

### **Managing Storage Using RAID**

Note

The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

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### **RAID Options**



The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

You can choose to store the E-Series Server data files on local Redundant Array of Inexpensive Disks (RAID). The following RAID levels are supported:

- The single-wide E-Series Server supports RAID 0 and RAID 1 levels.
- The double-wide E-Series Server supports RAID 0, RAID 1, and RAID 5 levels.
- The double-wide E-Series Server with the PCIe option supports RAID 0 and RAID 1 levels.

### RAID 0

With RAID 0, the data is stored evenly in stripe blocks across one or more disk drives without redundancy (mirroring). The data in all of the disk drives is different.

### Figure 1: RAID 0



Compared to RAID 1, RAID 0 provides additional storage because both disk drives are used to store data. The performance is improved because the read and write operation occurs in parallel within the two disk drives.

However, there is no fault tolerance, error checking, hot spare, or hot-swapping. If one disk drive fails, the data in the entire array is destroyed. Because there is no error checking or hot-swapping, the array is susceptible to unrecoverable errors.

### RAID 1

RAID 1 creates a mirrored set of disk drives, where the data in both the disk drives is identical, providing redundancy and high availability. If one disk drive fails, the other disk drive takes over, preserving the data.

RAID 1 also allows you to use a hot spare disk drive. The hot spare drive is always active and is held in readiness as a hot standby drive during a failover.

#### Figure 2: RAID 1



RAID 1 supports fault tolerance and hot-swapping. When one disk drive fails, you can remove the faulty disk drive and replace it with a new disk drive.

However, compared to RAID 0, there is less storage space because only half of the total potential disk space is available for storage and there is an impact on performance.

### RAID 5

With RAID 5, the data is stored in stripe blocks with parity data staggered across all disk drives, providing redundancy at a low cost.

#### Figure 3: RAID 5



RAID 5 provides more data storage capacity than RAID 1 and better data protection than RAID 0. It also supports hot swapping; however, RAID 1 offers better performance.

### Non-RAID

When the disk drives of a computer are not configured as RAID, the computer is in non-RAID mode. Non-RAID mode is also referred to as Just a Bunch of Disks or Just a Bunch of Drives (JBOD). Non-RAID mode does not support fault tolerance, error checking, hot-swapping, hot spare, or redundancy.

ounning of that options	Summary	of RA	AID O	ptions
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RAID Option	Description	Advantages	Disadvantages
RAID 0	Data stored evenly in stripe blocks without redundancy	<ul> <li>Better storage</li> <li>Improved performance</li> </ul>	<ul> <li>No error checking</li> <li>No fault tolerance</li> <li>No hot-swapping</li> <li>No redundancy</li> <li>No hot spare</li> </ul>
RAID 1	Mirrored set of disk drives and an optional hot spare disk drive	<ul> <li>High availability</li> <li>Fault tolerance</li> <li>Hot spare</li> <li>Hot-swapping</li> </ul>	<ul><li> Less storage</li><li> Performance impact</li></ul>
RAID 5	Data stored in stripe blocks with parity data staggered across all disk drives	<ul> <li>Better storage efficiency than RAID 1</li> <li>Better fault tolerance than RAID 0</li> <li>Low cost of redundancy</li> <li>Hot-swapping</li> </ul>	• Slow performance
Non-RAID	Disk drives not configured for RAID Also referred to as JBOD	• Portable	<ul> <li>No error checking</li> <li>No fault tolerance</li> <li>No hot-swapping</li> <li>No redundancy</li> <li>No hot spare</li> </ul>

### **Configuring RAID**

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The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to configure the RAID level, strip size, host access privileges, drive caching, and initialization parameters on a virtual drive. You can also use this procedure to designate the drive as a hot spare drive and to make the drive bootable.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- Step 2 On the Server tab, click RAID. Do one of the following:
  - If the **Configure Virtual Drive** dialog box does not appear, proceed to the next step.
  - If the **Configure Virtual Drive** dialog box appears, and the virtual drives are not configured, complete the fields as shown in Step 5.
- Step 3 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

#### Figure 4: Virtual Drive Info Tab

' Cisco Inte	grated Management Controller	Logged in as: admin@10.154.164.172
Server Status		
od	Storage Cards	
0.dmin	Storage Adapters	
Romm	Controller Product Name Firmware Package Build Product ID Cache Memory Size Current Boot Drive	
ry 	SLOT-5 LSI MegaRAID SAS 2004 RC 20.10.1-0107 LSI Logic 0 MB Virtual Drive 0	
5		
	Storage Card: SLOT-5	
Event Log		
Presence	Controllerinto Physical Drive Into Virtual Drive Into	
	Virtual Drives	
olicies	Virtual Drive Name State Size RAID Level Bootable Actions	Actions -
immary	0 r1h Optimal 571250 ME RAID 0 🔗 - Actions - 🕃	🛆 🎲 Creat
age Mapping		🔯 Edit
		👻 🌼 Delet
	. Coneral	
	Name: rth	
	Strip Size: 64 KB strip Size: 64 KB	
	Drives Per Span: 1	
	Span Depth: 1	
	Access Policy: Read-Write	
	Cache Policy: Direct	
	Read Ahead Policy: None	
	Write Cache Policy: Write Through	
	Disk Cache Policy: Unchanged	

**Step 4** In the Actions area of the Virtual Drive Info tab, click Create.

The Configure Virtual Drive dialog box appears.

Figure 5: Configure Virtual Drive Dialog Box

	Selected Drives:
1 (system) 2 (unconfigured good)	> Drag < TOSHIBA HDD, SAS 571250 MB Physical Drive 1 (system) in JBOD mode.
t RAID Attributes	Please drag to move
ATD I SHOLD ATD A	🗧 Initialization: Quick 🔍
Name: ud1	Drive cache: Disable
Name: vd1 Strip size: 64KB	Drive cache: Disable

**Step 5** Complete the following fields as appropriate:

Name	Description		
Available Drives table	Displays the drives that are available for RAID configuration.		
	<b>Note</b> To move a drive, click and drag a drive to the appropriate table.		
Selected Drives table	Displays the drives that are selected for RAID configuration.		
	<b>Note</b> To move a drive, click and drag a drive to the appropriate table.		
RAID Level drop-down list	The RAID level options. This can be one of the following:		
	• RAID 0—Block striping.		
	• RAID 1—Mirroring.		
	• <b>RAID 5</b> —Block striping with parity.		
	NoteThe single-wide E-Series Server supports RAID 0 and RAID 1 levels. The double-wide E-Series Server supports RAID 0, RAID 1, and RAID 5 levels. The double-wide E-Series Server with the PCIe option supports RAID 0 and RAID 1 levels.		

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Name	Description
Name field	The name of the virtual drive.
	Enter a maximum of 15 characters. The characters can have numbers and upper- or lower-case letters. Special characters are not supported.
Strip Size drop-down list	The strip size options. This can be one of the following:
	• 64 KB
	• 32 KB
	• 16 KB
	• 8 KB
Initialization drop-down list	How the controller initializes the drives. This can be one of the following:
	• <b>Quick</b> —The controller initializes the drive quickly. This is the default and recommended option.
	• Full—The controller does a complete initialization of the new configuration.
	<b>Note</b> Depending on the size of the drives, full initialization can take several hours to complete. To view the progress, see the <b>Initialize Progress</b> and <b>Initialize Time Elapsed</b> fields in the <b>General</b> area.
	• None—The controller does not initialize the drives.
Drive Cache drop-down list	How the controller handles drive caching. This can be one of the following:
	• <b>Disable</b> —Caching is disabled on the drives.
	Note This is the default and recommended option.
	• <b>Unchanged</b> —The controller uses the caching policy specified on the drive. This is the default and recommended option.
	• <b>Enable</b> —Caching is enabled on the drives. This option minimizes the delay in accessing data.
	CautionEnabling Drive Cache, voids all warranty on the hard disk drives. This configuration option is not supported. Use this option at your own risk.

Name	Description		
Access Policy drop-down list	Configures host access privileges. This can be one of the following:		
	• <b>Read-Write</b> —The host has full access to the drive.		
	• Read Only—The host can read only data from the drive.		
	• <b>Blocked</b> —The host cannot access the drive.		
Set this Virtual Drive Bootable	How the controller boots the drive. This can be one of the following:		
check box	• Enable—The controller makes this drive bootable.		
	• <b>Disable</b> —This drive is not bootable.		
	<b>Note</b> If you plan to install an operating system or hypervisor into the RAID array, we recommend that you check this check box.		
Use the Remaining Drive as Hot Spare check box	Designates the drive that is in the Available Drives table as a hot spare drive.		
	<b>Note</b> Applicable for RAID 1 only. This check box is greyed out for other RAID levels.		
	Applicable for double-wide E-Series Servers.		

**Step 6** Review the RAID configuration, and then click **Confirm** to accept the changes.

### **Modifying the RAID Configuration**



Note

The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to enable or disable auto rebuild on the storage controller.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- Step 2 On the Server tab, click RAID.
- Step 3 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

### Figure 6: Virtual Drive Info Tab

cisco Cisco Integ	rated Manage	ement C	ontrol	ller						CIMC Hostname: Logged in as:	ucse_user admin@10.154.164.172	Log Out
Overall Server Status	C   J 🕹 🔳	0										
Good	Storage Cards											
Server Admin	Controller Pro	oduct Name	Fin	mware Packa	age Build	Product ID	Cache Memory Size	Current Boot Drive				
Inventory	SLOT-5 LSI Megal	RAID SAS 2004	RC 20.10.	1-0107	LSI	Logic	0 MB	Virtual Drive 0				
RAID Sensors System Event Log	Storage Card: SLOT-5											
Remote Presence	Virtual Drives	,			-							]
Power Policies	Virtual Drive	Name	State	Size	RAID Level	Bootable	Actions	1			A	ctions
Fault Summary Host Image Mapping	0	r1h	Optimal	571250 ME	RAID 0	<b>~</b>	- Actions -					Delete
	General			Ph	ysical Drives—							ر ۲
		Name: r1h			Physical Drive	Span	Starting Block	Number Of Blocks	State			
	Str	rip Size: 64 KI	В	1		0	0	1169920000	online			
	Span	n Depth: 1										
	Access	s Policy: Read	-Write									
	Cache Read Abeac	e Policy: Direc d Policy: None	:t									
	Write Cache	e Policy: Write	e Through									
	Disk Cache	e Policy: Unch	anged									×
											Save Changes	Reset Values

### **Step 4** In the Actions area of the Virtual Drive Info tab, click Edit.

The Modify RAID Configuration dialog box appears. Modify the following as appropriate:

Name	Description		
<b>Enable</b> or <b>Disable Auto Rebuild</b> button	Whether the rebuild process starts on the new drive automatically when a virtual drive becomes degraded. This can be one of the following:		
	• Enabl in, the	ed—If a drive becomes degraded and a new drive is plugged rebuild process starts automatically on the new drive.	
	Note	The rebuild process overwrites all existing data; therefore, make sure that the drive that is plugged in does not contain important data.	
	• Disab in, the proces	<b>led</b> —If a drive becomes degraded and a new drive is plugged new drive is ignored. You must manually start the rebuild ss on the new drive.	
	Important	The <b>Disable Auto Rebuild</b> button indicates that auto rebuild is enabled.	

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### **Deleting the RAID Configuration**

**Note** The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to clear all RAID or foreign configurations.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- **Step 3** In the tabbed menu of the **Storage Cards** area, click the **Virtual Drive Info** tab.

### Figure 7: Virtual Drive Info Tab



### **Step 4** In the Actions area of the Virtual Drive Info tab, click Delete. The Clear Configurations dialog box appears. Do the following as appropriate:

Name	Description	
Clear All RAID Config radio	Deletes al	ll RAID configuration.
button	Caution	When you click this radio button, all existing data in the drives is deleted.

Name	Description		
Clear Foreign Config radio button	Deletes all foreign configuration.		
	If you plug in a drive from another E-Series Server, you must clear its foreign configuration to make it usable.		
	<b>Note</b> When you click this radio button, only the configuration in the new plugged-in drive is deleted, while the configurations in the existing drives stay untouched.		
Proceed button	Continues with the delete operation.		

### **Changing the Physical Drive State**



The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to change the state of the physical drive. Options are hotspare, jbod, or unconfigured good.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- Step 3 In the tabbed menu of the Storage Cards area, click the Physical Drive Info tab.

#### Figure 8: Physical Drive Info Tab

cisco Cisco Integ	rated Management Co	ntroller			C Hostname: ucse_ Logged in as: admin	user @10.21.166.146 Log Out
Overall Server Status	C   J 🛃 📰   0 0					
Good	Storage Cards Storage Adapters					
Server Admin	Controller Product Name	Firmware Package Build	Product ID	Cache Memory Size	Current Boot Drive	
Summary	SLOT-5 LSI MegaRAID SAS 2004 RC	20.10.1-0126	LSI Logic 0	) MB	Physical Drive 1	
Inventory						
RAID		Storage	Cord: SLOT 5			
Sensors System Event Lon		Sturage	: Caru, SEOT-S			
Remote Presence	ControllerInfo Physical Drive Info	Virtual Drive Info				
BIOS	Physical Drives					
Power Policies	Slot Number State	Mode Type	Coerced Size	Bootable A	octions	
Fault Summary	1 system	JBOD HDD, SAS	571250 MB	- Actio	ns -	
Host Image Mapping	2 unconfigured good	HDD, SAS, SED	571250 MB	- Actio	ns -	
	General		Inquiry Data			
	Enclosure Device ID: 64			Vendor: TOSHIBA		
	Slot Number: 1		Pr	roduct ID: MBF2600	RC	
	Power State: active		Drive I	Firmware: 5704		
	Device ID: 9		Drive Serial	Number: EA10PB9	0	
	Sequence Number: 2		Status			
	Media Error Count: 0		Status	State: system		
	Other Error Count: 0			Fault: false		
	Predictive Failure Count: 0			Online: true		
	Block Size: 512			]		
	Block Count: 117212	23568	Security	a 11 false		
	Raw Size: 572325	5 MB	FDE	Capable: false		
	Non Coerced Size: 571813	3 MB	Security	Enabled: Talse		X
	Coorned Size: 571250	1 MR	II Secured by C	ontroller: laise		
					Save Changes	Reset Values

- **Step 4** From the Actions column in the Physical Drives pane, choose one of the following from the Change State To list:
  - hotspare—The drive is designated as a spare drive.
  - jbod—The drive is not configured as RAID.
  - unconfigured good—The drive is ready to be assigned to a drive group or hot spare pool.

**Step 5** Click **OK** to confirm.

### **Rebuilding the Physical Drive**

Note

The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to manually start the rebuild process on the physical drive.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- **Step 3** In the tabbed menu of the **Storage Cards** area, click the **Physical Drive Info** tab.

### Figure 9: Physical Drive Info Tab



**Step 4** From the **Actions** column in the **Physical Drives** pane, choose **Rebuild** from the drop-down list, and then click **OK** to confirm.

The Rebuild process takes a few hours to complete.

**Note** The **Rebuild** option appears in the drop-down list when the state of the physical drive is Failed or Offline.

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- **Step 5** To view the progress of the Rebuild process, see the **Rebuilding Progress** and the **Rebuilding Time Elapsed** fields in the **General** area.
- **Step 6** To stop the Rebuild process, click the **Abort** button, which is located next to the **Rebuilding Progress** field in the **General** area, and then click **OK** to confirm.

### **Erasing the Contents of a Physical Drive**



The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to erase all of the contents of a physical drive and set it to zero.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- **Step 3** In the tabbed menu of the **Storage Cards** area, click the **Physical Drive Info** tab.

#### Figure 10: Physical Drive Info Tab



**Step 4** From the Actions column in the Physical Drives pane, choose Erase from the drop-down list, and then click OK to confirm.

The Erase process takes a few hours to complete.

- **Step 5** To view the progress of the Erase process, see the **Erasing Progress** and the **Erasing Time Elapsed** fields in the **General** area.
- **Step 6** To stop the Erase process, click the **Abort** button, which is located next to the **Erasing Progress** field in the **General** area, and then click **OK** to confirm.

### **Enabling Auto Rebuild on the Storage Controller**

Note

The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to rebuild a disk drive automatically. If one of the disk drives that is configured with RAID becomes degraded, and a new drive is plugged it, the rebuild process on the new drive starts automatically.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- Step 3 In the Storage Adapters area, select the storage card.If the server is powered on, the resources of the selected storage adapter appear in the tabbed menu in the Storage Cards area.

Step 4 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

Cisco Inte <u>c</u>	grated Management Controller	Logged in as: admin@10.154.164.172
Server Status	C   3 🕹 🧮   0 0	
d	Storage Cards /storage Adapters	
Admin	Controller Product Name Firmware Package Build Product ID Cache Memory Size Current Boot Drive SLOT-5 LSI MegaRAID SAS 2004 RC 20.10.1-0107 LSI Logic 0 MB Virtual Drive 0	
	Storage Card: SLOT-5	
vent Log resence	ControllerInfo Physical Drive Info	
er Policies t Summary t Image Mapping	Virtual Drive Name State Size RAID Level Bootable Actions 0 rih Optimal 571250 Mt RAID 0 V Actions 2	Actions Crea Edit
	General Physical Drives	
	Name:     r1h     Physical Drive     Span     Starting Block     Number Of Blocks     State       Drives Per Span:     1     0     0     3169920000     online       Drives Per Span:     1     0     0     3169920000     online       Span Depth:     1     0     0     3169920000     online       Cache Policy:     Direct     2     2     2     2       Write Cache Policy:     Vrite Through     2     2     2     2	
	Uisk Cache Yoldy: Unchanged	Save Changes Reset Vi

Figure 11: Virtual Drive Info Tab

- **Step 5** In the Actions area of the Virtual Drive Info tab, click Edit. The Modify RAID Configuration dialog box appears.
- **Step 6** If the **Enable Auto Rebuild** button appears, click the button to make the **Disable Auto Rebuild** button appear. The **Disable Auto Rebuild** button indicates that auto rebuild is enabled.
  - **Caution** The rebuild process overwrites all existing data; therefore, make sure that the drive that is plugged in does not contain important data.

### **Deleting the Virtual Drive**

**Note** The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- Step 3 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

#### Figure 12: Virtual Drive Info Tab

cisco Integ	irated Management Controller	CIMC Hostname: Logged in as:	ucse_user admin@10.154.164.172 Log Out
Overall Server Status	C ↓ J ■ 0 0 Storage Cards		
Server Admin Summary Inventory RAID	Storage Adapters Controller Product Name Firmware Package Build Product ID Cache Memory Size Current Boot Drive Storage Cardia Control Product ID Cache Memory Size Current Boot Drive Control Product ID Cache Memory Size Current Boot Drive Charage Cardia Control Contr		
System Event Log Remote Presence BIOS Power Policies Fault Summary Host Image Mapping	ControllerInfo Physical Drive Info Virtual Drives Virtual Drives Virtual Drives Virtual Drive Name State Size RAID Level Bootable Actions 0 rzb Optimal S71250 ME RAID 0 - Actions - 3	_	Actions Croste Croste Croste Croste Croste Croste
	Seneral         Physical Drives           Strip Size: 64 KB         Physical Drives           Drives Per Span: 1         0           Span Depth: 1         0           Access Policy: Read-Write         0           Cache Policy: Direct         Image: Direct           Read Abead Policy: None         Write Through           Disk Cache Policy: Unchanged         Unchanged		
			Save Changes Reset Values

**Step 4** From the **Actions** column in the **Virtual Drives** area, choose the **Delete** option.

**Step 5** Click **OK** to confirm.

### **Performing a Consistency Check on Virtual Drives**

Note

The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to perform a consistency check on virtual drives. This can be one of the following:

- For RAID 1-Checks if the data in both drives is identical.
- For RAID 5—Checks if the data in all of the parity stripe blocks is correct.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- Step 3 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

#### Figure 13: Virtual Drive Info Tab

cisco Cisco Integ	rated Management Controller	CIMC Hostname: Logged in as:	ucse_user admin@10.154.164.172 Log Out
Overall Server Status	C   3 3 🧱   0 0		
Server Admin	Storage Cards _storage Adapters		
Summary Inventory RAID	SLOT-S LSI MegaRAID SAS 2004 RC 2010.1-0107 LSI Logic 0 MB Virtual Drive 0		
Sensors System Event Log Remote Presence	Controller(rife) Physical Drive Info Virtual Drive Info		
BIOS Power Policies Fault Summary Host Image Mapping	Virtual Drives - Virtual Drives - Name State Size RAID Level Bootable Actions - Optimal S71250 NE RAID 0 - Actions - 2		Actions © Create © Edit © Delete
	Deneral     Name:     r1h       Strip Size:     64 KB       Drives Per Span:     1       Span Depth:     1       Access Policy:     Read-Write       Cache Policy:     Direct       Read Ahead Policy:     Name       Dirke Cache Policy:     Unchanged		
			Save Changes Reset Values

**Step 4** From the Actions column in the Virtual Drives area, choose the Consistency Check option, and then click OK to confirm.

The Consistency Check process takes a few hours to complete.

- **Step 5** To view the progress of the Consistency Check process, see the **Consistency Check Progress** and the **Consistency Check Time Elapsed** fields in the **General** area.
- **Step 6** To stop the Consistency Check process, click the Abort button, which is located next to the Consistency Check Progress field in the General area, and then click OK to confirm.

### **Reconstructing the Virtual Drive Options**



The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

To migrate (reconstruct) the virtual drive to a new RAID level, you might need to add or remove physical drives. When you add or remove physical drives, the size of the virtual drive is either retained or increased.

You can retain or increase the size of the virtual drive, but you cannot decrease its size. For example, if you have two physical drives with RAID 0, you cannot migrate to RAID 1 with the same number of drives. Because with RAID 1, a mirrored set of disk drives are created, which reduces the size of the virtual drive to half of what it was before, which is not supported.



The virtual drive reconstruction process might take several hours to complete. You can continue to use the system during the reconstruction process.

#### **Options for Retaining the Size of the Virtual Drive**

See the following figure and the table that follows for options that retain the size of the virtual drive when you migrate the virtual drive to a new RAID level.

#### Figure 14: Retaining the Virtual Drive Size Options



The following table lists the options that retain the size of the virtual drive and provides information about how many physical drives you must add or remove to migrate the virtual drive to a specific RAID level.

#### Table 1: Retaining the Virtual Drive Size

From:	Migrate to:	Add or Remove Disks
One physical drive with RAID 0	Two physical drives with RAID 1	Add one disk.
Two physical drives with RAID 1	One physical drive with RAID 0	Remove one disk.
Two physical drives with RAID 0	Three physical drives with RAID 5	Add one disk.
Three physical drives with RAID 5	Two physical drives with RAID 0	Remove one disk.

### **Options for Increasing the Size of the Virtual Drive**

See the following figure and the table that follows for options that increase the size of the virtual drive when you migrate the virtual drive to a new RAID level.

### Figure 15: Increasing the Virtual Drive Size Options



The following table lists the options that increase the size of the virtual drive and provides information about how many physical drives you must add or remove to migrate the virtual drive to a specific RAID level.

From:	Migrate to:	Add or Remove Disks
One physical drive with RAID 0	Two physical drives with RAID 0	Add one disk.
See the <b>red</b> arrows in the figure.	Three physical drives with RAID 5	Add two disks.
	Three physical drives with RAID 0	Add two disks.
Two physical drives with RAID 1	Two physical drives with RAID 0	-
See the <b>green</b> arrows in the figure.	Three physical drives with RAID 5	Add one disk.
	Three physical drives with RAID 0	Add one disk.
Two physical drives with RAID 0	Three physical drives with RAID 0	Add one disk.
See the <b>black</b> arrow in the figure.		
Three physical drives with RAID 5	Three physical drives with RAID 0	—
See the <b>purple</b> arrow in the figure.		

### **Reconstructing the Virtual Drive**

Note

The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

Use this procedure to migrate (reconstruct) the virtual drive to a new RAID level.

### **Before You Begin**

See Reconstructing the Virtual Drive Options.

#### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- Step 3 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

### Figure 16: Virtual Drive Info Tab



Step 4 From the Actions column in the Virtual Drives area, choose the Reconstruct option.

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The Reconstruct Virtual Drive dialog box appears.

Figure 17: Reconstruct Virtual Drive Dialog Box

Reconstruct Virtual D	rive 0 (vdd) 🛛 😵
Physical Drives	
🔵 Migrate RAID Level 🔘 Add d	Irives 🥥 Remove drives
Add From Available Drives:	Remove From Configured Drives
RAID Level	
From Current Level: RAID 0 M	igrate To: RAID 1
Warning: Reconstruct may tak and cannot be aborted. After start and you must wait for it	ce several hours to complete, you confirm, reconstruct will to complete.
	Confirm Cancel

**Step 5** Complete the following as appropriate:

Name	Description	
Migrate RAID Level radio button	Select this option to migrate the virtual drives to the specified new RAID level.	
Add Drives radio button	Select this option, and then choose the drives to add from the Add from Available Drives table.	
Remove Drives radio button	Select this option, and then choose the drives to remove from the <b>Remove from Configured Drives</b> table.	
Add from Available Drives table	Lists the physical drives that you can add to migrate to the new RAID level.	
	<b>Note</b> This table is active after you select the <b>Add Drives</b> radio button.	
Remove from Configured Drives table	s Lists the physical drives that you can remove to migrate to the new RAID level.	
	<b>Note</b> This table is active after you select the <b>Remove Drives</b> radio button.	

Name	Description	
<b>From Current Level: RAID</b> <i>x</i> <b>Migrate To:</b> drop-down list	The new RAID level to which you want to migrate the drives. Starts the reconstruction process after you click <b>Confirm</b> .	
	NoteYou can retain or increase the size of the virtual drive, but you cannot decrease its size.See Reconstructing the Virtual Drive Options.	

The Reconstruct process takes a few hours to complete.

**Step 6** To view the progress of the Reconstruct process, see the **Reconstruct Progress** and the **Reconstruct Time Elapsed** fields in the **General** area.

### Making the Virtual Drive or Physical Drive Bootable



The RAID feature is applicable to E-Series Servers and the SM E-Series NCE. The RAID feature is not applicable to the EHWIC E-Series NCE and the NIM E-Series NCE.

When you configure RAID, the **Configure Virtual Drive** dialog box has a check box that allows you to make the disk drive bootable. If you did not check the **Set this Virtual Drive Bootable** check box during the RAID configuration process, you can use this procedure to make the disk drive bootable.

### Procedure

- **Step 1** In the Navigation pane, click the Server tab.
- **Step 2** On the Server tab, click **RAID**.
- **Step 3** To make a virtual drive bootable, do the following:

a) In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

cisco Cisco Integ	rated Management Controller	CIMC Hostnam Logged in a
Cisco Cisco Integ	Storage Cards         Storage Adapters       Current Boot Drive         Storage Cards         Storage Storage Cards       Virtual Drive 0         Storage Card: SLOT-5         ControllerInfo       Virtual Drive Info         Virtual Drive       Name       State       Size       RAID 0       Actions       Storage	CIMC Hostnam Logged in a
	General       Name:       r1h         Strip Size:       64 KB         Drives Per Span:       1         Span Depth:       1         Access Policy:       Breet         Cache Policy:       Direct         Read Ahead Policy:       None         Write Cache Policy:       Unchanged	

Figure 18: Virtual Drive Info Tab

- b) From the Actions column of the appropriate virtual drive, choose Set Bootable from the drop-down list.c) Click OK to change the boot drive to this virtual drive.
- **Note** After you set the drive to be bootable, the **Bootable** column displays a checkmark against the configured drive.
- **Step 4** To make a physical drive bootable, do the following:

a) In the tabbed menu of the Storage Card area, click the Physical Drive Info tab.



#### Figure 19: Physical Drive Info Tab

- b) From the Actions column of the appropriate physical drive, choose Set Bootable from the drop-down list.
- c) Click OK to change the boot drive to this physical drive.
   Note The physical drive must be in non-RAID mode to be bootable. After you set the drive to be bootable, the Bootable column displays a checkmark against the configured drive.

### Installing W2K12 to Support RAID Volumes Larger than 2TB

On a UCS-E160D-M2 series server, if you want to run Windows with more than 2 TB of hard drive space installed, follow the procedure explained in this section. There are two ways you can install W2K12: Using Legacy BIOS or using UEFI:

# Installing W2K12 Using Legacy BIOS to Support RAID Volumes Larger than 2TB

This workaround shows how to install W2K12 using legacy BIOS to support RAID volumes larger than 2TB. The workaround involves the following major tasks:

- 1 Configure all the drives in 'Unconfigured Good' state.
- 2 Configure a Virtual Drive 0 (VD0) using the first hard disk and put it in RAID 0. W2K12 will be installed on VD0.
- **3** Configure a Virtual Drive 1(VD1) using the remaining hard disks and put it in RAID 0. Use W2K12 to convert this volume to GPT so that it can access the entire storage.

The detailed procedure is explained below:

### Procedure

Step 1 Configure all the drives in 'Unconfigured Good' state. Refer Changing the Physical Drive State, on page 11

Step 2 In the tabbed menu of the Storage Cards area, click the Virtual Drive Info tab.

cisco Cisco Integ	rated Management Controller CiMC Hostname: Unknown Logged in as: admin@220.0.0.100 Log Out
Overall Server Status	c   3 4 🖩   0 0
Server Admin Summary Inventory RAID Sensors Remote Presence BIOS Power Policies Faults and Logs Host Image Mapping	Storage Cards Controller  Froduct Name Firmware Package Build Product ID Cache Memory Size Current Boot Drive Storage Card: SLOT-5  Controller.nfo Physical Drive Info Virtual Drive Info Virtual Drive Actions Action
	Series       64 K8         Drives Per Span       1         Span Deptiv       1         Access Policy:       Read-Write         Cache Policy:       Drives         Write Cache Policy:       Write Through         Dick Cache Policy:       Disable         Allow Background Init:       true         Auto Delete Oldest:       true
	Save Changes Reset Values

### Figure 20: Virtual Drive Info Tab

**Step 3** In the Actions area of the Virtual Drive Info tab, click **Create**. The **Configure Virtual Drive** dialog box appears:

cisco Cisco Integ	rated Management Controller Controller Logged in as: admin@220.0.0.100
Overall Server Status	C Storage Cards
Server Admin Summary Inventory RAID	Controller         Product Name         Firmware Package Build         Product ID         Cache Memory Size         Current Boot Drive           SLOT-5         LSI MegaRAID SAS 2004 RC         20.11.1-0181         LSI Logic         0 MB
Sensors Remote Presence BIOS Power Policies	Storage Card: SLOT-5
Faults and Logs Host Image Mapping	Virtual Drive       Name       State       Size       RAI         Configure Virtual Drive       @
	Save Changes Reset Values

Figure 21: Configuring Virtual Drive 0

- **Step 4** Select drive 1 from the Available Devices and drag to Selected Devices.
- **Step 5** Click **Confirm**. You have now created Virtual Drive 0.
- **Step 6** In the Actions area of the Virtual Drive Info tab, click **Create**. The **Configure Virtual Drive** dialog box appears.
- **Step 7** Select the remaining drives from the Available Devices and drag to Selected Devices.

### Figure 22: Configuring Virtual Drive 1

راسان Cisco Integ	rated Management Controller ClMC Hostname: Unknown Logged in as: admin@220.0.0.100 Log Ou
Overall Server Status Good Server Admin	C J E Product Name Firmware Parkane Build Product ID Cache Memory Size Current Boot Drive
Summary Inventory RAID Sensors	SLOT-5 LSI MegaRAID SAS 2004 RC 20.11.1-0181 LSI Logic 0 MB Storage Card: SLOT-5
Remote Presence BIOS Power Policies Eaulte and Loop	ControllerInfo Physical Drive Info Virtual Drive Info Virtual Drives Configure Virtual Drive Name State Size RAID Level & Configure Virtual Drive @
Host Image Mapping	0 Optimal 1716352 M RAID 0 Available Drives: Selected Drives: 2 (Unconfigured Good) 3 (Unconfigured Good) 3 (Unconfigured Good)
	Name:     Physical Drives       Strip Size: 64 KB     Physical Drive       Drives Per Span: 1     Set RAID Attributes
	Span Depth:     1       Access Policy:     Read-Write       Cache Policy:     Direct       Read Ahead Policy:     Name:       Drive cache:     Disable       Strip size:     64KB       Access Policy:     Read-Write
	Wite Cache Policy:     Wite Cache Policy:       Disk Cache Policy:     Disable       Allow Background Init:     Image: Set this Virtual Drive Bootable       Auto Snapshot:     false       Auto Snapshot:     Image: Set this Virtual Drive as Hot Spare
	Save Changes) Reset Values

Step 8 Click Confirm. You have now created Virtual Drive 1. Verify the Virtual Drives.



Figure 23: Verifying Virtual Drives

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**Step 9** Use Host Image Mapping or vKVM to install W2K12 on Virtual Drive 0.



Figure 24: Installing W2K12 on Virtual Drive 0

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**Step 10** After W2K12 installation, log in and check the status of volume.

File View	/ Macros Tools Help		
G' KVM	📋 Virtual Media	Server Monager	
		Server Myaager	
$(\epsilon)$	🔊 🔹 📢 File and	Storage Services 🔸 Volumes 🔸 🛛 🗸 🧭 🛛 🖉 Manage Toc	ols View Help
Π	Servers	VOLUMES All volumes   2 total	TASKS -
i li	Volumes Disks	Filter $\rho$ $(ii)$ $(ii)$	$\odot$
i p	Storage Pools	Volume Status File System Label Provisioning Capacity Free Space Deduplication Rate Dedup     WIN-OMETI KIARKI (2)	plication Savings
		\\7d0 System Reserved Fixed 350 MB 89.1 MB	
		C: Fixed 1.64 TB 1.62 TB	
		< III	>
		SHARES         No related shares are available.         To use this functionality, install the File Server role service.         Start the Add Roles and Features Wizard.         DISK         100% Allocated         110% Allocated         100% Allocated	e TASKS 🔻
			~

Figure 25: Status of Volume

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**Step 11** Check the storage size of C drive.

Figure 26: Storage Size of C Drive



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**Step 12** Go to Disk and create a new volume using the Virtual Drive 1. Select Virtual Drive 1 and right click on it. Click **New Volume**. The New Volume wizard appears. This wizard helps you create a volume, assign it a drive letter, and then format it with a file system.

File View Macros Tools Help									
14		Serve	r Manager					-	a x
€ · · · File and	Storage Service	s • Volum	es 🕨 Disk	S	• ③	/ ™	lanage Tools	s View	Help
Servers	All disks   4 total							TASKS	•
Volumes Disks	Filter	م	•	•				6	•
Storage Pools	Number Virtual Disk St	tatus Capacity	/ Unallocated	Partition	Read Only	Clustered	Subsystem	Bus Type	N
	3 0	nline 7.82 GB	0.00 B	MBR				USB	c
	0 0	nline 1.64 TB	0.00 B	MBR				RAID	L
	2 Fa	ailed 0.00 B	0.00 B	Unknown	~			USB	L
	1 New Y	/aluma	3.27 TB	Unknown				RAID	- L
	K Bring: Take C Initiali Last refreshed	Online Offline ze Disk	ш						>
	VOLUMES Related Volumes   0 total		TASKS	STO LSI M	<b>RAGE POOL</b> IRSASRoMB-4i	SCSI Disk Dev	ice on WIN-0ME	TASKS	•
	No To create a volume,	volumes exist. start the New Volun	ne Wizard.		,	No related stor	age pool exists.		

Figure 27: Creating a New Volume

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1 IYUI C 20. INGVV VOIUIIIC VVI2AIU
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	Server Manager		-	0
. ✓ File and S	Storage Services • Volumes • Disks • 🕝   🚩 м	nage Tools	View	H
Servers	New Volume Wizard	1	(	
Before you begir	1	Subsystem	Bus Type	N
Before You Begin Server and Disk Size Drive Letter or Folder File System Settings Confirmation Results	This wizard helps you create a volume, assign it a drive letter or folder, and then format it with a file system. You can create a volume on a physical disk or a virtual disk. A virtual disk is a collection of one or more physical disks from a previously created storage pool. The layout of data across the physical disks can increase the reliability and performance of the volume. To continue, click Next.	pn WIN-OME.	USB RAID USB RAID	
	Don't show this page again			
	< Previous Next > Create Cancel			

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Step 13 Select the server and disk, and click Next. You will be prompted with a dialog box.

View         Macros         Foors         Help           (VM         S         Virtual Media							
		Server Ma	anager			_	Ø
) 🗧 📲 🖓 🚽	d Storage Servio	ces • Volumes	<ul> <li>Disks</li> </ul>	• 🕲 I 🧗	Manage Tool	s View	Hel
Servers	DISKS All disks   4 total					TASKS	•
<b>b</b>	Ν	lew Volume Wizard			x	6	•
Select the serv	er and disk				Subsystem	Bus Type	N
Before You Begin	Server:					USB	c
Server and Disk	Provision to	Status	Cluster Role	Destination		RAID	L
Size	WIN-OMETLKIARK	J Online	Not Clustered	Local		USB	L
Drive Letter or Folder						RAID	L
File System Settings					1		
Confirmation							
Results							
	Disk:			Refresh Rescar			>
	Disk	Virtual Disk Capacity	Free Space Subsy	stem			
	Disk 1	3.27 TB	3.27 TB		an WINLOW	TACKS	-
					On WIN-OWE	TASKS	-
					pool exists.		
		< Previous	Next >	Create Cancel	<u>E</u>		
				0. 1995 1997			

Figure 29: Server and Disk

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### Step 14 Click OK.

#### Figure 30: Server and Disk



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**Step 15** Specify the size of the disk volume.

Figure 31: Size of the Disk Volume

KVM	Server Manad ar	- 0
€) → ··· File and	d Storage Services • Volumes • Disks • 😕   🌾	Manage Tools View Help
Servers	DISKS All disks   4 total	TASKS 🔻
Ras,	New Volume Wizard	×
Specify the size	e of the volume	Subsystem Bus Type N
Before You Begin Server and Disk Size Drive Letter or Folder File System Settings Confirmation Results	Available Capacity: 3.27 TB Minimum size: 8.00 MB Volume size: 3.27 TB •	USB C RAID L USB L RAID L DI WIN-OME TASKS V pool exists.
	< Previous Next > Create Cancel	]

**Step 16** Assign the volume to a drive letter.

Figure 32: Drive Letter or Folder



**Step 17** Select the File System Settings.

Figure 33: File System Settings



1

Step 18 Confirm the selections and click Create. A completion message appears. Click Close.

à	New Volu	ime Wizard	_ <b>D</b> X	
				$\odot$
Confirm selection	) C		Subsystem	Bus Type
Committi Sciectior	13			
Before You Begin	Confirm that the following	ng are the correct settings, and then	click Create.	USB
Server and Disk	NOUNTELOCATION	-		RAID
Size	VOLUME LOCATION	WINI OMETI KIADKI		USB
Drive Letter or Folder	Disk:	Disk 1		RAID
File System Settings	Free stace:	3.27 TB		
Confirmation	NE			
Popultz	VOLUME PROPERTIES	2 27 70		
	Volume size:	3.27 IB		
	Volume label:	New Volume		
	, or other rabely	Ten Foldine		
	FILE SYSTEM SETTINGS			
	File system:	NTFS		
	Short file name creation:	Disabled	on WIN-0M	IE TASKS
	Allocation unit size:	Delault		
			pool exists.	

Figure 34: Confirm Selections

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### Figure 35: Completion

	DISKS				TACKO
Servers	All disks   4 total	olume Wizard	_	×	
Completion Before You Begin Server and Disk Size	You have successfully Task Gather information	completed the New Vo	lume Wizard. Status Completed	Subsystem	USB RAID USB
Drive Letter or Folder File System Settings Confirmation Results	Create new partition Format volume Add access path Update cache		Completed Completed Completed Completed		RAID
				elated storage	TASKS 🔻

**Step 19** Verify the new volume created and W2K12 recognizes the remaining storage.



Figure 36: Verifying the New Volume

### Installing W2K12 using UEFI to Support RAID Volumes Larger than 2TB

This workaround shows how to install W2k12 using UEFI to support RAID volumes larger than 2TB. The workaround involves the following major tasks:

- 1 Configure all the drives in 'Unconfigured Good' state.
- 2 Configure a Virtual Drive 0 (VD0) using all the hard disks and put it in RAID 0. W2K12 will be installed on VD0 and the OS will recognize the entire storage capacity.
- **3** Enter BIOS setup and configure it to boot using UEFI.
- 4 Map W2K12 ISO using Host Image Mapping or Virtual Media using vKVM.
- 5 Boot UCS-E module into EFI shell.
- 6 From the EFI shell, navigate to the ISO and boot BOOTX64.EFI.
- 7 Install W2K12. During W2K12 installation, the server will reboot.
- 8 Enter BIOS setup and change the 'UCSM boot order rules' from 'Strict' to 'Loose'. This change disallows CIMC to override the BIOS boot order. The BIOS boot order will be used instead of the CIMC boot order.

**9** Move 'Windows Boot Manager' to top of the boot order. W2K12 should now automatically boot and recognize the entire storage.

The detailed procedure is explained below:

### Procedure

- Step 1 Configure all the drives in 'Unconfigured Good' state. Refer Changing the Physical Drive State, on page 11
- Step 2 Configure a Virtual Drive 0 (VD0) using all the hard disks and put it in RAID 0. W2K12 will be installed on VD0 and the OS will recognize the entire storage capacity. Refer the procedure explained in Installing W2K12 Using Legacy BIOS to Support RAID Volumes Larger than 2TB, on page 25
- Step 3 Enter BIOS setup and change storage to 'UEFI only'.
  - a) On a Cisco UCS-E180D-M2 server, go to Boot > Launch Storage > OpROM and, select 'UEFI only'.

### Figure 37: Configuring BIOS Setup

	g – copyright (c) 2012 F Boot	imerican Megatrends, inc.
Launch CSM Boot option filter Launch PXE OpROM poli Launch Storage OpROM Launch Video OpROM po Other PCI device ROM	[Enabled] [UEFI and Legacy] [Legacy only] [UEFI only] [Legacy only] [UEFI OpROM]	Controls the execution of UEFI and Legacy Storage OpROM
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F9: Optimized Default: F10: Save & Exit ESC: Exit

- **Step 4** Map ISO using virtual media or use the host image mapping. Configure 'CD/DVD' as the first bootable device using CIMC GUI.
- Step 5 Power cycle the server. Press F2 while booting up. Enter BIOS setup and select one time boot to EFI shell.
- Step 6 Boot from the EFI shell. Locate the file system number (fs#) that contains the 'Removable CDRom'.

Figure 38: Booting from EFI Shell

🖌 💣 Virtual N	ledia
fs2	:Removable CDRom – Alias cd26b0c0b blk2
	PciRoot(0x0)/Pci(0x1a,0x0)/USB(0x1,0x0)/USB(0x2,0x0)/CDROM(0x1,0x878,
0x1fe25e	
b1k0	Removable HardDisk – Alias hd16a0c fs0:
	PciRoot(0x0)/Pci(0x3,0x2)/Pci(0x0,0x0)/Ctrl(0x0)/Scsi(0x0,0x0)/HD(2,G
PT,16ee7	b95-7015-4f95-be31-422add7b736b,0x96800,0x32000)
blk1	:Removable HardDisk – Alias hd31b0f0b fs1
	PciRoot(0x0)/Pci(0x1d,0x0)/USB(0x1,0x0)/USB(0x5,0x0)/HD(1,MBR,0x00000
000,0x20	00,0xf9f800)
b1k2	:Removable CDRom – Alias cd26b0c0b fs2
	PciRoot(0x0)/Pci(0x1a,0x0)/USB(0x1,0x0)/USB(0x2,0x0)/CDROM(0x1,0x878,
0x1fe25e	
b1k3	:Removable HardDisk – Alias (null)
	PciRoot(0x0)/Pci(0x3,0x2)/Pci(0x0,0x0)/Ctrl(0x0)/Scsi(0x0,0x0)/HD(1,G
PT,8a096	920–a527–4cb9–bedb–53da6813a065,0x800,0x96000)
blk4	:Removable HardDisk – Alias (null)
	PciRoot(0x0)/Pci(0x3,0x2)/Pci(0x0,0x0)/Ctrl(0x0)/Scsi(0x0,0x0)/HD(3,G
PT,3a21c	3c6-98ab-4d87-98ce-e2b6e0649c3e,0xc8800,0x40000)
b1k5	:Removable HardDisk – <b>Alias (null)</b>
	PciRoot(0x0)/Pci(0x3,0x2)/Pci(0x0,0x0)/Ctrl(0x0)/Scsi(0x0,0x0)/HD(4,G
PT,e4d4f	652-9e2d-46d7-856d-1c83aec28ed9,0x108800,0x2747b7000)
b1k6	:Removable CDRom – Alias (null)
	PciRoot(0x0)/Pci(0x1a,0x0)/USB(0x1,0x0)/USB(0x2,0x0)/CDROM(0x0,0x876,
0x8)	
b1k7	Removable BlockDevice – Alias (null)

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Figure 39: Booting from EFI Shell

ile View Macros Tools Help	
🖆 KVM 🥤 🖆 Virtual Media 🛛	
fs2:\> cd FET	
fs2:\FFT> is	
Directory of: fs2:\FFI	
08/21/13 10:44n <dir></dir>	
08/21/13 10:44p <dir></dir>	0
08/21/13 10:44p <dir></dir>	
0 File(s) 0 byte	es
3 Dir(s)	
fs2:\EFI> cd BOOT	
fs2:\EFI\BOOT> ls	
Directory of: fs2:\EFI\BOOT	
08/21/13 10:44p <dir></dir>	
08/21/13 10:44p <dir></dir>	
08/22/13 05:39a 1,360,	224 BOOTX64.EFI
1 File(s) 1,360,224 byte	35
2 DIr(s)	
fo2. YEET POOT POOTV64 EET	
132. (LI 1 00017 D001/04.LI 1_	

Step 7 Choose W2K12 Standard Evaluation Server with GUI. Click Next

Select the operating system you want to install         Operating system         Windows Server 2012 R2 Standard Evaluation (Server Core Installation, Vs4         Windows Server 2012 R2 Datacenter Evaluation (Server Core Installation, Vs4         Windows Server 2012 R2 Datacenter Evaluation (Server Core Installation, Vs4         Windows Server 2012 R2 Datacenter Evaluation (Server Core Installation, Vs4         Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)         x64         & Coreption         This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."	(	💭 🔏 Windows Setup		L	
Operating system       Architecture       Date moi         Windows Server 2012 R2 Standard Evaluation (Server Core Installation)       x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201         Comparison       Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201         Comparison       Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201         Comparison       Server Core installation, All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."		Select the operating system you want to install			
Windows Server 2012 R2 Standard Evaluation (Server Core Installation) x64       8/22/201         Windows Server 2012 R2 Backenter Evaluation (Server Core Installation, x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server Core Installation, x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server With a GUI)       x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server With a GUI)       x64       8/22/201         C       >       >         Description:       This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."		Operating system	Architecture	Date mor	
Winclows Server 2012 R2 Standard Evaluation (Server Core Installati		Windows Server 2012 R2 Standard Evaluation (Server Core Installation)	x64	8/22/201	
Windows Server 2012 R2 Datacenter Evaluation (Server Core Installati x64       8/22/201         Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201		Windows Server 2012 R2 Standard Evaluation (Server with a GUI)	x64	8/22/201	
Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)       x64       8/22/201          Description:       >         This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be non a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."		Windows Server 2012 R2 Datacenter Evaluation (Server Core Installati	x64	8/22/201	
Description: This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."		Windows Server 2012 R2 Datacenter Evaluation (Server with a GUI)	x64	8/22/201	
Description: This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options." <u>Next</u>		٢		>	
Next		Description: This option is useful when a GUI is required—for example, to provide b application that cannot be run on a Server Core installation. All server ru supported. You can switch to a different installation option later. See "v Options."	ackward compat oles and features Vindows Server II	bility for an are nstallation	
Net					
				Next	

Figure 40: Installing Windows Server

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Step 8 Select the drive you want to install Windows. Click Next.

A 220.220.1.6 - KVM Console File View Macros Tools Help				
KVM TVirtual Media				
0	💰 Windows Setup			
	Where do you want to in	stall Windows?		
	Name	Total size	Free space Type	
	Drive 0 Unallocated Spa	ce 5028.4 GB	5028.4 GB	
	Refresh De Load driver De	lete ØEormat	<mark>₩</mark> N <u>e</u> w	
			<u>N</u> e	t
1 Collecting information 2	nstalling Windows			
4				

Figure 41: Installing Windows Server

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**Step 9** Wait till the installation completes.

Figure 42: Installing Windows Server

File View Macros Tools Help			
🔓 KVM 💣 Virtual Media			
	🌃 Windows Setup		
	Installing Windows		
	Your computer will restart several times. This might take a while.		
	Copying Windows files (0%) Getting files ready for installation Installing features Installing updates		
	Finishing up	[₽	
1 Collecting information	2 Installing Windows		

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Step 10 After the installation, enter BIOS setup (press F2) or BIOS Boot Menu (press F6) and boot using Windows Boot Manager. You may find several Windows Boot Manager. Select the one that works.

Aptio Setup Utility - Copyright (C) : Save & Exit	2015 American Megatrends, Inc.
Save Options	*
Save Changes	
Discard Changes	
Restore Defaults	
Save as User Defaults	
Restore User Defaults	
Boot Override	
Linux Virtual CD/DVD 0324	
Linux Virtual FDD/HDD 0324	++: Select Screen
UEFI: BUILT-IN EFI Shell	T+: Select Item
Linux Vintual Elonnu 0324	+/-: Change Ont
HEFT: Linux Virtual CD/DVD 0324	E1: General Help
Windows Boot Manager	F2: Previous Values
Windows Boot Manager	F3: Optimized Defaults
	F4: Save & Exit
Windows Boot Manager	▼ ESC: Exit

Figure 43: Booting Using Windows Boot Manager from F2 Bios Setup

File View Macros Tools Help 💣 KVM 🧉 Virtual Media Please select boot device: Linux Virtual CD/DVD 0324 Cypress Linux Virtual FDD/HDD 0324 BRCM MBA Slot 0300 v15.0.11 BRCM MBA Slot 0301 v15.0.11 BRCM MBA Slot 0302 v15.0.11 BRCM MBA Slot 0303 v15.0.11 UEFI: Built-in EFI Shell Linux Virtual Floppy 0324 Windows Boot Manager Windows Boot Manager Windows Boot Manager ↑ and ↓ to move selection ENTER to select boot device ESC to boot using defaults

Figure 44: Booting Using Windows Boot Manager from F6 BIOS Boot Menu

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Step 11 After W2K12 boots up, verify the GPT volume using the diskpart command.

Figure 45: Verifying the GPT Volume

	Administrator: Windows PowerShell	
Windows PowerShell Copyright (C) 2013 Microsoft Corporation	All rights reserved.	^
PS C:\Users\Administrator> diskpart		
Microsoft DiskPart version 6.3.9600		
Copyright (C) 1999-2013 Microsoft Corpor On computer: WIN-9MAG4V545N3	tion.	
DISKPART> list disk		
Disk ### Status Size Free	Dyn Gpt	
Disk 0 Online 5028 GB Disk 1 Online 8003 MB Disk 2 No Media 0 B	8 * 8 8 8	
DISKPART>		

1

**Step 12** Verify W2K12 recognizes the entire volume.

		Server I	Manager					- 4
●	nd Storage Service	es • Volume	s •		• 🕲	Manag	je Tools	View
Servers	VOLUMES All volumes   2 total							TASKS
Volumes Disks	Filter	٩	) • (II) •					
Storage Pools	Volume Star	tus File System Label BGL (2)	Provisioning	Capacity	Free Space	Deduplication Rat	te Deduplic	ation Saving
	\\?5c	Recovery	Fixed	300 MB	59.8 MB			
	C;		Fixed	4.91 TB	4.90 TB			
	< Last refreshed on 12/23/20	015 8:45:10 PM	10					
	<ul> <li>Last refreshed on 12/23/20</li> <li>SHARES</li> <li>No related shares are availal</li> </ul>	015 8:45:10 PM	III TASKS 💌	DISK \\?\Volu	ime{5c17ad7	10-8dbe-446d-a978	3-f448c9ad	TASKS
	Last refreshed on 12/23/20       SHARES       No related shares are availal       To use this functionality	015 8:45:10 PM ble. y, install the File Server	III TASKS role service.	DISK \\?\Volu LSI N Capa	ime(5c17ad7 MRSASRoM	10-8dbe-446d-a978 MB-4i SCSI Disk 4.91 TB	3-f448c9ad Device	TASKS

Figure 46: Verifying the Volume

**Step 13** Verify W2K12 recognizes the full storage of C drive.

Figure 47: Verifying the Storage Capacity



- **Step 14** To make W2K12 boot automatically, enter BIOS and make the following changes:
  - a) Change 'UCSM boot order rules' from 'Strict' to 'Loose'. This change disallows CIMC to override BIOS boot order. The BIOS boot order will be used instead of CIMC boot order.

b) Move 'Windows Boot Manager' to top of the boot order.

### Figure 48: BIOS Settings



Step 15 Finally, save your changes and exit BIOS setup.