

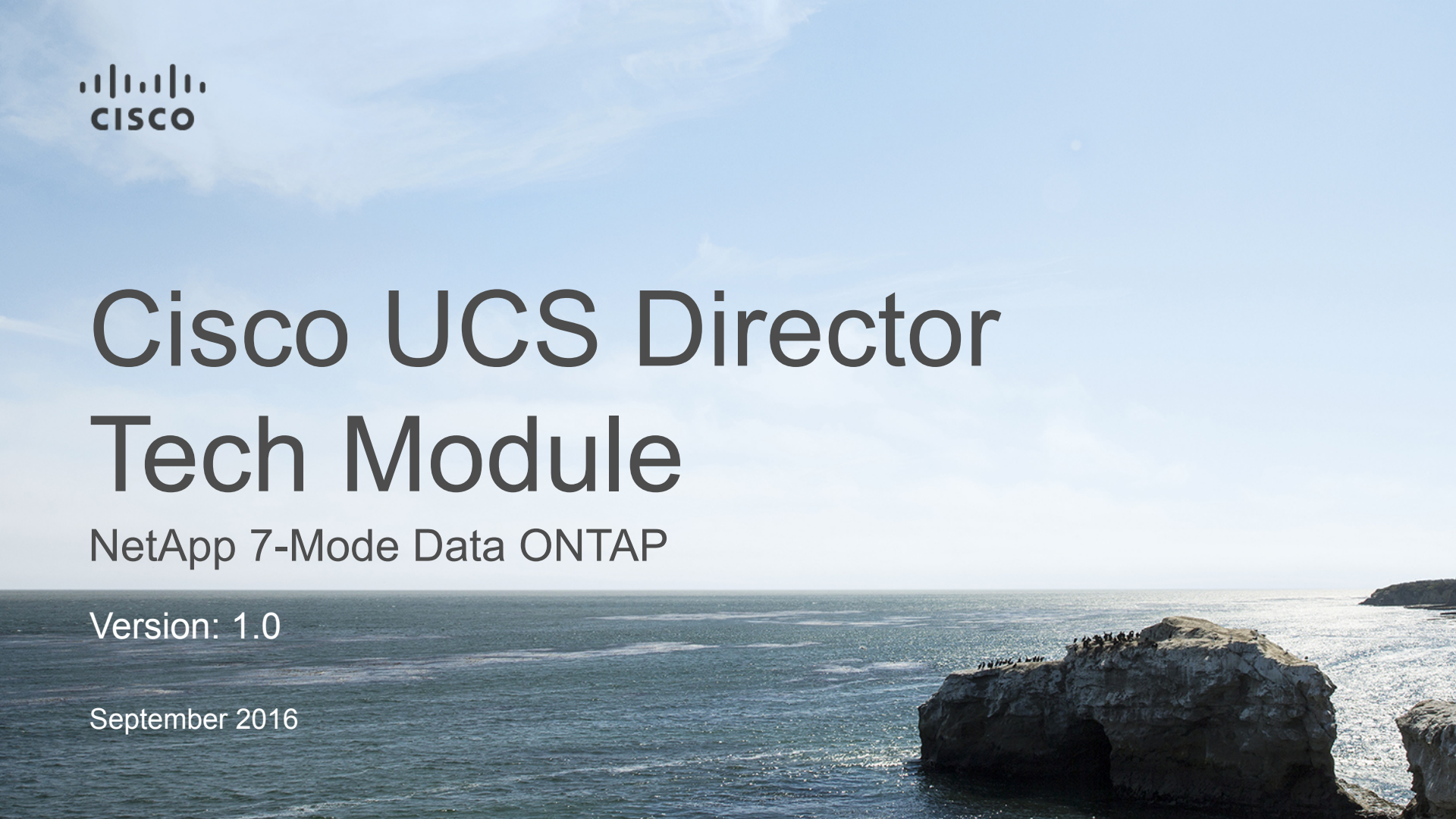


# Cisco UCS Director Tech Module

NetApp 7-Mode Data ONTAP

Version: 1.0

September 2016



# Agenda

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



# Overview & Architecture

# NetApp Data ONTAP

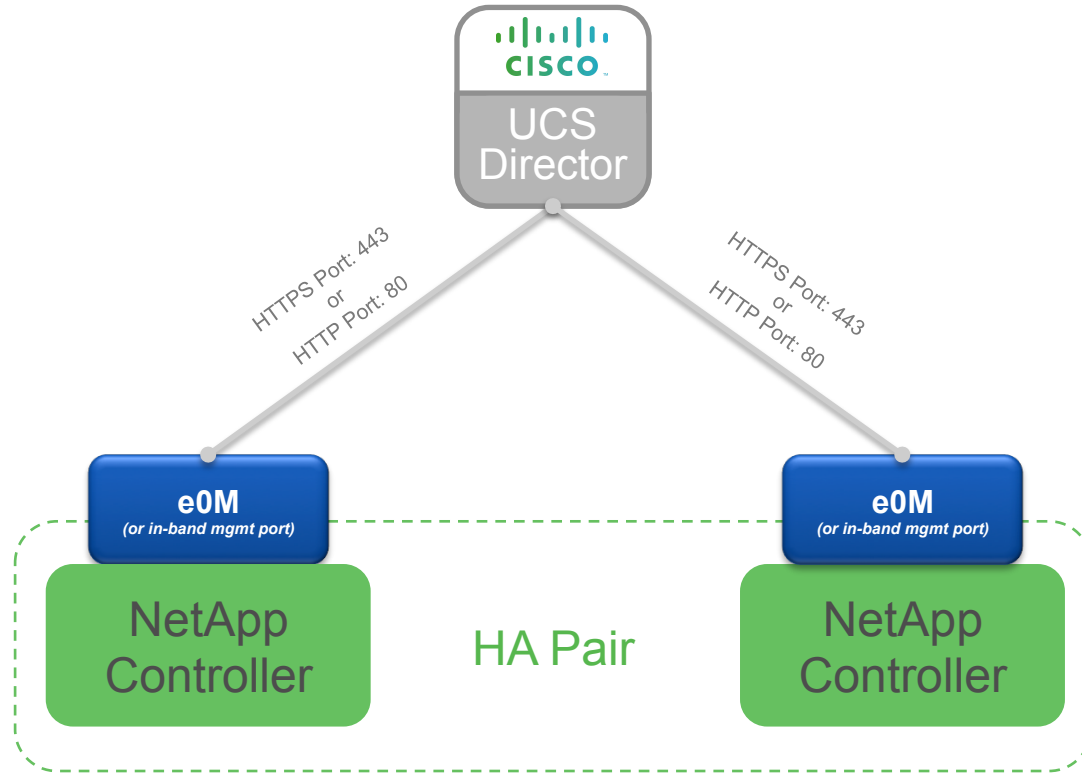
- NetApp offers multiple Enterprise-level storage array platforms
  - NetApp FAS, E-Series, SolidFire, etc.
- UCS Director currently supports only the NetApp FAS storage family of arrays
- The entire family of NetApp FAS arrays run the same operating system called NetApp “Data ONTAP” or “ONTAP” for short

# NetApp Data ONTAP Modes

- There are two modes of operation for ONTAP...
  1. **Data ONTAP 7-Mode** – legacy mode which has been phased out as of ONTAP 8.3
  2. **Clustered Data ONTAP** – newer version of ONTAP, future of NetApp FAS arrays moving forward

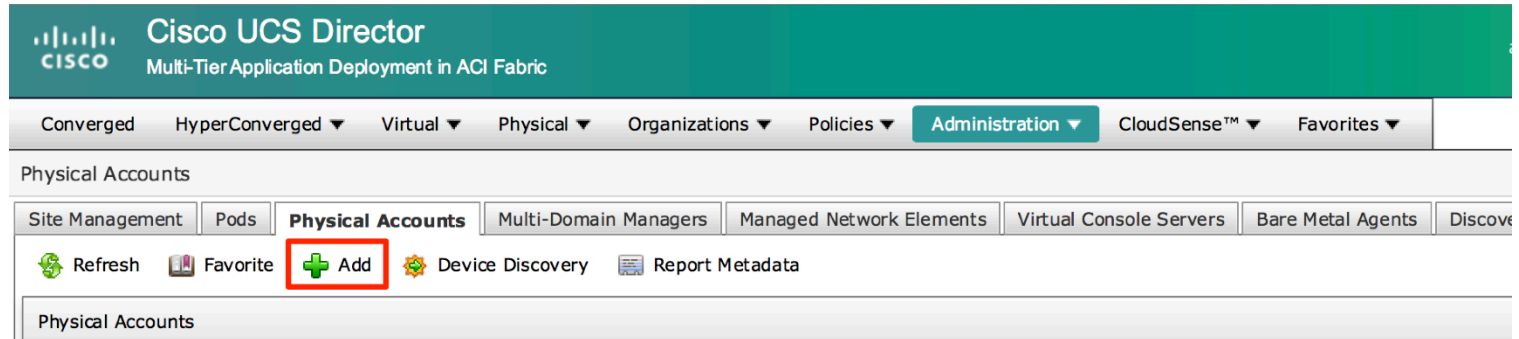
*UCS Director supports both ONTAP modes, however this tech module focuses solely on NetApp 7-Mode Data ONTAP*

# UCS Director – NetApp 7-Mode ONTAP Architecture



# Adding a NetApp 7-Mode Account

- Navigate to **Administration** → **Physical Accounts**, choose the **Physical Accounts** tab and click **Add**

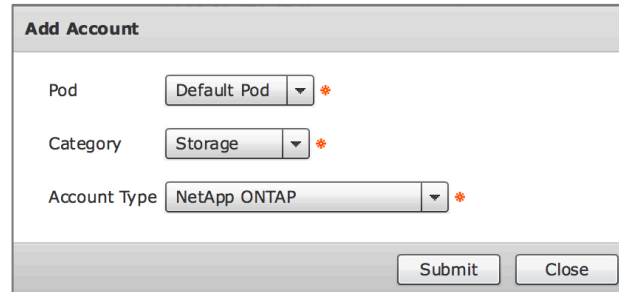


The screenshot displays the Cisco UCS Director web interface. At the top, the header shows the Cisco logo and the text "Cisco UCS Director Multi-Tier Application Deployment in ACI Fabric". Below the header is a navigation bar with several tabs: "Converged", "HyperConverged", "Virtual", "Physical", "Organizations", "Policies", "Administration", "CloudSense™", and "Favorites". The "Administration" tab is currently selected. Underneath, there is a sub-section titled "Physical Accounts" with a row of tabs: "Site Management", "Pods", "Physical Accounts", "Multi-Domain Managers", "Managed Network Elements", "Virtual Console Servers", "Bare Metal Agents", and "Discover". The "Physical Accounts" tab is selected. Below these tabs is a toolbar with icons for "Refresh", "Favorite", "Add", "Device Discovery", and "Report Metadata". The "Add" button, represented by a green plus sign icon, is highlighted with a red rectangular box. Below the toolbar, the main content area is titled "Physical Accounts".



# Adding a NetApp 7-Mode Account

- Select the appropriate **Pod**
- Set **Category** to **Storage**
- Set **Account Type** to **NetApp ONTAP**



The screenshot shows a dialog box titled "Add Account" with three dropdown menus and two buttons. The "Pod" dropdown is set to "Default Pod", the "Category" dropdown is set to "Storage", and the "Account Type" dropdown is set to "NetApp ONTAP". Each dropdown menu has a red asterisk icon to its right, indicating a required field. At the bottom right of the dialog box are "Submit" and "Close" buttons.

Field	Value
Pod	Default Pod
Category	Storage
Account Type	NetApp ONTAP



# Adding a NetApp 7-Mode Account

- Enter the information about the NetApp controller to add the account

**Add Account**

Pod: Default Pod \*

Category: Storage \*

Account Type: NetApp ONTAP \*

Account Name: NTAP-7-Mode-A \*

Server Address: 172.31.240.118 \*

Use Credential Policy

User ID: root \*

Password: \*\*\*\*\* \*

Transport Type: https \*

Port: 443 \*

Description:

Contact Email:

Location:

Service Provider:

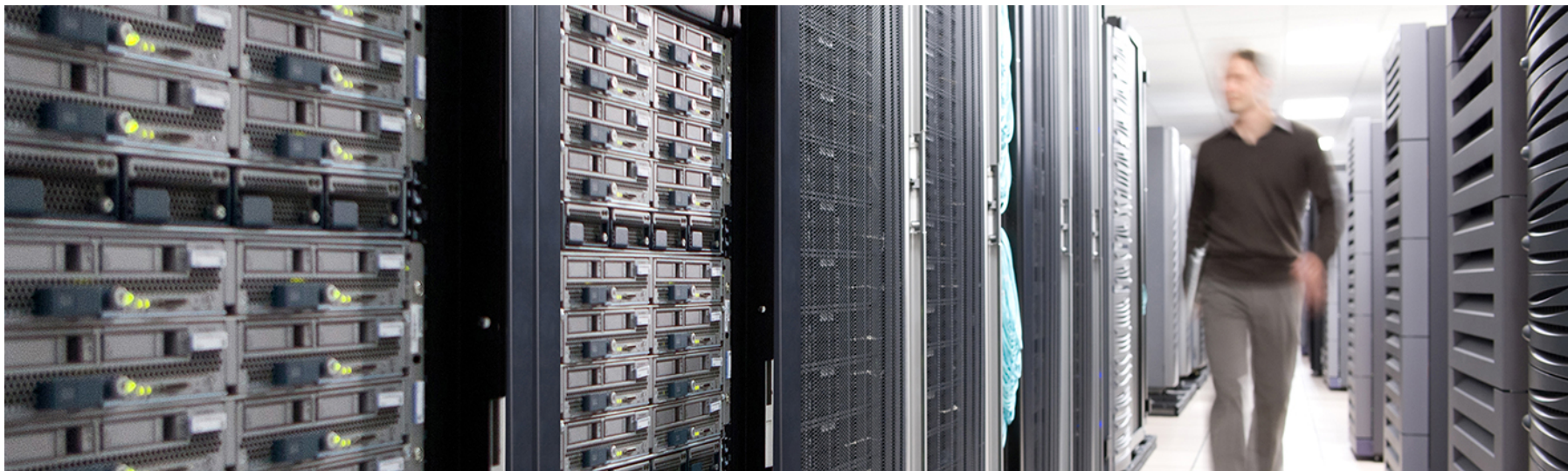
Converged HyperConverged Virtual Physical Organizations Policies Administration CloudSense™ Favorites

Physical Accounts

Site Management Pods Physical Accounts Multi-Domain Managers Managed Network Elements Virtual Console Servers Bare Metal Agents Discovered Devices

Refresh Favorite Add Device Discovery View Edit Delete Test Connection Manage Tag Add Tags Delete Tags

Account Name	Account Type	Connection St	Pod	Contact	Location	Server / Filer	Description
ACI-UCSM	UCSM	Success	myPOD			172.31.241.1 [myPOD]	
ACI_NetApp	NetApp ONTAP	Success	myPOD			172.31.241.74 [myPOD]	
NTAP-7-Mode-A	NetApp ONTAP	Success	Default Pod			172.31.240.118 [Default Pod]	



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

# UCS Director Supported NetApp Storage Platforms

*(As of UCS Director 6.0)*

## Currently **Supported** NetApp Storage Platforms

- NetApp FAS Storage

## Currently **Unsupported** NetApp Storage Platforms

- NetApp E-Series
- NetApp SolidFire

# UCS Director 7-Mode Data ONTAP Support

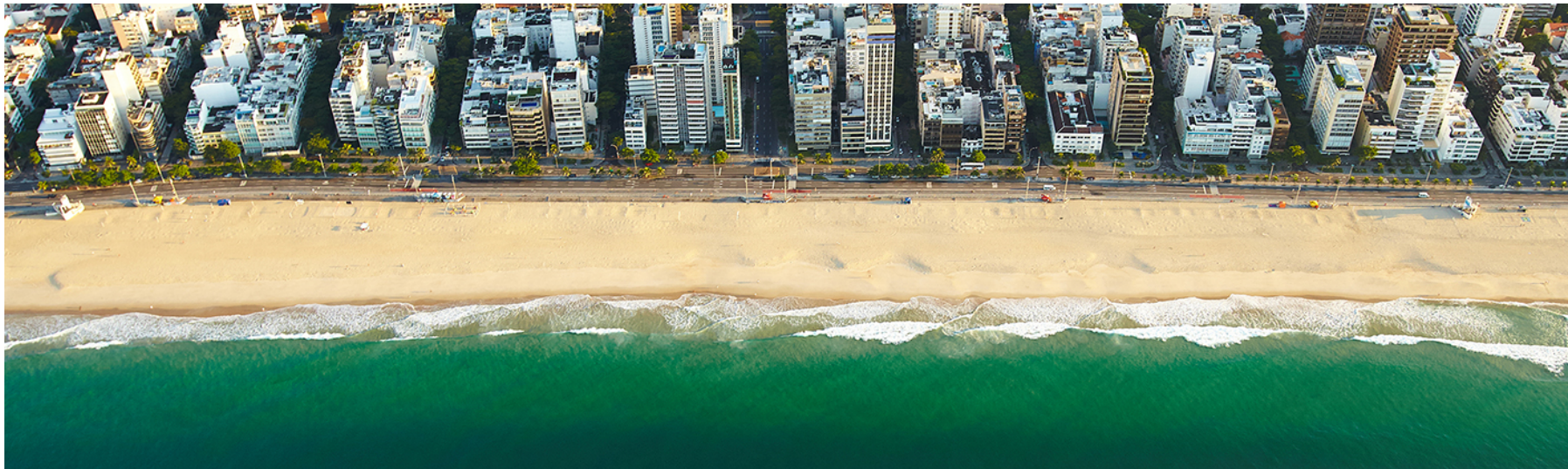
(As of UCS Director 6.0)

## Supported NetApp FAS Hardware Platforms

- Support all NetApp FAS hardware platforms running a supported version of 7-Mode Data ONTAP software

## Supported Clustered ONTAP Software Versions

- 8.2.2P1
- 8.1.4P1
- 8.2.1
- 8.2.0
- 7.3.x
- 8.2.2P2



# Licensing

# Licensing Information

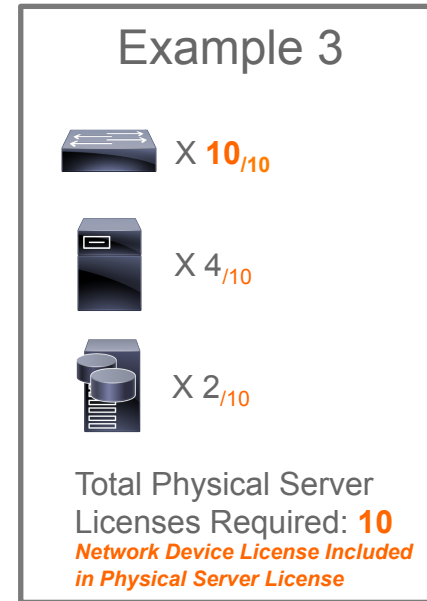
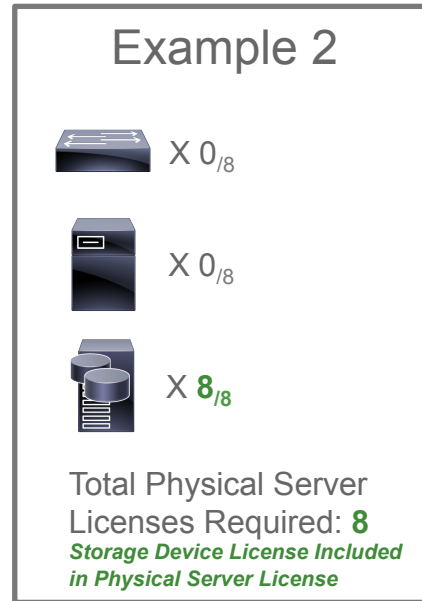
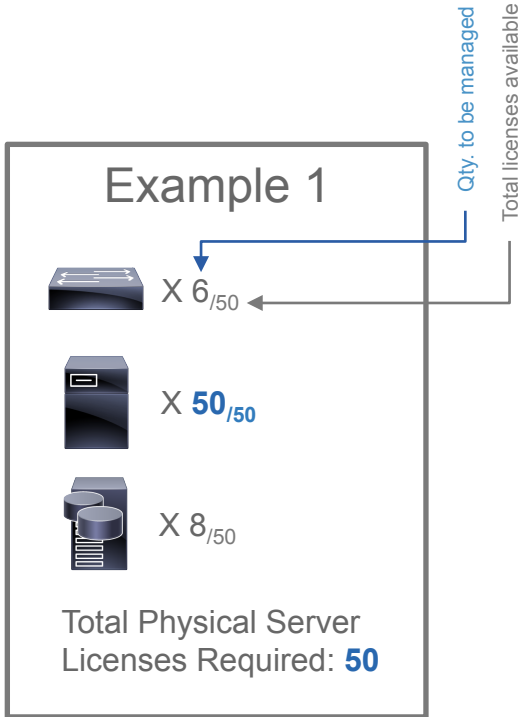
- UCS Director licensing is purchased solely in the form of physical server licenses
- However, included in each physical server license purchased is a storage device license and a network device license
- In addition to physical server tracking and licensing, UCS Director tracks the number of storage and network devices being managed against the number of licenses available
- If additional storage and/or network device licenses are required, they can be acquired by purchasing additional physical server licenses



# Licensing Information

- Each 7-Mode Data ONTAP storage controller requires a UCS Director storage device license
- **NOTE!:** storage device licenses are included in and solely available by purchasing additional physical server licenses

# Licensing Examples





# Orchestration Capabilities

# Orchestration Capabilities

## Aggregates

- Create Aggregate
- Add Disk to Aggregate
- Delete Aggregate

## Flexible Volume

- Create Flexible Volume
- Resize Flexible Volume
- Destroy Flexible Volume
- Create Volume Snapshot

## vFiler

- Create vFiler Setup
- Create vFiler using ONTAP
- Destroy vFiler using ONTAP
- Resize vFiler Volume
- Add Storage to vFiler
- Remove Storage from vFiler
- Add vFiler NFS Volume Export
- Remove vFiler NFS Volume Export
- Add IP Address to vFiler
- Remove IP Address from vFiler
- Create vFiler Initiator Group
- Delete vFiler Initiator Group
- Add vFiler Initiator to Initiator Group
- Remove vFiler Initiator from Initiator Group
- Map vFiler LUN to Initiator Group
- Unmap vFiler LUN from Initiator Group
- Create vFiler LUN
- Destroy vFiler LUN
- Resize vFiler LUN

## SnapMirror

- Create Snapmirror Schedule
- Delete Snapmirror Schedule
- Configure Snapmirror
- Snapmirror Destination Actions

## SnapVault

- Create Snapvault
- Modify Snapvault
- Delete Snapvault
- Release Snapvault
- Abort Snapvault
- Update Snapvault
- Restore Snapvault

## NFS

- Add NFS Export
- Remove Volume NFS Export

## CIFS

- Setup CIFS on vFiler
- Remove CIFS Volume Share
- Set CIFS Volume Share Access
- Add CIFS Volume Share

## VMware Datastore

- Associate Volume as NFS Datastore
- Associate vFiler Volume as NFS Datastore
- Resize VM Datastore (NetApp)

## LUNs

- Create LUN
- Destroy LUN
- Move LUN
- Resize LUN
- Clone LUN
- Map LUN to Initiator Group
- Unmap LUN from Initiator Group

## IPSpaces

- Create IPspace
- Assign VLAN to IPspace
- Delete IPspace

## VLAN Interfaces

- Create VLAN Interface
- Delete VLAN Interface
- Configure VLAN Interface

## Initiator Groups

- Create Initiator Group
- Delete Initiator Group
- Add Initiator to Initiator Group
- Remove Initiator to Initiator Group
- Add Existing Initiator to Initiator Group

# Orchestration Capabilities Cont.

## **Qtrees**

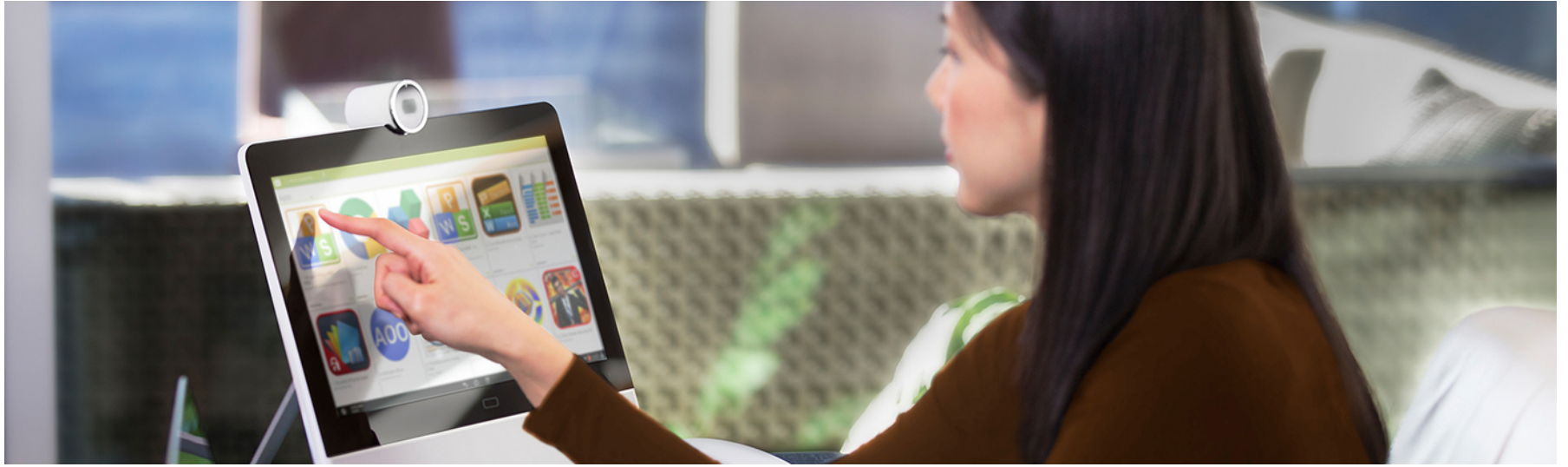
- Create Qtree
- Destroy Qtree
- Add Qtree NFS Export
- Remove Qtree NFS Export

## **Quotas**

- Add Quota
- Delete Quota

## **Other**

- Get NetApp Partner Info
- Add License to Filer
- Persist Network Configuration
- Execute NetApp CLI



# Reports

# Tabular Reports and Information

## *At ONTAP Controller Level*

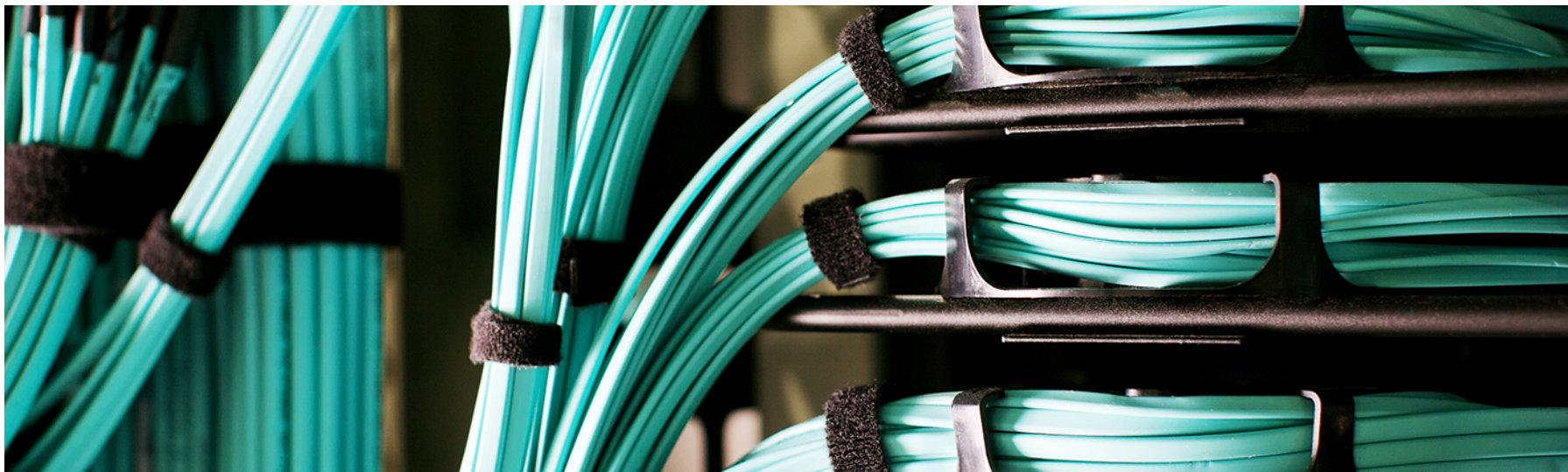
- Aggregates
- Volumes
- Qtrees
- Quotas
- VMs
- LUNs
- Disks
- Initiators Groups
- Initiators
- License
- SnapMirrors
- SnapVault
- vFilers
- IP Spaces
- Interfaces
- FC Adapters
- NFS Exports
- CIFS Shares



# Tabular Reports and Information

*At ONTAP vFiler Level*

- Volumes
- LUNs
- Qtrees
- Quotas
- Initiator Groups
- Initiators
- SnapMirros
- NFS Exports
- CIFS Shares
- VMs



# Example Use-Cases

# Example Use-Cases

- Use-Case #1: Create Flexible Volume, Export via NFS and Mount on ESXi Cluster
- Use-Case #2: Create LUN and Map to iSCSI Client

# Use-Case #1: Create Flexible Volume, Export via NFS and Mount on ESXi Cluster

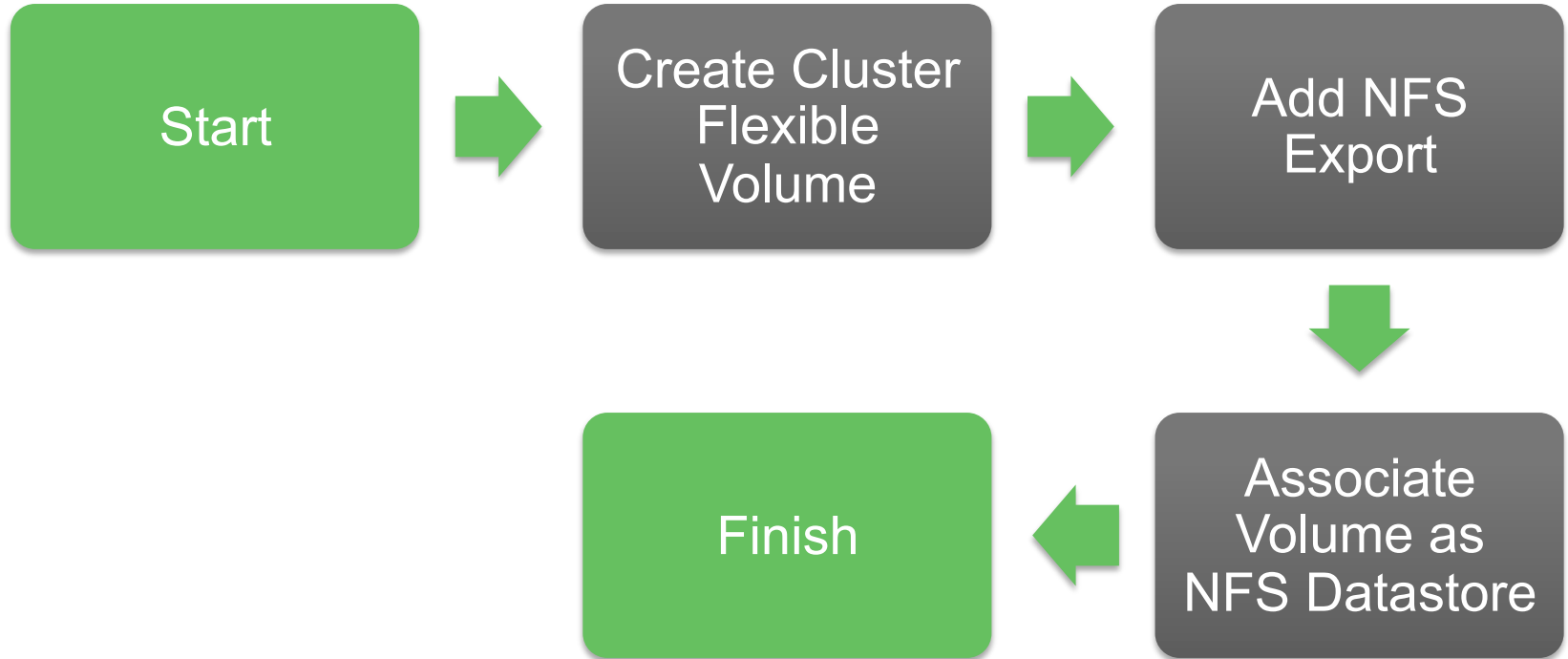
- The following use case example highlights how to automate the provisioning and configuration of a new NFS datastore in VMware from NetApp Data ONTAP 7-Mode storage.
- The automated workflow will create a new Flexible Volume, export the Flexible Volume via NFS and then mount the Flexible Volume as an NFS datastore to the selected ESXi hosts

# Use-Case #1: Create Flexible Volume, Export via NFS and Mount on ESXi Cluster

Pre-requisites for Use-Case #1:

- NetApp Data ONTAP 7-Mode controller already added to UCS Director as a storage account
- One or more interfaces are configured on the storage controller that have network connectivity to one or more VMkernel interfaces on the target ESXi hosts

# Use-Case #1: Create Flexible Volume, Export via NFS and Mount on ESXi Cluster



# Use-Case #1: Create Flexible Volume, Export via NFS and Mount on ESXi Cluster

- NFS Datastore Creation Successfully Completed

**Service Request**

Status Refresh

Current status for the service request.

Request ID	869	1 Initiated by admin	09/01/2016 15:41:33
Request Type	Admin Workflow	2 Create Flexible Volume	09/01/2016 15:41:44
Workflow Name	Create_NetApp_7Mode_NFS_Datastore	3 Add NFS Export	09/01/2016 15:41:47
Workflow Version Label	0	4 Create NFS Datastore Completed action	09/01/2016 15:42:03
Request Time	09/01/2016 15:41:30 GMT-0400	5 Complete Completed successfully.	09/01/2016 15:42:09
Request Status	Complete		
Comments			
Ownership			
Initiating User	admin		

aci-demo-prod-vcenter

- aci-demo
  - aci-demo
    - 172.31.241.76
    - 172.31.241.77
  - Infrastructure
  - Tenant01
  - Yoda
  - Bronze
  - Gold
  - Silver

172.31.241.76 VMware ESXi, 5.5.0, 3029944

Getting Started Summary Virtual Machines Performance Configuration Tasks & Events Alarms Permissions Maps Storage Views Hardware Status

**Hardware**

- Processors
- Memory
- Storage
- Networking
- Network Adapters
- Storage Adapters
- Network Adapters
- Advanced Settings
- Power Management

**Software**

Licensed Features

View: Datastores Devices

Identification	Status	Device	Drive Type	Capacity	Free	Type	Last Update	Alarm
datastore1	Normal	Local WD Disk (n...	Non-SSD	272.00 GB	271.05 GB	VMFSS	9/1/2016 12:03:32 PM	Enab
demo_infra_ds_1	Normal	192.168.254.10:/...	Unknown	475.00 GB	447.33 GB	NFS	9/1/2016 12:03:10 PM	Enab
mysds01	Normal	192.168.254.10:/...	Unknown	50.00 GB	50.00 GB	NFS	9/1/2016 12:03:10 PM	Enab
mz01	Normal	172.31.240.118:/...	Unknown	50.00 GB	50.00 GB	NFS	9/1/2016 12:03:10 PM	Enab
ucsd_aci_shared_...	Normal	192.168.254.10:/...	Unknown	500.00 GB	490.89 GB	NFS	9/1/2016 12:03:02 PM	Enab
ucsdshare	Warning	172.31.240.5:/uc...	Unknown	665.00 GB	155.43 GB	NFS	9/1/2016 12:03:10 PM	Enab



# Use-Case #1: Create Flexible Volume, Export via NFS and Mount on ESXi Cluster

- Use Case #1 workflow can be downloaded from the UCS Director community site here:  
<https://communities.cisco.com/docs/DOC-69433>
- The UCS Director community site also includes other workflows, custom tasks and information

# Use-Case #2: Create LUN and Map to iSCSI Client

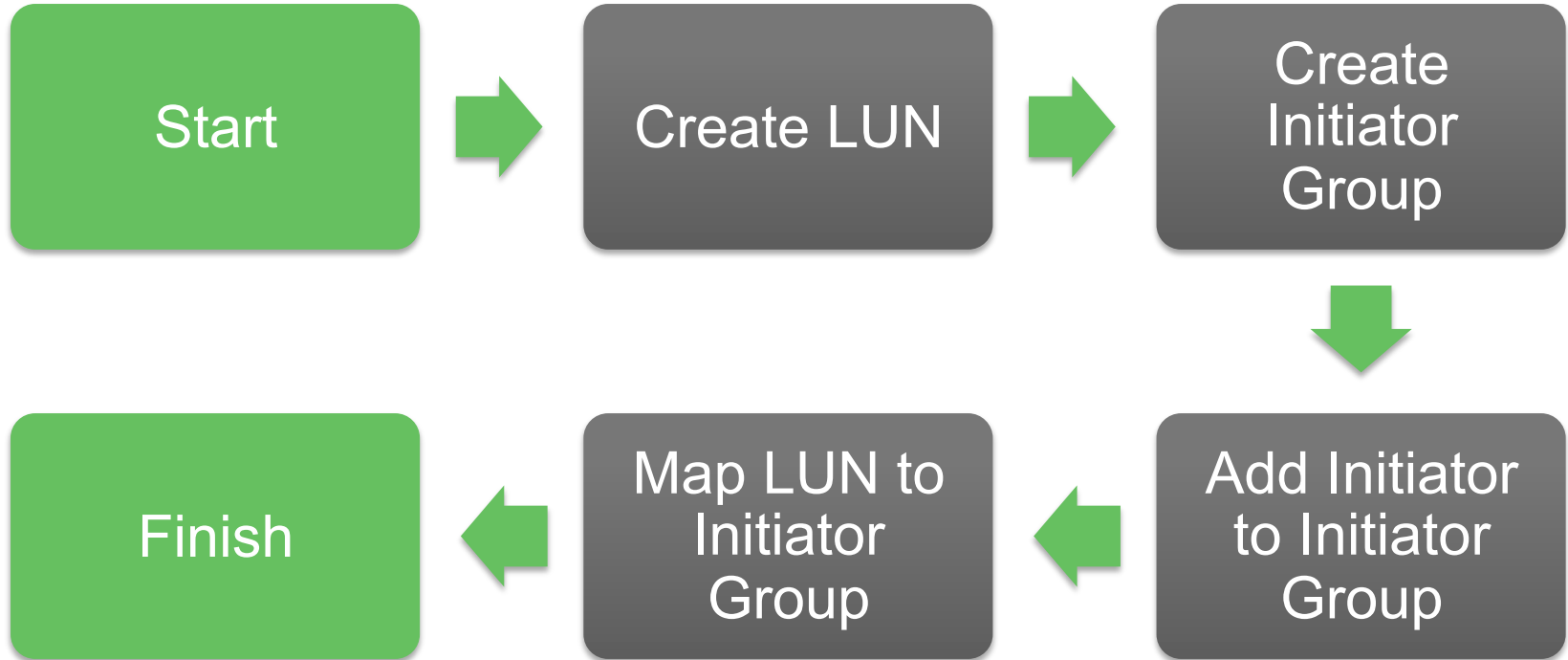
- The following use case example highlights how to automate the provisioning and configuration of a new iSCSI LUN and map the newly created LUN to a remote iSCSI client.

# Use-Case #2: Create LUN and Map to iSCSI Client

## Pre-requisites for Use-Case #2:

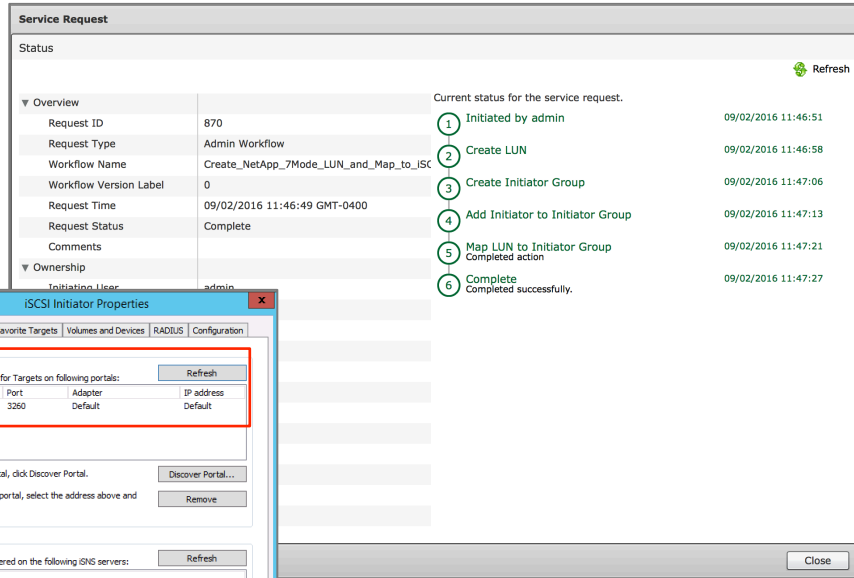
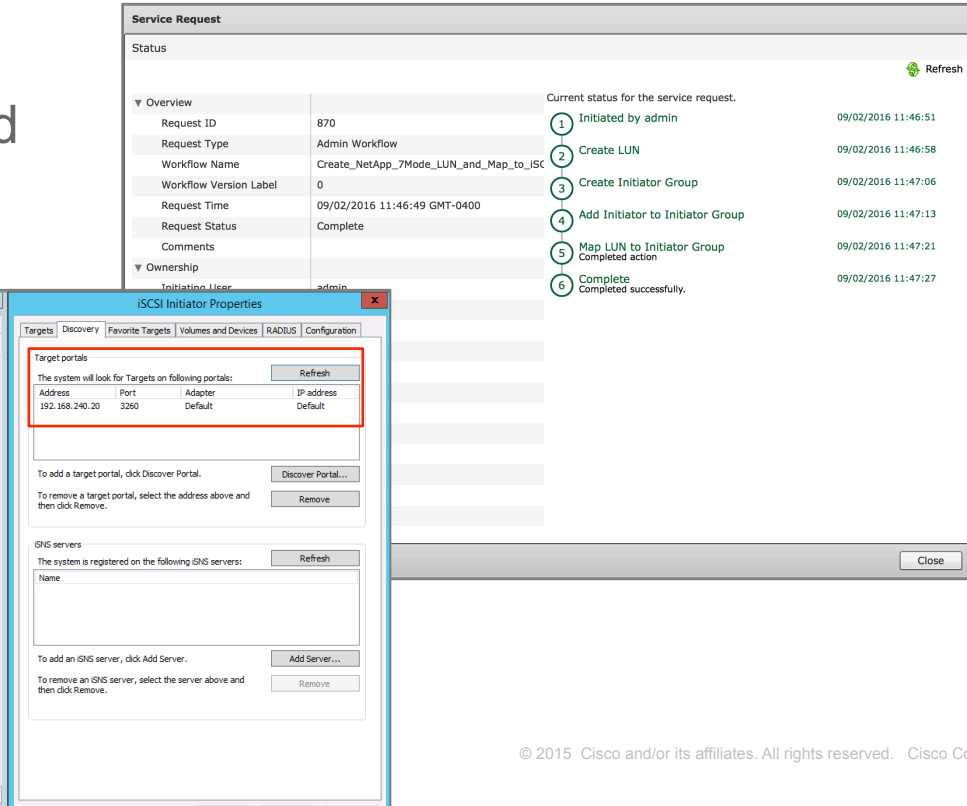
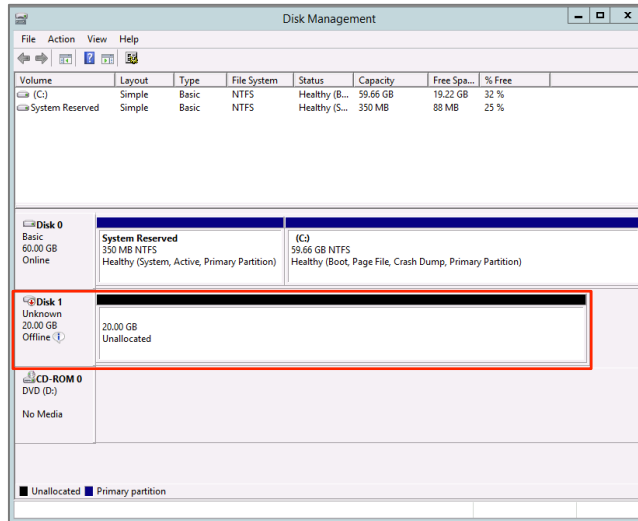
- NetApp Data ONTAP 7-Mode controller already added to UCS Director as a storage account
- One or more interfaces are configured on the storage controller that have IP network connectivity to one or more iSCSI clients
- iSCSI service is licensed and running on NetApp Data ONTAP 7-Mode controller

# Use-Case #2: Create LUN and Map to iSCSI Client



# Use-Case #2: Create LUN and Map to iSCSI Client

- iSCSI LUN Creation Successfully Completed



# Use-Case #2: Create LUN and Map to iSCSI Client

- Use Case #2 workflow can be downloaded from the UCS Director community site here:  
<https://communities.cisco.com/docs/DOC-69442>
- The UCS Director community site also includes other workflows, custom tasks and information



**CISCO**

*TOMORROW starts here.*