

# Origin200™ FailSafe Network Server Quick Reference Guide

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## CONTRIBUTORS

Written by Mark Schwenden

Illustrated by Dan Young

Edited by Christina Cary

Production by Allen Clardy

Engineering contributions by Greg Cibinski, Mike Koken, Chander Kant, Ira Pramanick, Ashwinee Dinkar, Vesna Vrdoljak, Jon Olson, Robert Thome, Michael Nishimoto, and Ajit Dandapani.

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## About This Guide

This manual describes the general function, configuration, and use of the Silicon Graphics Origin200 FailSafe network server (OFNS) system. This server consists of two Origin200 host systems and two Origin Vaults preconfigured, cabled, and installed in a rack 42 inches (107 cm) high. A PCI Ethernet controller board in each Origin200 links the systems to the public networks. Internally, the standard (built-in) Ethernet controller provides a private link between the two hosts as part of the FailSafe configuration. The product also includes a special express setup manager for configuring and administering the network server.

### Audience

This guide is written for the operator, administrator, or user of an OFNS system. Many system components can be installed, removed, or replaced by the end user; this guide provides instructions for only the most common procedures. Other less common procedures are covered in the *Origin200 and Origin200 GIGAchannel Owners Guide* (p/n 007-3708-xxx), *Origin200 and Origin200 GIGAchannel Maintenance Guide* (p/n 007-3709-xxx), and the *Origin Vault Owner's Guide* (p/n 007-3455-xxx).

This guide presumes the user has some familiarity with Origin200 and/or Origin Vault systems, but no special training is presumed.

### Structure of This Document

This guide contains the following chapters and appendixes:

- Chapter 1, "Introduction and Setup," provides information necessary to properly unpack and set up the OFNS rack.
- Chapter 2, "Configuring OFNS With the Express Setup Manager," describes the FailSafe Express screens and the information you need to properly configure them. This chapter tells you how to quickly set up your system for immediate use as a high-availability network resource. Troubleshooting tips and error messages are included.

- Chapter 3, “Installing or Replacing Disks or PCI Boards,” describes the installation or replacement rules for mirrored disks in the Origin Vaults. It also explains the remove and replace process for a system disk or other disks installed in one of the two Origin200 hosts.
- Chapter 4, “Cabling and Configuration,” explains the proper cabling configurations and how to properly reconnect the system if one of the enclosures must be removed for maintenance.
- Appendix A, “Technical Specifications,” supplies technical specifications for the rack and individual enclosures within the rack.

## Additional Useful Manuals

Other manuals that provide additional useful information include:

- *Origin200 and Origin200 GIGAchannel Owner’s Guide* (p/n 007-3708-xxx)
- *Origin200 and Origin200 GIGAchannel Maintenance Guide* (p/n 007-3709-xxx)
- *Origin Vault Owner’s Guide* (p/n 007-3455-xxx)
- *IRIX Admin: Disks and Filesystems* (p/n 007-2825-xxx)
- *IRIS FailSafe Administrator’s Guide* (p/n 007-3109-xxx)

If you don’t have the printed manuals available and you can access the Internet, the manuals are available online in the Technical Publications Library at the following location:

<http://techpubs.sgi.com/library/>

Once you are in the Library, select Catalogs> Hardware Catalog > and look under the product name for the document you need.

## Release Notes

You can view the release notes for a variety of Silicon Graphics products and software subsystems using one of two utilities:

*relnotes*

Text-based viewer for online release notes.

*grelnotes*

Graphical viewer for online release notes.

To see a list of available Release Notes, type the following at a shell prompt:

```
relnotes
```

For more information, see the *relnotes(1)* and *grelnotes(1)* reference (man) pages.

## Typographical Conventions

These type conventions and symbols are used in this guide:

**Helvetica Bold** Hardware labels

*Italics* Executable names, filenames, IRIX commands, manual or book titles, new terms, program variables, tools, utilities, variable command-line arguments, variable coordinates, and variables to be supplied by the user in examples, code, and syntax statements

**Bold** Function names

Fixed-width type

Error messages, prompts, and onscreen text

**Bold fixed-width type**

User input, including keyboard keys (printing and nonprinting); literals supplied by the user in examples, code, and syntax statements

"" (Double quotation marks) Onscreen menu items and references in text to document section titles or

[] (Brackets) Optional syntax statement arguments



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## Introduction and Setup

This chapter introduces you to the Origin200 FailSafe network server (OFNS) rack system.

It describes the basic unpacking and system setup procedures you use to get your OFNS system ready to operate.

This chapter includes

- “Removing the System From the Carton” on page 4
- “Site Placement Considerations” on page 6
- “Power Source Connections” on page 7
- “Connecting an ASCII Terminal” on page 9
- “Powering the System On and Off” on page 10

The OFNS system is a pre-packaged, highly available solution using two Origin200 servers and two Origin Vault drive enclosures in a 42-inch (107 cm) rack (see Figure 1-1). The system comes with IRIS FailSafe software already installed and internal cables connected, and it is ready for unpacking, installation, and configuration.

**Note:** The key that opens the rear door of the rack and the key for the front doors of the Origin enclosures are two different keys.



**Figure 1-1** Origin200 FailSafe Rack System (Front View)



**Figure 1-2** Origin200 FailSafe Rack System (Rear View)

## Removing the System From the Carton

Read this section for information on how to unpack the rack system and move it to the operational location. The packing crate is 40.5 inches (103 cm) long. You will need an area at least 10 feet (3 m) long to properly unpack the crate.

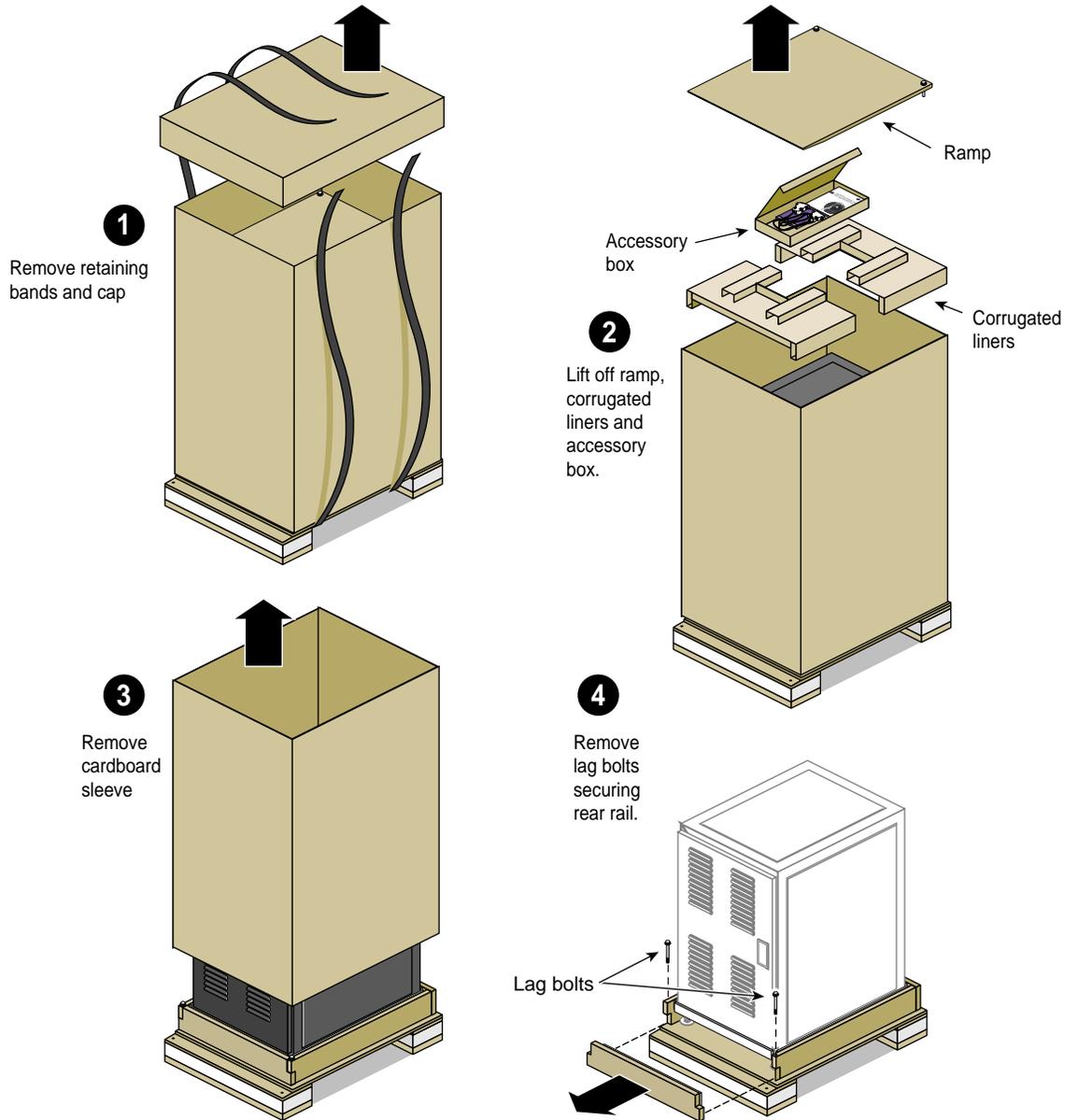
**Caution:** Be careful when unpacking and moving the OFNS rack chassis. The unit weighs 440 lbs (200 kg) before unpacking, and 365 lbs (166 kg) when ready for installation. Get help from a second or third person whenever you need it.

Ensure that the chassis remains on a level surface and that the chassis weight remains evenly distributed across the four casters. If the casters must be lifted over an obstacle, such as a door threshold, use proper lifting techniques and employ a minimum of two people. Do not subject the rack cabinet to any unnecessary shocks or vibration while unpacking and installing the system.

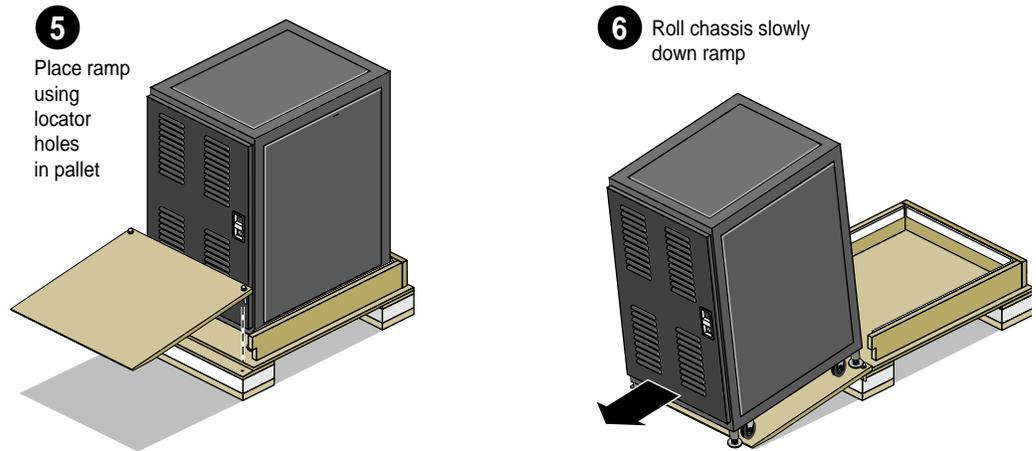
Follow these procedures to properly uncrate the rack and move it to the operating location:

1. Use a pallet jack to move the pallet and carton as close to the operation area as possible. Use a 1/2-inch (12.7 mm) wrench to adjust the rack's leveling feet up or down.
2. Carefully cut the pallet's bands, then lift off the cardboard top cover (see Figure 1-3).
3. Remove the flat wooden pallet ramp, then pull the corrugated cardboard liners out and remove the accessory box (it contains additional manuals, CDs, and a console terminal cable).
4. Pull the cardboard sleeve off and remove the rack's plastic cover.
5. Go to the rear of the system and pull out the two lag bolts (one at each corner) that hold the rear 2 x 6 board (also known as the gate) to the side boards.
6. Remove the rear 2 x 6 board. Note that the other 2 x 6 boards are not removable and there are no bolts holding the rack chassis directly to the bottom of the pallet.
7. Set the ramp in place at the rear of the chassis. Secure the ramp by inserting the two lag bolts through the holes in the ramp and into the pallet's bolt holes (see Figure 1-4).
8. With one person in front and one in back, slowly roll the unit down the ramp to the floor.

**Caution:** The rack chassis weighs 365 lbs (166 kg). Take care when rolling it.



**Figure 1-3** Unpacking the OFNS Rack



**Figure 1-4** Unpacking the OFNS Rack (Continued)

## Site Placement Considerations

The OFNS system should be fully configured with all hardware and software needed to start immediate network operation. Two Ethernet and four power connections are required for proper operation of the system. You must also have a console terminal connected to one of the Origin200 systems in the rack to properly configure the system's interface; see "Connecting an ASCII Terminal" on page 9. If you wish to make other connections to the system for peripherals such as a modem or printer, see the *Origin200 and Origin200 GIGAchannel Owners Guide* for information.

### Floor Space, Network, and Environmental Planning

Be sure the proper physical, electrical, and environmental preparations have been completed in advance of the installation. See Appendix A for information relating to the OFNS server's technical specifications.

- Ensure proper floor space is available to permit connectivity and service access.
- Be sure networking plans are in place to support the Origin200 host systems on a local public Ethernet.
- Be sure proper power sources and cooling have been arranged.

## Determine Local Network IP Addresses and Hostnames

You must have network IP addresses and hostnames on the network for each of the Origin200 units in the rack. You will need two IP addresses per Origin200 (four total).

Be sure to have the network address, host IP addresses, and hostnames before continuing.

At this point, most of the preparatory steps should be complete. The section “Label Networking Cables” on page 7 is helpful but not required before you begin the actual installation.

## Label Networking Cables

Label both ends of the networking cables with numbers that can be matched up later. This may save you time and confusion if the OFNS system is installed in a crowded lab or server room.

## Power Source Connections

Each of the four units inside the OFNS rack has its own power cord. Depending on the country of operation, you may use 100-120 VAC or 200-240 VAC power connections. Chapter 4, “Cabling and Configuration,” has additional information on plug type and connector requirements.

The best power availability can be attained by connecting each power cord to an individual uninterruptable power supply (UPS). Be sure to check the inrush current capacity of any UPS you decide to use with the system. If this is not possible, you should try to connect each enclosure power cable to a separate power connection (see Figure 1-5). See Appendix A for information relating to enclosure inrush current maximums.

An acceptable (but somewhat less reliable) power connection scheme is to ensure that an Origin200 and Origin Vault pair are each connected to one power branch, while the other two enclosures are plugged to a different branch.

To ensure the availability of the system, you should *never* plug all four cords into the same branch power source. Doing this means you have a single point of electrical failure or overload. If that single power branch fails, you lose all connectivity.

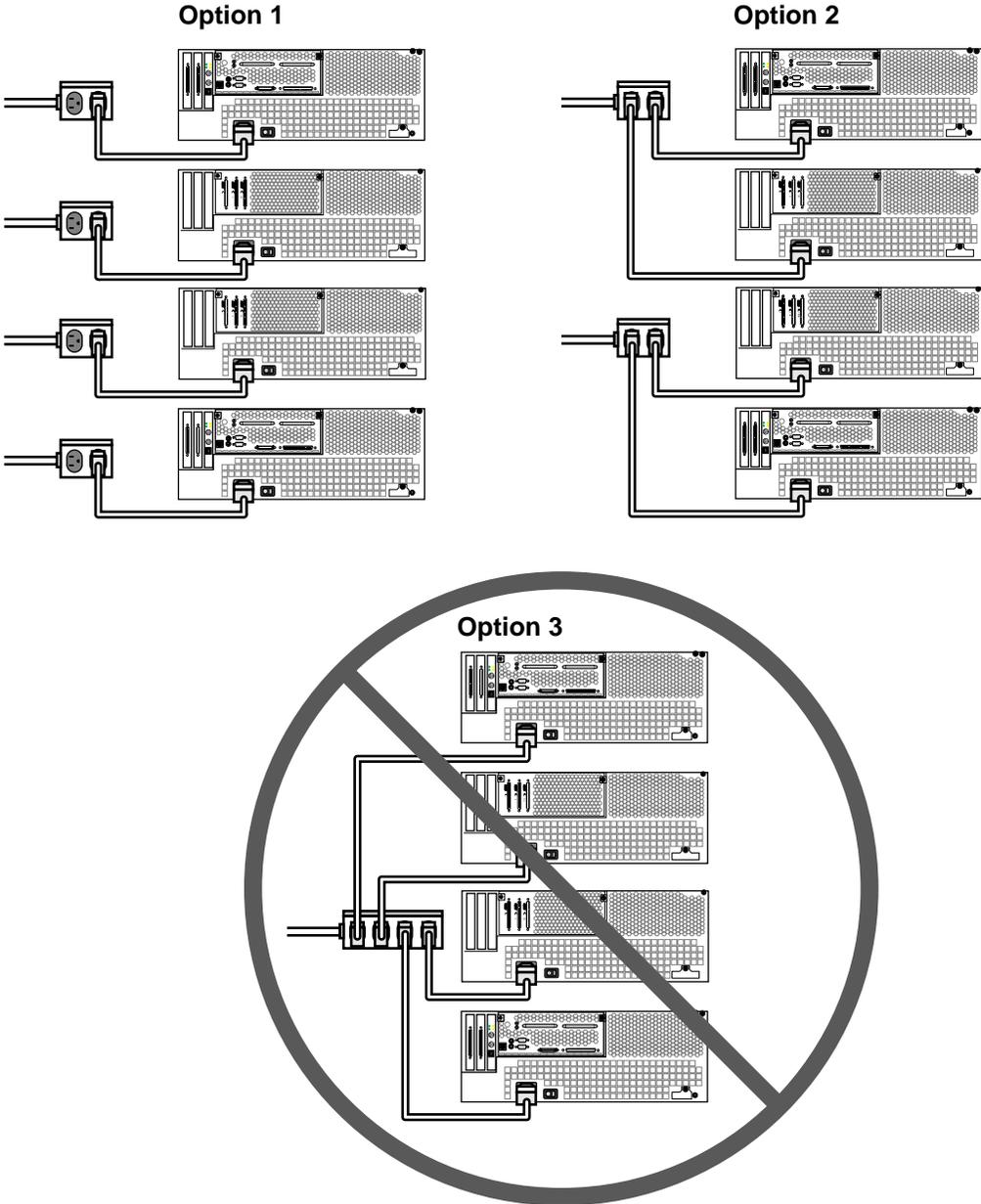


Figure 1-5 Power Connection Recommendations

## Connecting an ASCII Terminal

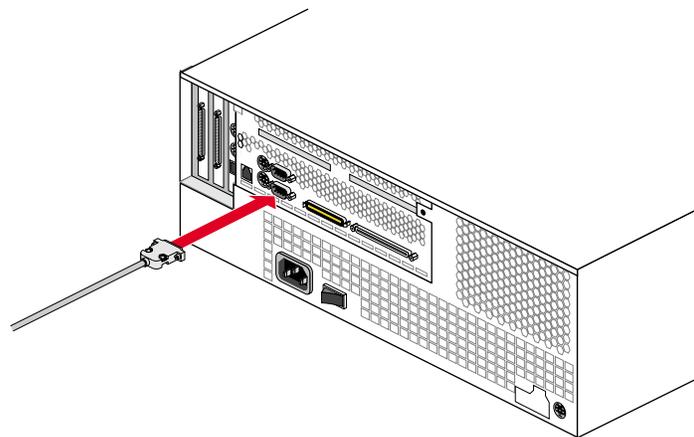
You should connect an optional ASCII terminal to one of the Origin200 servers in your OFNS rack. This section tells you how to use the serial cable shipped with your server. It has a DB-9 connector on one end and a 25-pin serial connector on the other. Note that you must have a console terminal connected to `tty_1` to configure the software for your OFNS system.

Be sure to read the documentation that comes with the terminal. Always connect your system console terminal to serial port 1 (`tty_1`).

Set the terminal with the following operational characteristics:

- 9600 baud
- 8 bits
- 1 stop bit
- no parity

Connect the RS-232 serial cable (provided) to an ASCII terminal. The cable is approximately 10 feet (3 meters) long and is sometimes called a "dumb terminal cable." Plug the D-shaped, 9-pin connector into serial port 1 (`tty_1`) on the back of the system, as shown in Figure 1-6. See the *Origin200 and Origin200 GIGAchannel Owner's Guide* (p/n 007-3708-xxx) for additional information on using ASCII terminals with your system.



**Figure 1-6** Attaching the Console Serial Cable

## Powering the System On and Off

The Origin200 host system and the Origin Vault storage enclosure are similar in that they each have both a main (master) power switch at the rear and a power button in the front. See Figure 1-7 for an example and switch locations.

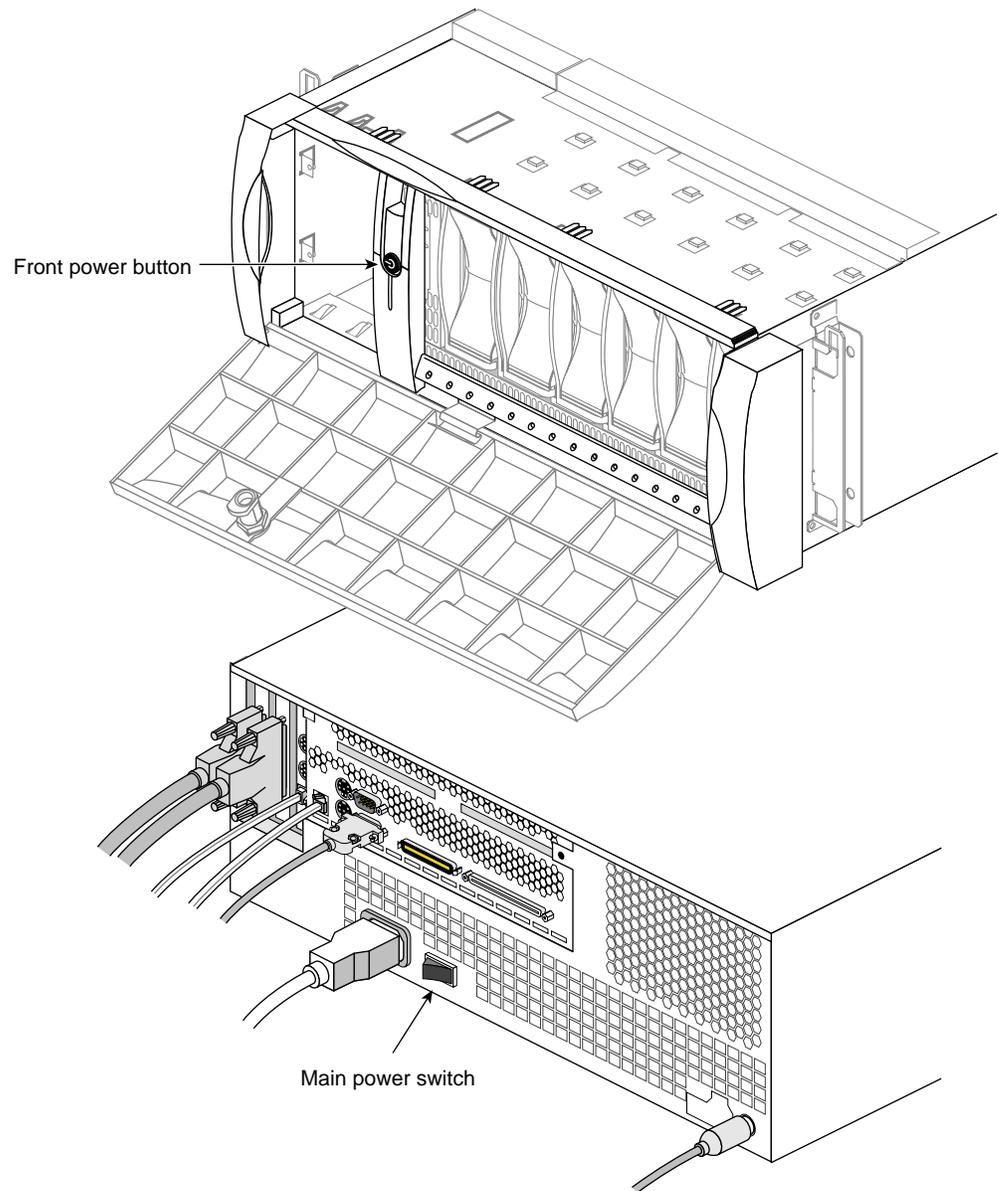
Pressing the power button at the front is a soft power-off. Residual power is still supplied to the unit as long as the main power switch at the rear is on. The main power switch is a circuit breaker that cuts off all power to the enclosure. Note that the Origin Vault does *not* power on and off automatically along with the Origin200 server to which it is attached.

**Note:** When you power off an Origin200 using the rear power switch, wait at least seven seconds before you turn the master power switch on again. If you do not wait at least seven seconds, the system controller may fail to initialize properly.

Generally, to power off an enclosure, press the power button at the front and then turn off the main switch at the rear. To turn the enclosure back on, reverse these steps.

On the Origin Vault, if you turn off the main switch and do not press the power button at the front, the enclosure “remembers” the state of the front power switch (independently of the main power switch). When power is restored after a power cutoff from the rear switch (or a failure), the enclosure immediately powers back on.

For more information regarding turning the enclosures on or off, see the *Origin200 and Origin200 GIGAchannel Owners Guide* (p/n (007-3708-xxx)).



**Figure 1-7** Origin200 and Vault Enclosure Power Switch Locations



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## Configuring OFNS With the Express Setup Manager

This chapter covers the FailSafe Express Setup Manager used with the Origin200 FailSafe network server (OFNS) system. The topics necessary for use of the express screens and troubleshooting errors are covered in the following sections:

- “Starting the FailSafe Express Setup Manager” on page 13
- “Express Setup Manager Screen (#1)” on page 14
- “Hardware Configuration Test Screen (#2)” on page 15
- “Network Configurator for OFNS Screen (#3)” on page 16
- “FailSafe Express Configurator Selection Screen (#4)” on page 17
- “Configuration Confirmation Screen (#5)” on page 18
- “Running the Express Configurator Without the `-setup` Option” on page 19
- “Troubleshooting Tips and Error Messages” on page 19

### Starting the FailSafe Express Setup Manager

The following information presumes that you have a console terminal connected to `tty_1` on one of the two Origin200 host systems. When you bring up the system:

- Login as the superuser (`root`).
- Change the directory to `/var/ha/ofns`.

You may wish to confirm this by entering the `pwd` command, which lists your working directory.

Enter the following at the root prompt:

```
# ha_express_config -setup
```

You should see the express setup manager screen appear.

This screen provides requirements for the system and other helpful information to get you started. An example of the screen is shown in the next section, “Express Setup Manager Screen (#1).”

A highly available IP alias is an IP address to which clients can communicate even when software and hardware upgrades or crashes occur on an OFNS system. A hostname IP address stays with a particular host system (Origin200), while a highly available IP address name can move from host to host within a cluster.

## Express Setup Manager Screen (#1)

When you enter the express setup manager screen, you see information similar to this:

```
EXPRESS SETUP MANAGER FOR FAILSAFE 1.2
```

```
Express Setup Manager for FailSafe allows you to set up a FailSafe cluster for Highly Available Web and NFS in dual-active or active-standby configurations. For other configurations, you must use the FailSafe GUI Configurator fsconf(1M).
```

```
It is STRONGLY recommended you use '-setup' option when configuring your cluster for the first time.
```

```
To properly configure the cluster, contact your network administrator to get the following information:
```

- Hostnames for the two machines.
- Appropriate netmask for the network to which these machines will be connected.
- Two highly available IP alias names
- Actual numeric addresses (in '.' format) for hostnames and highly available IP aliases (Only required if addresses cannot be resolved from /etc/hosts or another name service).

```
Defaults are provided for most of the input values, but they may not be appropriate for your environment. For example, ip-addresses will be specific to your network.
```

```
Do you want to continue [Y]?
```

If you have all the information required by the setup manager screen, press Enter and go on to the next screen. Screen two tests the hardware configuration of the Origin200 FailSafe network server.

## Hardware Configuration Test Screen (#2)

The second screen provides a list of hardware tests that the express setup manager runs and displays on the console monitor. The following example shows a normal system with no problems. OFNS is an acronym for Origin200 FailSafe network server. The term hans is an acronym for highly available network server.

```
HARDWARE CONFIGURATION TEST FOR OFNS
-----
Checking for volumes ....PASSED
Testing Private Network Interface ....PASSED
Testing Private Network Interface ....PASSED
Testing Serial Connection to hans2 ....PASSED
Testing Serial Connection from hans2 ....PASSED
Hardware Diagnostics Succeeded
Go on to Network Configuration [Y]?
```

If the OFNS system fails any part of the hardware configuration test, an error message appears. The problem must be resolved before you can continue with the configuration setup using screen three (the network configurator screen). See “Troubleshooting Tips and Error Messages” on page 19 for a list of error messages and possible solutions.

If you believe you may have a loose or improper cable connection, see Chapter 4, “Cabling and Configuration” for information on proper connections.

### Network Configurator for OFNS Screen (#3)

The network configurator screen prompts you for the machine name for your first server. If you want to assign a machine name other than the default `hans1` name, you should enter it. The example below shows the use of `ofns1` as an assigned machine name.

```
NETWORK CONFIGURATOR FOR OFNS

Enter the hostname for this server [hans1]? ofns1

You have entered : ofns1 : Is This Correct ? [Y]

Enter the hostname for the other server [hans2]? ofns2

You have entered : ofns2 : Is This Correct ? [Y]

Enter the domain name []? sgi.com

You have entered : sgi.com : Is This Correct ? [Y]

Enter netmask [0xffffffff00]?

You have entered : 0xffffffff00 : Is This Correct ? [Y]

Changing hostname of hans1 to ofns1 .... Done

Changing hostname of hans2 to ofns2 .... Done
.....

It is necessary to reboot hans2 for these changes to be in effect

Reboot hans2 [Y]?
Rebooting hans2 ....

You have changed hostname of hans2 to ofns2
Applying these changes now ....
Waiting for hans2 to reboot ....priv-hans2: Connection timed out
rsh: connection failed

Testing Public Network Interface ....PASSED

Network Configuration Succeeded

Go on to FailSafe Configuration [Y]?
```

If you are satisfied with the information on hostnames, you are ready for the fourth screen, the FailSafe express configurator selection. Note that the messages

```
.priv-hans2: Connection timed out  
rsh: connection failed
```

are benign messages and do not indicate an error.

## FailSafe Express Configurator Selection Screen (#4)

This screen confirms the specific options you want for your OFNS system and asks you to choose the primary server for the Web or NFS applications.

```
EXPRESS CONFIGURATOR  FOR FAILSAFE
```

```
A Highly Available IP alias is a floating IP address to which  
clients can communicate while software and hardware upgrades  
and/or crashes occur on a OFNS server.
```

```
This value should be a name string and *NOT* in `.' format  
For example, it can be "HA-Web" but not like 192.0.2.15
```

```
Enter Highly Available IP Alias for ofns1 []?  ha-serv1
```

```
Enter Highly Available IP Alias for ofns2 []?  ha-serv2
```

```
Do you want to configure ofns1 as Web server  [Y]?
```

```
Do you want configure NFS on ofns1 [Y]?
```

```
Do you want to configure ofns2 as Web server [Y]?
```

```
Do you want configure NFS on ofns2 [Y]?
```

```
You have the opportunity to change these values
```

```
Press Enter to continue ....
```

If you press enter, you move to a screen that shows a summary of all choices made on this screen.

## Configuration Confirmation Screen (#5)

Configuration Selected for OFNS

Name of node1 : ofns1  
Name of node2 : ofns2

IP Alias for ofns1 : ha-serv1  
IP Alias for ofns2 : ha-serv2

ofns1 is the Primary Server for the following applications :

Web  
NFS

Backup server is ofns2

ofns2 is the Primary Server for the following applications :

Web  
NFS

Backup server is ofns1

Is this configuration Correct [N]? y

.....

FailSafe Configuration completed successfully

If you answer no to the correct configuration question above, your inputs to the screen are erased and you are returned to the express configurator selection screen (#4).

## Running the Express Configurator Without the -setup Option

You can run the FailSafe Express interface screens anytime you need to reconfigure some functional aspect of the Origin200 OFNS system. You must be at the location */var/ha/ofns*, and you must have superuser (root) access to both host systems.

Enter the command

```
# ha_express_config
```

You see a screen that looks similar to the following:

```
EXPRESS SETUP MANAGER FOR FAILSAFE 1.2
Main Menu
1. Configure Network
2. Verify Hardware
3. Create Configuration File
4. Exit
Enter Your Choice [1]?
```

This screen allows you to directly access and modify information without stepping through each screen process in a linear fashion. This method of configuration is recommended only after you have completed the initial setup of the OFNS rack system.

## Troubleshooting Tips and Error Messages

This section offers some general tips and troubleshooting information along with error messages you may encounter using the configuration screens.

### Mail Configuration

The Express Setup Manager screens used with the OFNS rack system do not configure mail on the machines in the cluster. Therefore, the mail notification feature of FailSafe will not be available.

## Accessing Highly Available Services

Users wishing to have their Web sites remain highly available must be careful to put the Web documents in the appropriate filesystem. Consider the following example:

Configuration Selected for OFNS

Name of node1 : ofns1

Name of node2 : ofns2

IP Alias for ofns1 : ha-serv1

IP Alias for ofns2 : ha-serv2

ha-serv1 is the Primary Server for the following applications :

Web

NFS

Backup server is ha-serv2

ha-serv2 is the Primary Server for the following applications :

Web

NFS

Backup server is ha-serv1

The highly available network filesystem for ha-serv1 is */fs1*. The clients of this filesystem must access it as *ha-serv1:/fs1*. The primary document root for the Web server on ha-serv1 is located at */fs1/www*.

Similarly, the highly available network file system for ha-serv2 is */fs2*. The clients of this filesystem must access it as *ha-serv2:/fs2*. The primary document root for the Web server is */fs2/www*.

If the cluster is configured so that one node is not actively serving any application, then filesystems */fs1* and */fs2* will both be configured as highly available NFS.

Note that the node from which *ha\_xpress\_config* is run will always serve */fs1*, while the other node will serve */fs2*.

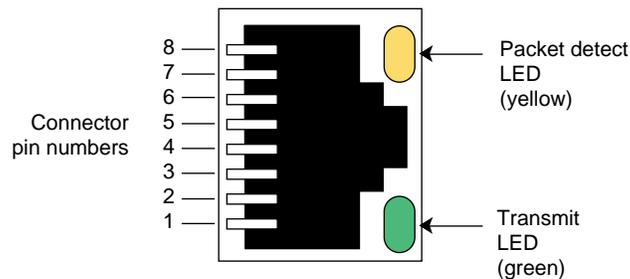
## Packet Detect and Transmit LEDs

If you believe there is a problem with a public Ethernet connection, you can check the LED activity on the PCI Ethernet board.

There are two LEDs on the RJ45 connector:

- the packet detect LED (yellow)
- the transmit LED (green)

Figure 2-1 shows the locations of these LEDs.



**Figure 2-1** Location of the Packet Detect and Transmit LEDs

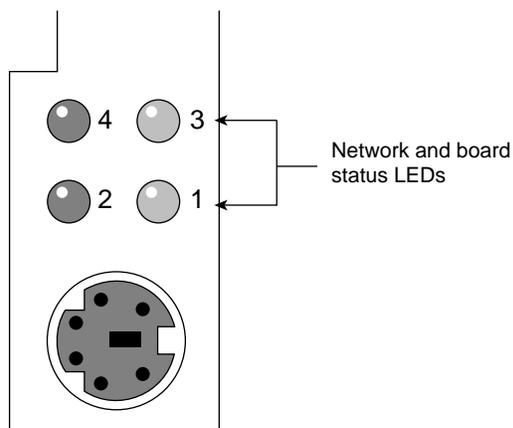
## Board and Network Status LEDs

There are four LEDs on the I/O plate that indicate the status of the board and the network. Table 2-1 summarizes the LEDs and their meanings.

**Table 2-1** Fast Ethernet PCI Board and Network Status LEDs

LED Number	Color	Meaning
1	Yellow	When lit, the network is in Fast (100Mbps) mode
2	Green	When lit, indicates that the board is receiving power
3	Yellow	When lit, indicates that the network is in Full Duplex mode
4	Green	When lit, indicates that Link is established between the board and other network equipment

Figure 2-2 shows the locations of the LEDs.



**Figure 2-2** Locations of the Board and Network Status LEDs

### Restoring a Failed OFNS System Disk

If one of the Origin200 system disks fails in the OFNS rack system, you must replace it using the procedures outlined in this section. If the disk has been backed up regularly, you may restore its content from backup tapes. If the disk has not been backed up, use the procedures in this section to restore OFNS functionality.

Substituting a standard Origin200 system disk does not restore OFNS functionality.

A system disk may need to be replaced due to either mechanical failure or file corruption. Note that the procedures listed restore only the FailSafe configurations done by *ha\_xpress\_config*.

1. Obtain the latest WebForce system disk and install it in the Origin200. Use the instructions in the *Origin200 and Origin200 GIGAchannel Owner's Guide* (007-3708-xxx) if you need help.
2. Connect a serial console terminal to the Origin200 you are restoring and power it on.
3. Install the following subsystems:
  - nfs subsystem – from the NFS CD supplied with the OFNS package

- IRIS FailSafe 1.2 – from the FailSafe 1.2 CD
- IRIS FailSafe NFS 1.2 recovery kit – from the IRIS FailSafe NFS 1.2 CD
- IRIS FailSafe WEB 1.2 recovery kit – from the IRIS FailSafe Web 1.2 CD
- IRIS FailSafe 1.2 OFNS install utilities – from the FailSafe 1.2 CD
- the most recent NFS rollup patch – contact your service provider
- the most recent IRIS FailSafe rollup patch – contact your service provider

**Note:** See the *IRIX Admin: Software Installation and Licensing* manual (007-1364-xxx) for help with command line software installation. For help with the graphical Software Manager tool, see the *Personal System Administration Guide* (007-1366-xxx).

4. Run the `restore_config` command using the following steps:

- `# cd /var/ha/ofns`
- `# restore_config <good_node>`

Where `<good_node>` is the name of the other properly functioning Origin200 in the OFNS rack system.

After completing the restoration steps the OFNS system is ready to serve highly available applications as before. If you wish to change any OFNS configuration, you must have the console terminal connected to the Origin200 that was originally used to configure the OFNS system (called `hans1` or `ofns1` in the examples). You cannot use the secondary Origin200 (called `hans2` or `ofns2` in the examples) as the express configurator.

## Express Configurator Error Messages

This section lists some error messages you might encounter while working with the express configuration screens.

### Configuration DB Error

If you receive the error message

```
Error : Configuration DB file ./sections does not exist
```

this indicates the accidental deletion of the `./sections` file. This is a database file used by `ha_xpress_config` to create the FailSafe configuration file. This file must be present in `/var/ha/ofns`.

If this file has been accidentally deleted, please reinstall the OFNS software from the IRIS FailSafe 1.2 CD.

### Wrong Default Hostname at Startup

```
I don't know how to proceed ....
```

```
Mfg config has been changed before running this script. Set node names to "hans1" and "hans2" and private network addresses to priv-hans1 and priv-hans2 correspondingly
```

```
Or try running from the other node.
```

This error will appear in the Network configurator screen, if either one of the following is true:

1. This is the first time *ha\_xpress\_config* is being run. But the hostnames were changed at the site before running *ha\_xpress\_config*.
2. This is not the first time this script is run, but now the script is not being run from the machine that was first used to configure the OFNS cluster.

If number 1 is true then you must change hostnames and network addresses as instructed in chapter 3 of the release notes for OFNS.

**Note:** The following error message refers to option [2]; the correct option is [1].

```
Hostname is other than hans1 or hans2 Select option [2] from Main Menu to configure hostname and networks.
```

This message can appear if the user selects option 3 from the main menu when the command *ha\_xpress\_config* is run for the first time and the menu order is not followed.

The OFNS rack system is pre-configured with certain default values. As a consistency check, the command expects this configuration to be present when *ha\_xpress\_config* is run for the first time. This error is reported when the machine names have been changed before running the script. That is, the default hostnames are other than hans1 and hans2.

Go to the main menu and select item 3 to configure hostname and networks information.

Additional information regarding resetting names and network addresses is available in Chapter 3 of the release notes for the Origin FailSafe network server subsystem (*ha\_ofns*).

### **FailSafe Configuration File Modified**

WARNING: Your FailSafe configuration file (ha.conf) has been modified by other means since you last ran the Express Setup Manager. If you continue to use the Express Setup Manager, changes you made using other methods will be lost. Do you want to continue ? [N]

This message appears if the IRIS FailSafe configuration file has been changed by means other than *ha\_xpress\_config*. If you continue, these changes will be lost.

### **Same IP Alias Error**

IP alias for <node2> cannot be the same as <ipAlias1>

The two nodes must have different IP aliases. This is a FailSafe requirement.

### **OFNS Configuration File Verification Fails**

Check the log file *cfgverify.out* for errors.

This message is displayed if one or more ip-aliases are not present in the */etc/hosts* file. These entries may not be present in the */etc/hosts* file because the user did not want the hosts file to be edited by *ha\_xpress\_config*. This error also occurs if any configuration was changed by any means other than *ha\_xpress\_config*.



---

## Installing or Replacing Disks or PCI Boards

Highly available storage for the Origin200 FailSafe network server (OFNS) system is provided by mirrored SCSI disk drive modules installed in the system's Origin Vaults. This mass storage is supported by two differential PCI SCSI controllers that install in each Origin200 host (four total). In addition, each host uses one PCI Ethernet controller board for public Ethernet access.

Two mirrored disk modules come standard in each of the two Origin Vaults (four total). Each Origin200 host has one system disk installed. Optional additional disks may be ordered with your system or installed at a later date.

You have to remove the Origin200 server before you can remove and replace a faulty PCI board or perform certain other types of service. Instructions for properly removing an enclosure from the OFNS rack are covered in "Removing an Enclosure From the OFNS Rack" on page 32.

### Installing or Replacing a Disk Drive

Read the following information before you add, remove, or replace a disk drive. You should not need to remove the enclosure to replace a drive.

The SCSI device IDs of the 3.5-inch bays in the Origin200 and Origin Vault are numbered 1 through 6, counting from the right to the left. Figure 3-1 shows a removal and replacement example for a drive in position 6.

Drives 6 and 5 in the Origin Vaults (closest to the power button) are always the mirrored high-availability disks and should never be moved to a different location within the enclosure. See "Mirrored Disk Replacement Example" on page 30 for more information. Only the Origin Vaults can hold the mirrored highly available disks.

Data disks ordered from Silicon Graphics are preconfigured; you can install them in bays 1 through 5 in the Origin200 with no additional configuration.

There are very specific rules for use of third-party disks in the Origin200 and Origin Vault. See the *Origin200 and Origin GIGAchannel Owner's Guide* (p/n 007-3708-xxx) for information before installing any third-party drives.

**Note:** Save any blanking plates you remove. If you ever remove a peripheral and do not replace it with another one, you should reinstall the blanking plate to ensure proper cooling, air flow, and electromagnetic interference (EMI) shielding in the enclosure.

To add or replace a disk in either an Origin200 or Origin Vault enclosure you must shut it off. You should always minimize the time this takes, because shutting it off compromises the high availability of the rack system.

As the superuser (root), use the command

```
# init 0
```

to properly shut down the Origin200 before disk installation or replacement.

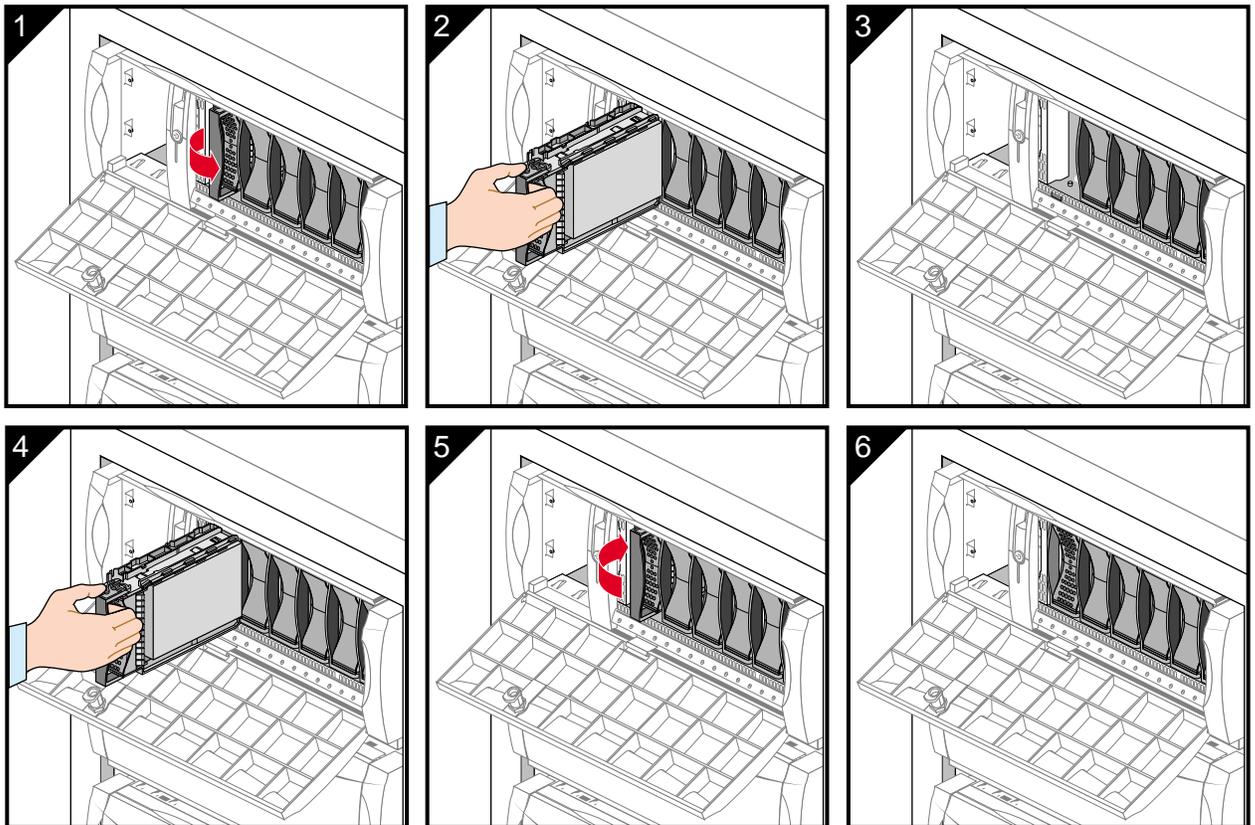
See the section "Restoring a Failed OFNS System Disk" on page 22 for useful information on replacing a failed system disk in an Origin200.

In the Origin Vaults you can use the power button on the front to power off the enclosure. See "Adding or Replacing a Drive in the Origin Vault" on page 29.

Note that if you want to replace one of the mirrored disks you should read the information in the section "Mirrored Disk Replacement Example" on page 30. If you are adding a disk that is not part of a mirrored volume, you must still follow the guidelines for restoring any outdated data that affects the mirrored disks in the vault. See "Updating voll in Origin Vault 1" on page 31 for information and an example.

General information on a system's disks, volume sizes, or XLV configuration is covered in the *IRIX Admin: Disks and Filesystems* manual (p/n 007-2825-xxx).

The *IRIS FailSafe Administrator's Guide* (p/n 007-3109-xxx) has other information you may need if you wish to modify or expand your system's disks.

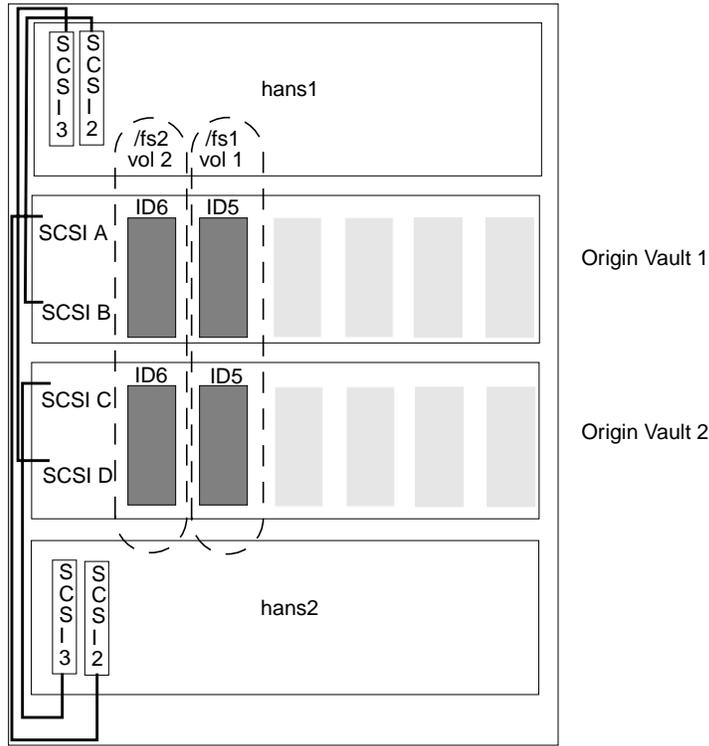


**Figure 3-1** Replacing a Disk in Slot Six

### Adding or Replacing a Drive in the Origin Vault

Before replacing or adding a disk to the Origin Vault enclosure, you must first turn the power off to the enclosure. You can shut down the power to the Origin Vault using the front power button. Note that any time you do this (for whatever reason) you should turn power back on as soon as possible. See “Powering the System On and Off” in Chapter 1 if you need more information.

As you will note in Figure 3-2, SCSI controller 2 in each Origin200 connects to Origin Vault 1 and each SCSI controller 3 connects to Origin Vault 2.



**Figure 3-2** Disk and Volumes Diagram

### Mirrored Disk Replacement Example

Mirrored disks always go in the Origin Vaults used with your OFNS system rack. In the following example we assume that a failed disk in Origin Vault 1 must be replaced.

#### Remove the disk from XLV

Assume that the failed disk is drive ID 6 in Origin Vault 1 (dks2d6s7). This drive is in vol2 (plex 0). If a step uses exact syntax, the syntax has been modified to fix this specific disk failure example.

1. Delete the plex (or volume element) containing the broken disk from the volume (in this case vol2).

- # xlv\_mgr
- xlv\_mgr> detach plex vol2.data.0 badplex

If the deletion is successful, go on to “Physically Replacing the Drive in vol2” on page 31 and continue the procedure.

If the failed disk is unresponsive and causes the detachment attempt to fail, input the following to *xlvmgr*:

- xlv\_mgr> detach -force plex vol2.data.0 badplex
- xlv\_mgr> delete object badplex

If the detachment operation still fails, go on to step 2.

2. Forcibly unmount the filesystem
  - # umount -k /fs2
3. Save the volume configuration using *xlvmgr*.
4. Delete the volume object:
  - xlvmgr> delete object vol2
5. Remake the volume without the broken disk.

### Physically Replacing the Drive in vol2

1. Identify the enclosure with the failed drive (Origin Vault 1 in this example).
2. Turn off power to Origin Vault 1. See “Powering the System On and Off” in Chapter 1 if you need more information.
3. Wait 10 seconds. This wait time is important, as it ensures the failed drive doesn’t receive additional damage.
4. Physically remove the failed disk drive and install the replacement disk. See Figure 3-1 for an example.
5. Power the Origin Vault 1 back on.

### Updating vol1 in Origin Vault 1

If I/O writes occur to vol1 in Origin Vault 2 during the time that Origin Vault 1 is powered off, then vol1 will need to be updated/repaired. Use *xlvmgr* to determine if

part of vol1 is outdated or [offline] by entering the following command:

```
xlvmgr> show kernel
```

If the output shows [offline] then disk ID5 in Origin Vault 1 contains outdated data. If part of vol1 is [offline], use *xlvmgr* to put the affected volume element back on line. In our example, drive dks2d5s7 would have been [offline] due to the power outage. This drive is plex 0 of volume 1. In this example, you would enter the command:

```
xlvmgr> change online vol1.data.0.0
```

### Replacing the XLV Volume Element on the New Drive

Use the following information to provide the replacement drive with all the proper XLV volume elements.

1. Use *fx* to partition the new drive exactly as the old drive.

**Note:** The new drive must be repartitioned the same as the failed drive.

2. Create a plex (volume element) on the new disk drive.

```
# xlv_make  
xlvmake> plex newplexname  
xlvmake> ve dks2d6s7
```

3. Attach the plex (or attach/insert the ve) back to the volume.

```
# xlv_mgr  
xlvmgr> attach plex newplexname vol2.data
```

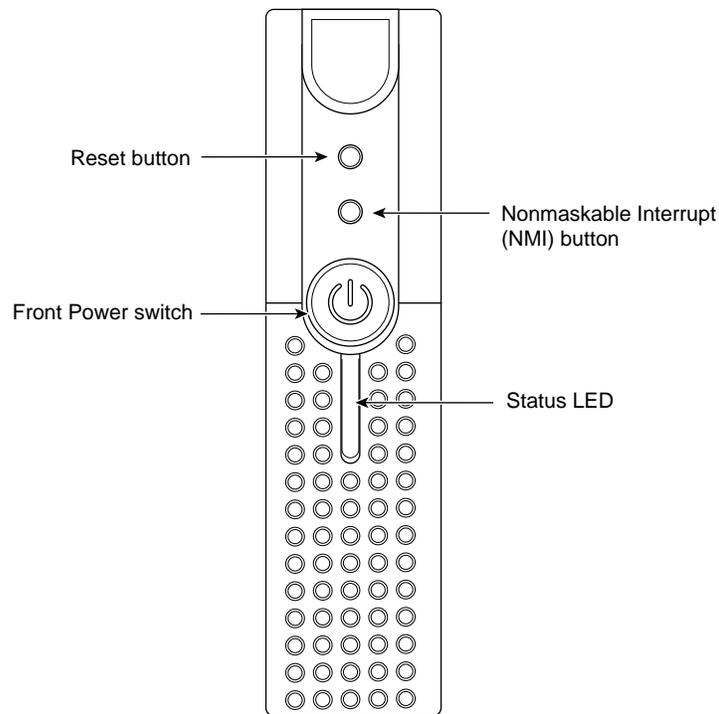
## Removing an Enclosure From the OFNS Rack

Use the instructions in this section to remove an Origin200 server before replacing a PCI board or performing other service. These instructions can be used to remove any of the enclosures in the OFNS rack system. This should be necessary only when service or replacement of an internal component is required. See “Replacing a PCI Board in an Origin200 Host” on page 38 for an example. Replacement or installation of a disk does not require removal of the enclosure from the rack. See “Installing or Replacing a Disk Drive” on page 27 for an example.

**Caution:** To maintain stability, remove only one enclosure at a time. Before removing an enclosure, ensure that all other enclosures in the rack are properly secured with their mounting hardware.

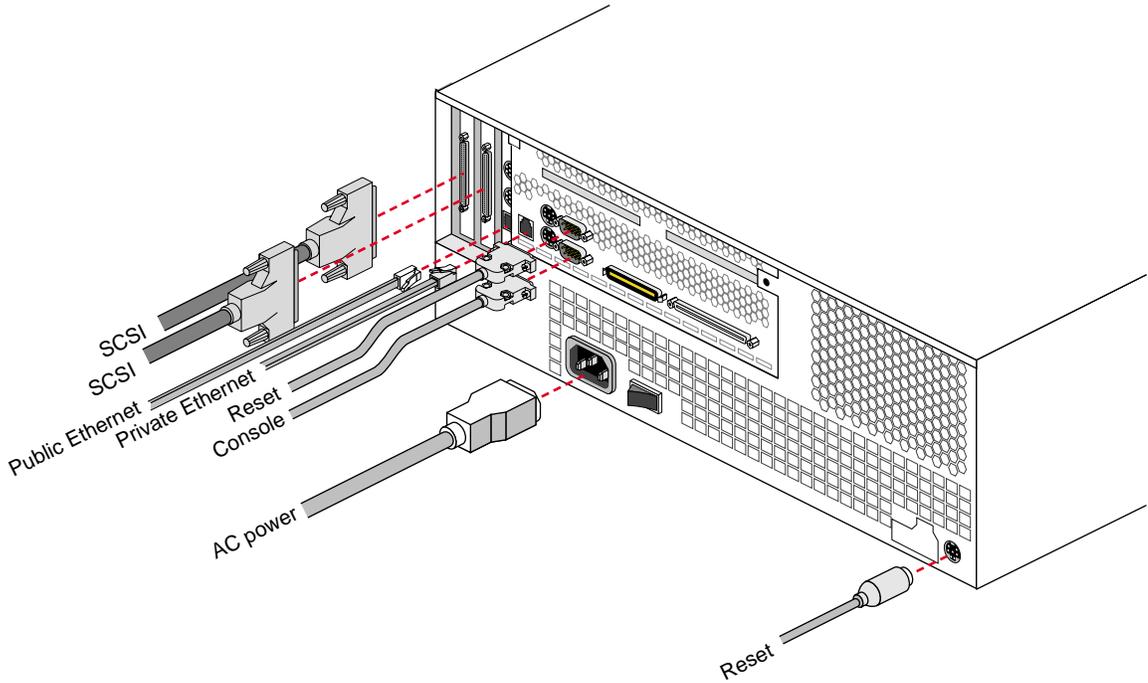
Use the following instructions to shut down the enclosure, detach its cables, and remove it from the OFNS rack:

1. Turn off the power to the enclosure.
  - Press the front power switch to shut off power to the drive bays, PCI backplane, main system board and CPU daughter card (see Figure 3-3).
  - Turn off the master power switch and unplug the power cable.

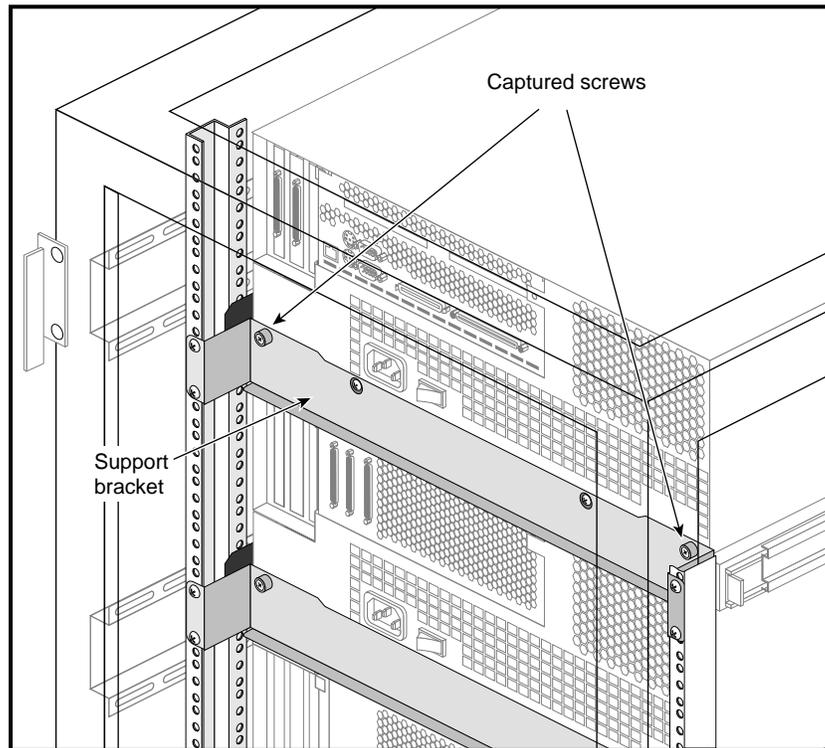


**Figure 3-3** Origin200 and Origin Vault Front Power Switch

2. Open the rear door of the rack and disconnect the appropriate SCSI cables, public and private Ethernet cables, dumb terminal cable (if attached to serial port 1), the reset cable attached to serial port 2, and the reset cable attached to the eight-pin module system controller port (see Figure 3-4).
3. Using your fingers or a Phillips head screwdriver, undo the two captive screws that hold the enclosure to the rear retaining bracket (see Figure 3-5).

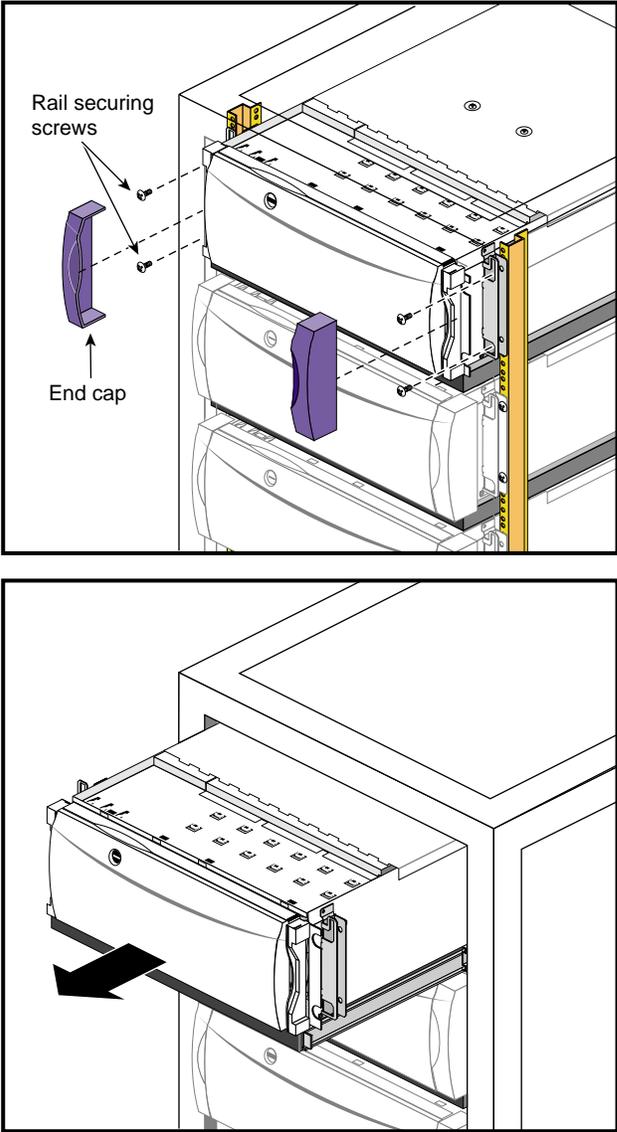


**Figure 3-4** Origin200 Cable Disconnect

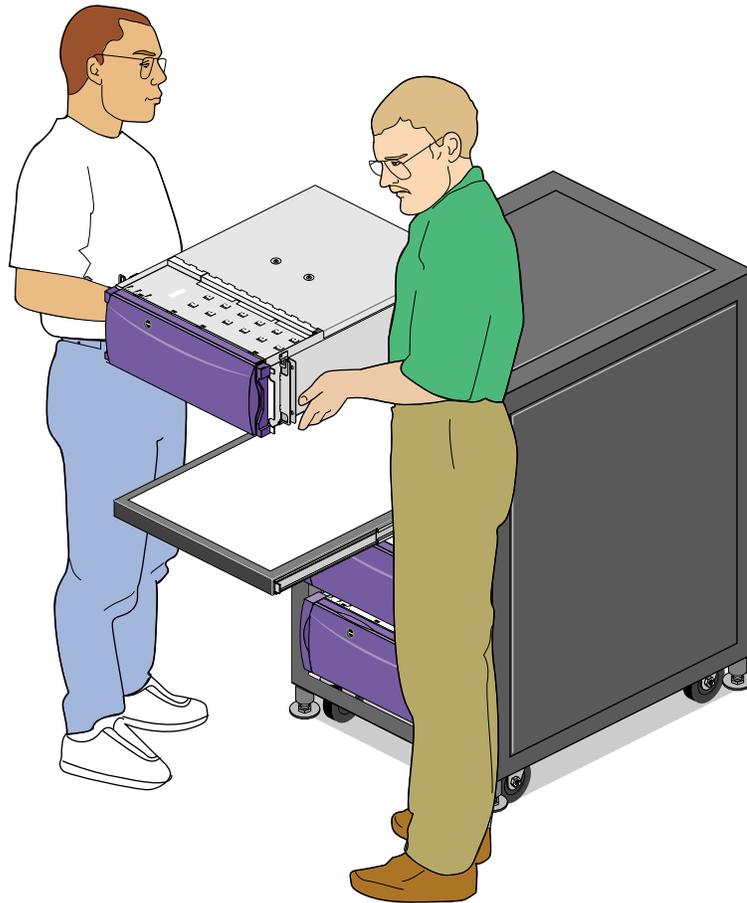


**Figure 3-5** Rear Bracket Disconnect Example

4. Go to the front of the system and pull the plastic side caps off both sides of the enclosure.
5. Undo the four screws that hold the enclosure to the front rails.
6. Slide the “drawer” and enclosure gently out of the cabinet (about 14 inches [35.5 cm]) until the drawer stops.
7. With one person on either side of the enclosure, gently lift it up and forward off its foam drawer pad and place it on a clean work surface, (see Figure 3-6).



**Figure 3-6** Sliding an Enclosure Out of the OFNS Rack



**Figure 3-7** Lifting the Enclosure Away From the Rack

Go on to the section “Replacing a PCI Board in an Origin200 Host” on page 38 or see the *Origin200 and Origin200 GIGAchannel Maintenance Guide* if you need to do other procedures.

## Replacing a PCI Board in an Origin200 Host

Each of the Origin200 host servers in the OFNS rack system comes with PCI boards installed. If a PCI board malfunctions or must be replaced for any reason, use the information in the *Origin200 and Origin200 GIGAchannel Maintenance Guide* (p/n 007-3709-xxx) to properly complete the procedure.

Prepare the system for servicing by removing it from the rack using the information in “Removing an Enclosure From the OFNS Rack” on page 32. Always use two people to lift and carry the enclosure.

You will need a #2 Phillips screwdriver to remove and replace a PCI board; an electrostatic discharge (ESD) wrist strap is provided.

---

## Cabling and Configuration

The Origin200 FailSafe network server (OFNS) is configured in what is defined as a dual-host dual-option FailSafe configuration.

This chapter discusses cabling information applicable to the OFNS rack system.

### System Cables

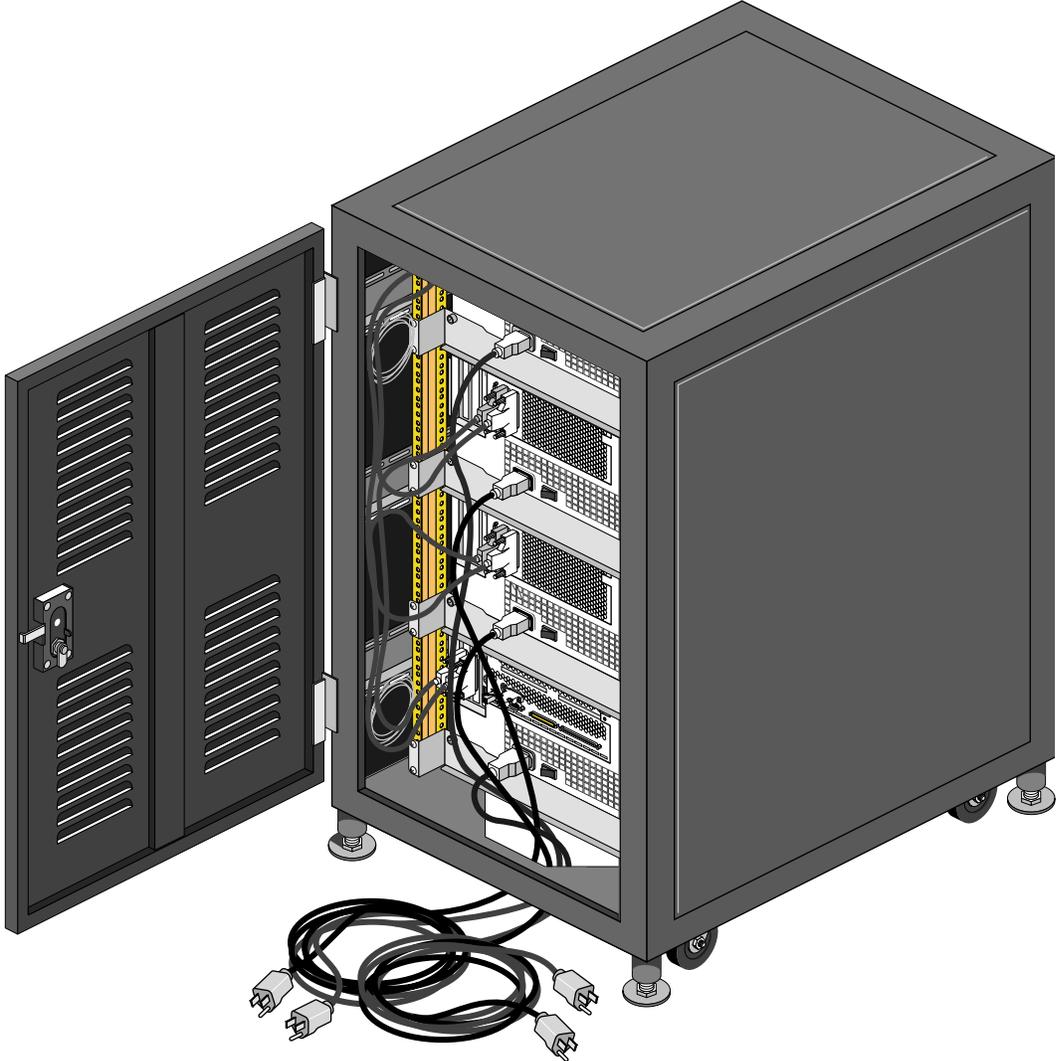
This section highlights key points of information about system cables to help you during or after system installation. Most of the cables used with the OFNS system come already connected. These include:

- cable assembly, 8-pin mini-DIN to 9-pin serial, 20-foot (018-0690-001) (quantity two)
- differential SCSI cable, 1-meter (9290111) (quantity four)
- Ethernet cable assembly RJ45-RJ45 (null modem), 20-foot (9290131) (quantity one)

The Origin200 systems use PC-style serial (console terminal) cables. Each OFNS rack comes with one packed in the accessory box on top of the unit. See “Connecting an ASCII Terminal” in Chapter 1 for information on connecting the cable to a terminal.

The cables that leave the rack, (power, public Ethernet, and console) exit through an opening at the bottom-rear portion of the rack (see Figure 4-1).

For information on power cables and what type of connectors they use, see the section “Power Cables and Connectors” on page 41.



**Figure 4-1** Cable Exit at Rear of OFNS Rack

## Power Cables and Connectors

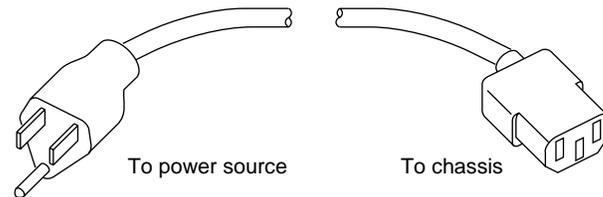
Table 4-1 summarizes the power cables and connectors for each power configuration.

**Table 4-1** Power Cable and Connector Specifications

Description (Cable Part Number)	Cable Connector, Chassis End	Cable Connector, Source End	Cable Type	Power Source (Wall Plug)
<b>Origin200 and Origin Vault</b>				
U.S., Canada, and Japan (9350102)	IEC320-C13	NEMA 5-15P	UL/CSA	NEMA 5-15R
International (9350018)	IEC320-C13	CEE 7/7, 2-P, 3-W, 10A, 240V	HAR	CEE 7/7, 2-P, 3-W, 10A, 240V

### U.S. Canada and Japan 95-125 VAC Power Cable

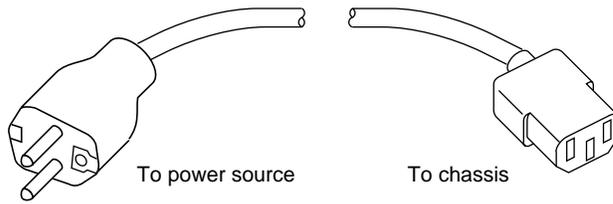
As listed in the table, the 95-125 VAC power cable is a 15 amp, round UL/CSA cable, 8.2 feet (2.5 m) long with a NEMA 5-15P plug at the source end, and an IEC320-C13 receptacle at the chassis end. See Figure 4-2 for an example of the connectors.



**Figure 4-2** U.S. Canada and Japan Origin200 and Origin Vault Power Cable Connectors

### International 200-240 VAC Power Cable

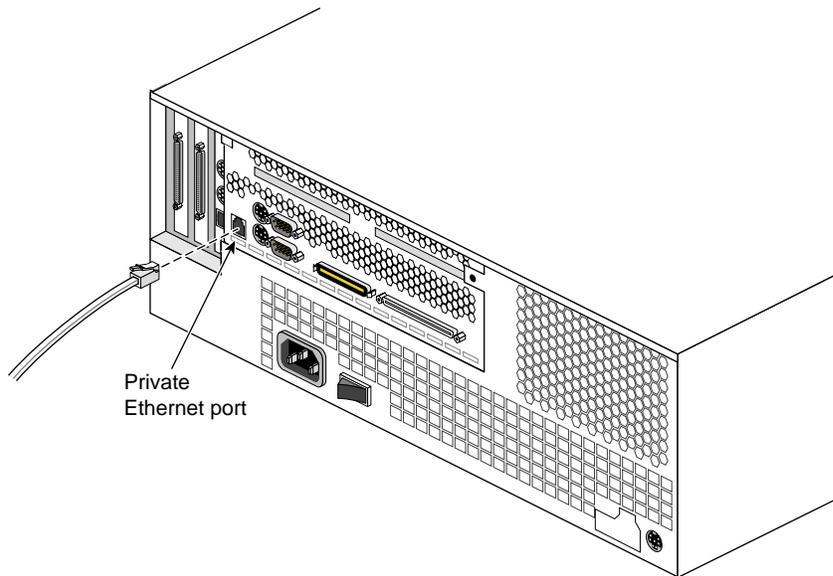
The international power cable is a 200-240 VAC, 10 amp, round HAR cable. It is 8.2-feet (2.5 m) long with a CEE 7/7 plug at the source end and an IEC320-C13 receptacle at the chassis end for Origin200 and Origin Vault in the OFNS rack system.



**Figure 4-3** Origin200 and Origin Vault International Power Cable

### Private Ethernet Network

The private Ethernet that connects the two Origin200 servers in the OFNS rack must remain connected for proper operation. The private Ethernet connection is always attached at the location shown in Figure 4-4.



**Figure 4-4** Private Ethernet Cable Location

Figure 4-5 shows an overall view of the rack's internal cabling.

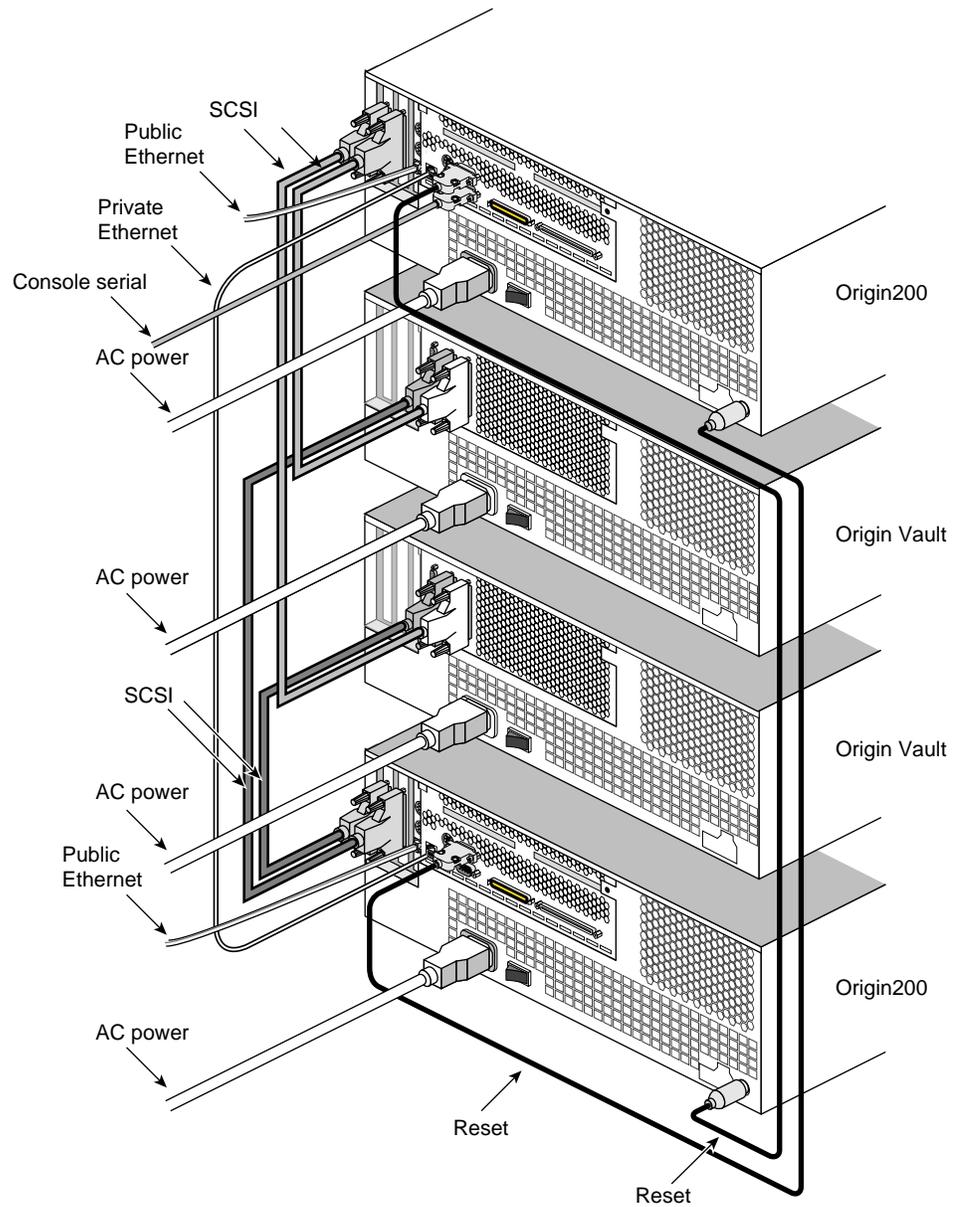


Figure 4-5 OFNS Internal Rack Cabling



## Technical Specifications

This appendix summarizes technical information and operational limits for the fibre products. These topics are covered:

- “Rack and Enclosure Specifications” on page 45
- “Site Requirements for the Rack and Enclosures” on page 46

### Rack and Enclosure Specifications

Table A-1 gives the various technical specifications for the OFNS rack system.

**Table A-1** Origin200 FailSafe Network Server Specifications

Category	Specification	Value
Rack physical specs	Height	42 inches (107 cm)
	Width	22.5 inches (57.2 cm)
	Depth	31.5 inches (80 cm)
System power	OFNS rack system total	2230 watts
	Origin200 power	765 watts
	Origin200 inrush current	120 amps (maximum)
	Origin Vault power	350 watts
	Origin Vault inrush current	140 amps (maximum)
	Frequency	47-63 Hz
	Voltage	100-240 VAC
Cooling requirement	OFNS rack system total	7,600 BTU/hr. (0.64-ton AC load)
Maximum Weights	Total rack system	440 lbs (200 kg) in base configuration

**Table A-1 (continued)**      Origin200 FailSafe Network Server Specifications

Category	Specification	Value
	Origin200	75 lbs (34 kg)
	Origin Vault	55 lbs (25 kg)
Altitude	Operating	10,000 ft (3,048 m) max
	Non-operating	40,000 ft (12,192 m) max
Humidity:	Operating	10-90% (non-condensing)
	Non-operating	10-95% (non-condensing)
Temperature	Operating	+41° F to +104° F (+5° to +35° C)

**Caution:** The operating limits for temperature and humidity must not be exceeded inside the closed rack in which the enclosures are mounted.

## Site Requirements for the Rack and Enclosures

Before installing the rack, make sure the site meets the power, thermal, and cabling requirements for the rack and its enclosures. To determine an enclosure’s power requirements, always use the power rating that is on the label on the chassis as the final authority. This rating is the maximum power required for a fully loaded chassis.

The input current, power (VA), and dissipation per enclosure are based on the maximum capability of the power supplies and cooling system to provide internal regulated power. Typical values may be less, depending on the number and manufacturer of disk drives.

The site must also have main branch AC distribution that can handle these values.

### Enclosure Thermal Requirements

The ambient temperature specification is measured at the enclosure’s front door inlet. The site must have air conditioning of the correct size and placement to maintain the specified ambient temperature range. The air conditioning must be able to handle the BTU requirements of the rack’s four enclosures.



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