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Every reasonable attempt has been made to comply with all licensing requirements for all components used in the system. Any oversight is unintentional and will be remedied if brought to the attention of Harmonic at support@harmonicinc.com.

Documentation Conventions

This guide may use some special symbols and fonts to call your attention to important information. The following symbols appear throughout this guide:

**DANGER:** The Danger symbol calls your attention to information that, if ignored, can cause physical harm to you.

**CAUTION:** The Caution symbol calls your attention to information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.

**LASER DANGER:** The Laser symbol and the Danger alert call your attention to information about the lasers in this product that, if ignored, can cause physical harm to you.

**NOTE:** The Note symbol calls your attention to additional information that you will benefit from heeding. It may be used to call attention to an especially important piece of information you need, or it may provide additional information that applies in only some carefully delineated circumstances.

**IMPORTANT:** The Important symbol calls your attention to information that should stand out when you are reading product details and procedural information.

**TIP:** The Tip symbol calls your attention to parenthetical information that is not necessary for performing a given procedure, but which, if followed, might make the procedure or its subsequent steps easier, smoother, or more efficient.

In addition to these symbols, this guide may use the following text conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typed Command</td>
<td>Indicates the text that you type in at the keyboard prompt.</td>
</tr>
<tr>
<td><strong>&lt;Ctrl&gt;, &lt;Ctrl&gt;+&lt;Shift&gt;</strong></td>
<td>A key or key sequence to press.</td>
</tr>
<tr>
<td><strong>Links</strong></td>
<td>The <em>italics in blue</em> text to indicate Cross-references, and hyperlinked cross-references in online documents.</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td>Indicates a button to click, or a menu item to select.</td>
</tr>
<tr>
<td><strong>ScreenOutput</strong></td>
<td>The text that is displayed on a computer screen.</td>
</tr>
<tr>
<td><strong>Emphasis</strong></td>
<td>The <em>italics text used for emphasis and document references.</em></td>
</tr>
</tbody>
</table>

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Introduction

This document provides the following component replacement instructions for the Harmonic MediaGrid system:

- Replacing a ContentServer and Related Components
- Replacing a ContentStore and Related Components
- Replacing a ContentDirector and Related Components
- Replacing a ContentBridge and Related Components
- Replacing the Network Switches
- Powering Down the Harmonic MediaGrid System

Technical Support

See Contacting the Technical Assistance Center for information on contacting Technical Support.

Useful Information when Contacting Technical Support

In order to assist Technical Support, review the following information:

- What version of firmware is installed on your system?
  From the Home tab, click the Upgrade Firmware icon in the left-hand column to display the Upgrade Firmware page. The firmware version for each device is shown in the Current Firmware Version column.

- What version of SystemManager software is installed?
  From SystemManager, click the Help tab. The version is shown in the Server Software section of the page.

- Which Windows operating system is running on the SystemManager client PC?
  a. From Windows, click the Start button, and then click Run.
  b. In the Open field, type: winver, and then press Enter to open the About Windows dialog box, which shows the version number.

- How much memory is installed on the SystemManager platform? (for example, 256 MB, 512 MB, or 1 GB)
  a. From Windows, click the Start button, and then click Run.
  b. In the Open field, type: winver and then press Enter to open the About Windows dialog box. Look for the line which reads “Physical memory available to Windows.”

- Please provide the manager.oda file from the SystemManager platform or client PC
  Technical Support may request that you email the manager.oda file, which contains configuration information for your system. This file is located on the SystemManager platform at D:\Omneon\Manager\omdb, or if you are using a client PC with a single C: partition, it will be in the same directory on the C: drive.

- What is the model and serial number of the hardware involved?
  a. For Spectrum and MediaDeck devices: from the Home tab, click the Upgrade Firmware icon in the left-hand column to display the Upgrade Firmware page. Both MediaDirectors
and MediaDecks are listed in the **MediaDirectors** section. Find the Model Numbers and Serial Numbers listed in their respective columns.

Scroll down to the **MediaPorts** section to view the Model Numbers and Serial Numbers for MediaPorts and MediaDeck Modules.

- For Harmonic MediaGrid Devices: Click the **Servers & Switches** icon in the left-hand column. From the Servers and Switches page, in the **Name** column, click the link for the Harmonic MediaGrid device to open the **Properties** page for that device.
- For ProXchange devices: Click the ProXchange Servers icon in the left-hand column. From the **Servers** page, in the **Name** column, click the link for the ProXchange device to open the **Properties** page for that device.
- For ProBrowse devices: Click the ProBrowse Servers icon in the left-hand column. From the **Servers** page, in the **Name** column, click the link for the ProBrowse device to open the **Properties** page for that device.
- For MAS devices: Click the MAS Servers icon in the left-hand column. From the **Servers** page, in the **Name** column, click the link for the MAS device to open the **Properties** page for that device.

**For Spectrum Systems**

- **What is the name of the Player that is being used?**

  From SystemManager, click the **Player Configuration** link in the left-hand column, and then click the name of the MediaDirector or MediaDeck. The **Player List** page for that device appears. The names and status of all players are listed.

- **What file format and bit rate is the Player configured for? (for example, MPEG, DV, IMX?)**
  
  a. From SystemManager, click the **Player Configuration** link in the left-hand column, and then click the name of the MediaDirector or MediaDeck. The **Player List** page for that device appears.
  
  b. From the player list, click the **Properties** link to view all the details for a player.

- **If the problem is related to Ingest or Playout of a clip, what is the Clip ID involved?**

  The clip name or clip ID should be indicated by whatever software application you are using to play or record video. For ClipTool, clip names are displayed in the clip management area of the ClipTool main window.

- **What brand of Automation, if any, is being used for control?**

- **Is the Automation using VDCP or API for communication control?**

- **What other third party device (for example, Tandberg* or Snell and Wilco)* is involved?**

**For Harmonic MediaGrid Systems**

For failures with the Harmonic MediaGrid client:

- **What operating system is running on the client computer?**

- **What applications are you using?**

- **What version of the Harmonic MediaGrid FSD is installed?**

To determine the FSD version on Windows:

  a. From the Control dialog box, click the **Add/Remove Programs** icon.
b. Locate the Harmonic MediaGrid File System Driver entry and click the link, which says Click here for support information. The version is displayed.

To determine the FSD version on Macintosh:

a. Select Find from the File menu.
b. Click Applications in the Finder sidebar of the Searching “This Mac” window.
c. Double-click the Connect to MediaGrid icon to open the Connect to Harmonic MediaGrid dialog box.

To determine the FSD version on Linux:

Use the following command: `tail /proc/sys/omfs`

- Please supply an error message, screen capture, or description of the symptom
- Is the issue repeatable? If so, what is the procedure to reproduce the issue?
- Please supply log files for the client FSD and ContentBridge FSD

Once you are able to reproduce the issue, Technical Support may ask you to provide log files from the client computers or the ContentBridge. The following instructions describe how to turn on logging on a client system.

**IMPORTANT:** Do not perform the following procedures unless directed by Technical Support.

**To enable logging for a Windows client:**

i. Add two registry parameters to the OmRdr registry key:
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\OmRdr\Parameters
   - DWORD “debug” with value 1
   - DWORD “LogToFile” with value 1

ii. For debug to take effect, make sure the client is mounted to the Harmonic MediaGrid system.

iii. For LogToFile to take effect, run the “taillog” executable and redirect the output to a file. From the Start menu, click Run, and paste the location of tailog.exe and desired location of the log file into the Open field, as shown in this example: “C:\Program Files\Omneon\Omneon MediaGrid\taillog.exe” > c:\clxxxxxx-1.log

   In this example, the log file will be created at the c:\ directory.

iv. Reproduce the issue, and then collect all log files from taillog and the omxxx.log from the WinFSD installed directory.

v. Once you have collected the log files make sure to delete the LogToFile parameter from the registry, otherwise it will have a negative impact on performance.

**To enable logging for a Macintosh client:**

i. Run the following command to ensure that the debug level is set to default:
   `sudo sysctl –w debug.omfs=3`

ii. Reproduce problem.

iii. Collect the following log files: `/var/log/system.log` and `/var/log/kernel.log`.

**To collect log messages for a Linux client:**

Collect `/var/log/messages`. 
Harmonic may also wish to collect the current configured Linux FSD parameters. Access these by entering the following command:

```
cat /proc/sys/omfs*
```

To collect log messages for the ContentBridge:

Locate the log file at:/var/log/omneon/remote/IP address of ContentBridge.

- **What was the time of the failure?**
  
  For information on the time of failure, navigate to the View Alarms page in SystemManager. To open the View Alarms page, click the **Diagnostics** tab, and then click the **View Alarms** icon in the left-hand column.

For failures with the Harmonic MediaGrid cluster:

- **What is the name of the device that experienced the failure?**

  From SystemManager, click the **Servers & Switches** icon in the left-hand column to access the **Servers & Switches** page. Device names are listed in the **Name** column.

- **Please provide an error message and/or a description of the symptom**

- **Is this failure affecting clients or other systems?**

- **Please provide the appropriate log file or remote access to the device**

The Harmonic MediaGrid provides logs files for all of the core services. Technical support may wish to view one of these logs to determine the root cause of the problem. The following three log files are used most often when troubleshooting. These files are located on the ContentDirector at /var/log/omneon.

- **ssmd**: SliceServer Manager
- **mdscore**: MetaData Server
- **startup**: Core Harmonic MediaGrid Services Startup and Shutdown
Chapter 1
Replacing a ContentServer and Related Components

This section provides instructions for the following ContentServer replacement procedures. It includes the following sections:

- Replacing a ContentServer
- Replacing ContentServer 1042B/1042C-DP Components
- Replacing ContentServer 2124A Components
- Replacing ContentServer 3000 Components

DANGER: Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

Replacing a ContentServer

This section describes the procedures required to replace a ContentServer. Replace the ContentServer if there are problems with a power supply, fan or other issue not related to a hard drive. The hard drives can be replaced without returning the ContentServer to Harmonic.

NOTE: When you replace a ContentServer, any data on that ContentServer or managed ContentStore will be unavailable during replacement. If you are accessing the Harmonic MediaGrid at this time, I/O failures can be expected.

Determining Component Problems

Follow these steps to view the ContentServer environmental properties. An abnormal voltage level or temperature reading may indicate a failed or failing component.

To determine problems:

1. Click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
2. In the ContentServers section, click the Name hyperlink for the required component to access the Properties screen. Figure 1–1 shows the Environment portion of a ContentServer Properties screen for a ContentServer 3000.
**Chapter 1 Replacing a ContentServer and Related Components**

Figure 1–1: Environment for a ContentServer


### Checking Alarms

From the **ContentServer Properties** page, scroll to the **Events** section to view the alarms. Look for any indication of problems.

Alarms are color coded for display as follows:

- **Red** indicates a critical error condition requiring immediate attention.
- **Orange** indicates a failed component requiring attention.
- **Yellow** indicates a warning requiring action to avert additional error situations.
- **Blue** alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the **Alarm** icon directly (from any SystemManager screen) to access the **View Alarms** screen, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the *Harmonic SystemManager User Guide* for more information.

**NOTE:** Before commencing the replacement procedure, note the ID of the Group to which the ContentServer belongs in order to add the replacement Server to the same Group. The Group ID for a ContentServer is displayed in the ContentServer section on the Servers page of the SystemManager application.
Replacing a ContentServer

To replace a ContentServer (while keeping the drives):

1. Remove the ContentServer from the Group using SystemManager. Refer to Adding or Removing a ContentServer to/from a Group for instructions.

   **CAUTION:** You MUST remove the original ContentServer from the Group before adding the replacement ContentServer. Failure to do so could result in loss of data.

2. Power off the ContentServer. Refer to Powering Down the Harmonic MediaGrid System for complete instructions.

3. Disconnect the power cord(s) from the ContentServer.

4. Remove the Ethernet cables that are connected to the ContentServer’s Ethernet ports. **Note** the port in which each network cable is connected and then use the same ports on the replacement ContentServer.

5. **For ContentServers 3000 series only:** remove the SAS cables attached to ContentStores.

6. Remove the screws that attach the front mounting brackets to the front of the rack. Remove the ContentServer from the rack. See the Harmonic MediaGrid Installation and Configuration Guide for more information.

7. Remove the drives from the ContentServer.

8. Unpack the replacement ContentServer.

9. Attach the side brackets to the replacement ContentServer.

10. Mount the ContentServer on the rack.

11. Connect the Ethernet cables to the same ports that were used on the original ContentServer.

12. **For ContentServers 3000 series only:** connect the SAS cables to any ContentStores.

13. Insert the drives into the new ContentServer.

14. Connect the power cord(s).

15. Power on the ContentServer. Once powered on, the ContentServer joins the Harmonic MediaGrid Cluster.

16. Add the ContentServer to the Group using SystemManager. Refer to Adding or Removing a ContentServer to/from a Group for instructions.

   **NOTE:** The information about the replaced ContentServer may remain viewable in SystemManager. You can remove the obsolete entry if desired. For instructions, refer to “Removing Devices” in the Harmonic SystemManager User Guide.

17. Make sure the replacement ContentServer is running the same version of software as the rest of your Harmonic MediaGrid system. For information on upgrading or changing the firmware version, refer to “Upgrading Harmonic MediaGrid Firmware” in the Harmonic SystemManager User Guide.

Adding or Removing a ContentServer to/from a Group

**NOTE:** You must have Administrator privileges to perform these functions.

To add or remove a ContentServer to/from a Group:

1. From SystemManager click the **Servers & Switches** icon on the **Configuration** tab to access the **Servers & Switches** page.

2. In the **Clusters** sections, click the **Name** hyperlink for the cluster with the required Group. The **Cluster Properties** page appears. Scroll down the page to display the **Group** section.
3. Click the required Group ID to display the **Group Properties** page.

![Group Properties](image)

- To remove a Server from the Group, click **Remove Server(s) from this Group**. A confirmation message appears. Click **OK**.
- To add a Server to the Group, click **Add Server(s) to this Group**. A confirmation message appears. Click **OK**.

4. Click **Done** to complete the change.

**Manually Removing a ContentServer from a Group**

**IMPORTANT:** Harmonic recommends that you use SystemManager to remove a ContentServer from a Group. If, for some reason, this does not work, use the following procedure.

To manually remove a ContentServer from a Group:
1. Connect a monitor and keyboard to the ContentDirector.
2. Log on to the ContentDirector using the following user name and password:
   - **User name:** ovnuser
   - **Password:** OVN@SvCaUsa
3. Start mdsclientn by typing the following:
   ```bash
   # /opt/omcld/bin/mdsclientn localhost
   ```
4. Authenticate with the following command, using “omneon” as the user name “usm” as the password:
   ```bash
   session authenticate USERNAME PASSWORD
   ```
5. Remove the ContentServer from current group with the following command:
   ```bash
   group removeserver GROUPID SSID
   ```

The GROUPID and SSID for your ContentServer can be found in the **Volume/Group/CS ID** column of the **ContentServer** section on the **Servers and Switches** page in SystemManager.
Replacing ContentServer 1042B/1042C-DP Components

This section includes the following component replacement procedures for the ContentServer 1042B/1042C-DP:

- Replacing a Hard Drive
- Replacing a Power Supply

Replacing a Hard Drive

This section describes the procedures required to replace a ContentServer hard drive. In the event of a drive failure, replacement hard drives are available from Harmonic.

Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentServer Properties page on SystemManager:

- ContentServer Name
- ContentServer Serial Number
- ContentServer Firmware Version

From the Drive Information section on SystemManager:

- Drive Serial Number
- Drive Model Number
- Drive Firmware Version
- Drive Size (GB)


Determining a Hard Drive Failure

To determine if a drive needs replacing:

1. Examine the disk state LEDs on the front of the ContentServer. A solid red LED may indicate a failed drive.
Chapter 1 Replacing a ContentServer and Related Components

Replacing ContentServer 1042B/1042C-DP Components

Figure 1–3: ContentServer Front Panel LEDs

The drive numbers, shown in the ContentServer Front Panel LEDs illustration, correspond to the 1RU ContentServer’s four drive slots. The drive slots are numbered from left to right.

A solid red LED may also simply indicate that the disk is offline, unmounted or inactive.

2. Remove and then replace the drive to see if this solves the problem. Refer to Replacing a Hard Drive for removal instructions.

The most reliable way of identifying the correct drive is by comparing the serial number (located on the front and top of the hard drive) to the serial number displayed on SystemManager. The serial number is shown in the Drive Information section on the SystemManager ContentServer Properties page.

Viewing ContentServer Drive Information

To view the ContentServer drive information:

1. Click the MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.

2. In the ContentServers section, click the Name hyperlink for the ContentServer. The ContentServer Properties page appears. Following is a sample page for a 1RU ContentServer with 4 drives.

Drive Information:

<table>
<thead>
<tr>
<th>Slot</th>
<th>Serial #</th>
<th>Model</th>
<th>FwRev</th>
<th>Total Space</th>
<th>Total Used</th>
<th>Drive Status</th>
<th>SMART Errors</th>
<th>Total Slices</th>
<th>Bad Slices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9GQ56CL</td>
<td>ST3500630NS</td>
<td>3.4K</td>
<td>500107 MB</td>
<td>319032 MB</td>
<td>Online</td>
<td>151940</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>9GQ56U02</td>
<td>ST3500630NS</td>
<td>3.4K</td>
<td>500107 MB</td>
<td>318040 MB</td>
<td>Online</td>
<td>151970</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>9GQ56ZT</td>
<td>ST3500630NS</td>
<td>3.4K</td>
<td>500107 MB</td>
<td>317995 MB</td>
<td>Online</td>
<td>151857</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>9GQ568DT</td>
<td>ST3500630NS</td>
<td>3.4K</td>
<td>500107 MB</td>
<td>318902 MB</td>
<td>Online</td>
<td>151932</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 1–4: Drive Information

3. Scroll to the Drive Information section, as shown above, and then examine the following:

- Locate the Drive Status field, which displays the current operational status of each ContentServer drive. A status of “Offline” may indicate that the drive needs replacing.

- Check to see if the drive has any SMART Errors, which provide advanced warning of potential drive problems. If the SMART Errors value is greater than 0, monitor this drive for future failures.
Replacing a Hard Drive

ContentServer drives can be replaced while the system is running (hot swap). Note the following important points before replacing a ContentServer hard drive:

- Ensure that you have a replacement drive from Harmonic on hand.
- For the ContentServer 1042B/1042C-DP, drives are numbered from left to right from one to four.
- There is no need to reboot the system once the drive is replaced.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace a hard drive:

1. Loosen the two captive thumb screws that secure the bezel to the chassis until the spring releases the screws from the chassis. Pull the bezel directly away from the chassis.
2. Locate the drive needing replacement.
3. Unlatch the hard-drive handle by pulling the raised end toward you until the handle releases from the hard-drive carrier. Open the handle fully.

**CAUTION:** Damage can occur to a drive if it is removed while still spinning. Before removing a drive from an enclosure, wait 30 seconds to ensure that the drive has stopped spinning.

4. Holding the hard-drive carrier, remove the failed drive by sliding it out of the drive enclosure.
5. Compare the serial number on the drive with the serial number found in the **Drive Information** section on SystemManager.
6. Wait for SystemManager to recognize that the drive was removed before inserting the new drive, as shown below.

![Figure 1–5: Drive Information with Slot 2 Drive Removed](image)

7. Unpack the replacement hard drive. Open the hard-drive handle fully.
8. Insert the replacement drive by sliding the drive into the drive enclosure until it stops. Close the hard-drive handle to lock the drive in place.
9. Replace the front panel by first aligning the LED connector on the right side and then simultaneously pressing on both sides of the panel until it rests in place. Hand-tighten the two thumb screws to secure the front panel in place.
10. Verify that the new drive appears in the **Drive Information** section on SystemManager. Click the **Refresh** button to update the screen if the drive is not yet shown. Ensure that the drive appears in its slot and that its **Drive Status** is “Online.” Contact Technical Support for assistance if the drive is not reported as Online.
Replacing a Power Supply

**IMPORTANT:** Refer to *Determining Component Problems* before replacing a power supply.

If you are using the ContentServer 1042C-DP with dual power supplies, you can replace one of the power supplies in the event of a failure. If you are using the ContentServer 1042B with a single power supply, do not remove the power supply. The ContentServer 1042B must be replaced in the event of a power supply failure.

**NOTE:** Although a ContentServer can operate with one failed power supply module without loss of performance, running the ContentServer with only one power supply could cause some components, such as the remaining power supply, to overheat. Harmonic therefore recommends you leave the failed power supply plugged in until you are ready to replace it, even though the failed supply may cause an alarm to sound.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace a power supply:
1. Locate the failed power supply.
2. Disconnect the AC power cable from the failed power supply.
3. Press the release lever on the power supply and pull the handle to remove the power supply.
4. Unpack the replacement power supply.
5. Using the handle, insert the replacement power supply into the empty slot. The release lever clicks to indicate that the unit is locked in place.
6. Connect the AC power cable to the power supply.

Replacing ContentServer 2124A Components

This section includes the following component replacement procedures for the ContentServer 2124A:

- Replacing a Hard Drive
- Replacing a Fan
- Replacing a Power Supply

Replacing a Hard Drive

This section describes the procedures required to replace a ContentServer hard drive. In the event of a drive failure, replacement hard drives are available from Harmonic.

Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:
Chapter 1 Replacing a ContentServer and Related Components

Replacing ContentServer 2124A Components

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the **ContentServer Properties** page on SystemManager:
- ContentServer Name
- ContentServer Serial Number
- ContentServer Firmware Version

From the **Drive Information** section on SystemManager:
- Drive Serial Number
- Drive Model Number
- Drive Firmware Version
- Drive Size (GB)

Refer to “Viewing Properties for Harmonic MediaGrid Components” in the *Harmonic SystemManager User Guide* for additional information.

**Determining a Hard Drive Failure**

To determine if a drive needs replacing:

1. Examine the disk state LEDs on the front of the ContentServer. A solid red LED may indicate a failed drive.

![ContentServer Front Panel LEDs](image)

**Figure 1–6: ContentServer Front Panel LEDs**

The drive numbers, shown in the **ContentServer Front Panel LEDs** illustration, correspond to the 2RU ContentServer’s 12 drive slots, which are numbered by column. The columns are numbered from left to right when facing the front of the unit:

- LED #1 represents the state of the disks in column 1 (disks #1, 5, 9)
- LED #2 represents the state of the disks in column 2 (disks #2, 6, 10)
- LED #3 represents the state of the disks in column 3 (disks #3, 7, 11)
- LED #4 represents the state of the disks in column 4 (disks #4, 8, 12)

A solid red LED may also simply indicate that the disk is offline, unmounted or inactive.

2. Remove and then replace the drive to see if this solves the problem. Refer to **Replacing a Hard Drive** for removal instructions.
The most-reliable way of identifying the correct drive is by comparing the serial number (located on the front and top of the hard drive) to the serial number displayed on SystemManager. The serial number is shown in the Drive Information section on the SystemManager ContentServer Properties page.

Viewing ContentServer Drive Information

To view the ContentServer drive information:
1. From SystemManager, click the MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
2. In the ContentServers section, click the Name hyperlink for the ContentServer. The ContentServer Properties page appears.
3. Scroll to the Drive Information section and then examine the following:
   - Locate the Drive Status field, which displays the current operational status of each ContentServer drive. A status of “Offline” may indicate that the drive needs replacing.
   - Check to see if the drive has any SMART Errors, which provide advanced warning of potential drive problems. If the SMART Errors value is greater than 0, monitor this drive for future failures.

Replacing a Hard Drive

ContentServer drives can be replaced while the system is running (hot swap). Note the following important points before replacing a ContentServer hard drive:
- Ensure that you have a replacement drive from Harmonic on hand.
- Drives are numbered from left to right, starting with drive 1 on the top left and ending with drive 12 on the bottom right as shown below.

   ![Drive Layout Diagram]

- There is no need to reboot the system once the drive is replaced.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace:
1. Loosen the two captive thumb screws that secure the bezel to the chassis until the spring releases the screws from the chassis. Pull the bezel directly away from the chassis.
2. Locate the drive needing replacement. If the drive carrier is locked, use the “Torx” tool to turn the locking mechanism until the latch can be depressed.

**CAUTION:** Damage can occur to a drive if it is removed while still spinning. Before removing a drive from an enclosure, wait 30 seconds to ensure that the drive has stopped spinning.

3. Push the latch on the front of the carrier to the right, open the lever fully and then pull out the carrier from the drive enclosure.
4. Remove the failed hard drive from the drive enclosure.
5. Compare the serial number on the drive with the serial number found in the **Drive Information** section on SystemManager.

6. Wait for SystemManager to recognize that the drive was removed before inserting the new drive. Check the **Drive Information** section in SystemManager, as shown below.

![Drive Information](image)

**Figure 1–7: Drive Information with Slot 2 Drive Removed**

7. Unpack the replacement hard drive.

8. Attach the replacement hard drive to the carrier.

9. Insert the replacement drive by sliding the drive into the drive enclosure until it provides resistance. Push the lever closed while pressing on the right side of the carrier until the carrier clicks into place.

10. Replace the front bezel by aligning the two tabs (on the outside of the thumb screws) with the two compatible slots on the front of the unit. Evenly press the bezel into place.

   The six LEDs flash amber when the bezel is attached, turn off, and then remain white when the bezel is in place.

11. Tighten the two thumb screws.

12. Verify that the new drive appears in the **Drive Information** section on SystemManager. Click the **Refresh** button to update the screen if the drive is not yet shown. Ensure that the drive appears in its slot and that its Drive Status is “Online.” Contact Technical Support for assistance if the drive is not reported as Online.

### Replacing a Fan

**IMPORTANT**: Refer to *Determining Component Problems* before replacing a fan.

In the event of a fan failure, replacement fans are available from Harmonic. The fans can be replaced while the system is running.

Note the following important points before replacing a ContentServer fan:

- Ensure that you have a replacement fan from Harmonic on hand.
- There is no need to reboot the system once the fan is replaced.

**DANGER**: Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

**To replace:**

1. Remove the cover by first aligning the lock icon with the notch, as shown in *Cover Removal*. Press down and hold the arrow button and then slide the cover toward the back of the unit.
Chapter 1 Replacing a ContentServer and Related Components

Replacing ContentServer 2124A Components

Figure 1–8: Cover Removal

2. With the cover removed, locate the failed fan.

Figure 1–9: Fan Removal

3. To remove the fan, grasp both ends of the fan and pull the fan upward, as shown.
4. Unpack the replacement fan.
5. With the replacement fan in hand, ensure that the front of the fan is in the front and the LED is on the right. Insert the replacement fan and press down until it is fully seated.
6. Replace the cover.

Replacing a Power Supply

IMPORTANT: Refer to Determining Component Problems before replacing a power supply.
In the event of a power supply failure, replacement power supplies are available from Harmonic. The power supplies can be replaced while the system is running, and there is no need to reboot the system after you have replaced the power supply.

**NOTE:** Although a ContentServer can operate with one failed power supply module without loss of performance, running the ContentServer with only one power supply could cause some components, such as the remaining power supply, to overheat. Harmonic therefore recommends you leave the failed power supply plugged in until you are ready to replace it, even though the failed supply may cause an alarm to sound.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace:
1. Locate the failed power supply.
2. Remove the retainer clip from the power cord.
3. Disconnect the AC power cable from the failed power supply.

![Power Supply Removal](image)

Figure 1–10: Power Supply Removal

4. Press the release lever to the left and pull the handle to remove the power supply, as shown above.
5. Unpack the replacement power supply.
6. Using the handle, insert the replacement power supply into the empty slot. The release lever clicks to indicate that the unit is locked in place.
7. Connect the AC power cable to the power supply.
8. Attach the retainer clip.

**Replacing ContentServer 3000 Components**

This section includes the following component replacement procedures for the ContentServer 3000:

- Replacing a Hard Drive
- Replacing a Controller
- Replacing a Power Supply
Replacing a Hard Drive

This section describes the procedures required to replace a ContentServer 3000 hard drive. In the event of a drive failure, replacement hard drives are available from Harmonic.

Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentServer Properties page on SystemManager:

- ContentServer Name
- ContentServer ESN (Enclosure Serial Number).
- ContentServer Firmware Version

From the Drives section of the ContentServer Properties page on SystemManager:

- Drive Serial Number
- Drive Model Number
- Drive Firmware Version
- Drive Size (GB)
- Drive GUID


The Harmonic MediaGrid provides logs files for all of the core services. Technical support may wish to view one of these logs to determine the root cause of the problem. The following three log files are used most often when troubleshooting. These files are located on the ContentDirector at /var/log/omneon/remote.

- ssmd: SliceServer Manager
- mdscore: MetaData Server
- startup: Core Harmonic MediaGrid Services Startup and Shutdown

Viewing ContentServer Drive Information

To view the ContentServer drive information:

1. Click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
2. In the ContentServers/ContentStores section, click the Name hyperlink for the ContentServer. The ContentServer Properties page appears.
3. Scroll to the Drives section, as shown in Figure 1–11, and then examine the following:

   - Locate the Status field, which displays the current operational status of each ContentServer drive. A status of “Offline” may indicate that the drive needs replacing.
Click the GUID link to open the Drive Properties page and check to see if the drive has any SMART Errors, which provide advanced warning of potential drive problems. Replace the hard drive if the SMART Errors value is greater than 0.

![Drive Information]

**Replacing a Hard Drive**

ContentServer drives can be replaced while the system is running. Note the following important points before replacing a ContentServer hard drive:

- Ensure that you have a replacement drive from Harmonic on hand.

**IMPORTANT:** Use ONLY Harmonic-supplied replacement disk drives. Disk drives from any other source will be excluded from coverage under the Harmonic product limited warranty and maintenance services programs. In addition, any errors or damages caused by the use of disk drives provided from any other source will cause the entire product to be excluded from coverage under the Harmonic product limited warranty and maintenance services programs.

THE PERFORMANCE OF YOUR CONTENTSERVER MAY BE ADVERSELY AFFECTED BY THE USE OF COMPONENTS NOT SUPPLIED BY HARMONIC.

- For systems with pre-3.2.2. software, the drive size (in GB) and form factor must match the other drives in the enclosure. Replacement drives should have the same or greater drive capacity as those they are replacing.

- For systems with version 3.2.2 and later, you may use different capacity Harmonic-supplied drives in the same ContentServer 3000 or ContentStore 3160 RAID set. Note the following when replacing a ContentServer 3000 or ContentStore 3160 drive with a different capacity drive than the others in the same RAID set:
  - Any drive you add to an existing RAID set must be at least as large as the smallest existing drive in that RAID set.
  - Adding a drive that is larger than the smallest drive in the RAID set will cause it to be treated as if it were the lesser capacity drive. In other words, the RAID set capacity will not increase by replacing smaller drives with larger drives.

- For the ContentServer 3000, drives are numbered from right to left as shown here.
Chapter 1 Replacing a ContentServer and Related Components

There is no need to reboot the system once the drive is replaced.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

**To replace a hard drive:**

1. Remove the bezel.
   a. Press in the release button on the right side of the bezel and then pull the right side of the bezel away from the chassis.
   b. Pull the left side of the bezel slightly to the right and away from the chassis. The two posts on the left side of the bezel will detach from the holes in the left-hand rack ear. See Figure 1–12 for reference.

2. In SystemManager, fail the drive. From the Drives section of the ContentServer Properties page, click the Select check box for the drive, and then click Fail Drives.

![Figure 1–12: Removing the bezel](image)
3. Physically locate the drive needing replacement. The red Status LED on the failed drive will be blinking rapidly (4 times/sec). See the following table for a description of drive LED states.

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Green Solid</td>
<td>Drive is powered on</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No power is being provided to the drive</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Drive is in use.</td>
</tr>
<tr>
<td></td>
<td>Red Block</td>
<td>Drive is not being used by the ContentServer.</td>
</tr>
<tr>
<td></td>
<td>Rapid blink (4 per second)</td>
<td>Drive has failed.</td>
</tr>
<tr>
<td></td>
<td>Slow blink (1 per second)</td>
<td>Drive is being winked.</td>
</tr>
<tr>
<td></td>
<td>Two rapid blinks then pause</td>
<td>Drive is being rebuilt, repaired.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Drive state is normal. Drive is being used by the ContentServer.</td>
</tr>
</tbody>
</table>

Also note that drives are numbered 0 to 15 from right to left.

4. Unlatch the hard-drive carrier handle by pressing down on the red button at the bottom of the carrier. See Figure 1–13.

⚠️ **CAUTION:** Never remove a drive if the green LED on the drive carrier is blinking. If the green LED is blinking, the drive is in use by the system. Removing a drive that is in use may result in loss of data.
5. Use the handle on the hard drive carrier to pull out the failed drive, sliding it out of the drive enclosure.

6. Compare the serial number on the top of the drive with the serial number found in SystemManager.

To view the serial number in SystemManager:
   a. From the Drives section of the ContentServer Properties page, click the link in the GUID column for the failed drive. The Drive Properties page for the drive appears.
   b. From the Drive Properties page, view the Serial Number field.

If the serial numbers match, continue to the next step. If the serial numbers do not match, wait at least 15 seconds after removal, then reinsert the drive. Call Technical Support immediately, and do not continue with this procedure.

7. Wait for SystemManager to recognize that the drive was removed before inserting the new drive, as shown in Figure 1–14.
8. Unpack the replacement hard drive.
9. Insert the replacement drive by sliding the drive into the drive enclosure until it stops. Close
   the hard-drive handle to lock the drive in place.
10. Within three minutes, the new drive should appear in the Drives section of the ContentServer
    Properties page the SystemManager application. Verify that the drive is reported as Alive by
    SystemManager. Wait for the refresh interval to make sure the GUI is updated. Continue to
    Step 11.

    If the drive is not reported as Alive, remove the drive, and replace with another drive if available.
    Repeat this step and, if successful, continue to Step 11. If you do not have another drive available,
    contact Technical Support.
11. In the RAID Sets section of the ContentServer Properties page, monitor the status for the
    RAID set. An automatic rebuild will commence on this drive, and the status will change from
    Compromised to Rebuilding. If it does not, contact Technical Support.
12. Periodically monitor the rebuild until complete. Once complete, RAID Set status will change
to Normal, Attached, Viable.

   NOTE: If you replaced a failed drive with a new drive from Harmonic, use the packaging materials (carton,
   cushion, and electrostatic sensitive bag) from the replacement disk drive to carefully repackage the failed
   drive and return it promptly to Harmonic for analysis. Contact Technical Support for a Return Authorization
   Number (RA) before shipping the drive back to Harmonic. Refer to Technical Support for contact
   information and a shipping address.
13. Install the bezel.
   a. Fit the two posts on the left side of the bezel into the holes in the rack ear on the left side
      of chassis.
   b. Press in the release button on the right side of the bezel while pushing the right side of
      the bezel straight onto the chassis, and then release the button. The posts on the right
      side of the bezel will fit into the holes in the right-hand rack ear and secure the bezel on
      the chassis.
Replacing a Controller

When one ContentServer 3000 controller fails, all the Harmonic MediaGrid processes and functionality automatically fail over to the other controller. If this occurs, replacement controllers are available from Harmonic. The controller can be replaced while the ContentServer is running, and there is no need to restart the ContentServer after you have replaced the controller.

**NOTE:** Harmonic recommends that, when replacing a controller, the replacement controller contains the same type of NVRAM card as the other controller in the ContentServer. For details on the NVRAM card, refer to "ContentServer 3000" in the *Harmonic MediaGrid Installation and Configuration Guide*.

**CAUTION:** Although a ContentServer can operate with one failed controller without loss of performance, running the ContentServer with only one controller will cause some components, such as the hard drives, to overheat. Harmonic therefore recommends you leave the failed controller plugged in until you are ready to replace it.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace a controller:

1. In SystemManager, locate the failed controller.
   a. From SystemManager, click the **MediaGrid Servers & Switches** icon on the **Configuration** tab to access the **Servers & Switches** page.
   b. In the **ContentServers/ContentStores** section, click the **Name** hyperlink for the ContentServer. The **ContentServer Properties** page appears.
   c. Scroll to the **Controller** section. The **Status** for the failed controller will show **Not Responding**. Note that the status for the remaining functioning controller will show **Connected**.

2. Power down the failed controller by clicking the associated **Shutdown** button for that controller.
CAUTION: You must power down the controller before removing it to ensure that you do not lose any data.

A confirmation message appears. Click OK.

3. Physically locate the failed controller.
   a. You can wink the ContentServer that contains the failed controller from the ContentServer Properties page in SystemManager. From that page, click the Wink On button to wink the ContentServer.
   b. Once you have located the ContentServer, locate the failed controller on the rear panel of the chassis.

IMPORTANT: When facing the rear of the chassis, the controller on the left side of the chassis corresponds to Controller 0 in SystemManager, and the controller on the right side of the chassis corresponds to Controller 1 in SystemManager.

4. Disconnect all cables from the controller.

5. Clear a path so that no cables will obstruct the controller or get hooked on controller components when you remove it from the chassis.

6. Remove the controller from the chassis. See Figure 1–16 for reference.
   a. Unscrew the controller handle using a Phillips screwdriver. Once unscrewed, the handle releases.
   b. Pull the handle to remove the controller from the chassis.
7. Unpack the replacement controller.
8. Using the handle to guide the controller, insert the replacement controller into the empty slot in the chassis. Once the controller is fully inserted, push the handle up and screw it back into place.
9. Reattach all cables to the controller, including any SAS cable which may go to a ContentStore. For detailed instructions on attaching cables, refer to “Connecting the Harmonic MediaGrid System Components” in the Harmonic MediaGrid Installation and Configuration Guide.
10. Press and release the power button on the front panel of the ContentServer. This powers on the replacement controller.
11. Once you have powered on the replacement controller, SystemManager will discover the new device in approximately two minutes. From SystemManager, verify that the new controller details appear and the Status is shown as Connected. If the new controller details do not appear or the status does not change, contact Technical Support for assistance.

12. From the ContentServer Properties page in SystemManager, click the Failback button. The Failback function balances the Slice Server processes across controllers to help improve performance.

13. After SystemManager has refreshed, verify that all ContentStores and ContentServers appear in the Managed ContentStores and ContentServers field on the ContentServer Properties page. If they are not all listed, contact Harmonic Technical Support for assistance.

Replacing a Power Supply

In the event of a power supply failure, replacement power supplies are available from Harmonic. The power supplies can be replaced while the system is running, and there is no need to restart the system after you have replaced the power supply.

**NOTE:** Although a ContentServer can operate with one failed power supply module without loss of performance, running the ContentServer with only one power supply could cause some components, such as the remaining power supply, to overheat. Harmonic therefore recommends you leave the failed power supply plugged in until you are ready to replace it.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace:

1. Locate the failed power supply.
2. Disconnect the AC power cable from the failed power supply.
3. Press the release lever to the left to unlock the power supply handle, and then pull the handle to remove the power supply, as shown in Figure 1–17.
4. Unpack the replacement power supply.
5. Using the handle, insert the replacement power supply into the empty slot, and push the handle up to lock it into place. The release lever clicks to indicate that the unit is locked in place.
6. Connect the AC power cable to the power supply.

Figure 1–17: Replacing the power supply
Chapter 2
Replacing a ContentStore and Related Components

This section provides instructions for the following ContentStore replacement procedures. It includes the following sections:
- Replacing a ContentStore 3160
- Replacing ContentStore 3160 Components

DANGER: Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

Replacing a ContentStore 3160

This section describes the procedures required to replace a ContentStore. Replace the ContentStore if there are problems with a power supply, fan or other issue not related to a hard drive. The hard drives can be replaced without returning the ContentStore to Harmonic.

NOTE: When you replace a ContentStore, any data on that ContentStore will be unavailable during replacement. If you are accessing the Harmonic MediaGrid at this time, I/O failures can be expected.

Checking Alarms

The ContentStore Properties page in SystemManager displays any alarms that occur. Scroll to the Events section of the page to view the alarms. Look for any indication of problems.

Alarms are color coded for display as follows:
- Red indicates a critical error condition requiring immediate attention.
- Orange indicates a failed component requiring attention.
- Yellow indicates a warning requiring action to avert additional error situations.
- Blue alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the Alarm icon directly (from any SystemManager page) to access the View Alarms page, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the Harmonic SystemManager User Guide for more information.

NOTE: Before commencing the replacement procedure, note the ID of the Group to which the ContentStore belongs in order to add the replacement ContentStore to the same Group. The Group ID for a ContentStore is displayed in the ContentServers/ContentStores section on the Servers and Switches page of the SystemManager application.

Replacing a ContentStore

To replace a ContentStore (while keeping the drives):
1. Remove the ContentStore from the Group using SystemManager. Refer to Adding or Removing a ContentStore to/from a Group for instructions.

CAUTION: You MUST remove the original ContentStore from the Group before adding the replacement ContentStore. Failure to do so could result in loss of data.
Chapter 2 Replacing a ContentStore and Related Components

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2. Power off the ContentStore. Refer to Powering Down a Single ContentStore for complete instructions.
3. Power off the associated ContentServer. Refer to Powering Down a Single ContentServer 3000 Series for complete instructions.
4. Disconnect the power cords from the ContentStore.
5. Remove the SAS cables that are connected to the ContentStore. Note the port in which each cable is connected and then use the same ports on the replacement ContentStore.
6. Remove the screws that attach the front mounting brackets to the front of the rack. Remove the ContentStore from the rack. See the Harmonic MediaGrid Installation and Configuration Guide for more information.
7. Remove the drives from the ContentStore. (See Figure 2–4 for details).
8. Unpack the replacement ContentStore.
9. Attach the side brackets to the replacement ContentStore.
10. Mount the ContentStore on the rack.
11. Connect the SAS cables to the same ports that were used on the original ContentStore.
12. Insert the drives into the new ContentStore.
13. Connect the power cords.
14. Power on the ContentStore. Once powered on, the ContentStore joins the Harmonic MediaGrid Cluster.
15. Power on the associated ContentServer.
16. Add the ContentStore to the Group using SystemManager. Refer to Adding or Removing a ContentStore to/from a Group for instructions.

NOTE: The information about the replaced ContentStore may remain viewable in SystemManager. You can remove the obsolete entry if desired. For instructions, refer to “Removing Devices” in the Harmonic SystemManager User Guide.

Adding or Removing a ContentStore to/from a Group

NOTE: You must have Administrator privileges to perform these functions.

To add or remove a ContentStore to/from a Group:
1. From SystemManager click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
2. In the Clusters sections, click the Name hyperlink for the cluster with the required Group. The Cluster Properties page appears. Scroll down the page to display the Group section.
3. Click the required Group ID to display the Group Properties page.
To remove a ContentStore from the Group, click **Remove Server(s) from this Group**. A confirmation message appears. Click **OK**.

To add a Server to the Group, click **Add Server(s) to this Group**. A confirmation message appears. Click **OK**.

4. Click **Done** to complete the change.

**Manually Removing a ContentStore from a Group**

---

**IMPORTANT:** Harmonic recommends that you use SystemManager to remove a ContentStore from a Group. If, for some reason, this does not work, use the following procedure.

**To manually remove a ContentStore from a Group:**

1. Connect a monitor and keyboard to the ContentDirector.
2. Log on to the ContentDirector using the following user name and password:
   - User name: ovnuser
   - Password: OVN@SvCaUsa
3. Start mdsclientn by typing the following:
   ```
   # /opt/omcld/bin/mdsclientn localhost
   ```
4. Authenticate with the following command, using “omneon” as the user name “usm” as the password:
   ```
   session authenticate USERNAME PASSWORD
   ```
5. Remove the ContentStore from current group with the following command:
   ```
   group removeserver GROUPID SSID
   ```

The GROUPID and SSID for your ContentStore can be found in the **Volume/Group/CS ID** column of the **ContentServers/ContentStores** section on the **Servers and Switches** page in SystemManager.
Replacing ContentStore 3160 Components

This section includes the following component replacement procedures for the ContentStore 3160:

- Replacing a Hard Drive
- Replacing a Controller
- Replacing a Power Supply

Replacing a Hard Drive

This section describes the procedures required to replace a ContentStore hard drive. In the event of a drive failure, replacement hard drives are available from Harmonic.

Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentStore Properties page on SystemManager:

- ContentStore Name
- ContentStore ESN (Enclosure Serial Number).

From the Drive Information section on SystemManager:

- Drive Serial Number
- Drive Model Number
- Drive Firmware Version
- Drive Size (GB)
- Drive GUID


The Harmonic MediaGrid provides logs files for all of the core services. Technical support may wish to view one of these logs to determine the root cause of the problem. The following three log files are used most often when troubleshooting. These files are located on the ContentDirector at /var/log/omneon.

- ssmd: SliceServer Manager
- mdscore: MetaData Server
- startup: Core Harmonic MediaGrid Services Startup and Shutdown
Viewing ContentStore Drive Information

To view the ContentStore drive information:

1. Click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
2. In the ContentServers/ContentStores section, click the Name hyperlink for the ContentStore. The ContentStore Properties page appears.
3. Scroll to the Drive Information section, as shown in Figure 2–2, and then examine the following:
   - Locate the Status field, which displays the current operational status of each ContentServer drive. A status of “Offline” may indicate that the drive needs replacing.
   - Click the GUID link to open the Drive Properties page and check to see if the drive has any SMART Errors, which provide advanced warning of potential drive problems. Replace the hard drive if the SMART Errors value is greater than 0.

![Drive Information Table]

Figure 2–2: Drive Information

Replacing a Hard Drive

ContentStore drives can be replaced while the system is running. Note the following important points before replacing a ContentStore hard drive:

- Ensure that you have a replacement drive from Harmonic on hand.

**IMPORTANT:** Use ONLY Harmonic-supplied replacement disk drives. Disk drives from any other source will be excluded from coverage under the Harmonic product limited warranty and maintenance services programs. In addition, any errors or damages caused by the use of disk drives provided from any other source will cause the entire product to be excluded from coverage under the Harmonic product limited warranty and maintenance services programs.

**THE PERFORMANCE OF YOUR CONTENTSTORE MAY BE ADVERSELY AFFECTED BY THE USE OF COMPONENTS NOT SUPPLIED BY HARMONIC.**

- For systems with pre-3.2.2. software, the drive size (in GB) and form factor must match the other drives in the enclosure. Replacement drives should have the same or greater drive capacity as those they are replacing.
For systems with version 3.2.2 and later, you may use different capacity Harmonic-supplied drives in the same ContentServer 3000 or ContentStore 3160 RAID set. Note the following when replacing a ContentServer 3000 or ContentStore 3160 drive with a different capacity drive than the others in the same RAID set:

- Any drive you add to an existing RAID set must be at least as large as the smallest existing drive in that RAID set.
- Adding a drive that is larger than the smallest drive in the RAID set will cause it to be treated as if it were the lesser capacity drive. In other words, the RAID set capacity will not increase by replacing smaller drives with larger drives.

For the ContentStore 3160, drives are numbered from right to left as shown here.

![Drive numbering diagram]

There is no need to reboot the system once the drive is replaced.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

**To replace a hard drive:**

1. Remove the bezel.
   a. Press in the release button on the right side of the bezel and then pull the right side of the bezel away from the chassis.
   b. Pull the left side of the bezel slightly to the right and away from the chassis. The two posts on the left side of the bezel will detach from the holes in the left-hand rack ear. See *Figure 2–3* for reference.
2. In SystemManager fail the drive. From the Drives section of the ContentStore Properties page, click the Select check box for the drive, and then click Fail Drives.

3. Locate the drive needing replacement. The red Status LED on the failed drive will be blinking rapidly (4 times/sec).

4. Unlatch the hard-drive carrier handle by pressing down on the red button at the bottom of the carrier. See Figure 2–4.
Chapter 2 Replacing a ContentStore and Related Components

Replacing ContentStore 3160 Components

Figure 2–4: Removing a hard drive

![Image of hard drive removal process]

**CAUTION:** Damage can occur to a drive if it is removed while still spinning. Before removing a drive from an enclosure, wait 30 seconds to ensure that the drive has stopped spinning.

5. Use the handle on the hard drive carrier to pull out the failed drive, sliding it out of the drive enclosure.
6. Compare the serial number on the top of the drive with the serial number found in SystemManager.

To view the serial number in SystemManager:

- a. From the Drives section of the ContentStore Properties page, click the link in the GUID column for the failed drive. The Drive Properties page for the drive appears.
- b. From the Drive Properties page, view the Serial Number field.

If the serial numbers match, continue to the next step. If the serial numbers do **not** match, wait at least 15 seconds after removal, then reinsert the drive. Call Technical Support immediately, and do not continue with this procedure.

7. Wait for SystemManager to recognize that the drive was removed before inserting the new drive, as shown in Figure 2–5.
8. Unpack the replacement hard drive.
9. Insert the replacement drive by sliding the drive into the drive enclosure until it stops. Close the hard-drive handle to lock the drive in place.
10. Within three minutes, the new drive should appear in the Drives section of the ContentStore Properties page the SystemManager application. Verify that the drive is reported as Alive by SystemManager. Wait for the refresh interval to make sure the GUI is updated Continue to Step 11.

If the drive is not reported as Alive, remove the drive, and replace with another drive if available. Repeat this step and, if successful, continue to Step 11. If you do not have another drive available, contact Technical Support.

11. In the RAID Sets section of the ContentStore Properties page, monitor the status for the RAID set. An automatic rebuild will commence on this drive, and the status will change from Compromised to Rebuilding. If it does not, contact Technical Support.
12. Periodically monitor the rebuild until complete. Once complete, RAID Set status will change to Normal, Attached, Viable.

**NOTE:** If you replaced a failed drive with a new drive from Harmonic, use the packaging materials (carton, cushion, and electrostatic sensitive bag) from the replacement disk drive to carefully repackage the failed drive and return it promptly to Harmonic for analysis. Contact Technical Support for a Return Authorization Number (RA) before shipping the drive back to Harmonic. Refer to Technical Support for contact information and a shipping address.

13. Install the bezel.
   a. Fit the two posts on the left side of the bezel into the holes in the rack ear on the left side of chassis.
   b. Press in the release button on the right side of the bezel while pushing the right side of the bezel straight onto the chassis, and then release the button. The posts on the right side of the bezel will fit into the holes in the right-hand rack ear and secure the bezel on the chassis.
Replacing a Controller

When one ContentStore 3160 controller fails, all the functionality automatically fails over to the other controller. If this occurs, replacement controllers are available from Harmonic. The controller can be replaced while the ContentStore is running, and there is no need to restart the ContentStore after you have replaced the controller.

**CAUTION:** Although a ContentStore can operate with one failed controller without loss of performance, running the ContentStore with only one controller will cause some components, such as the hard drives, to overheat. Harmonic therefore recommends you leave the failed controller plugged in until you are ready to replace it.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace a controller:

1. Locate the rear panel of the failed ContentStore controller. Although the ContentStore cannot be winked, you can wink the ContentServer that controls the ContentStore from the Servers & Switches page in SystemManager. From that page, click the Select checkbox for the ContentServer and then click Wink On.

If cabled properly, each controller on a ContentStore will be connected via SAS cable in a daisy chain fashion to a ContentServer controller on the same side and directly above it, and possibly another ContentStore controller on the same side and directly below it. See Figure 2–7 for an example.

2. Once you have located the failed controller note the serial number, or ESN, on the rear panel of the unit and then compare it with the serial number of the failed controller in SystemManager.
   a. From SystemManager, click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
   b. In the ContentServers/ContentStore section, click the Name hyperlink for the ContentStore. The ContentStore Properties page appears.
c. Scroll to the **Controller** section. The **Status** for the failed controller will show **Not Responding**. Verify the serial number is correct.

3. Using **SystemManager**, power down the **ContentServer** controller that controls the failed **ContentStore** controller. To identify this controller, follow the SAS cable connections on the rear panel of the **ContentStore** controller all the way up to the respective **ContentServer** controller. Refer to **Figure 2–7** for an example.
   a. From **SystemManager**, open the **ContentServer Properties** page for the controlling **ContentServer**.
   b. In the **Controllers** section of the page, click the **Shutdown** button for the associated **ContentServer** controller.

4. Disconnect all SAS cables from the **ContentStore** controller.

5. Clear a path so that no cables will obstruct the controller or get hooked on controller components when you remove it from the chassis.

6. Remove the controller from the chassis. See **Figure 2–8** for reference.
   a. Unscrew the controller handle using a Phillips screwdriver. Once unscrewed, the handle releases.
b. Pull the handle to remove the controller from the chassis.

Figure 2–8: Replacing a controller

7. Unpack the replacement controller.
8. Using the handle to guide the controller, insert the replacement controller into the empty slot. Once the controller is fully inserted, push the handle up and screw it back into place.
9. Reattach all SAS cables to the controller. For detailed instructions on attaching cables, refer to “Connecting the Harmonic MediaGrid System Components” in the Harmonic MediaGrid Installation and Configuration Guide.

**NOTE:** Do not twist SAS cables or bundle them with power cables.

10. Press and release the power button on the front panel of the ContentServer, which controls the ContentStore with the replacement controller. This powers on the ContentServer controller.
11. Once you have powered on the controller, SystemManager will discover the devices in approximately two minutes. For both the ContentServer controller and the replacement ContentStore controller, verify that details appear and the Status is shown as Connected. If the new controller details do not appear, contact Technical Support for assistance.

12. From the ContentStore Properties page in SystemManager, click the Failback button. The Failback function balances the Slice Server processes across controllers to help improve performance.

13. After SystemManager has refreshed, verify that all ContentStores and ContentServers appear in the Managed ContentStores and ContentServers field on the ContentServer Properties page. If they are not all listed, contact Technical Support for assistance.

Replacing a Power Supply

In the event of a power supply failure, replacement power supplies are available from Harmonic. The power supplies can be replaced while the system is running, and there is no need to reboot the system after you have replaced the power supply.

**NOTE:** Although a ContentStore can operate with one failed power supply module without loss of performance, running the ContentStore with only one power supply could cause some components, such as the remaining power supply, to overheat. Harmonic therefore recommends you leave the failed power supply plugged in until you are ready to replace it.

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

To replace:

1. Locate the failed power supply.
2. Disconnect the AC power cable from the failed power supply.
3. Press the release lever to the left to unlock the power supply handle, and then pull the handle to remove the power supply, as shown in Figure 2–9.
4. Unpack the replacement power supply.
5. Using the handle, insert the replacement power supply into the empty slot, and push the handle up to lock it into place. The release lever clicks to indicate that the unit is locked in place.
6. Connect the AC power cable to the power supply.
Chapter 3
Replacing a ContentBridge and Related Components

This section provides instructions for the following ContentBridge replacement procedures:

- Determining a ContentBridge Problem
- Checking Alarms
- Replacing a ContentBridge 1000B
- Replacing a High Bandwidth ContentBridge
- Replacing a ContentBridge 2010E in a High Availability (HA) Pair
- Replacing ContentBridge 2010A Components
- Replacing ContentBridge 2010B/C/D/E Components

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

**IMPORTANT:** You must complete the Harmonic MediaGrid Configuration Assistant after replacing a ContentBridge. See the *Harmonic MediaGrid Installation and Configuration Guide* for instructions.

Determining a ContentBridge Problem

Follow these steps to view the ContentBridge environmental properties. An abnormal voltage level or temperature reading may indicate a failed or failing component.

1. Click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers List page.
2. In the ContentServers section, click the Name hyperlink for the required component to access its Properties screen. Figure 3–1 shows the Environment portion of a ContentBridge Properties page for a ContentBridge 1000.

![Environment Table](image)

**Figure 3–1: Environment**

Checking Alarms

From the **ContentBridge Properties** page, scroll to the **Events** section to view the alarms. Look for any indication of problems.

Alarms are color coded for display as follows:

- Red indicates a critical error condition requiring immediate attention.
- Orange indicates a failed component requiring attention.
- Yellow indicates a warning requiring action to avert additional error situations.
- Blue alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the **Alarm** icon directly (from any SystemManager screen) to access the **View Alarms** screen, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the *Harmonic SystemManager User Guide* for more information.

Replacing a ContentBridge 1000B

This section describes the procedures required to replace a ContentBridge 1000B. Replace the ContentBridge if there are problems with a power supply, fan or other issue. Refer to *Determining a ContentBridge Problem* before proceeding.

**To replace a ContentBridge:**

1. Shut down the ContentBridge using SystemManager and disconnect the power supply. Refer to *Powering Down or Restarting a Single ContentBridge* from Appendix A, of this guide.
2. Remove the Ethernet cables that are connected to the ContentBridge’s Ethernet ports. **Note** the port in which each network cable is connected and then use the same ports on the replacement ContentBridge.
3. Remove the screws that attach the front mounting brackets to the front of the rack. Remove the ContentBridge from the rack. See the *Harmonic MediaGrid Installation and Configuration Guide* for more information.
4. Unpack the replacement ContentBridge.
5. Attach the side brackets to the replacement ContentBridge.
6. Mount the ContentBridge on the rack.
7. Connect the Ethernet cables to the same ports that were used on the original ContentBridge.
8. Connect the power cord.
9. Power on the ContentBridge.
10. Once you have powered on the unit, you must configure the ContentBridge. Note the following:

   - The ContentBridge must have a fixed (static) IP address. It is recommended that you assign an IP address from the bottom of the dynamic range and that those addresses be removed from the range.
   - The DHCP server must also recognize the MAC address of the ContentBridge and assign it a reserved IP address during startup. The ContentBridge MAC address is located on the outside of the unit.

Follow these steps to assign a static IP address to the ContentBridge. Additionally, a DNS entry must exist in the domain server for the ContentBridge. Use the following IP address range when assigning the addresses: xx.xx.xx.50-99.
In the following example, “CLB0F118” is the ContentBridge host name. Make sure that the hardware Ethernet addresses match the port numbers (eth0 or eth1) and the public network addresses.

c. Using an attached monitor and keyboard, open the /etc/dhcpd.conf file for the primary ContentDirector by typing the following:
   
   `sudo vim /etc/dhcpd.conf`

d. In the entry for the ContentBridge that was replaced, modify the MAC address to match the new unit and modify the name to match the new ContentBridge as well.

e. Enter the following commands after editing the file:
   
   `sudo service dhcpd configtest`
   `sudo service dhcpd restart`

Examples are shown below. Your site-specific entries will be different.

```
# Gateway CLB0F118 eth0
host CLB0F118-eth0 {
  option subnet-mask 255.255.255.0;
  option routers 172.16.1.1;
  filename "pxelinux.0";
  hardware ethernet 00:11:11:9f:d6:05;
  fixed-address 172.16.1.99;
}

# Gateway CLB0F118 eth1
host CLB0F118-eth1 {
  option subnet-mask 255.255.255.0;
  option routers 172.16.2.1;
  filename "pxelinux.0";
  hardware ethernet 00:00:5a:72:8d:ee;
  fixed-address 172.16.2.99;
}
```

f. Repeat steps a-c on the secondary ContentDirector.

g. In SystemManager, navigate to the Properties page for the original ContentBridge, by clicking the Configuration tab, the Harmonic MediaGrid Servers & Switches icon, and then the cluster Name. Note that this ContentBridge will appear as Not Responding.

h. Click View/Edit ContentBridge Config to open the Edit ContentBridge Config File page.
Replacing a High Bandwidth ContentBridge

This section describes the procedures required to replace a ContentBridge 2010A/2010B/2010C/2010D.

To replace a High Bandwidth ContentBridge:

1. Loosen the two captive thumb screws that secure the front bezel to the chassis until the spring releases the screws from the chassis. Pull the bezel directly away from the chassis.
2. Shut down the ContentBridge using SystemManager and disconnect the power supply. Refer to Powering Down or Restarting a Single ContentBridge from Appendix A of this guide.
3. Remove the Ethernet cables that are connected to the ContentBridge’s Ethernet ports.
4. Note the port in which each network cable is connected and use the same ports on the replacement ContentBridge.
5. Remove the ContentBridge from the rack. See the rack installation instructions that came with the ContentBridge for instructions.
6. Unpack the replacement ContentBridge.
7. Mount the ContentBridge on the rack.
8. Connect the power cord(s).
9. Connect the Ethernet cables to the same ports that were used on the original ContentBridge.
10. Power on the ContentBridge.
11. Complete the Harmonic MediaGrid Configuration Assistant to attain the client-specific network information for the ContentBridge and to set up the list of user IDs permitted access to the ContentBridge. See the Harmonic MediaGrid Installation and Configuration Guide for instructions.
12. Restart the ContentBridge.
13. Remove the original ContentBridge from SystemManager using the Remove Device feature in SystemManager. For detailed instructions, refer to “Removing Devices” in the Harmonic SystemManager User Guide.

Replacing a ContentBridge 2010E in a High Availability (HA) Pair

For general information on HA pairs for ContentBridges 2010E, see “Configuring ContentBridges 2010E in a High Availability (HA) Pair” in the Harmonic Installation and Configuration Guide.

To replace a ContentBridge 2010E in an HA pair:
1. Destroy the HA pair for the ContentBridge 2010E you wish to replace:
   a. Connect to one of the ContentBridges 2010E in the HA pair directly or via SSH, or connect to one of the ContentDirectors in your Harmonic MediaGrid system via SSH.
   b. Log on to the ContentBridge 2010E or ContentDirector using the following user name and password:
      - User name: ovnuser
      - Password: OVN@SvCaUsa
   c. Run one of the following commands:
      - If both nodes in the HA pair are available, enter the following command:
        run /home/ovnuser/scripts/utils/hapair --destroy
      - If one node in the HA pair is unavailable, enter the following command:
        run /home/ovnuser/scripts/utils/hapair -- force --destroy
      When the HA pair utility runs, indicate the HA pair you wish to destroy. Note that in some cases, if the ContentBridge 2010B/2010 you wish to replace is unaccessible, you may not be able to remove the HA pair configuration. Continue to the next step regardless.
2. Follow all the steps in Replacing a High Bandwidth ContentBridge to remove the original ContentBridge 2010E, install the new one, and configure it.
3. Create a new HA pair by running the HA pair utility and entering the desired IP address for the new ContentBridge 2010E.

CAUTION: if you replace a ContentBridge 2010E and wish to reconnect the original ContentBridge 2010E at a later time, make sure to completely reconfigure it, including removing the HA configuration, before adding it back to your Harmonic MediaGrid system. Failure to do so may result in network conflicts.
Replacing ContentBridge 2010A Components

This section includes the following component replacement procedures for the ContentBridge 2010A:

- Replacing a Hard Drive
- Replacing a Power Supply

Replacing a Hard Drive

In the event of a drive failure, replacement hard drives are available from Harmonic. This section describes the procedures required to replace a ContentBridge hard drive.

Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentBridge Properties page on SystemManager:

- ContentBridge Name
- ContentBridge Serial Number
- ContentBridge Firmware Version


Determining a Hard Drive Failure

The following will help you determine if a drive needs replacing.

Examine the LCD Display on the front of the ContentBridge. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or hard drives.

Examine the Drive Status Indicators on the front of the ContentBridge, looking for the following: A drive has failed if the indicator blinks amber four times per second.

Figure 3–3: ContentBridge Front Panel
See the *Harmonic MediaGrid Installation and Configuration Guide* for more information. Refer to *Removing a Hard Drive* for instructions.

### Removing a Hard Drive

The hard drives on the ContentBridge are hot swappable. You do not need to power off the ContentBridge to replace a hard drive.

Ensure that you have a replacement drive from Harmonic on hand. The drive size (in GB) and form factor must match the other drives in the enclosure. Keep in mind that replacement drives should have the same or greater drive capacity as those they are replacing.

**NOTE:** When installing a hard drive, ensure that the adjacent drive is fully installed. Inserting a hard-drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier’s shield spring and make it unusable.

**Figure 3–4: Removing a Hard Drive**

**To remove:**
1. Squeeze the drive carrier release handle to unlatch it from the chassis.
2. Open the drive carrier release handle to release the drive carrier.
3. Slide the hard drive out until it is free of the drive bay.

**Installing a Hard Drive**

**To install:**
1. Open the drive carrier release handle.
2. Insert the hard drive carrier into the drive bay

1. Drive carrier release handle
2. Drive carrier
3. Drive
3. Slide the hard drive until it contacts the backplane.
4. Close the drive carrier release handle to lock the drive in place.

Replacing a Power Supply

This section describes the procedures required to replace a ContentBridge power supply. Replacement power supplies are available from Harmonic in the event of a failure.

Diagnosing the Problem

To assist in power supply diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the power supply:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentBridge Properties page on SystemManager:

- ContentBridge Name
- ContentBridge Serial Number
- ContentBridge Firmware Version

Determining a Power Supply Failure

From the ContentBridge Properties page, scroll to the Events section to view the alarms. Look for any indication of a drive problem.

Alarms are color coded for display as follows:

- Red indicates a critical error condition requiring immediate attention.
- Orange indicates a failed component requiring attention.
- Yellow indicates a warning requiring action to avert additional error situations.
- Blue alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the Alarm icon directly (from any SystemManager screen) to access the View Alarms screen, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the Harmonic SystemManager User Guide for more information.

NOTE: The Dell OpenManage Server Administrator provides additional tools to monitor power supplies and alert users of system issues. Click the System Management hyperlink to access the Dell OpenManage Log in screen. See the Harmonic SystemManager User Guide for more information.

Removing a Power Supply

The system requires one power supply for the system to operate normally. The system is in the redundant mode when two power supplies are installed and both power supplies are connected to an AC power source.
CAUTION: Remove and replace only one power supply at a time in a system that is powered on. Operating the system with only one power supply installed and without a power supply blank installed for extended periods of time can cause the system to overheat. If only one power supply is installed, it must be installed in the left power supply bay.

If you connect the system to a power source in the range of 120 to 220 VAC, and if two power supplies are installed, the second power supply serves as a redundant, hot-plug power source.

To remove:
1. If your system has a single power supply, turn off the system and all attached peripherals. For a redundant system, you can leave the system running and proceed to the next step.
2. Disconnect the power cable from the power source.
3. Disconnect the power cable from the power supply and remove the cable from the cable retention bracket.
4. Release the locking tab on the left side of the power supply by pressing in toward the right until the power supply is released from the chassis.
5. Holding the power supply handle, pull the power supply straight out to clear the chassis.

Installing a Power Supply

To install:
1. Holding the power-supply handle, slide the new power supply into the chassis until it is fully seated and contacts the system chassis.
2. Insert the power cable through the cable retention bracket, connect the power cable to the power supply, and plug the cable into a power outlet.

3. After installing a new power supply in a system with two power supplies, allow several seconds for the system to recognize the power supply and determine its status. The power-supply status indicator turns green to signify that the power supply is functioning properly.

### Replacing ContentBridge 2010B/C/D/E Components

This section includes the following component replacement procedures for the ContentBridge 2010B/C/D/E (High Bandwidth ContentBridge):

- Replacing a Hard Drive
- Replacing a Power Supply

### Replacing a Hard Drive

In the event of a drive failure, replacement hard drives are available from Harmonic. This section describes the procedures required to replace a High Bandwidth ContentBridge hard drive.

#### Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentBridge Properties page on SystemManager:

- ContentBridge Name
- ContentBridge Serial Number
- ContentBridge Firmware Version


#### Determining a Hard Drive Failure

The following will help you determine if a drive needs replacing.

![High Bandwidth ContentBridge Front Panel](image)
Examine the LCD Display on the front of the ContentBridge. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or hard drives.

Examine the Drive Status Indicators on the front of the ContentBridge, looking for the following: A drive has failed if the indicator blinks amber four times per second.

See the Harmonic MediaGrid Installation and Configuration Guide for more information.

Refer to Removing a Hard Drive for instructions.

Removing a Hard Drive

The hard drives on the ContentBridge are hot swappable. You do not need to power off the ContentBridge to replace a hard drive.

Ensure that you have a replacement drive from Harmonic on hand. The drive size (in GB) and form factor must match the other drives in the enclosure. Keep in mind that replacement drives should have the same or greater drive capacity as those they are replacing.

![Figure 3–7: Removing a Hard Drive](image)

1. Press the release button.
2. Open the drive carrier release handle to release the drive.
3. Slide the hard drive out of the drive bay.

Installing a Hard Drive

NOTE: When installing a hard drive, ensure that the adjacent drive is fully installed. Inserting a hard-drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
To install:
1. Open the drive carrier release handle.
2. Insert the hard drive carrier into the drive bay.
3. Slide the hard drive until it contacts the backplane.
4. Close the drive carrier release handle to lock the drive in place.

Replacing a Power Supply

This section describes the procedures required to replace a ContentBridge power supply.

Replacement power supplies are available from Harmonic in the event of a failure.

To assist in power supply diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the power supply:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentBridge Properties page on SystemManager:

- ContentBridge Name
- ContentBridge Serial Number
- ContentBridge Firmware Version

Determining a Power Supply Failure

From the ContentBridge Properties page, scroll to the Events section to view the alarms. Look for any indication of a drive problem.

Alarms are color coded for display as follows:

- Red indicates a critical error condition requiring immediate attention.
- Orange indicates a failed component requiring attention.
- Yellow indicates a warning requiring action to avert additional error situations.
- Blue alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the Alarm icon directly (from any SystemManager screen) to access the View Alarms screen, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the Harmonic SystemManager User Guide for more information.

The Dell OpenManage Server Administrator provides additional tools to monitor power supplies and alert users of system issues. Click the System Management hyperlink to access the Dell OpenManage Log in screen. See the Harmonic SystemManager User Guide for more information.

Removing a Power Supply

The system requires one power supply for the system to operate normally. The system is in the redundant mode when two power supplies are installed and both power supplies are connected to an AC power source.
CAUTION: Remove and replace only one power supply at a time in a system that is powered on. Operating the system with only one power supply installed and without a power supply blank installed for extended periods of time can cause the system to overheat. If only one power supply is installed, it must be installed in the left power supply bay.

If you connect the system to a power source in the range of 120 to 220 VAC, and if two power supplies are installed, the second power supply serves as a redundant, hot-plug power source.

To remove:
1. If your system has a single power supply, turn off the system and all attached peripherals. For a redundant system, you can leave the system running and proceed to the next step.
2. Disconnect the power cable from the power source.
3. Disconnect the power cable from the power supply and remove the Velcro straps that bundle and secure the system cables.
4. Press the release latch and, using the handle, pull the power supply straight out to clear the chassis.

Installing a Power Supply

To install:
1. Holding the power-supply handle, slide the new power supply into the chassis until it is fully seated and contacts the system chassis.
2. Insert the power cable through the cable retention bracket, connect the power cable to the power supply, and plug the cable into a power outlet.
3. After installing a new power supply in a system with two power supplies, allow several seconds for the system to recognize the power supply and determine its status. The power-supply status indicator turns green to signify that the power supply is functioning properly.
Chapter 4
Replacing a ContentDirector and Related Components

This section provides instructions for the following ContentDirector replacement procedures:

- Replacing a ContentDirector
- Replacing ContentDirector 1000A Components
- Replacing ContentDirector 1000B/C/D/E and High Performance ContentDirector 2000/2000B Components

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

### Replacing a ContentDirector

**IMPORTANT:** This section describes the procedures required to replace a ContentDirector in an Harmonic MediaGrid system running software version 2.4 or later. If you need to replace a ContentDirector in a system with pre-2.4 software, contact Technical Support for assistance.

**To replace a ContentDirector:**

1. Obtain the cluster security keys from Technical Support. Refer to [Obtaining the Cluster Security Keys](#).

   **NOTE:** If your Harmonic MediaGrid system was installed with version 3.1 or later, you may disregard this step.

2. Shut down the ContentDirector using SystemManager and disconnect the power supply. Refer to [Powering Down or Restarting a Single ContentDirector](#) from Appendix A of this guide.

3. Remove the original ContentDirector and mount the replacement ContentDirector in the rack. Refer to [Replacing the ContentDirector](#).

4. Verify that the Harmonic MediaGrid firmware version running on all ContentDirectors is the same version. Refer to [Verifying the Harmonic MediaGrid Firmware Version](#). If the versions are not the same, manually upgrade the firmware on the ContentDirectors that require it. Refer to [Manually Upgrading the Harmonic MediaGrid Firmware](#).

5. Configure the replacement ContentDirector by running the Harmonic MediaGrid Configuration Assistant. Refer to [Configuring a Replacement ContentDirector](#).

6. Initialize the cluster. Follow the steps in [Installing Security Keys and Initializing the Cluster](#).

7. Rejoin the Harmonic MediaGrid cluster to the Windows Domain (optional).

8. Use the SystemManager to copy the required configuration file settings to the replacement ContentDirector.

**Obtaining the Cluster Security Keys**

**NOTE:** If your Harmonic MediaGrid system was installed with version 3.1 or later, you may disregard this step.

The Configuration Assistant allows you to install cluster security keys and initialize clusters during the configuration process. If you decide to install cluster security keys and initialize clusters at this time, you will need the security keys on a USB drive.
Replacing a ContentDirector and Related Components

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Chapter 4 Replacing a ContentDirector and Related Components

Replacing a ContentDirector

The security keys are generated at Harmonic and provided for the installation upon request. Contact Harmonic to obtain these security keys prior to arriving at the installation site. The security keys are typically provided by Harmonic in a file named using a shortened customer name, for example, “acme.tar.gz”. Before installing the security key, you must rename the file to cluster.omkey, where cluster is the name of the Cluster ID. In the case of multiple identically named clusters, rename the file to unique-id_cluster.omkey, where unique-id is a uniquely identifiable prefix. Make sure that you have the security key file on a USB drive before beginning.

Replacing the ContentDirector

To replace:
1. Power down the ContentDirector according to the instructions in Powering Down or Restarting a Single ContentDirector.
2. Note the port in which each network cable is connected so that you can use the same ports on the replacement ContentDirector.
3. Remove the Ethernet cables that are connected to the ContentDirector’s Ethernet ports.
4. Remove the front panel from the ContentDirector.
5. Remove the ContentDirector from the slide assemblies. See the rack installation instructions that came with the ContentDirector for detailed instructions.
6. Unpack the replacement ContentDirector.
7. Mount the replacement ContentDirector on the rack. Follow the instructions included in the rack mounting kit and use the screws that are included with the mounting hardware.

IMPORTANT: When installing a ContentDirector 1000A on a rack, be aware that the rail for this model type is different from that for the ContentDirector 1000. Remove the rail for the ContentDirector 1000 and insert the rail that ships with the replacement unit. Refer to the documentation that ships with the rail for detailed information.

8. Connect the power cord(s).
9. Connect the Ethernet cables to the same ports that were used on the original ContentDirector.
10. Power on the ContentDirector.

Verifying the Harmonic MediaGrid Firmware Version

The latest software is installed on the replacement ContentDirector prior to shipment from Harmonic. Before configuring a replacement ContentDirector, you must ensure that it is running the same version of Harmonic MediaGrid software as the existing ContentServers in the cluster. Use the following procedure to verify Harmonic MediaGrid firmware versions.

To verify:
1. Log on to the new ContentDirector.
2. Enter the following command to obtain the firmware version:
   
   sudo rpm -q omneon_cld

   An example of the output is below:
   
   [root@4RU_CLD0 omneonupgrade]# rpm -q omneon_cld
   omneon_cld-2.5-2010nnnn

   where 2.5-2010nnnn represents the Harmonic MediaGrid firmware version.
3. Compare the software version to version running on the existing ContentDirectors.
4. Do one of the following:
If the Harmonic MediaGrid firmware versions do not match, go to the next section, *Manually Upgrading the Harmonic MediaGrid Firmware*, and perform the procedure.

If the Harmonic MediaGrid firmware versions do match, go to the section, *Configuring a Replacement ContentDirector*, and perform the procedure.

### Manually Upgrading the Harmonic MediaGrid Firmware

**To upgrade:**

1. Contact Technical Support to obtain a copy of the upgrade package. It is called mediagrid.tar.gz.
2. Copy the file to a client directory to which you have access.
3. Connect the monitor, keyboard, and mouse to the ContentDirector you want to upgrade.
4. Log on to the ContentDirector you want to upgrade.
5. Mount the client where you copied the mediagrid.tar.gz file, as follows:
   ```
   sudo mount -t cifs //<10.6.165.10>/Upgrades /mnt/mgfw -o user=administrator
   ```
   where `<10.6.165.10>` is the IP address of the client system and Upgrades is the directory where the mediagrid.tar.gz is located.
6. At the prompt, enter your password.
7. Enter the following command to untar the file:
   ```
   tar -xvf mediagrid.tar.gz
   ```
8. Enter the following command to change directories:
   ```
   cd omneonupgrade
   ```
9. Enter the following command to run the upgrade script:
   ```
   sudo ./upgrade.sh
   ```

A long series of messages is displayed. A snippet of the messages is shown below:

```
Upgrading ContentDirector on Fri Nov 21 13:02:31 GMT+8 2008...
Stopping snmpd: Stopping omserver:
Stopping OMCLD daemon:
Stopping trapmond daemon:
.......
Upgrading package gdb-6.6-8om.x86_64.rpm...
Upgrading package ipmitool-1.8.2-1.x86_64.rpm...
Upgrading package tzdata-2007c-1.noarch.rpm...
Upgrading package omneon...
.......
Upgrading package samba...
Upgrading package net-snmp
Upgrading package dhcp
Upgrading package centrifydc
.......
Starting syslog-ng:
Starting Winbind services:
Starting trapmond daemon
Starting OMCLD daemon:
Starting omserver:
Starting snmpd:
```
10. At the completion of the upgrade, verify that the new version is installed by using the following command:
   
   ```
   sudo rpm -q omneon_cld
   ```
   
   The following shows a sample output:
   
   ```
   [root@4RU_CLD0 omneonupgrade]# rpm -q omneon_cld
   omneon_cld-2.5-20100924
   ```

11. Once the Harmonic MediaGrid firmware versions are the same on all ContentDirectors in the cluster, continue to the next section, Configuring a Replacement ContentDirector.

### Configuring a Replacement ContentDirector

The next step is to configure the replacement ContentDirector by running the Harmonic MediaGrid Configuration Assistant in manual mode.

The Configuration Assistant is a Q&A script that prompts you for Harmonic MediaGrid information specific to the customer site. The Configuration Assistant files are located on the ContentDirector. The information you provide is used to populate the Harmonic MediaGrid configuration files with the specific customer information. These files are copied to a USB drive, and then copied to the appropriate locations on the ContentDirectors.

You will need the following to complete the Harmonic MediaGrid Configuration Assistant:

- A completed copy of the *Harmonic MediaGrid Installation Planning Guide*.
- USB memory key (any size) with at least 120 KB free space.
- Monitor and keyboard.
- Cluster security keys (only required for systems with a pre-3.1 version of Harmonic MediaGrid software).

**To configure:**

1. Connect a monitor and keyboard to the replacement ContentDirector.
2. Log on to the ContentDirector using the following user name and password:
   - User name: ovnuser
   - Password: OVN@SvCaUsa
3. Enter the following command to change directories:
   
   ```
   cd /home/ovnuser/scripts
   ```
4. Enter the following command to start the configuration script:
   
   ```
   sudo ./autoconfig -m
   ```

   The configuration script asks a series of questions requiring information specific to the customer site. Use the information from the *Harmonic MediaGrid Installation Planning Guide* to complete the answers correctly for the replacement ContentDirector. Note that the assistant will display suggested responses in brackets. During the assistant, you can use the up or down arrow keys to tab to previous responses.

   **NOTE:** When entering the timezone, you can use the Tab key to auto-complete, and then double-click the Tab key to select from a list of potential auto-completions.

5. When prompted, insert the USB drive. The script copies all required configuration files to the configfiles directory on the USB drive.
6. Run the following command on the replacement ContentDirector:
   
   ```
   copyconfig -m
   ```
Chapter 4 Replacing a ContentDirector and Related Components

Replacing a ContentDirector

The copyconfig script will ask which ContentDirector you are replacing. Note that ContentDirectors are numbered starting from zero (for example, if you are replacing cld-1, you will need to enter 0 at the prompt).

Installing Security Keys and Initializing the Cluster

To install the security keys and initialize clusters:

1. If you would like to use a custom set of security keys (or if you have a pre-existing set of custom security keys), insert a USB drive containing the renamed security key file.
2. Make sure you are logged on to the ContentDirector with the following credentials:
   
   User name: ovnuser
   
   Password: OVN@SvCaUsa

3. Type the following at the command prompt:
   
   cd /home/ovnuser/scripts

4. Start the initialization script with the following command:
   
   sudo ./initialize

   Follow the prompts to install the security keys and initialize the cluster(s).
   
   a. The script asks if you want to use a custom set of keys. If so, insert the USB drive containing the renamed security key file.

   b. If necessary, the script will ask for a cluster name. At this point, both the cluster name and automatically generated cluster ID are shown, and the script asks if you would like to use the generated ID. If the ID does not match the expected ID, you will be allowed to change it at this point by answering “no.”

Near the end of the initialize script, output similar to the following should appear:

   D|getAndTestKeys|Read the RSA keys successfully
   D|getAndTestKeys|The RSA keys verified correctly
   D|doClusterInit2|SSH public key length is 394
   D|doClusterInit2|SSH private key length is 1675
   mdsclientn: built by lsasaki on 2012-Mar-09 02:33 (unknown)
   Not connecting to "localhost"
   Connecting to host "localhost", protocol "tcp", prog 0x20000004
   Attempting cluster init, (clustername=mgraid-eng7, clusterid=eng7,
   keyspath=/opt/mds/security/ca)
   Retrieving the temporary public key
   Initializing the cluster
   The cluster was initialized successfully
   Setting cluster name

5. Run the following command to take the replacement ContentDirector out of the RECONFIG state:
   
   sudo initconfig --rmflag

6. Type the following to complete the process:
   
   exit

The cluster ID should now be set on the ContentDirector, and the programs should begin to execute in sequence.
Rejoining the Windows Domain

If the Harmonic MediaGrid cluster is part of a Windows Domain, you’ll need to rejoin the Harmonic MediaGrid to the controller. Refer to “Joining a Harmonic MediaGrid Cluster to a Windows Domain” in the *Harmonic MediaGrid Installation and Configuration Guide* for complete information.

Copying Configuration File Settings

Perform the procedure in this section to ensure that the following configuration file settings are copied to the replacement ContentDirector:

- Slice size configuration file
- ContentBridge configuration file
- ContentServer configuration file

To copy:
1. Log on to the SystemManager.
2. Click the **Harmonic MediaGrid Servers & Switches** icon on the **Configuration** tab to access the **Servers & Switches** page.
3. In the **Clusters** sections, click the **Name** hyperlink for the cluster you want. The **Cluster Properties** page appears.

![Figure 4–1: Cluster Properties](image)

4. Click **View/Edit Slice Size Config** and then click **Save File**.
5. Click **View/Edit ContentServer Config** and then click **Save File**.
6. For each ContentBridge, click **View/Edit ContentBridge Config** and then click **Save File**. These actions “push” the configuration settings out to the replacement ContentDirector.

7. When you are finished, click **Done** at the bottom of the **Cluster Properties** page.

## Replacing ContentDirector 1000A Components

This section includes the following component replacement procedures for the ContentDirector 1000A:

- **Replacing a Hard Drive**
- **Replacing a Power Supply**

### Replacing a Hard Drive

In the event of a drive failure, replacement hard drives are available from Harmonic. This section describes the procedures required to replace a ContentDirector hard drive.

#### Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentDirector Properties page on SystemManager:

- ContentDirector Name
- ContentDirector Serial Number
- ContentDirector Firmware Version


#### Determining a Hard Drive Failure

The following will help you determine if a drive needs replacing.

![Figure 4–2: ContentDirector Front Panel](image)
Examine the LCD Display on the front of the ContentDirector. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or hard drives.

Examine the Drive Status Indicators on the front of the ContentDirector, looking for the following: A drive has failed if the indicator blinks amber four times per second.

See the *Harmonic MediaGrid Installation and Configuration Guide* for more information.

### Removing a Hard Drive

The hard drives on the ContentDirector are hot swappable. You do not need to power off the ContentDirector to replace a hard drive.

Ensure that you have a replacement drive from Harmonic on hand. The drive size (in GB) and form factor must match the other drives in the enclosure. Keep in mind that replacement drives should have the same or greater drive capacity as those they are replacing.

**NOTE:** When installing a hard drive, ensure that the adjacent drive is fully installed. Inserting a hard-drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier’s shield spring and make it unusable.

---

**Figure 4–3: Removing a Hard Drive**

**To remove:**

1. Squeeze the drive carrier release handle to unlatch it from the chassis.
2. Open the drive carrier release handle to release the drive carrier.
3. Slide the hard drive out until it is free of the drive bay.
Installing a Hard Drive

To install:
1. Open the drive carrier release handle.
2. Insert the hard drive carrier into the drive bay
3. Slide the hard drive until it contacts the backplane.
4. Close the drive carrier release handle to lock the drive in place.

Replacing a Power Supply

This section describes the procedures required to replace a ContentDirector power supply.

Replacement power supplies are available from Harmonic in the event of a failure.

To assist in power supply diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the power supply:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentDirector Properties page on SystemManager:

- ContentDirector Name
- ContentDirector Serial Number
- ContentDirector Firmware Version

Determining a Power Supply Failure

From the ContentDirector Properties page, scroll to the Events section to view the alarms. Look for any indication of a drive problem.

Alarms are color coded for display as follows:

- Red indicates a critical error condition requiring immediate attention.
- Orange indicates a failed component requiring attention.
- Yellow indicates a warning requiring action to avert additional error situations.
- Blue alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the Alarm icon directly (from any SystemManager screen) to access the View Alarms screen, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the Harmonic SystemManager User Guide for more information.

NOTE: The Dell OpenManage Server Administrator provides additional tools to monitor power supplies and alert users of system issues. Click the System Management hyperlink to access the Dell OpenManage Log in screen. See the Harmonic SystemManager User Guide for more information.

Removing a Power Supply

The system requires one power supply for the system to operate normally. The system is in the redundant mode when two power supplies are installed and both power supplies are connected to an AC power source.
**CAUTION:** Remove and replace only one power supply at a time in a system that is powered on. Operating the system with only one power supply installed and without a power supply blank installed for extended periods of time can cause the system to overheat. If only one power supply is installed, it must be installed in the left power supply bay.

If you connect the system to a power source in the range of 120 to 220 VAC, and if two power supplies are installed, the second power supply serves as a redundant, hot-plug power source.

---

**Figure 4–4: Power Supply Replacement**

**To remove:**
1. If your system has a single power supply, turn off the system and all attached peripherals. For a redundant system, you can leave the system running and proceed to the next step.
2. Disconnect the power cable from the power source.
3. Disconnect the power cable from the power supply and remove the cable from the cable retention bracket.
4. Release the locking tab on the left side of the power supply by pressing in toward the right until the power supply is released from the chassis.
5. Holding the power supply handle, pull the power supply straight out to clear the chassis.

**Installing a Power Supply**

**To install:**
1. Holding the power-supply handle, slide the new power supply into the chassis until it is fully seated and contacts the system chassis.
2. Insert the power cable through the cable retention bracket, connect the power cable to the power supply, and plug the cable into a power outlet.

3. After installing a new power supply in a system with two power supplies, allow several seconds for the system to recognize the power supply and determine its status. The power-supply status indicator turns green to signify that the power supply is functioning properly.

Replacing ContentDirector 1000B/C/D/E and High Performance ContentDirector 2000/2000B Components

This section includes the following component replacement procedures for the ContentDirector 1000B/1000C/1000D and the High Performance ContentDirector 2000:

- Replacing a Hard Disk Drive
- About Solid-State Drive Replacement
- Replacing a Power Supply

Replacing a Hard Disk Drive

In the event of a drive failure, replacement disk drives are available from Harmonic. This section describes the procedures required to replace a ContentDirector hard disk drive.

Diagnosing the Problem

To assist in drive problem diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed drive:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentDirector Properties page on SystemManager:

- ContentDirector Name
- ContentDirector Serial Number
- ContentDirector Firmware Version


Determining a Hard Disk Drive Failure

The following will help you determine if a drive needs replacing.
Chapter 4 Replacing a ContentDirector and Related Components

Replacing ContentDirector 1000B/C/D/E and High Performance ContentDirector 2000/2000B Components

Figure 4–5: ContentDirector Front Panel

- Examine the LCD Display on the front of the ContentDirector. The LCD display lights amber when the system needs attention due to a problem with power supplies, fans, system temperature or disk drives.

- Examine the Drive Status Indicators on the front of the ContentDirector, looking for the following: A drive has failed if the indicator blinks amber four times per second. See the Harmonic MediaGrid Installation and Configuration Guide for more information.

Removing a Disk Drive

The drives on the ContentDirector are hot swappable. You do not need to power off the ContentDirector to replace a drive.

Ensure that you have a replacement drive from Harmonic on hand. The drive size (in GB) and form factor must match the other drives in the enclosure. Keep in mind that replacement drives should have the same or greater drive capacity as those they are replacing.

Figure 4–6: Removing a Drive

1. Release button
2. Drive carrier handle
To remove:
1. Press the release button.
2. Open the drive carrier release handle to release the drive.
3. Slide the drive out of the drive bay.

Installing a Disk Drive

**NOTE:** When installing a drive, ensure that the adjacent drive is fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier’s shield spring and make it unusable.

To install:
1. Open the drive carrier release handle.
2. Insert the drive carrier into the drive bay.
3. Slide in the drive until it contacts the backplane.
4. Close the drive carrier release handle to lock the drive in place.

About Solid-State Drive Replacement

This section applies only to the High Performance ContentDirector 2000.

Over time, the solid-state drive (SSD) in the High Performance ContentDirector 2000 may wear out and need to be replaced. To view the percentage of wear on the SSD, navigate to the ContentDirector Properties page in SystemManager, scroll down to the Environment Data section at the bottom of the page, and check the SSD Lifetime field. If this value shows 95 percent or greater, then the SSD should be replaced. For assistance with replacing the SSD, contact Technical Support.

Replacing a Power Supply

This section describes the procedures required to replace a ContentDirector power supply.

Replacement power supplies are available from Harmonic in the event of a failure.

To assist in power supply diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the power supply:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure

From the ContentDirector Properties page on SystemManager:

- ContentDirector Name
- ContentDirector Serial Number
- ContentDirector Firmware Version

Determining a Power Supply Failure

From the ContentDirector Properties page, scroll to the Events section to view the alarms. Look for any indication of a drive problem.
Alarms are color coded for display as follows:

- Red indicates a critical error condition requiring immediate attention.
- Orange indicates a failed component requiring attention.
- Yellow indicates a warning requiring action to avert additional error situations.
- Blue alarms are informational in nature and usually do not require any action to be taken.

Additionally, you can click the **Alarm** icon directly (from any SystemManager screen) to access the **View Alarms** screen, which lists system-wide alarms. See “Viewing and Clearing Alarms” in the *Harmonic SystemManager User Guide* for more information.

**NOTE:** The Dell OpenManage Server Administrator provides additional tools to monitor power supplies and alert users of system issues. Click the System Management hyperlink to access the Dell OpenManage Log in screen. See the *Harmonic SystemManager User Guide* for more information.

### Removing a Power Supply

The system requires one power supply for the system to operate normally. The system is in the redundant mode when two power supplies are installed and both power supplies are connected to an AC power source.

**CAUTION:** Remove and replace only one power supply at a time in a system that is powered on. Operating the system with only one power supply installed and without a power supply blank installed for extended periods of time can cause the system to overheat. If only one power supply is installed, it must be installed in the left power supply bay.

If you connect the system to a power source in the range of 120 to 220 VAC, and if two power supplies are installed, the second power supply serves as a redundant, hot-plug power source.

![Power Supply Replacement Diagram](image)

1. Power supply
2. Release latch
3. Power supply handle

**Figure 4–7: Power Supply Replacement**
To remove:

1. If your system has a single power supply, turn off the system and all attached peripherals. For a redundant system, you can leave the system running and proceed to the next step.
2. Disconnect the power cable from the power source.
3. Disconnect the power cable from the power supply and remove the Velcro straps that bundle and secure the system cables.
4. Press the release latch and, using the handle, pull the power supply straight out to clear the chassis.

Installing a Power Supply

To install:

1. Holding the power supply handle, slide the new power supply into the chassis until it is fully seated and contacts the system chassis.
2. Insert the power cable through the cable retention bracket, connect the power cable to the power supply, and plug the cable into a power outlet.
3. After installing a new power supply in a system with two power supplies, allow several seconds for the system to recognize the power supply and determine its status. The power-supply status indicator turns green to signify that the power supply is functioning properly.
Chapter 5
Replacing the Network Switches

This section provides instructions for the following Harmonic MediaGrid replacement procedures:

- Replacing a Network Switch
- Managing an Uplink Card Failure

**DANGER:** Observe all conventional ESD precautions when handling Harmonic MediaGrid devices and components.

### Replacing a Network Switch

This section describes the procedures required to replace a Network Switch 1010, 2924/48 or 5406. In the event of a Network Switch failure, replacement switches are available from Harmonic.

To assist in switch diagnosis and remediation, please gather the information below for use by Technical Support. You will need to collect some of this information before you remove the failing/failed Network Switch:

- Site Location
- Date of Failure
- Time of Failure
- Description of Failure


### Determining a Network Switch Failure

The following will help you determine if a Network Switch needs replacing.

Examine the Fault LED on the front of the Network Switch. The Fault LED is on (solid orange) briefly after power on and at the beginning of the self test. A fatal hardware error or failed self test has occurred if the LED is on for a prolonged period of time.

![Figure 5–1: 1010 Network Switch Front Panel](image)
Replacing a Network Switch

NOTE: For the 2924 Network Switch and 2948 Network Switch, the Fault LED is located in the same place.

See the following for more information about diagnosing Network Switch problems:

- The Troubleshooting sections in the HP documentation that ships with the Network Switch.
- The Harmonic Network Switch Quick Reference Guides, which ship with the Harmonic MediaGrid, for descriptions of LED activity.
- Additionally, use the HP ProCurve Switch utility for switch management. Refer to Accessing the HP ProCurve Switch Utility for additional information.

Accessing the HP ProCurve Switch Utility

Follow these steps to access the HP ProCurve utility for Harmonic MediaGrid:

1. On SystemManager, click the Harmonic MediaGrid Servers & Switches icon on the Configuration tab to access the Servers & Switches page.
2. Scroll down to the Network Switches section.

Figure 5–4: Servers & Switches
3. In the **Network Switches** section, click the **Switch Management** hyperlink.

The HP ProCurve Switch window appears.

![Figure 5–5: HP ProCurve Switch](image)

Navigate to the following locations:

- **Status** tab > **Overview** for port utilization details and log messages for Network Switches.
- **Configuration** tab > **Device View** to gain Telnet access for advanced configuration and to view port LEDs.
- **Diagnostics** tab > **Configuration Report** to view the switch configuration report.

See the HP ProCurve documentation that ships with the Network Switch for additional information on the functionality of this utility.

**Replacing a Network Switch**

Follow these steps if you have determined that the Network Switch needs replacing.

1. Power off the Network Switch by unplugging the power cord.
2. Note the port in which each network cable is connected and use the same ports on the replacement switch.
3. Remove the network cables from the front and back of the switch.
4. Remove the Network Switch from the rack. See “Connecting the Harmonic MediaGrid System Components” in the **Harmonic MediaGrid Installation and Configuration Guide**, or the HP documentation that ships with the switch for more information.
5. Mount the replacement switch on the rack.
6. Connect the power cord to the switch.
7. Connect the network cables to the same ports that were used on the original switch.
8. Complete the Harmonic MediaGrid Configuration Assistant to update the replacement switch with the current configuration files. See “System Configuration” in the **Harmonic MediaGrid Installation and Configuration Guide** for instructions on completing the Configuration Assistant.
Managing an Uplink Card Failure

If an Uplink Card failure occurs, contact Technical Support for assistance.
Appendix A
Powering Down the Harmonic MediaGrid System

This section includes the following procedures:

- Powering Down the Harmonic MediaGrid System
- Powering Down or Restarting a Single ContentDirector
- Powering Down or Restarting a Single ContentBridge
- Powering Down or Restarting a Single ContentServer 1000 Series or 2000 Series
- Powering Down a Single ContentServer 3000 Series
- Powering Down a Single ContentStore
- Powering On a Harmonic MediaGrid System

NOTE: The following instructions only apply for systems running both SystemManager version 5.10 or later and Harmonic MediaGrid version 2.1SR3 or later. If your version of SystemManager is earlier than 5.10 or if your version of Harmonic MediaGrid is earlier than 2.1SR3, refer to the shutdown instructions in the Harmonic MediaGrid Installation and Configuration Guide that accompanies your software.

Powering Down the Harmonic MediaGrid System

Use the following steps to safely power down the Harmonic MediaGrid system. Only perform the following steps if directed by Technical Support.

To power down a Harmonic MediaGrid system:
1. In SystemManager, click the Configuration tab and then click the Servers & Switches icon in the left-hand column to access the Servers & Switches page.
2. Click the link for the Cluster that you wish to shut down. The Cluster Properties page appears.
3. From the Cluster Properties page, in the Shutdown cluster section, click Shutdown all ContentDirectors in a Cluster.

Figure 0–1: Shut down all ContentDirectors in a cluster

4. A confirmation message appears. Click OK.
5. Scroll down to the ContentDirectors section of the page. Make sure the Network Status of the ContentDirectors indicates Not Responding. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.
6. Disconnect the power cords from the ContentDirectors.
7. Once the ContentDirectors are shut down, the Shutdown all ContentBridges in a Cluster button will be activated.
8. Click **Shutdown all ContentBridges in a Cluster**. When the confirmation message appears, click **OK**.

9. Scroll down to the **ContentBridges** section of the page. Make sure the **Network Status** of the ContentBridges indicates **Not Responding**. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.

10. Disconnect the power cords from the ContentBridges.

Once the ContentBridges are shut down, the **Shutdown all ContentServers in a Cluster** button will be activated.

11. Click **Shutdown all ContentServers in a Cluster**. When the confirmation message appears, click **OK**.

12. Scroll down to the **ContentServers/ContentStores** section of the page. Make sure the **Network Status** of the ContentServers and ContentStores indicates **Not Responding**. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.

13. For ContentServers 1000 series and 2000 series, the LEDs on the front panel will repeatedly blink red, white, and then blue to indicate that it is safe to shut down. Power down the ContentServers and ContentStores as follows, depending on the model:

   - **ContentServer 1042 (1U)**—press the power switch on the back of the server to the **OFF** position. Disconnect the power cord from the back of the server.
   - **ContentServer 2124A (2U)**—disconnect the two power cords from the back of the server.
   - **ContentServer 3000 (3U)**—press the red power button on the control panel on the front of the server and hold for five seconds. Once the disk drive LEDs are off, disconnect the two power cords from the back of the server.
   - **ContentStore 3160 (3U)**—press the red power button on the control panel on the front of the device and hold for five seconds. Once the disk drive LEDs are off, disconnect the two power cords from the back of the device.

14. From the SystemManager platform, click the **Start** button on the task bar, and then click **Shut Down** to shut down the SystemManager platform. Disconnect the power cord if necessary.

15. Power down the Network Switches by disconnecting the power cords.

### Powering Down or Restarting a Single ContentDirector

**To power down a single ContentDirector:**

1. From the **Configuration** tab, click the **Servers & Switches** icon in the left-hand column to open the **Servers & Switches** page.

2. In the **ContentDirectors** section, click the name of the **ContentDirector** you wish to power down. The **ContentDirector Properties** page appears.

3. Click the **Shutdown** button located at the bottom of the General Properties section.

4. When the confirmation message appears, click **OK**.

5. Check the **Status** field to verify that it indicates **Not Responding**. Note that this may take a few minutes depending on the length of the discovery cycle and the status of other devices in your network.

6. Disconnect the power supply.
To restart a single ContentDirector without removing the power supply:
1. From the ContentDirector Properties page, click the Reboot button located at the bottom of the General Properties section.
2. When the confirmation message appears, click OK. The ContentDirector will restart.
3. Check the Status field to verify that it changes to Not Responding, and then returns to its previous state. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.

Powering Down or Restarting a Single ContentBridge

To power down a single ContentBridge:
1. From the Configuration tab, click the Servers & Switches icon in the left-hand column to open the Servers & Switches page.
2. In the ContentBridge section, click the name of the ContentBridge you wish to power down. The ContentBridge Properties page appears.
3. Click the Shutdown button located at the bottom of the General Properties section.
4. When the confirmation message appears, click OK.
5. Check the Status field to verify that it indicates Not Responding. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.
6. Disconnect the power supply.

To restart a single ContentBridge without removing the power supply:
1. From the ContentBridge Properties page, click the Reboot button located at the bottom of the General Properties section.
2. When the confirmation message appears, click OK. The ContentBridge will restart.
3. Check the Status field to verify that it changes to Not Responding, and then returns to its previous state. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.

Powering Down or Restarting a Single ContentServer 1000 Series or 2000 Series

To power down a single ContentServer:
1. From the Configuration tab, click the Servers & Switches icon in the left-hand column to open the Servers & Switches page.
2. In the ContentServers/ContentStores section, click the name of the ContentServer you wish to power down. The ContentServer Properties page appears.
3. Click the Shutdown button located at the bottom of the General Properties section. For ContentServers with Harmonic MediaGrid firmware version 2.1.1 or later, you can also use the Shutdown button located on the Cluster Properties page in the ContentServer section of the page.
4. When the confirmation message appears, click OK.
5. Check the Status field to verify that it indicates Not Responding. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.
6. The LEDs on the front panel of a ContentServer will repeatedly blink red, white, and then blue to indicate that it is safe to shut down. Power down the ContentServers as follows, depending on the model:

- **ContentServer 1042 (1U)**—press the power switch on the back of the server to the OFF position. Disconnect the power cord from the back of the server.
- **ContentServer 2124A (2U)**—disconnect the two power cords from the back of the server.

To restart a single ContentServer without removing the power supply:

1. From the **ContentServer Properties** page, click the **Reboot** button located at the bottom of the **General Properties** section.
2. When the confirmation message appears, click **OK**. The ContentServer will restart.
3. Check the **Status** field to verify that it changes to **Not Responding**, and then returns to its previous state. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.

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### Powering Down a Single ContentServer 3000 Series

**To power down a single ContentServer:**

1. From the **Configuration** tab, click the **Servers & Switches** icon in the left-hand column to open the **Servers & Switches** page.
2. In the **ContentServers/ContentStores** section, click the name of the ContentServer you wish to power down. The **ContentServer Properties** page appears.
3. Click the **Shutdown All Enclosures** button to shut down both controllers on the ContentServer. Note that this also shuts down all managed ContentStores or ContentServers.
4. When the confirmation message appears, click **OK**.
5. Check the **Status** field to verify that it indicates **Not Responding**. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.
6. Press the red power button on the control panel on the front of the server and hold for five seconds. Once the disk drive LEDs are off, disconnect the two power cords from the back of the server.

---

### Powering Down a Single ContentStore

**To power down a single ContentStore:**

1. From the **Configuration** tab, click the **Servers & Switches** icon in the left-hand column to open the **Servers & Switches** page.
2. In the **ContentServers/ContentStores** section, click the name of the ContentStore you wish to power down. The **ContentStore Properties** page appears.
3. Click the **Shutdown** button located in the top section of the page.
4. When the confirmation message appears, click **OK**.
5. Check the **Status** field to verify that it indicates **Not Responding**. Note that it may take a few minutes for the status to change, depending on the length of the discovery cycle and the status of other devices in your network.
6. Power down as follows:
Appendix A Powering Down the Harmonic MediaGrid System

*ContentStore 3160 (3U)—press the red power button on the control panel on the front of the device and hold for five seconds. Once the disk drive LEDs are off, disconnect the two power cords from the back of the device.*

**Powering On a Harmonic MediaGrid System**

Use the following steps to power on the devices in a Harmonic MediaGrid system.

**IMPORTANT:** The procedures must be followed in the order described below.

1. Apply power to the ContentDirectors by connecting both power cords to separate, isolated power sources.
2. Press the Power button on the front of each ContentDirector. The ContentDirectors take approximately five minutes to start. Wait for the power-on indicator to light before continuing.
3. Apply power to the ContentServers by connecting the power cords to power sources.
4. Turn on the ContentServers as follows:
   - For ContentServers 1000 Series and 2000 Series, press the Power switch on the back of the server.
   - For ContentServers 3000 Series, press the Power button on the control panel on the front of the server.
5. Turn on the ContentStores as follows:
   - For ContentStore 3160 Series, connect the power cords to power sources, and then press the Power button on the control panel on the front of each ContentStore.
6. Apply power to the SystemManager by connecting the power cord to a power source. Press the Power button on the front of the SystemManager.
7. Apply power to the ContentBridge (if part of the system) by pressing the Power switch on the back of the device. Make sure all of the ContentServers are running before powering on the ContentBridge.
Appendix B

Contacting the Technical Assistance Center

Harmonic Global Service and Support has many Technical Assistance Centers (TAC) located globally, but virtually co-located where our customers can obtain technical assistance or request on-site visits from the Regional Field Service Management team. The TAC operates a Follow-The-Sun support model to provide Global Technical Support anytime, anywhere, through a single case management and virtual telephone system. Depending on time of day, anywhere in the world, we will receive and address your calls or emails in one of our global support centers. The Follow-the-Sun model greatly benefits our customers by providing continuous problem resolution and escalation of issues around the clock.

Table B–1: For Distribution and Delivery (Legacy Harmonic) Products

<table>
<thead>
<tr>
<th>Region</th>
<th>Telephone Technical Support</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas</td>
<td>888.673.4896 or 408.490.6477</td>
<td><a href="mailto:support@harmonicinc.com">support@harmonicinc.com</a></td>
</tr>
<tr>
<td>EME</td>
<td>+44.1252.555.450</td>
<td><a href="mailto:support.emea@harmonicinc.com">support.emea@harmonicinc.com</a></td>
</tr>
<tr>
<td>Asia Pacific – Other Territories</td>
<td>+852.3713.9300</td>
<td><a href="mailto:hongkongtechsupport@harmonicinc.com">hongkongtechsupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>India</td>
<td>+44.1252.555.450</td>
<td><a href="mailto:support.emea@harmonicinc.com">support.emea@harmonicinc.com</a></td>
</tr>
<tr>
<td>Russia</td>
<td>+7.495.926.4608</td>
<td><a href="mailto:rusupport@harmonicinc.com">rusupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Africa</td>
<td>+44.1252.555.450</td>
<td><a href="mailto:support.emea@harmonicinc.com">support.emea@harmonicinc.com</a></td>
</tr>
<tr>
<td>Mainland China</td>
<td>+86.10.8391.3313</td>
<td><a href="mailto:chinatechsupport@harmonicinc.com">chinatechsupport@harmonicinc.com</a></td>
</tr>
</tbody>
</table>

Table B–2: For Production and Playout (Legacy Omneon and Rhozet) Products

<table>
<thead>
<tr>
<th>Region</th>
<th>Telephone Technical Support</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas</td>
<td>888.673.4896 or 408.490.6477</td>
<td><a href="mailto:omneon.support@harmonicinc.com">omneon.support@harmonicinc.com</a></td>
</tr>
<tr>
<td>EME</td>
<td>+44.1252.555.450</td>
<td><a href="mailto:omneonemeasupport@harmonicinc.com">omneonemeasupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Asia Pacific – Other Territories</td>
<td>+65.6542.0050</td>
<td><a href="mailto:apacsupport@harmonicinc.com">apacsupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Japan</td>
<td>+81.3.5565.6737</td>
<td><a href="mailto:japansupport@harmonicinc.com">japansupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>China - Mainland</td>
<td>+86.10.8391.3313</td>
<td><a href="mailto:chinasupport@harmonicinc.com">chinasupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Russia and CIS</td>
<td>+7.495.926.4608</td>
<td><a href="mailto:rusupport@harmonicinc.com">rusupport@harmonicinc.com</a></td>
</tr>
</tbody>
</table>
The Harmonic Inc. support website is:
http://www.harmonicinc.com/content/technical-support

The Harmonic Inc. Distribution and Delivery product software downloads site is:
ftp://ftp.harmonicinc.com

The Harmonic Inc. Playout and Production software downloads site is:

The Harmonic Inc. corporate address is:
Harmonic Inc.
4300 North First St.
San Jose, CA 95134, U.S.A.
Attn: Customer Support

The corporate telephone numbers for Harmonic Inc. are:
Tel. 1.800.788.1330 (from the U.S. and Canada)
Tel. +1.408.542.2500 (outside the U.S. and Canada)
Fax. +1.408.542.2511
Legal Disclaimer: Information in this document is provided in connection with Harmonic products. Unless otherwise agreed in writing Harmonic products are not designed nor intended for any application in which the failure of the product could cause personal injury or death.

NOTE: The information in this appendix may apply to purchased products only.

Important Safety Instructions

This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electric shock or injury to persons. You must adhere to the guidelines in this document to ensure and maintain compliance with existing product certifications and approvals. In this document, we use “product,” “equipment,” and “unit” interchangeably.

This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if it is not installed and used in accordance with the instructions in this manual. Operation of this equipment in a residential area is likely to cause harmful interference If this occurs, the user will be required to correct the interference at his or her own expense.

In event of conflict between the information in this document and information provided with the product or on our website for a particular product, this product documentation takes precedence.

Safety Symbols & Translated Safety, Warning & Caution Instructions (English)

To avoid personal injury or property damage, before you begin installing or replacing the product, read, observe, and adhere to all the following safety instructions and information. Harmonic products and/or product packaging may be marked with the safety symbols used throughout this document, when it is necessary to alert operators, users, and service providers to pertinent safety instructions in the manuals.
## Mark

### Installing or Replacing the Product Unit Warning
- Only trained and qualified service personnel should be allowed to install, replace, or service this unit (refer AS/NZS 3260 Clause 1.2.14.3 Service Personnel).
- Read the installation instructions before connecting the system to the power source.
- When installing or replacing the unit, always make the ground connection first and disconnect it last.
- Installation of the unit must comply with local and national electrical codes.
- This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of special tool, lock and key or other means of security.
- Use only specified replacement parts.
- Do not use this unit in or near water. Disconnect all AC power before installing any options or servicing the unit unless instructed to do so by this manual.

### Rack Mount Warning
- To prevent bodily injury when mounting or servicing this unit in a rack, special precautions must be taken to ensure your safety and stability of system:
  - Conform to local occupational health and safety requirements when moving and lifting the equipment.
  - Ensure that mounting of the unit by mechanical loading tools should not induce hazardous conditions.
  - To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed on it.

### Chassis Warning
- Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit.
- To prevent personal injury or damage to the chassis, lift the unit only by using handles that are an integral part of the chassis, or by holding the chassis underneath its lower edge.
- Any instructions in this guide that require opening the chassis or removing a board should be performed by qualified service personnel only.
- Slots and openings in the chassis are provided for ventilation. Do not block them. Leave the back of the frame clear for air exhaust cooling and to allow room for cabling - a minimum of 6 inches (15.24 cm) of clearance is recommended.
<table>
<thead>
<tr>
<th>Mark</th>
<th>Electric Shock Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>▪ This unit might have more than one power cord. To reduce the risk of electric shock,</td>
</tr>
<tr>
<td></td>
<td>disconnect the two power supply cords before servicing the unit.</td>
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<tr>
<td></td>
<td>▪ Before working on a chassis or working near power supplies, unplug the power cord</td>
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<tr>
<td></td>
<td>on AC units.</td>
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<tr>
<td></td>
<td>▪ Do not work on the system or connect or disconnect cables during periods of lightning</td>
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<tr>
<td></td>
<td>activity.</td>
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<td></td>
<td>▪ This unit is grounded through the power cord grounding conductor. To avoid electric</td>
</tr>
<tr>
<td></td>
<td>shock, plug the power cord into a properly wired receptacle before connecting the</td>
</tr>
<tr>
<td></td>
<td>product input or outputs.</td>
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<tr>
<td></td>
<td>▪ Route power cords and other cables so that they are not likely to be damaged.</td>
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<tr>
<td></td>
<td>Disconnect power input to unit before cleaning. Do not use liquid or aerosol cleaners;</td>
</tr>
<tr>
<td></td>
<td>use only a damp cloth to clean chassis.</td>
</tr>
<tr>
<td></td>
<td>▪ Dangerous voltages exist at several points in this product. To avoid personal injury,</td>
</tr>
<tr>
<td></td>
<td>do not touch exposed connections and components while power is on. Do not insert</td>
</tr>
<tr>
<td></td>
<td>anything into either of the system's two power supply cavities with power connected.</td>
</tr>
<tr>
<td></td>
<td>▪ Never install an AC power module and a DC power module in the same chassis.</td>
</tr>
<tr>
<td></td>
<td>▪ Do not wear hand jewelry or watch when troubleshooting high current circuits, such as</td>
</tr>
<tr>
<td></td>
<td>the power supplies.</td>
</tr>
<tr>
<td></td>
<td>▪ To avoid fire hazard, use only the specified correct type voltage and current ratings</td>
</tr>
<tr>
<td></td>
<td>as referenced in the appropriate parts list for this unit. Always refer fuse</td>
</tr>
<tr>
<td></td>
<td>replacement to qualified service personnel.</td>
</tr>
<tr>
<td></td>
<td>▪ This unit relies on the building's installation for short-circuit (overcurrent)</td>
</tr>
<tr>
<td></td>
<td>protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S.</td>
</tr>
<tr>
<td></td>
<td>(240 VAC, 10A international) is used on the phase conductors (all current-carrying</td>
</tr>
<tr>
<td></td>
<td>conductors).</td>
</tr>
<tr>
<td></td>
<td>▪ To avoid electrocution ensure that the rack has been correctly grounded before</td>
</tr>
<tr>
<td></td>
<td>switching on the unit. When removing the unit remove the grounding connection only</td>
</tr>
<tr>
<td></td>
<td>after the unit is switched off and unplugged.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mark</th>
<th>Electrostatic Discharge (ESD) Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>▪ Follow static precaution at all times when handling this unit.</td>
</tr>
<tr>
<td></td>
<td>▪ Always wear an ESD-preventive wrist or ankle strap when handling electronic</td>
</tr>
<tr>
<td></td>
<td>components. Connect one end of the strap to an ESD jack or an unpainted metal</td>
</tr>
<tr>
<td></td>
<td>component on the system.</td>
</tr>
<tr>
<td></td>
<td>▪ Handle cards by the faceplates and edges only; avoid touching the printed circuit</td>
</tr>
<tr>
<td></td>
<td>board and connector pins.</td>
</tr>
<tr>
<td></td>
<td>▪ Place any removed component on an antistatic surface or in a static shielding bag.</td>
</tr>
<tr>
<td></td>
<td>▪ Avoid contact between the cards and clothing.</td>
</tr>
<tr>
<td></td>
<td>▪ Periodically check the resistance value of the antistatic strap.</td>
</tr>
<tr>
<td></td>
<td>Recommended value is between 1 and 10 mega-ohms (Mohms).</td>
</tr>
</tbody>
</table>
### Symbols of Security and Traducitons of Security, d'avertissement and Attention Instructions (français)

Pour éviter des blessures ou des dommages matériels, avant de commencer l'installation ou le remplacement du produit, lire, observer, et de respecter toutes les instructions et informations de sécurité suivantes. Produits harmoniques et / ou l'emballage du produit peuvent être marqués avec les symboles de sécurité utilisés dans le présent document, lorsque cela est nécessaire pour alerter les opérateurs, les utilisateurs et les fournisseurs de services de consignes de sécurité pertinentes dans les manuels.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser Radiation Warning</td>
<td>Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Never operate a unit with a broken fibre or with a separated fiber connector.</td>
</tr>
<tr>
<td>Lithium Battery Handling Safety Instructions</td>
<td>- CALIFORNIA PERCHLORATE ADVISORY: Some lithium batteries may contain perchlorate material. The following advisory is provided: &quot;Perchlorate Material - special handling may apply, see: [<a href="http://www.dtsc.ca.gov/hazardous">www.dtsc.ca.gov/hazardous</a> waste/perchlorate/](<a href="http://www.dtsc.ca.gov/hazardous">http://www.dtsc.ca.gov/hazardous</a> waste/perchlorate/) for information&quot;.</td>
</tr>
<tr>
<td>Caution</td>
<td>- Risk of explosion if battery is replaced incorrectly or with an incorrect type</td>
</tr>
<tr>
<td></td>
<td>- Dispose of used batteries according to the manufacturer’s instructions</td>
</tr>
<tr>
<td></td>
<td>- There are no user-serviceable batteries inside Harmonic products. Refer to Harmonic qualified personnel only to service the replaceable batteries</td>
</tr>
<tr>
<td>Mark</td>
<td>Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| ![Warning Icon] | **Installation ou remplacement de l'unité de produit Avertissement**  
- Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés. (voir AS / NZS 3260 article 1.2.14.3 du personnel de service).  
- Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.  
- Lors de l'installation ou le remplacement de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.  
- L'équipement doit être installé conformément aux normes électriques nationales et locales.  
- Cet appareil est à installer dans des zones d'accès réservé. Ces dernières sont des zones aux quelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.  
- Utilisez uniquement des pièces de rechange spécifiées.  
- Ne pas utiliser ce produit dans l'eau ni à proximité de l'eau. Débrancher toutes les prises d'alimentation secteur avant d'installer des options ou d'effectuer l'entretien de l'unité, à moins d'instructions contraires dans le présent manuel. |
| ![Warning Icon] | **Rack Monture Avertissement**  
Pour éviter les blessures corporelles lors du montage ou l'entretien de cet appareil dans un rack, des précautions particulières doivent être prises pour assurer votre sécurité et la stabilité du système:  
- Conformez-vous aux exigences de médecine du travail et de sécurité lorsque vous déplacez et soulevez le matériel.  
- Assurez-vous que le montage de l'appareil par des outils de chargement mécaniques ne doit pas induire des conditions dangereuses.  
- Pour éviter tout risque d'électrocution, le rack et chaque élément de l'équipement installé dans le rack doivent être correctement reliés à la terre. |
| ![Warning Icon] | **Châssis Avertissement**  
- Avant de connecter ou de déconnecter les câbles d'alimentation (pôles et terre) du châssis, vérifiez que le circuit de courant continu est hors tension.  
- Pour éviter toute blessure ou des dommages au châssis, soulevez l'unité uniquement par les poignées du châssis lui-même ou en portant celui-ci par le bord inférieur.  
- Toutes les opérations du présent guide nécessitant l'ouverture du châssis ou le retrait d'une carte doivent être uniquement effectuées par du personnel d'entretien qualifié.  
- Le châssis est muni de fentes et d'ouvertures d'aération. Ne pas les bloquer. Dégager l’arrière du cadre pour permettre le refroidissement de l’évacuation d’air et laisser de la place au câblage; un dégagement d'au moins 15.24 cm (6 po) est recommandé. |
### Avertissement

**Choc électrique Avertissement**
- Il est possible que cette unité soit munie de plusieurs cordons d'alimentation. Pour éviter les risques d'électrocution, débrancher les deux cordons d'alimentation avant de réparer l'unité.
- Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.
- Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.
- Ce unité est mis à la terre par le conducteur de protection intégré au cordon d'alimentation. Pour éviter les chocs électriques, brancher le cordon d'alimentation dans une prise correctement câblée avant de raccorder les entrées ou sorties du unité.
- Installer les cordons d'alimentation et autres câbles de sorte qu'ils ne risquent pas d'être endommagés. Couper l'alimentation avant nettoyage. Ne pas utiliser de nettoyant liquide ou en aérosol; utiliser seulement un linge humide.
- Des courants électriques dangereux circulent dans cet appareil. Afin d'éviter les lessures, ne pas toucher les connexions et composants exposés lorsque l’appareil est sous tension. Ne rien insérer dans l'une ou l'autre des cavités des prises de courant du système lorsque l’appareil est sous tension.
- N'installez jamais un module d'alimentation AC et un module d'alimentation DC dans le même châssis.
- Ne pas porter de bijoux aux mains ni de montre durant le dépannage des circuits à haute tension, comme les transformateurs.
- Pour prévenir les risques d’incendie, n’utiliser que le type, la tension et le courant nominal spécifiés dans la nomenclature des pièces de ce unité. Toujours confier le remplacement des fusibles à du personnel d'entretien qualifié.
- Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).
- Pour éviter l’électrocution, assurez-vous que le rack a bien été mis à la terre avant de mettre l’unité en marche. Lors du retrait de l’unité, retirer le raccordement de terre seulement après avoir mis l'unité à l'arrêt et l'avoir débranchée.
### Sicherheit Symbole und übersetzt Sicherheit, Achtung & Vorsicht Anleitung (Deutsch)

Um Verletzungen oder Sachschäden zu vermeiden, bevor Sie mit der Installation oder Austausch des Produkts zu beginnen, zu lesen, zu beobachten, und sich an all den folgenden Sicherheitshinweise und Informationen. Harmonic Produkte und / oder Produktverpackungen können mit den Sicherheitssymbole in diesem Dokument verwendet werden, markiert, wenn es notwendig ist für die Betreiber, Anwender und Dienstleister, um relevante Sicherheitsanweisungen in den Handbüchern zu alarmieren.
<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Installation oder den Austausch des Produkts Einheit Warnung</strong></td>
</tr>
<tr>
<td></td>
<td>▪ Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet worden (siehe AS / NZS 3260 Clause 1.2. 4.3 Servicepersonal)</td>
</tr>
<tr>
<td></td>
<td>▪ Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.</td>
</tr>
<tr>
<td></td>
<td>▪ Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.</td>
</tr>
<tr>
<td></td>
<td>▪ Die Installation der Geräte muss den Sicherheitsstandards entsprechen.</td>
</tr>
<tr>
<td></td>
<td>▪ Verwenden Sie nur die angegebenen Ersatzteile</td>
</tr>
<tr>
<td></td>
<td><strong>Rack-Montage-Warnung</strong></td>
</tr>
<tr>
<td></td>
<td>Zur Vermeidung von Körperverschmutzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt:</td>
</tr>
<tr>
<td></td>
<td>▪ Entsprechen den lokalen Arbeitsschutzforderungen beim Bewegen und Heben der Ausrüstung.</td>
</tr>
<tr>
<td></td>
<td>▪ Stellen Sie sicher, dass die Montage des Gerätes durch mechanische Belastung Werkzeuge sollten nicht gefährlichen Bedingungen zu induzieren.</td>
</tr>
<tr>
<td></td>
<td>▪ Um das Risiko von möglichen elektrischen Schlag zu vermeiden, muss mit einer angemessenen Erdung für Rack und jedes Gerät installiert ist implementiert werden.</td>
</tr>
<tr>
<td></td>
<td><strong>Chassis Warnung</strong></td>
</tr>
<tr>
<td></td>
<td>▪ Gleichstrom-Unterbrechung Bevor Sie Erdungs- oder Stromkabel an das Chassis anschließen oder von ihm abtrennen, ist sicherzustellen, daß der Gleichstrom-Stromkreis unterbrochen ist.</td>
</tr>
<tr>
<td></td>
<td>▪ Um Verletzungen und Beschädigung des Chassis zu vermeiden, sollten Sie das Chassis nicht an den Henkeln auf den Elementen (wie z.B. Stromanschlüsse, Kühlerungen oder Karten) heben oder kippen; oder indem Sie es unterhalb der Unterkante packen.</td>
</tr>
<tr>
<td></td>
<td>▪ Alle Hinweise in diesem Handbuch, die das Öffnen benötigen Sie das Gehäuse oder das Entfernen eines Board sollte nur von qualifiziertem Fachpersonal durchgeführt werden.</td>
</tr>
</tbody>
</table>
Warnung

Elektroschock-Warnung

- Diese Einheit hat möglicherweise mehr als ein Netzkabel. Zur Verringerung der Stromschlaggefahr trennen Sie beide Netzgerätekabel ab, bevor Sie die Einheit warten.
- Vor der Arbeit an einem Chassis für Arbeiten in der Nähe Stromversorgung, ziehen Sie das Netzkabel mit Netzeinheiten.
- Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.
- Dieses Gerät ist über das Netzkabel Erdungsleiter geerdet. Um einen Stromschlag zu vermeiden, stecken Sie das Netzkabel in eine Steckdose richtig verdrahtet, bevor Sie das Produkt Eingang oder Ausgänge.
- Verlegen Sie Netzkabel und andere Kabel, so dass sie wahrscheinlich nicht beschädigt werden. Trennen Eingangsleistung Einheit vor der Reinigung. Verwenden Sie keine flüssigen oder Aerosolreiniger; nur mit einem feuchten Tuch zu reinigen Chassis.
- Ein Wechselstromsmodul und ein Gleichstrommodul dürfen niemals in demselben Chassis installiert werden.
- Tragen Sie keine Hand Schmuck oder schauen Sie bei der Fehlersuche hohen Stromkreise, wie beispielsweise die Stromversorgung.
- Um die Brandgefahr zu vermeiden, verwenden Sie nur den genannten richtige Art von Spannung und Strom Ratings als in der entsprechenden Stückliste für diese Einheit verwiesen. Beziehen sich immer auf Austausch der Sicherung von qualifiziertem Fachpersonal.
- Um einen Stromschlag zu vermeiden, sicherzustellen, dass die Zahnstange wurde korrekt vor dem Einschalten des Gerätes geerdet. Beim Entfernen der Einheit entfernen Sie die Masseverbindung nur, nachdem das Gerät ausgeschaltet und der Netzstecker gezogen.
## Site Preparation Instructions

**NOTE:** Only trained and qualified service personnel (as defined in IEC 60950 and AS/NZS 3260) should install, replace, or service the equipment. Install the system in accordance with the U.S. National Electric Code if you are in the United States.

1. **Preparing & Choosing a Site for Installation**
   - To ensure normal system operation, plan your site configuration and prepare the site before installation.
   - Install the unit in a restricted access area.

### Site Preparation Instructions

<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
</table>
| ![Vorsicht](https://example.com/vorsicht.png) | **Elektrostatische Entladung (ESD) Vorsicht**  
- Folgen Sie statische vorsorglich zu jeder Zeit beim Umgang mit diesem Gerät.  
- Hand Karten nur durch die Faceplates und Kanten; Berühren Sie die bedruckte Leiterplatte und Steckerstifte.  
- Legen Sie alle entfernten Komponenten auf eine antistatische Oberfläche oder in einem Statik-Beutel.  
- Kontakt zwischen den Karten und Kleidung vermeiden.  
- Den Widerstandswert der gegen statische Gurt in regelmäßigen Abständen überprüfen. Empfohlener Wert ist zwischen 1 und 10 Mega-Ohm (MOhm). |
| ![Warnung](https://example.com/warnung.png) | **Laserstrahlungen Warnung.**  
| ![Warnung](https://example.com/warnung.png) | **Lithium-Batterie Handhabung Sicherheitshinweise**  
| ![Vorsicht](https://example.com/vorsicht.png) | - Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr  
- Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.  
- Es gibt keine zu wartenden Akkus im Harmonic Produkte. Siehe Harmonic qualifiziertes Personal, um die austauschbare Batterien Service |

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Harmonic MediaGrid Release
Choose a site with a dry, clean, well-ventilated and air-conditioned area.
Choose a site that maintains an ambient temperature of 32 to 104°F (0 to 40°C).

2. Creating a Safe Environment
- Connect AC-powered systems to grounded power outlets or as per local regulations.
- Do not move or ship equipment unless it is correctly packed in its original wrapping and shipping containers.
- Only allow Harmonic trained personnel to undertake equipment service and maintenance. Do not permit unqualified personnel to operate the unit.
- Wear ear protection when working near an NSG Pro platform for a longer period of time.

3. Rack Mounting the Unit
- Install the system in an open rack whenever possible. If installation in an enclosed rack is unavoidable, ensure that the rack has adequate ventilation.
- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips). This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in the partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- The rack must be anchored to an immovable support to prevent it from tipping when the unit is mounted on it. The rack must be installed according to the rack manufacturer’s instructions.
- Disconnect all power and external cables before lifting the unit. Depending on the weight of the unit, more than one person might be required to lift it.

4. Power Considerations
   a. AC Power
      - Adding to the system a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulator) is highly recommended.
      - Installing the main power supply by a qualified electrician, according to power authority regulations. Make sure all powering are wired with an earth leakage, according to local regulations.
      - It is recommended to install the encoder within 1.5m (approximately 5 feet) from an easily accessible grounded AC outlet.
      - When the encoder is rack-mounted, ensure that the rack is correctly grounded.
   b. DC Power
      - Ensure a suitable overcurrent device is in-line between the equipment and the power source.
      - Connect DC-input power supplies only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in the UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, AS/NZS 60950-1, EN/IEC 60825-1, 21 CFR 1040, EN 60950-1, and IEC 60950-1 standards.
      - Ensure that power is removed from the DC circuit before installing or removing power supplies.

5. Handling Fiber Channel Cables
   - Always read and comply with the handling instructions on the shipping container.
   - Follow all ESD precautions and approved fiber cleaning procedures.
The fiber is made of a very pure, expensive glass and should be treated with great care. Handle fibers only in areas that are very clean and do not contain sharp objects.

Wear finger cots or gloves as dirt and oils can damage the fiber and contaminate connectors.

Do not allow kinks or knots to develop in the fiber. If tangles occur, carefully work out the tangles avoiding pulling or bending the fibre beyond its bend radius.

Always use the correct tools for stripping and cleaving the fiber. It will save time and reduce breakage caused by scratches.

If you must secure a bundle of fiber cables together, avoid plastic and metal tie wraps; secure with velcro instead.

6. Disposing of the Unit

Dispose of the unit and its components (including batteries) as specified by all national laws and regulations.

Product End-of-Life Disassembly Instructions

For disassembly instructions, please call the technical support in order to remove components requiring selective treatment, as defined by the EU WEEE Directive (2012/19/EU). See Contacting the Technical Assistance Center.

Product Disassembly Process

1. Disassemble equipment at a dedicated area only, gather the needed tools for disassembly.
2. Remove covers, housing, etc.
3. Remove and separate sub-assemblies (i.e. cables, metals, displays, fans, etc.).
4. Separate hazardous materials from the remainder of the material.
   a. Sort hazardous materials into their different types (i.e., batteries, hazardous liquids, hazardous solids, fiberglass, etc.).
   b. Proceed with hazardous waste management processes only.
5. Identify re-usable materials/sub-assemblies and separate these from the rest of the material.
6. Identify and separate recyclable materials as per below examples:
   a. Scrap material to be sent to smelter(s).
   b. E-waste such as displays, CPU’s, cables and wires, hard drives, keyboards, etc.
   c. Metals such as steel, brass, and aluminum.
   d. Plastics such as fan casings, housings, covers, etc.
   e. Fiber optics and plastic tubing not containing electrical or data wiring.

Safety Rules (English)

Recycler personnel are to wear personal protective equipment including proper eye protection, proper hand protection, and proper breathing protection if needed.

Recycler personnel shall be experienced with using the proper tools required for disassembling equipment. Untrained personnel shall not disassemble Harmonic products. Unfamiliarity with tools can cause damage and injury.

Règles de sécurité (French)

Le personnel du recycleur doit porter de l’équipement de protection individuelle, y compris des lunettes, des gants et un masque de protection appropriés au besoin.
Le personnel du recycleur doit avoir de l'expérience des outils de démontage de l'appareil. Les produits Harmonic ne doivent pas être démontés par du personnel non qualifié. Une mauvaise connaissance des outils peut causer des dommages et des blessures.

EU Manufacturer’s Declaration of Conformity

This equipment is in compliance with the essential requirements and other provisions of Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC.

**NOTE:** For specifics, about which standards have been applied, refer to the Declaration of Conformity of the product on Harmonic website at [Product Regulatory Compliance](http://www.harmonic.com) or contact Harmonic Compliance Team at regulatory.compliance@harmonicinc.com

Electromagnetic Compatibility Notices – Class A

**a.** FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Connections between the Harmonic equipment and other equipment must be made in a manner that is consistent with maintaining compliance with FCC radio frequency emission limits. Modifications to this equipment not expressly approved by Harmonic may void the authority granted to the user by the FCC to operate this equipment and you may be required to correct any interference to radio or television communications at your own expense.

**b.** ICES–003 Statement (Canada)

**English:** This Class A digital apparatus complies with Canadian ICES-003.

**French:** Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

c. CE Declaration of Conformity (European Union)

This product has been tested in accordance too, and complies with the Low Voltage Directive (2014/30/EU) and EMC Directive (2014/35/EU). The product has been marked with the CE Mark to illustrate its compliance.
Appendix C Safety and Regulatory Compliance

Information

Electromagnetic Compatibility Notices – Class A

d. VCCI Class A Warning (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用が適切な対策を講じるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this equipment is used in a domestic environment, it may cause radio interference. When such trouble occurs, the user may be required to take corrective actions.

e. BSMI EMC Notice (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

English translation of the notice above:

This is a Class A Information Product, when used in residential environment, it may cause radio frequency interference, under such circumstances, the user may be requested to take appropriate counter measures.

f. Class A Warning (Korea)

주의 A급 기기 이 기기는 업무용으로 전자파 적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

English translation of the notice above:

This is a Class A device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this was sold or purchased by mistake, it should be replaced with a residential-use type.

g. Class A Statement (China)

中华人民共和国“A类”警告声明

声明

此为A级产品，在生活环境巾，该产品可能会造成无线电干扰。在这种情况下，可能需要用户采取切实可行的措施。

English translation of the notice above:

This is a Class A device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this was sold or purchased by mistake, it should be replaced with a residential-use type.
When labeled with the CCC marking, the product meets the applicable safety and EMC requirements for China. This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

h. Class A Warning – CISPR 22 (AS/NZS)

Warning (English)

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Attention (French)

Il s’agit d’un produit de classe A. Dans un environnement local, ce produit peut entraîner des perturbations radioélectriques, auquel cas l’utilisateur devra éventuellement prendre des mesures adéquates.

Product Regulatory Compliance

Harmonic products are typically tested to the latest safety and electromagnetic compatibility (EMC) specifications and test methods, and are marked with one or more of the following regulatory/certification markings. Some of the certification markings will vary depending on what certifier was used to obtain a certification.

Please visit Harmonic Product Regulatory Compliance page to view information on applied safety & EMC standards and regulatory marks on Harmonic products. You can also email us at regulatory.compliance@harmonicinc.com for assistance on regulatory compliance for Harmonic products.

Product Regulatory Compliance Markings

Table 0–1: Regulatory Compliance Markings

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Testing Standard/Specification</th>
<th>Certification Type</th>
<th>Regulatory Mark Name</th>
<th>Product Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA/Canada</td>
<td>FCC CFR 47 Part 15, Class A, ICES-003: Issue 5, 2012; Class A</td>
<td>EMC</td>
<td>FCC Class A Statement</td>
<td>![FCC Approval]</td>
</tr>
</tbody>
</table>

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
### Table 0–1: Regulatory Compliance Markings

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<tr>
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<th>Testing Standard/ Specification</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>EN 60950-1; EN60825-1 (for laser)</td>
<td>Safety</td>
<td>GS</td>
<td>![GS]</td>
</tr>
<tr>
<td>Mexico</td>
<td>NOM-019-SCFI-1998</td>
<td>Safety</td>
<td>NOM</td>
<td>![NOM]</td>
</tr>
<tr>
<td>Taiwan</td>
<td>CNS 14336-1:2010; CNS 13438:2006; Class A</td>
<td>Safety and EMC</td>
<td>BSMI Certification (RPC Number &amp; Class A Warning)</td>
<td>![BSMI]</td>
</tr>
<tr>
<td>Japan</td>
<td>VCCI V-3/2013.04; CISPR 22:2008, Class A</td>
<td>EMC</td>
<td>VCCI</td>
<td>![VCCI]</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>AS/NZS CISPR22:2009+A1:2010; Class A</td>
<td>Safety</td>
<td>C-Tick</td>
<td>![C-Tick]</td>
</tr>
<tr>
<td>Korea</td>
<td>KN22 Class A and KN 24</td>
<td>EMC</td>
<td>KC</td>
<td>![KC]</td>
</tr>
</tbody>
</table>
Harmonic manufactures high quality and innovative IT and telecommunications equipment, video delivery infrastructure solutions and services for its customers worldwide. Harmonic is committed to providing our customers with safe and environmentally friendly products that are compliant with all relevant regulations, customer specifications, and environmental legislation, including the directives described below.

**EU RoHS**

In July 2006, the European Union’s (EU) Directive (2002/95/EC) on the Restriction of the use of certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE) went into effect, and in July, 2011, the European Union’s RoHS Recast Directive (2011/65/EU) also known as RoHS II entered into force.

Harmonic understands the environmental risks associated with the substances covered by the RoHS Directive and has committed to eliminating or reducing the use of these, as well as other environmentally sensitive substances in our products. Harmonic also continues to comply with the requirements under RoHS II.

For more information, please visit EU RoHS directive page at official EU website.


**Restricted Substance Statement**

Harmonic products contain less than the permitted limits for the six restricted substances except where exemptions published in the RoHS2 Directive are applicable. This statement is based on vendor-supplied analysis or material certifications, and/or lab test results of the component raw materials used in the manufacture of Harmonic products.

<table>
<thead>
<tr>
<th>Restricted Substance</th>
<th>Permitted Limit*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>≤0.01%</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>≤0.1%</td>
</tr>
<tr>
<td>Chromium (VI) (Cr (VI))</td>
<td>≤0.1%</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>≤0.1%</td>
</tr>
</tbody>
</table>

---

Table 0–2: Restricted Substances

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Testing Standard/ Specification</th>
<th>Certification Type</th>
<th>Regulatory Mark Name</th>
<th>Product Marketing</th>
</tr>
</thead>
</table>
Appendix C Safety and Regulatory Compliance

Information

EU REACH


Harmonic supports the basic aim of REACH in improving the protection of human health and environment through the better and earlier identification of intrinsic properties of chemical substances. Harmonic products are considered “articles” under REACH; therefore, we are required to provide recipients of our products with information on Substance of Very High Concern (SVHC) present in concentration above 0.1% (w/w).

Substances in our products are not intended to be released under normal or reasonably foreseeable conditions of use; therefore, the registration requirement in REACH Article 7(1) does not apply to our products.

For more information, please visit REACH regulation page at official EU website.

http://ec.europa.eu/environment/chemicals/reach/reach_en.htm

China RoHS

China’s regulation on restriction of the use of certain hazardous substances commonly (China RoHS), is applicable to all Electronic and Information Products (EIPs) and parts sold in China after March 01, 2007. China RoHS regulation restricts the use of the same six substances as the European Union’s ROHS, but has requirements for product labeling and regulated substance information disclosure.

Harmonic complies with China RoHS Phase I for labeling and information disclosure requirements and continues to monitor new developments in China RoHS Phase II towards substance restriction and certification program.

For more information, please visit China RoHS regulation page at official US export website.

http://www.export.gov/china/doingbizinchina/

Table 0–2: Restricted Substances

<table>
<thead>
<tr>
<th>Restricted Substance</th>
<th>Permitted Limit*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polybrominated biphenyls (PBBs)</td>
<td>≤0.1%</td>
</tr>
<tr>
<td>Polybrominated diphenyl ether (PBDE)</td>
<td>≤0.1%</td>
</tr>
</tbody>
</table>

*Homogeneous material definition as per the EU Directive.
## China RoHS Disclosure Report

Below table shows the presence of hazardous substances, or elements in Harmonic products, if the part is present.

<table>
<thead>
<tr>
<th>部件名称 (Part name)</th>
<th>有毒有害物质或元素 (Hazardous Substance)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>铅 (PB)</td>
</tr>
<tr>
<td>印刷线路板 (Printed Circuit Assemblies)</td>
<td>X</td>
</tr>
<tr>
<td>机械组件 (Mechanical Subassemblies)</td>
<td>X</td>
</tr>
<tr>
<td>光学组件 (Optical Subassemblies)</td>
<td>X</td>
</tr>
<tr>
<td>电源 (Power Supplies)</td>
<td>X</td>
</tr>
<tr>
<td>缆线 / 线束 (Cables, harnesses)</td>
<td>X</td>
</tr>
<tr>
<td>屏幕 / 显示器 (Screens, Monitors)</td>
<td>X</td>
</tr>
<tr>
<td>金属零件 (Metal Parts)</td>
<td>X</td>
</tr>
<tr>
<td>塑料 / 发泡材料 (Plastics, foams)</td>
<td>O</td>
</tr>
<tr>
<td>电池 (Batteries)</td>
<td>O</td>
</tr>
</tbody>
</table>

**O:** 表示在该部件的所有均质材料中，此类有毒有害物质的含量均小于 SJ/T11363-2006 标准所规定的限量。

**X:** 表示至少在该部件的某一均质材料中，此类有毒有害物质的含量超出 SJ/T11363-2006 标准规定的限量。
Other RoHS and REACH type Regulations

Harmonic will comply with RoHS and REACH type regulations evolving in other countries, if they become relevant to our products or in markets where we sell our products.

Waste Electrical and Electronic Equipment (WEEE)

European Parliament and the Council of the European Union’s WEEE Directive (2002/96/EC) came into force on August, 2005 and, were more recently amended in July, 2012. This directive encourages the reuse, recycling, and recovery of WEEE and to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment, especially those dealing with WEEE. Harmonic ensures that all requirements for registration, reporting, design and data tracking are complied with to meet the objectives of the WEEE directive.

For more information, please visit WEEE directive page at official EU website.


Battery Directive

In September 2006, the European Union’s Directive 2006/66/EC (Battery Directive) came into force with an aim to prohibit the sale of batteries and accumulators containing hazardous substances and to set rules and promote collection, treatment, recycling and disposal of waste batteries and accumulators. This directive applies to spent batteries collected together with WEEE and requires their removal and separate collection. Once removed from WEEE, spent batteries are governed by the Battery Directive. Harmonic uses lithium batteries in its products and our responsibility under the Battery Directive is taken care of under our WEEE Take-Back program.

For more information, please visit Batteries and Accumulators directive page at official EU website.

http://ec.europa.eu/environment/waste/batteries/

Harmonic is committed to manufacturing environmentally safe products for the community, and will make reasonable efforts and required adjustments to its practices, if necessary, to comply with various environmental directives and industry initiatives on the elimination of hazardous substances, labeling, marking, certification and registration as required in markets where we sell our products.

Download Harmonic’s Environmental Compliance Statement at the following location:


WEEE Take-Back Request Program

In order to assist EU member states to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally, Harmonic strives to recycle in compliance with the WEEE Directive any of its products that cannot be re-used.

Harmonic’s customers should:

- Not discard equipment in household or office garbage
- Arrange proper recycling of unneeded equipment. For the take-back of Harmonic equipment, customers must:
  - Collect the information required to complete Harmonic’s WEEE Take-Back Request form
Appendix C Safety and Regulatory Compliance

Information

- Complete and submit the online WEEE Take-Back Request form. Please note that forms must be fully completed in order to prevent process delays
- Receive instant online confirmation indicating the reference number
- Receive the End of Life (EOL) asset return authorization number and instruction for EOL asset return

Not ship EOL product to Harmonic without a Harmonic-provided EOL asset return authorization number

The crossed-out wheeled bin symbol on a Harmonic-branded commercial product indicates that the product should not be disposed of along with municipal waste, but invites our customers to return the product to us under Harmonic’s WEEE Take-Back program for product disposal.

Harmonic will pay for the cost of shipping and will provide a Certificate of Recycling or a Certificate of Destruction upon request. For more information on collection, reuse and recycling or to initiate the WEEE take-back process, please complete the form at http://www.harmonicinc.com/webform/weee-takeback-request or contact Harmonic Technical Assistance Center (TAC) or email RMA team at rma.emea@harmonicinc.com.

Compliance with additional country specific environmental, safety and EMC standards:

In addition to above listed standards and compliance regulations, Harmonic products may also be compliant with other country specific environmental, safety and EMC requirements. Please contact Harmonic Compliance Team at regulatory.compliance@harmonicinc.com or your local sales representative for more information about compliance with particular country or standard.