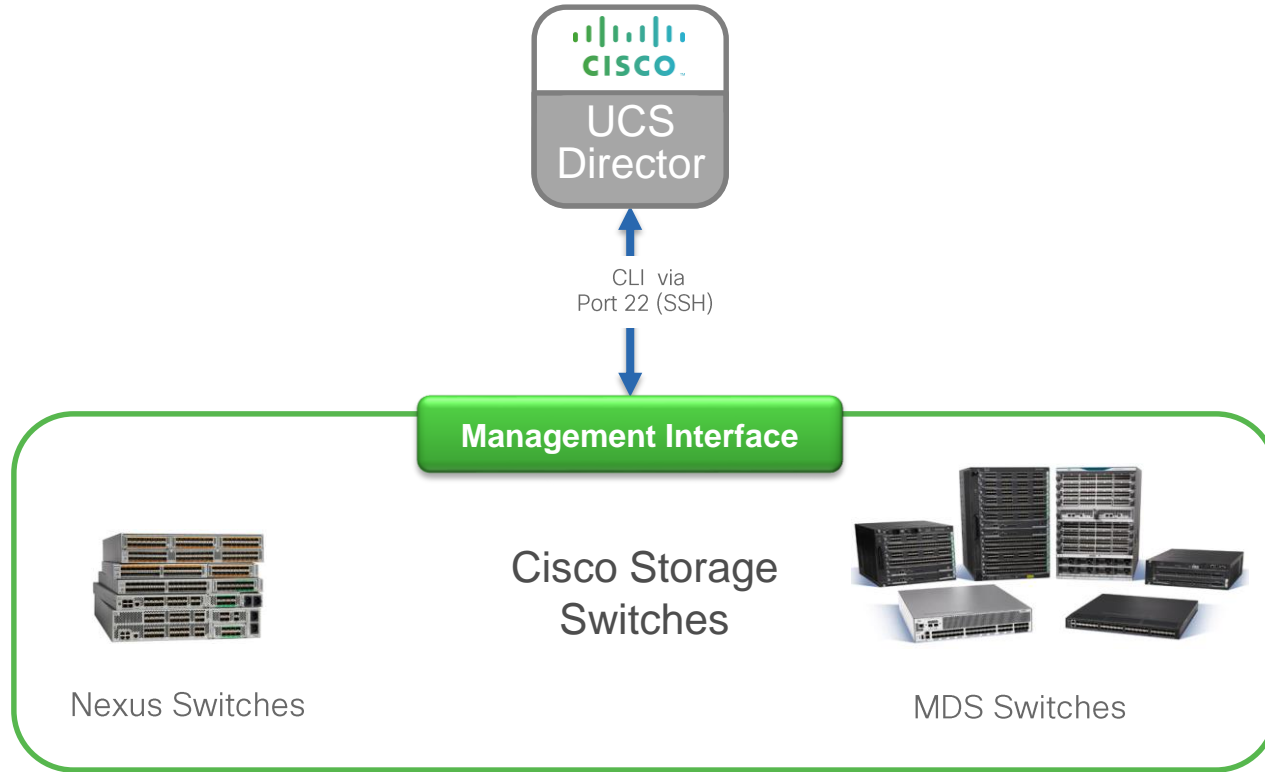
Agenda

- Overview & Architecture
- Hardware & Software Compatibility
- Licensing
- Orchestration Capabilities
- Reports
- Example Use-Cases



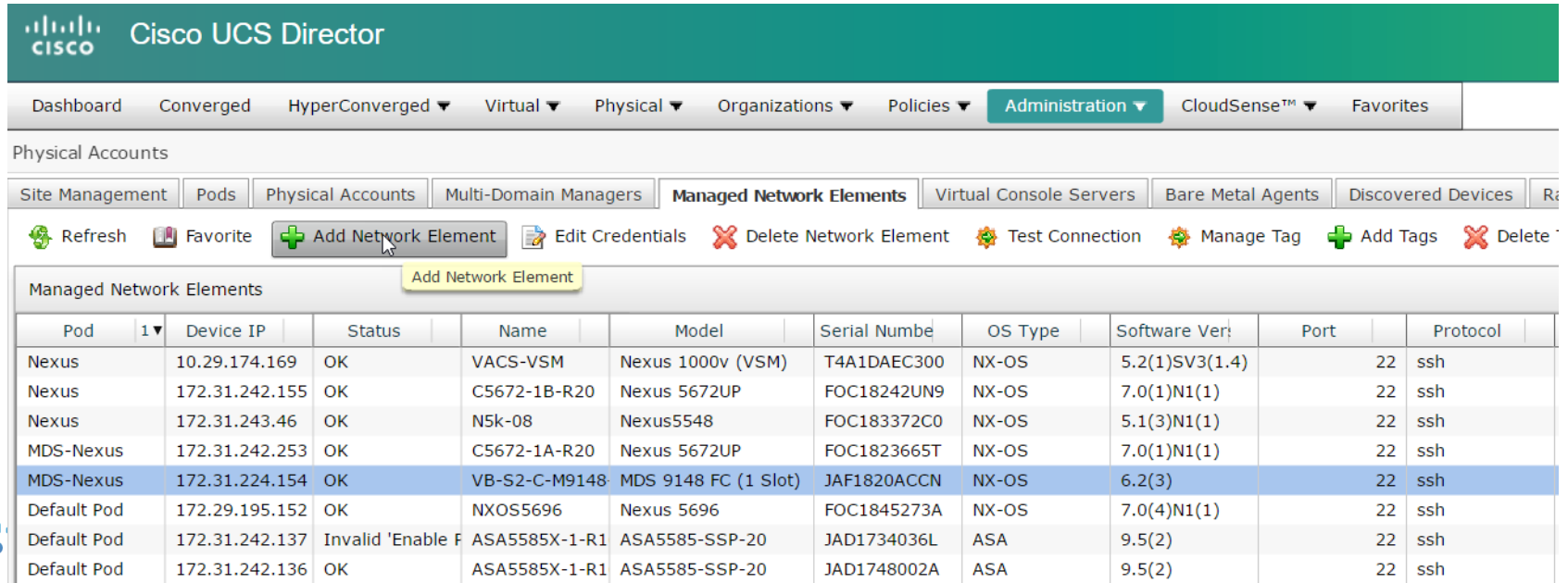
Architecture & Overview

UCS Director and SAN Switch Integration



Adding a SAN Data Center Switch

- Navigate to **Administration** → **Physical Accounts**, choose the **Managed Network Elements** tab and click **Add Network Element**



The screenshot displays the Cisco UCS Director interface. The top navigation bar includes 'Administration' and 'Physical Accounts'. The 'Managed Network Elements' tab is selected, and the 'Add Network Element' button is highlighted. Below the navigation, a table lists various network elements.

Pod	Device IP	Status	Name	Model	Serial Number	OS Type	Software Ver:	Port	Protocol
Nexus	10.29.174.169	OK	VACS-VSM	Nexus 1000v (VSM)	T4A1DAEC300	NX-OS	5.2(1)SV3(1.4)	22	ssh
Nexus	172.31.242.155	OK	C5672-1B-R20	Nexus 5672UP	FOC18242UN9	NX-OS	7.0(1)N1(1)	22	ssh
Nexus	172.31.243.46	OK	N5k-08	Nexus5548	FOC183372C0	NX-OS	5.1(3)N1(1)	22	ssh
MDS-Nexus	172.31.242.253	OK	C5672-1A-R20	Nexus 5672UP	FOC1823665T	NX-OS	7.0(1)N1(1)	22	ssh
MDS-Nexus	172.31.224.154	OK	VB-S2-C-M9148	MDS 9148 FC (1 Slot)	JAF1820ACCN	NX-OS	6.2(3)	22	ssh
Default Pod	172.29.195.152	OK	NXOS5696	Nexus 5696	FOC1845273A	NX-OS	7.0(4)N1(1)	22	ssh
Default Pod	172.31.242.137	Invalid 'Enable F	ASA5585X-1-R1	ASA5585-SSP-20	JAD1734036L	ASA	9.5(2)	22	ssh
Default Pod	172.31.242.136	OK	ASA5585X-1-R1	ASA5585-SSP-20	JAD1748002A	ASA	9.5(2)	22	ssh

Adding a SAN Switch

- Select the appropriate **Pod**, **Device Category** and **Protocol**

Serial Number	OS Type	Software Ver	Port	Protocol
R1				
R2				
R3				
T1				
J1				
J2				

Add Network Element

Pod: *

Device Category:

Device IP: *

Use Credential Policy

Protocol:

Port:

Login: *

Password: *



Hardware & Software Compatibility

IMPORTANT!!

- The following slide featuring support information may be out of date
- **ALWAYS** check the most up to date version of the UCS Director Compatibility Matrix
- The latest Compatibility Matrix and other supporting UCS Director documentation can be found at the following location:

http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/ucs-director/doc-roadmap/b_UCSDirectorDocRoadmap.html

UCS Director MDS Switch Support

(as of UCS Director 6.0)

Supported Models	Platform	Supported Software
Cisco MDS 9100 Series Data Center Fabric Switches	MDS 9124	NX-OS, Release 5.2(6b)
	MDS 9148	NX-OS, Release: 6.2(1) 6.2(7) 6.2(13a)
	MDS 9148S	NX-OS, Release 6.2(13a)
Cisco MDS 9500 Series Data Center Fabric Switches (Module level support exists, but is not listed here.)	MDS 9506	NX-OS, Release 6.2(1)
	MDS 9509	
	MDS 9513	

UCS Director MDS Switch Support Cont.

(as of UCS Director 6.0)

Supported Models	Platform	Supported Software
Cisco MDS 9700 Series Data Center Fabric Switches	MDS 9706	NX-OS, Release: •6.2(9a) •6.2(13a)
	MDS 9710	NX-OS, Release 6.2(1)
	MDS 9706	NX-OS, Release: •6.2(9a) •6.2(13a)

UCS Director Nexus 5000 Series Data Center Switch Support

(as of UCS Director 6.0)

Supported Models	Supported Software (NX-OS)
Nexus 5596Q	7.0(7)N1(1)
Nexus 5596UP Nexus 5596T	6.0(2)N2(5)
Nexus 5548UP	5.2(1)N1(4) 6.0(2)N2(5)
Nexus 5548P	5.2(1)N1(4) 5.2(1)N1(7) 5.2(1)N1(8b) 5.2(1)N1(9) 6.0(2)N2(5)
Nexus 5696Q	7.1(1)N1(1) 7.2(1)N1(1)

Supported Models	Supported Software (NX-OS)
Nexus 5672UP	7.0(1) 7.2(1)N1(1)
Nexus C5624Q	7.1(1)N1(1) 7.2(1)N1(1)
Nexus 5648Q	7.1(1)N1(1) 7.1(2)N1(1)
Nexus 56128P	7.1(1)N1(1)

UCS Director Nexus 6000 Series Data Center Switch Support (as of UCS Director 6.0)

Supported Models	Supported Software (NX-OS)
Nexus 6001-64P	6.0(2)N1(2) 7.0(1)N1(1)

UCS Director Nexus 7000 Series Data Center Switch Support (as of UCS Director 6.0)

Supported Models	Supported Software (NX-OS)
Nexus 7702 Nexus 7706 Nexus 7710 Nexus 7718	6.2(8a)
Nexus 7004 Nexus 7009 Nexus 7018	6.2(8a)
Nexus 7010	6.2(8a) 6.2(12) 6.2(14)
Supervisors	6.1(3)

Supported Models	Supported Software (NX-OS)
Supervisor 2E Supervisor 2	6.1(2)
Supervisor 1	6.2(2) 6.2(2a) 6.2(12) 6.2(14)

F-Series I/O Modules	
N7K-F132XP-15 N7K-F248XP-25	N7K-F248XP-25E N7K-F248XT-25E

UCS Director Nexus 9000 Series Data Center Switch Support

(as of UCS Director 6.0)

Supported Models	Supported Software (NX-OS)
Nexus 9136PX	6.1(2)I2(1) 7.0(3)I2(2a)
Nexus 9508	6.1(2)I2(2)
Nexus 9504	7.0(3)I1(2) 7.0(3)I2(2a)
Nexus C9516	7.0(3)I1(1) 7.0(3)I2(2a)
Nexus 9372TX	6.1(2)I3(1)
Nexus 9396TX	6.1(2)I3(1) 7.0(3)I1(2)

Supported Models	Supported Software (NX-OS)
Nexus 9332PQ	7.0(3)I1(1)
Nexus 9372PX	6.1(2)I3(1) 7.0(3)I2(2a)
Nexus 93120	7.0(3)I2(2)
Nexus 93128	7.0(3)I2(1a) 7.0(3)I2(2d)

****All versions pertain to Nexus 9000 switches running in standalone (non-ACI) mode only**

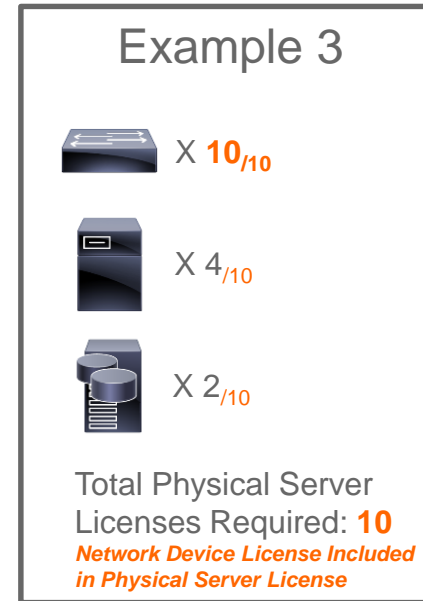
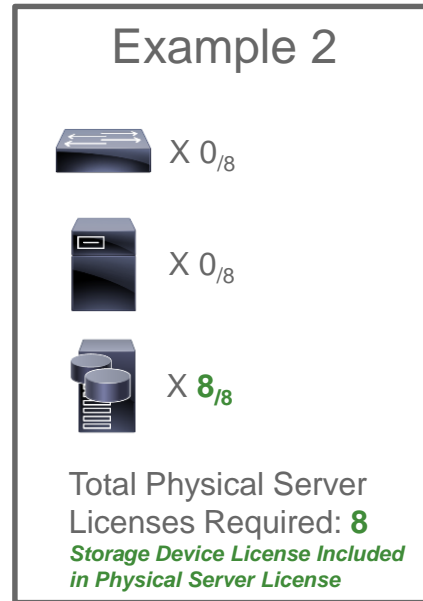
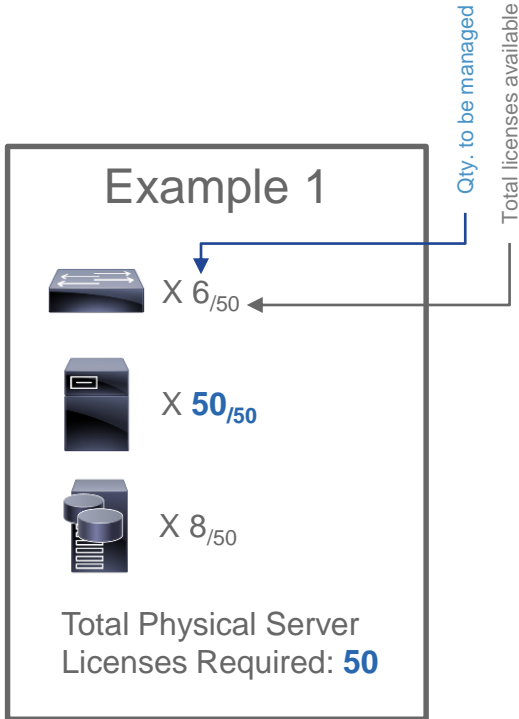


Licensing

Licensing Information

- UCS Director licensing is purchased solely in the form of physical server licenses
- Each physical server license includes a storage device license and a network device license as well
- UCS Director tracks the number of physical servers, storage and network devices being managed against the number of installed licenses
- If additional storage and/or network device licenses are required, you can purchase additional physical server licenses
- Each physical network device (switch) will consume a network device license
- Standalone VSM or VSM HA will require only 1 network device license for UCS Director to manage
- Enabling the VXLAN feature in UCS Director doesn't need any license as base license includes all the features

Licensing Examples





Orchestration Capabilities

Orchestration Capabilities

VSAN Tasks:

- Create VSAN
- Associate VSAN to VLAN
- UnAssociate VSAN from VLAN

Alias Tasks:

- Delete Device Alias
- Create Device FC Alias
- Update Device FC Alias
- Delete Device FC Alias
- Create Device Alias

VFC Tasks:

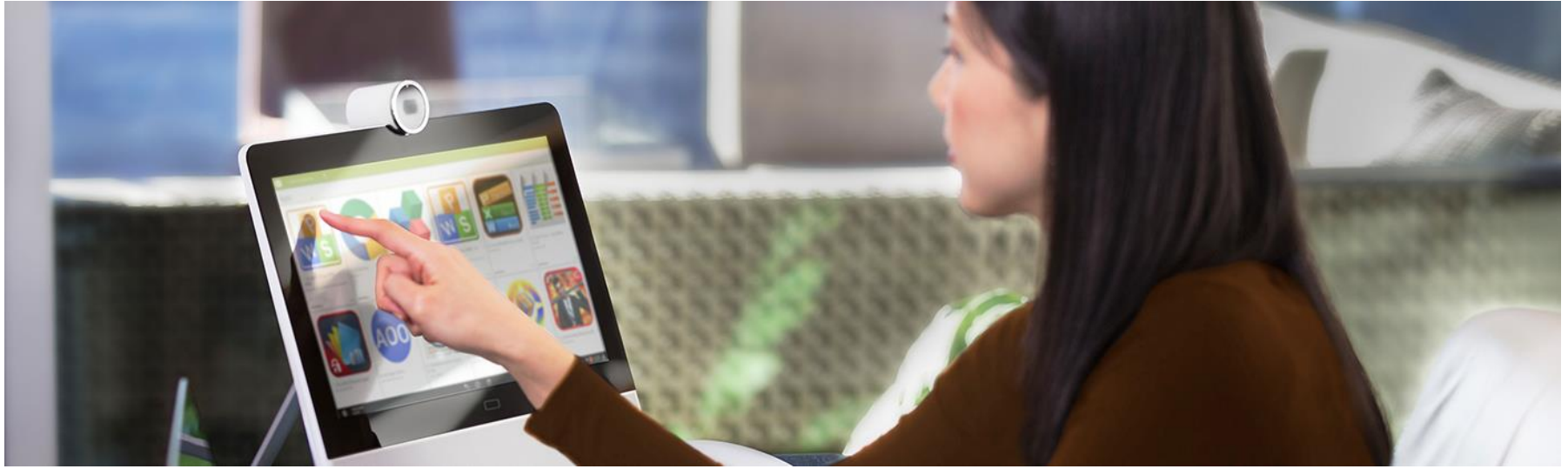
- Create VFC Interface
- Associate VFC Interface
- Delete VFC Interface

Zoning Tasks:

- Configure SAN Zoning
- Delete SAN Zone
- Enable SmartZone
- Assign FC Port to VSAN
- Create SAN Zone
- Convert To Smart Zone
- Create SAN Zone Set
- Delete SAN Zone Set
- Add SAN Zone to Zone Set
- Add Member To SAN Zone
- Remove Member From SAN Zone
- Activate SAN Zone Set
- Remove San Zone From Zone Set
- Generic Configure SAN Zoning



Note: Switch Storage tasks are embedded in Cisco Network tasks (in Task Library)



Reports

Tabular Reports and Information

- UCS Director discovers MDS/Nexus switches configuration through an inventory process and provides the below reports
- Depending upon the capability of the platform, UCSD will show specific parameters. Common storage parameters across platform are listed below:
 - Features
 - SAN Zones
 - SAN Zonesets
 - FCNS Database
 - Fabric Login
 - Device Alias
 - FC Alias
 - VSANs
 - Modules
 - Licenses
 - Interfaces
 - L2 Interfaces
 - VLANs
 - Configuration
 - Modules
 - Summary

Tabular Reports and Information

MDS

Network for VB-S2-C-M9148-1



- ▼ Vegas DataCenter
 - POD11
- ▼ Networking
 - ▶ Nexus
- ▼ Storage
 - ▼ MDS-Nexus
 - C5672-1A-R20
 - VB-S2-C-M9148-1**
- ▼ Unassigned Pods
 - ▶ Default Pod
- ▼ Multi-Domain Managers
 - ▶ APIC Accounts

Refresh Create VFC Associate VFC

Overview	
Pod	MDS-Nexus
Device IP	172.31.224.154
Device ID	9
Status	OK
Last Inventory Time	09/07/2016 14:11:51 GMT-0
Model	MDS 9148 FC (1 Slot)
OS Type	NX-OS
Software Version	6.2(3)

High Availability	
Administrative Role	
Operational Role	
Administrative Mode	
Operational Mode	

- Summary
- Licenses
- Configurations
- Modules
- L2 Neighbors
- Interfaces
- Port Capabilities
- VLANs
- Features
- SAN Zones
- SAN Zonesets
- FCNS Database
- Fabric Login
- Device Alias
- FCAlias
- VSANs
- QOS Class Maps
- QOS Policy Maps
- Service Request Details

Tabular Reports and Information

Nexus 5000

Network for C5672-1A-R20

Refresh Configure PVST Configure STP Port Configure MST Configure MST Instance Create VFC

Overview	
Pod	MDS-Nexus
Device IP	172.31.242.253
Device ID	3
Status	OK
Last Inventory Time	09/07/2016 14:13:01 GMT-0
Model	Nexus 5672UP
OS Type	NX-OS
Software Version	7.0(1)N1(1)

High Availability	
Administrative Role	
Operational Role	
Administrative Mode	
Operational Mode	

- Port Capabilities
- VLANs
- Private VLANs
- Port Profiles
- SXP Connection Peers
- HSRP
- VPC Info
- VTP Status
- Features
- MAC Address Table
- MAC Address Table Configuration
- SAN Zones
- SAN Zonesets
- FCNS Database
- Fabric Login
- Device Alias
- FCAlias
- VSANs
- QOS Class Maps
- QOS Policy Maps
- Service Request Details

- Vegas DataCenter
 - POD11
- Networking
 - Nexus
- Storage
 - MDS-Nexus
 - C5672-1A-R20
 - VB-S2-C-M9148-1
- Unassigned Pods
 - Default Pod
- Multi-Domain Managers
 - APIC Accounts



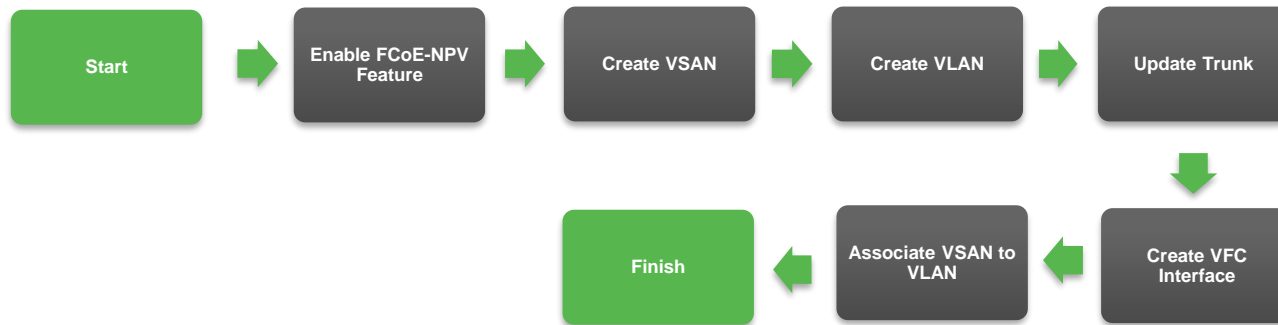
Example Use-Cases

Example Use-Cases

- Use-Case #1: Create VSAN, VFC Interface on Nexus 5000
- Use-Case #2: Create VSAN, and SAN Zoning on MDS Switch

Use Case # 1

- UCSD configures FCoE NPV functionality on Nexus switches.
- In this workflow UCSD enables FCoE NPV Feature, configures VSAN, VLAN, maps VSAN to VLAN, Creates VFC interface and binds it to Ethernet Interface, and updates VLAN on Ethernet interface



- Workflow can be downloaded from the UCS Director community site <https://communities.cisco.com/docs/DOC-69601>

Use Case # 1

The actual workflow for this use case is as shown below:



Use Case # 1

Execute the workflow and provide the requested user inputs

The screenshot shows a dialog box titled "Executing Workflow: N5k-VSAN-VFC". Inside the dialog, there is a "Workflow Version:" section with a dropdown menu set to "0 (default version)". Below this are four input fields, each with a red asterisk indicating a required field:

- VSAN ID:** A text input field containing "2000". A blue callout box labeled "Provide VSAN ID" has an arrow pointing to this field.
- VFC ID:** A text input field containing "20". A blue callout box labeled "Provide VFC ID" has an arrow pointing to this field.
- VLAN ID:** A text input field containing "200". A blue callout box labeled "Provide VLAN ID" has an arrow pointing to this field.
- Interface:** A dropdown menu with "Select..." and "Ethernet1/10" (with a red asterisk). A blue callout box labeled "Select Nexus Port" has an arrow pointing to the dropdown.

At the bottom of the dialog are "Submit" and "Close" buttons.

Use Case # 1

Service Request completion and Nexus Verification

Workflow Status Log Objects Created and Modified Input/Output

Service Request

Status Refresh

▼ Overview Current status for the service request.

Request ID	8	1	Initiated by admin	09/15/2016 13:54:29
Request Type	Admin Workflow	2	Configure Feature	09/15/2016 13:54:37
Workflow Name	N5k-VSAN-VFC	3	Create VSAN	09/15/2016 13:54:46
Workflow Version Label	0	4	Create VLAN	09/15/2016 13:54:52
Request Time	09/15/2016 13:54:26 GMT-0700	5	Update Trunk	09/15/2016 13:55:09
Request Status	Complete	6	Create VFC Interface	09/15/2016 13:55:27
Comments		7	Associate Vsan to Vlan Completed action	09/15/2016 13:55:44
Ownership		8	Complete Completed successfully.	09/15/2016 13:55:44
Initiating User	admin			

Close

```
172.31.242.253 - PuTTY
C5672-1A-R20#
C5672-1A-R20# show run int vfc20

!Command: show running-config interface vfc20
!Time: Mon Mar 10 10:15:45 2003

version 7.0(1)N1(1)

interface vfc20
  bind interface Ethernet1/10
  no shutdown

C5672-1A-R20# show vsan
vsan 1 information
  name:VSAN0001 state:active
  interoperability mode:default
  loadbalancing:src-id/dst-id/oxid
  operational state:down

vsan 2000 information
  name:VFC state:active
  interoperability mode:default
  loadbalancing:src-id/dst-id/oxid
  operational state:down

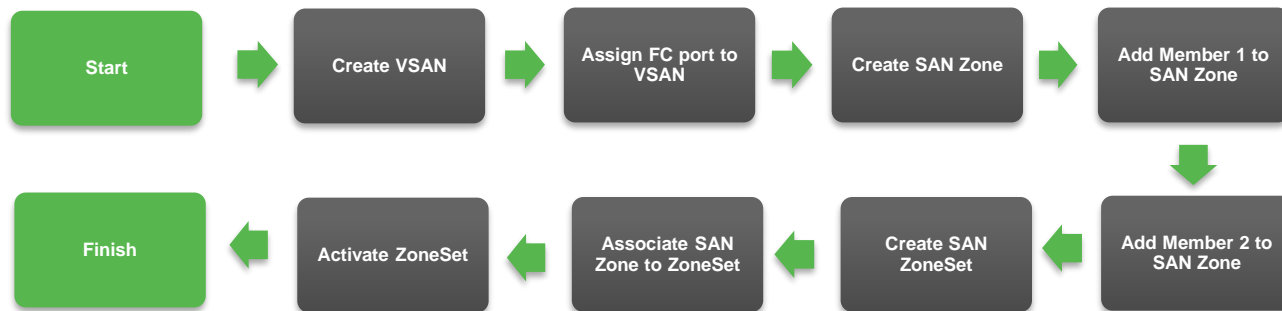
vsan 4079:evfp_isolated_vsan

vsan 4094:isolated_vsan

C5672-1A-R20#
```


Use Case # 2

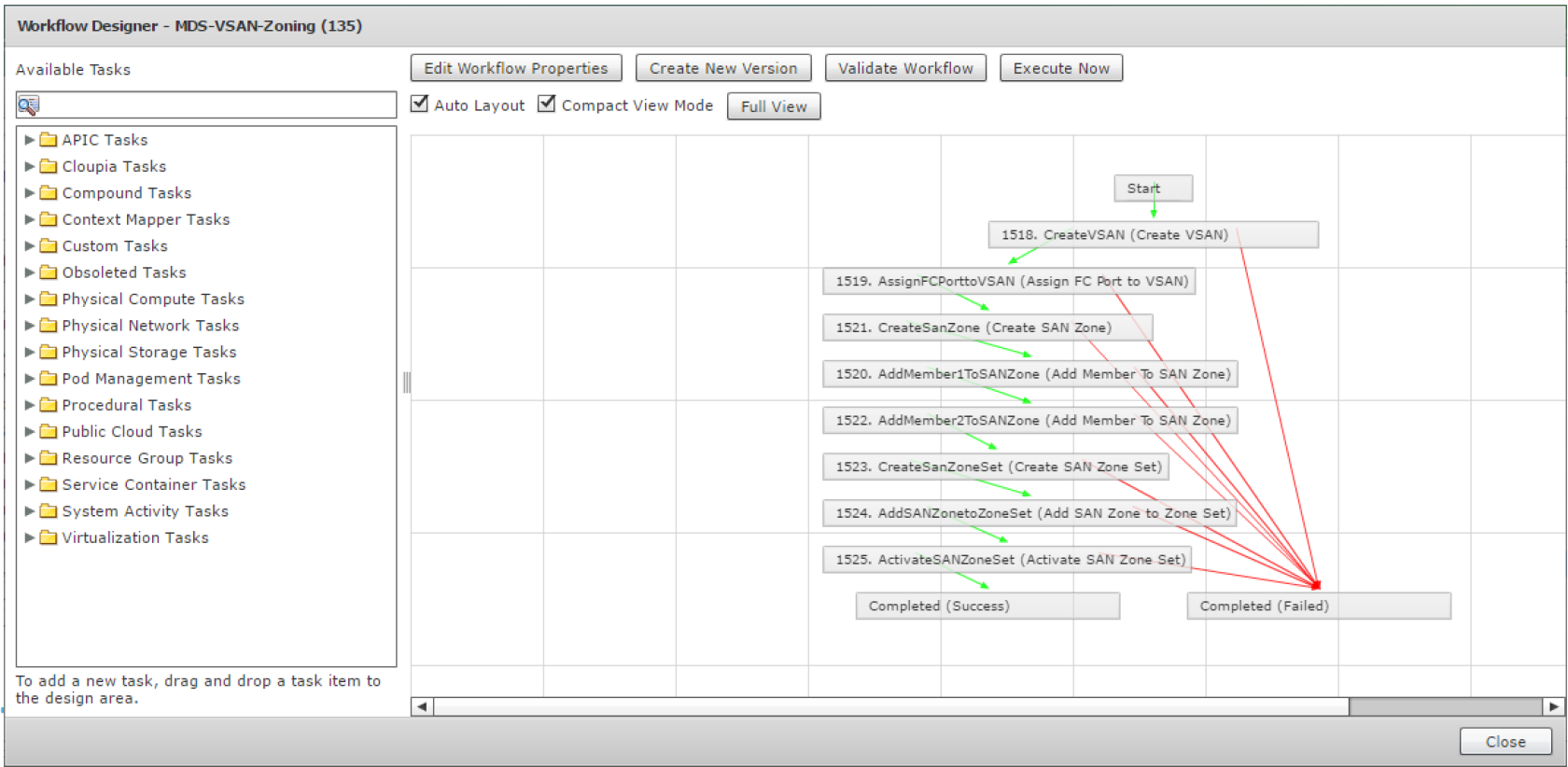
- UCSD can configure Enhanced zoning end-to-end on MDS Switch
- In this workflow UCSD creates VSAN, assigns FC port to VSAN, creates SAN Zone and add members to it, creates ZoneSet and adds Zone to it, finally activates the ZoneSet.



- Workflow can be downloaded from the UCS Director community site <https://communities.cisco.com/docs/DOC-69602>

Use Case # 2

The actual workflows for this use case is as shown below:



Use Case # 2

Execute the workflow and provide the requested user inputs

The screenshot shows a workflow execution window titled "Executing Workflow: MDS-VSAN-Zoning". It contains a "Workflow Version:" dropdown menu set to "0 (default version)". Below this are several input fields, each with a red asterisk indicating a required field. Blue callout boxes on the left provide instructions for each field:

- Select MDS Switch:** Points to the "MDS Switch" field, which has a "Select..." button and the value "172.31.224.154".
- Provide VSAN ID:** Points to the "VSAN ID" text input field containing "2000".
- Enter VSAN Name:** Points to the "VSAN NAME" text input field containing "TMVSAN".
- Enter Zone Name:** Points to the "Zone Name" text input field containing "TMZone".
- Enter 1st pWWN:** Points to the "Enter pWWN1" text input field containing "50:06:0e:80:03:8e:95:33".
- Enter 2nd pWWN:** Points to the "Enter pWWN2" text input field containing "10:00:00:00:c9:8b:54:78".
- Enter ZoneSet Name:** Points to the "ZoneSet Name" text input field containing "TMZoneSet".

At the bottom right of the window are "Submit" and "Close" buttons.

Use Case # 2

Service Request completion and MDS Verification

Workflow Status | Log | Objects Created and Modified | Input/Output

Service Request

Status Refresh

▼ Overview Current status for the service request.

Request ID	10	1	Initiated by admin	09/15/2016 15:35:31
Request Type	Admin Workflow	2	Create VSAN	09/15/2016 15:35:41
Workflow Name	MDS-VSAN-Zoning	3	Assign FC Port to VSAN	09/15/2016 15:35:47
Workflow Version Label	0	4	Create SAN Zone	09/15/2016 15:35:53
Request Time	09/15/2016 15:35:29 GMT-0700	5	Add Member To SAN Zone	09/15/2016 15:36:04
Request Status	Complete	6	Add Member To SAN Zone	09/15/2016 15:36:16
Comments		7	Create SAN Zone Set	09/15/2016 15:36:23
▼ Ownership		8	Add SAN Zone to Zone Set	09/15/2016 15:36:34
Initiating User	admin	9	Activate SAN Zone Set Completed action	09/15/2016 15:36:41
		10	Complete Completed successfully.	09/15/2016 15:36:43

Close

```
172.31.224.154 - PuTTY
VB-S2-C-M9148-1#
VB-S2-C-M9148-1# show vsan 2000 membership
vsan 2000 interfaces:
    fc1/34

VB-S2-C-M9148-1# show zoneset vsan 2000
zoneset name TMZoneSet vsan 2000
    zone name TMZone vsan 2000
        pwwn 50:06:0e:80:03:8e:95:33
        pwwn 10:00:00:00:c9:8b:54:78
VB-S2-C-M9148-1#
VB-S2-C-M9148-1#
```



CISCO

TOMORROW starts here.