SGI® Octane™ III Deskside Cluster Server Component Replacement Guide

Document Number 007-5649-001

COPYRIGHT
© 2010 SGI. All rights reserved; provided portions may be copyright in third parties, as indicated elsewhere herein. No permission is granted to copy, distribute, or create derivative works from the contents of this electronic documentation in any manner, in whole or in part, without the prior written permission of SGI.

LIMITED RIGHTS LEGEND
The software described in this document is “commercial computer software” provided with restricted rights (except as to included open/free source) as specified in the FAR 52.227-19 and/or the DFAR 227.7202, or successive sections. Use beyond license provisions is a violation of worldwide intellectual property laws, treaties and conventions. This document is provided with limited rights as defined in 52.227-14.

The electronic (software) version of this document was developed at private expense; if acquired under an agreement with the USA government or any contractor thereto, it is acquired as “commercial computer software” subject to the provisions of its applicable license agreement, as specified in (a) 48 CFR 12.212 of the FAR; or, if acquired for Department of Defense units, (b) 48 CFR 227-7202 of the DoD FAR Supplement; or sections succeeding thereto. Contractor/manufacturer is SGI, 46600 Landing Parkway, Fremont, CA 94538.

TRADEMARKS AND ATTRIBUTIONS
SGI and the SGI logo are registered trademarks and Octane is a trademark of Silicon Graphics International Corporation or it’s subsidiaries in the United States and/or other countries worldwide.

All other trademarks mentioned herein are the property of their respective owners.

Record of Revision

Version	Description
-001	March 2010 First Release

Contents

List of Figures

About This Guide

The *SGI® Octane™ III Component Replacement Guide* describes how to replace the following components in an SGI Octane III cluster server:

- Memory DIMMs
- PCIe cards
- Disk drives
- System fans
- Power supplies

Use these procedures to upgrade system components or replace failing components.

Note: All other components in the system should be upgraded or replaced by an SGI service representative or an SGI authorized service provider.

Audience

This guide is written for SGI Octane III owners who want to replace or upgrade components in their computer systems.

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III cluster server enclosure. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

Related Publications

The following documents are relevant to and can be used with the SGI Octane III deskside cluster server systems:

- *SGI Octane III Deskside Cluster Server System User's Guide*, (P/N 007-5633-00*x*)

  This guide describes the Octane III deskside cluster server system features, system operation and troubleshooting, system interfaces, BIOS, and system technical specifications.

- Man pages (online)

  Man pages locate and print the titled entries from the online reference manuals.

You can obtain SGI documentation, release notes, or man pages in the following ways:

- See the SGI Technical Publications Library at http://docs.sgi.com. Various formats are available. This library contains the most recent and most comprehensive set of online books, release notes, man pages, and other information.
- The release notes, which contain the latest information about software and documentation in this release, are in a file named README.SGI in the root directory of the SGI ProPack for Linux Documentation CD.
- You can also view man pages by typing **man** <*title*> on a command line.

SGI systems include a set of Linux man pages, formatted in the standard UNIX “man page” style. Important system configuration files and commands are documented on man pages. These are found online on the internal system disk (or DVD) and are displayed using the `man` command. For example, to display a man page, type the request on a command line:

```
man commandx
```

References in the documentation to these pages include the name of the command and the section number in which the command is found. For additional information about displaying man pages using the `man` command, see `man(1)`. In addition, the `apropos` command locates man pages based on keywords. For example, to display a list of man pages that describe disks, type the following on a command line:

```
apropos disk
```

For information about setting up and using `apropos`, see `apropos(1)`.

Conventions

The following conventions are used throughout this document

:

Convention	Meaning
`Command`	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
variable	The italic typeface denotes variable entries and words or concepts being defined. Italic typeface is also used for book titles.
`user input`	This bold fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[ ]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
`man page`(*x*)	Man page section identifiers appear in parentheses after man page names.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

Product Support

SGI provides a comprehensive product support and maintenance program for its products, as follows:

- If you are in North America, contact the Technical Assistance Center at +1 800 800 4SGI or contact your authorized service provider.
- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, contact SGI. Be sure to include the title and document number of the manual with your comments. (Online, the document number is located in the front matter of the manual. In printed manuals, the document number is located at the bottom of each page.)

You can contact SGI in any of the following ways:

- Send e-mail to the following address: techpubs@sgi.com
- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.
- Send mail to the following address:

  Technical Publications
  SGI
  46600 Landing Parkway
  Fremont, CA 94538

SGI values your comments and will respond to them promptly.

Component Replacement

This chapter describes basic component replacement for the SGI Octane III deskside cluster server.

General Precautions

Warning: **Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.**

Warning: **You should disconnect the AC power cord(s) from the server and/or from site power before attempting to access any internal components. Ensure that the power outlet used at your site is easily accessible so you can disconnect the power cords before you attempt to access components inside the server. Failure to disconnect the power cords from the power outlet and/or server enclosure before accessing internal server components can expose you to dangerous power levels, resulting in injury or death.**

Warning: **Do not open the SGI Octane III deskside cluster server enclosure while the AC power cords are connected to power at your site. Attempting to access components in the enclosure while the server is connected to power at you site can expose you to dangerous power levels, resulting in injury or death.**

Caution: Care must be taken to ensure that the cluster enclosure has adequate ventilation clearance when operating to ensure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Caution: Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge:

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.

Warning: If a lithium battery is installed in your system as a soldered part, only SGI qualified service personnel should replace this lithium battery. For a battery of another type, replace it only with the same type or an equivalent type recommended by the battery manufacturer, or an explosion could occur. Discard used batteries according to the manufacturer's instructions.

Manipulating the System Trays

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure.

The system trays are accessed via the rear of the system enclosure; refer to Figure 1-1. You must remove the rear fan assemblies to access the system trays. You will manipulate system trays to replace/upgrade memory DIMMs, disk drives, and PCIe cards.

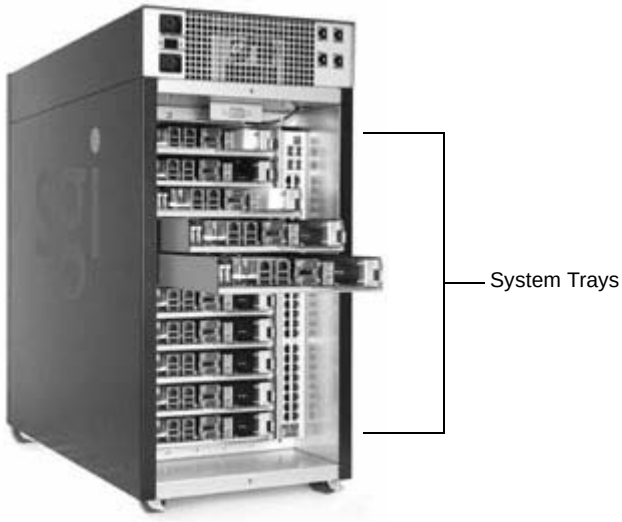


Figure 1-1 System Trays

Accessing the System Trays

Perform the following procedure to access the system trays:

Caution: Ensure that you properly shut down the operating system before removing power from the system. Failure to do so can result in data loss.

1. Shut down the operating system, and move the system enable switch on the rear of the enclosure to the OFF position.

Warning: You must disconnect the server from site power (by disconnecting the AC power cord[s] from the power outlet or the rear of the enclosure) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

2. Unplug the AC power cord(s) from the site power outlet and/or the rear of the system.
3. Remove the rear fan assemblies; refer to “Removing the Rear Fan Assembly” on page 34.

Extracting an Installed System Tray

Use the following procedure and Figure 1-2 to access the system trays so you can add or replace components:

1. Access the system trays (refer to “Accessing the System Trays”).
2. Identify the tray that needs to be removed from the enclosure.
3. Disconnect any cables (Ethernet, InfiniBand, USB, etc.) that are connected to the tray. (Be sure to note which cables connect to which ports, so you can properly re-connect the cables when you re-install the tray.)
4. Push the tab on the right-side of the tray to the left to release the tray from the chassis and then grasp the handle on the tray and pull the tray out of the chassis; refer to Figure 1-2.
5. Place the tray on an ESD-safe work surface or package.

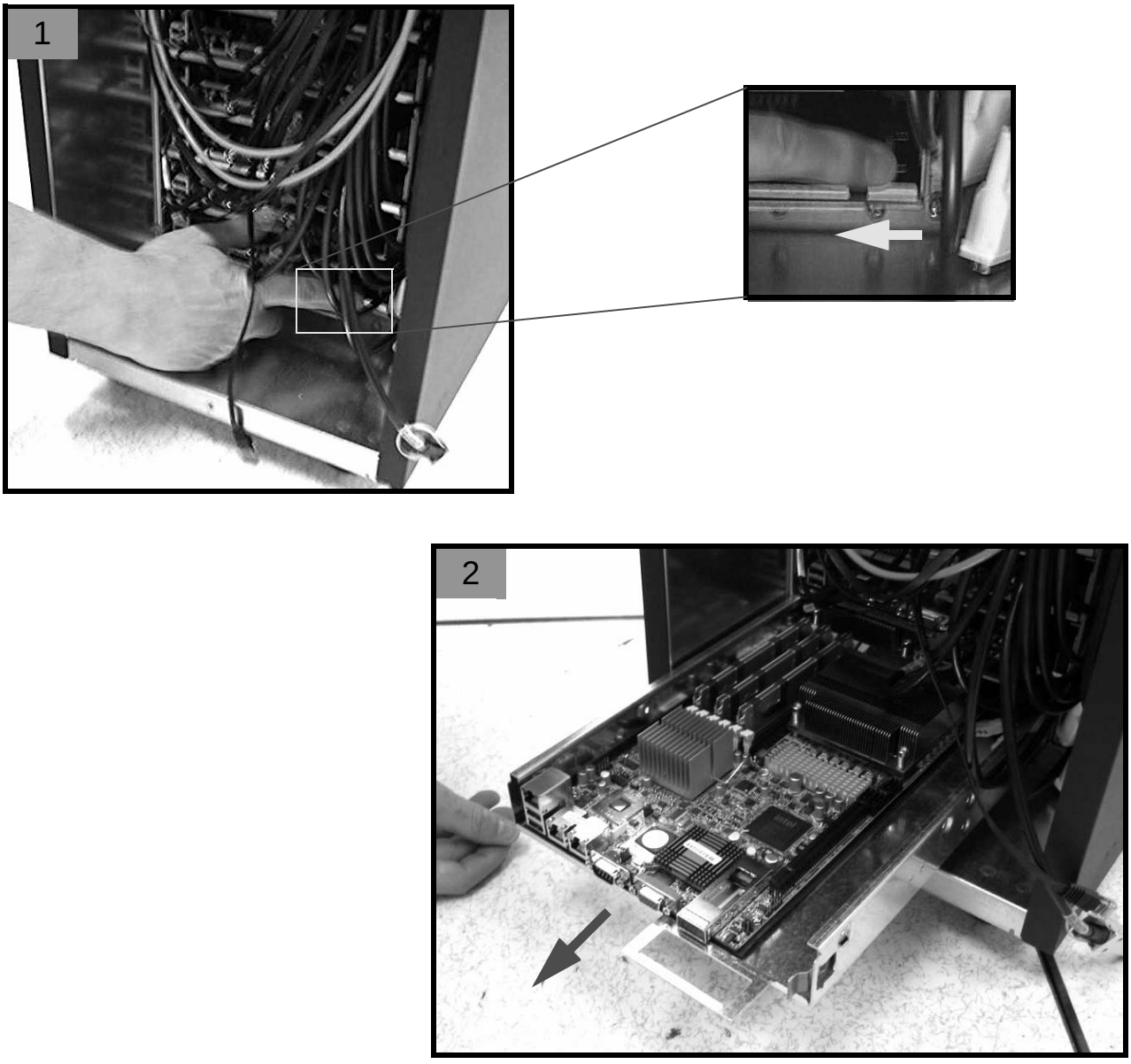


Figure 1-2 System Tray Removal

Installing a System Tray

Use the following steps to install a system tray into the Octane III deskside enclosure after replacing/upgrading DIMMs, disk drives, and/or PCIe cards in the tray:

Warning: Ensure that the server is disconnected from site power (by disconnecting the AC power cord[s] from the power outlet or rear of the system) before you attempt to install a system tray. Failure to do so can expose you to dangerous power levels, resulting in injury or death.

1. Access the system trays (refer to “Accessing the System Trays” on page 16).
2. Align the tray with the targeted tray slot in the enclosure. The tray should be inserted with the open area holding the components facing upwards and the ports and handle facing outwards.
3. Slide the tray all the way into the enclosure until it is seated firmly in the connectors at the rear of the slot (use your thumbs to snap it into place if necessary); refer to Figure 1-3 on page 19.
4. Connect the required cables (Ethernet, InfiniBand, USB, etc.) to the tray.
5. If the power button was depressed to turn the tray off before removing it, press the power button on the tray.
6. Reinstall the rear fan assembly; refer to “Installing the Rear Fan Assembly” on page 38.
7. Plug the AC power cord[s] into the rear of the system and the power outlet.
8. Move the system enable switch on the rear of the enclosure to the ON position.
9. Boot the operating system.

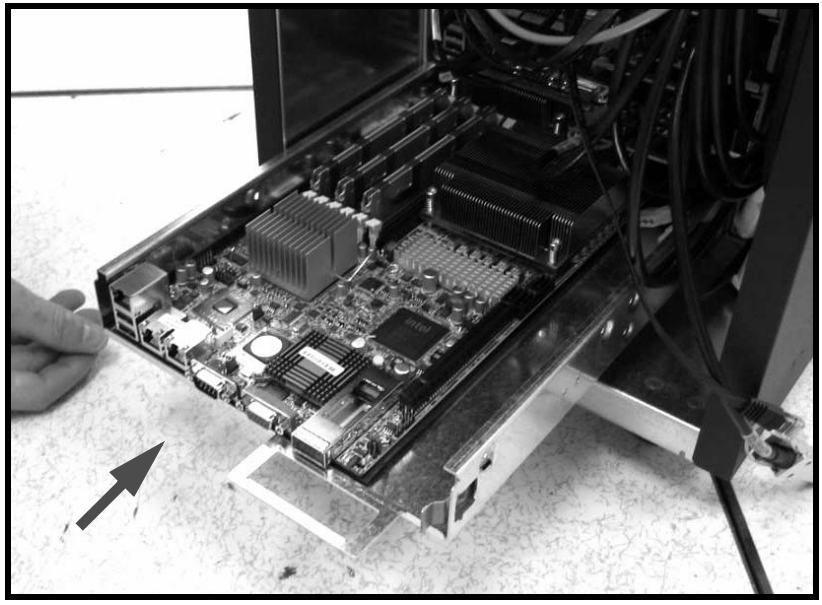


Figure 1-3 System Tray Installation

DIMM Memory Replacement

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure.

Note: Check with your SGI sales or service representative for approved replacement or upgrade DIMM memory modules.

Exercise extreme care when installing or removing DIMM modules to prevent electrostatic or any other possible damage.

Removing Memory Modules

Note: To remove memory modules, you must first remove the compute tray from the enclosure. Refer to “Extracting an Installed System Tray” on page 16 for detailed instructions. Be sure to power down the system and disconnect the power cords from the power outlet before opening the system enclosure.

To remove a DIMM: Use your thumbs to gently push the release tabs near both ends of the memory module. This should release it from the slot. Then, lift the DIMM out of the slot.

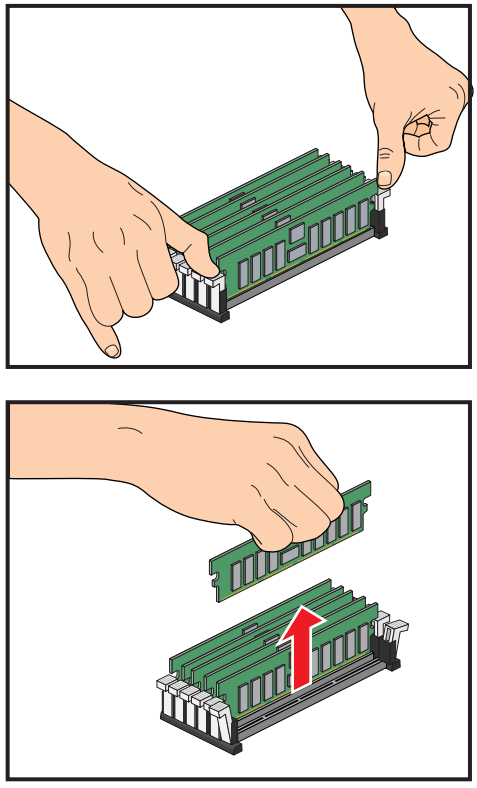


Figure 1-4 DIMM Removal

Installing Memory Modules

Insert each memory module vertically into a slot using the information and illustrations in this section. Pay attention to the notch along the bottom of the module to prevent inserting it incorrectly.

Note: To install memory modules, you must first remove the compute tray from the enclosure. Refer to “Extracting an Installed System Tray” on page 16 for detailed instructions. Be sure to power down the system and disconnect the power cords from the power outlet before opening the system enclosure.

To install a DIMM: Insert the module vertically and gently press down until it snaps into place. Pay attention to the alignment notch at the bottom. Repeat for all DIMMs. When all DIMMs are installed, install the tray in the chassis (refer to “Installing a System Tray” on page 18).

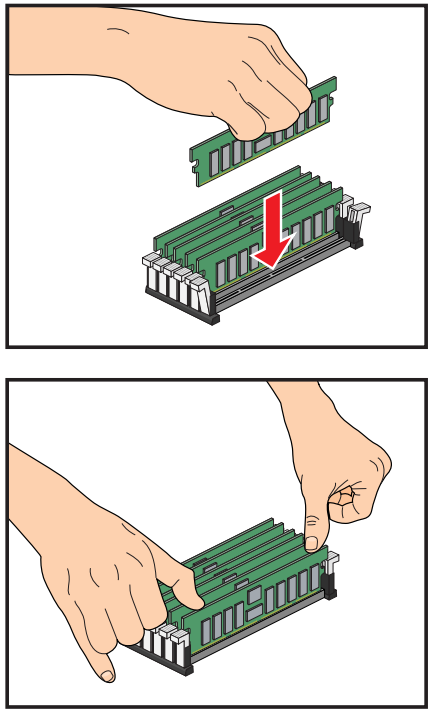


Figure 1-5 DIMM Installation

Adding PCIe Cards

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure.

Note: PCIe cards cannot be "hot installed." To install PCIe cards, you must first remove the compute tray from the enclosure. Refer to "Extracting an Installed System Tray" on page 16 for detailed instructions.

Perform the following steps to add a PCIe add-on card:

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Remove the system tray that will contain the PCIe card from the enclosure (refer to "Extracting an Installed System Tray" on page 16).
2. Place the tray on a static-free work surface.
3. If the tray contains a disk drive bracket that prevents you from accessing the PCI riser or PCI slot on the serverboard, remove the disk drive bracket.
4. If necessary, insert a PCI riser into the PCI slot on the serverboard.
5. Insert the add-on card into the riser card.
6. If you removed the disk drive bracket, re-install it.
7. Re-install the system tray (refer to "Installing a System Tray" on page 18).

Disk Drive Replacement

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure.

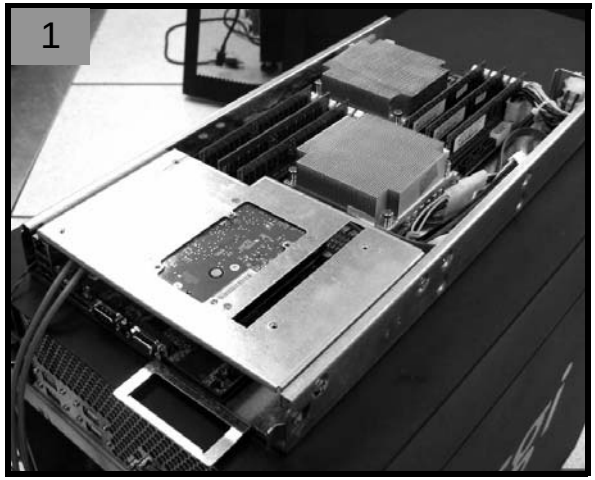
The system disk drives mount on brackets that attach to the systems trays.

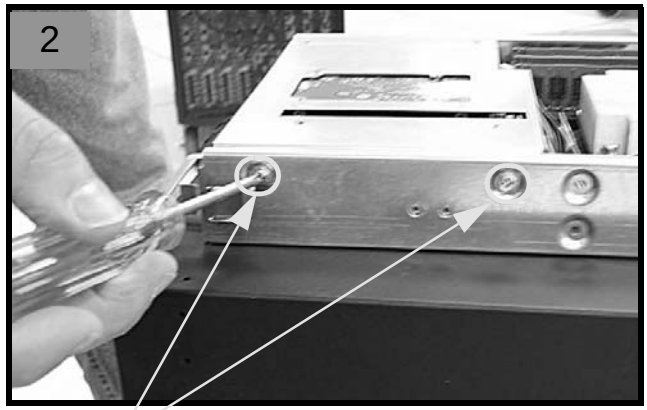
Removing a Drive from a System Tray

Use the following procedure to remove a drive from your system (refer to on page 25 and Figure 1-7 on page 26):

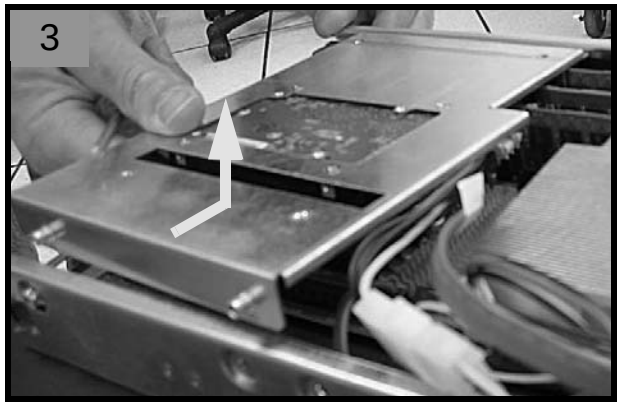
Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Extract the tray from which you want to remove the drive (refer to “Extracting an Installed System Tray” on page 16).
2. Remove the two Phillips screws on the right side of the tray that secure the disk drive bracket to the tray.
3. Lift the bracket upwards and pull it out of tray to access the disk drive.
4. Disconnect the data and power cables from the disk drive.
5. Remove the four Phillips screws that secure the disk drive to the disk drive bracket.





Remove these two Phillips screws.



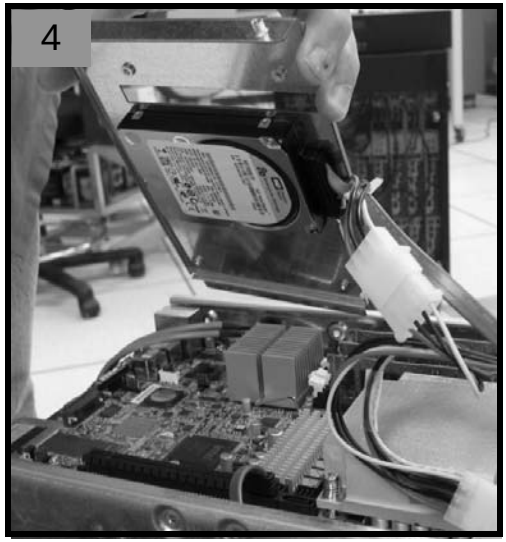


Figure 1-6 Disk Drive Removal (Part 1 of 2)

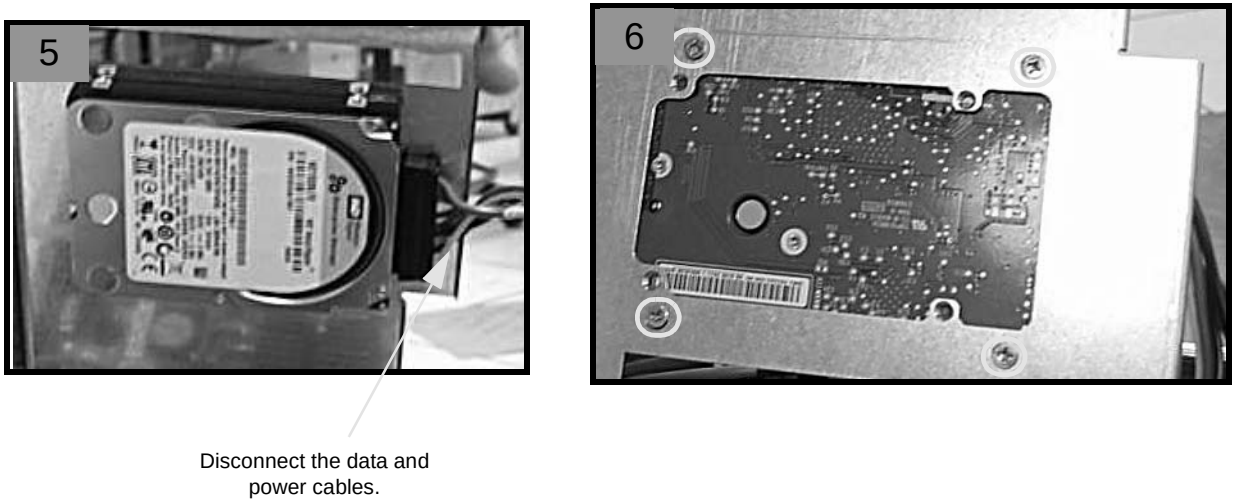


Figure 1-7 Disk Drive Removal (Part 2 of 2)

Installing a Drive in a System Tray

Check with your SGI sales or service representative to obtain new or replacement hard disk drives for the Octane III deskside cluster server.

Use the following procedure to install a drive in your system (refer to Figure 1-8 and Figure 1-9):

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Install the four Phillips screws that secure the disk drive to the disk drive bracket.
2. Connect the data and power cables to the disk drive.

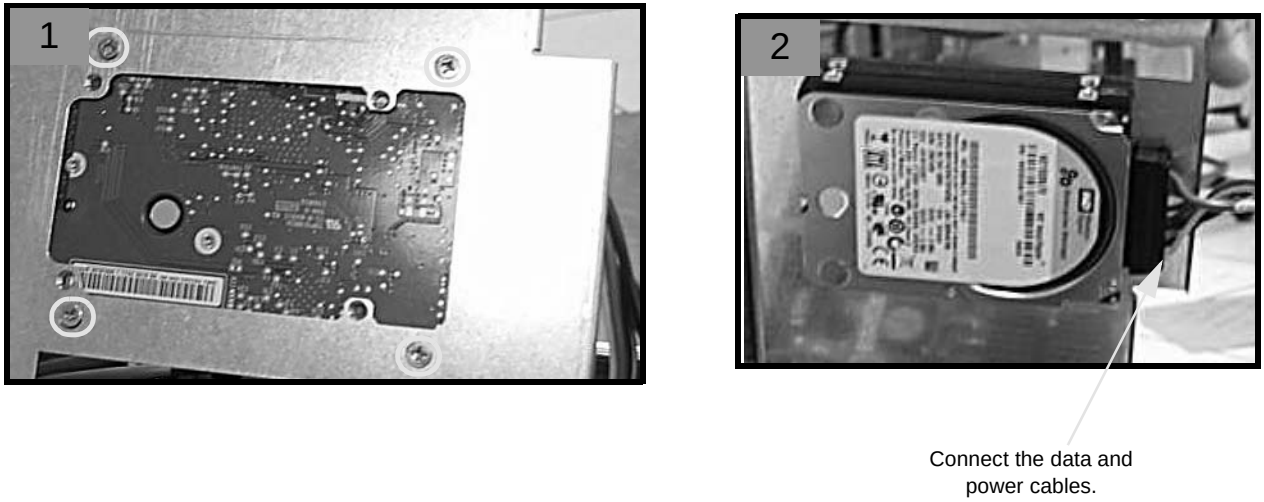


Figure 1-8 Disk Drive Installation (Part 1 of 2)

3. Insert the disk drive bracket into the tray.
4. On the right side of the tray, install the two Phillips screws that secure the disk drive bracket to the tray.

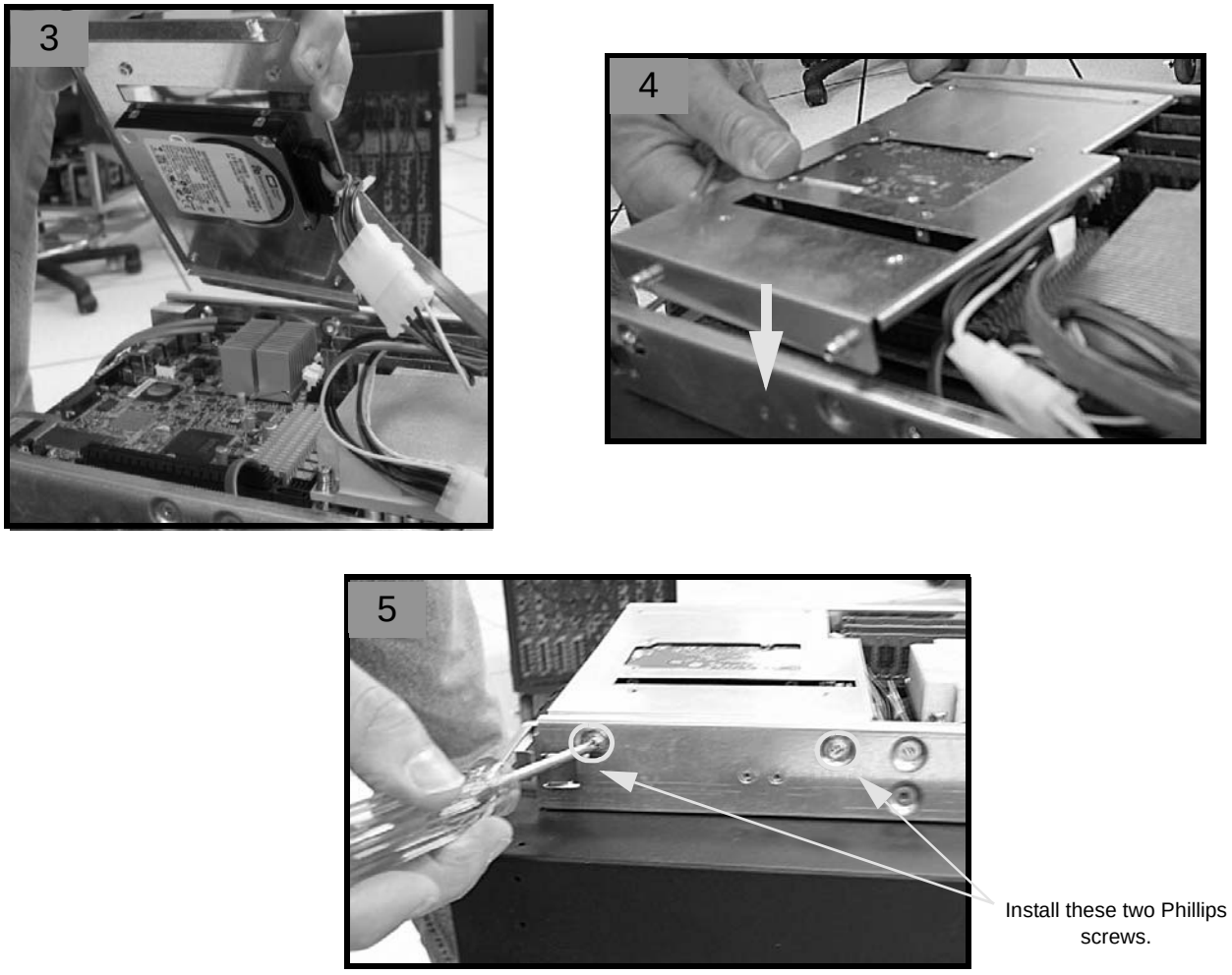


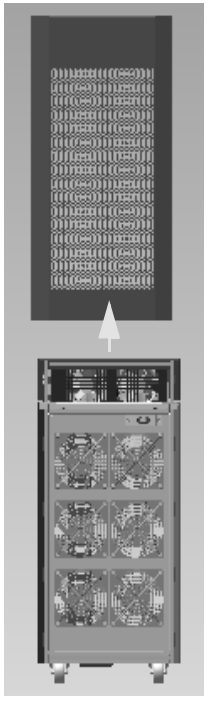
Figure 1-9 Disk Drive Installation (Part 2 of 2)

5. Install the tray in the enclosure; refer to “Installing a System Tray” on page 18.

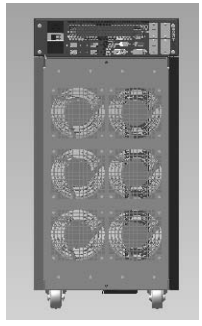
System Fan Assembly Replacement

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure.

Each enclosure has two sets of 6-fan assemblies to provide the main cooling for the system. One fan assembly is located on the front of the enclosure (behind the front cover); the other fan assembly is located on the rear of the enclosure.



Front Fan Assemblies (with Front Cover Removed)



Rear Fan Assemblies

Figure 1-10 Front and Rear Fan Assemblies

System Fan Failures

If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

Accessing the Front System Fans

Use the following procedure to access the system fan assembly:

Caution: Ensure that you properly shut down the operating system before removing power from the system. Failure to do so can result in data loss.

1. Shut down the operating system, and move the system enable switch on the rear of the enclosure to the OFF position.

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

2. Unplug the AC power cords from the site power outlet and/or the rear of the system.
3. Remove the front cover:
   - Slide the latch on the bottom of the cover to the right to release the cover.
   - Lift the cover upwards to remove it from the enclosure.

Accessing the Rear System Fans

Use the following procedure to access the rear system fan assembly:

Caution: Ensure that you properly shut down the operating system before removing power from the system. Failure to do so can result in data loss.

1. Shut down the operating system, and move the system enable switch on the rear of the enclosure to the OFF position.

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

2. Unplug the AC power cords from the site power outlet and/or the rear of the system.

The rear system fan assembly is directly accessible from the rear of the system; there is no cover/door.

Removing the Front Fan Assembly

Use the following procedure to remove the front fan assembly (refer to Figure 1-12 on page 35):

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Remove the front cover (refer to “Accessing the Front System Fans” on page 30).
2. Remove the two Phillips screws (at the top of the fan assembly) that secure the fan assembly to the enclosure.
3. Tip the fan assembly away from the enclosure.
4. Lift the fan assembly out of the enclosure.

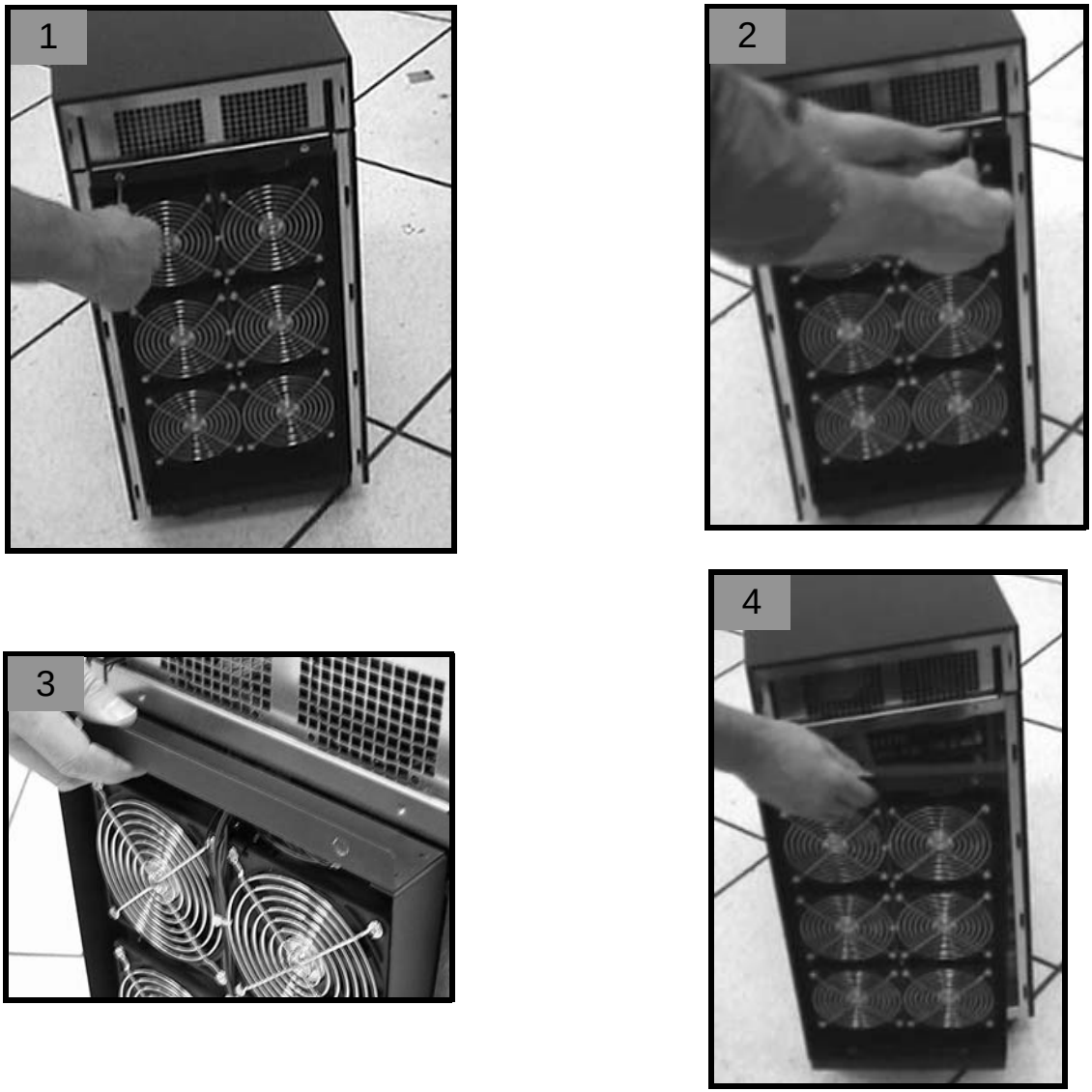


Figure 1-11 Front Fan Assembly Removal

Removing the Rear Fan Assembly

Use the following procedure to remove the rear fan assembly (refer to Figure 1-13 on page 37):

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Access the rear fan assembly (refer to “Accessing the Rear System Fans” on page 31).
2. Remove the two Phillips screws (one at the top of the fan assembly and one at the bottom of the fan assembly) that secure the fan assembly to the enclosure.
3. Tip the fan assembly away from the enclosure and lift the fan assembly out of the enclosure.

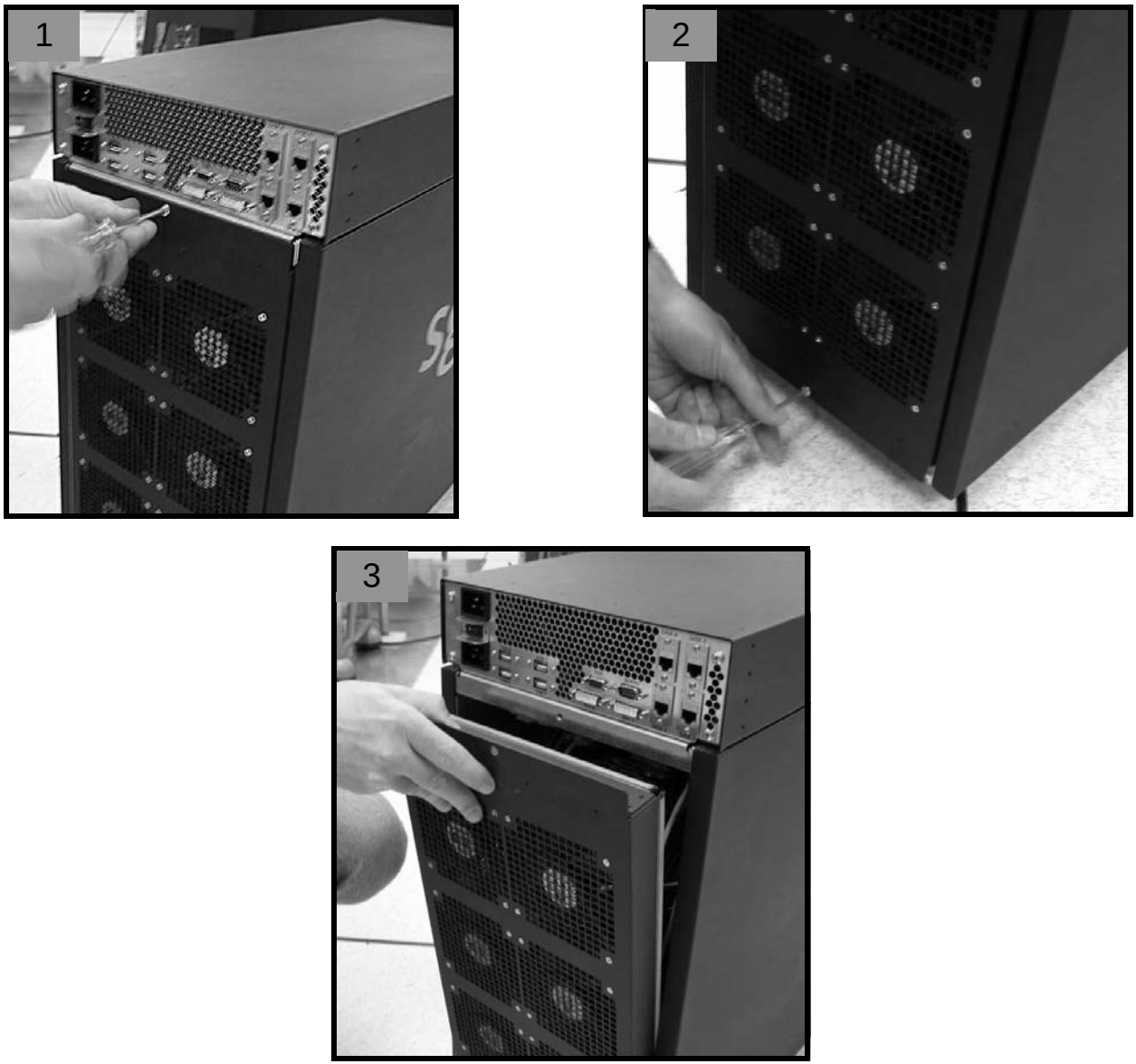


Figure 1-12 Rear Fan Assembly Removal

Installing the Front Fan Assembly

Use the following procedure to install the front fan assembly (refer to Figure 1-13 on page 37):

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Lower the fan assembly into the bottom of enclosure and push the top of the assembly into place.
2. Tighten the two Phillips screws to hold the fan assembly in place at the top of the fan assembly.
3. Place the front door in place and close the latch at the bottom of the door.
4. Plug the AC power cords into rear of the enclosure and into the power outlet.
5. Move the system enable switch on the rear of the enclosure to the ON position
6. Boot the operating system.

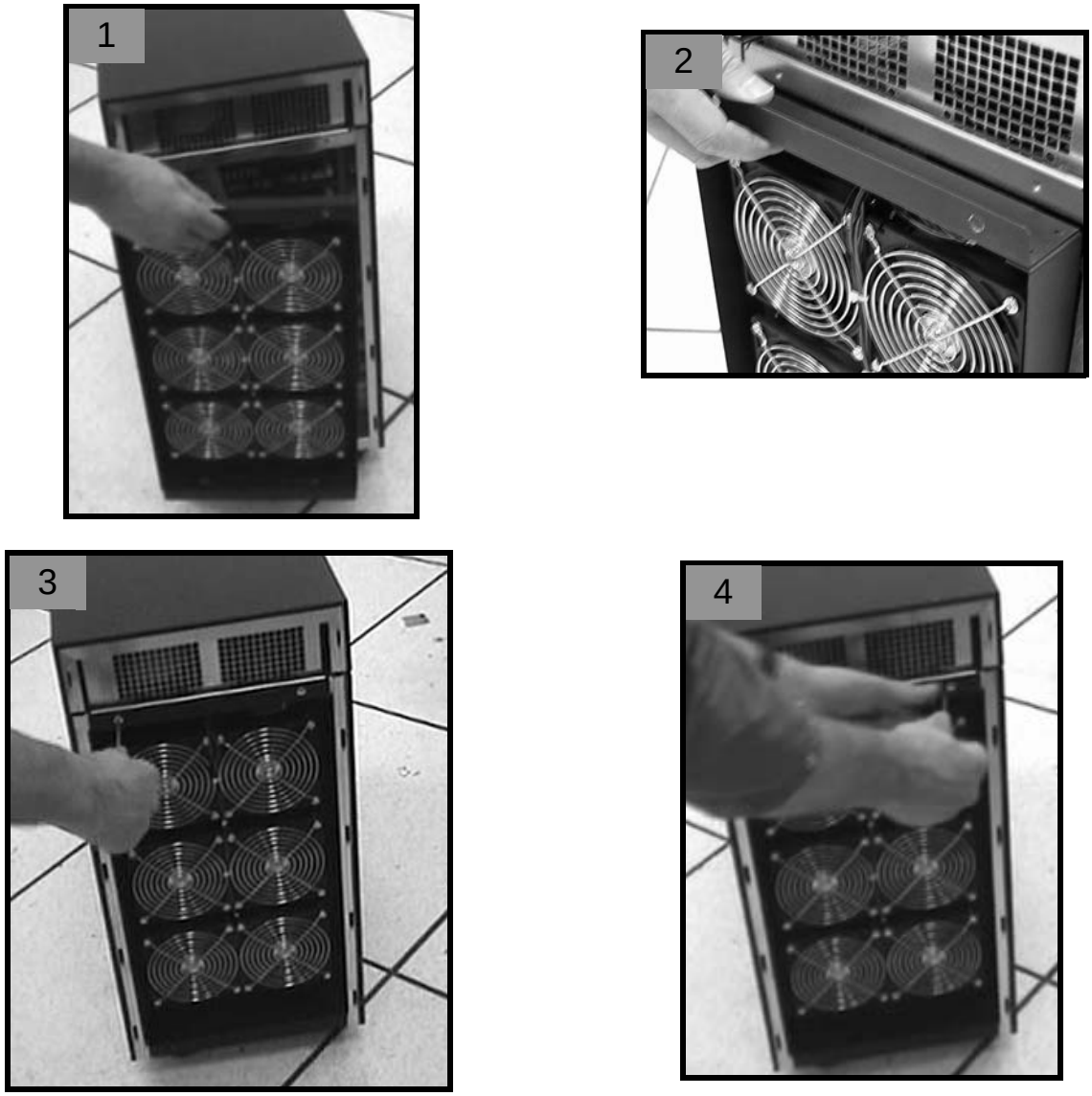


Figure 1-13 Front Fan Assembly Installation

Installing the Rear Fan Assembly

Use the following procedure to install the rear fan assembly (refer to Figure 1-14 on page 39):

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Lower the fan assembly into the bottom of enclosure and push the top of the assembly into place.
2. Tighten the two Phillips screws to hold the fan assembly in place (one at the top of the fan assembly and one at the bottom of the fan assembly).
3. Plug the AC power cords into rear of the enclosure and into the power outlet.
4. Move the system enable switch on the rear of the enclosure to the ON position
5. Boot the operating system.

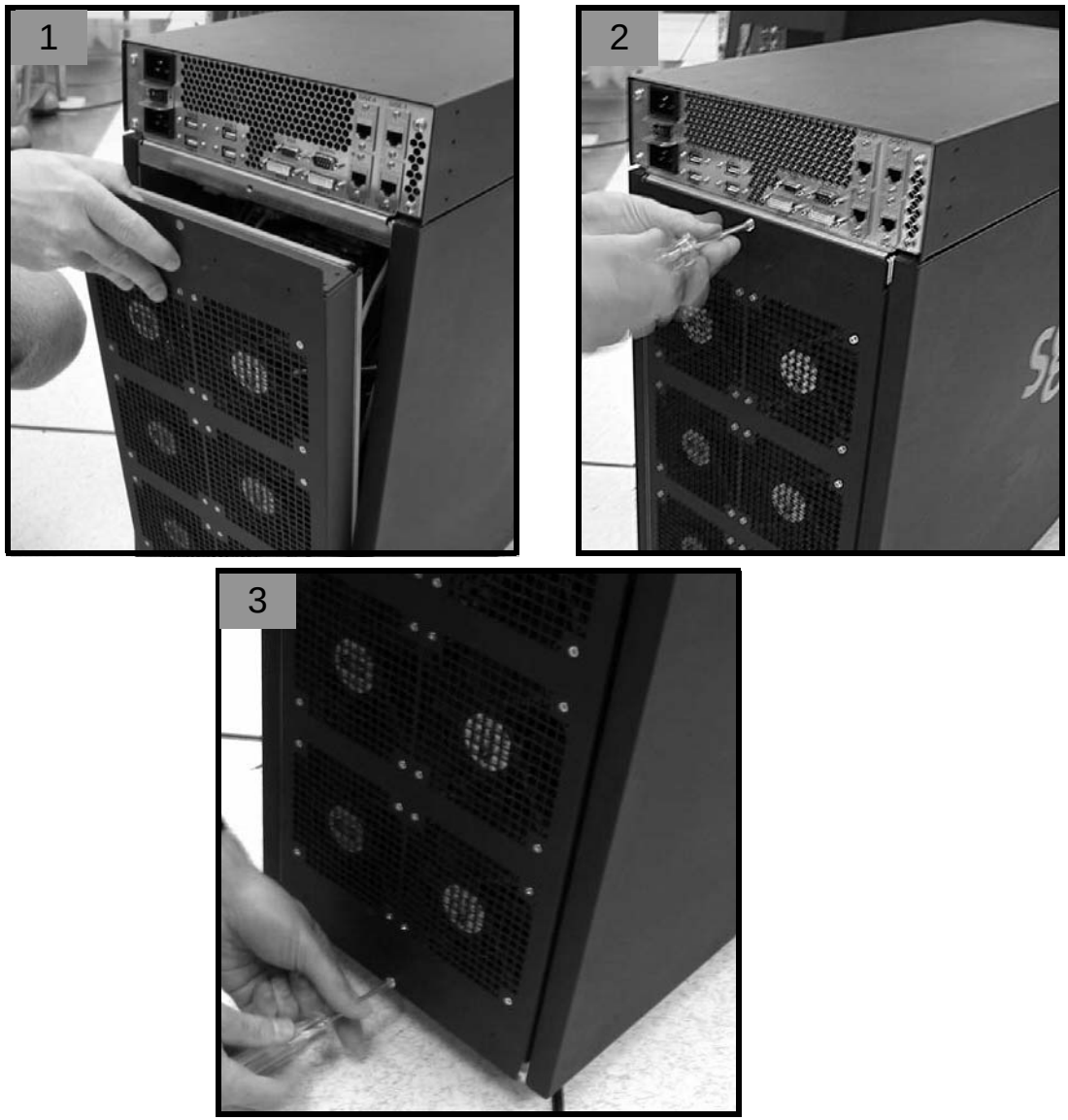


Figure 1-14 Rear Fan Assembly Installation

Chassis Power Supply Replacement

Warning: Only personnel with extensive experience repairing server hardware should attempt to replace or upgrade components inside an SGI Octane III deskside cluster server enclosure.

The Octane III deskside cluster uses two AC-to-DC power supplies. Each power supply has a separate power cord and is rated for a maximum DC output of 1000 watts at 100-120 VAC, or 1200 watts at 200-240 VAC. Each power supply is cooled by a built-in 40-mm fan. Each supply has one (bi-color) status LED on the rear which may be visible through the perforated sheetmetal panel at the upper rear of the enclosure.

Note: You must turn off the power for the enclosure and then unplug the AC power cords from power outlet and/or the rear of the system to completely remove power from the system before removing/installing a power supply.

Power Supply Failures

If a power supply unit (or its cooling fan) fails, the system must be shut down. The system requires both power supplies to operate.

If you need to replace the power supply unit and the system is out of warranty, replacement units can be ordered directly from your SGI sales or service representative.

Accessing the Power Supplies

Use the following procedure to access the inside of the enclosure to replace a power supply:

Caution: Ensure that you properly shut down the operating system before removing power from the system. Failure to do so can result in data loss.

1. Shut down the operating system, and move the system enable switch on the rear of the enclosure to the OFF position.

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

2. Unplug the AC power cords from the rear of the enclosure and/or the site power outlet.
3. Access the top of the enclosure (refer to Figure 1-15 on page 42):
   - Remove the four Phillips screws that secure the top cover to the rear of the enclosure.
   - Push the top cover towards the front of the enclosure.
   - Lift the top cover off of the enclosure.

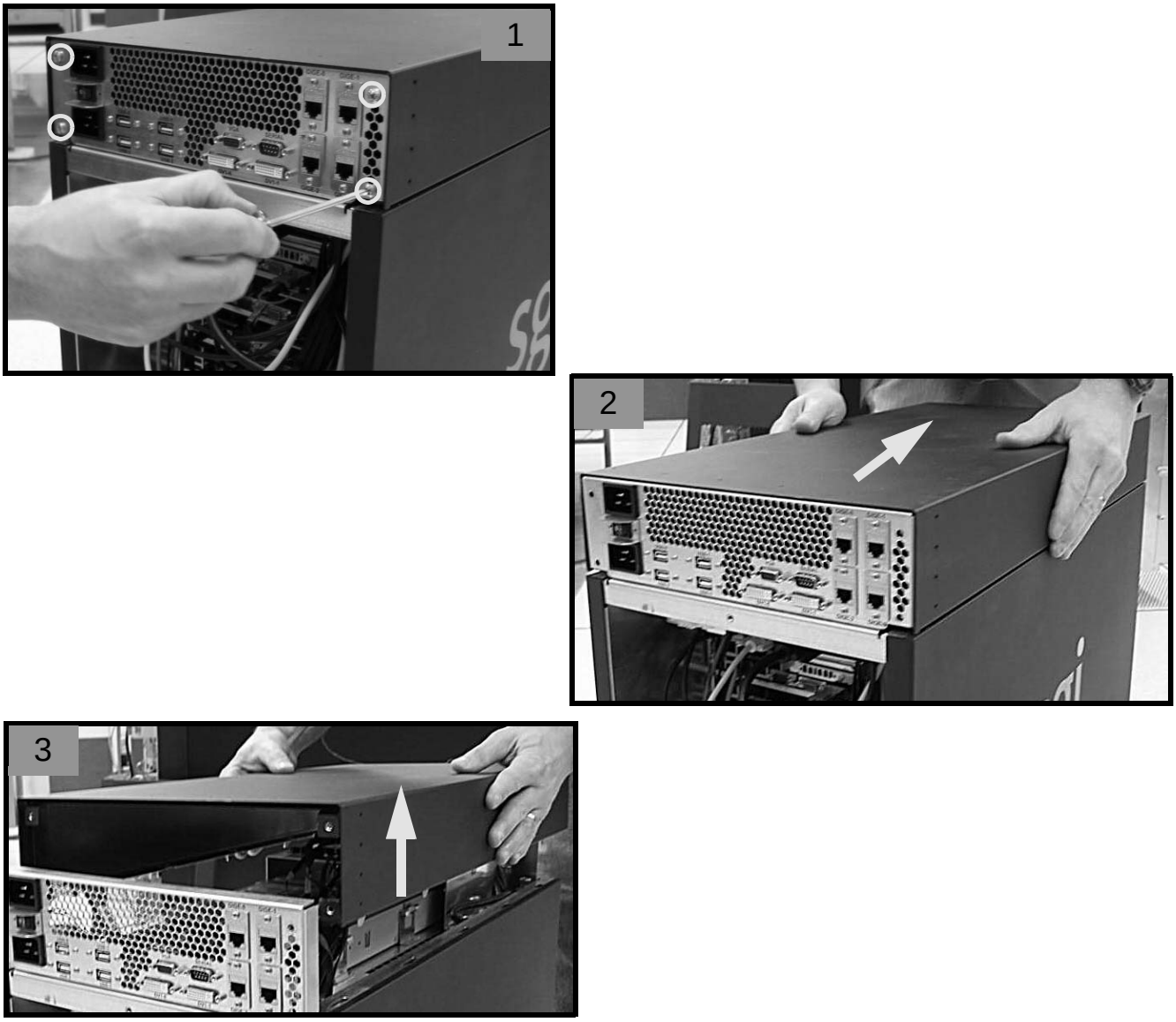


Figure 1-15 Removing the Top Cover

Removing a Power Supply

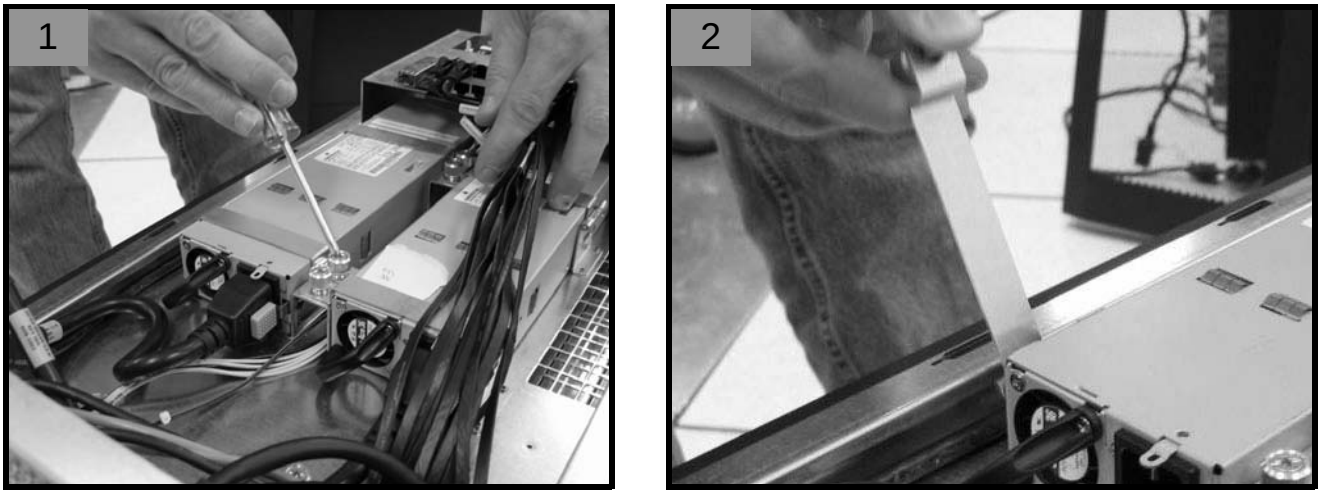
Use the following steps if you need to remove a failed power supply from the cluster server:

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

1. Power down the system and access the power supplies (refer to “Accessing the Power Supplies” on page 41).

Warning: The power supply that you want to replace might be hot if the system has been running. To prevent injury, allow the power supply to cool down for at least 5 minutes before removing it and handle it carefully while you remove it.

2. Remove the two Phillips screws that secure the restraining bands for the power supply that you want to remove. Lift the restraining bands out of the enclosure (refer to Figure 1-16 on page 44).
3. Unplug the power cable from the power supply (refer to Figure 1-17 on page 45).
4. Push the power supply release lever and pull the power supply to remove it from the enclosure (refer to Figure 1-17 on page 45).
5. Lift the unit away from the enclosure and place it on a heat-resistant work surface.



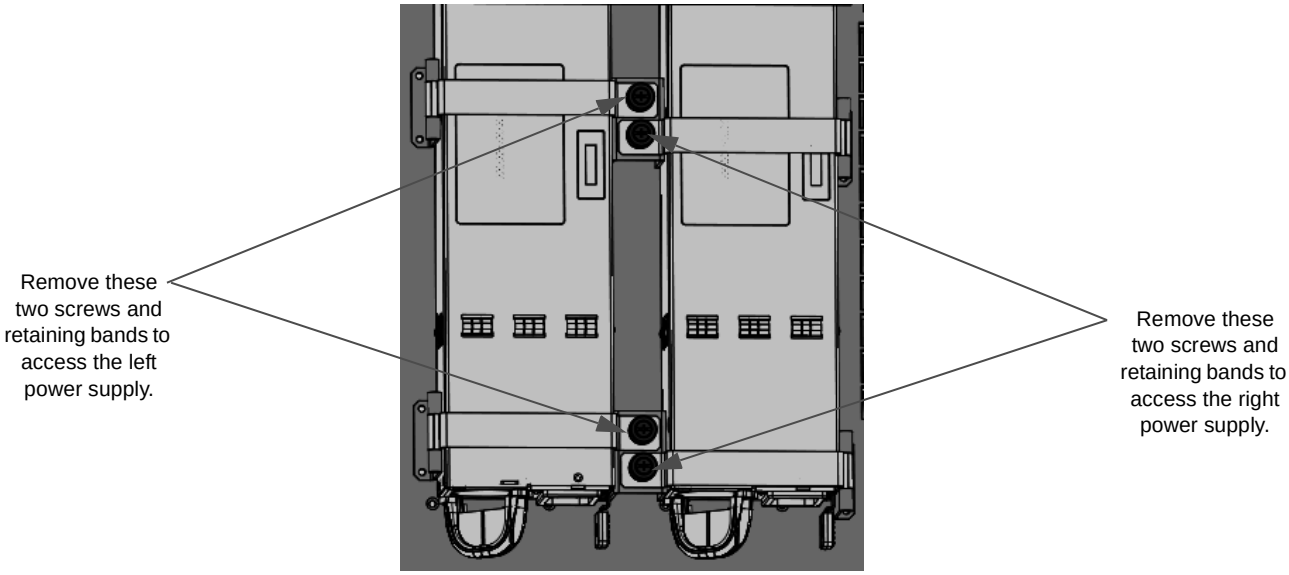
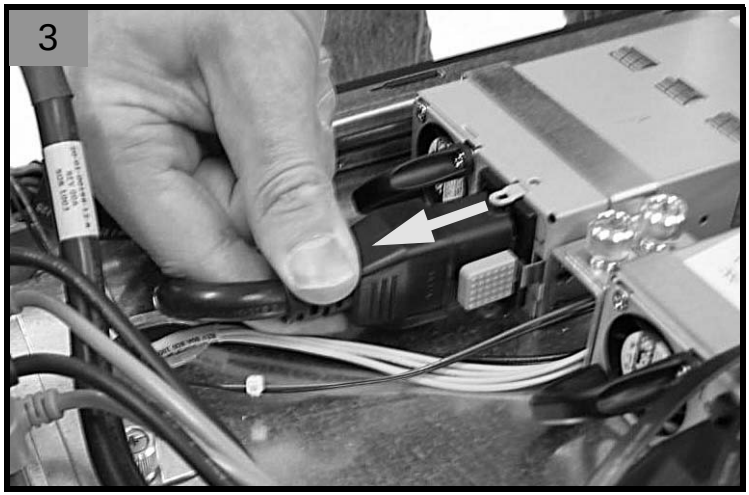


Figure 1-16 Power Supply Removal (Part 1 of 2)



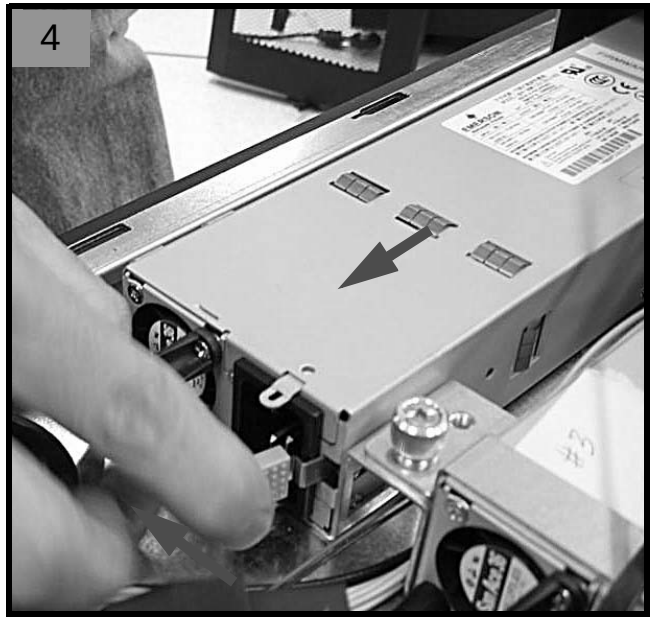


Figure 1-17 Power Supply Removal (Part 2 of 2)

Installing a Power Supply

Use the following steps to replace a failed power supply or install an additional power supply in the server:

Warning: You must disconnect the server from site power (by disconnecting the AC power cords from the power outlet) before you attempt to service any internal components. Failure to maintain proper safety measures while accessing internal server components can expose you to dangerous power levels, resulting in injury or death.

Note: Be sure to use the exact same model of power supply from SGI or another approved vendor; contact your SGI sales or service representative for more information.

1. Carefully insert the new unit into the enclosure and push it all the way in until it seats in the rear connectors (refer to Figure 1-18 on page 47).
2. Install the two restraining bands that hold the power supply in place (refer to Figure 1-18 on page 47).
3. Insert the power plug into the power supply (refer to Figure 1-18 on page 47).
4. Install the top cover (refer to Figure 1-19 on page 48):
   - Position the top cover on top the of the enclosure.
   - Push the top cover towards the rear of the enclosure.
   - Install the four Phillips screws that secure the top cover to the rear of the enclosure.
5. Plug the AC power cords into the rear of the system and the power outlet.
6. Move the system enable switch on the rear of the enclosure to the ON position
7. Boot the operating system.

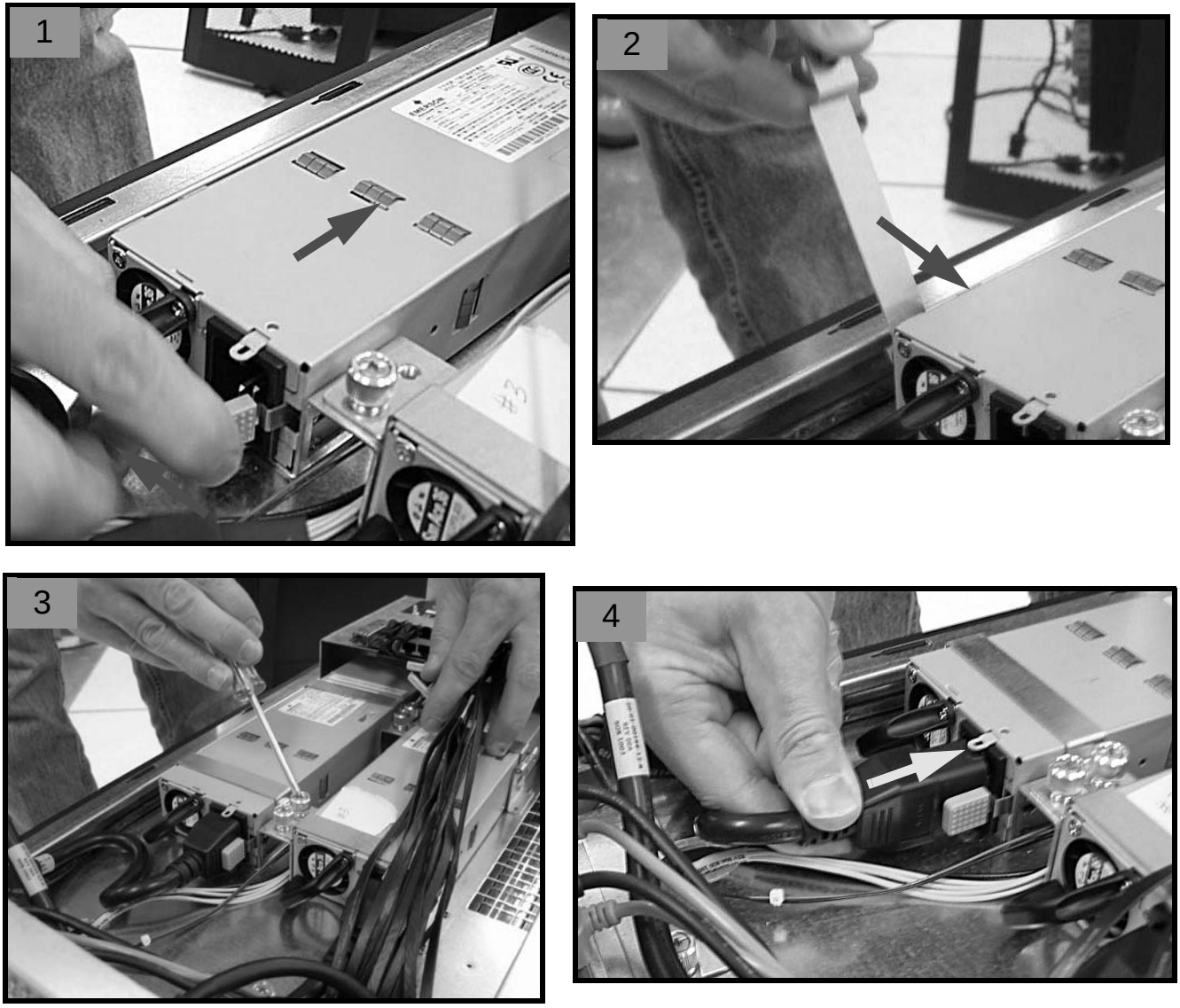


Figure 1-18 Power Supply Installation

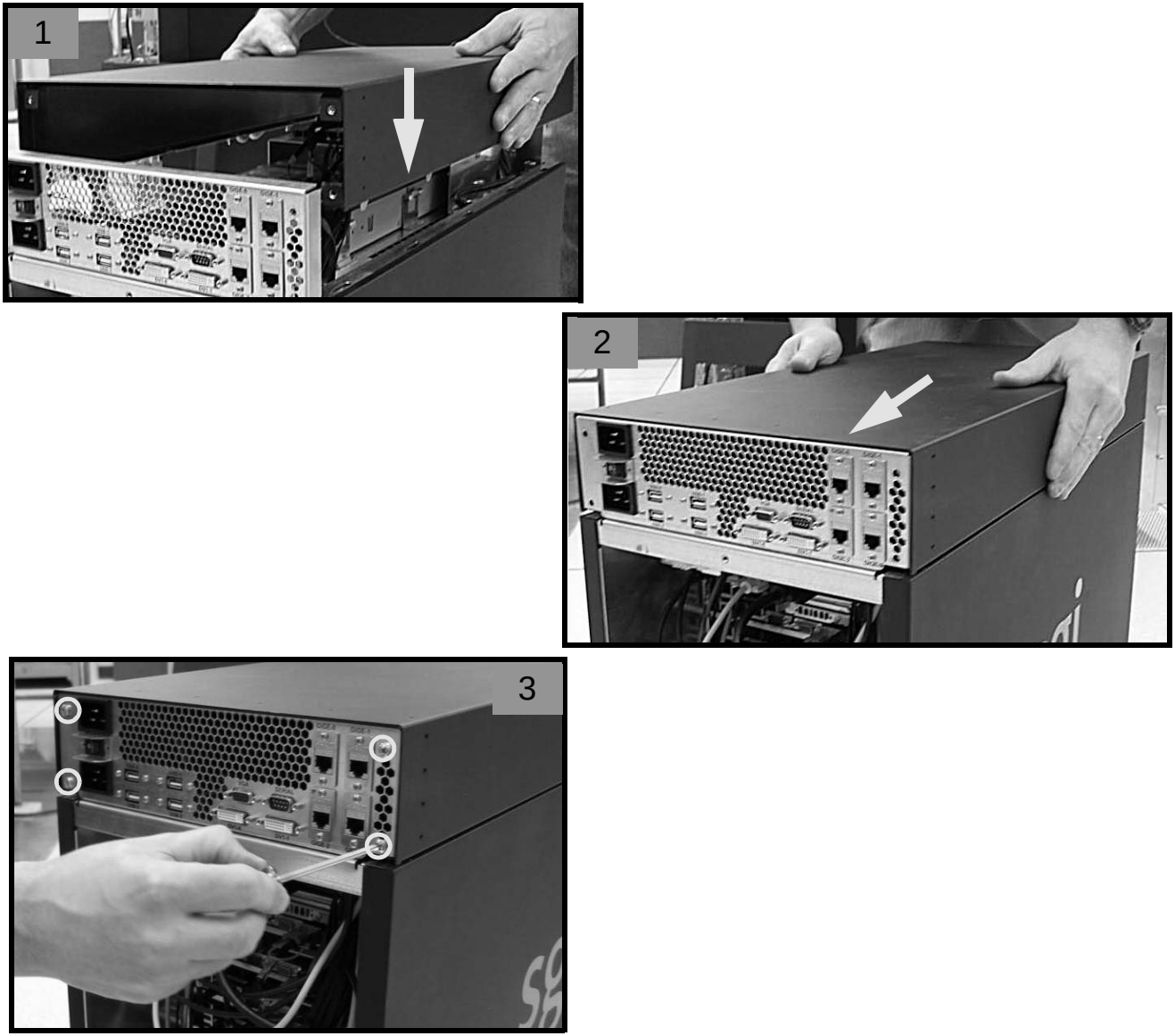


Figure 1-19 Top Cover Installation