



# Configuring Storage Profiles

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## Storage Profiles

Unlike Cisco UCS B-Series and C-Series servers, the Cisco UCS M-Series modular servers do not have local storage. Instead, storage is centralized per chassis, and this centralized storage is shared by all servers in the chassis. To allow flexibility in defining the number of storage disks, roles and usage of these disks, and other storage parameters, you can create and use storage profiles. A storage profile encapsulates the storage requirements for one or more service profiles. LUNs configured in a storage profile can be used as boot LUNs or data LUNs, and can be dedicated to a specific server. You can also specify a local LUN as a boot device. However, LUN resizing is not supported. The introduction of storage profiles allows you to do the following:

- Configure multiple virtual drives and select the physical drives that are used by a virtual drive. You can also configure the storage capacity of a virtual drive.
- Configure the number, type and role of disks in a disk group.
- Associate a storage profile with a service profile.

You can create a storage profile both at an org level and at a service-profile level. A service profile can have a dedicated storage profile as well as a storage profile at an org level.

# Disk Groups and Disk Group Configuration Policies

In UCS M-Series Modular Servers, servers in a chassis can use storage that is centralized in that chassis. You can select and configure the disks to be used for storage. A logical collection of these physical disks is called a disk group. Disk groups allow you to organize local disks. The storage controller controls the creation and configuration of disk groups.

A disk group configuration policy defines how a disk group is created and configured. The policy specifies the RAID level to be used for the disk group. It also specifies either a manual or an automatic selection of disks for the disk group, and roles for disks. You can use a disk group policy to manage multiple disk groups. However, a single disk group can be managed only by one disk group policy.

A hot spare is an unused extra disk that can be used by a disk group in the case of failure of a disk in the disk group. Hot spares can be used only in disk groups that support a fault-tolerant RAID level.

## Virtual Drives

A disk group can be partitioned into virtual drives. Each virtual drive appears as an individual physical device to the Operating System.

All virtual drives in a disk group must be managed by using a single disk group policy.

### Configuration States

Indicates the configuration states of a virtual drive. Virtual drives can have the following configuration states:

- Applying—Creation of the virtual drive is in progress.
- Applied—Creation of the virtual drive is complete, or virtual disk policy changes are configured and applied successfully.
- Failed to apply—Creation, deletion, or renaming of a virtual drive has failed due to errors in the underlying storage subsystem.
- Orphaned—The service profile that contained this virtual drive is deleted.
- Not in use—The service profile that contained this virtual drive is in the disassociated state.

### Deployment States

Indicates the actions that you are performing on virtual drives. Virtual drives can have the following deployment states:

- No action—No pending work items for the virtual drive.
- Creating—Creation of the virtual drive is in progress.
- Deleting—Deletion of the virtual drive is in progress.
- Modifying—Modification of the virtual drive is in progress.
- Apply-Failed—Creation or modification of the virtual drive has failed.

### Operability States

Indicates the operating condition of a virtual drive. Virtual drives can have the following operability states:

- Optimal—The virtual drive operating condition is good. All configured drives are online.
- Degraded—The virtual drive operating condition is not optimal. One of the configured drives has failed or is offline.
- Cache-degraded—The virtual drive has been created with a write policy of **write back** mode, but the BBU has failed, or there is no BBU.



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**Note** This state does not occur if you select the **always write back** mode.

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- Partially degraded—The operating condition in a RAID 6 virtual drive is not optimal. One of the configured drives has failed or is offline. RAID 6 can tolerate up to two drive failures.
- Offline—The virtual drive is not available to the RAID controller. This is essentially a failed state.
- Unknown—The state of the virtual drive is not known.

### Presence States

Indicates the presence of virtual drive components. Virtual drives have the following presence states:

- Equipped—The virtual drive is available.
- Mismatched—A virtual drive deployed state is different from its configured state.
- Missing—Virtual drive is missing.

## RAID Levels

The RAID level of a disk group describes how the data is organized on the disk group for the purpose of ensuring availability, redundancy of data, and I/O performance.

The following are features provided by RAID:

- Striping—Segmenting data across multiple physical devices. This improves performance by increasing throughput due to simultaneous device access.
- Mirroring—Writing the same data to multiple devices to accomplish data redundancy.
- Parity—Storing of redundant data on an additional device for the purpose of error correction in the event of device failure. Parity does not provide full redundancy, but it allows for error recovery in some scenarios.
- Spanning—Allows multiple drives to function like a larger one. For example, four 20 GB drives can be combined to appear as a single 80 GB drive.

The supported RAID levels include the following:

- RAID 0 Striped—Data is striped across all disks in the array, providing fast throughput. There is no data redundancy, and all data is lost if any disk fails.
- RAID 1 Mirrored—Data is written to two disks, providing complete data redundancy if one disk fails. The maximum array size is equal to the available space on the smaller of the two drives.
- RAID 5 Striped Parity—Data is striped across all disks in the array. Part of the capacity of each disk stores parity information that can be used to reconstruct data if a disk fails. RAID 5 provides good data throughput for applications with high read request rates.

RAID 5 distributes parity data blocks among the disks that are part of a RAID-5 group and requires a minimum of three disks.

- RAID 6 Striped Dual Parity—Data is striped across all disks in the array and two sets of parity data are used to provide protection against failure of up to two physical disks. In each row of data blocks, two sets of parity data are stored.

Other than addition of a second parity block, RAID 6 is identical to RAID 5. A minimum of four disks are required for RAID 6.

- RAID 10 Mirrored and Striped—RAID 10 uses mirrored pairs of disks to provide complete data redundancy and high throughput rates through block-level striping. RAID 10 is mirroring without parity and block-level striping. A minimum of four disks are required for RAID 10.

## Automatic Disk Selection

When you specify a disk group configuration, and do not specify the local disks in it, Cisco UCS Manager determines the disks to be used based on the criteria specified in the disk group configuration policy. Cisco UCS Manager can make this selection of disks in multiple ways.

When all qualifiers match for a set of disks, then disks are selected sequentially according to their slot number. Regular disks and dedicated hot spares are selected by using the lowest numbered slot.

The following is the disk selection process:

1. Iterate over all local LUNs that require the creation of a new virtual drive. Iteration is based on the following criteria, in order:
  - a. Disk type
  - b. Minimum disk size from highest to lowest
  - c. Space required from highest to lowest
  - d. Disk group qualifier name, in alphabetical order
  - e. Local LUN name, in alphabetical order
2. Select regular disks depending on the minimum number of disks and minimum disk size. Disks are selected sequentially starting from the lowest numbered disk slot that satisfies the search criteria.



**Note** If you specify **Any** as the type of drive, the first available drive is selected. After this drive is selected, subsequent drives will be of a compatible type. For example, if the first drive was SATA, all subsequent drives would be SATA. Cisco UCS Manager Release 2.5 supports only SATA and SAS.

Cisco UCS Manager Release 2.5 does not support RAID migration.

3. Select dedicated hot spares by using the same method as normal disks. Disks are only selected if they are in an **Unconfigured Good** state.
4. If a provisioned LUN has the same disk group policy as a deployed virtual drive, then try to deploy the new virtual drive in the same disk group. Otherwise, try to find new disks for deployment.

## Supported LUN Modifications

Some modifications that are made to the LUN configuration when LUNs are already deployed on an associated server are supported.

The following are the types of modifications that can be performed:

- Creation of a new virtual drive.
- Deletion of an existing virtual drive, which is in the orphaned state.
- Non-disruptive changes to an existing virtual drive. These changes can be made on an existing virtual drive without loss of data, and without performance degradation:
  - Policy changes. For example, changing the write cache policy.
  - Modification of boot parameters

The removal of a LUN will cause a warning to be displayed. Ensure that you take action to avoid loss of data.

## Unsupported LUN Modifications

Some modifications to existing LUNs are not possible without destroying the original virtual drive and creating a new one. All data is lost in these types of modification, and these modifications are not supported.

Disruptive modifications to an existing virtual drive are not supported. The following are unsupported disruptive changes:

- Any supported RAID level change that can be handled through reconstruction. For example, RAID0 to RAID1.
- Increasing the size of a virtual drive through reconstruction.
- Addition and removal of disks through reconstruction.

Destructive modifications are also not supported. The following are unsupported destructive modifications:

- RAID-level changes that do not support reconstruction. For example, RAID5 to RAID1.

- Shrinking the size of a virtual drive.
- RAID-level changes that support reconstruction, but where there are other virtual drives present on the same drive group.
- Disk removal when there is not enough space left on the disk group to accommodate the virtual drive.
- Explicit change in the set of disks used by the virtual drive.

## Disk Insertion Handling

When the following sequence of events takes place:

1. The LUN is created in one of the following ways:
  - a. You specify the slot specifically by using a local disk reference
  - b. The system selects the slot based on criteria specified by you
2. The LUN is successfully deployed, which means that a virtual drive is created, which uses the slot.
3. You remove a disk from the slot, possibly because the disk failed.
4. You insert a new working disk into the same slot.

The following scenarios are possible:

- [Non-Redundant Virtual Drives, on page 6](#)
- [Redundant Virtual Drives with No Hot Spare Drives, on page 6](#)
- [Redundant Virtual Drives with Hot Spare Drives, on page 7](#)
- [Replacing Hot Spare Drives, on page 7](#)
- [Inserting Physical Drives into Unused Slots, on page 7](#)

## Non-Redundant Virtual Drives

For non-redundant virtual drives (RAID 0), when a physical drive is removed, the state of the virtual drive is **Inoperable**. When a new working drive is inserted, the new physical drive goes to an **Unconfigured Good** state.

For non-redundant virtual drives, there is no way to recover the virtual drive. You must delete the virtual drive and re-create it.

## Redundant Virtual Drives with No Hot Spare Drives

For redundant virtual drives (RAID 1, RAID 5, RAID 6, RAID 10) with no hot spare drives assigned, virtual drive mismatch, virtual drive member missing, and local disk missing faults appear until you insert a working physical drive into the same slot from which the old physical drive was removed.

If the physical drive size is greater than or equal to that of the old drive, the storage controller automatically uses the new drive for the virtual drive. The new drive goes into the **Rebuilding** state. After rebuild is complete, the virtual drive goes back into the **Online** state.

## Redundant Virtual Drives with Hot Spare Drives

For redundant virtual drives (RAID 1, RAID 5, RAID 6, RAID 10) with hot spare drives assigned, when a drive fails, or when you remove a drive, the dedicated hot spare drive, if available, goes into the **Rebuilding** state with the virtual drive in the **Degraded** state. After rebuilding is complete, that drive goes to the **Online** state.

Cisco UCSM raises a disk missing and virtual drive mismatch fault because although the virtual drive is operational, it does not match the physical configuration that Cisco UCSM expects.

If you insert a new disk in the slot with the disk missing, automatic copy back starts from the earlier hot spare disk to the newly inserted disk. After copy back, the hot spare disk is restored. In this state all faults are cleared.

If automatic copy back does not start, and the newly inserted disk remains in the **Unconfigured Good**, **JBOD**, or **Foreign Configuration** state, remove the new disk from the slot, reinsert the earlier hot spare disk into the slot, and import foreign configuration. This initiates the rebuilding process and the drive state becomes **Online**. Now, insert the new disk in the hot spare slot and mark it as hot spare to match it exactly with the information available in Cisco UCSM.

## Replacing Hot Spare Drives

If a hot spare drive is replaced, the new hot spare drive will go to the **Unconfigured Good**, **Unconfigured Bad**, **JBOD**, or **Foreign Configuration** state.

Cisco UCSM will raise a virtual drive mismatch or virtual drive member mismatch fault because the hot spare drive is in a state different from the state configured in Cisco UCSM.

You must manually clear the fault. To do this, you must perform the following actions:

1. Clear the state on the newly inserted drive to **Unconfigured Good**.
2. Configure the newly inserted drive as a hot spare drive to match what is expected by Cisco UCSM.

## Inserting Physical Drives into Unused Slots

If you insert new physical drives into unused slots, neither the storage controller nor Cisco UCSM will make use of the new drive even if the drive is in the **Unconfigured Good** state and there are virtual drives that are missing good physical drives.

The drive will simply go into the **Unconfigured Good** state. To make use of the new drive, you will need to modify or create LUNs to reference the newly inserted drive.

## Virtual Drive Naming

When you use UCSM to create a virtual drive, UCSM assigns a unique ID that can be used to reliably identify the virtual drive for further operations. UCSM also provides the flexibility to provide a name to the virtual

drive at the time of service profile association. Any virtual drive without a service profile or a server reference is marked as an orphan virtual drive.

In addition to a unique ID, a name is assigned to the drive. Names can be assigned in two ways:

- When configuring a virtual drive, you can explicitly assign a name that can be referenced in storage profiles.
- If you have not preprovisioned a name for the virtual drive, UCSM generates a unique name for the virtual drive.

You can rename virtual drives that are not referenced by any service profile or server.

## LUN Dereferencing

A LUN is dereferenced when it is no longer used by any service profile. This can occur as part of the following scenarios:

- The LUN is no longer referenced from the storage profile
- The storage profile is no longer referenced from the service profile
- The server is disassociated from the service profile
- The server is decommissioned

When the LUN is no longer referenced, but the server is still associated, re-association occurs.

When the service profile that contained the LUN is disassociated, the LUN state is changed to **Not in use**.

When the service profile that contained the LUN is deleted, the LUN state is changed to **Orphaned**.

## Guidelines and Limitations

- Cisco UCS Manager does not support initiating the following storage profile functions. However, you can monitor them through Cisco UCS Manager after they are performed:
  - Virtual Drive Rebuild
  - Virtual Drive Consistency Check
  - Virtual Drive Initialization
  - Patrol Read
  - BBU Relearning
  - Locator LED
  - BBU Configuration
  - Destructive LUN modifications
  - Automatic LUN creation
  - Disk replacement with hot spares



- JBOD mode
- Additional disk selection qualifiers
- Cisco UCS Manager does not support a combination of SAS and SATA drives in storage configurations.
- Cisco UCS Manager Release 2.5 only supports a stripe size of 64k and more. Having a stripe size of less than 64k will result in failure when a service profile is associated.

## Controller Constraints and Limitations

In Cisco UCS Manager Release 2.5, the storage controller allows 64 virtual drives per controller, and up to 4 virtual drives per server, of which up to 2 virtual drives are bootable.



**Note** Only the modular servers in Cisco UCSME-2814 compute cartridges include support for up to 4 virtual drives per server.

## Configuring Storage Profiles

### Configuring a Disk Group Policy

Configuring a disk group involves the following:

1. Setting the RAID level
2. Automatically or manually configuring disks in a disk group policy
3. Configuring virtual drive properties

### Configuring a Disk Group Policy

You can configure the disks in a disk group policy automatically or manually.

#### Procedure

- Step 1** In the **Navigation** pane, click **Storage**.
- Step 2** Expand **Storage** > **Storage Provisioning** > **Storage Policies**
- Step 3** Expand the node for the organization where you want to create the disk group policy.
- Step 4** Right-click **Disk Group Policies** in the organization and select **Create Disk Group Policy**.
- Step 5** In the **Create Disk Group Policy** dialog box, specify the following:

Name	Description
Name field	The name of the policy

Name	Description
	This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object has been saved.
<b>Description</b> field	A description of the policy. We recommend that you include information about where and when the policy should be used.  Enter up to 256 characters. You can use any characters or spaces except ` (accent mark), \ (backslash), ^ (carat), " (double quote), = (equal sign), > (greater than), < (less than), or ' (single quote).
<b>RAID Level</b> drop-down list	This can be one of the following: <ul style="list-style-type: none"> <li>• <b>RAID 0 Striped</b></li> <li>• <b>RAID 1 Mirrored</b></li> <li>• <b>RAID 5 Striped Parity</b></li> <li>• <b>RAID 6 Striped Dual Parity</b></li> <li>• <b>RAID 10 Mirrored and Striped</b></li> </ul> <p><b>Note</b> When you create a disk group with RAID 1 policy and configure four disks for it, a RAID 1E configuration is created internally by the storage controller.</p>

**Step 6** To automatically configure the disks in a disk group policy, select **Disk Group Configuration (Automatic)** and specify the following:

Name	Description
<b>Number of drives</b> field	Specifies the number of drives for the disk group.  The range for drives is from 0 to 24 drives. <b>Unspecified</b> is the default number of drives. When you select the number of drives as <b>Unspecified</b> , the number of drives will be selected according to the disk selection process.
<b>Drive Type</b> field	Drive type for the disk group. You can select: <ul style="list-style-type: none"> <li>• <b>HDD</b></li> </ul> <p><b>Note</b> HDDs are not supported with modular servers.</p> <ul style="list-style-type: none"> <li>• <b>SSD</b></li> <li>• <b>Unspecified</b></li> </ul> <p><b>Unspecified</b> is the default type of drive. When you select the drive type as <b>Unspecified</b>, the first available drive is selected. After this drive is selected, subsequent drives will be of a compatible type. For example, if the first was SSD, all subsequent drives would be SSD.</p>
<b>Number of Hot Spares</b> field	Number of dedicated hot spares for the disk group.

Name	Description
	The range for dedicated hot spares is from 0 to 24 hot spares. <b>Unspecified</b> is the default number of dedicated hot spares. When you select the number of dedicated hot spares as <b>Unspecified</b> , the hot spares will be selected according to the disk selection process.
<b>Min Drive Size</b> field	Minimum drive size for the disk group. Only disks that match this criteria are available for selection.  The range for minimum drive size is from 0 to 10240 GB. <b>Unspecified</b> is the default minimum drive size. When you select the minimum drive size as <b>Unspecified</b> , drives of all sizes will be available for selection.

**Step 7** To manually configure the disks in a disk group policy, select **Disk Group Configuration (Manual)** and do the following:

- a) On the icon bar to the right of the table, click +
- b) In the **Create Local Disk Configuration Reference** dialog box, complete the following fields:

Name	Description
<b>Slot</b> field	Slot for which the local disk reference is configured.
<b>Role</b> field	Role of the local disk in the disk group. You can select: <ul style="list-style-type: none"> <li>• <b>Dedicated Hot Spare</b></li> <li>• <b>Normal</b></li> </ul>
<b>Span ID</b> field	Span ID for the local disk. The values range from 0 to 8.  <b>Unspecified</b> is the default Span ID of the local disk. Use this only when spanning information is not required.

**Step 8** In the **Virtual Drive Configuration** area, specify the following:

Name	Description
<b>Strip Size (KB)</b> field	Stripe size for a virtual drive. This can only be <b>Platform Default</b> .
<b>Access Policy</b> field	Access policy for a virtual drive. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Platform Default</b></li> <li>• <b>Read Write</b></li> <li>• <b>Read Only</b></li> <li>• <b>Blocked</b></li> </ul>
<b>Read Policy</b> field	Read policy for a virtual drive. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Platform Default</b></li> <li>• <b>Read Ahead</b></li> <li>• <b>Normal</b></li> </ul>

Name	Description
<b>Write Cache Policy</b> field	Write-cache-policy for a virtual drive. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Platform Default</b></li> <li>• <b>Write Through</b></li> <li>• <b>Write Back Good Bbu</b></li> <li>• <b>Always Write Back</b></li> </ul>
<b>IO Policy</b> field	I/O policy for a virtual drive. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Platform Default</b></li> <li>• <b>Direct</b></li> <li>• <b>Cached</b></li> </ul>
<b>Drive Cache</b> field	State of the drive cache. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Platform Default</b></li> <li>• <b>No Change</b></li> <li>• <b>Enable</b></li> <li>• <b>Disable</b></li> </ul>

All virtual drives in a disk group should be managed by using the same disk group policy.

**Step 9** Click **OK**.

## Creating a Storage Profile

You can create storage profile policies from the **Storage** tab in the **Navigation** pane. Additionally, you can also configure the default storage profile that is specific to a service profile from the **Servers** tab.

### Procedure

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- Step 1** In the **Navigation** pane, click **Storage**.
- Step 2** Expand **Storage > Storage Profiles**
- Step 3** Expand the node for the organization where you want to create the storage profile.  
If the system does not include multitenancy, expand the **root** node.
- Step 4** Right-click the organization and select **Create Storage Profile**.
- Step 5** In the **Create Storage Profile** dialog box, specify the storage profile **Name**. You can provide an optional **Description** for this storage profile.
- Step 6** (Optional) In the **Storage Items** area, **Create Local LUNs** and add them to this storage profile.

**Step 7** Click **OK**.

## Deleting a Storage Profile

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Storage</b> .	
<b>Step 2</b>	Expand <b>Storage &gt; Storage Profiles</b>	
<b>Step 3</b>	Expand the node for the organization that contains the storage profile that you want to delete.	
<b>Step 4</b>	Right-click the storage profile that you want to delete and select <b>Delete</b> .	
<b>Step 5</b>	Click <b>Yes</b> in the confirmation box that appears.	

## Configuring Local LUNs

You can create local LUNs within a storage profile policy from the **Storage** tab in the **Navigation** pane. Additionally, you can also create local LUNs within the default storage profile that is specific to a service profile from the **Servers** tab.

### Procedure

- Step 1** In the **Navigation** pane, click **Storage**.
- Step 2** Expand **Storage > Storage Profiles**
- Step 3** Expand the node for the organization that contains the storage profile within which you want to create a local LUN.
- Step 4** In the **Work** pane, click the **General** tab.
- Step 5** In the **Actions** area, click **Create Local LUN**.
- Step 6** In the Create Local LUN dialog box, complete the following fields:

Name	Description
Name field	Name for the new local LUN.
Size (GB) field	Size of this LUN in GB. The size can range from 1 to 10240 GB. <b>Note</b> You do not need to specify a LUN size while claiming an orphaned LUN.
Order field	Order of this LUN. The order can range from 1 to 64. By default, the order is specified as lowest-available. This means that the system will automatically assign the lowest available order to the LUN.

Name	Description
	Multiple LUNs referenced by a storage profile must have unique names and unique orders.
<b>Auto Deploy</b> field	Whether the local LUN should be automatically deployed or not.
<b>Select Disk Group Configuration</b> field	The disk group configuration to be applied to this local LUN.

**Step 7** (Optional) Click **Create Disk Group Policy** to create a new disk group policy for this local LUN.

**Step 8** Click **OK**.

## Reordering Local LUNs

You can change the local LUN visibility order to the server. This operation will reboot the server.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Storage</b> .	
<b>Step 2</b>	Expand <b>Storage &gt; Storage Profiles</b>	
<b>Step 3</b>	Expand the node for the organization that contains the storage profile within which you want to reorder local LUNs.	
<b>Step 4</b>	Expand <b>Local LUNs</b> for the storage profile that you want and select the LUN that you want to reorder.	
<b>Step 5</b>	In the <b>Work</b> pane, click the <b>General</b> tab.	
<b>Step 6</b>	In the <b>Properties</b> area, change the <b>Order</b> of the local LUN.	
<b>Step 7</b>	Click <b>Save Changes</b> .	

## Deleting Local LUNs

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Storage</b> .	
<b>Step 2</b>	Expand <b>Storage &gt; Storage Profiles</b>	
<b>Step 3</b>	Expand the node for the organization that contains the storage profile from which you want to delete a local LUN.	

	Command or Action	Purpose
<b>Step 4</b>	Expand <b>Local LUNs</b> for the storage profile that you want and select the LUN that you want to delete.	
<b>Step 5</b>	Right-click the LUN that you want to delete and select <b>Delete</b> .	A confirmation dialog box appears.
<b>Step 6</b>	Click <b>Yes</b> .	

## Associating a Storage Profile with an Existing Service Profile

You can associate a storage profile with an existing service profile or a new service profile. *Creating a Service Profile with the Expert Wizard* in the *Cisco UCS Manager GUI Configuration Guide, Release 2.2* provides more information about associating a storage profile with a new service profile.

### Procedure

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- Step 1** In the **Navigation** pane, click **Servers**.
  - Step 2** Expand **Servers > Service Profiles**.
  - Step 3** Expand the node for the organization that contains the service profile that you want to associate with a storage profile.
  - Step 4** Choose the service profile that you want to associate with a storage profile.
  - Step 5** In the **Work** pane, click the **Storage** tab.
  - Step 6** Click the **LUN Configuration** subtab.
  - Step 7** In the **Actions** area, click **Modify Storage Profile**. The **Modify Storage Profile** dialog box appears.
  - Step 8** Click the **Storage Profile Policy** tab.
  - Step 9** To associate an existing storage profile with this service profile, select the storage profile that you want to associate from the **Storage Profile** drop-down list, and click **OK**. The details of the storage profile appear in the **Storage Items** area.
  - Step 10** To create a new storage profile and associate it with this service profile, click **Create Storage Profile**, complete the required fields, and click **OK**. [Creating a Storage Profile, on page 12](#) provides more information on creating a new storage profile.
  - Step 11** (Optional) To dissociate the service profile from a storage profile, select **No Storage Profile** from the **Storage Profile** drop-down list, and click **OK**.
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## Displaying Details of All Local LUNs Inherited By a Service Profile

Storage profiles can be defined under org and as a dedicated storage profile under service profile. Thus, a service profile inherits local LUNs from both possible storage profiles. It can have a maximum of 2 such local LUNs. You can display the details of all local LUNs inherited by a service profile by using the following command:

## Procedure

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- Step 1** In the **Navigation** pane, click **Servers**.
- Step 2** Expand **Servers > Service Profiles**.
- Step 3** Expand the node for the organization that contains the service profile that you want to display.
- Step 4** Choose the service profile whose inherited local LUNs you want to display.
- Step 5** In the **Work** pane, click the **Storage** tab.
- Step 6** Click the **LUN Configuration** subtab, and then click the **Local LUNs** tab.

Displays the following detailed information about all the local LUNs inherited by the specified service profile:

- **Name**—LUN name in the storage profile.
- **Admin State**—Specifies whether a local LUN should be deployed or not. Admin state can be **Online** or **Undeployed**.  
 When the local LUN is being referenced by a service profile, if the auto-deploy status is **no-auto-deploy** then the admin state will be **Undeployed**, else it will be **Online**. After the local LUN is referenced by a service profile, any change made to this local LUN's auto-deploy status is not reflected in the admin state of the LUN inherited by the service profile.
- **RAID Level**—Summary of the RAID level of the disk group used.
- **Provisioned Size (GB)**—Size, in GB, of the LUN specified in the storage profile.
- **Assigned Size (MB)**—Size, in MB, assigned by UCSM.
- **Config State**—State of LUN configuration. The states can be one of the following:
  - **Applying**—Admin state is online, the LUN is associated with a server, and the virtual drive is being created.
  - **Applied**—Admin state is online, the LUN is associated with a server, and the virtual drive is created.
  - **Apply Failed**—Admin stage is online, the LUN is associated with a server, but the virtual drive creation failed.
  - **Not Applied**—The LUN is not associated with a server, or the LUN is associated with a service profile, but admin state is undeployed.
  - **Not In Use**—Service profile is using the virtual drive, but the virtual drive is not associated with a server.
- **Referenced LUN Name**—The preprovisioned virtual drive name, or UCSM-generated virtual drive name.
- **Deploy Name**—The virtual drive name after deployment.
- **ID**—LUN ID.
- **Order**—Order of LUN visibility to the server.
- **Bootable**—Whether the LUN is bootable or not.
- **LUN New Name**—New name of the LUN.



- **Drive State**—State of the virtual drive. The states are:
  - **Unknown**
  - **Optimal**
  - **Degraded**
  - **Inoperable**
  - **Partially Degraded**

## Displaying Detailed Information About LUNs Used By a Modular Server

### Procedure

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment > Chassis > Chassis Number > Cartridges > Cartridge Number > Servers**
- Step 3** Choose the server to display detailed information about all the LUNs used by it.
- Step 4** In the **Work** pane, click the **General** tab.
- Step 5** Expand the **Storage Details** area. Details of the LUNs that are used by the server appear in the **LUN References** table.

## Importing Foreign Configurations for a RAID Controller

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Equipment</b> .	
<b>Step 2</b>	Expand <b>Equipment &gt; Chassis &gt; Chassis Number</b>	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>Controller</b> subtab.	
<b>Step 5</b>	In the <b>Actions</b> area, click <b>Import Foreign Configuration</b> .	

## Configuring Local Disk Operations

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Equipment</b> .	
<b>Step 2</b>	Expand <b>Equipment &gt; Chassis &gt; Chassis Number</b>	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>Disks</b> subtab.	
<b>Step 5</b>	<p>Right-click the disk that you want and select one of the following operations:</p> <ul style="list-style-type: none"> <li>• <b>Clear Foreign Configuration State</b>—Clears any foreign configuration that exists in a local disk when it is introduced into a new configuration.</li> <li>• <b>Set Unconfigured Good</b>—Specifies that the local disk can be configured.</li> <li>• <b>Set Prepare For Removal</b>—Specifies that the local disk is marked for removal from the chassis.</li> <li>• <b>Set Undo Prepare For Removal</b>—Specifies that the local disk is no longer marked for removal from the chassis.</li> <li>• <b>Mark as Dedicated Hot Spare</b>—Specifies the local disk as a dedicated hot spare. You can select the virtual drive from the available drives.</li> <li>• <b>Remove Hot Spare</b>—Specifies that the local disk is no longer a hot spare.</li> <li>• <b>Set JBOD to Unconfigured Good</b>—Specifies that the new local disk can be configured after being marked as Unconfigured Good.</li> </ul>	

## Configuring Virtual Drive Operations

The following operations can be performed only on orphaned virtual drives:

- Delete an orphaned virtual drive
- Rename an orphaned virtual drive

## Deleting an Orphan Virtual Drive

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Equipment</b> .	
<b>Step 2</b>	Expand <b>Equipment &gt; Chassis &gt; Chassis Number</b>	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>LUNs</b> subtab.	
<b>Step 5</b>	Right-click the virtual drive that you want and select <b>Delete Orphaned LUN</b> .	A confirmation dialog box appears.
<b>Step 6</b>	Click <b>Yes</b> .	

## Renaming an Orphan Virtual Drive

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Equipment</b> .	
<b>Step 2</b>	Expand <b>Equipment &gt; Chassis &gt; Chassis Number</b>	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>LUNs</b> subtab.	
<b>Step 5</b>	Right-click the virtual drive that you want and select <b>Rename Referenced LUN</b> .	
<b>Step 6</b>	In the <b>Rename Referenced LUN</b> dialog box that appears, enter the new <b>LUN Name</b> .	
<b>Step 7</b>	Click <b>OK</b> .	

## Local LUN Operations in a Service Profile

### Preprovisioning a LUN Name

Preprovisioning a LUN name can be done only when the admin state of the LUN is **Undeployed**. If this LUN name exists and the LUN is orphaned, it is claimed by the service profile. If this LUN does not exist, a new LUN is created with the specified name.



#### Important

Preprovisioning a LUN name will result in rebooting the server.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Servers</b> .	
<b>Step 2</b>	Expand <b>Servers &gt; Service Profiles &gt; Service_Profile_Name</b> .	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>LUN Configuration</b> tab.	
<b>Step 5</b>	In the <b>Local LUNs</b> subtab, right-click the LUN for which you want to preprovision a LUN name and select <b>Pre-Provision LUN Name</b> .	
<b>Step 6</b>	In the <b>Set Pre-Provision LUN Name</b> dialog box, enter the LUN name.	
<b>Step 7</b>	Click <b>OK</b> .	

**Claiming an Orphan LUN**

Claiming an orphan LUN can be done only when the admin state of the LUN is **Undeployed**.

**Important**

Claiming an orphan LUN will result in rebooting the server.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Servers</b> .	
<b>Step 2</b>	Expand <b>Servers &gt; Service Profiles &gt; Service_Profile_Name</b> .	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>LUN Configuration</b> tab.	
<b>Step 5</b>	In the <b>Local LUNs</b> subtab, right-click the LUN that you want to claim and select <b>Claim Orphan LUN</b> .	
<b>Step 6</b>	In the <b>Claim Orphan LUN</b> dialog box that appears, select an orphaned LUN to claim ownership.	
<b>Step 7</b>	Click <b>OK</b> .	

**Deploying and Undeploying a LUN**

You can deploy or undeploy a LUN. If the admin state of a local LUN is **Undeployed**, the reference of that LUN is removed and the LUN is not deployed.



**Important** This operation will reboot the server.

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Servers</b> .	
<b>Step 2</b>	Expand <b>Servers &gt; Service Profiles &gt; Service_Profile_Name</b> .	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>LUN Configuration</b> tab.	
<b>Step 5</b>	In the <b>Local LUNs</b> subtab, right-click the LUN that you want to deploy or undeploy and select <b>Set Admin State</b> .	
<b>Step 6</b>	In the <b>Set Admin State</b> dialog box that appears, select <b>Online</b> to deploy a LUN or <b>Undeployed</b> to undeploy a LUN.	
<b>Step 7</b>	Click <b>OK</b> .	

## Renaming a Service Profile Referenced LUN

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	In the <b>Navigation</b> pane, click <b>Servers</b> .	
<b>Step 2</b>	Expand <b>Servers &gt; Service Profiles &gt; Service_Profile_Name</b> .	
<b>Step 3</b>	In the <b>Work</b> pane, click the <b>Storage</b> tab.	
<b>Step 4</b>	Click the <b>LUN Configuration</b> tab.	
<b>Step 5</b>	In the <b>Local LUNs</b> subtab, right-click the LUN for which you want to rename the referenced LUN, and select <b>Rename Referenced LUN</b> .	
<b>Step 6</b>	In the <b>Rename Referenced LUN</b> dialog box that appears, enter the new name of the referenced LUN.	
<b>Step 7</b>	Click <b>OK</b> .	

