

# **Internal Cabling Guide for HP Smart Array Controllers**

**First Edition**



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# 1 Cabling for the HP Integrity rx8620 Server

This chapter describes how to connect the cables of an HP Smart Array controller card to the internal hard drives of an HP Integrity rx8620 Server.

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**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

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Table 1-1 shows the product numbers, descriptions and support matrix for the HP Smart Array controllers supported on the rx8620 server.

**Table 1-1 Smart Array Cards Available for the HP Integrity rx8620 Server**

<b>Controller</b>	<b>Product Number</b>	<b>Description</b>
<b>SA5302</b>	<b>A9825A</b>	<b>2 channel / 128 MB cache</b>
<b>SA5304</b>	<b>A9826A</b>	<b>4 channel / 256 MB cache</b>
<b>SA6402</b>	<b>A9890A</b>	<b>2 channel / 128 MB cache</b>
<b>SA6404</b>	<b>A9891A</b>	<b>4 channel / 256 MB cache</b>

Before you begin, you need:

- Cable kit (part number: A7027-63001)
- Smart Array controller card: See Table 1-1 for product numbers.

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**NOTE** The part and product numbers listed in this document are correct as of the release date of the document. Check <http://partsurfer.hp.com> for the most current part numbers.

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## HP Smart Array Controller Card Ports

The ports on the HP Smart Array Controller Cards are labeled as shown in Table 1-2

**Table 1-2 HP Smart Array Controller Card Port Labels**

Controller Card	Port	Location
SA 5302/SA5304	Port 1	Port near bulkhead
	Port 2	Port near center of card
SA 6402/SA6404	Port A2	Port near bulkhead
	Port A1	Port near center of card

When a port is referenced in this document the following notation is used (See Figure 1-1 for additional information):

**Table 1-3 Port Identification Notation**

Notation	Port Location
Port 1/A2	Port near bulkhead
Port 2/A1	Port near center of card

---

## Installing the HP Smart Array Controller Card

- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cords.
- Step 2.** Remove the top cover of the server.
- Step 3.** If only one HP Smart Array controller card is to be installed, install it into slot 8 of IO Chassis 0 for internal RAID configuration.
- Step 4.** If two HP Smart Array controller cards are to be installed, install them into slots 8 of IO Chassis 0 and IO Chassis 1 for internal RAID configuration.

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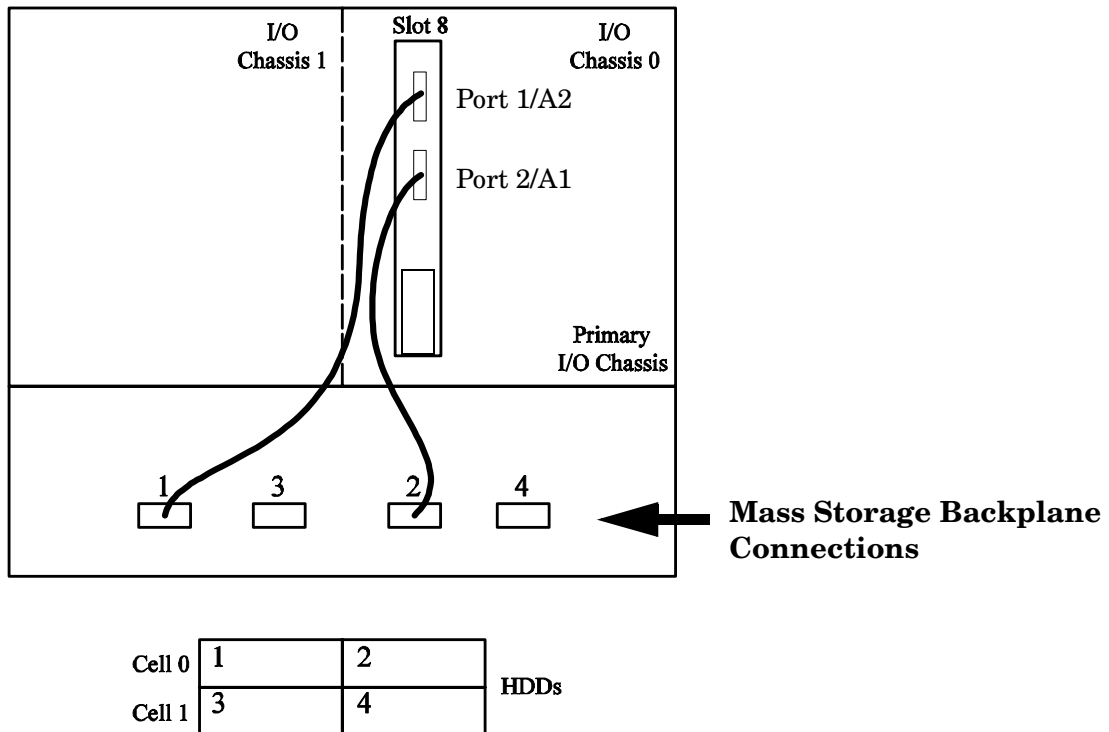
**NOTE** The HP Smart Array controller card must be installed in PCI slot 8 for internal RAID configurations. If another PCI card is located in slot 8, that card must be relocated to another slot.

---

## Single Partition RAID Configuration

Figure 1-1 shows the correct cabling for a single partition configuration, as viewed from the front of the server.

**Figure 1-1 Smart Array Controller Card with Single Partition Cabling**



## RAID Cabling for IO Chassis 0 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of the IO Chassis 0.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are contained in the cable kit. For each cable, use two of the same color tie, one on each end.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled “This Connector to PCI Card”. This end of the cable connects to the HP Smart Array card.

---

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1/A2 on the Smart Array card. Repeat for SCSI connector Port 2/A1.
- Step 5.** Route the cables as shown in Figure 1-3 towards the front of the server and over to the Mass Storage Backplane connectors.

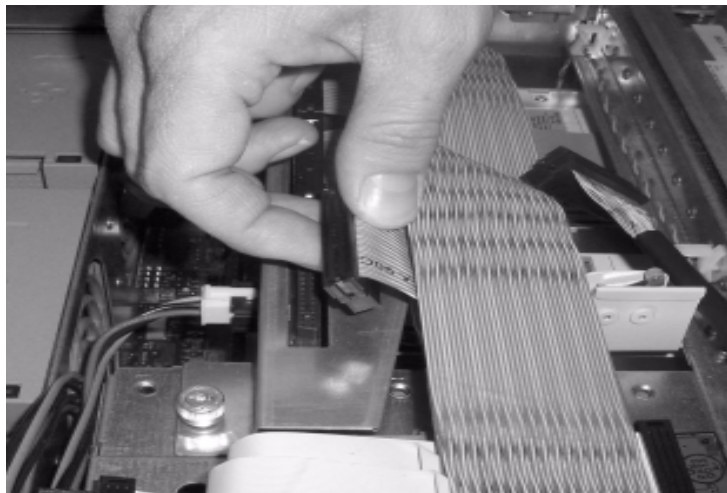
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**WARNING** The cables must be routed along the side of the server. They must not lay on top of the flat SCSI ribbon cable bundle or the PCI air dam. Doing so will damage the cables when the top is installed.

---

- Step 6.** Unplug the existing SCSI ribbon cable for the top left HDD. This is the left most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 1-3
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 1-2.

**Figure 1-2 Folded SCSI Connector**

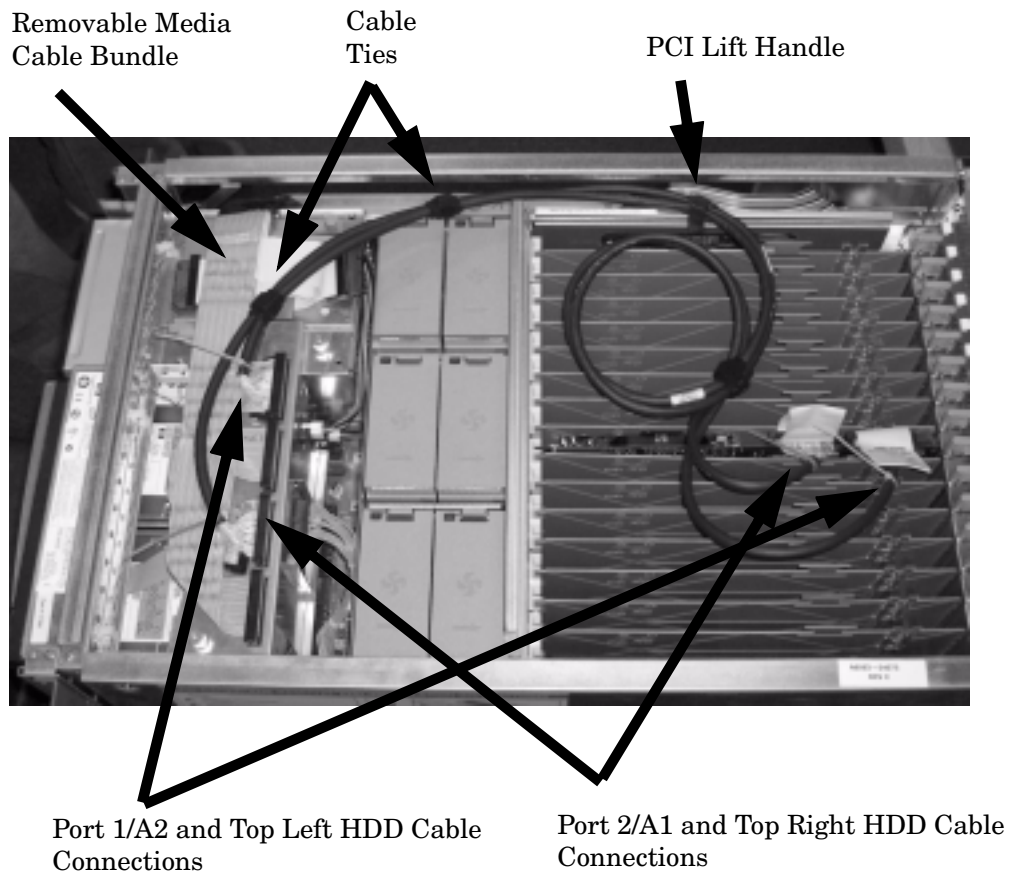


- Step 8.** Plug the new cable from the Smart Array card Port 1/A2 into the mass storage connector for the top left drive.



- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the second connector from the right on the Mass Storage Backplane when viewed from the front of the server. See Figure 1-3
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 1-2.
- Step 11.** Plug the new cable from the Smart Array card Port 2/A1 into the mass storage connector for the top right drive.
- Step 12.** Arrange the new cables as shown in Figure 1-3 so that all of the slack is located in the PCI card cage. The cables must be routed behind the removable media cable bundle and to the side of the air dam as shown.
- Step 13.** Loop the cable slack as shown in Figure 1-3.
- Step 14.** Use the Kwik Wrap ties to secure the cables in the chassis and to maintain the slack. One tie should secure the cables to the PCI card cage through the lift handle

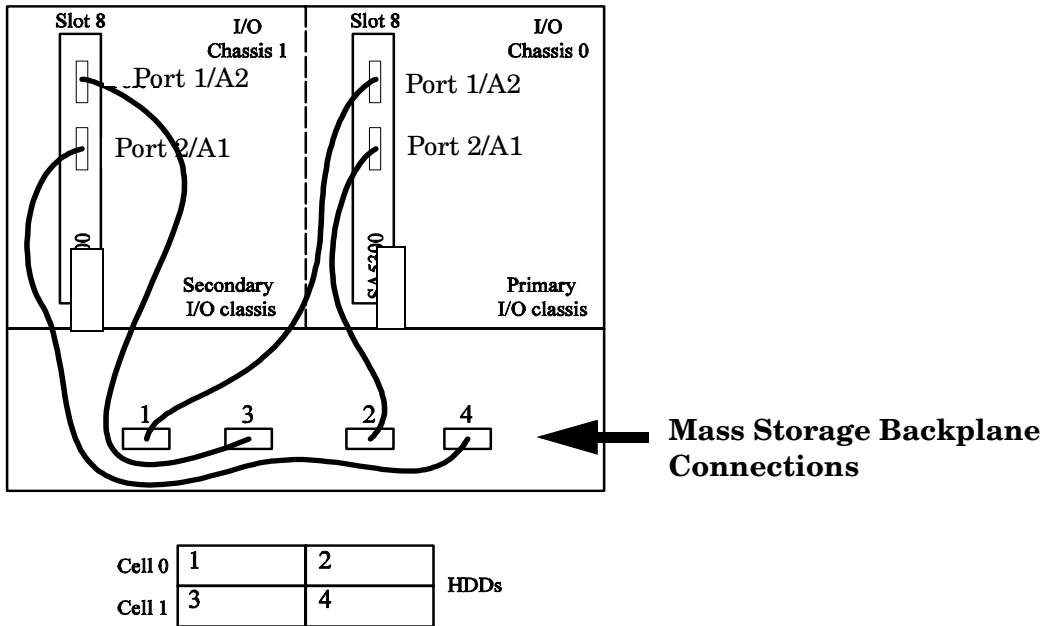
**Figure 1-3 Smart Array Controller Card with Single Partition Cabling**



## Dual Partition Configurations

Figure 1-4 shows the correct cabling for a dual partition configuration, as viewed from the front of the server.

**Figure 1-4 Smart Array Controller Card with Dual Partition Cabling**



### RAID Cabling for IO Chassis 0 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of the IO Chassis 0.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color, one on each end.

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1/A2 on the Smart Array card. Repeat for SCSI connector Port 2/A1.
- Step 5.** Route the cables as shown in Figure 1-3 towards the front of the server and over to the Mass Storage Backplane connectors.

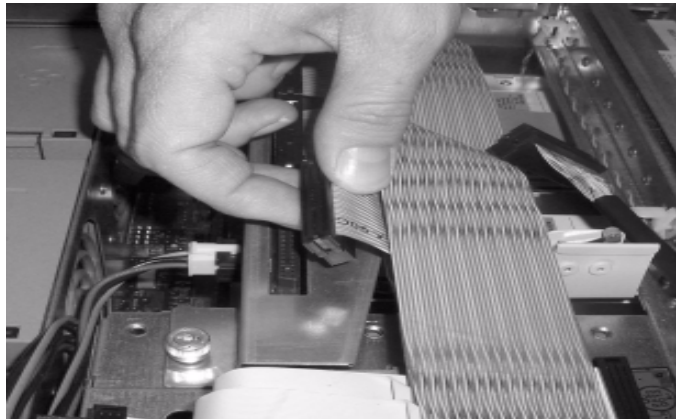
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**WARNING** The cables must be routed along the side of the server. They must not lay on top of the flat SCSI ribbon cable bundle or the PCI air dam. Doing so will damage the cables when the top is installed.

---

- Step 6.** Unplug the existing SCSI ribbon cable for the top left HDD. This is the left most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 1-4
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 1-5.

**Figure 1-5 Folded SCSI Connector**



- Step 8.** Plug the new cable from the Smart Array card Port 1/A2 into the mass storage connector for the top left drive.
- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the second connector from the right on the Mass Storage Backplane when viewed from the front of the server. See Figure 1-4
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 1-5.
- Step 11.** Plug the new cable from the Smart Array card Port 2/A1 into the mass storage connector for the top right drive.

### **RAID Cabling for IO Chassis 1 (Bottom Left and Bottom Right Hot Plug Hard Drives)**

To set up the RAID cabling on the bottom left and bottom right hot plug hard drives, do the following, from the front of the server:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of IO Chassis 1.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end). Using a different color tie on each cable makes it easier to identify the cables for installation and servicing.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled “This Connector to PCI Card”. This end of the cable connects to the HP Smart Array card.

---

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1/A2 on the Smart Array card. Repeat for SCSI connector Port 2/A1.
- Step 5.** Route the cables as shown in Figure 1-6 towards the front of the server and over to the Mass Storage Backplane connectors.

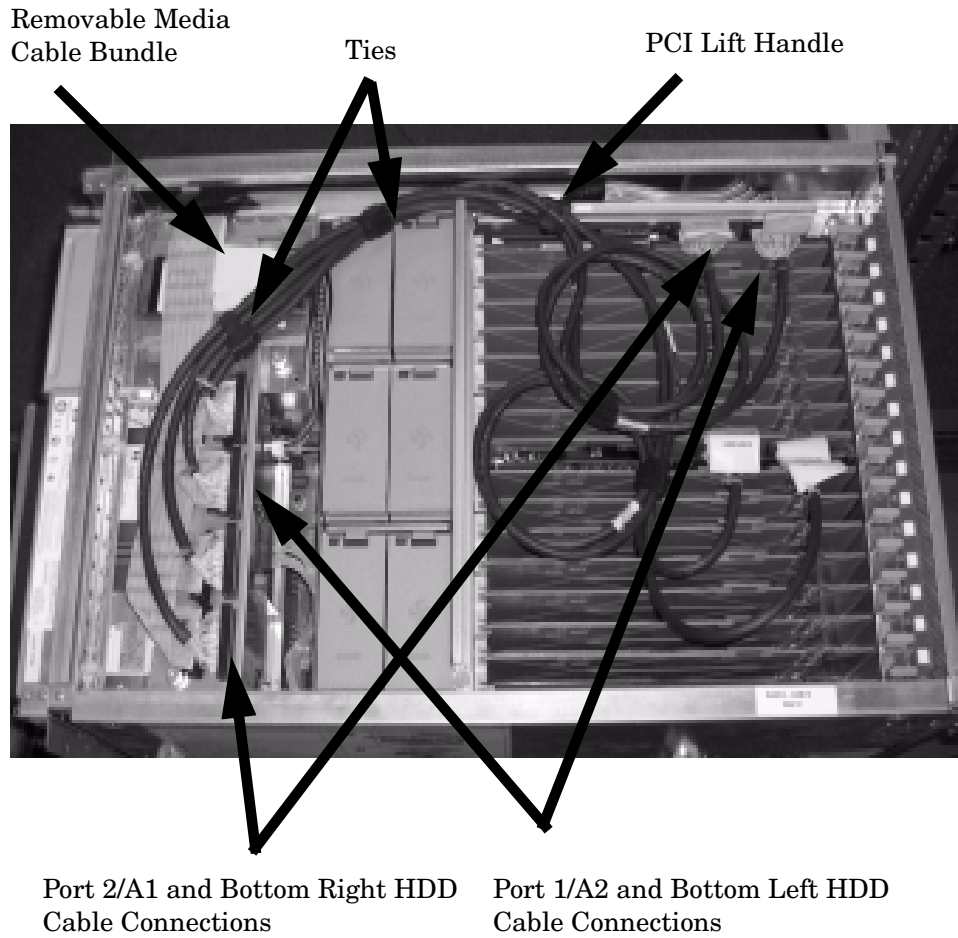
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**WARNING** **The cables must be routed along the side of the PCI card cage and PCI fans. They must not lay on top of the PCI fans or the PCI air dam. Doing so will damage the cables.**

---

- Step 6.** Unplug the existing SCSI ribbon cable for the bottom left HDD. This is the second connector from the left on the Mass Storage Backplane when viewed from the front of the server. See Figure 1-6
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 1-5.
- Step 8.** Plug the new cable from the Smart Array card Port 1/A2 into the mass storage connector for the top left drive.
- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the right most connector on the Mass Storage Bacplane when viewed from the front of the server. See Figure 1-6
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 1-5.
- Step 11.** Plug the new cable from the Smart Array card Port 2/A1 into the mass storage connector for the top right drive.
- Step 12.** Arrange the new cables as shown in Figure 1-6 so that all of the slack is located in the PCI card cage. The cables must be routed behind the removable media cable bundle and to the side of the air dam as shown.
- Step 13.** Loop the cable slack as shown in Figure 1-6.
- Step 14.** Use the Kwik Wrap ties to secure the cables in the chassis and to maintain the slack. One tie should secure the cables to the PCI card cage through the lift handle
- Step 15.** Arrange the new cables as shown in Figure 1-6 so that all of the slack is located in the PCI card cage.
- Step 16.** Loop the cable slack as shown in Figure 1-6. Use the Kwik Wraps to fasten the cables in place and maintain the slack (this allows servicing of the other PCI cards). See Figure 1-6.

**Figure 1-6 Smart Array Controller Card with Dual Partition Cabling**



## Insight Manager 7 Hard Disk Drive Mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD, as shown in Table 1-4.

**Table 1-4 Hard Drive Mapping for the HP Integrity rx8620 Server**

SA5302 or 5304 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	0	8	0	0	1/A2	6	rx8620 Top Left
0	0	0	8	0	0	2/A1	6	rx8620 Top Right
0	0	1	8	0	1	1/A2	6	rx8620 Bottom Left
0	0	1	8	0	1	2/A1	6	rx8620 Bottom Right
8	0	0	8	8	2	1/A2	6	SEU Top Left
8	0	0	8	8	2	2/A1	6	SEU Top Right
8	0	1	8	8	3	1/A2	6	SEU Bottom Left
8	0	1	8	8	3	2/A1	6	SEU Bottom Right

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array Controller User Guide*:

- Configure your HP Smart Array controller card in an HP Integrity server (use HP Smart Array utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array utilities and software that help you manage your RAID
- Configure the HP Smart Array controller card for an external RAID storage system





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## 2 Cabling for the HP Integrity rx8640 Server

This chapter describes how to connect the cables of an HP Smart Array controller card to the internal hard drives of an HP Integrity rx8640 Server.

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**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

---

Table 2-1 shows the product numbers, descriptions and support matrix for the HP Smart Array controllers supported on the rx8640 server.

**Table 2-1 Smart Array Cards Available for the HP Integrity rx8640 Server**

Controller	Product Number	Description	Supported on rx8640
SA6402	A9890A	2 channel / 128 MB cache	Y
SA6404	A9891A	4 channel / 256 MB cache	Y

Before you begin, you need:

- Cable kit (part number: A7027-63001)
- Smart Array controller card: See Table 2-1 for product numbers.

---

**NOTE** The part and product numbers listed in this document are correct as of the release date of the document. Check <http://partsurfer.hp.com> for the most current part numbers.

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### Installing the HP Smart Array Controller Card

**Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cords.

**Step 2.** Remove the top cover of the server.

**Step 3.** If only one HP Smart Array controller card is to be installed, install it into slot 8 of IO Chassis 0 for internal RAID configuration.

**Step 4.** If two HP Smart Array controller cards are to be installed, install them into slots 8 of IO Chassis 0 and IO Chassis 1 for internal RAID configuration.

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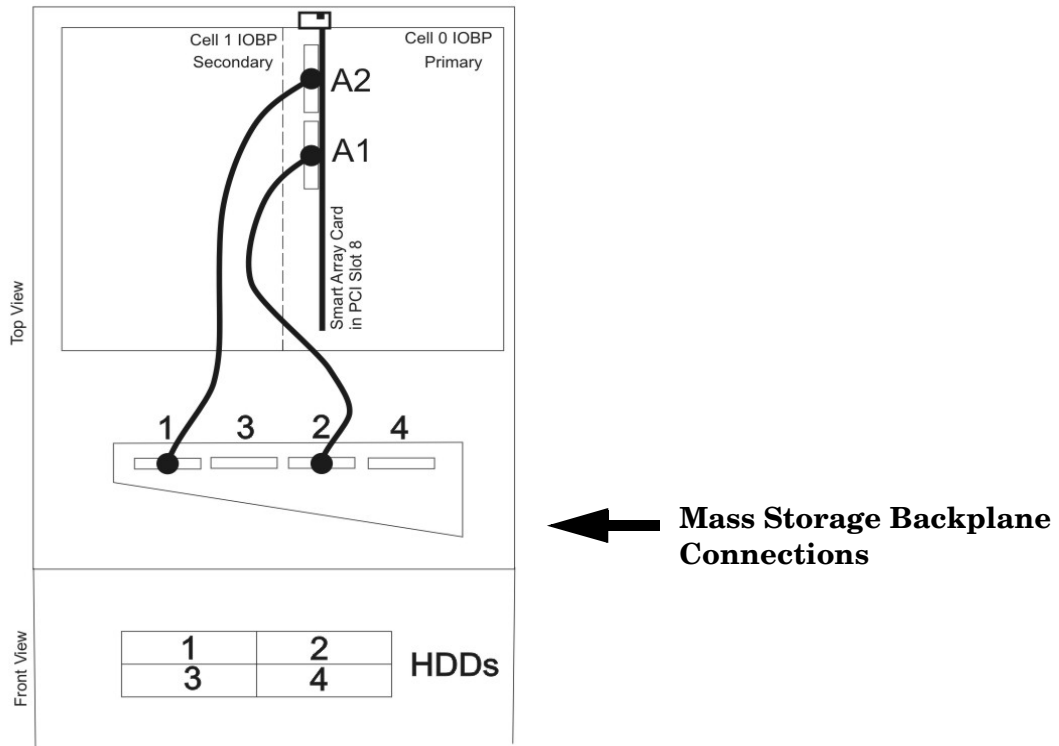
**NOTE** The HP Smart Array controller card must be installed in PCI slot 8 for internal RAID configurations. If another PCI card is located in slot 8, that card must be relocated to another slot.

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## Single Partition RAID Configuration

Figure 2-1 shows the correct cabling for a single partition configuration, as viewed from the front of the server.

**Figure 2-1 Smart Array Controller Card with Single Partition Cabling**



## RAID Cabling for IO Chassis 0 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of the IO Chassis 0.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color tie, one on each end.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled “This Connector to PCI Card”. This end of the cable connects to the HP Smart Array card.

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- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port A2 on the Smart Array card (Port A2 is near the rear of the server). Repeat for SCSI connector Port A1 (Port A1 is near the center of the board).
- Step 5.** Route the cables as shown in Figure 2-3 towards the front of the server and over to the Mass Storage Backplane connectors.

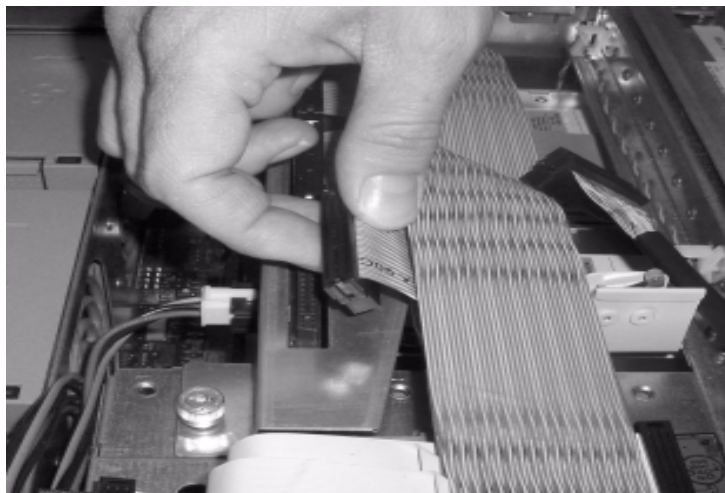
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**WARNING** The cables must be routed along the side of the server. They must not lay on top of the flat SCSI ribbon cable bundle or the PCI air dam. Doing so will damage the cables when the top is installed.

---

- Step 6.** Unplug the existing SCSI ribbon cable for the top left HDD. This is the left most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 2-3
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 2-2.

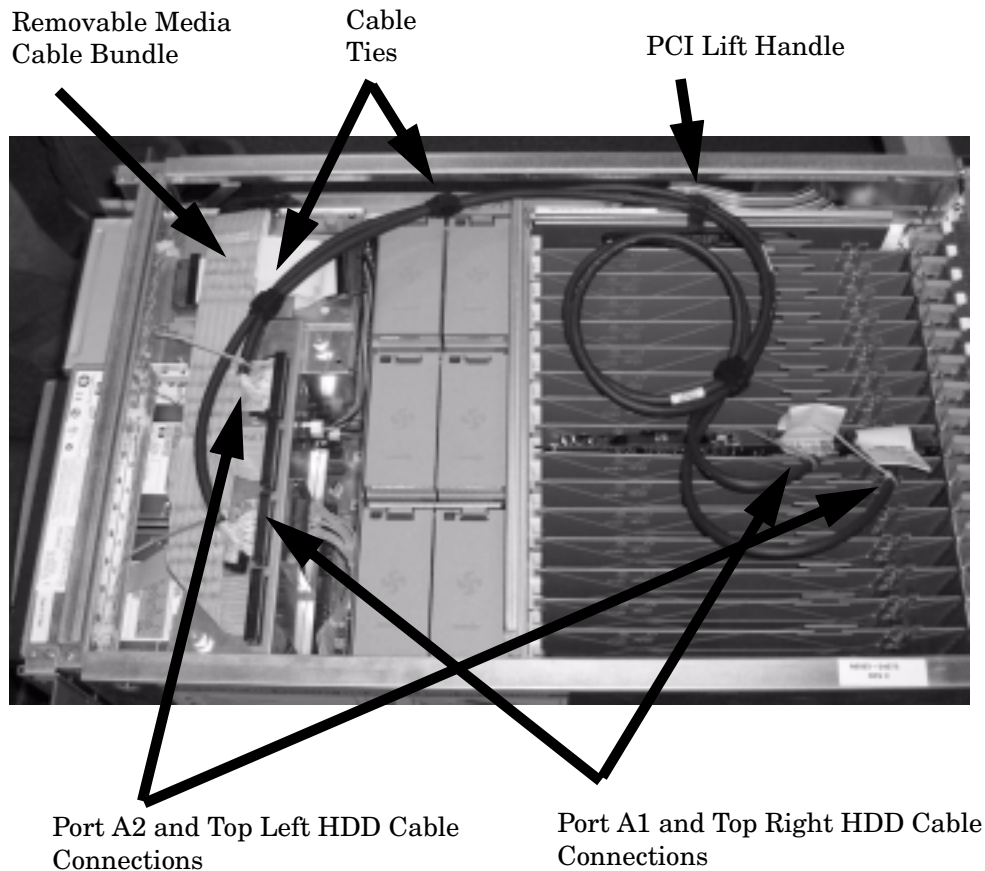
**Figure 2-2 Folded SCSI Connector**



- Step 8.** Plug the new cable from the Smart Array card Port A2 into the mass storage connector for the top left drive.

- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the second connector from the right on the Mass Storage Backplane when viewed from the front of the server. See Figure 2-2
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 2-2.
- Step 11.** Plug the new cable from the Smart Array card Port A1 into the mass storage connector for the top right drive.
- Step 12.** Arrange the new cables as shown in Figure 2-2 so that all of the slack is located in the PCI card cage. The cables must be routed behind the removable media cable bundle and to the side of the air dam as shown.
- Step 13.** Loop the cable slack as shown in Figure 2-3.
- Step 14.** Use the Kwik Wrap ties to secure the cables in the chassis and to maintain the slack. One tie should secure the cables to the PCI card cage through the lift handle

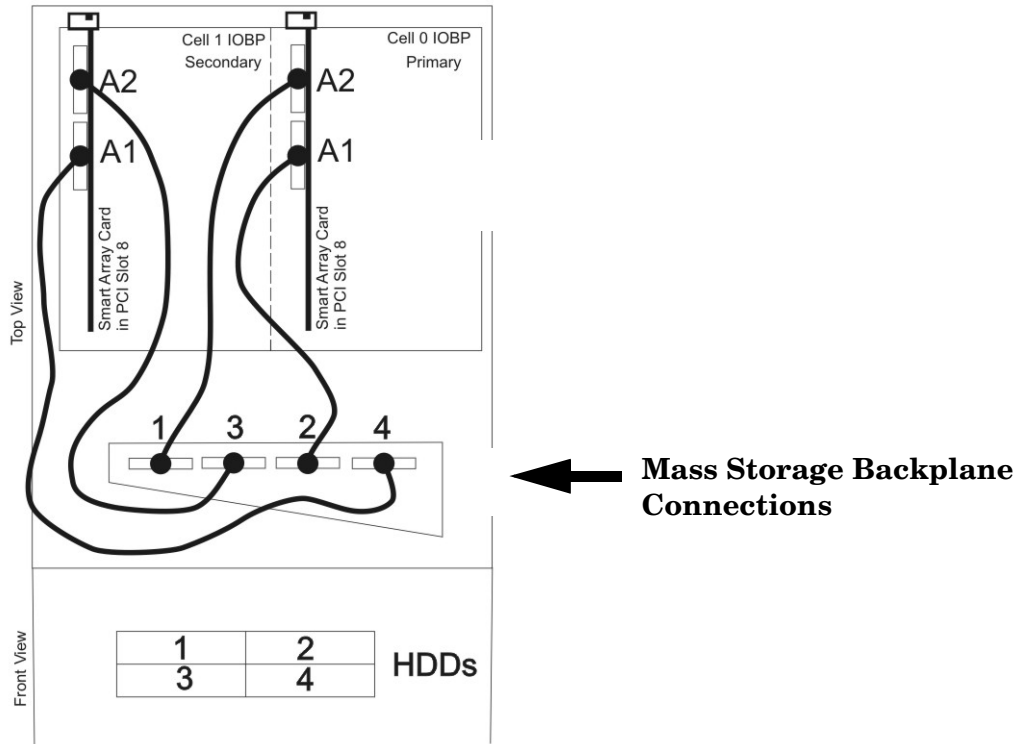
**Figure 2-3 Smart Array Controller Card with Single Partition Cabling**



## Dual Partition Configurations

This section gives instructions for the installation of a second Smart Array Controller Card into the server. This will provide a dual partition configuration in the server. Figure 2-4 shows the correct cabling for a dual partition configuration, as viewed from the front of the server.

**Figure 2-4 Smart Array Controller Card with Dual Partition Cabling**



### RAID Cabling for IO Chassis 0 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of the IO Chassis 0.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color, one on each end.

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port A2 on the Smart Array card (Port 1 is near the rear of the server). Repeat for SCSI connector Port A1 (Port 2 is near the center of the board).

**Step 5.** Route the cables as shown in Figure 2-3 towards the front of the server and over to the Mass Storage Backplane connectors.

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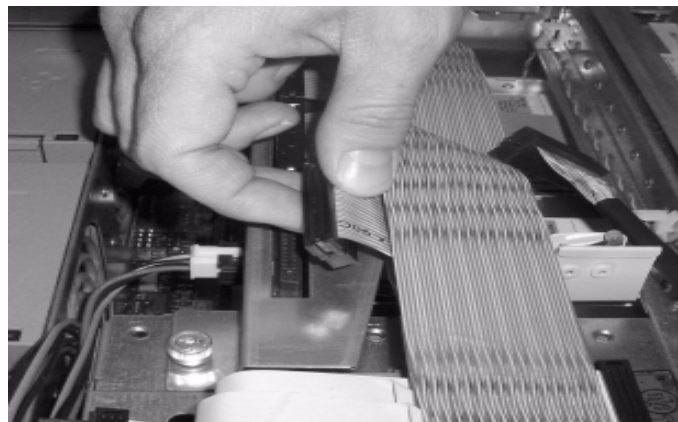
**WARNING**    **The cables must be routed along the side of the server. They must not lay on top of the flat SCSI ribbon cable bundle or the PCI air dam. Doing so will damage the cables when the top is installed.**

---

**Step 6.** Unplug the existing SCSI ribbon cable for the top left HDD. This is the left most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 2-3

**Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 2-5.

**Figure 2-5 Folded SCSI Connector**



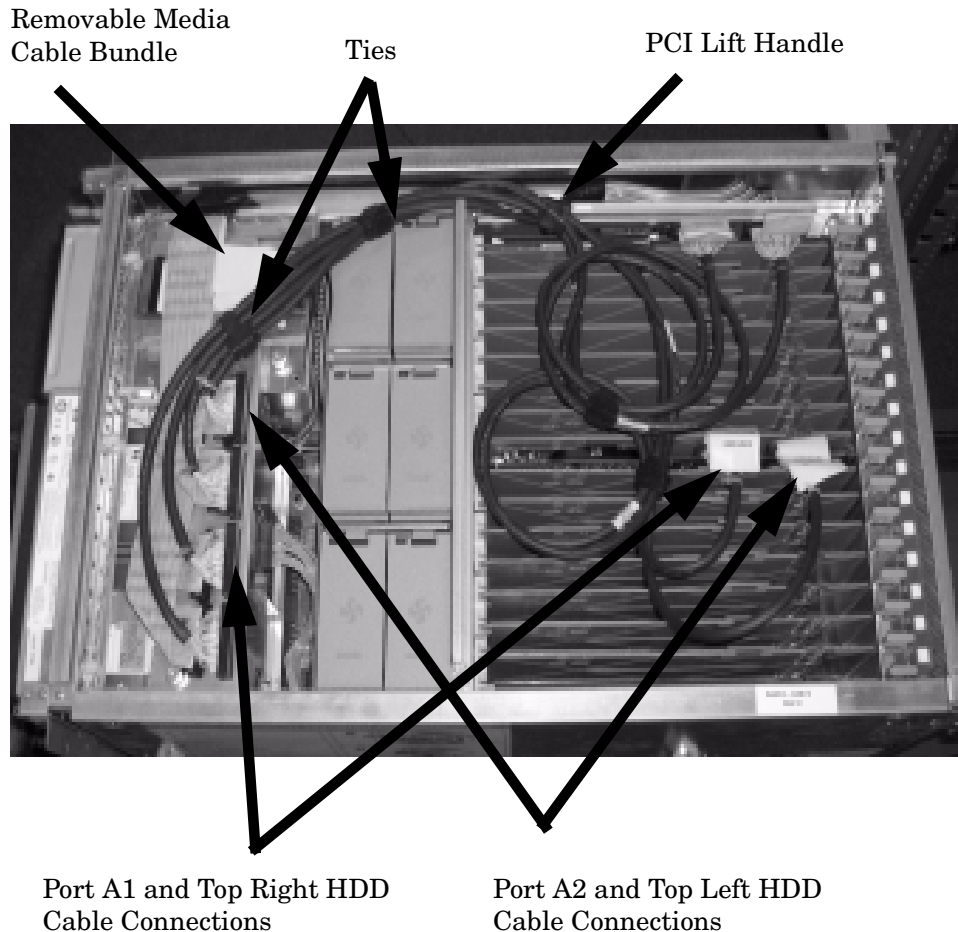
**Step 8.** Plug the new cable from the Smart Array card Port A2 into the mass storage connector for the top left drive.

**Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the second connector from the right on the Mass Storage Backplane when viewed from the front of the server. See Figure 2-3

**Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 2-5.

**Step 11.** Plug the new cable from the Smart Array card Port A1 into the mass storage connector for the top right drive.

**Figure 2-6 Smart Array Controller Card with Dual Partition Cabling**



### **RAID Cabling for IO Chassis 1 (Bottom Left and Bottom Right Hot Plug Hard Drives)**

To set up the RAID cabling on the bottom left and bottom right hot plug hard drives, do the following, from the front of the server:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of IO Chassis 1.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end). Using a different color tie on each cable makes it easier to identify the cables for installation and servicing.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.

---

## Dual Partition Configurations

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port A2 on the Smart Array card (Port 1 is near the rear of the server). Repeat for SCSI connector Port A1 (Port 2 is near the center of the board).
- Step 5.** Route the cables as shown in Figure 2-7 towards the front of the server and over to the Mass Storage Backplane connectors.

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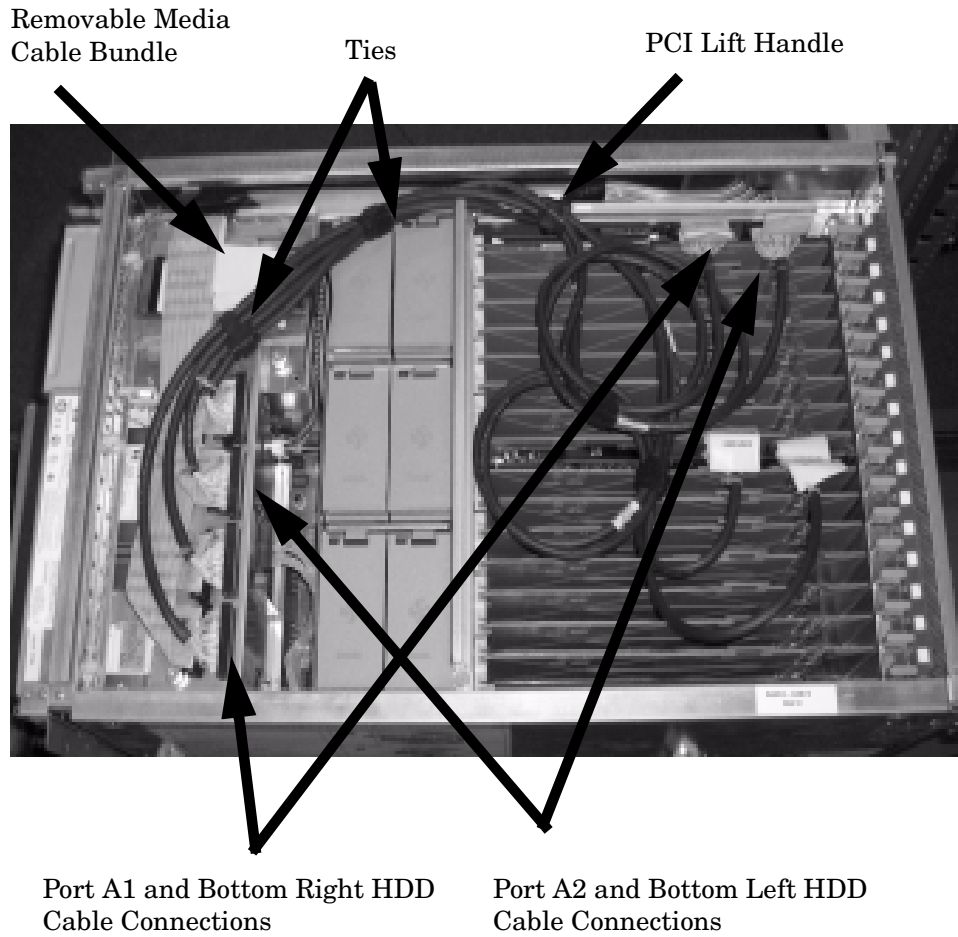
**WARNING**    **The cables must be routed along the side of the PCI card cage and PCI fans. They must not lay on top of the PCI fans or the PCI air dam. Doing so will damage the cables.**

---

- Step 6.** Unplug the existing SCSI ribbon cable for the bottom left HDD. This is the second connector from the left on the Mass Storage Backplane when viewed from the front of the server. See Figure 2-7
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 2-5.
- Step 8.** Plug the new cable from the Smart Array card Port A2 into the mass storage connector for the top left drive.
- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the right most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 2-7
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 2-5.
- Step 11.** Plug the new cable from the Smart Array card Port A1 into the mass storage connector for the top right drive.
- Step 12.** Arrange the new cables as shown in Figure 2-7 so that all of the slack is located in the PCI card cage. The cables must be routed behind the removable media cable bundle and to the side of the air dam as shown.
- Step 13.** Loop the cable slack as shown in Figure 2-7.
- Step 14.** Use the Kwik Wrap ties to secure the cables in the chassis and to maintain the slack. One tie should secure the cables to the PCI card cage through the lift handle
- Step 15.** Arrange the new cables as shown in Figure 2-7 so that all of the slack is located in the PCI card cage.
- Step 16.** Loop the cable slack as shown in Figure 2-7. Use the Kwik Wraps to fasten the cables in place and maintain the slack (this allows servicing of the other PCI cards).



**Figure 2-7 Smart Array Controller Card with Dual Partition Cabling**



## Insight Manager 7 Hard Disk Drive Mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD, as shown in Table 2-2.

**Table 2-2 Hard Drive Mapping for the HP Integrity rx8620 Server**

SA5302 or 5304 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	0	8	0	0	A2	6	rx8620 Top Left
0	0	0	8	0	0	A1	6	rx8620 Top Right
0	0	1	8	0	1	A2	6	rx8620 Bottom Left
0	0	1	8	0	1	A1	6	rx8620 Bottom Right
8	0	0	8	8	2	A2	6	SEU Top Left
8	0	0	8	8	2	A1	6	SEU Top Right
8	0	1	8	8	3	A2	6	SEU Bottom Left
8	0	1	8	8	3	A1	6	SEU Bottom Right

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array Controller User Guide*:

- Configure your HP Smart Array controller card in an HP Integrity server (use HP Smart Array utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array utilities and software that help you manage your RAID
- Configure the HP Smart Array controller card for an external RAID storage system



---

## 3 Cabling for the Server Expansion Unit

This chapter describes how to connect the cables of an HP Smart Array controller card to the internal hard drives of a Server or Server Expansion Unit (SEU) connected to an HP Integrity rx8620 or rx8640 server.

---

**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

---

Table 3-1 shows the product numbers, descriptions and support matrix for the HP Smart Array controllers supported on the rx8620 and rx8640 servers. If a card is supported in a server, that card is also supported in a SEU connected to that server.

**Table 3-1 Smart Array Cards Available for the HP Integrity rx8620 Server**

Controller	Product Number	Description	Supported on rx8620	Supported on rx8640
SA5302	A9825A	2 channel / 128 MB cache	Y	N
SA5304	A9826A	4 channel / 256 MB cache	Y	N
SA6402	A9890A	2 channel / 128 MB cache	Y	Y
SA6404	A9891A	4 channel / 256 MB cache	Y	Y

---

**NOTE** When cabling an HP Smart Array controller card to the Server Expansion Unit (SEU), the PCI-X I/O and SCSI HDD Backplane architecture are identical in the rx8620/rx8640 server and in the Server Expansion Unit. Adding the Server Expansion Unit allows for a 3-partition or 4-partition configuration.

---

Before you begin, you need:

- Cable kit (part number: A7027-63001)
- Smart Array controller card: See Table 3-1 for product numbers.

---

**NOTE** The part and product numbers listed in this document are correct as of the release date of the document. Check <http://partsurfer.hp.com> for the most current part numbers.

---

---

## HP Smart Array Controller Card Ports

The ports on the HP Smart Array Controller Cards are labeled as shown in Table 3-2

**Table 3-2 HP Smart Array Controller Card Port Labels**

Controller Card	Port	Location
SA 5302/SA5304	Port 1	Port near bulkhead
	Port 2	Port near center of card
SA 6402/SA6404	Port A2	Port near bulkhead
	Port A1	Port near center of card

When a port is referenced in this document the following notation is used. See Figure 3-1 for additional information.

**Table 3-3 Port Identification Notation**

Notation	Port Location
Port 1/A2	Port near bulkhead
Port 2/A1	Port near center of card

---

## Installing the HP Smart Array Controller Card

- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cords.
- Step 2.** Remove the top cover of the SEU.
- Step 3.** If only one HP Smart Array controller card is to be installed, install it into slot 8 of IO Chassis 0 for internal RAID configuration.
- Step 4.** If two HP Smart Array controller cards are to be installed, install them into slots 8 of IO Chassis 0 and IO Chassis 1 for internal RAID configuration.

---

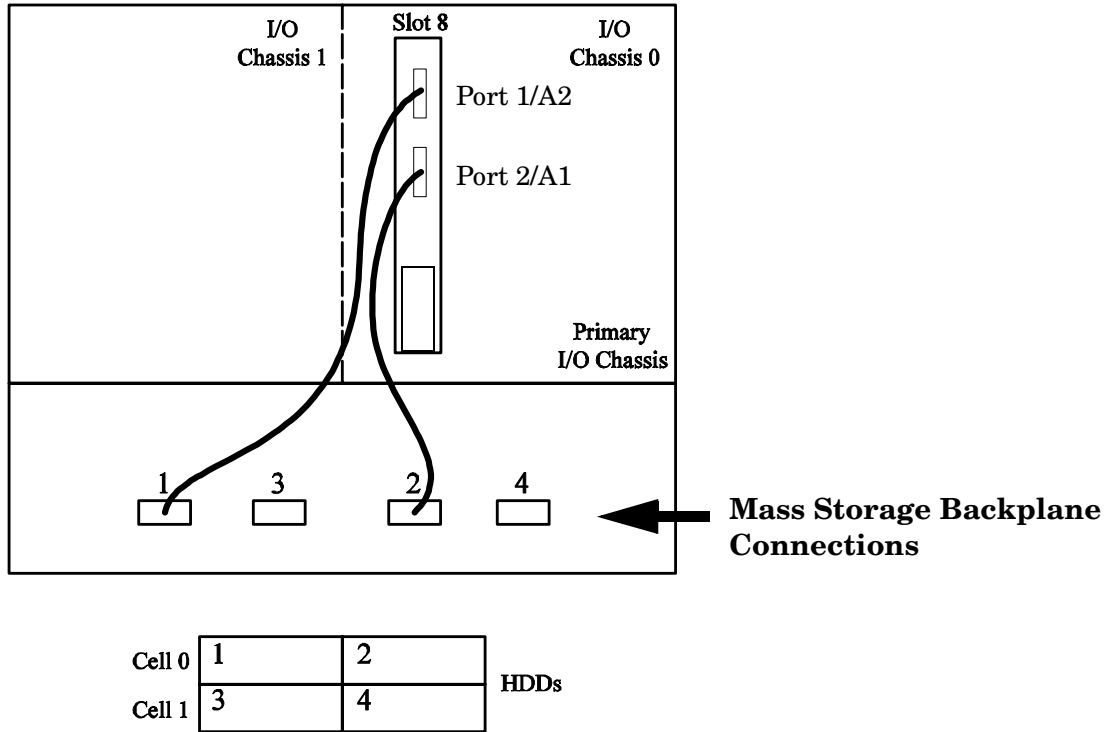
**NOTE** The HP Smart Array controller card must be installed in PCI slot 8 for internal RAID configurations. If another PCI card is located in slot 8, that card must be relocated to another slot.

---

## Single Partition RAID Configuration

Figure 3-1 shows the correct cabling for a single partition configuration, as viewed from the front of the SEU.

**Figure 3-1 Smart Array Controller Card with Single Partition Cabling**



## RAID Cabling for IO Chassis 0 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of the IO Chassis 0.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color tie, one on each end.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled “This Connector to PCI Card”. This end of the cable connects to the HP Smart Array card.

---

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1/A2 on the Smart Array card. Repeat for SCSI connector Port 2 /A1.
- Step 5.** Route the cables as shown in Figure 3-3 towards the front of the server and over to the Mass Storage Backplane connectors.

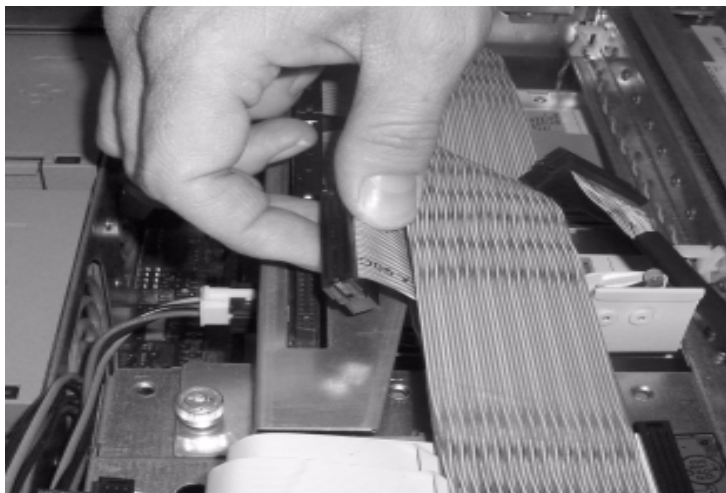
---

**WARNING** The cables must be routed along the side of the SEU. They must not lay on top of the flat SCSI ribbon cable bundle or the PCI air dam. Doing so will damage the cables when the top is installed.

---

- Step 6.** Unplug the existing SCSI ribbon cable for the top left HDD. This is the left most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 3-1
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 3-2.

**Figure 3-2 Folded SCSI Connector**

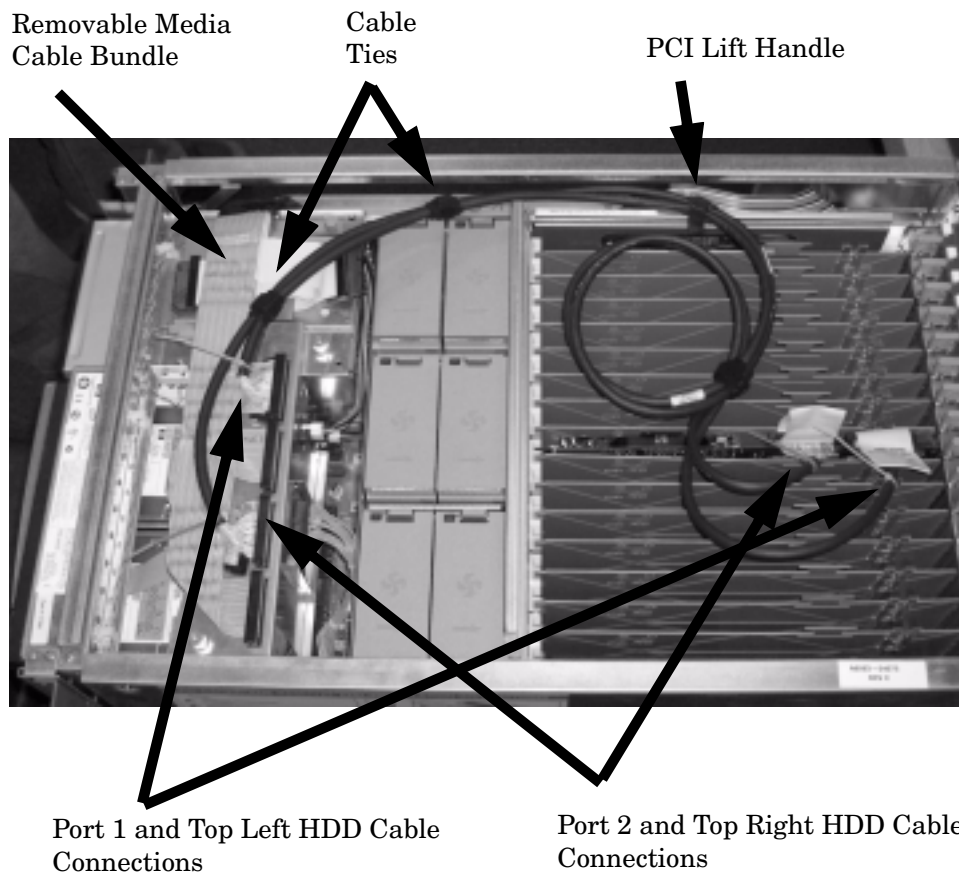


- Step 8.** Plug the new cable from the Smart Array card Port 1/A2 into the mass storage connector for the top left drive.



- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the second connector from the right on the Mass Storage Backplane when viewed from the front of the server. See Figure 3-3
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 3-2.
- Step 11.** Plug the new cable from the Smart Array card Port 2/A1 into the mass storage connector for the top right drive.
- Step 12.** Arrange the new cables as shown in Figure 3-3 so that all of the slack is located in the PCI card cage. The cables must be routed behind the removable media cable bundle and to the side of the air dam as shown.
- Step 13.** Loop the cable slack as shown in Figure 3-3.
- Step 14.** Use the Kwik Wrap ties to secure the cables in the chassis and to maintain the slack. One tie should secure the cables to the PCI card cage through the lift handle

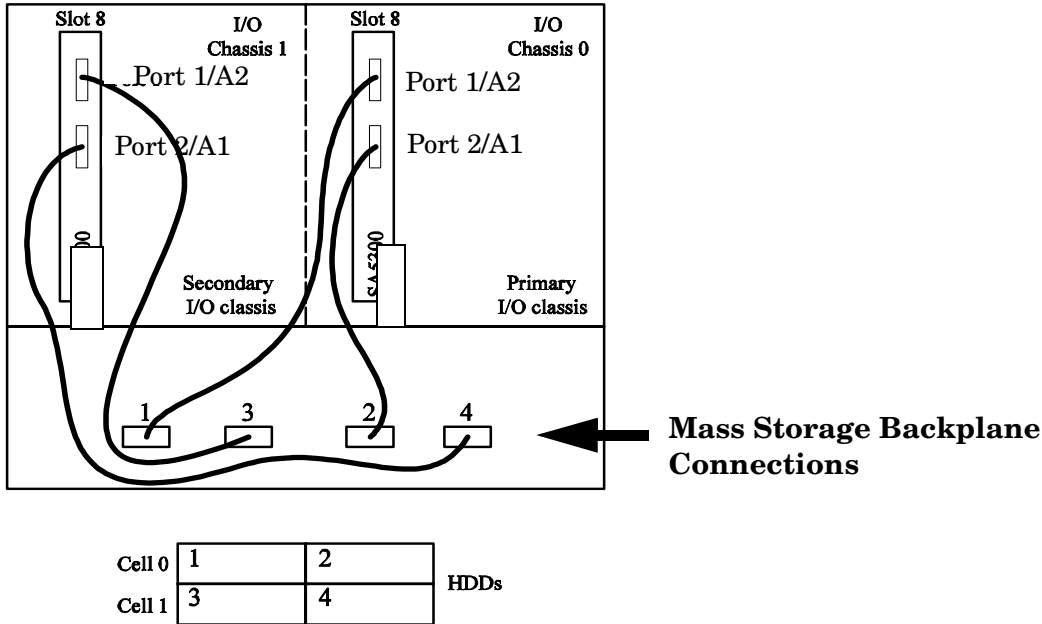
**Figure 3-3 Smart Array Controller Card with Single Partition Cabling**



## Dual Partition Configurations

Figure 3-4 shows the correct cabling for a dual partition configuration, as viewed from the front of the SEU.

**Figure 3-4 Smart Array Controller Card with Dual Partition Cabling**



### RAID Cabling for IO Chassis 0 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of the IO Chassis 0.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color, one on each end.

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled “This Connector to PCI Card”. This end of the cable connects to the HP Smart Array card.

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1/A2 on the Smart Array card. Repeat for SCSI connector Port 2A1.
- Step 5.** Route the cables as shown in Figure 3-3 towards the front of the server and over to the Mass Storage Backplane connectors.

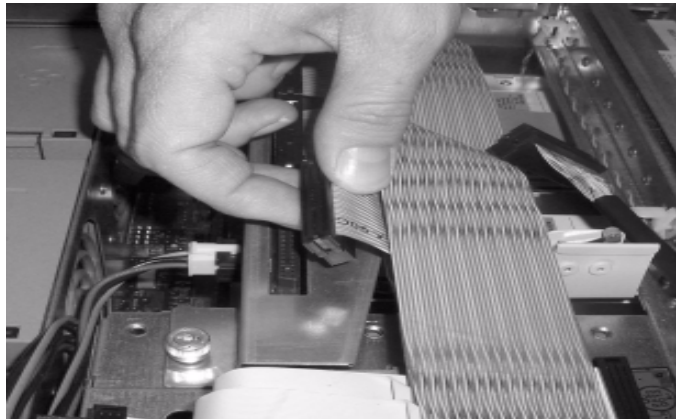
---

**WARNING** The cables must be routed along the side of the server. They must not lay on top of the flat SCSI ribbon cable bundle or the PCI air dam. Doing so will damage the cables when the top is installed.

---

- Step 6.** Unplug the existing SCSI ribbon cable for the top left HDD. This is the left most connector on the Mass Storage Backplane when viewed from the front of the server. See Figure 3-1
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 3-5.

**Figure 3-5 Folded SCSI Connector**



- Step 8.** Plug the new cable from the Smart Array card Port 1/A2 into the mass storage connector for the top left drive.
- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the second connector from the right on the Mass Storage Backplane when viewed from the front of the server. See Figure 3-1
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 3-5.
- Step 11.** Plug the new cable from the Smart Array card Port 2/A1 into the mass storage connector for the top right drive.

### **RAID Cabling for IO Chassis 1 (Bottom Left and Bottom Right Hot Plug Hard Drives)**

To set up the RAID cabling on the bottom left and bottom right hot plug hard drives, do the following, from the front of the server:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 8 of IO Chassis 1.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end). Using a different color tie on each cable makes it easier to identify the cables for installation and servicing.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled “This Connector to PCI Card”. This end of the cable connects to the HP Smart Array card.

---

- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1A2 on the Smart Array card. Repeat for SCSI connector Port 2/A1.
- Step 5.** Route the cables as shown in Figure 3-6 towards the front of the server and over to the Mass Storage Backplane connectors.

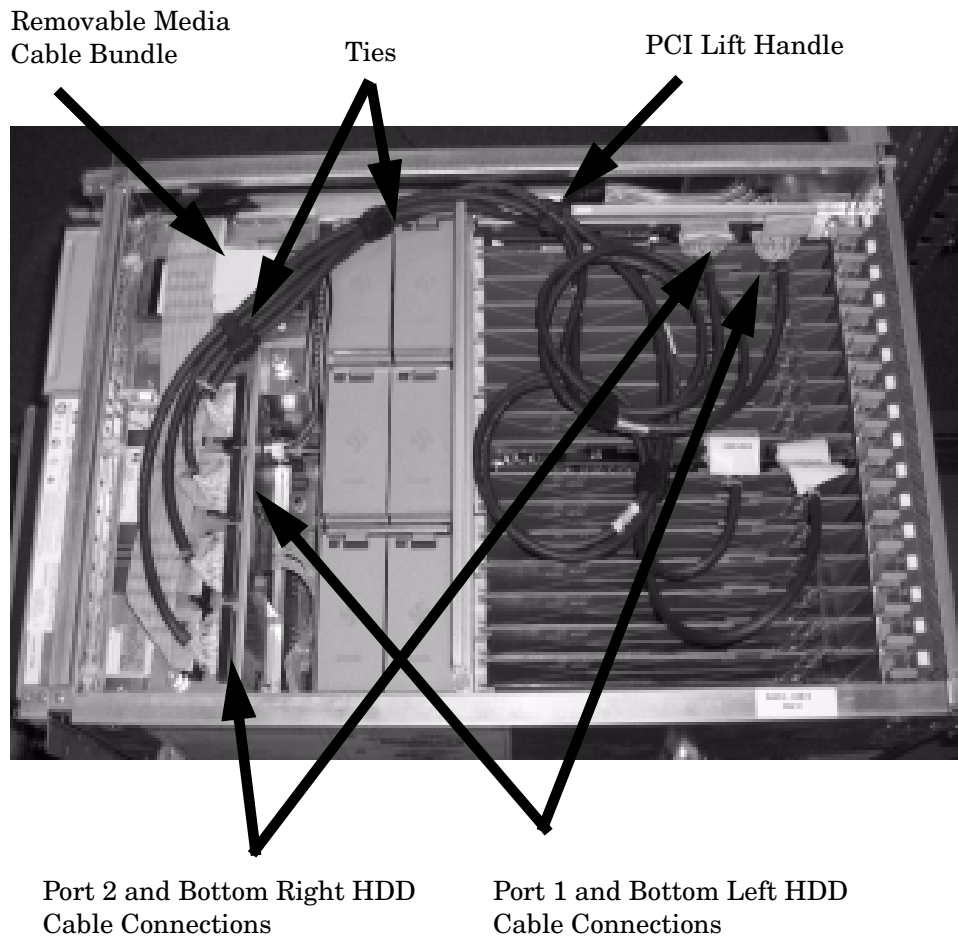
---

**WARNING** The cables must be routed along the side of the PCI card cage and PCI fans. They must not lay on top of the PCI fans or the PCI air dam. Doing so will damage the cables.

---

- Step 6.** Unplug the existing SCSI ribbon cable for the bottom left HDD. This is the second connector from the left on the Mass Storage Backplane when viewed from the front of the server. See Figure 3-6
- Step 7.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 3-5.
- Step 8.** Plug the new cable from the Smart Array card Port 1A2 into the mass storage connector for the top left drive.
- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD. This is the right most connector on the Mass Storage Bacplane when viewed from the front of the server. See Figure 3-6
- Step 10.** Fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 3-5.
- Step 11.** Plug the new cable from the Smart Array card Port 2/A1 into the mass storage connector for the top right drive.
- Step 12.** Arrange the new cables as shown in Figure 3-6 so that all of the slack is located in the PCI card cage. The cables must be routed behind the removable media cable bundle and to the side of the air dam as shown.
- Step 13.** Loop the cable slack as shown in Figure 3-6.
- Step 14.** Use the Kwik Wrap ties to secure the cables in the chassis and to maintain the slack. One tie should secure the cables to the PCI card cage through the lift handle
- Step 15.** Arrange the new cables as shown in Figure 3-6 so that all of the slack is located in the PCI card cage.
- Step 16.** Loop the cable slack as shown in Figure 3-6. Use the Kwik Wraps to fasten the cables in place and maintain the slack (this allows servicing of the other PCI cards).

**Figure 3-6 Smart Array Controller Card with Dual Partition Cabling**



## Insight Manager 7 Hard Disk Drive Mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD, as shown in Table 3-4.

**Table 3-4 Hard Drive Mapping for the HP Integrity rx8620 Server**

SA5302 or 5304 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	0	8	0	0	1/A2	6	rx8620 Top Left
0	0	0	8	0	0	2/A1	6	rx8620 Top Right
0	0	1	8	0	1	1/A2	6	rx8620 Bottom Left
0	0	1	8	0	1	2/A1	6	rx8620 Bottom Right
8	0	0	8	8	2	1/A2	6	SEU Top Left
8	0	0	8	8	2	2/A1	6	SEU Top Right
8	0	1	8	8	3	1/A2	6	SEU Bottom Left
8	0	1	8	8	3	2/A1	6	SEU Bottom Right

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array Controller User Guide*:

- Configure your HP Smart Array controller card in an HP Integrity server (use HP Smart Array utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array utilities and software that help you manage your RAID
- Configure the HP Smart Array controller card for an external RAID storage system





---

# 4 Cabling for the HP Integrity rx7620 Server

This chapter describes how to connect the cables of an HP Smart Array 6402 or 6404 controller card to the internal hard drives of an HP Integrity rx7620 Server.

---

**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

---

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache.

Table 4-1 shows the product numbers and descriptions for these cards.

**Table 4-1 Smart Array Cards Available for the HP Integrity rx7620 Server**

Controller	Product Number	Description
SA6402	A9890A	2 channel / 128 MB cache
SA6404	A9891A	4 channel / 256 MB cache

Before you begin, you need:

- Cable kit (part number: A7027-63001)
- T-15 Torx driver
- 3/16-inch hex driver
- Smart Array controller card

---

## Installing the HP Smart Array 6402 or 6404 Controller Card

**Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.

**Step 2.** Remove the top cover of the server.

**Step 3.** If only one HP Smart Array controller card is to be installed, install it into slot 7 of IO Chassis 1 for internal RAID configuration.

**Step 4.** If two HP Smart Array controller cards are to be installed, install one into slot 8 of IO Chassis 0 and the other into slot 7 of IO Chassis 1 for internal RAID configuration.

---

**NOTE** The HP Smart Array 6402 or 6404 controller card must be installed in PCI slot 8 in IO Chassis 0 and PCI slot 7 in IO Chassis 1 for internal RAID cabling. If another PCI card is installed in these slots it must be relocated to another slot. The LAN SCSI Core IO card is installed in slot 8 of IO Chassis 1. If a second LAN SCSI card is installed it will be in slot 1 of IO Chassis 0.

---

## Recabling for RAID

From the factory, the internal hot plug drives for the HP Integrity rx7620 server are connected to the integrated SCSI card as follows (when viewed from the front of the server):

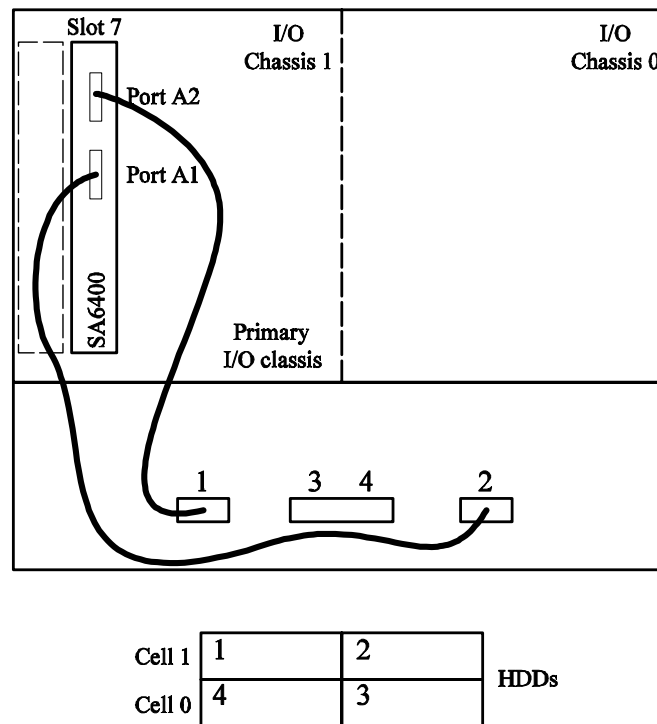
- The top left hard drive has a SCSI connector cabled to the management processor (MP) card
- The top right hard drive has a SCSI connector cabled to the Core I/O slot 8 cell 1
- The bottom left and right hard drive has a SCSI connector cabled to internal SCSI cell 0

To use RAID with your hot plug drives, you must disconnect the internal SCSI cables from their embedded controller and use the Cable kit (A7027-63001). Then follow the appropriate set of instructions given below.

### Single Partition Configuration

Figure 4-1 shows the correct cabling for a single partition configuration, as viewed from the front of the server.

**Figure 4-1 Smart Array Controller Card with Single Partition Cabling**



### Setting up RAID Cabling for IO Chassis 1 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 1-7.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color, one on each end.

---

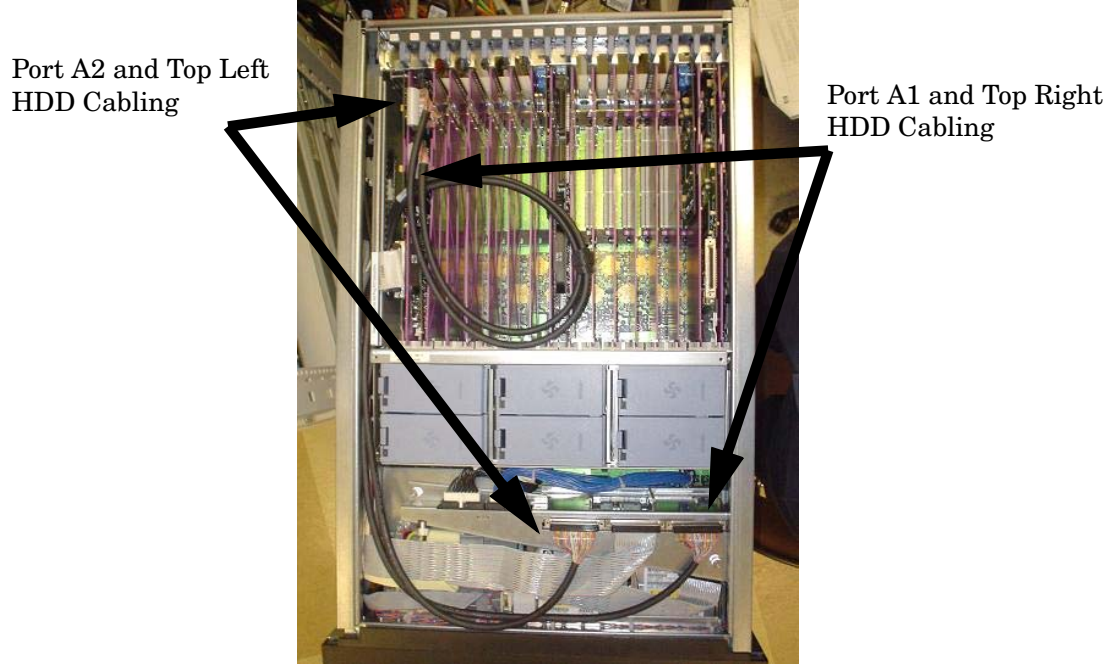
<b>NOTE</b>	One end of each cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.
-------------	--

---

- Step 4.** Plug the end of the cable with the pull-tab into the SCSI connector port A1 on the Smart Array card. Repeat for SCSI connector port A2.
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cables for the top left and top right HDDs (use the label behind the connectors to determine which connector goes to which drive).
- Step 8.** Plug the new cable from the Smart Array card Port A2 (closest to the bracket) into the mass storage connector for the top left drive.
- Step 9.** Plug the new cable from the Smart Array card Port A1 (closest to the center of the board) into the mass storage connector for the top right drive.
- Step 10.** Arrange the new cables so that all of the slack is located in the PCI area.
- Step 11.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).
- Step 12.** Leave the un-plugged SCSI ribbon cable to rest just in front of the SCSI connector.

Figure 4-2 shows what the cabling looks like when installed.

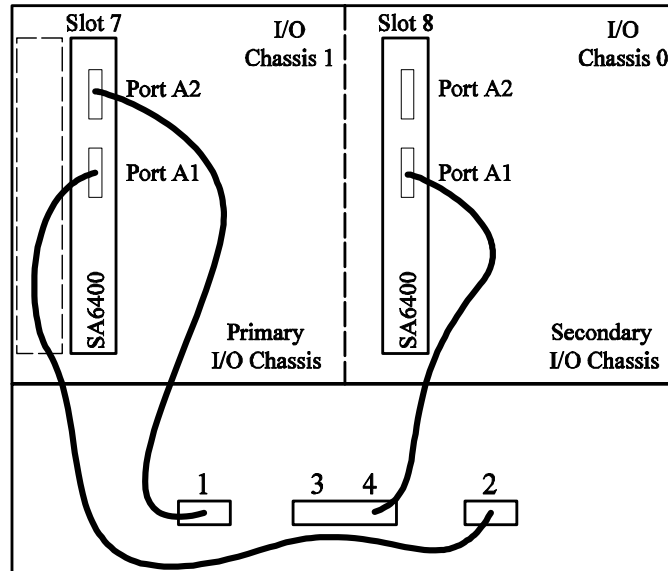
**Figure 4-2 Smart Array 6402 Controller Card with Single Partition Cabling**



## Dual Partition Configurations

Figure 4-3 shows the correct cabling for a dual partition configuration, as viewed from the front of the server.

**Figure 4-3 Smart Array 6402 or 6404 Controller Card with Dual Partition Cabling**



Cell 1	1	2	HDDs
Cell 0	4	3	

### Setting up RAID Cabling for IO Chassis 1 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

- Step 1.** Verify that the HP Smart Array controller card is installed in PCI slot 1-7.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit. For each cable, use two of the same color, one on each end.

---

**NOTE** One end of each cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.

---

- Step 4.** Plug the end of the cable with the pull-tab into the SCSI connector port A1 on the Smart Array card. Repeat for SCSI connector port A2.
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cables for the top left and top right HDDs (use the label behind the connectors to determine which connector goes to which drive).

## Recabling for RAID

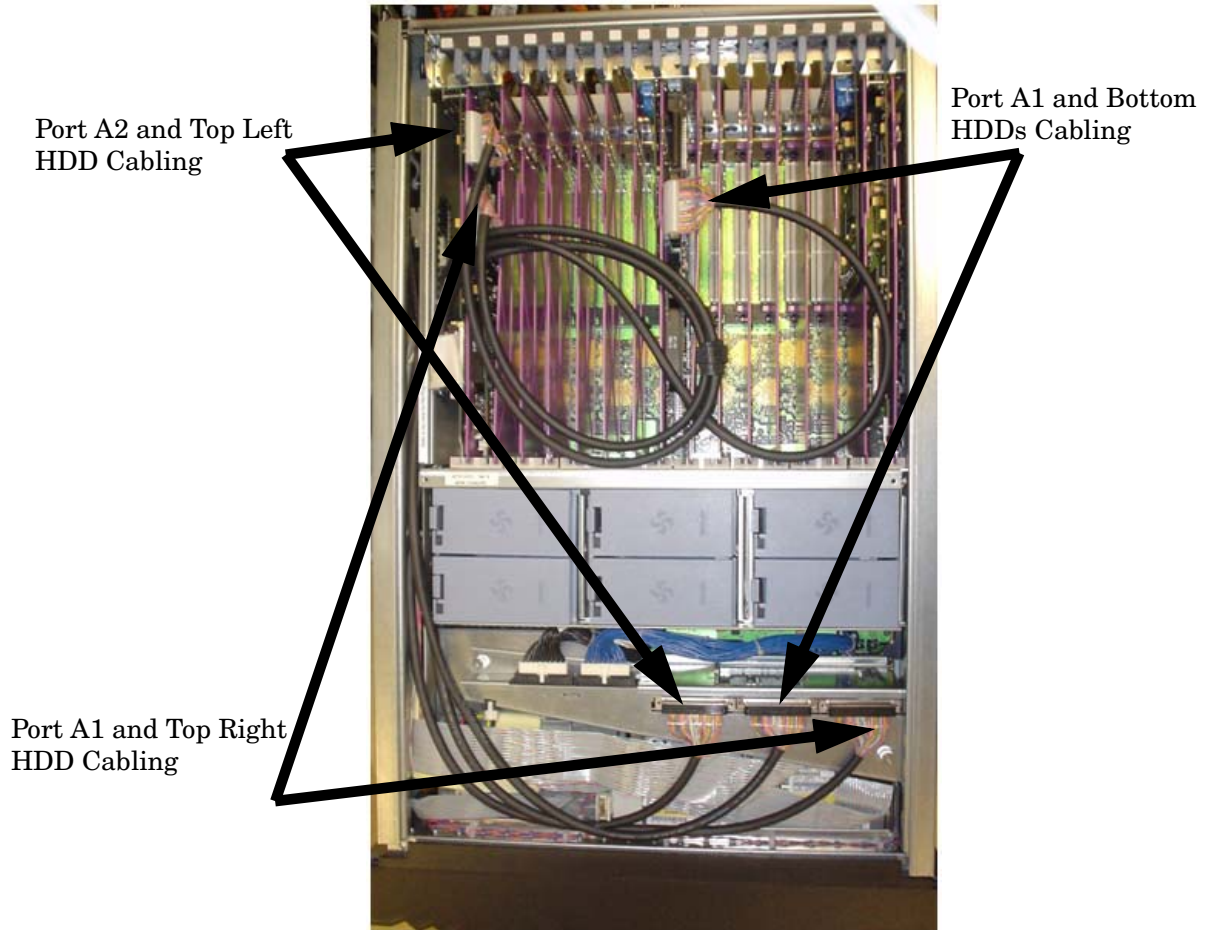
- Step 8.** Plug the new cable from the Smart Array card Port A2 (closest to the bracket) into the mass storage connector for the top left drive. See Figure 4-3.
- Step 9.** Plug the new cable from the Smart Array card Port A1 (closest to the center of the board) into the mass storage connector for the top right drive. See Figure 4-3.
- Step 10.** Arrange the new cables so that all of the slack is located in the PCI area.
- Step 11.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).

### Setting up RAID Cabling for IO Chassis 0 (Bottom Hot Plug Hard Drives)

To set up the RAID cabling on the bottom hot plug hard drives, do the following, from the front of the server:

- Step 1.** Verify that the HP Smart Array 6402 or 6404 controller card is installed in PCI slot 0-8. Refer to *HP Smart Array 6400 User Guide*.
- Step 2.** Retrieve one cable from the cable kit (A7027-63001).
- Step 3.** Identify the new cable using the colored cable ties which are also contained in the cable kit (use two of the same color, one on each end).
- Step 4.** Plug the end of the cable with the pull-tab into the SCSI connector port A1 on the Smart Array card. See Figure 4-3.
- Step 5.** Route the other end of the cable out through the left hand side of the server.
- Step 6.** Route the cable towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cable for the bottom HDDs. This is the center connector on the Mass Storage Backplane.
- Step 8.** Plug the new cable from the Smart Array card into the mass storage connector for the bottom HDDs.
- Step 9.** Arrange the new cables so that all the slack is located in the PCI area.
- Step 10.** Fold the cable slack and use the Kwik Wraps to secure and maintain the slack (this allows servicing of the other PCI cards). See Figure 4-4.

**Figure 4-4 Smart Array 6402 or 6404 Controller Card with Dual Partition Cabling**



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## Insight Manager 7 Hard Disk Drive Mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD as shown in Table 4-2.

**Table 4-2 Hard Drive Mapping for the HP Integrity rx7620 Server**

SA6402 or 6404 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	1	7	0	1	2	6	Top Left
0	0	1	7	0	1	1	6	Top Right
0	0	0	8	0	0	1	6	Bottom Left
0	0	0	8	0	0	1	5	Bottom Right

---

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array 6400 Controller User Guide*:

- Configure your HP Smart Array 6402 or 6404 controller card in an HP Integrity server (use HP Smart Array 6400 utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array 6400 utilities and software that help you manage your RAID
- Configure the HP Smart Array 6402 or 6404 controller card for an external RAID storage system



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# 5 Cabling for the HP Integrity rx7640 Server

This chapter describes how to connect the cables of an HP Smart Array 6402 or 6404 controller card to the internal hard drives of an HP Integrity rx7640 Server.

---

**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

---

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache.

Table 5-1 shows the product numbers and descriptions for these cards.

**Table 5-1 Smart Array Cards Available for the HP Integrity rx7620 Server**

Controller	Product Number	Description
SA6402	A9890A	2 channel / 128 MB cache
SA6404	A9891A	4 channel / 256 MB cache

Before you begin, you need:

- Cable kit (part number: A7027-63001)
- T-15 Torx driver
- 3/16-inch hex driver
- Smart Array controller card.

---

## Installing the HP Smart Array 6402 or 6404 Controller Card

Installation of the HP Smart Array Controller Card requires that the LAN/SCSI card for each partition is moved from the standard installation position to slot 7. Follow the procedures below to install and cable the Smart Array Controller Card.

---

## Recabling for RAID

From the factory, the internal hot plug drives for the HP Integrity rx7620 server are connected to the integrated SCSI card as follows (when viewed from the front of the server):

- The top left hard drive has a SCSI connector cabled to the management processor (MP) card for cell 1
- The top right hard drive has a SCSI connector cabled to the Core I/O slot 8 cell 1 LAN SCSI card
- The bottom left hard drive has a SCSI connector cabled to the management processor (MP) card for cell 0

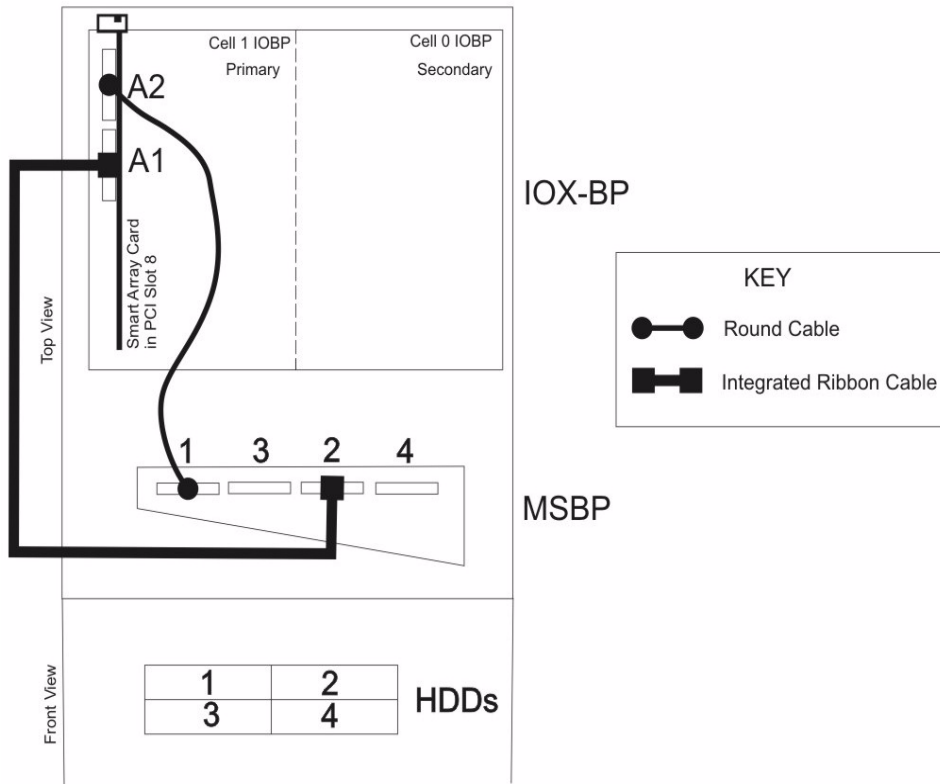
- The bottom right hard drive has a SCSI connector cabled to Core I/O slot 8 cell 0 LAN SCSI card.

To use RAID with your hot plug drives, you must reconfigure the internal SCSI cables as instructed and use the Cable kit (A7027-63001). Follow the instruction below for the configuration you are installing.

### Single Partition Configuration

Figure 5-1 shows the correct cabling for a single partition configuration, as viewed from the front of the server.

**Figure 5-1 Single Partition RAID Cabling**



### Setting up RAID Cabling for IO Chassis 1 (Top Left and Top Right Hot Plug Hard Drives)

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following:

**Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cords.

**Step 2.** Remove the top and left covers of the server.

---

<b>NOTE</b>	The HP Smart Array Card must be installed in slot 8 of the rx7640 server. This requires the LAN/SCSI card to be moved to slot 7 in the IO chassis. This will change the boot paths of any devices connected to the external SCSI connectors on the LAN/SCSI card.
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**Step 3.** Carefully disconnect the flat ribbon cable from the LAN/SCSI card installed in slot 8 of IO chassis 1. The ribbon cable will be re-used in the RAID configuration.

**Step 4.** Label and disconnect any external cables from the LAN/SCSI card installed in slot 8 of IO chassis 1.

**Step 5.** Remove the LAN/SCSI card from the server and set it aside to be installed later

**Step 6.** Retrieve one cable from the cable kit (A7027-63001).

**Step 7.** Identify the new cable using the colored cable ties which are also contained in the cable kit. Use two of the same color ties on the cable.

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<b>NOTE</b>	One end of the cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.
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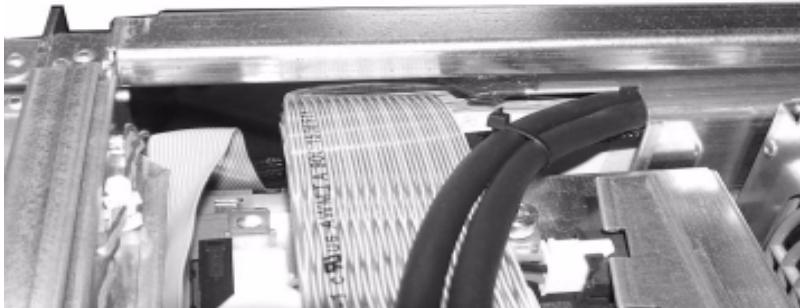
**Step 8.** Route the end of the cable with the pull-tab through the PCI Card cage handle on the left side of the server. See Figure 5-2.

**Figure 5-2 SCSI Cables Routed Through PCI Card Cage Handle**



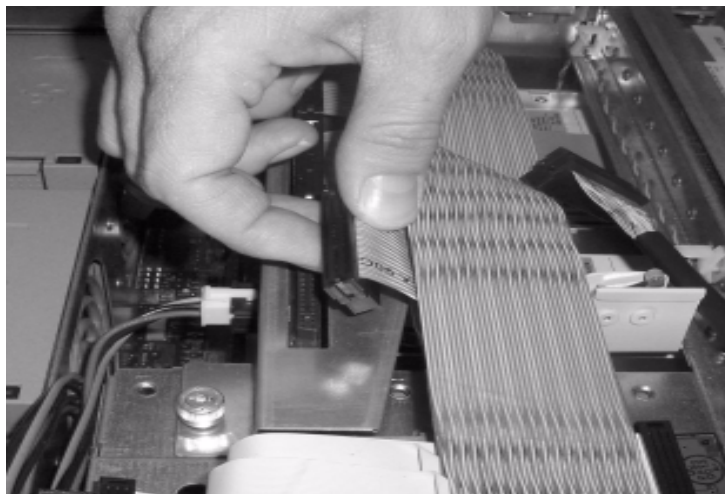
- Step 9.** Carefully route the round SCSI cable through the cable guide attached to the system backplane to the front of the server. The cable follows the same path as the flat SCSI ribbon cable already installed in the server. See Figure 5-3.

**Figure 5-3 SCSI Cable Routed Through Cable Guide**



- Step 10.** Unplug the existing SCSI ribbon cable for the top left HDD and fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 5-4.

**Figure 5-4 Folded SCSI Connector**

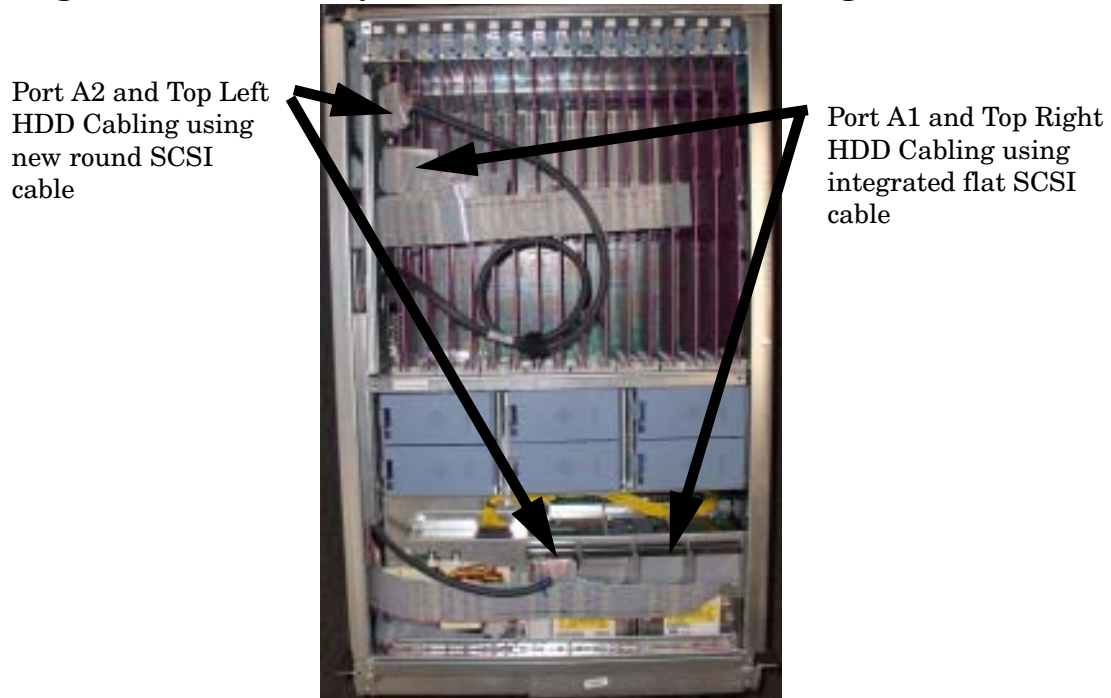


- Step 11.** Plug the new cable into the mass storage connector for the top left drive.
- Step 12.** Pull any excess cable into the PCI card cage of the server.
- Step 13.** Install the HP Smart Array Controller Card into slot 8 of IO chassis 1 of the server.
- Step 14.** Install the LAN SCSI Core IO card into slot 7 of IO chassis 1 of the server.
- Step 15.** Connect the flat SCSI cable to port A1 of the HP Smart Array Controller Card. (closest to the front of the server).
- Step 16.** Connect the round SCSI cable to port A2 of the HP Smart Array Controller Card. (closest to the rear of the server).
- Step 17.** Re-connect any other cables disconnected during installation.

**Step 18.** Arrange the new cable so that all of the slack is located in the PCI area.

**Step 19.** Loop the cable slack and wrap a Kwik Wrap around it to maintain the slack. This allows servicing of the other PCI cards. See Figure 5-5.

**Figure 5-5 Smart Array 6402 Controller Card with Single Partition Cabling**



**Step 20.** Reinstall the top and side covers.

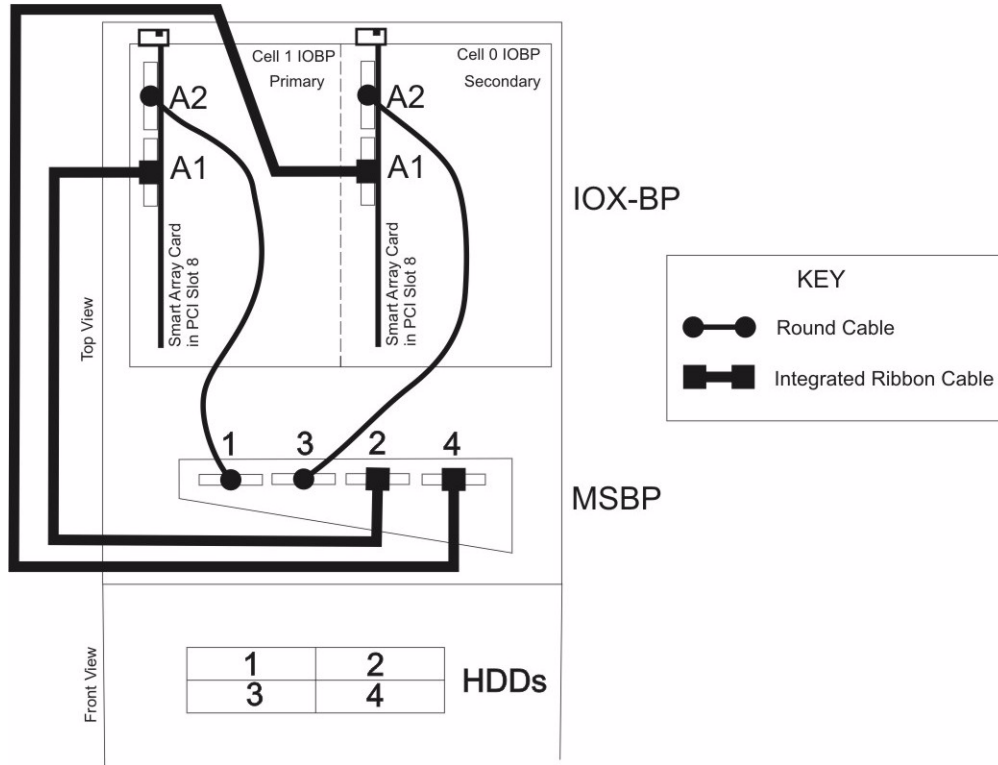
**Step 21.** Reinstall the power cords.

**Step 22.** HP Smart Array Controller card installation is complete.

## Dual Partition Configuration

Figure 5-1 shows the correct cabling for a dual partition configuration, as viewed from the front of the server.

**Figure 5-6 Single Partition RAID Cabling**



## Setting up RAID Cabling for Dual Partitions

To set up the RAID cabling do the following:

**Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cords.

**Step 2.** Remove the top and left covers of the server.

---

<b>NOTE</b>	The HP Smart Array Cards must be installed in slot 8 of the rx7640 server. This requires the LAN/SCSI cards to be moved to slot 7 in the IO chassis. This will change the boot paths of any devices connected to the external SCSI connectors on the LAN/SCSI card.
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**Step 3.** Carefully disconnect the flat ribbon cable from the LAN/SCSI card installed in slot 8 of IO chassis 0. The ribbon cable will be re-used in the RAID configuration.

**Step 4.** Label and disconnect any external cables from the LAN/SCSI card installed in slot 8 of IO chassis 0.

**Step 5.** Label and remove the LAN/SCSI card from the server and set it aside to be installed later.

**Step 6.** Carefully disconnect the flat ribbon cable from the LAN/SCSI card installed in slot 8 of IO chassis 1. The ribbon cable will be re-used in the RAID configuration.

**Step 7.** Label and disconnect any external cables from the LAN/SCSI card installed in slot 8 of IO chassis 1.

**Step 8.** Label and remove the LAN/SCSI card from the server and set it aside to be installed later.

**Step 9.** Retrieve two cables from the cable kit (A7027-63001).

**Step 10.** Identify the new cables using the colored cable ties which are also contained in the cable kit. Use two of the same color ties on each cable.

---

<b>NOTE</b>	One end of each cable has a pull-tab connected to the SCSI connector which is labeled "This Connector to PCI Card". This end of the cable connects to the HP Smart Array card.
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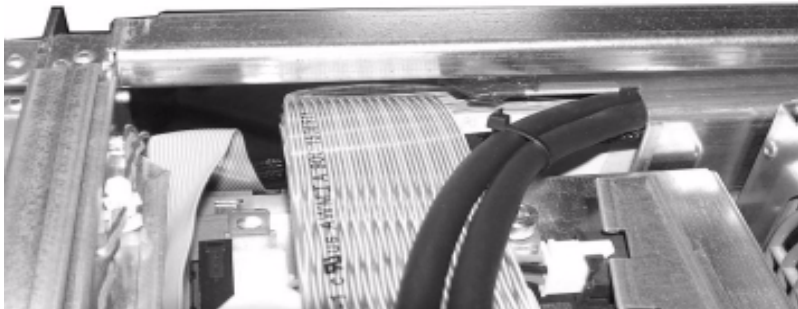
**Step 11.** Route the end of the cables with the pull-tab through the PCI Card cage handle on the left side of the server. See Figure 5-7.

**Figure 5-7 SCSI Cables Routed Through PCI Card Cage Handle**



**Step 12.** Carefully route the round SCSI cables through the cable guide attached to the system backplane to the front of the server. The cable follows the same path as the flat SCSI ribbon cable already installed in the server. See Figure 5-8.

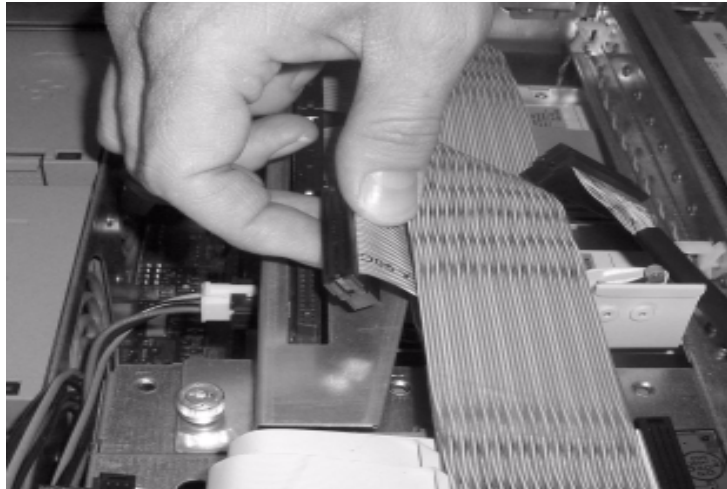
**Figure 5-8 SCSI Cable Routed Through Cable Guide**



**Step 13.** Unplug the existing SCSI ribbon cable for the top left HDD (disk 1) and fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 5-9.

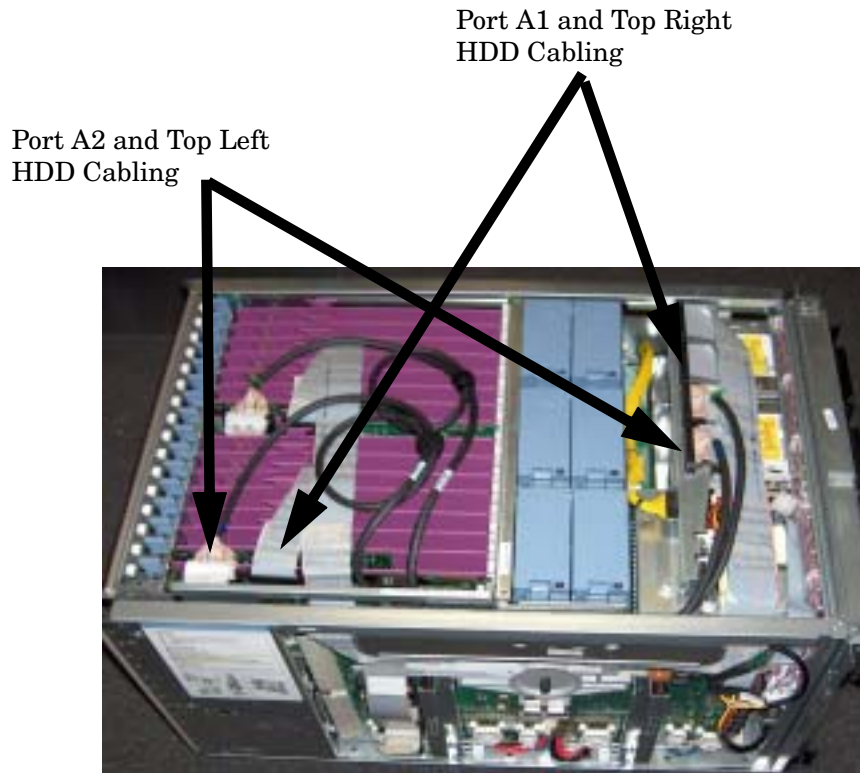


**Figure 5-9** Folded SCSI Connector

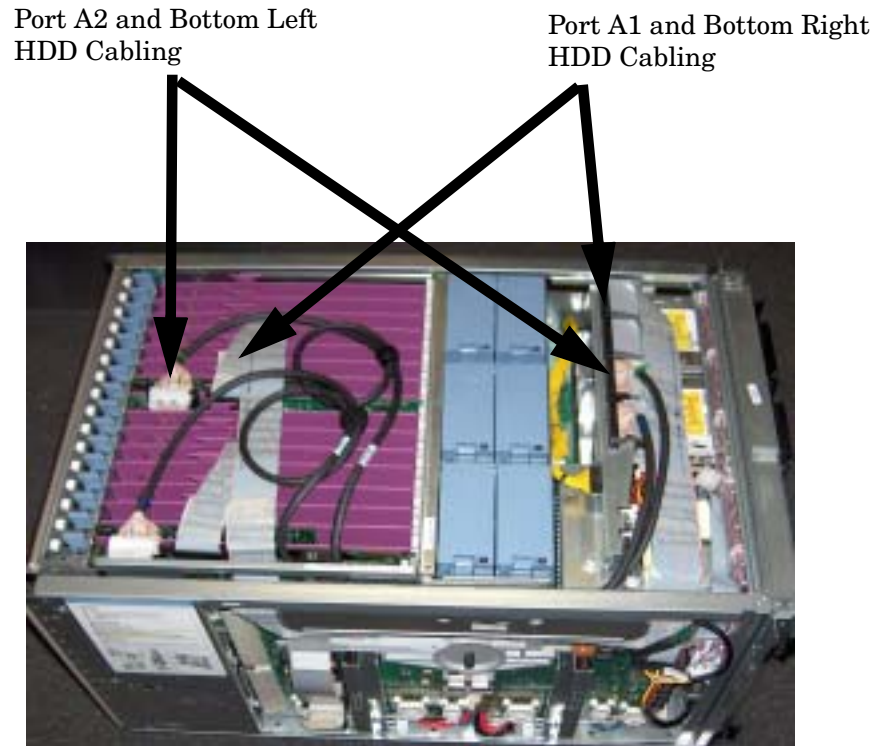


- Step 14.** Plug a new cable into the mass storage connector for the top left drive.
- Step 15.** Unplug the existing SCSI ribbon cable for the bottom left HDD (disk 3) and fold the SCSI connector on the ribbon cable so it will lay in front of the connector on the Mass Storage Backplane. See Figure 5-6 and Figure 5-9.
- Step 16.** Pull any excess cable into the PCI card cage of the server.
- Step 17.** Install one of the HP Smart Array Controller Cards into slot 8 of IO chassis 1 of the server.
- Step 18.** Reinstall the LAN/SCSI Core IO card from chassis 1 into slot 7 of IO chassis 1.
- Step 19.** Install the other HP Smart Array Controller Card into slot 8 of IO chassis 0 of the server.
- Step 20.** Reinstall the LAN/SCSI Core IO card from chassis 0 into slot 7 of IO chassis 0.
- Step 21.** Bend and crease the flat SCSI cables so they align with prot A1 on the HP Smart Array Controller Cards.
- Step 22.** Connect the flat SCSI cables to port A1 of the HP Smart Array Controller Cards. (closest to the front of the server). See Figure 5-10.
- Step 23.** Connect the round SCSI cable connected to the top left HDD to port A2 of the HP Smart Array Controller Card installed in slot 8 of IO Chassis 1. See Figure 5-10.
- Step 24.** Connect the round SCSI cable connected to the bottom left HDD to port A2 of the HP Smart Array Controller Card installed in slot 8 of IO Chassis 0. See Figure 5-10.
- Step 25.** Re-connect any other cables disconnected during installation.
- Step 26.** Arrange the new cables so that all of the slack is located in the PCI area.
- Step 27.** Loop the cable slack and wrap a Kwik Wrap around it to maintain the slack. This allows servicing of the other PCI cards. See Figure 5-10 and Figure 5-11.

**Figure 5-10 Smart Array 6402 Controller Card with Dual Partition Cabling  
Chassis 1**



**Figure 5-11 Smart Array 6402 Controller Card with Dual Partition Cabling  
Chassis 0**



**Step 28.** Reinstall the top and side covers.

**Step 29.** Reinstall the power cords.

**Step 30.** HP Smart Array Controller card installation is complete.

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## Insight Manager 7 Hard Disk Drive Mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD as shown in Table 5-2.

**Table 5-2 Hard Drive Mapping for the HP Integrity rx7620 Server**

SA6402 or 6404 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	1	7	0	1	2	6	Top Left
0	0	1	7	0	1	1	6	Top Right
0	0	0	8	0	0	1	6	Bottom Left
0	0	0	8	0	0	1	5	Bottom Right

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## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array 6400 Controller User Guide*:

- Configure your HP Smart Array 6402 or 6404 controller card in an HP Integrity server (use HP Smart Array 6400 utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array 6400 utilities and software that help you manage your RAID
- Configure the HP Smart Array 6402 or 6404 controller card for an external RAID storage system

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# 6 Cabling for the HP Integrity rx5670 Server

This chapter describes how to connect the cables of an HP Smart Array 5302 or 5304 controller card to the internal hard drives of an HP Integrity rx5670 Server.

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**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

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The Smart Array 5300 series of controller cards includes two models: the 5302 and the 5304. Model 5302 has two Wide Ultra160 SCSI channels and 128 MB of cache. Model 5304 has four Wide Ultra160 SCSI channels and 256 MB of cache.

Table 6-1 shows the product numbers and descriptions for these cards.

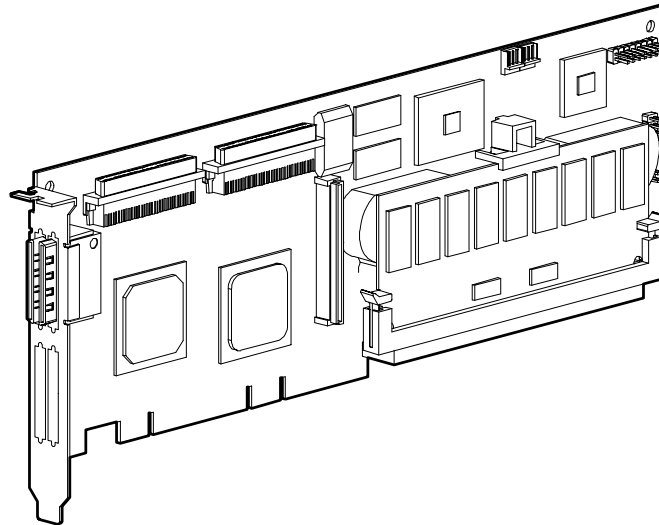
**Table 6-1 Smart Array Cards Available for the HP Integrity rx5670 Server**

Controller	Product Number	Description
SA5302	A9825A	2 channel / 128 MB cache
SA5304	A9826A	4 channel / 256 MB cache

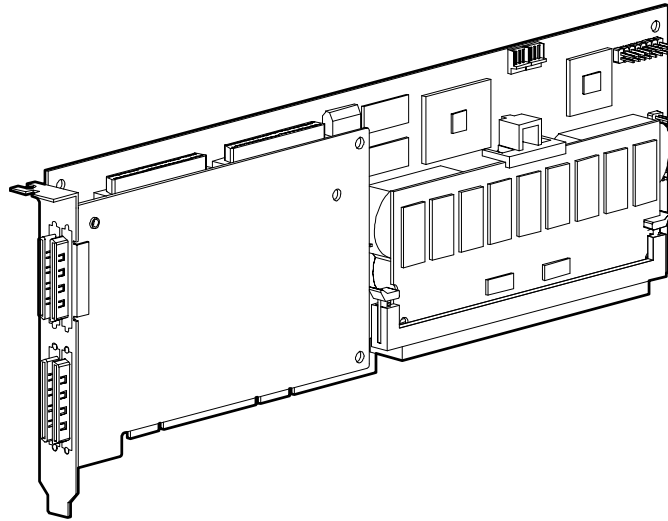
Before you begin, you need:

- Two extension cables included in this kit (part numbers: A9828-63001 and A9828-63002)
- Smart Array controller card (refer to Figure 6-1 and Figure 6-2)

**Figure 6-1 Smart Array 5302 Controller Card**



**Figure 6-2**      **Smart Array 5304 Controller Card**



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**NOTE**

If an HP Server rx5670 is ordered from the factory along with an internal RAID option (with the HP Smart Array controller card and extension cable A9828-63001 pre-installed), this extension cable connects hot plug drives A and B to PORT 1 of the HP Smart Array controller card installed in PCI slot 4. Refer to Figure 6-5 for the PCI slot location and Figure 6-7 for the physical drive location. The additional cable A9828-63002 is placed in the server top tray. The internal hot plug drives C and D are connected to the internal SCSI adapter in PCI slot 3.

PORT 2 of the HP Smart Array controller card is still be available to connect the external StorageWorks mass storage or internal hot plug drives C and D. If the internal hot plug drives C and D are required for RAID, you need to install cable A9828-63002 as described in the “Recabling for RAID” section later in this chapter.

If you opt to use both ports of the Smart Array controller card for your internal drives, you must purchase an additional HP Smart Array controller if you want external RAID mass storage.

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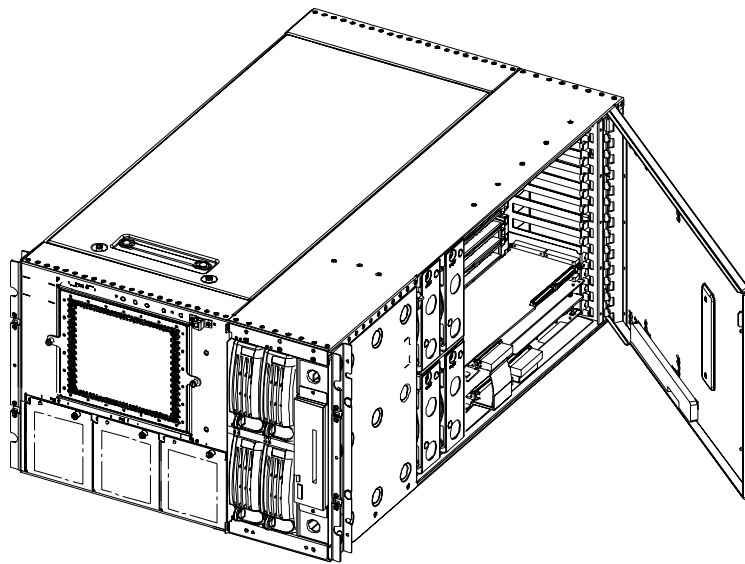
## Installing the HP Smart Array 5302 or 5304 Controller Card

**Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.

**Step 2.** Remove the side cover of the server:

- a. Loosen the captive T-15 screws that hold the side cover in place.
- b. Grasp the strap handle, pull the side cover slightly away from the server, and pull the cover toward the front of the server to free the cover tabs from the slots in the rear of the chassis (see Figure 6-3).

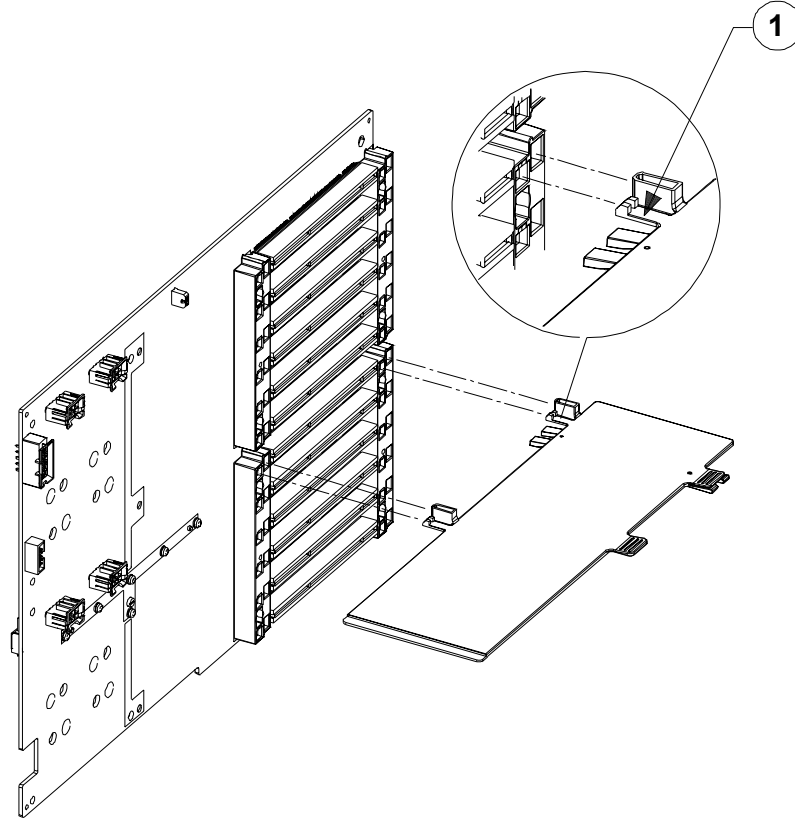
**Figure 6-3** Removing the Side Cover



**Step 3.** The HP Smart Array 5302 or 5304 controller card must be installed in PCI slot 4 for internal RAID. If another PCI card is located in slot 4, remove that card and relocate it to another slot. If the PCI card separator/extractor is in slot 4, remove it as follows:

- a. Remove the corresponding PCI card.
- b. Carefully slide a long-shaft, medium-width, flat-headed screwdriver into the side service bay along the top of the PCI card separator/extractor.
- c. At the point where the PCI card separator/extractor inserts into the PCI backplane connector (Item 1 in Figure 6-4) there are two slotted, hook tab connectors on the PCI card separator/extractor, one on either side of the PCI backplane connector. Press one, then the other, to disengage the separator/extractor from the PCI backplane.
- d. Slide the PCI card separator/extractor out of the PCI card cage.

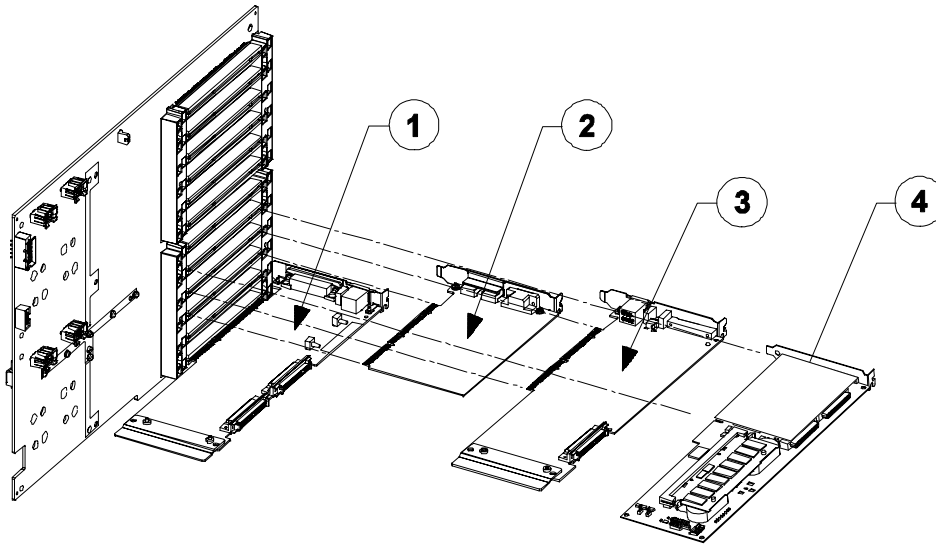
**Figure 6-4 PCI Card Separator/Extractor**



- Step 4.** Install the HP Smart Array 5302 or 5304 controller card in PCI Slot 4 (see Figure 6-5). When finished, you should have the following cards in the server's first four PCI slots:
1. MP/SCSI board located in PCI slot 1 (Item 1 in Figure 6-5)
  2. Optional Video board located in PCI slot 2
  3. LAN/SCSI board located in PCI slot 3
  4. HP Smart Array 5302 or 5304 controller card must be installed in PCI slot 4 for internal RAID



**Figure 6-5 PCI Card Order**

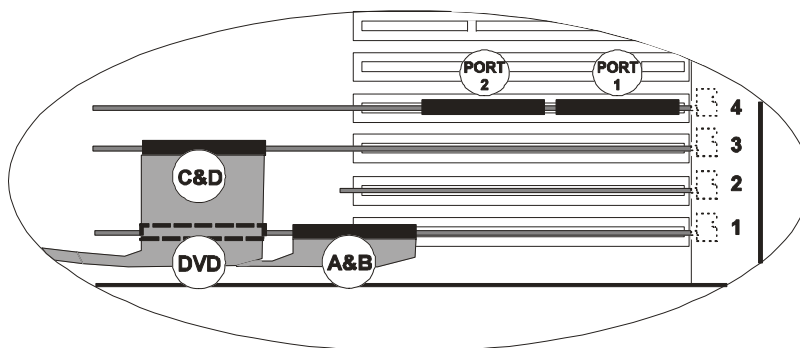


## Recabling for RAID

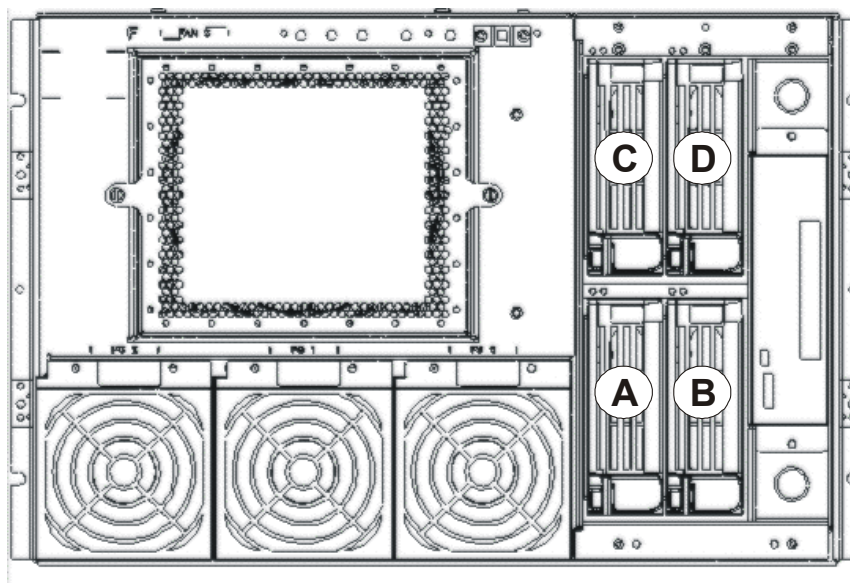
From the factory, the internal hot plug drives for the HP rx5670 server are connected to the integrated SCSI as follows (see Figure 6-6 and Figure 6-7):

- The MP/SCSI board in PCI slot 1 has a SCSI connector cabled to physical drives A and B
- The LAN/SCSI board in PCI slot 3 has a SCSI connector cabled to physical drives C and D

**Figure 6-6** Default Cabling for Internal SCSI Hot Plug Drives



**Figure 6-7** Physical Drive Location (front of server with bezel removed)



To use RAID with your hot plug drives, you need to disconnect the internal SCSI cables from their embedded controller and reconnect them to the HP Smart Array 5302 or 5304 controller card using the supplied A9828-63001 and A9828-63002 cables, as described below.

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**NOTE** To connect drives A, B, C, and D, follow all steps in both of the sections described below.

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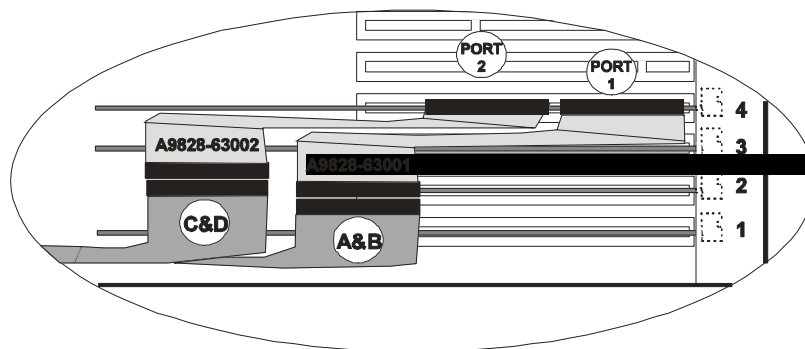
### Setting Up RAID on Hot Plug Drives A and B

- Step 1.** Confirm the HP Smart Array 5302 or 5304 controller card is installed in PCI slot 4. See “Installing the HP Smart Array 5302 or 5304 Controller Card” on page 59.
- Step 2.** Plug one end of the A9828-63001 cable into the controller card's internal PORT 1 connector. Rout the cable between the card and the side cover (see Figure 6-8).
- Step 3.** Unplug the SCSI cable that connects the A and B hot plug drives to the MP/SCSI board located in PCI slot 1. There are two connectors on the MP/SCSI board. When looking at the MP/SCSI board, as shown in Figure 6-8, the connector towards the rear of the server goes to hot plug drives A and B. The connector towards the front of the server, where the drives are located, is for the DVD drive.
- Step 4.** Take the unplugged SCSI cable and connect it to the A9828-63001 cable (see Figure 6-8). Once the cable is plugged in at both ends, it should be parallel to the side cover.
- Step 5.** If only hot plug drives are required, the setup is complete and you may close the server. Otherwise continue on to the next section.

### Setting Up RAID on Hot Plug Drives C and D

- Step 1.** Plug one end of the A9828-63002 cable into the controller card's internal PORT 2 connector.
- Step 2.** Unplug the SCSI cable that connects the C and D hot plug drives to the MP/SCSI board located in PCI Slot 3.
- Step 3.** Take the unplugged SCSI cable and connect it to the A9828-63002 cable (see Figure 6-8). Once the cable is plugged in at both ends, it should be parallel to the side cover.
- Step 4.** When finished, close the server.

**Figure 6-8 Recabling for RAID**



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**NOTE** Once the setup is complete, the cables should be parallel to the side cover.

---

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array 5300 Controller User Guide*:

- Configure your HP Smart Array 5302 or 5304 controller card in an HP Integrity server (use HP Smart Array 5300 utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array 5300 utilities and software that help you manage your RAID
- Configure the HP Smart Array 5302 or 5304 controller card for an external RAID storage system

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# 7 Cabling for the HP 9000 rp3440 Server

This chapter describes how to connect the cables of an HP Smart Array 6402 or 6404 controller card to the internal hard drives of an HP 9000 rp3440 server.

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**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

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The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache.

Table 7-1 shows the product numbers and descriptions for these cards.

**Table 7-1 Smart Array Cards Available for the HP9000 rp3440 Server**

Controller	Product Number	Description
SA6402	A9890A	2 channel / 128 MB cache
SA6404	A9891A	4 channel / 256 MB cache

Before you begin, you need:

- A7231-63024 cable for single channel configurations; or
- A7231-63025 cable for dual channel configurations
- T-15 Torx driver
- 3/16-inch hex driver
- Smart Array controller card (see Figure 7-1)

**Figure 7-1 Smart Array 6402 Controller Card (SA 6404 card not shown)**

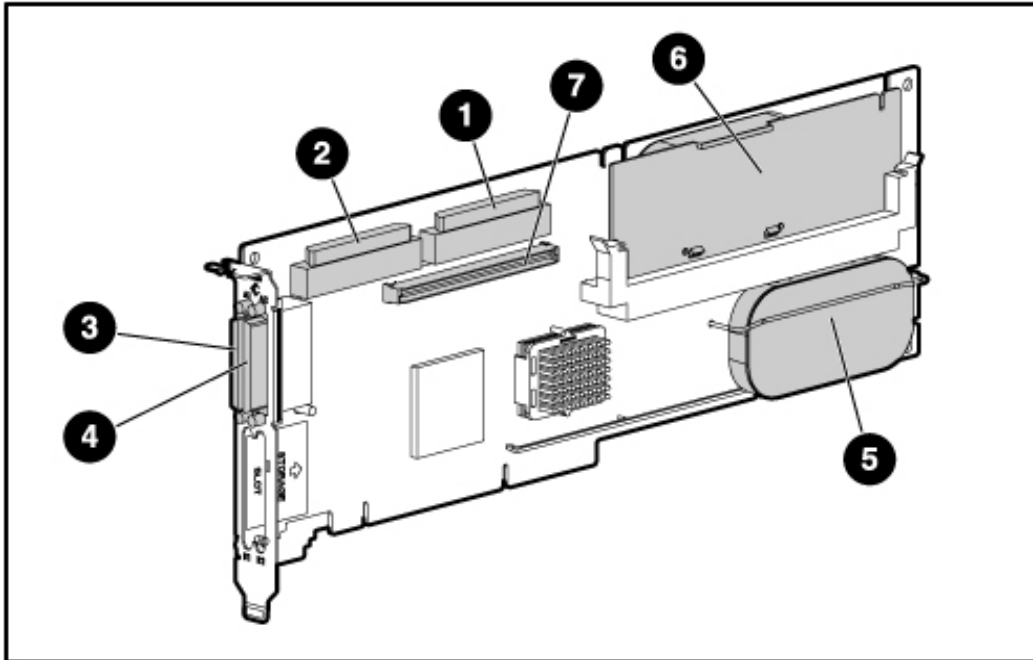


Table 7-2 identifies the major components of the Smart Array 6402 controller card.

**Table 7-2 SA 6402 Controller Card Components**

Item ID	Description
1	Internal SCSI connector, port A1*
2	Internal SCSI connector, port A2*
3	External SCSI connector, port A1*
4	External SCSI connector, port A2*
5	Controller battery
6	Battery-backed cache module
7	Connector for expansion board
* <b>NOTE: Do not use both connectors on a port simultaneously.</b>	

**NOTE** If an HP 9000 rp3440 server is ordered from the factory along with an internal RAID option (with the HP Smart Array controller card and SCSI cable A7231-63024 pre-installed), this SCSI cable connects the hot plug drives 0 and 1 to PORT 1 of the HP Smart Array controller card installed in PCI slot 3. The additional cable (A7231-63025) is placed in the server top tray. The internal hot plug drive 2 is still connected to the integrated SCSI controller.

PORT 2 of the HP Smart Array controller card is still available to connect the external StorageWorks mass storage or internal hot plug drive 2. If the internal hot plug drive 2 is

required for RAID, you need to install cable A7231-63025. Refer to “Recabling for RAID” on page 69.

If you opt to use both ports of the Smart Array controller card for your internal drives, you must purchase an additional HP Smart Array controller if you want external RAID mass storage.

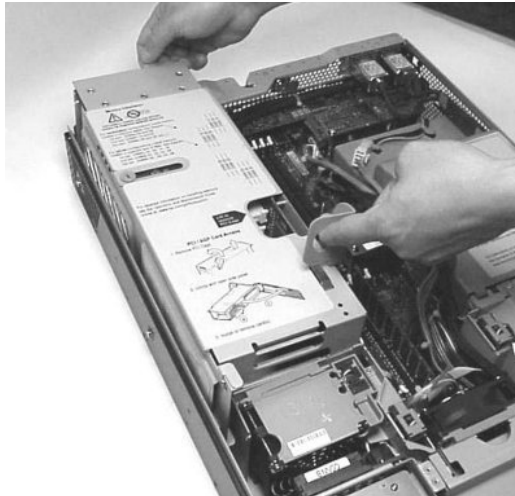
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## Installing the HP Smart Array Controller Card

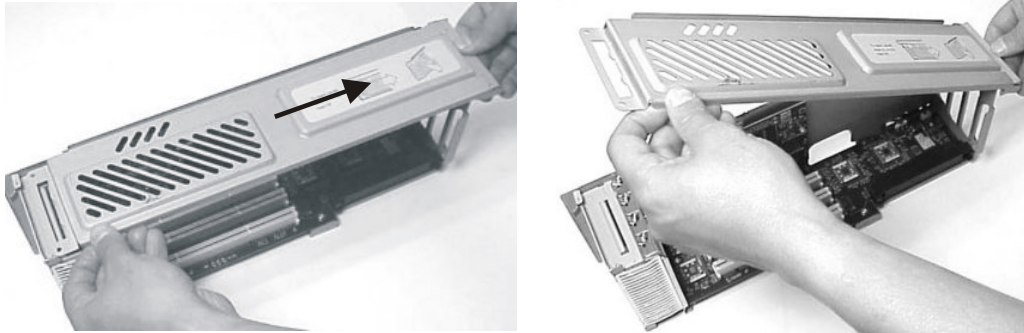
- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the metal system cover as described in the server's operation and maintenance guide.
- Step 3.** Lift the PCI cage release lever along with the back edge of the PCI cage in order to lift the PCI cage out of the system (see Figure 7-2).

**Figure 7-2 Removing the PCI Cage**



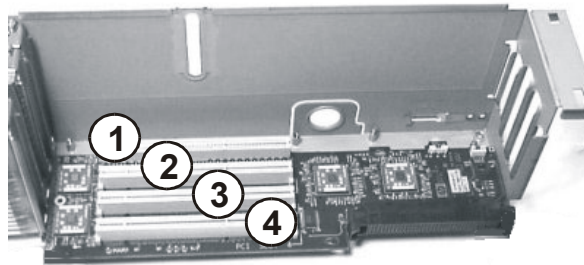
**Step 4.** Grasp the PCI cage cover and slide it away from the bulkhead end of the PCI cage. Lift the cover off the PCI cage as shown in Figure 7-3.

**Figure 7-3 Removing the PCI Cage Board Cover**



**Step 5.** Install the HP Smart Array controller card in PCI Slot 3 (see Figure 7-4). This is required when connecting the HP Smart Array controller card to the internal hard disk drives.

**Figure 7-4 PCI Card Order**



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**NOTE** Do not slide the PCI cage cover back onto the system at this point. You do this later.

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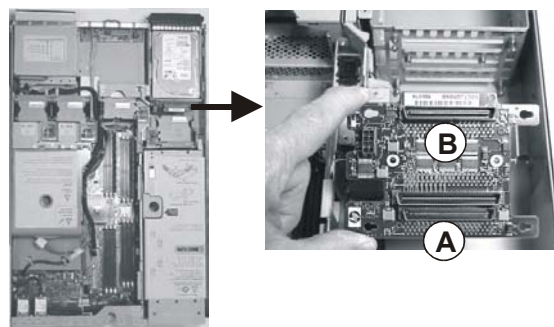


## Recabling for RAID

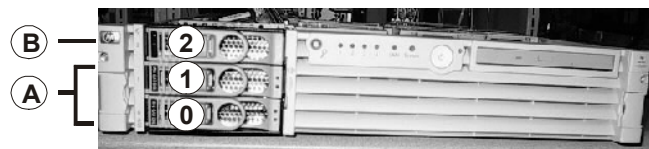
If the HP Smart Array controller card is not pre-installed in your server from the factory, then the rp3440 internal hard drives are connected to the integrated SCSI controller with two internal SCSI cables attached to the system board and the hard drive backplane, as follows:

- One of the internal SCSI cables (p/n A7231-63017) connects to the CH A connector of the hard drive backplane, and is then routed and connected to physical drives 0 and 1 (see Figure 7-5 and Figure 7-6).
- The other SCSI cable (p/n A7231-63018) connects to the CH B connector of the hard drive backplane, and is then routed and connected to physical drive 2 (see Figure 7-5 and Figure 7-6).

**Figure 7-5** Default Cabling for Internal Hard Drives



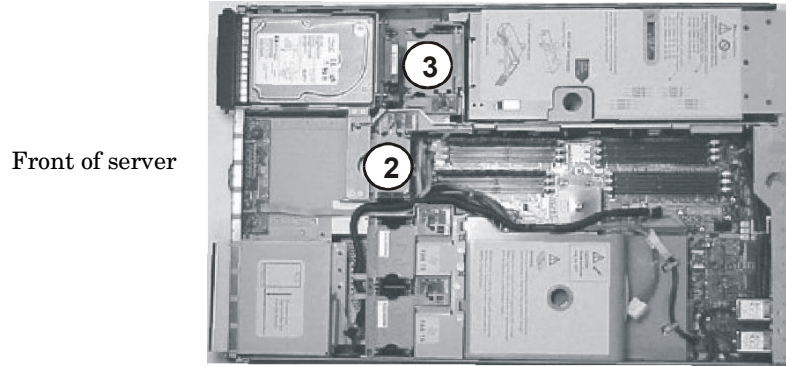
**Figure 7-6** Physical Drive Location (front of server)



Your server's internal hard disk drives can be set up for single or dual channel RAID support. To use RAID with your server's internal hard disk drives, you must disconnect the internal SCSI cable(s) from their controller and the hard disk drive backplane (described below) and remove them from the system. Then you must connect the HP Smart Array controller card to the hard disk drive backplane using the supplied single channel cable or dual channel cable, as described below.

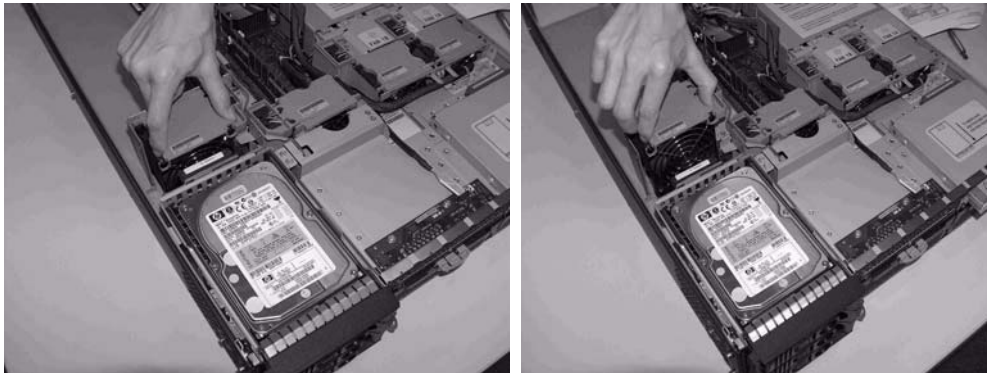
- Step 1.** To gain access to the hard drive backplane and the internal SCSI cables, you must first remove fans 2 and 3. See Figure 7-7 for their location, then proceed to the next step.

**Figure 7-7 Location of Fan 2 and Fan 3**



**Step 2.** To remove a fan, grasp the fan module with your index finger and thumb and lift it out of its slot. Note that each of the modules has indentations for grasping them with your index finger and thumb (see Figure 7-8).

**Figure 7-8 Removing the Fans**



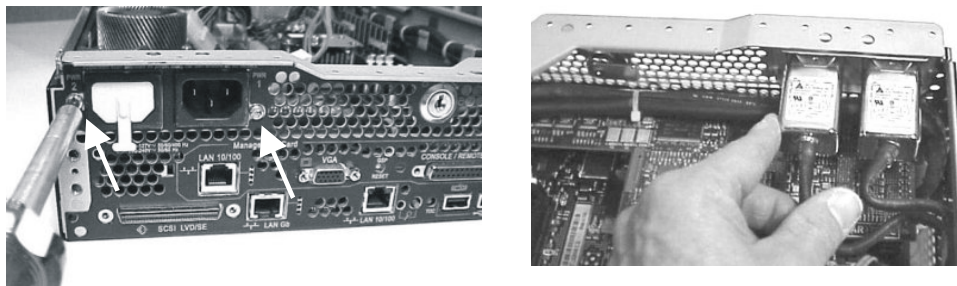
**Step 3.** To remove a SCSI cable, lift up on the fan power bridge as shown in Figure 7-9.

**Figure 7-9 Lifting the Fan Power Bridge**



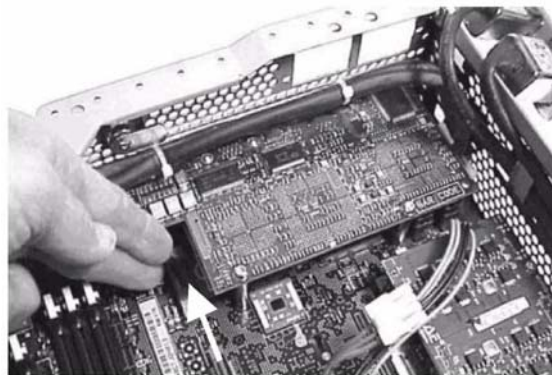
- Step 4.** Unplug one or both of the SCSI cables connected to the hard drive backplane (see Figure 7-5), depending upon whether you want to use one or both channels of the HP Smart Array controller card:
- Single channel: unplug backplane SCSI cable Channel A (bottom) connector
  - Dual channel: unplug backplane SCSI cable Channel A (bottom) and SCSI cable Channel B (top) connectors
- Step 5.** Disconnect the power cables and any LAN or telecommunications cables from the back of the server.
- Step 6.** Use a T-15 torx driver to unscrew the two power connector mounting screws and remove the power connectors from the back of the system. See Figure 7-10.

**Figure 7-10 Removing the Power Connectors**



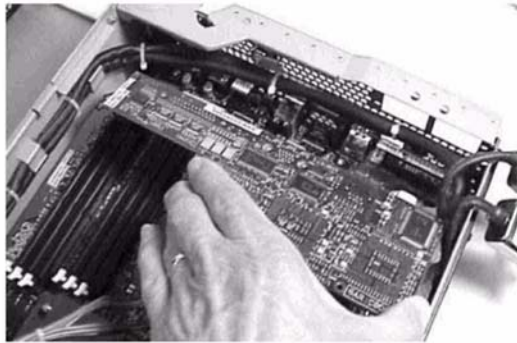
- Step 7.** Disconnect the iLO Manageability Card connector (orange) as shown in Figure 7-11.

**Figure 7-11 Disconnecting the iLO Manageability Card Connector**



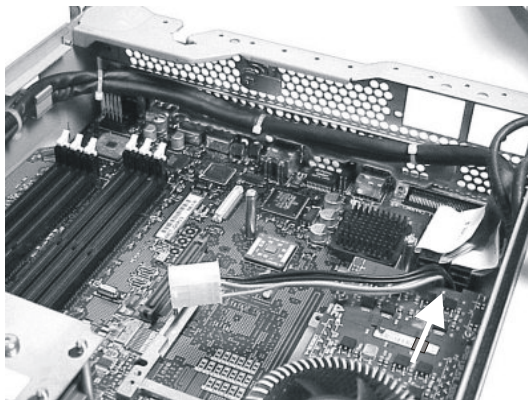
- Step 8.** Remove the two screws holding the iLO Manageability Card to the system board. The screws are located on the far left and right sides of the card when viewed from the back of the server chassis.
- Step 9.** Remove the two connector-screws for the 25-Pin Management Port located on the right end of the card (holding it against the back of the server chassis).
- Step 10.** Remove the card by grasping it by the edges and pulling it out (see Figure 7-12). Place the card on the anti-static bag that the controller card came in.

**Figure 7-12 Removing the iLO Manageability Card**



**Step 11.** Disconnect and remove any unused SCSI cables from the system board, as shown in Figure 7-13.

**Figure 7-13 Disconnecting and Removing Unused SCSI Cables from System Board**



**Step 12.** Do *one* of the following, depending on whether you are configuring for single or dual channel support:

- a. Single Channel Support:** Plug the end of the A7231-63024 single channel cable labeled “PORT 1” into PORT A2 of the HP Smart Array controller card (see Figure 7-14). The cable connectors are marked for clarity. The excess cable goes between PCI slots 3 and 4 and part of the cable must be folded down (90 degrees). Be sure it lies flush against the HP Smart Array controller card to prevent it from obstructing access to the other PCI slots. The other part of the cable that is labeled Channel A (bottom) should exit the PCI cage flush against where the PCI board cover and cable channel fit on the PCI cage (see Figure 7-16).

---

**NOTE** Do not reinstall the PCI cage or plug the other end of the cable into the hard drive backplane yet. You do this later.

---

- b. Dual Channel Support:** Plug the ends of the A7231-63024 dual channel cable labeled “PORT 1” and “PORT 2” into PORT A2 and PORT A1, respectively, of the HP Smart Array controller card (see Figure 7-15). The cable connectors are marked for clarity. The excess cable goes between PCI slots 3 and 4 and part of the cable must be folded down (90 degrees). Be sure it lies flush against the controller card to prevent it from obstructing access to the other PCI slots. The

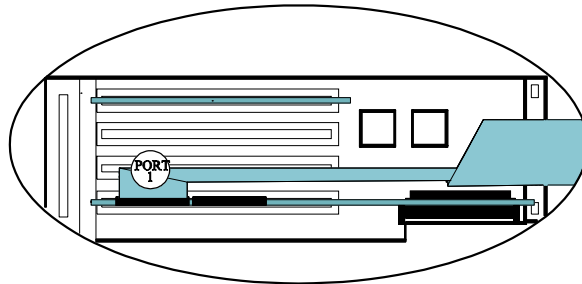
other part of the cables which are labeled Channel A (bottom) and Channel B (top) should exit the PCI cage flush against where the PCI board cover and cable channel fit on the PCI cage (see Figure 7-16).

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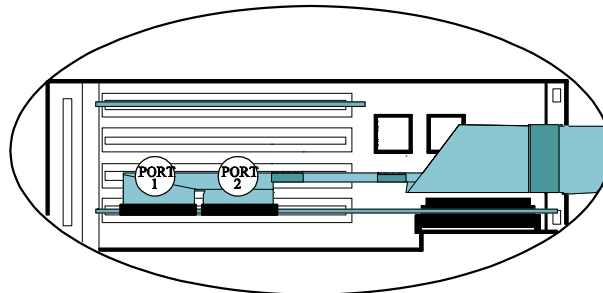
**NOTE** Do not reinstall the PCI cage or plug the other end of the cable into the hard drive backplane yet. You do this later.

---

**Figure 7-14 Single Channel RAID Cabling from a Controller Card Installed in the PCI Cage**

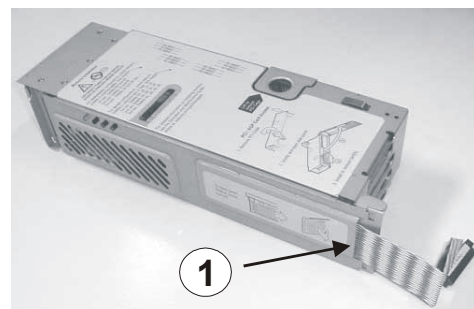
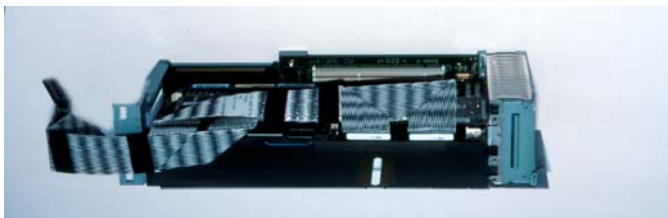


**Figure 7-15 Dual Channel RAID Cabling from a Controller Card Installed in the PCI Cage**



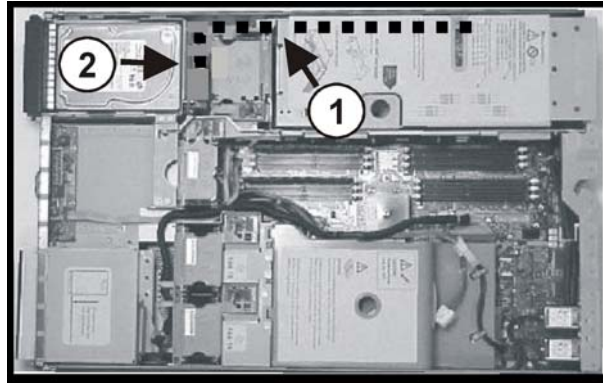
**Step 13.** Replace the PCI cage board cover, routing the RAID cable out of the cover's cable channel (see Figure 7-16). Note that the cable should be folded down flush against the controller card, with the latter half of the cable bent in order to exit through the cover's cable channel (see Item 1 in Figure 7-16).

**Figure 7-16 RAID Cable Routing Through the PCI Cage Board Cover**



**Step 14.** Place the PCI cage back into the system. Note that the RAID cable(s) must be flush against the server chassis as they exit the PCI cage cable channel (see Item 1 in Figure 7-17). Then they must be routed around the chassis side of fan 3 to the hard drive backplane (see Item 2 in Figure 7-17) to avoid crimping.

**Figure 7-17 RAID Cable Routing Through the PCI Cage Board Cover**



**Step 15.** Connect the free end(s) of the RAID cable(s) from the controller card to the backplane. The cable connectors are marked.

**Step 16.** Reinstall the iLO Manageability Card and power supply connectors.

**Step 17.** Lower the fan power bridge.

**Step 18.** Reinstall fans 2 and 3.

**Step 19.** Replace the metal system cover.

---

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *HP Smart Array 6402/6404 Controller Installation Guide*:

- Configure your HP Smart Array controller card in an HP 9000 server (use HP Smart Array utilities)
- Install and use the operating system-specific HP Smart Array utilities and software that help you manage your RAID
- Configure the HP Smart Array controller card for an external RAID storage system

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# 8 Cabling for the HP Integrity rx2620 and rx2600 Servers

This chapter describes how to connect the cables of an HP Smart Array 5302, 5304, or 6402 controller card to the internal hard drives of an HP Integrity rx2620 or rx2600 Server.

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**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

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The Smart Array 5300 series of controller cards includes two models: the 5302 and the 5304. Model 5302 has two Wide Ultra160 SCSI channels and 128 MB of cache. Model 5304 has four Wide Ultra160 SCSI channels and 256 MB of cache.

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache. Only Models 5302, 5304, and 6402 are supported on HP Integrity rx2620 and rx2600 servers.

Table 8-1 shows the product numbers and descriptions for these cards.

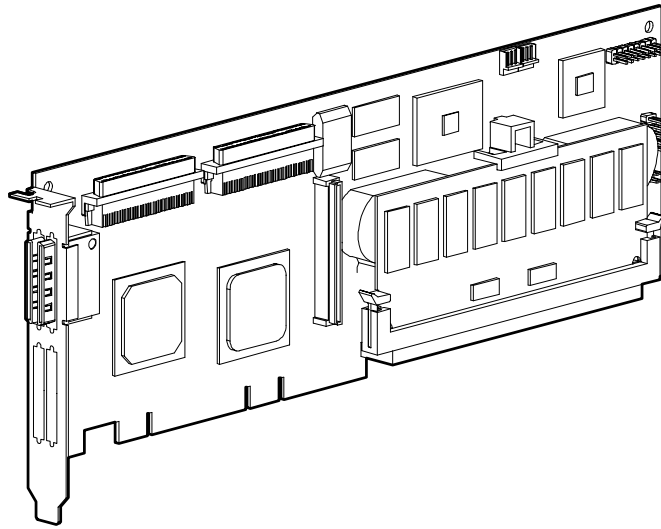
**Table 8-1 Smart Array Cards Available for the HP Integrity rx2620 and rx2600 Servers**

Controller	Product Number	Description
SA5302	A9825A	2 channel / 128 MB cache
SA5304	A9826A	4 channel / 256 MB cache
SA6402	A9890A	2 channel / 128 MB cache

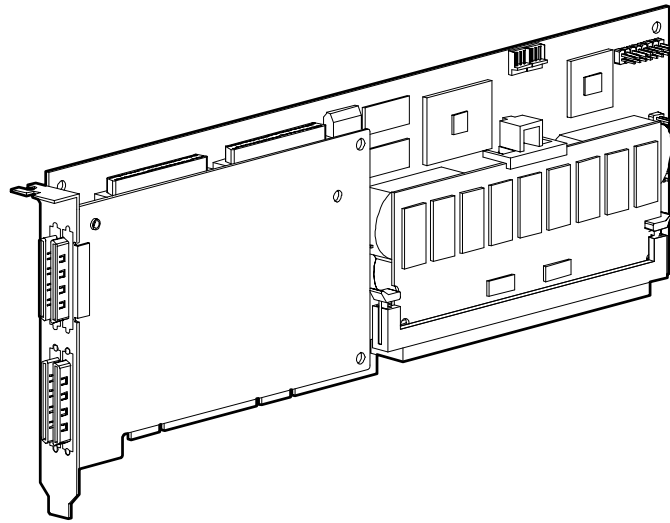
Before you begin, you need:

- Cable kit for single channel configuration (part number: A7231-63024), or
- Cable kit for dual channel configuration (part number: A7231-63025)
- T-15 Torx driver
- 3/16-inch hex driver
- Smart Array controller card (see Figure 8-1, Figure 8-2, and Figure 8-3)

**Figure 8-1 Smart Array 5302 Controller Card**



**Figure 8-2 Smart Array 5304 Controller Card**





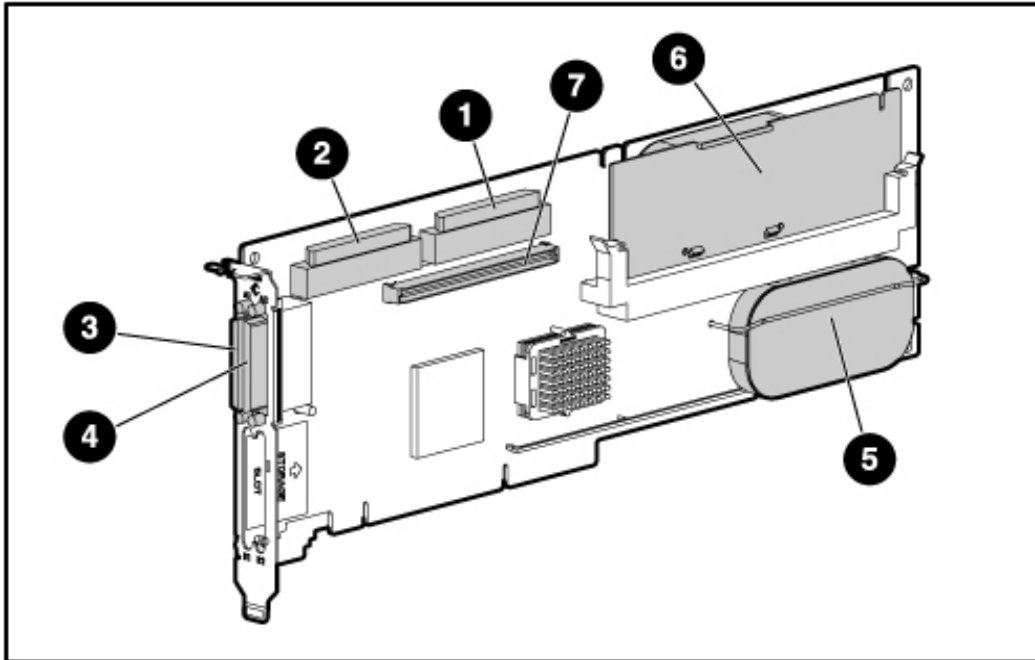
**Figure 8-3 Smart Array 6402 Controller Card**

Table 8-2 identifies the major components of the Smart Array 6402 controller card.

**Table 8-2 SA 6402 Controller Card Components**

Item ID	Description
1	Internal SCSI connector, port A1*
2	Internal SCSI connector, port A2*
3	External SCSI connector, port A1*
4	External SCSI connector, port A2*
5	Controller battery
6	Battery-backed cache module
7	Connector for expansion board
<b>* NOTE: Do not use both connectors on a port simultaneously.</b>	

**NOTE** If an HP rx2600 server is ordered from the factory along with an internal RAID option (with the HP Smart Array controller card and extension cable A7231-63024 pre-installed), this extension cable connects the hot plug drives 0 and 1 to PORT 1 of the HP Smart Array controller card installed in PCI slot 3. The additional cable (A7231-63025) is placed in the server top tray. The internal hot plug drive 2 is still connected to the integrated SCSI controller.

PORT 2 of the HP Smart Array controller card is still available to connect the external StorageWorks mass storage or internal hot plug drive 2. If the internal hot plug drive 2 is

## Installing the HP Smart Array Controller Card

required for RAID, you need to install cable A7231-63025 as described in the “Recabling for RAID” section later in this chapter.

If you opt to use both ports of the Smart Array controller card for your internal drives, you must purchase an additional HP Smart Array controller if you want external RAID mass storage.

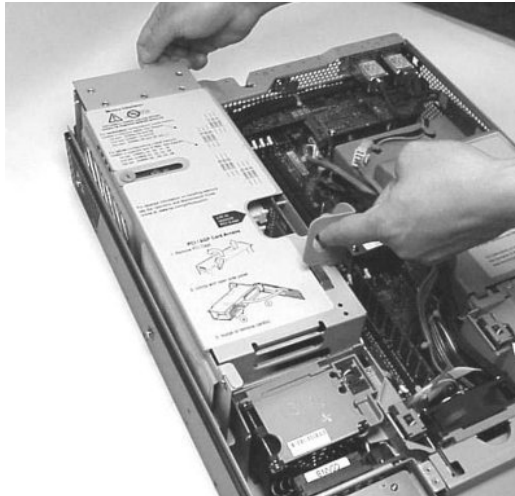
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## Installing the HP Smart Array Controller Card

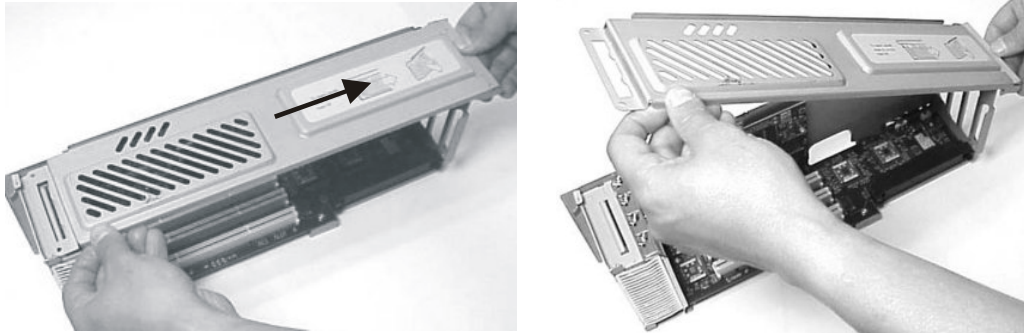
- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the metal system cover as described in the server's operation and maintenance guide.
- Step 3.** Lift the PCI cage release lever along with the back edge of the PCI cage in order to lift the PCI cage out of the system. See Figure 8-4.

**Figure 8-4 Removing the PCI Cage**



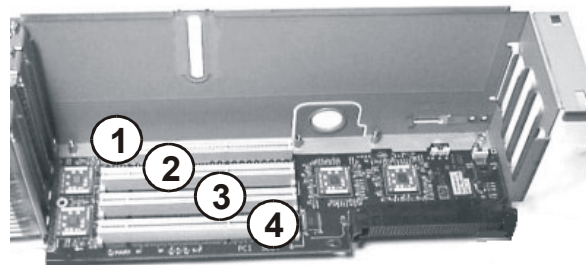
**Step 4.** Grasp the PCI cage cover and slide it away from the bulkhead end of the PCI cage. Lift the cover off the PCI cage as shown in Figure 8-5.

**Figure 8-5 Removing the PCI Cage Board Cover**



**Step 5.** Install the HP Smart Array controller card in PCI Slot 3 (see Figure 8-6). This is required when connecting the HP Smart Array controller card to the internal hard disk drives.

**Figure 8-6 PCI Card Order**



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**NOTE** Do not slide the PCI cage cover back onto the system at this point. You do this later.

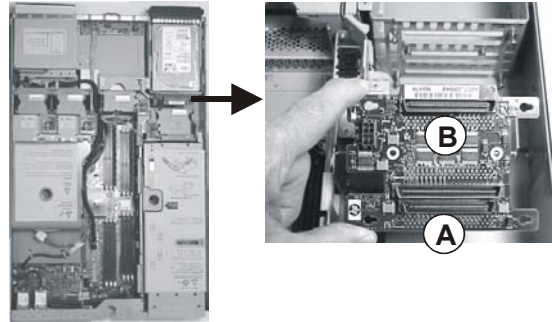
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## Recabling for RAID

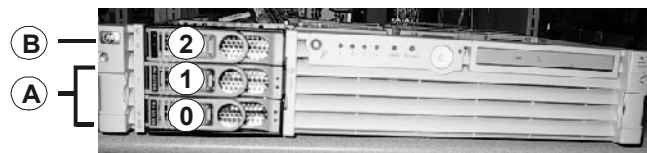
If the HP Smart Array controller card is not pre-installed in your server from the factory, then the rx2600 internal hard drives are connected to the integrated SCSI controller with two internal SCSI cables attached to the system board and the hard drive backplane, as follows:

- One of the internal SCSI cables (p/n A7231-63017) connects to the CH A connector of the hard drive backplane, and is then routed and connected to physical drives 0 and 1 (see Figure 8-7 and Figure 8-8).
- The other SCSI cable (p/n A7231-63018) connects to the CH B connector of the hard drive backplane, and is then routed and connected to physical drive 2 (see Figure 8-7 and Figure 8-8).

**Figure 8-7**      **Default Cabling for Internal Hard Drives**



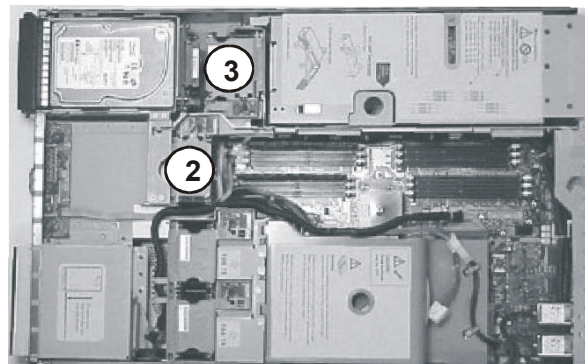
**Figure 8-8**      **Physical Drive Location (front of server)**



Your server's internal hard disk drives can be set up for single or dual channel RAID support. To use RAID with your server's internal hard disk drives, you must disconnect the internal SCSI cable(s) from their controller and the hard disk drive backplane (described below) and remove them from the system. Then you must connect the HP Smart Array controller card to the hard disk drive backplane using the supplied single channel cable or dual channel cable, as described below.

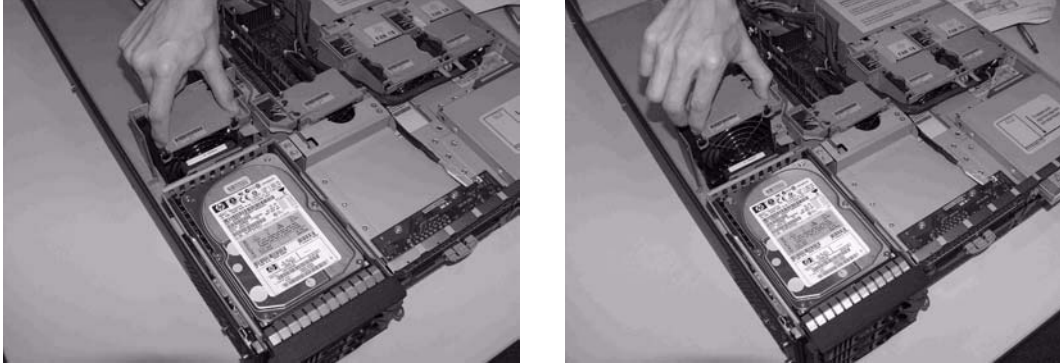
**Step 1.** To get access to the hard drive backplane and the internal SCSI cables, you must first remove fans 2 and 3 (see Figure 8-9 for their location).

**Figure 8-9** **Location of Fan 2 and Fan 3**



- Step 2.** To remove a fan, grasp the fan module with your index finger and thumb and lift it out of its slot. Note that each of the modules has indentations for grasping them with your index finger and thumb. See Figure 8-10.

**Figure 8-10 Removing the Fans**



- Step 3.** To remove a SCSI cable, lift up on the fan power bridge as shown in Figure 8-11.

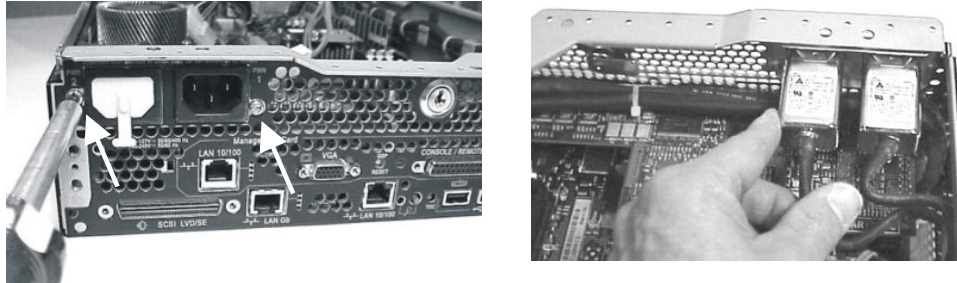
**Figure 8-11 Lifting the Fan Power Bridge**



- Step 4.** Unplug one or both of the SCSI cables connected to the hard drive backplane (see Figure 8-7), depending upon whether you want to use one or both channels of the HP Smart Array controller card:
- Single channel: unplug backplane SCSI cable Channel A (bottom) connector
  - Dual channel: unplug backplane SCSI cable Channel A (bottom) and SCSI cable Channel B (top) connectors
- Step 5.** Disconnect the power cables and any LAN or telecommunications cables from the back of the server.

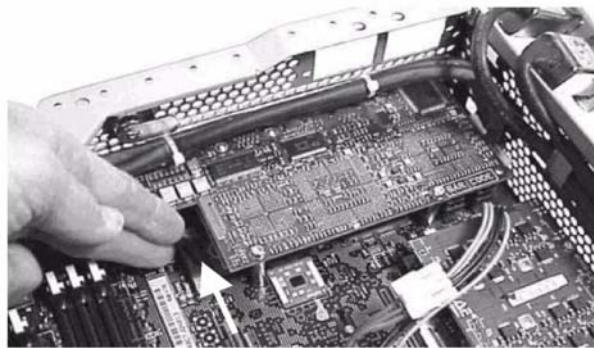
**Step 6.** Use a T-15 torx driver to unscrew the two power connector mounting screws and remove the power connectors from the back of the system. See Figure 8-12.

**Figure 8-12 Removing the Power Connectors**



**Step 7.** Disconnect the iLO Manageability card connector (orange) as shown in Figure 8-13.

**Figure 8-13 Disconnecting the iLO Manageability Card Connector**

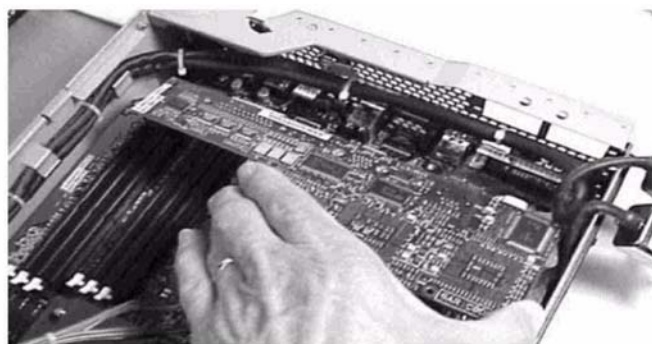


**Step 8.** Remove the two screws holding the iLO Manageability Card to the system board. The screws are located on the far left and right sides of the card when viewed from the back of the server chassis.

**Step 9.** Remove the two connector-screws for the 25-Pin Management Port located on the right end of the card (holding it against the back of the server chassis).

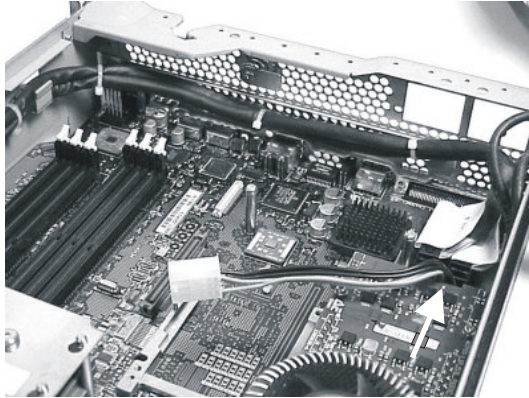
**Step 10.** Remove the card by grasping it by the edges and pulling it out (see Figure 8-14). Place the card on the anti-static bag that the controller card came in.

**Figure 8-14 Removing the iLO Manageability Card**



**Step 11.** Disconnect and remove any unused SCSI cables from the system board, as shown in Figure 8-15.

**Figure 8-15 Disconnecting and Removing Unused SCSI Cables from System Board**



**Step 12.** Do *one* of the following, depending on whether you are configuring for single or dual channel support:

- a. **Single Channel Support:** For 5300 series cards, plug the end of the A7231-63024 single channel cable labeled “PORT 1” into PORT 1 of the HP Smart Array controller card. For 6400 series cards, plug the end of the A7231-63024 single channel cable labeled “PORT 1” into PORT A2 of the HP Smart Array controller card (see Figure 8-16). The cable connectors are marked for clarity. The excess cable goes between PCI slots 3 and 4 and part of the cable must be folded down (90 degrees). Be sure it lies flush against the HP Smart Array controller card to prevent it from obstructing access to the other PCI slots. The other part of the cable that is labeled Channel A (bottom) should exit the PCI cage flush against where the PCI board cover and cable channel fit on the PCI cage (see Figure 8-18).

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**NOTE** Do not reinstall the PCI cage or plug the other end of the cable into the hard drive backplane yet. You do this later.

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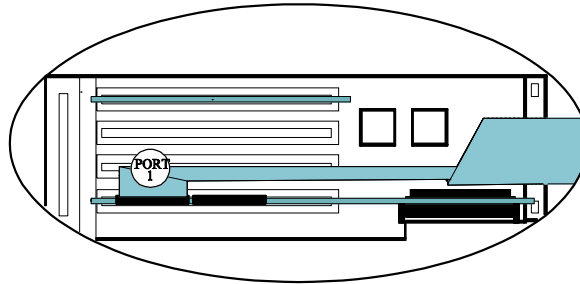
- b. **Dual Channel Support:** For 5300 series cards, plug the ends of the A7231-63025 dual channel cable labeled “PORT 1” and “PORT 2” into PORT 1 and PORT 2, respectively, of the HP Smart Array controller card. For 6400 series cards, plug the ends of the A7231-63024 dual channel cable labeled “PORT 1” and “PORT 2” into PORT A2 and PORT A1, respectively, of the HP Smart Array controller card (see Figure 8-17). The cable connectors are marked for clarity. The excess cable goes between PCI slots 3 and 4 and part of the cable must be folded down (90 degrees). Be sure it lies flush against the controller card to prevent it from obstructing access to the other PCI slots. The other part of the cables which are labeled Channel A (bottom) and Channel B (top) should exit the PCI cage flush against where the PCI board cover and cable channel fit on the PCI cage (see Figure 8-18).

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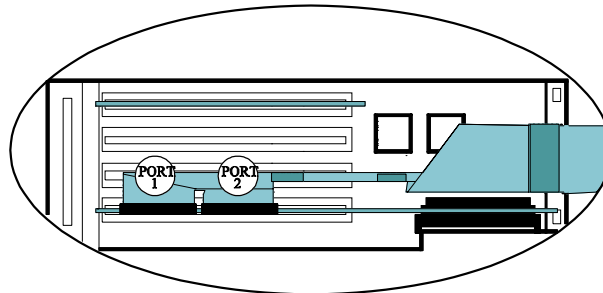
**NOTE** Do not reinstall the PCI cage or plug the other end of the cable into the hard drive backplane yet. You do this later.

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**Figure 8-16 Single Channel RAID Cabling from a Controller Card Installed in the PCI Cage**

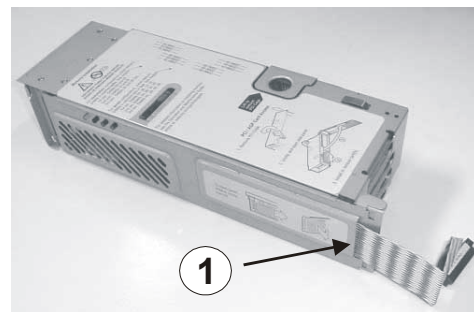
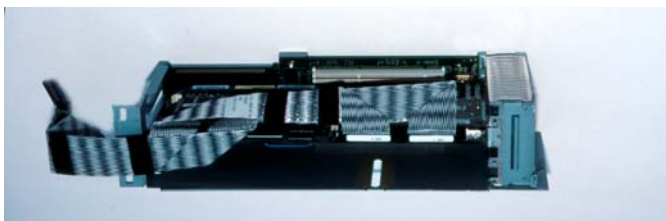


**Figure 8-17 Dual Channel RAID Cabling from a Controller Card Installed in the PCI Cage**



**Step 13.** Replace the PCI cage board cover, routing the RAID cable out of the cover's cable channel (see Figure 8-18). Note that the cable should be folded down flush against the controller card, with the latter half of the cable bent in order to exit through the cover's cable channel (see Item 1 in Figure 8-18).

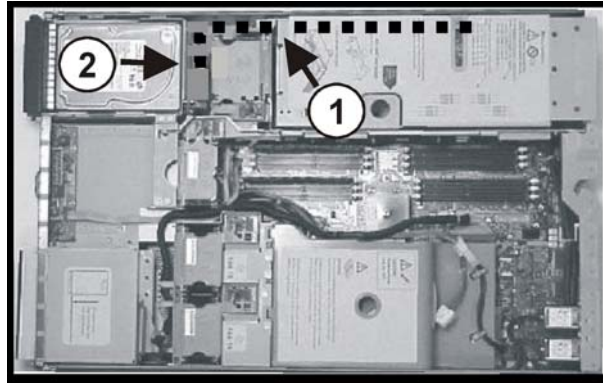
**Figure 8-18 RAID Cable Routing Through the PCI Cage Board Cover**



**Step 14.** Place the PCI cage back into the system. The RAID cable(s) must be flush against the server chassis as they exit the PCI cage cable channel (see Item 1 in Figure 8-19). They must be routed around the chassis side of fan 3 to the hard drive backplane (see Item 2 in Figure 8-19) to avoid crimping.



**Figure 8-19 RAID Cable Routing Through the PCI Cage Board Cover**



- Step 15.** Connect the free end(s) of the RAID cable(s) from the controller card to the backplane. The cable connectors are marked.
- Step 16.** Reinstall the iLO Manageability Card and power supply connectors.
- Step 17.** Reinstall any DIMMs that were removed back into their memory banks.
- Step 18.** Lower the fan power bridge.
- Step 19.** Reinstall fans 2 and 3.
- Step 20.** Replace the metal system cover.

---

## Configuring the Server Firmware and Software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *HP Smart Array Controller User Guide*:

- Configure your HP Smart Array controller card in an HP Integrity server (use HP Smart Array utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array utilities and software that help you manage your RAID
- Configure the HP Smart Array controller card for an external RAID storage system



# 9 Cabling for the HP Integrity rx1620 Server

This chapter describes how to connect the cables of an HP Smart Array 6402 controller card to the internal hard drives of an HP Integrity rx1620 Server.

**NOTE** These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache. Only Model 6402 is supported on the HP Integrity rx1620 server.

Table 9-1 shows the product number and description for this card.

**Table 9-1 Smart Array Card Available for the HP Integrity rx1620 Server**

Controller	Product Number	Description
SA6402	A9890A	2 channel / 128 MB cache

Before you begin, you need:

- Cable kit (part number: A7027-63001)
- T-15 Torx driver
- 3/16-inch hex driver
- Smart Array controller card (see Figure 9-1)

**Figure 9-1 Smart Array 6402 Controller Card**

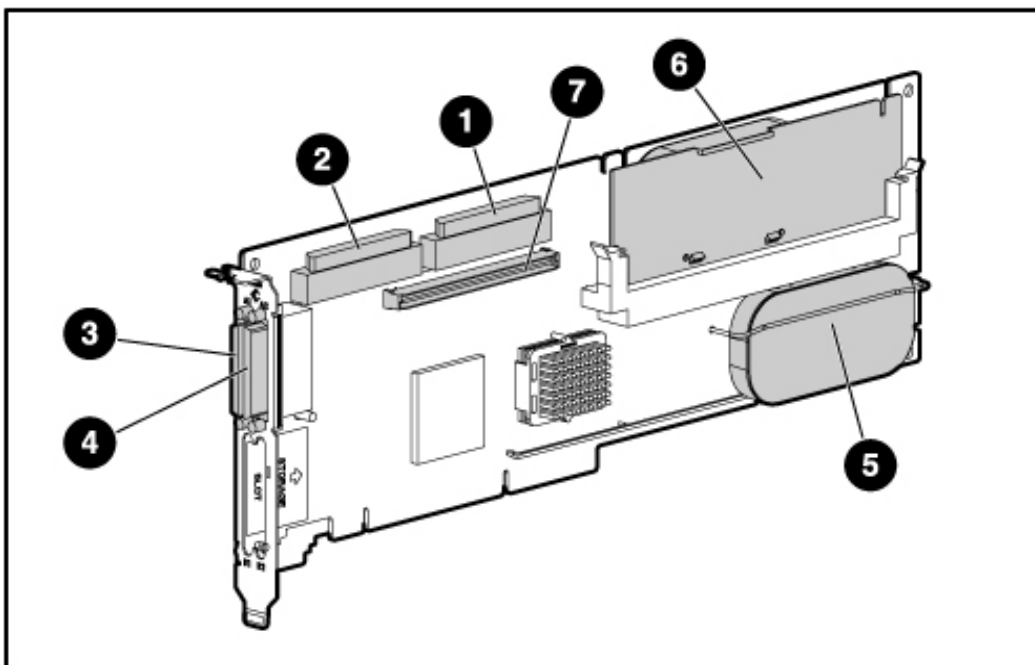


Table 9-2 identifies the major components of the Smart Array 6402 controller card.

**Table 9-2 SA 6402 Controller Card Components**

<b>Item ID</b>	<b>Description</b>
1	Internal SCSI connector, port A1*
2	Internal SCSI connector, port A2*
3	External SCSI connector, port A1*
4	External SCSI connector, port A2*
5	Controller battery
6	Battery-backed cache module
7	Connector for expansion board
<b>* NOTE: Do not use both connectors on a port simultaneously.</b>	

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## Installing the HP Smart Array 6402 Controller Card

In this procedure, the existing SCSI cable connected to the Channel A connector on the system board is relocated to the Channel A connector on the Smart Array controller card installed in slot 1 (full-length slot) of the PCI cage. Then the SCSI cable is routed from the PCI cage under the power supply bracket and over the IDE cable (if installed) without blocking the air flow of the chassis fans.

**Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.

**Step 2.** Remove the top cover of the server.

**Step 3.** Disconnect the SCSI cable from the Channel A connector on the system board by pulling on the cable release strap (see Figure 9-2).

---

**NOTE** If an optional management processor card is installed in the server, follow the instructions provided in the server's Operation and Maintenance Guide to remove the card, allowing access to the Channel A connector. Then reinstall the card after the SCSI cable has been disconnected.

---

**Figure 9-2 SCSI Channel A Connector on System Board**



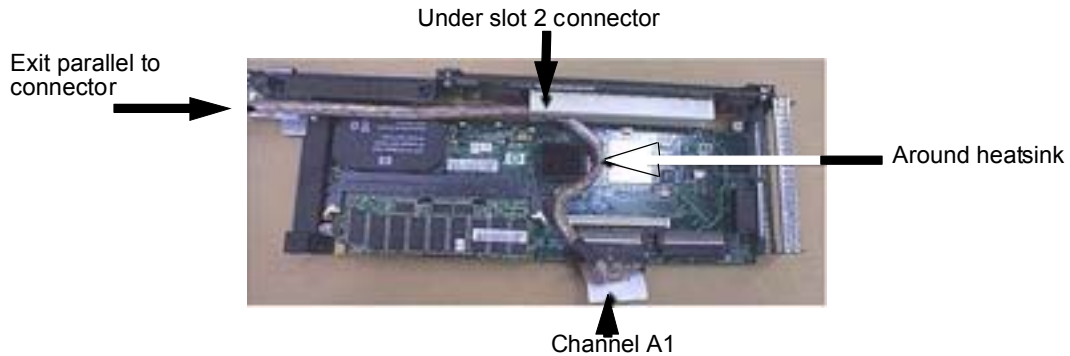
**Step 4.** Remove the PCI cage from the server.

**Step 5.** Remove any accessory cards installed in PCI slot 2 (half-length slot).

**Step 6.** Install the HP Smart Array controller card in PCI slot 1 (full-length slot).

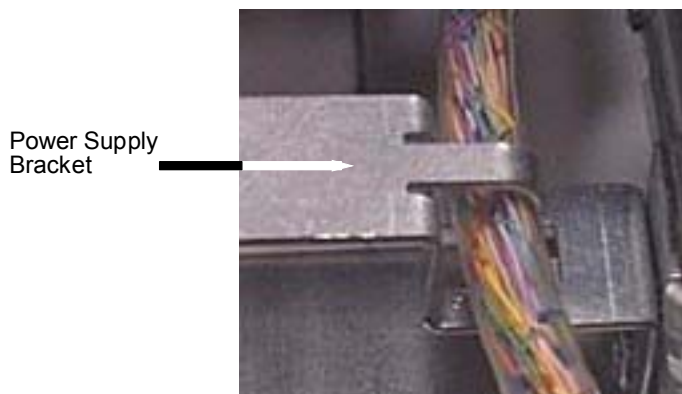
**Step 7.** Orient the PCI cage with the installed card component-side-up to allow routing of the SCSI cable. See Figure 9-3.

**Figure 9-3 Cable Routing on Smart Array Card and PCI Cage**



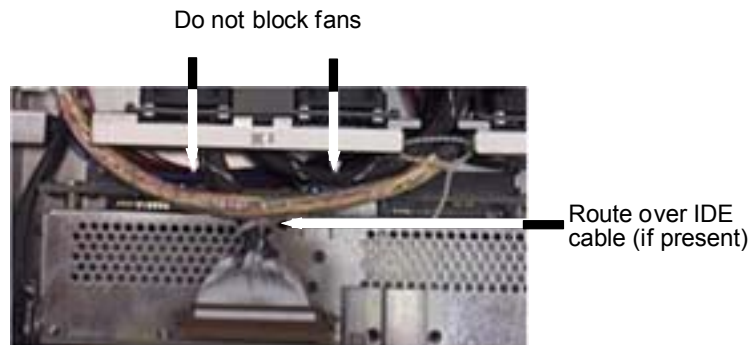
- Step 8.** Attach the SCSI Channel A connector (previously removed from the system board connector) to the A1 Channel of the controller card.
- Step 9.** Route the SCSI cable around the heatsink on the controller card and under the edge of the PCI slot 2 connector. See Figure 9-3.
- Step 10.** Continue routing the cable parallel to the connector edge of the PCI cage.
- Step 11.** Reinstall any accessory cards previously removed from PCI slot 2.
- Step 12.** Install the PCI cage into the server chassis.
- Step 13.** Route the SCSI cable under the power supply bracket. See Figure 9-4.

**Figure 9-4 Cable Routing Under Power Supply Bracket**



- Step 14.** Route the SCSI cable through the access slot of the fan assembly to the connector on the SCSI backplane. See Figure 9-5.

**Figure 9-5 Cable Routing at SCSI Cage**



- Step 15.** Complete the installation by following the instructions provided in the *HP Integrity rx1600 Operation and Maintenance Guide* for closing up the server, installing it in a rack, and powering it up. To enable RAID, refer to the controller card documentation.

