

# Configure UCS-M2-HWRAID on UCS Blades

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## Introduction

This document describes how to configure the Unified Computing System (UCS)-M2-HWRAID so an operating system (OS) can use the disks for storage or as bootable disks.

## Prerequisites

### Requirements

Cisco recommends that you have knowledge of these topics:

- UCS M5 Server
- UCSM 3.2.2b or higher
- Compatible OS in UEFI Mode (minimums follow) CentOS 7.6ESXi 6.5U2RHEL 7.6WinServer 2016 WinServer 2019More: [UCS Hardware and Software Compatibility Adapters > RAID > Cisco Boot Optimized M.2 HW Raid Controller \(Cisco\)](#)

### Components Used

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

- UCS-M2-HWRAID
- 2x m.2 Drives of the same model and capacity

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 Information

The UCS-M2-HWRAID holds two m.2 gumsticks; one on each side of the carrier. The UCS-M2-

HWRAID and UCS-MSTOR-M2 look similar but in this configuration example hardware RAID requires a UCS-M2-HWRAID controller.

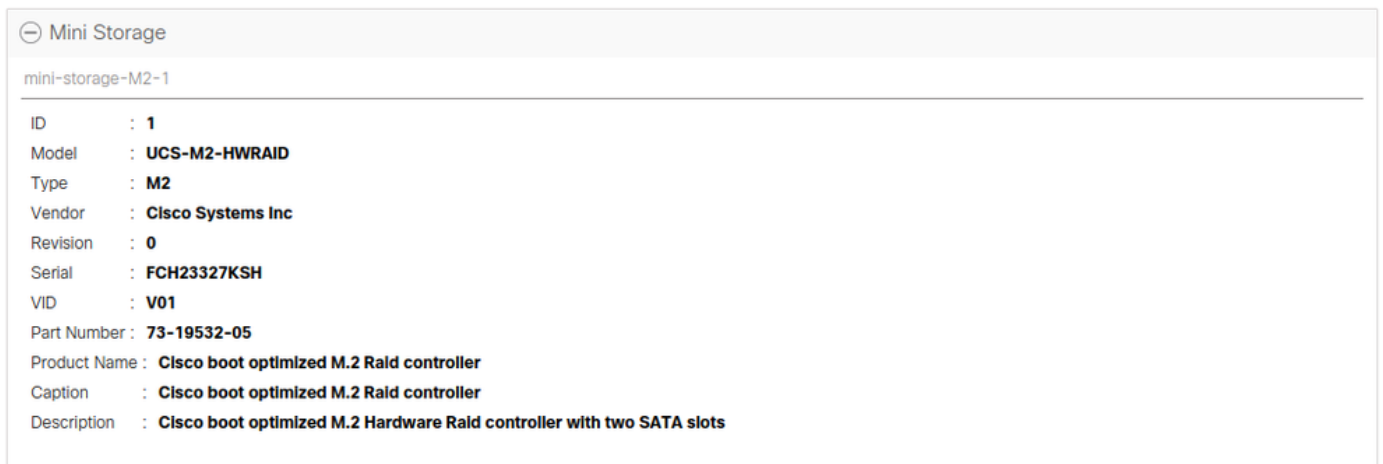
# Configure

## Check Current Status

1. Check that the necessary parts show in the server's inventory.

In UCSM, navigate to **Equipment > Chassis x > Servers > Server x**.

Select the **Inventory** tab at the top, **Motherboard**. Select **Mini Storage**. Ensure that your Model shows as **UCS-M2-HWRAID** as shown in this image.

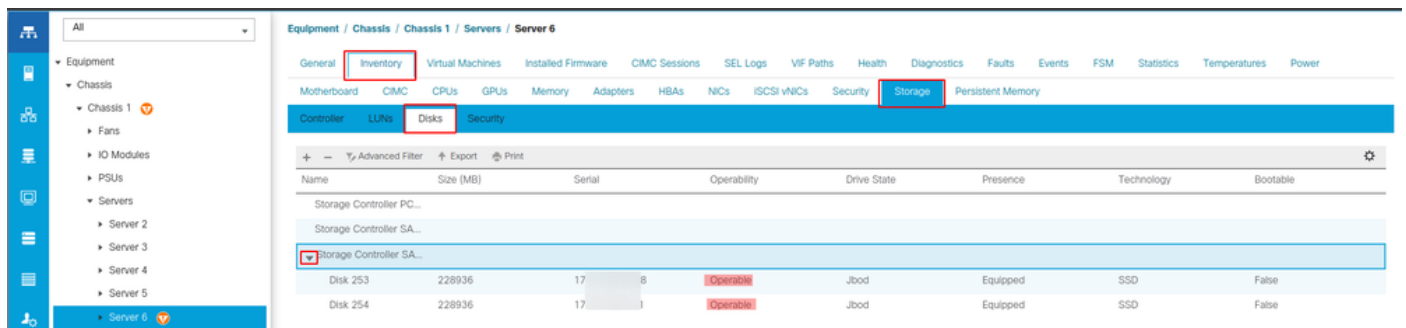


2. Check that there are two m.2 drives installed and detected.

Navigate to **Inventory > Storage > Disks**.

From the drop-down, select **Storage Controller Sata 1**.

Check what two m.2 disks (253 & 254) are presented, and are in an operable state. On M6 the two m.2 disks will be 245 and 246. The drive state can differ.

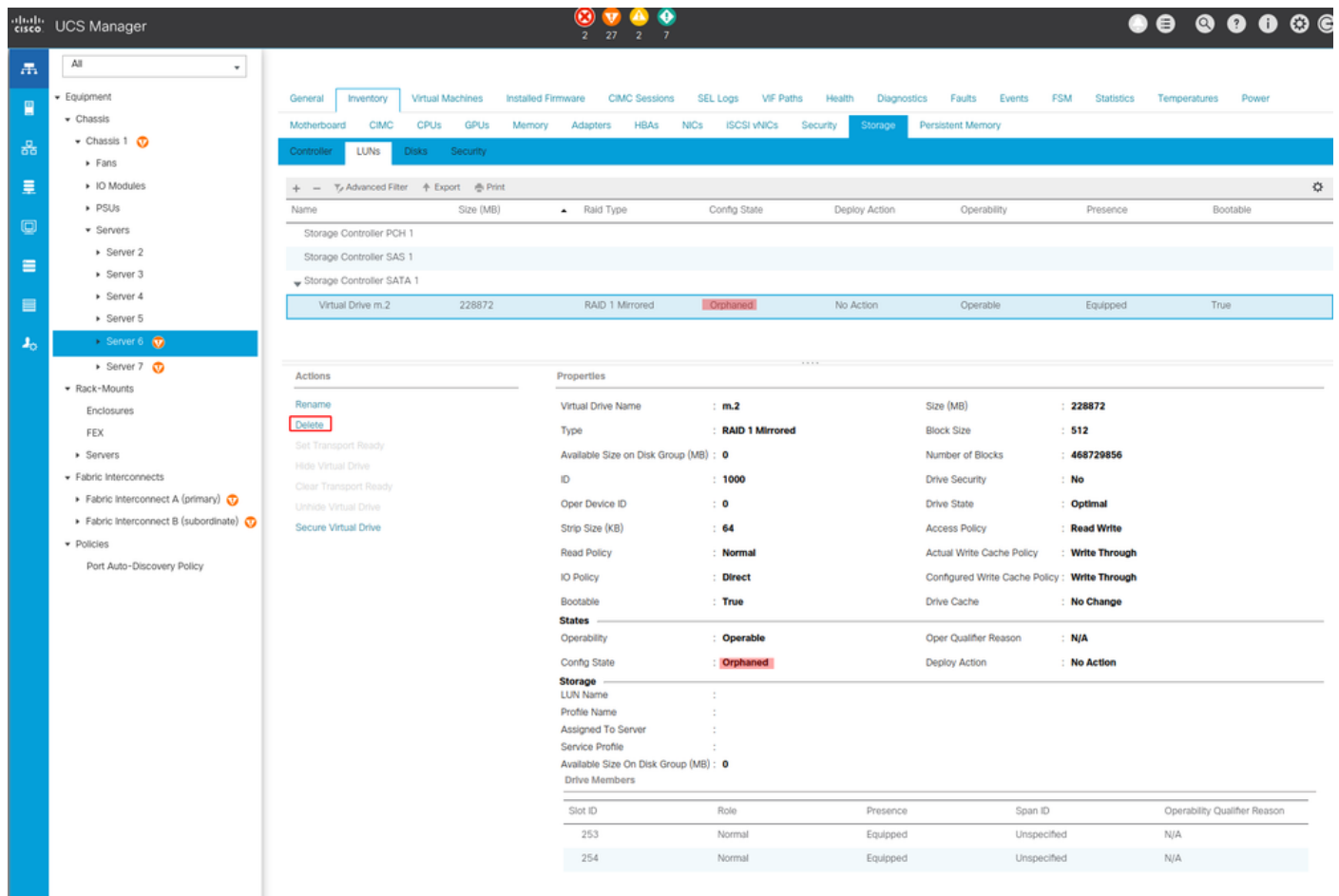


3. Check for any orphaned LUNs.

Navigate to **Inventory > Storage > LUNs**.

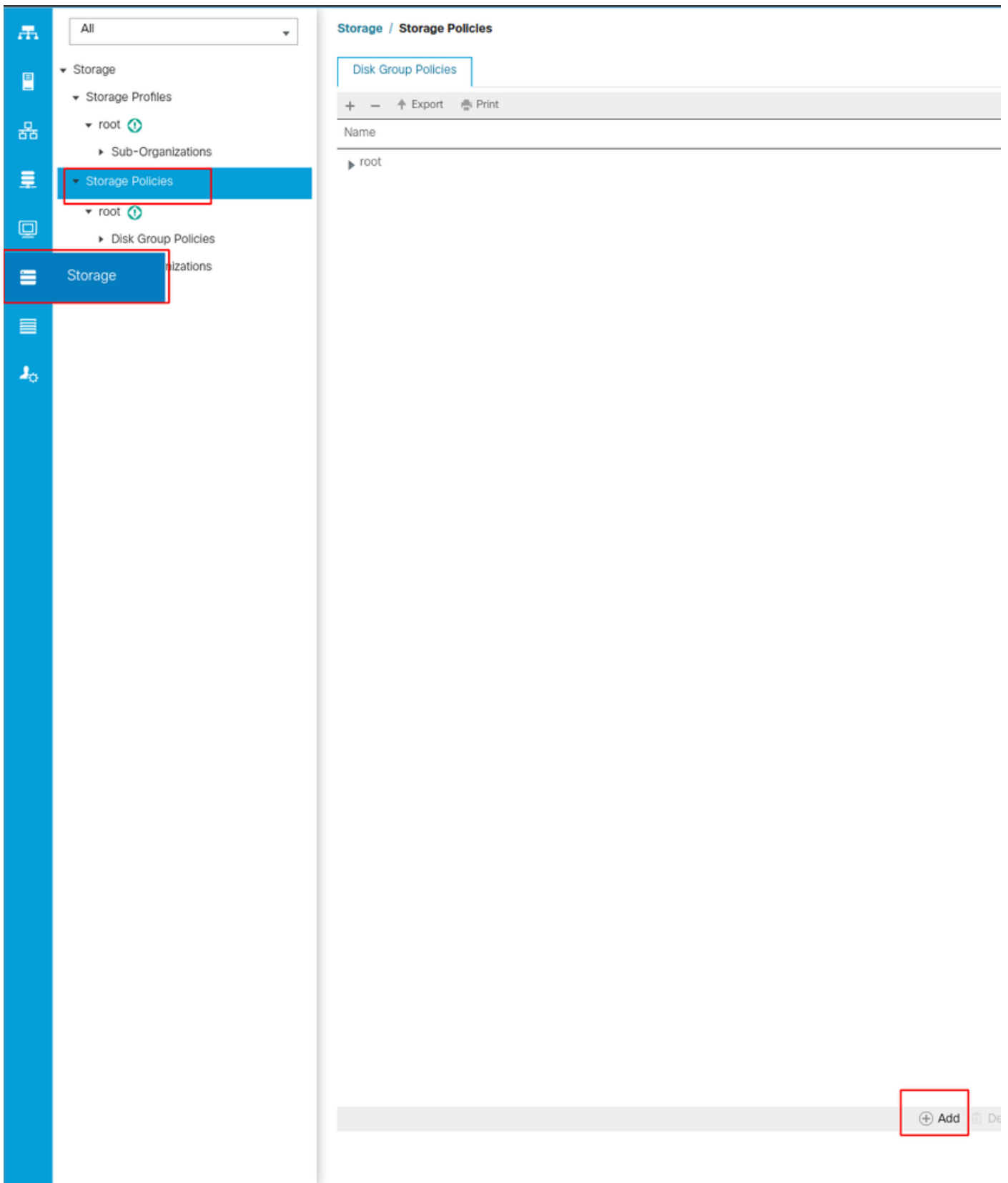
Check if there is a drop-down arrow for **Storage Controller SATA 1**. If not, there is not an orphaned LUN.

If you see an orphaned LUN, skip to the Troubleshooting section at the bottom before you begin the configuration.



## Setup Storage Configuration

1. First, you need to make a storage policy. Navigate **Storage > Storage Policies > Add** as shown in the image.



In the **Create Disk Group Policy** window:

- Enter a name
- Description (optional)
- RAID Level RAID1 Mirrored is used in this guide and is the safest option.
- Select the **Disk Group Configuration** Manual Radio Button.

## Create Disk Group Policy



Name :

Description :

RAID Level :

Disk Group Configuration (Automatic)  **Disk Group Configuration (Manual)**

Advanced Filter Export Print

Slot Number	Role	Span ID
No data available		

Virtual Drive Configuration

Strip Size (KB) :

Access Policy :  Platform Default  Read Write  Read Only  Blocked

Click the **Add Button** in the **Disk Group Configuration (Manual)** box.

This opens a new window **Create Local Disk Configuration Reference**.

- Slot Number can be set to 253 (the ID of the first m.2. This value can be checked in the prerequisites)
- The role must be **Normal**
- Leave the Span ID as **unspecified**

Click **OK** as shown in this image.

Repeat the last step for the other disk, but use slot number **254** as shown in this image.

The screenshot shows the 'Create Disk Group Policy' window. The main window has the following fields:  
Name: m.2\_raid1  
Description: Raid1 group policy for m2. drives  
RAID Level: RAID 1 Mirrored  
Disk Group Configuration (Automatic) is selected.  
Virtual Drive Configuration:  
Strip Size (KB): Platform Default  
Access Policy: Platform Default (selected), Read Write, Read Only, Blocked.  
A sub-dialog 'Create Local Disk Configuration Reference' is open, showing:  
Slot Number: 254 (highlighted with a red box)  
Role: Normal (selected), Dedicated Hot Spare, Global Hot Spare  
Span ID: unspecified  
Buttons: OK, Cancel

Now your Disk Policy must look like this:

The screenshot shows the 'Create Disk Group Policy' window with 'Disk Group Configuration (Manual)' selected. The table below shows the configuration for two disks:

Slot Number	Role	Span ID
253	Normal	Unspecified
254	Normal	Unspecified

Buttons: + Add, Delete, Info  
Virtual Drive Configuration:  
Strip Size (KB): Platform Default  
Access Policy: Platform Default (selected), Read Write, Read Only, Blocked  
Buttons: OK (highlighted with a red box), Cancel

2. Make a Storage Profile.

Navigate to **Storage > Storage Profiles > Create a Storage Profile** as shown in this image.

All

▼ Storage

▼ Storage Profiles

▼ root

▶ Sub-Organizations

▼ Storage Policies

▼ root

▶ Disk Group Policies

▶ Sub-Organizations

## Storage / Storage Profiles

Getting Started All

### Storage Profiles

A storage profile encapsulates the storage requirements for one or more service profiles and can include:

1. Local LUNs, which are configured using a local RAID controller in a UCS blade or rack-mount server.

LUNs configured in a storage profile can be used as boot or shared among multiple servers for clustered applications.

#### Using Storage Profiles

1. Create a [Storage Profile](#)
2. Create a [Service Profile](#)

Assign the storage profile to the service profile

A **Create Storage Profile** window opens that asks for:

- Name: Enter a logical name
- Description (optional)
- Click the **Add** button as shown in this image.

# Create Storage Profile



Name :

Description :

## LUNs

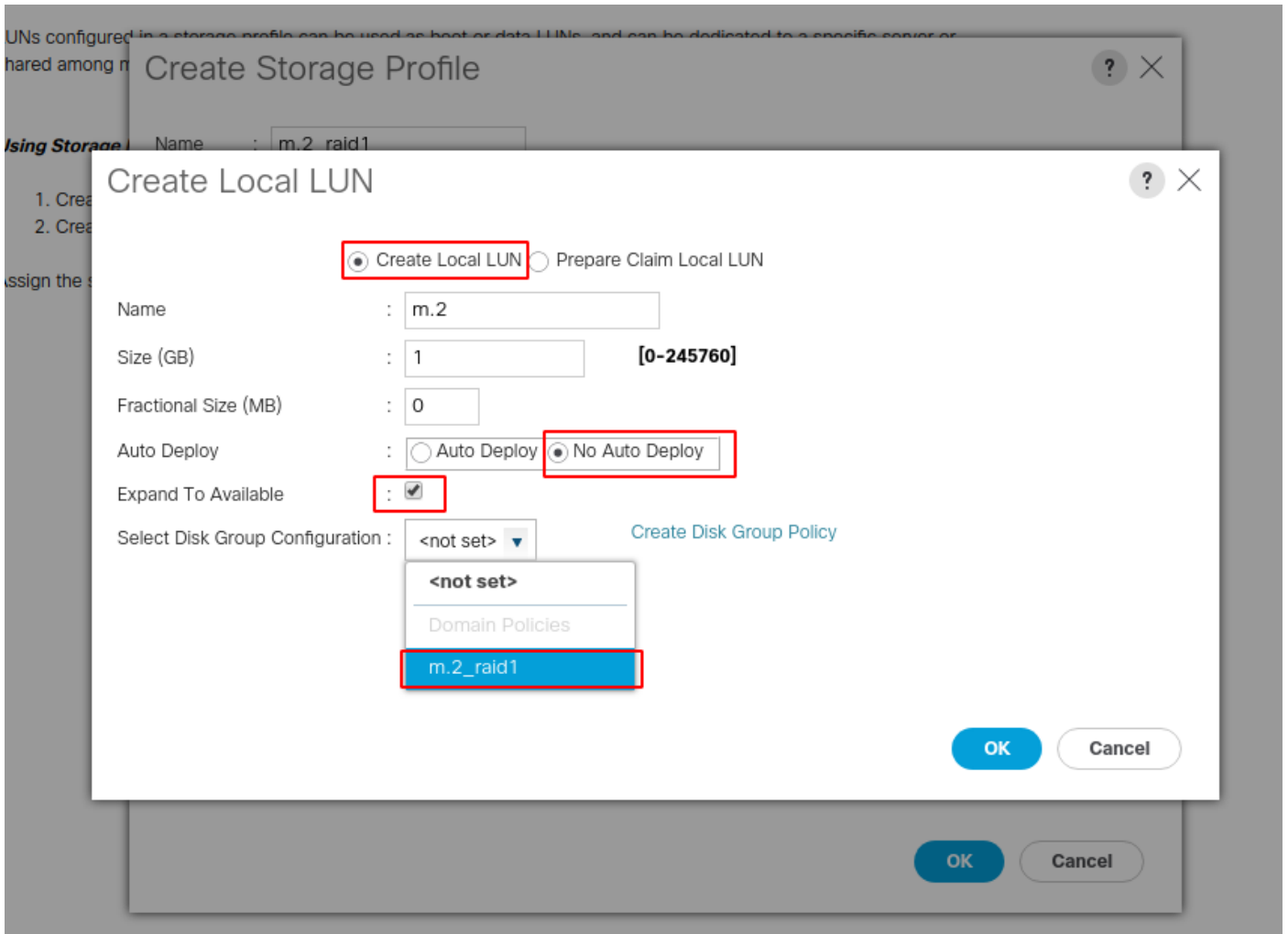
Local LUNs			
LUN Set	Controller Definitions	Security Policy	
Advanced Filter   Export   Print   Settings			
Name	Size (GB)	Order	Fractional Size (MB)

No data available

In the **Create Local LUN** window:

- Select the **Create Local LUN** radio button
- Give the LUN a name (I used m.2)
- Set the Size to 1
- Set the Fractional Size 0
- Select if you would like to have the LUN auto-deploy (if you select no you have to manually enable the LUN on each service profile)
- Tick the **Expand to Available** box
- Select the previously made disk group configuration
- Click **OK** as shown in this image





Your Storage Profile must now look like this:

## Create Storage Profile



Name :

Description :

### LUNs

**Local LUNs** | LUN Set | Controller Definitions | Security Policy

Advanced Filter | Export | Print |

Name	Size (GB)	Order	Fractional Size (MB)
<b>m.2</b>	1	Not Applicable	0

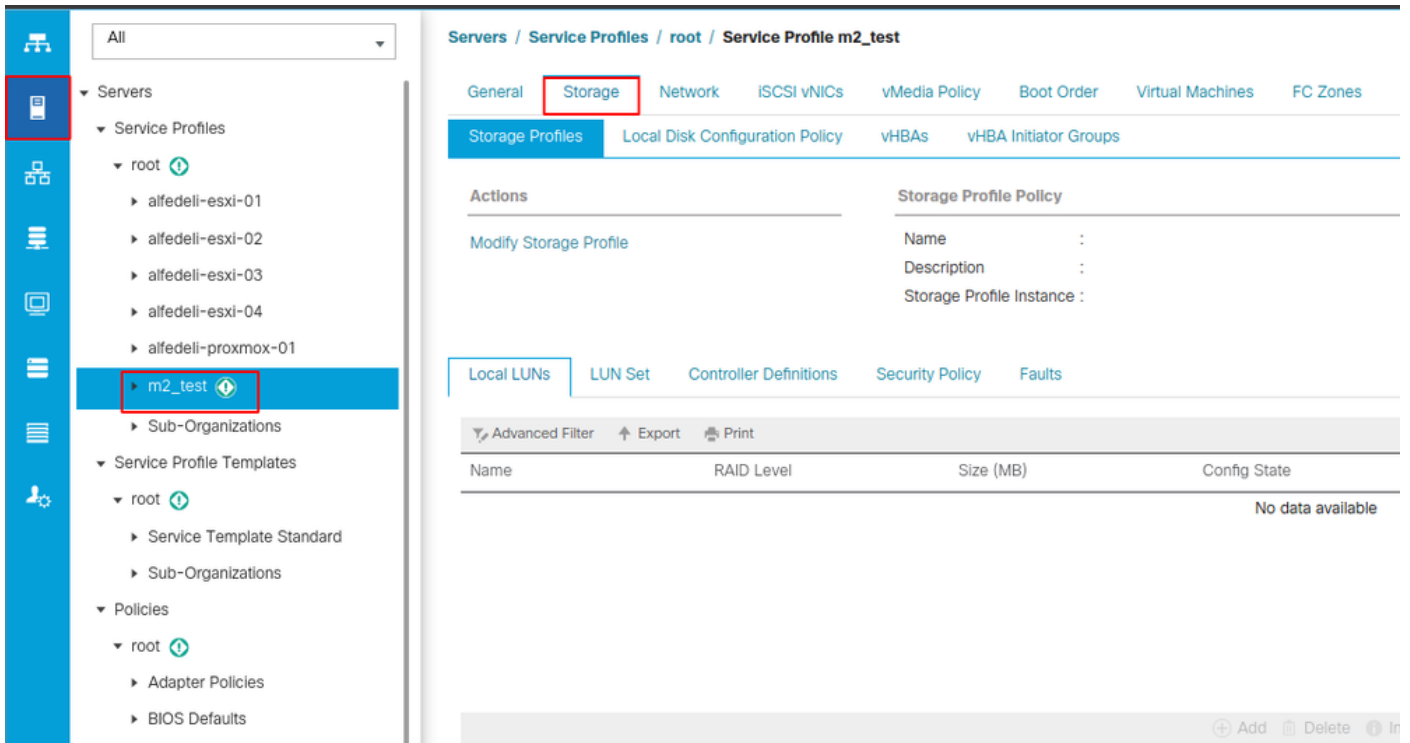
Add | Delete | Info

**OK** | Cancel

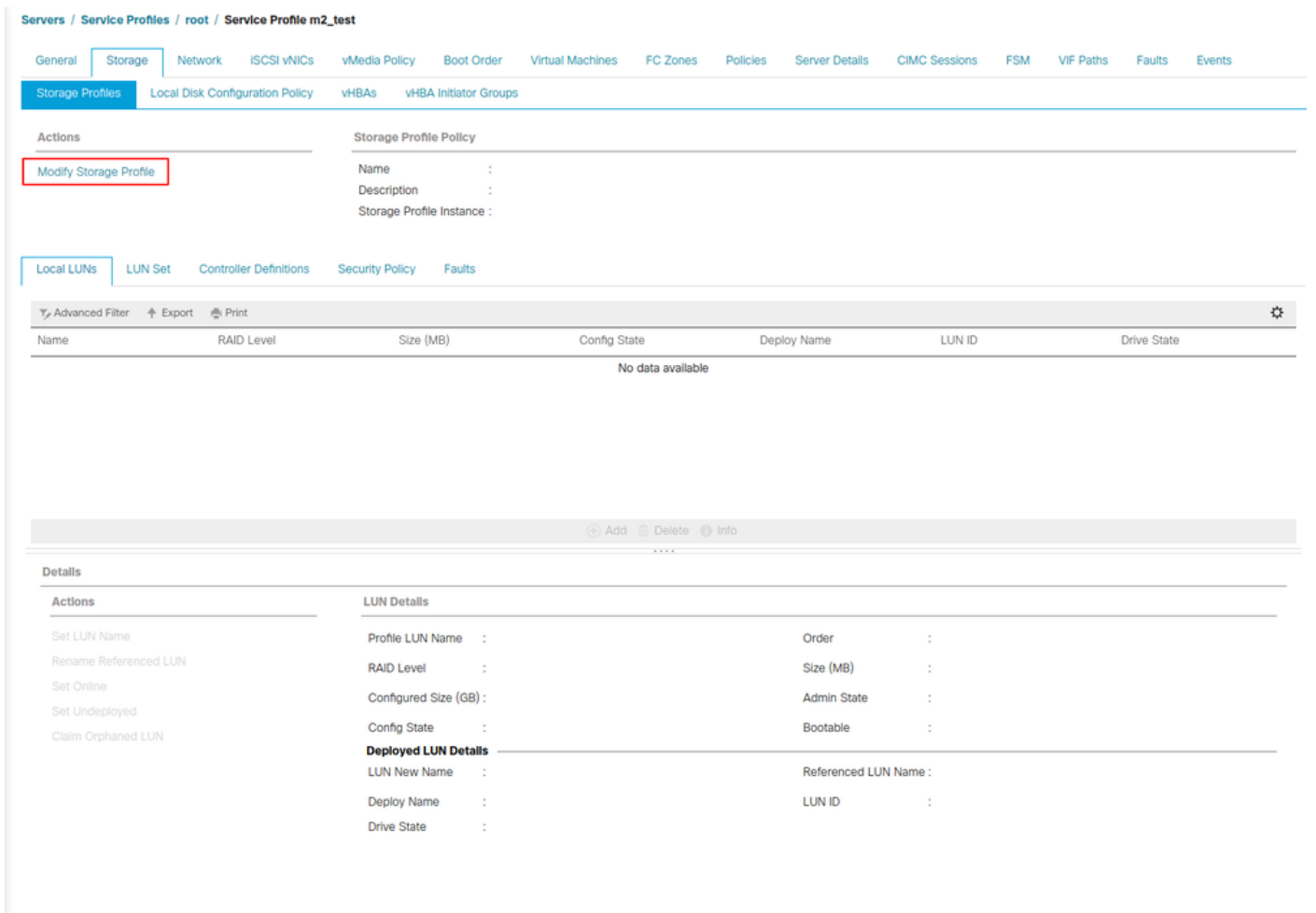
Click **OK** and you get a message that says the storage profile was successfully created. Push **OK** on that message to clear it.

### 3. Apply the Storage Profile

Navigate to **Servers > Service Profiles** and select your service profile. Click the **Storage** tab at the top of the service profile as shown in this image.

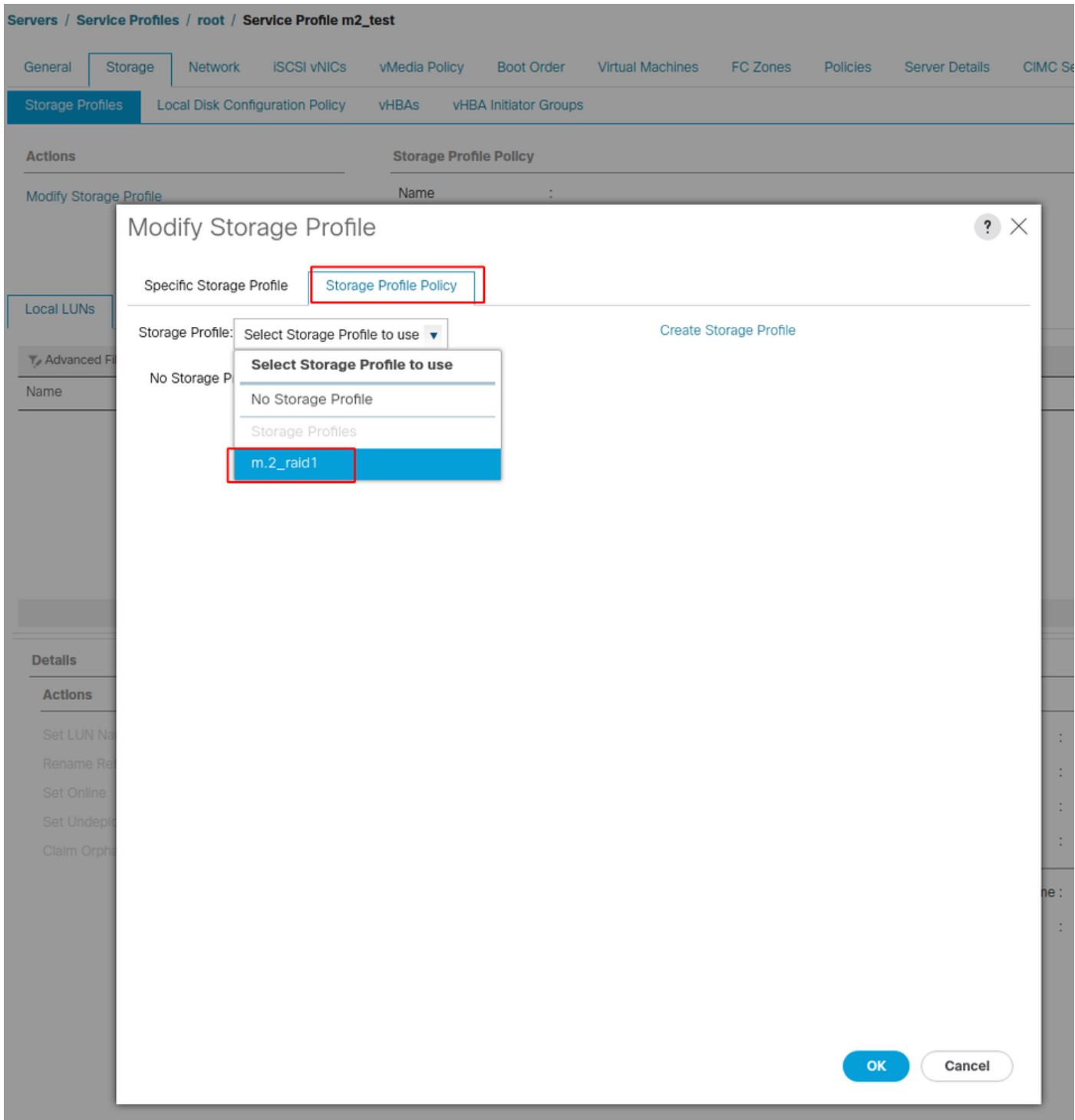


Select the **Modify Storage Profile** link as shown in this image.



In the **Modify Storage Profile** Window:

- Select the **Storage Profile Policy** tab
- In the **Storage Profile** dropdown, select the previously created profile as shown in this image



Your window must now look like this:

# Modify Storage Profile



Specific Storage Profile

Storage Profile Policy

Storage Profile: m.2\_raid1

[Create Storage Profile](#)

Name : **m.2\_raid1**

Description : **Profile for m.2 raid1 storage**

### LUNs

Local LUNs

LUN Set

Controller Definitions

Security Policy

Advanced Filter Export Print

Name	Size (GB)	Order	Fractional Size (MB)
m.2	1	Not Applicable	0

OK

Cancel

**Actions**

Modify Storage Profile

**Storage Profile Policy**

Name : **m.2\_raid1**  
Description : **Profile for m.2 raid1 storage**  
Storage Profile Instance : org-root/profile-m.2\_raid1

Advanced Filter Export Print

Name	RAID Level	Size (MB)	Config State	Deploy Name	LUN ID	Drive State
m.2	RAID 1 Mirrored	0	Not Applied			

+ Add - Delete Info

**Details**

**Actions**

Set LUN Name  
Rename Referenced LUN  
Set Online  
Set Undeployed  
Claim Orphaned LUN

**LUN Details**

Profile LUN Name : **m.2**  
RAID Level : **RAID 1 Mirrored**  
Configured Size (GB) : **1**  
Config State : **Not Applied**  
**Deployed LUN Details**  
LUN New Name :  
Deploy Name :  
Drive State :  
Order : **Not Applicable**  
Size (MB) : **0**  
Admin State : **Undeployed**  
Bootable : **Disabled**  
Referenced LUN Name :  
LUN ID :

Select **OK** on the window, and success window.

If auto-deploy is enabled or disabled, ensure the Local LUN is set to online. In order to set the LUN online, click the **Set Online** button as shown in this image.

Servers / Service Profiles / root / Service Profile m2\_test

General Storage Network iSCSI vNICs vMedia Policy Boot Order Virtual Machines FC Zones Policies Server Details CIMC Sessions FSM VIF Paths Faults Events

Storage Profiles Local Disk Configuration Policy vHBAs vHBA Initiator Groups

Actions Storage Profile Policy

Modify Storage Profile Name : **m.2\_raid1**  
 Description : **Profile for m.2 raid1 storage**  
 Storage Profile Instance : org-root/profile-m.2\_raid1

Local LUNs LUN Set Controller Definitions Security Policy Faults

Advanced Filter Export Print

Name	RAID Level	Size (MB)	Config State	Deploy Name	LUN ID	Drive State
m.2	RAID 1 Mirrored	0	Not Applied			

+ Add - Delete Info

Details

Actions	LUN Details
Set LUN Name	Profile LUN Name : <b>m.2</b>
Rename Referenced LUN	RAID Level : <b>RAID 1 Mirrored</b>
Set Online	Configured Size (GB) : <b>1</b>
Set Undeployed	Config State : <b>Not Applied</b>
Claim Orphaned LUN	<b>Deployed LUN Details</b>
	LUN New Name : Referenced LUN Name :
	Deploy Name : LUN ID :
	Drive State :
	Order : <b>Not Applicable</b>
	Size (MB) : <b>0</b>
	Admin State : <b>Undeployed</b>
	Bootable : <b>Disabled</b>

## Details

### Actions

Set LUN Name

Rename Referenced LUN

Set Online

Set Undeployed

Claim Orphaned LUN

The LUN can take a minute to initialize and come online.

Once the LUN is online, it shows an **Applied Config** state and the **Optimal Drive** state.

4. Verify The LUN.

Under the **General** tab of the service profile, click the link for the **Associated Server** as shown in this image.

Servers / Service Profiles / root / Service Profile m2\_test

General Storage Network iSCSI vNICs vMedia Policy Boot Order Virtual Machines FC Zones Policies Server Details CIMC Sessions FSM VIF Paths Faults Events

**Fault Summary**

0 0 0 1

**Status**

Overall Status : **Config**

+ Status Details

**Actions**

- Set Desired Power State
- Boot Server
- Shutdown Server
- Reset
- KVM Console >>
- SSH to CIMC for SoL >>
- Rename Service Profile
- Create a Clone
- Create a Service Profile Template
- Disassociate Service Profile
- Change Service Profile Association
- Unbind from the Template
- Bind to a Template
- Reapply Configuration
- Change Maintenance Policy
- Set UUID Sync Behavior
- Change UUID
- Reset UUID
- Change Management IP Address
- Reset Management IP Address
- Delete Inband Configuration
- Modify vNIC/vHBA Placement
- Start Fault Suppression
- Stop Fault Suppression
- Suppression Task Properties
- Delete

**Properties**

**Pending Activities**

Reboot now

Pending Disruptions : **defaultValue**

Pending Changes : **operational-policies**

+ Details

Name : **m2\_test**

User Label :

Description :

Asset Tag :

Owner : **Local**

Unique Identifier : **d81b94dc-8601-11e9-0000-00000000001f**

UUID Pool : **alfedell\_prod**

UUID Pool Instance : **org-root/uuid-pool-alfedell\_prod**

**Associated Server** : **sys/chassis-1/blade-6**

Service Profile Template :

Template Instance :

+ Assigned Server or Server Pool

+ Management IP Address

+ Maintenance Policy

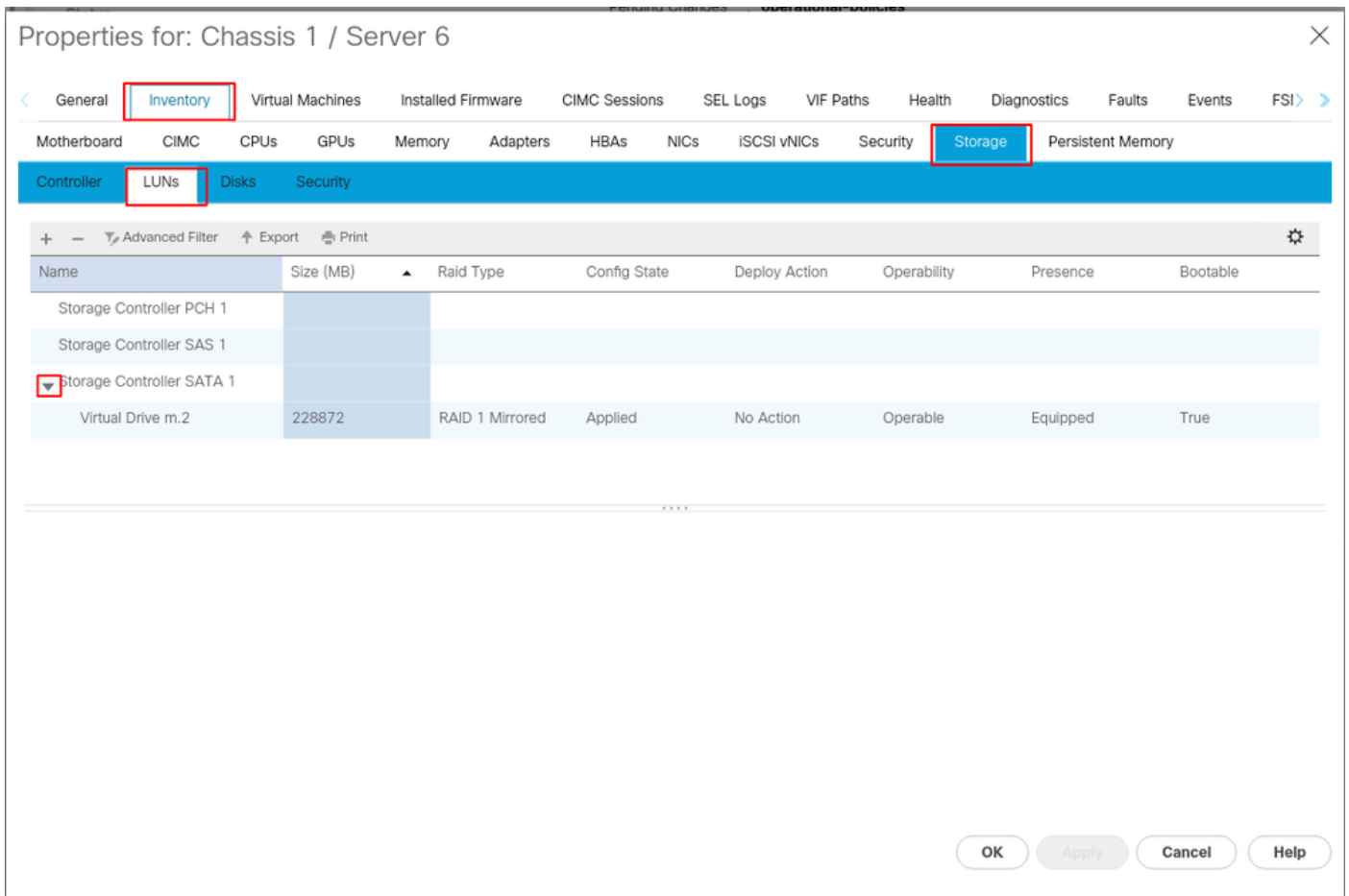
Save Changes Reset Values

Navigate to **Inventory> Storage> LUNs**.

Select the drop-down arrow to the left of **Storage Controller SATA 1**. You must see **Virtual Drive [your drive profile name]**

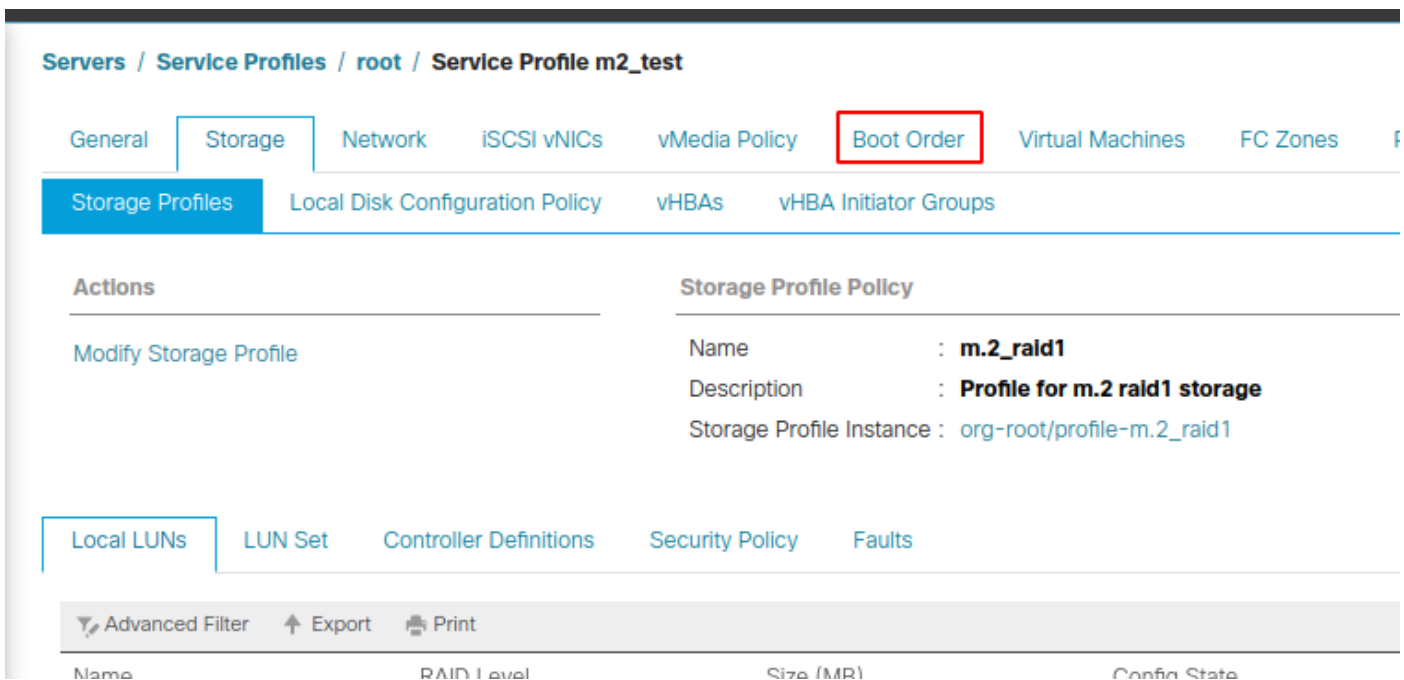
The drive must have auto-configured its size, and be in an **Operable, Equipped, and Bootable** state as shown in this image.





5. Set the Boot Order to boot off the m.2 arrays.

In the service profile, select the **Boot Order** tab as shown in this image.



Set your boot policy to use **Uefi**. After your install media (if any), select the **Add Local Disk** option. Here is an example that the Boot Policy might not match exactly:

## Modify Boot Policy



Boot Policy: Specific Boot Policy

[Create Boot Policy](#)

Local Devices

- Add Local Disk
- Add Local LUN
- Add Local JBOD
- Add SD Card
- Add Internal USB
- Add External USB
- Add Embedded Local LUN
- Add Embedded Local Disk
- Add CD/DVD
- Add Local CD/DVD
- Add Remote CD/DVD
- Add Floppy
  - Add Local Floppy
  - Add Remote Floppy
- Add Remote Virtual Drive
- Add NVMe

+ CIMC Mounted vMedia

**Boot Order**

Reboot on Boot Order Change :

Enforce vNIC/vHBA/iSCSI Name :

Boot Mode :  Legacy  Uefi

Boot Security :

**WARNINGS:**  
The type (primary/secondary) does not indicate a boot order presence.  
The effective order of boot devices within the same device class (LAN/Storage/iSCSI) is determined by PCIe bus scan order.  
If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported.  
If it is not selected, the vNICs/vHBAs are selected if they exist, otherwise the vNIC/vHBA with the lowest PCIe bus scan order is used.

Name	Order	vNIC/v...	Type	LUN Na...	WWN	Slot Nu...	Boot N...	Boot Pa...	Descrip...
CD/DVD	1								
Local Disk	2								

↑ Move Up ↓ Move Down Delete

**OK** **Cancel**

You can need to reboot the host for the configs to apply. This changes the **Bootable** field from **Disabled to Enabled** in the Storage Profile.

## Verify

Check **Inventory > Storage > LUN > Config State is Applied**

## Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

When an orphaned LUN is found, select the LUN and **Delete** it. This removes any and all data that exists on the array as shown in this image.

- All
- Equipment
- Chassis 1
  - Fans
  - IO Modules
  - PSUs
  - Servers
    - Server 2
    - Server 3
    - Server 4
    - Server 5
    - Server 6
    - Server 7
- Rack-Mounts
- Enclosures
- FEX
- Servers
- Fabric Interconnects
  - Fabric Interconnect A (primary)
  - Fabric Interconnect B (subordinate)
- Policies
  - Port Auto-Discovery Policy

Controller | LUNs | Disks | Security

Name	Size (MB)	Raid Type	Config State	Deploy Action	Operability	Presence	Bootable
Storage Controller PCH 1							
Storage Controller SAS 1							
Storage Controller SATA 1							
Virtual Drive m.2	228872	RAID 1 Mirrored	Orphaned	No Action	Operable	Equipped	True

Actions

- Rename
- Delete
- Set Transport Ready
- Hide Virtual Drive
- Clear Transport Ready
- Unhide Virtual Drive
- Secure Virtual Drive

Properties

Virtual Drive Name	: m.2	Size (MB)	: 228872
Type	: RAID 1 Mirrored	Block Size	: 512
Available Size on Disk Group (MB)	: 0	Number of Blocks	: 468729856
ID	: 1000	Drive Security	: No
Oper Device ID	: 0	Drive State	: Optimal
Strip Size (KB)	: 64	Access Policy	: Read Write
Read Policy	: Normal	Actual Write Cache Policy	: Write Through
IO Policy	: Direct	Configured Write Cache Policy	: Write Through
Bootable	: True	Drive Cache	: No Change
<b>States</b>			
Operability	: Operable	Oper Qualifier Reason	: N/A
Config State	: Orphaned	Deploy Action	: No Action
<b>Storage</b>			
LUN Name	:		
Profile Name	:		
Assigned To Server	:		
Service Profile	:		
Available Size On Disk Group (MB)	: 0		
<b>Drive Members</b>			

Slot ID	Slot	Role	Presence	Span ID	Operability Qualifier Reason
253		Normal	Equipped	Unspecified	N/A
254		Normal	Equipped	Unspecified	N/A