Netra™ ft 1800 Installation Guide

Sun

microsystems

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Preface

This document describes the installation procedures for the core hardware and software used in the Netra™ ft 1800. Upon completion of the procedures in this manual, the Netra ft 1800 is fully functional as a fault-tolerant Solaris™ server.

Who Should Use This Book

This guide is intended to be read by installation engineers, software support personnel and service personnel. It is not intended for the end user of the system.

How This Book Is Organized

This guide is arranged as follows:

Chapter 1 "Before Installation" gives guidelines on site preparation and environmental considerations.

Chapter 2 "Hardware Installation" describes how to unpack the system, fit the mounting flanges and install the chassis in a rack.

Chapter 3 "Electrical Supply Installation" provides the information required to install the electrical supply.

Chapter 4 "Powering on the System" tells you how apply power to the Netra ft 1800.

Chapter 5 "Software and Operating Environment Installation" explains the software installation procedure.

Chapter 6 "Installing and Configuring Sun StorEdge Volume Manager" summarizes what you need to know in order to use the Volume Manager on the Netra ft 1800.

Related Books

- *Netra ft 1800 Software Release Notes* (Part No. 805-4527-10)
- *Netra ft 1800 Hardware Release Notes* (Part No. 806-0179-10)
- *Netra ft 1800 CMS API Developer's Guide* (Part No. 805-5870-10)
- *Netra ft 1800 CMS Developer's Guide* (Part No. 805-7899-10)
- *Netra ft 1800 Developer's Guide* (Part No. 805-4530-10)
- *Netra ft 1800 Hardware Reference Guide* (Part No. 805-4531-10)
- *Netra ft 1800 User's Guide* (Part No. 805-4529-10)
- *Netra ft 1800 Reference Manual* (Part No. 805-4532-10)
- *Netra ft 1800 Safety and Compliance Manual* (Part No. 805-7019-10)
- *Sun StorEdge™ Volume Manager 2.5.4 Installation Guide* (Part No. 805-5706-10).

What Typographic Changes Mean

The following table describes the typographic changes used in this book.

TABLE P-1   Typographic conventions

Typeface or Symbol	Meaning	Example
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `machine_name% You have mail.`
`AaBbCc123`	What you type, contrasted with on-screen computer output	`machine_name%` **`su`** `Password:`
AaBbCc123	Command-line placeholder: replace with a real name or value	To delete a file, type `rm` *filename*.
AaBbCc123	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in *User's Guide*. These are called *class* options. You *must* be root to do this.

Shell Prompts in Command Examples

The following table shows the default Open Boot PROM (OBP) prompt and the system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2   Shell prompts

Shell	Prompt
Open Boot PROM prompt	`ok`
C shell prompt	`machine_name%`
C shell superuser prompt	`machine_name#`
Bourne shell and Korn shell prompt	`$`
Bourne shell and Korn shell superuser prompt	`#`

Symbols

The following symbols mean:

Note – A note provides information which should be considered by the reader.

Caution – Cautions accompanied by this Attention icon carry information about procedures or events which if not considered may cause damage to the data or hardware of your system.

Caution – Cautions accompanied by this Hazard icon carry information about procedures which must be followed to reduce the risk of electric shock and danger to personal health. Follow all instructions carefully.

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Please include the part number of your document in the subject line of your email.

Before Installation

This section provides information on what should be considered when choosing a location for a Netra ft 1800 system.

Note – This equipment is only intended for installation in a Restricted Access Location as defined by UL1950, 3rd Edition, and EN60950: 1992 / A11: 1997.

Electrical Supply Considerations

Before you install the system, verify that the correct power supply is available. Refer to "DC Source Site Requirements" on page 44 for further information.

Environmental Considerations

The system can be installed in an environment with the following specific parameter ranges:

- Ambient temperature
  - Operating: 0 to 40 degrees Celsius (short term operation up to a temperature of 50 degrees Celsius is possible; however, the operation of removable media devices cannot be guaranteed.)
  - Storage: –40 to 70 degrees Celsius

- Relative humidity
  - Operating: 5 to 85% noncondensing[1]
  - Storage: 10 to 90% noncondensing[1]

- Elevation
  - Operating: 0 to 3000 meters
  - Storage: 0 to 12000 meters

Dimensions

- Height: 1466.85 mm (57.75 inches) 33U NOM
- Width: 437.60 mm (17.22 inches)
- Depth: 392.8 mm (15.4 inches)
- Weight: Maximum 190.5 kg (420 lb) (excluding rack or AC converter items)
- Maximum rate of heat release for fully configured system: 3000W (10,200 Btu/hour)
- GR 63 CORE heat release calculation result: 425.4 W per square foot [3000 W / (3.25 ft x 2.17 ft)] (4579 W per square meter).

These dimensions are for the product without rack-mount flange adapters; the overall width of the flanges varies according to the equipment mounting requirements.

The depth given does not include any I/O or power connectors. The power connectors add 50 mm (2 inches) to the depth.

Airflow Consideration when Mounting in the Equipment Frame

The Netra ft 1800 system has been designed to function while mounted in a natural convection airflow, but to meet the declared environmental specification the following rules apply. Refer to FIGURE 1-1 on page 1-4 and FIGURE 1-2 on page 1-5.

1. Adequate airflow through the equipment frame must be ensured. The Netra ft 1800 system utilizes internal fans that can achieve a maximum airflow of 840 cfm in free air.

2. The inlet air must enter at the bottom of the Netra ft 1800 cabinet and in front of the Power Supply Units (PSUs); the airflow exhausts vertically from the top of the cabinet.

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1. Subject to a maximum absolute humidity of 0.024Kg of water per Kg of dry air.

3. A minimum of 2U (88.9 mm/3.5 inches) clearance must be allowed at both top and bottom of the Netra ft 1800 cabinet when mounted to allow adequate inlet and exhaust ventilation.

4. The Netra ft 1800 system must not be mounted above any heat-generating sources within the same frame *unless* a heat deflector is used to provide fresh inlet air at ambient temperature.

5. To maintain adequate airflow, replace the environmental filters every six months (contact your local support organization for further information). The environmental filter replacement kit (X-Option No.X6952A) contains six PSU filters and three base filters.
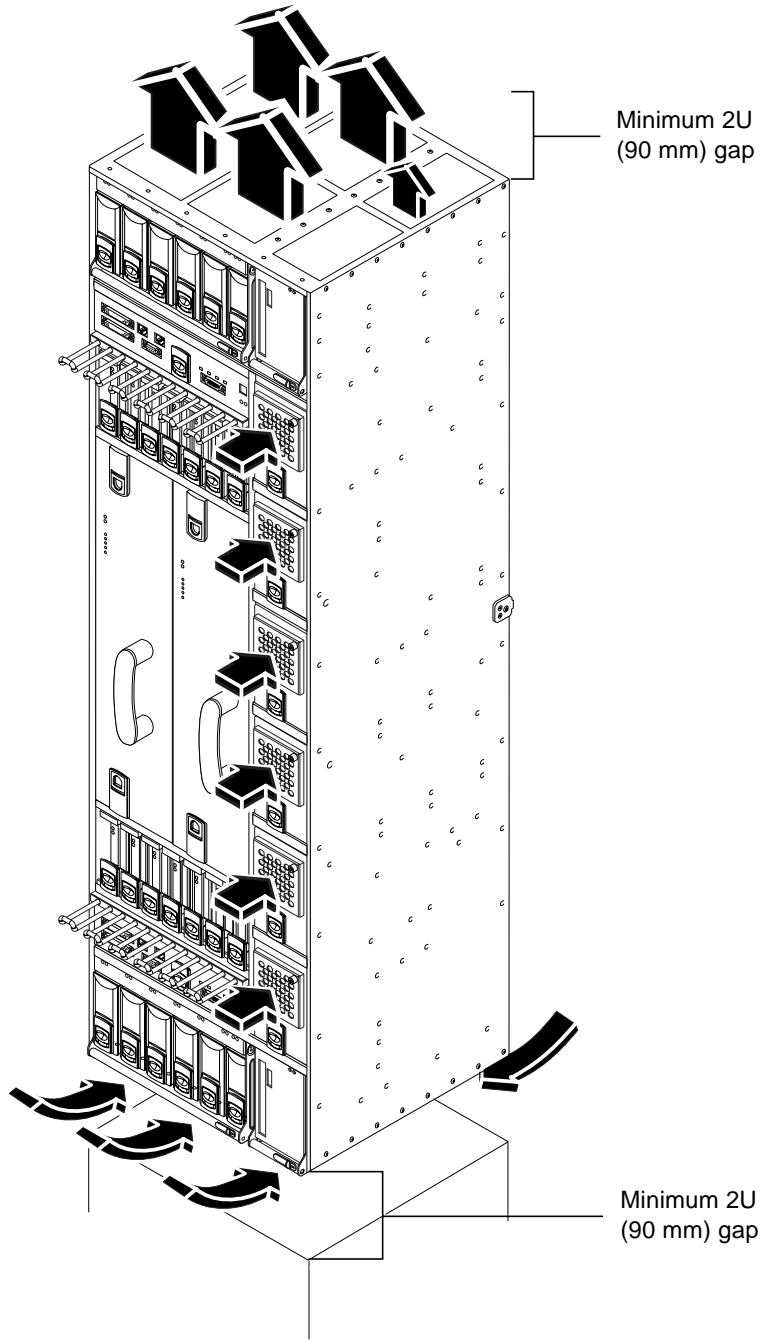
FIGURE 1-1   Netra ft 1800 Airflow Requirements (External)
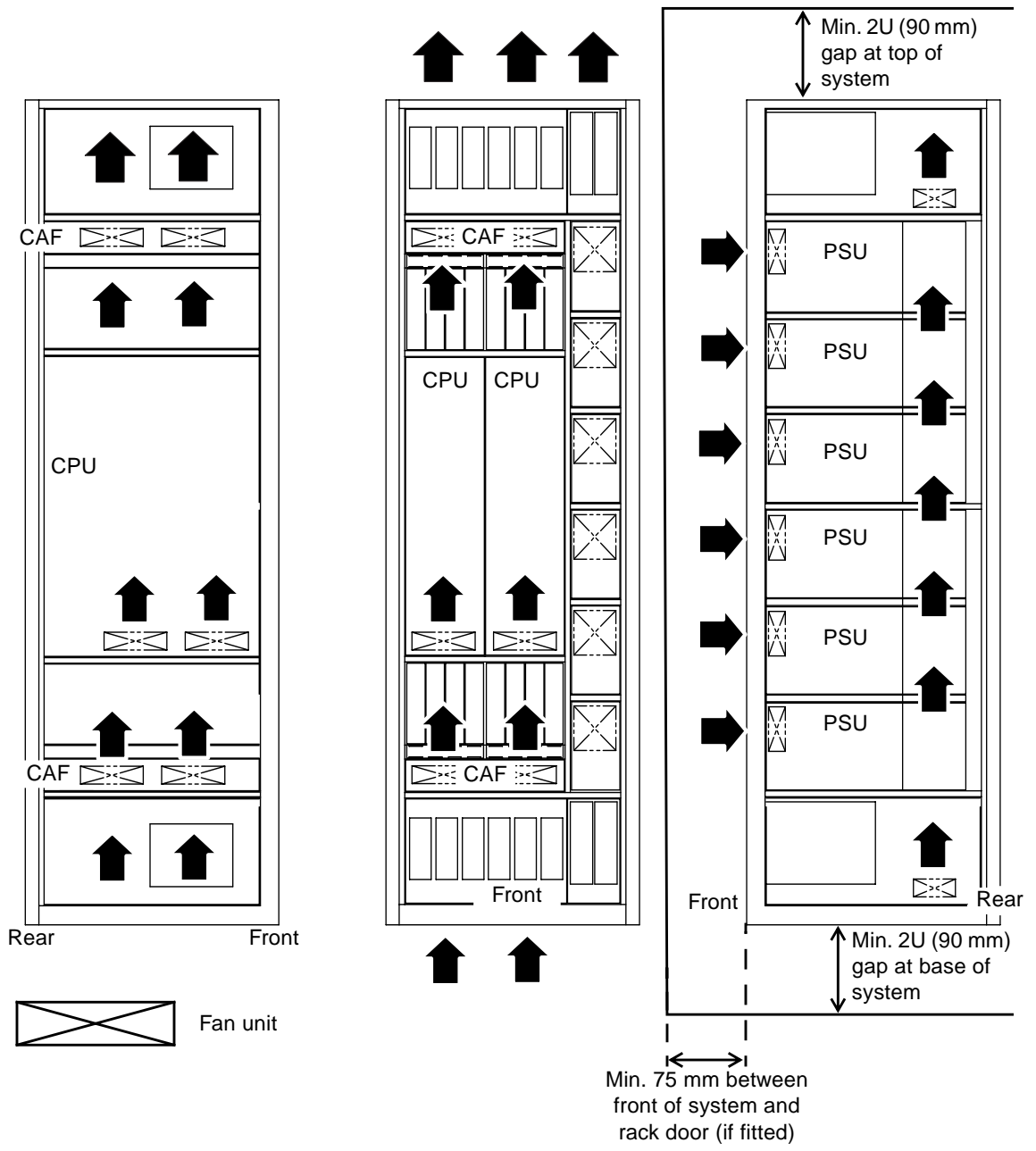
FIGURE 1-2 Netra ft 1800 Airflow Requirements (Internal)

The following labels appear in the figure:

Min. 2U (90 mm) gap at top of system

CAF

CPU

Front

Rear

PSU

Fan unit

Min. 2U (90 mm) gap at base of system

Min. 75 mm between front of system and rack door (if fitted)

Mechanical Considerations when Mounting in the Equipment Frame

> **Caution –** Mechanical assistance is required if installing a loaded chassis.

If you intend not to use a lifting device for installation, all modules other than the motherboards must be removed from the system prior to lifting. The empty chassis weighs approximately 49 kg (108 lb), or 68 kg (150 lb) with the motherboards, plus the adaptors. The weight of any removable module depends on its configuration. Weight warning labels are for guidance only.

See "Removing and Installing Modules" on page 23 for information about adding modules to the motherboard.

The Netra ft 1800 chassis has been designed to accommodate most mounting configurations. Adaptor flanges to suit 19-inch, 23-inch, 24-inch and 600-mm (ETSI) rack sizes are available as required.

The Netra ft 1800 system is shipped with a plinth, which protects the bottom of the chassis during transit and handling, and also ensures that the correct airflow inlet plenum is provided during installation. The plinth must be removed once the Netra ft 1800 is installed in a rack, then stored in a safe place.

The Netra ft 1800 chassis must be mounted using screws suitable for the equipment frame. The screws should be M5, M6 or 10-32 UNF. All screws must be fitted. The recommended tightening torque value for either M5 or 10-32 UNF recess head screws is 3.8 Nm (2.8 lbf/ft), and that for M6 screws is 6 Nm (4.4 lbf/ft).

Mounting Requirements

The Netra ft 1800 is available with the following removable mounting flanges:

- 19 inch EIA pattern
- 23 inch EIA pattern
- 24 inch EIA pattern
- 600 mm IEC917 (ETSI) pattern

Any of these flanges can be fitted in the following positions:

- Flush with the front of the system
- 65 mm (2.56 inches) from front of system
- 196.1 mm (7.72 inches) from front of system

The second and third positions are intended for use with 5-inch web open frames (relay racks).

Adjustable rear flanges can be fitted. They provide a mounting face anywhere between 400 mm and 500 mm (15.75 inches and 19.7 inches) from the front of the system (see "Mounting Flanges" on page 13).

The vertical mounting hole pattern should conform to the standard dimensions given in TABLE 1-1.

TABLE 1-1 Mounting Hole Pattern Dimensions

Standard	Pattern
EIA/RETMA (RU)	Repeating pattern of 5/8 inch, 5/8 inch, 1/2 inch
IEC917/ETSI (SU)	Constant pitch of 25 mm

Loading

The rack must be capable of supporting 230 kg (500 lbs) for a fully configured and cabled Netra ft 1800.

In Seismic (Earthquake) Risk Zones 3 and 4, it is recommended that the Netra ft 1800 is installed in an appropriate secured seismic rack or cabinet.

Vertical space

The Netra ft 1800 chassis occupies 33RU (57.75 inches) of vertical height.

To allow adequate airflow, the rack must provide a minimum of 38RU (66 inches) of rackable height, together with minimum inlet and exhaust vents of 2U gap each. If the rack provides unobstructed vertical airflow via vents of adequate size in the top and/or bottom panels, then the minimum rack vertical opening required is 37RU (64.75 inches).

When you fit the Netra ft 1800 into a rack with its red transit plinth in place, allow 1U (1.75 inches) of clearance beneath the plinth. This space permits removal of the plinth.

Note – The plinth must be removed to allow fitment of the chassis environmental filters.

Depth

The front door (if fitted) must provide a minimum of 75 mm (3 inches) of clearance across the entire front surface of the Netra ft 1800 to allow for routing of I/O cables.

As all I/O cables must be routed from the front of the Netra ft 1800 system, due consideration should be made of the space required within the rack for these cables, as well as the power cables at the rear of the system.

There must be a minimum of 545 mm (21.5 inches) usable internal depth in the rack/cabinet. This dimension includes space for connector housings, cabling and the power inlet filters.

Safety

All racks must be bolted to the floor, to adjacent frames or to both. This must be done in accordance with the rack manufacturer's instructions, using the recommended hardware and fixings.

Free-standing racks with a footprint of less than 600 mm x 600 mm (23.6 inches x 23.6 inches) are likely to be unstable and should be treated with caution.

Hardware Installation

This chapter provides information on the initial hardware installation procedure, including installing modules and external I/O connections.

Unshipping and Mounting the System

Once you have removed the packaging from the system, you must then unship the system from the delivery pallet and brackets before attempting to mount the chassis in a rack.

Caution – Do not attempt to remove the red plinth before the chassis has been mounted in the rack.

There is an instruction card attached to the front of the system; the instructions below are intended to supplement this.

Note – Do not discard the packaging after removing it from the system. It should be stored in safe, dry place so it can be used in the event that the system requires moving or returning for repair.

Tools

The tools required to unship the system are contained in a cloth bag attached to the chassis.

Note – Do not discard the tools after unshipping and mounting the system. They can be stored in the cloth bag supplied and attached to the rack adjacent to the system for easy access when required.

▼ To Unship and Mount the System

4 x Phillips screws
at front of plinth

Insert lifting
device here

3 x Phillips screws
at rear of plinth

2 x Allen bolts
securing bracket to
pallet

2 x Phillips screws
on each bracket
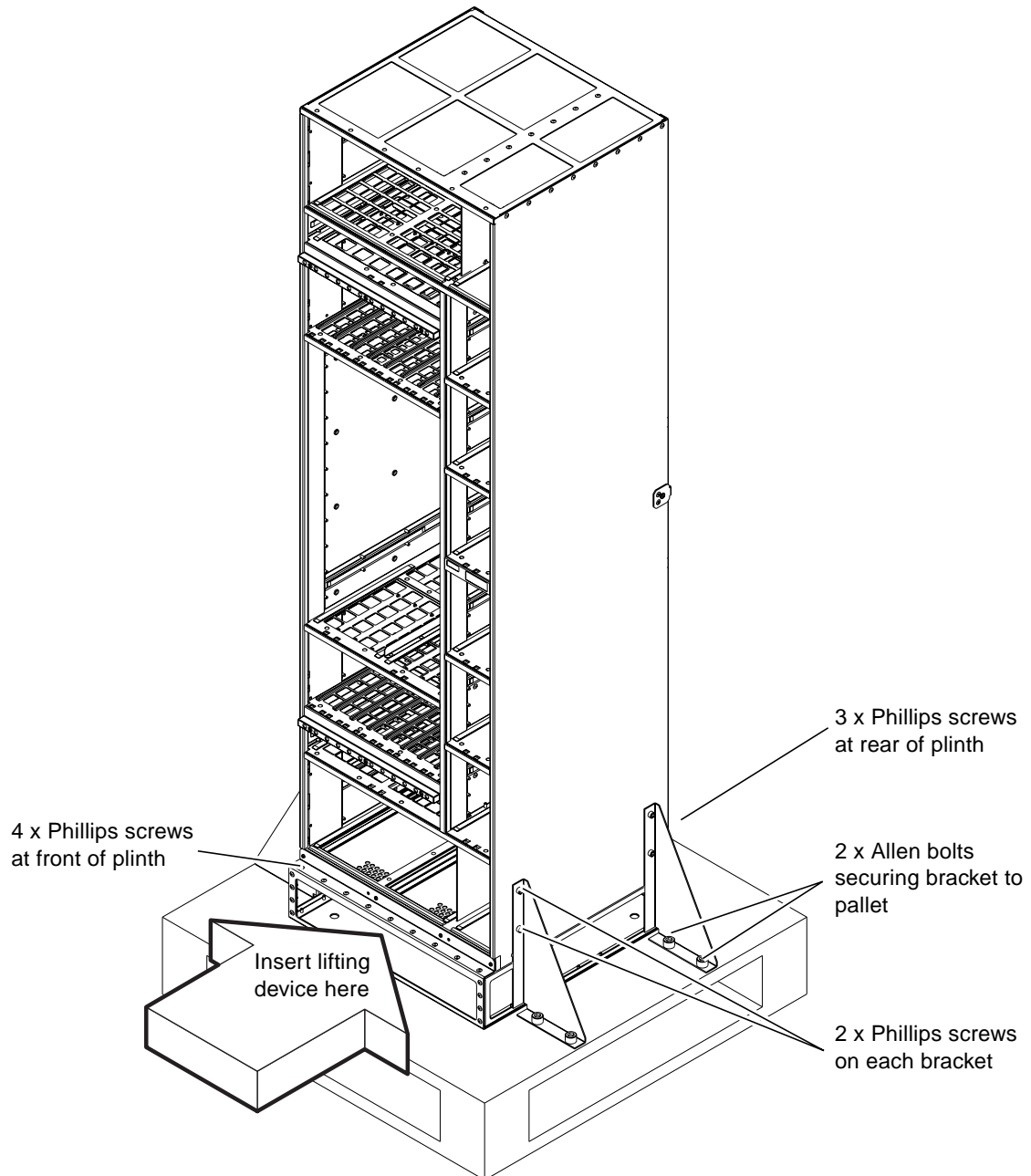
FIGURE 2-1   Shipping Brackets and Sacrificial Plinth

1. **Remove all modules except the motherboards from the chassis and put them in a safe place.**

   Refer to "Removing and Installing Modules" on page 23.

2. **Using the Phillips No.2 screwdriver (supplied), remove the two Phillips screws securing the four red brackets (two on each side) to the chassis (see FIGURE 2-1).**

   You may also need to remove the brackets from the pallet. Use the Allen key supplied to remove the two Allen screws from each bracket. The brackets are not attached to the red mounting plinth.

3. **Install the appropriate mounting flanges.**

   Refer to "Mounting Flanges" on page 13.

4. **Use an appropriate lifting device to lift the chassis by the red mounting plinth, and install it in the rack.**

   ⚠️ **Caution –** If using a fork-lift device, ensure the tines of the lift extend right through the mounting plinth and beyond the rear of the chassis. The chassis could deform if you use incorrect lifting techniques.

5. **Secure the chassis into the rack using the appropriate mounting points.**

   See "Mounting Flanges" on page 13.

6. **Remove the mounting plinth.**

   Use the No.2 Phillips screwdriver supplied to remove the four screws from the front and the three screws from the rear.

   Mounting the chassis with the plinth attached ensures that the minimum amount of clearance for air flow is provided beneath the system.

7. **Install the two large and one small filter trays in the spaces immediately beneath the chassis revealed by the removal of the plinth.**

   Refer to "To Install the Filter Trays" on page 36. The filter tray thumbscrews are inserted in the tapped threads exposed by removal of the mounting plinth.

8. **Install the modules into their appropriate locations.**

   Refer to "Removing and Installing Modules" on page 23.

Mounting Flanges

The system is supplied with the appropriate mounting flanges; other mounting flanges kits are available, as follows, to enable the system to mounted in different industry-standard racks:

- 19-inch racks X-Option No.X6938A
- 23-inch racks X-Option No.X6939A
- 24-inch racks X-Option No.X6940A
- ETSI (600 mm) racks X-Option No.X6941A

Each mounting kit also includes six cable bracket assemblies, which can be fitted to the mounting flanges to facilitate cable management; see "Cable Bracket Assemblies" on page 22.

19-inch Mountings

The 19-inch mounting kit consists of the following items:

TABLE 2-1   19-inch Mounting Flange Kit

Quantity	Item	Part number
1	Front left-hand mounting flange	340-4699
1	Front right-hand mounting flange	340-4698
1	Rear top left mounting flange	340-5479
1	Rear top right mounting flange	340-5480
1	Rear bottom left mounting flange	340-5481
1	Rear bottom right mounting flange	340-5482
16	Spacers	340-5483
8	Support rails	340-5484
6	Cable hook bracket with hooks already installed	340-5553
16	M4 10mm panhead screws (for rear flanges)	N/A
16	M4 crinkle washers (for M4 screws)	N/A
20	M5 8mm countersunk screws (for front flanges)	N/A
16	M5 10mm countersunk screws (for support rails)	N/A

Refer to FIGURES 2-3 to 2-6.

The sides of the system chassis are provided with tapped screwholes as shown in
FIGURE 2-2.
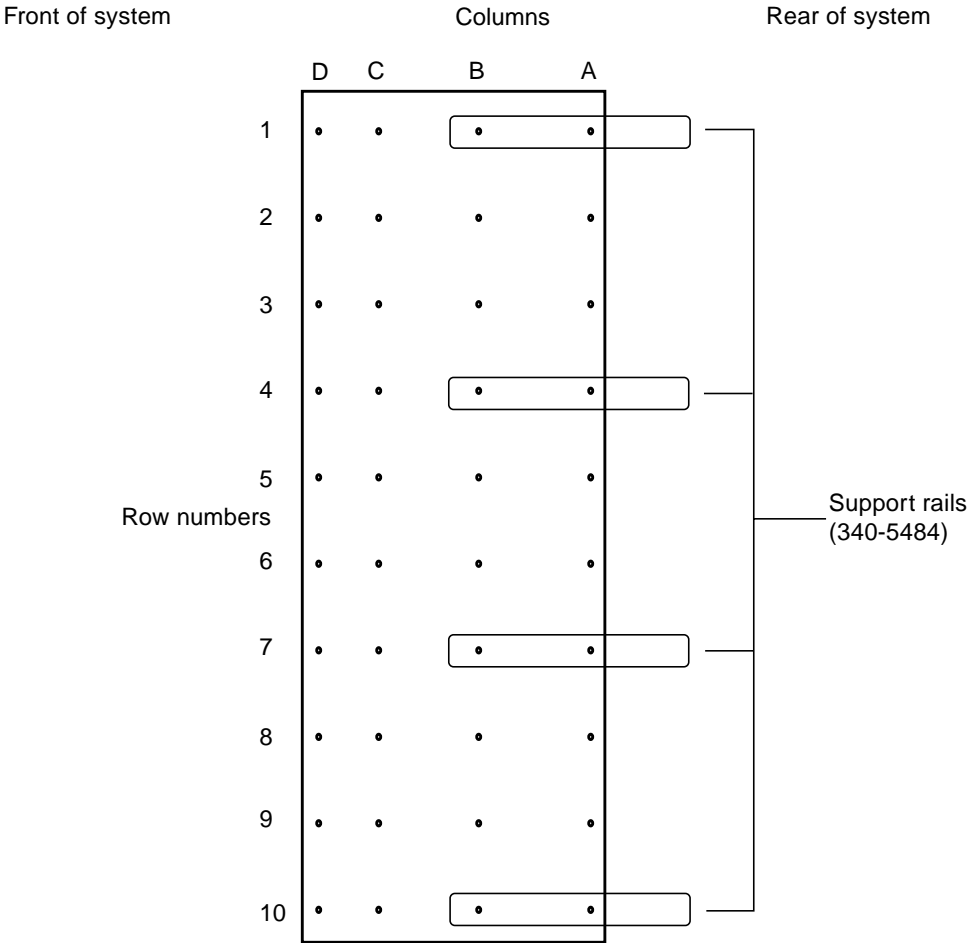
FIGURE 2-2   Location Matrix For Mounting Flange Screws (19-inch rack)

The front flanges (see FIGURE 2-6 on page 17) are screwed to holes in column C or
column D. Use column B only if the rear flanges are not going to be used.

The support rails (see FIGURE 2-7 on page 19) are screwed to holes A and B in rows 1,
4, 7 and 10. The spacers provided must be used between the rails and the chassis to
prevent the rails being fouled by the rivets in the chassis metalwork.

Spacer   ◎   ◎ Spacer (340-5483)

F1   F2   F3   F4   E1   E2   E3   E4   E5   G

F5
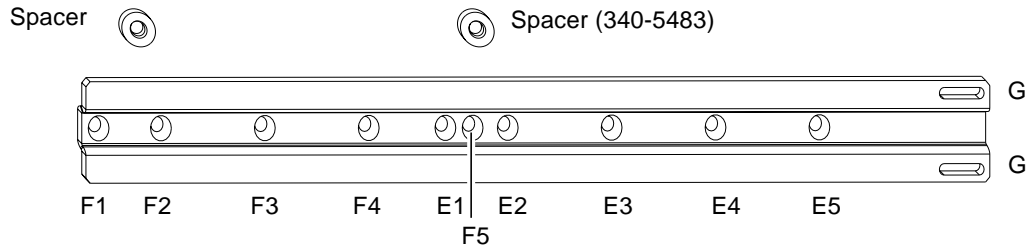
FIGURE 2-3   Support Rail and Fixings (19-inch Rack)

The mounting screws should be placed in position pairs E1 and F1, E2 and F2, E3 and F3, E4 and F4 or E5 and F5. The pair of holes to be used depends on the front-to-back depth of the rack (mounting flange to mounting flange). The holes marked with the appropriate figure, as shown in TABLE 2-2, should be closest to the rear of the chassis.

TABLE 2-2   Support Rail Screw Hole Locations

Rack depth	Screw holes
480 mm	E5 and F5
530 mm	E4 and F4
580 mm	E3 and F3
630 mm	E2 and F2
680 mm	E1 and F1

The slots labeled G are used for mounting the rear flanges (see FIGURE 2-6 on page 17). Only one of the vertical pairs of holes in the rear flanges should be used.

The spacers must be placed with the flat side towards the chassis and the countersink towards the support rail (see FIGURE 2-4).
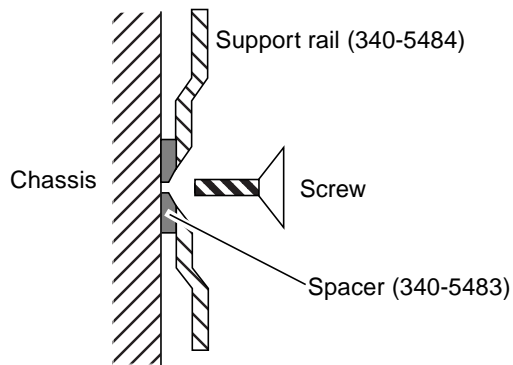
FIGURE 2-4 Orientation of Support Rail Spacers

The rear flanges are used to mount the chassis in the rear of the rack as shown in FIGURE 2-5.
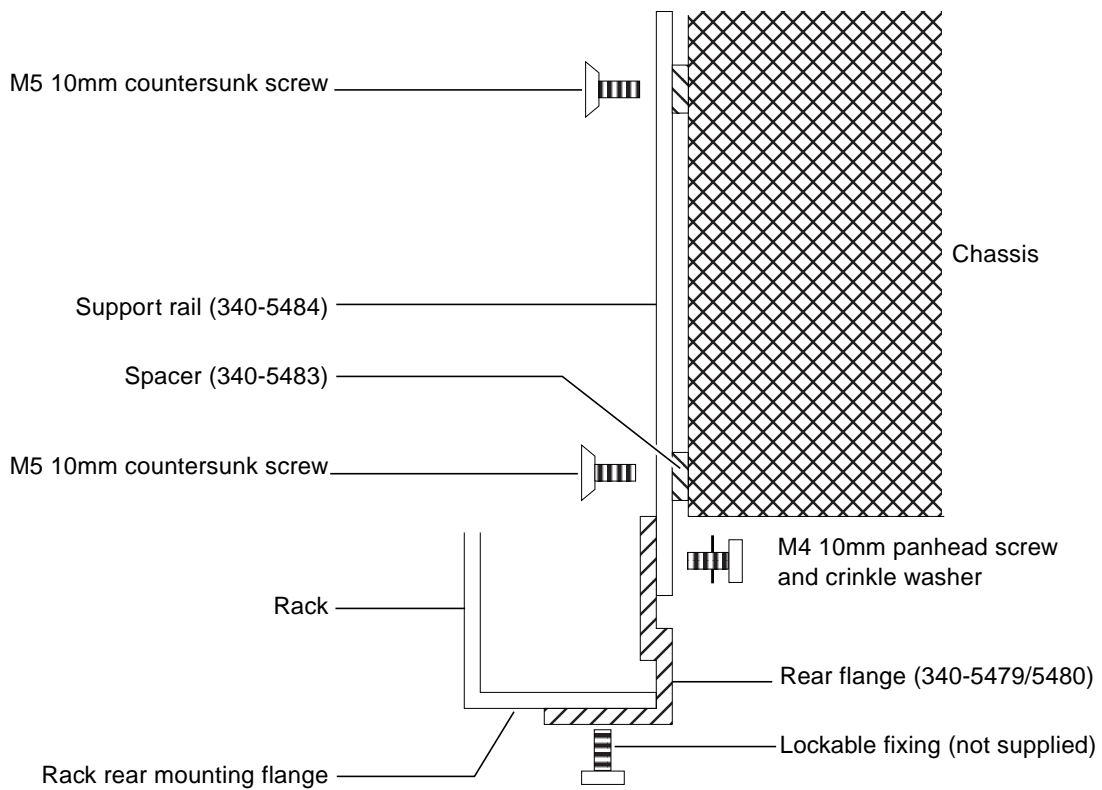
FIGURE 2-5 Rear Rack Mounting (19-inch Rack)

Support rail
(340-5484)
Use M5 10mm
screws

Spacer
(340-5483)

Rear top mounting
flange
(left 340-5479
right 340-5480)
Use M4 10mm
screws

Front mounting flange
(left 340-4699
right 340-4698)
Use M5 8mm screws

Rear bottom mounting
flange
(left 340-5481
right 340-5482)
Use M4 10mm screws
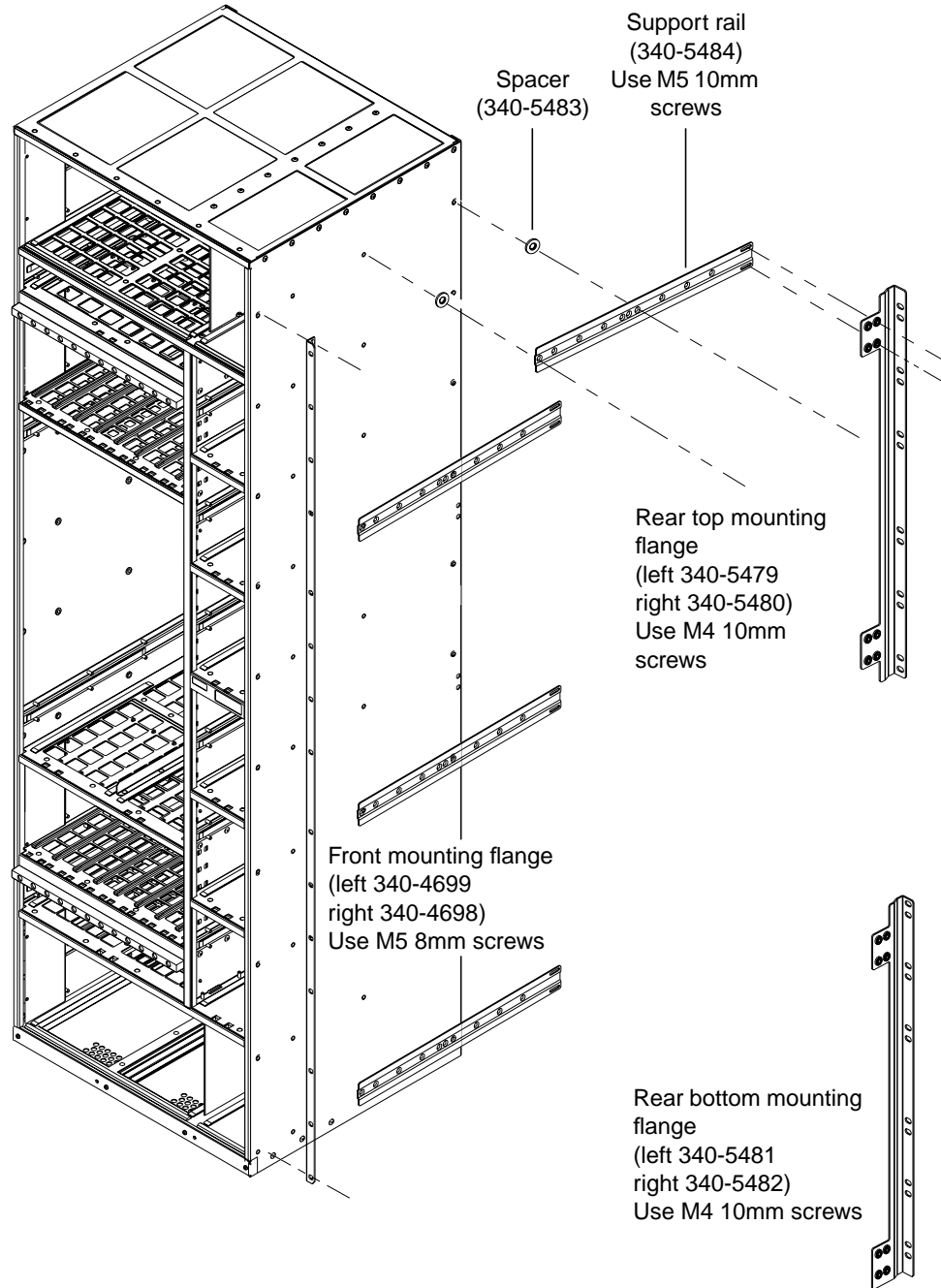
FIGURE 2-6   19-inch Rack Mounting Flange Kit

23-inch, 24-inch and 600mm Mountings

The 23-inch, 24-inch and 600mm mounting kits consist of the following items:

TABLE 2-3   23-inch, 24-inch and 600mm Mounting Flange Kits

		Part number		
Quantity	Item	23-inch	24-inch	600mm
1	Front left-hand mounting flange	340-4592	340-5445	340-5328
1	Front right-hand mounting flange	340-4591	340-5446	340-5329
2	Rear top mounting flange	340-5449	340-5447	340-5331
2	Rear bottom mounting flange	340-5450	340-5448	340-5427
8	Support rails	340-5330	340-5330	340-5330
6	Cable hook bracket with hooks already installed	340-5553	340-5553	340-5553
40	M5 6mm panhead screws (for front and rear flanges)	N/A	N/A	N/A
16	M5 8mm countersunk screws (for support rails)	N/A	N/A	N/A

Refer to FIGURE 2-7 on page 19 for 23-inch kits, FIGURE 2-8 on page 20 for 24-inch kits and FIGURE 2-9 on page 21 for 600mm kits.

The sides of the system chassis are provided with tapped screwholes as shown in FIGURE 2-2 on page 14.

Fit the front brackets using the screwholes in columns C and D, or just column C, or just column D.

Screw the slide mounts to holes A and B in rows 1, 4, 7 and 10. You can then screw the rear brackets to the rear of the rack (see FIGURE 2-7, FIGURE 2-8 and FIGURE 2-9) and slide the chassis onto the brackets until the front brackets are flush with the front of the rack.

Front mounting
flange
(left 340-4592
right 340-4591)
Use M5 6mm
screws

Rear top mounting
flange (340-5449)
Use M5 6mm
screws

Slide support
(340-5330)
Use M5 8mm
screws

Rear bottom mounting
flange (340-5450)
Use M5 6mm screws
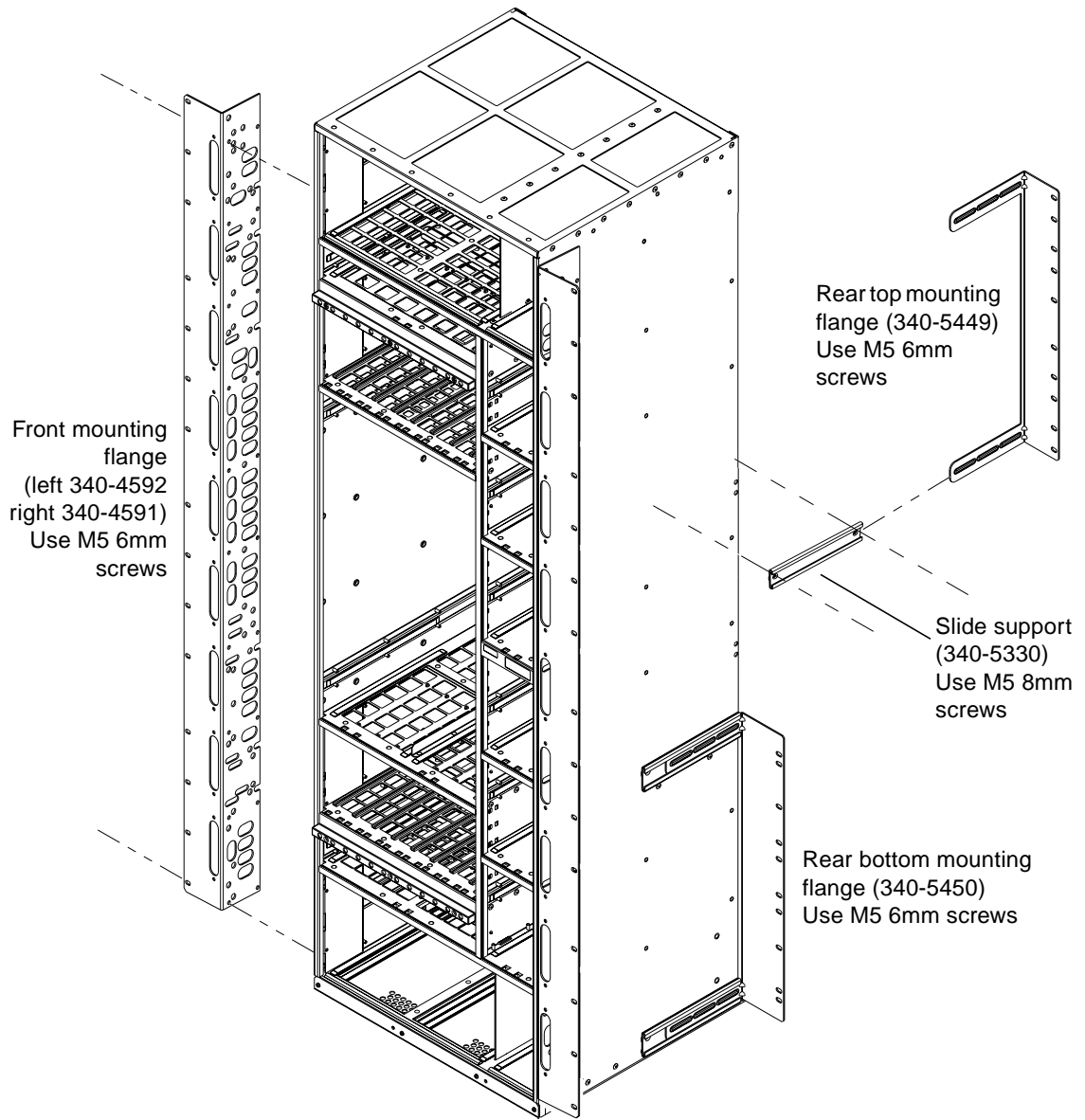
FIGURE 2-7   23-inch Rack Mounting Flange Kit

Rear top mounting
flange (340-5447)
Use M5 6mm
screws

Front mounting
flange
(left 340-5445
right 340-5446)
Use M5 6mm
screws

Slide support
(340-5330)
Use M5 8mm
screws

Rear bottom mounting
flange (340-5448)
Use M5 6mm screws
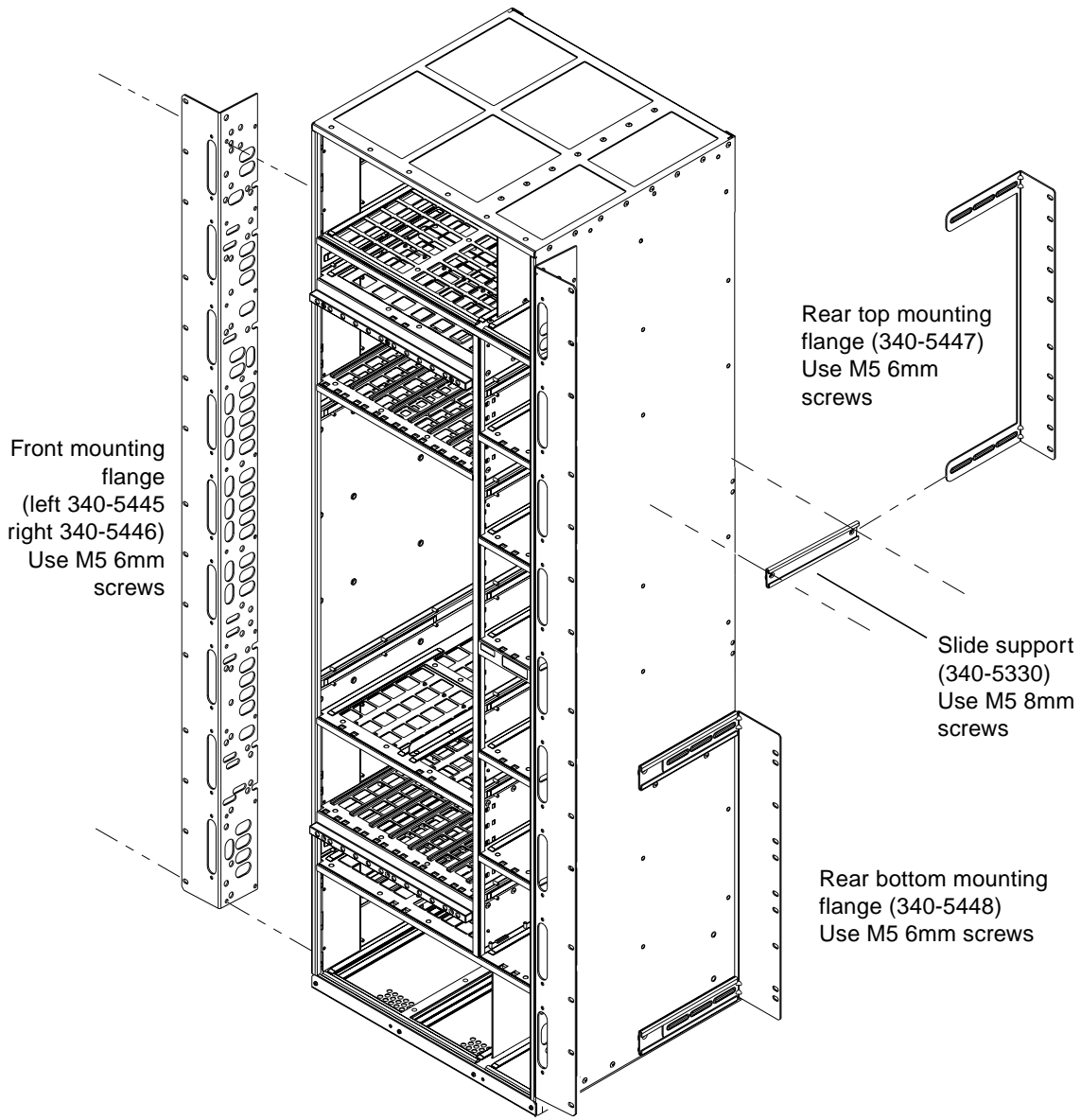
FIGURE 2-8 24-inch Rack Mounting Flange Kit

Front mounting
flange
(left 340-5328
right 340-5329)
Use M5 6mm
screws

Rear top mounting
flange (340-5331)
Use M5 6mm screws

Slide support
(340-5330)
Use M5 8mm
screws

Rear bottom mounting
flange (340-5427)
Use M5 6mm screws
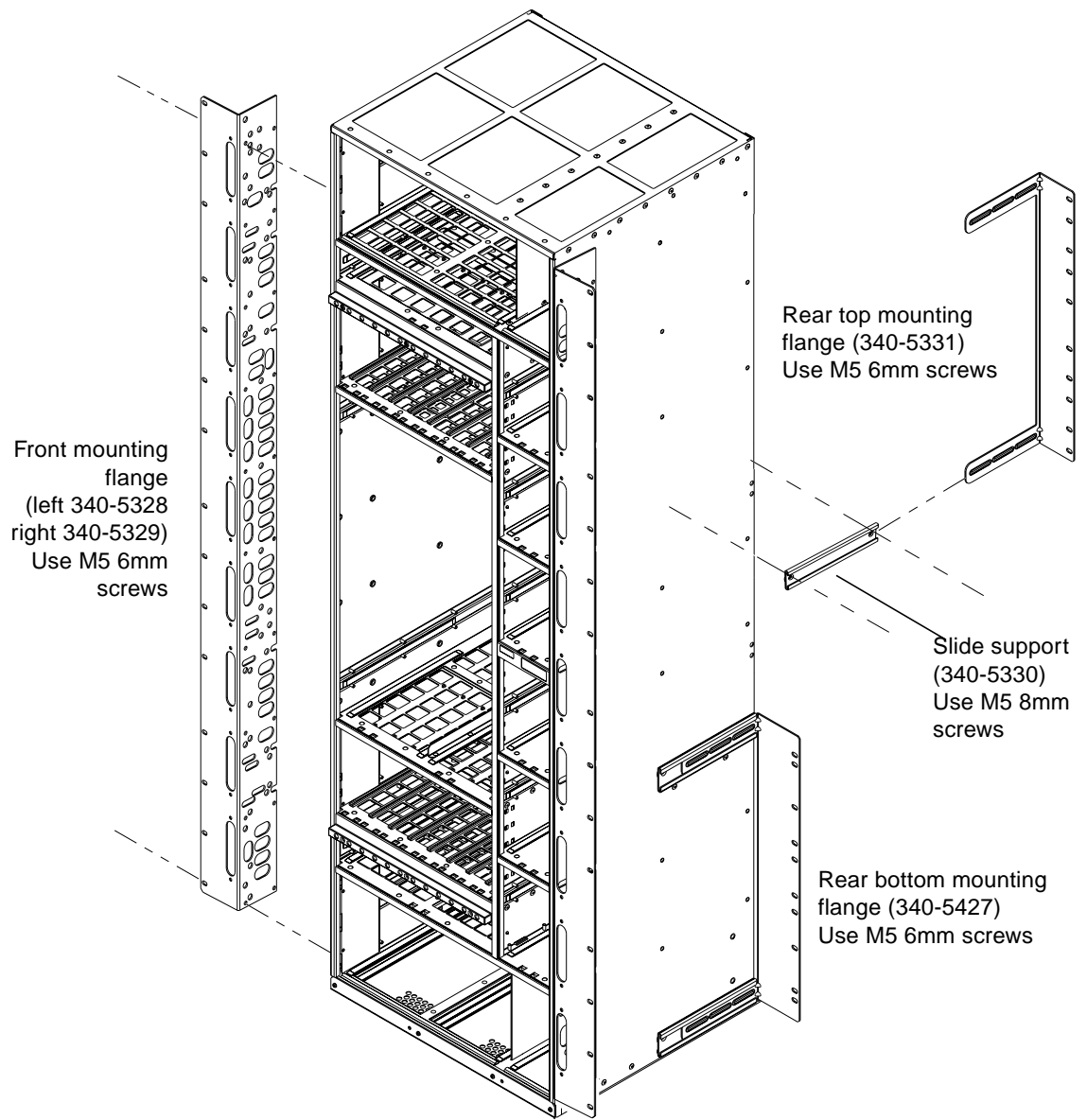
FIGURE 2-9 600-mm Rack Mounting Flange Kit

Cable Bracket Assemblies

Six cable bracket mounting assemblies are provided with each mounting flange kit. These can be fitted to the mounting flanges to facilitate cable management.
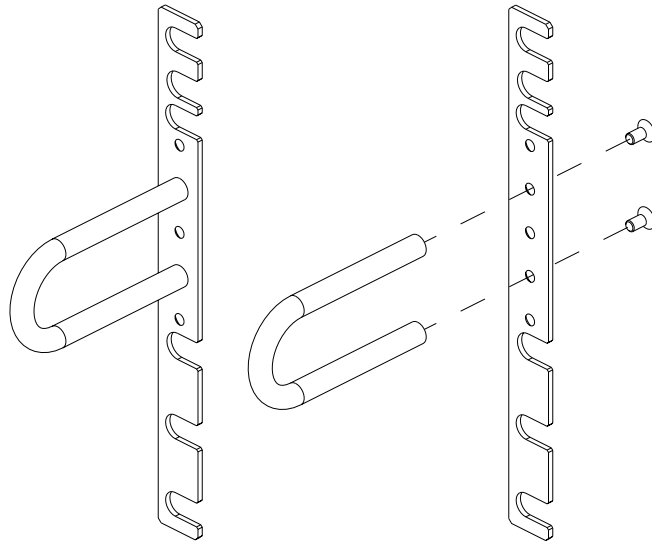
FIGURE 2-10 Cable Bracket Assembly

The brackets can be fixed to the mounting flanges in the required position, using the same screws that fix the flanges to the rack. The hooks can be fitted to the brackets in one of three positions using the countersunk M3 screws supplied. The hooks must be fitted before the brackets are fixed to the mounting flange/rack.

Removing and Installing Modules

This chapter describes how to remove and insert:

- CPUset, PCI, CAF and PSU modules ("To Remove a Module" on page 24)
  - CPUset modules: "CPUset Modules" on page 25
  - PCI modules: "PCI Modules" on page 28
  - CAF modules: "CAF Modules" on page 27
  - PSU modules: "PSU Modules" on page 29
- Drive chassis ("Replacing a Disk Chassis" on page 32)
- Removable media module ("Replacing an RMM" on page 30)

Caution – The wrist-strap provided must be used when replacing modules, or making cable connections to the rear of the system. The wrist-strap connection point on the Netra ft 1800 system is located on the panel at the bottom rear of the chassis.

All modules have their own guides in slots in the chassis, into which they fit exactly. No module will fit into a slot allocated to a different class of module. No module will fit into its own slot if it is upside down.

Module Injector/Ejector Mechanisms

All the modules except the disk chassis (DSK) and RMM have an injector/ejector lever (CPUset modules have two). They are all similar in function and usage. A common feature is a slide which engages and disengages the module's electrical connection to the motherboard, and a lever which physically engages and disengages the module. When the latch is disengaged, a red dot is exposed. This facilitates the identification of unlatched injectors.

Open

Closed
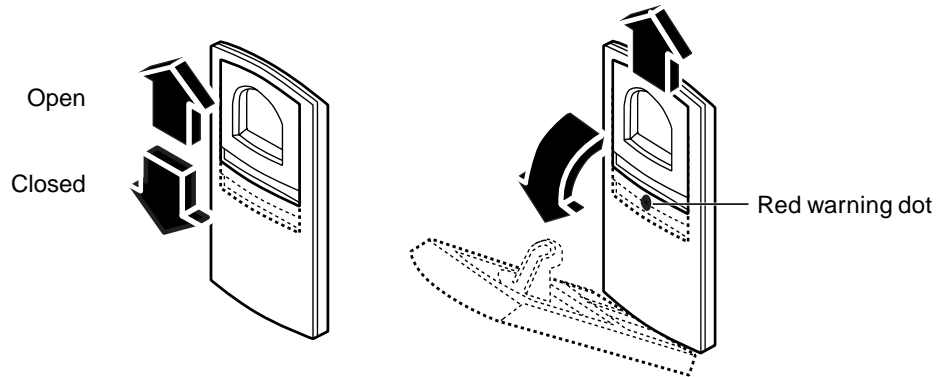
Red warning dot

FIGURE 2-11 Module Injector/ejector Lever

The module is disengaged from its electrical connection when the slide is moved towards the rounded end of the lever, exposing the red warning dot.

The general procedure refers to CPUset, CAF, PCI and PSU modules. For more specific instructions for the RMM and disk chassis, refer to:

- "Replacing an RMM" on page 30
- "Replacing a Disk Chassis" on page 32

▼ To Remove a Module

1. **Move the slide in the lever on the module to the disengaged position.**

   This will expose the red warning dot.

2. **Lower the lever.**

   The module will slide out a small amount when the lever is fully lowered.

3. **Slide the module out of its slot, using the handle if there is one.**

   For specific procedures relating to individual modules, refer to:

   - "CPUset Modules" on page 25
   - "CAF Modules" on page 27
   - "PCI Modules" on page 28
   - "PSU Modules" on page 29

CPUset Modules

CPUset modules have two injector levers which must be operated simultaneously.

As you pull out the CPUset module, the handle in the top panel pops up and must be depressed again manually in order to withdraw the module fully from the chassis (see FIGURE 2-12). Once the handle is clear of the crossbar and has popped up again, it can be used to take the weight of the module.

Caution – CPUset modules are very heavy. The weight warning label on the CPUset is for guidance only. The actual weight of a CPUset depends on its configuration. Both the front and top handles must be used simultaneously once the module has been withdrawn as illustrated in FIGURE 2-12.

On inserting the CPUset module the handle must be depressed in order to push the module fully into the chassis.
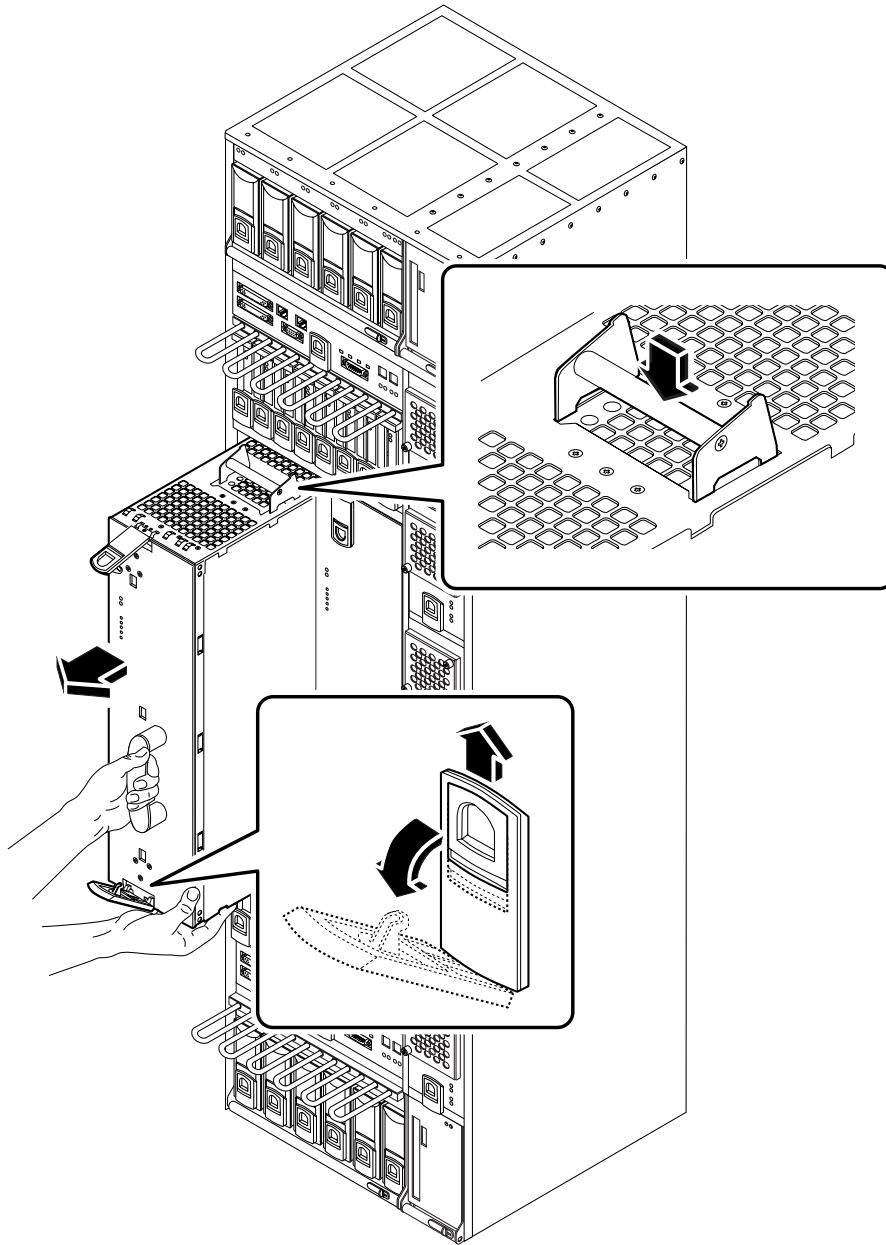
FIGURE 2-12 Removing a CPUset Module

CAF Modules
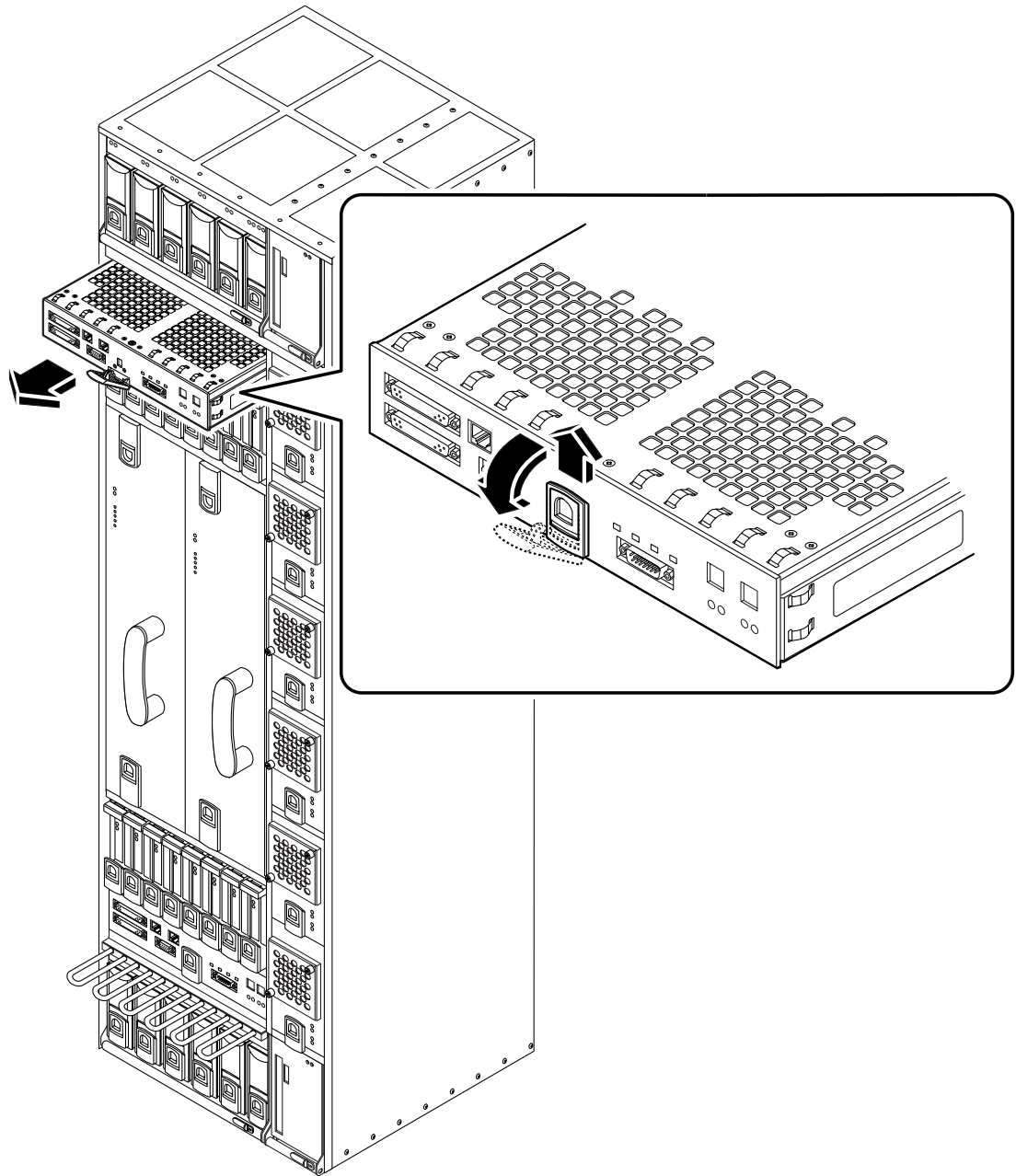
FIGURE 2-13 Removing a CAF

PCI Modules
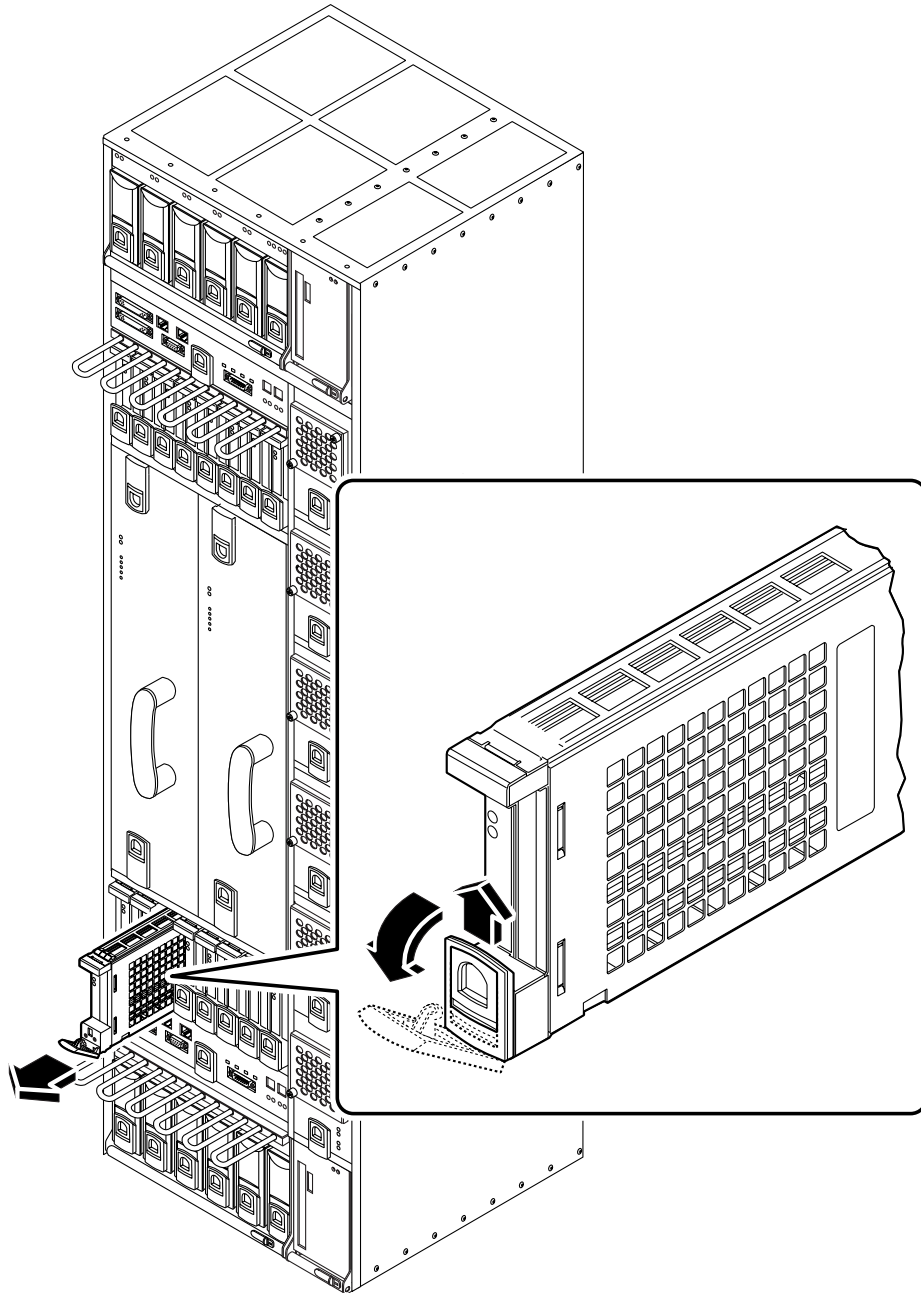
FIGURE 2-14 Removing a PCI Card Carrier

PSU Modules
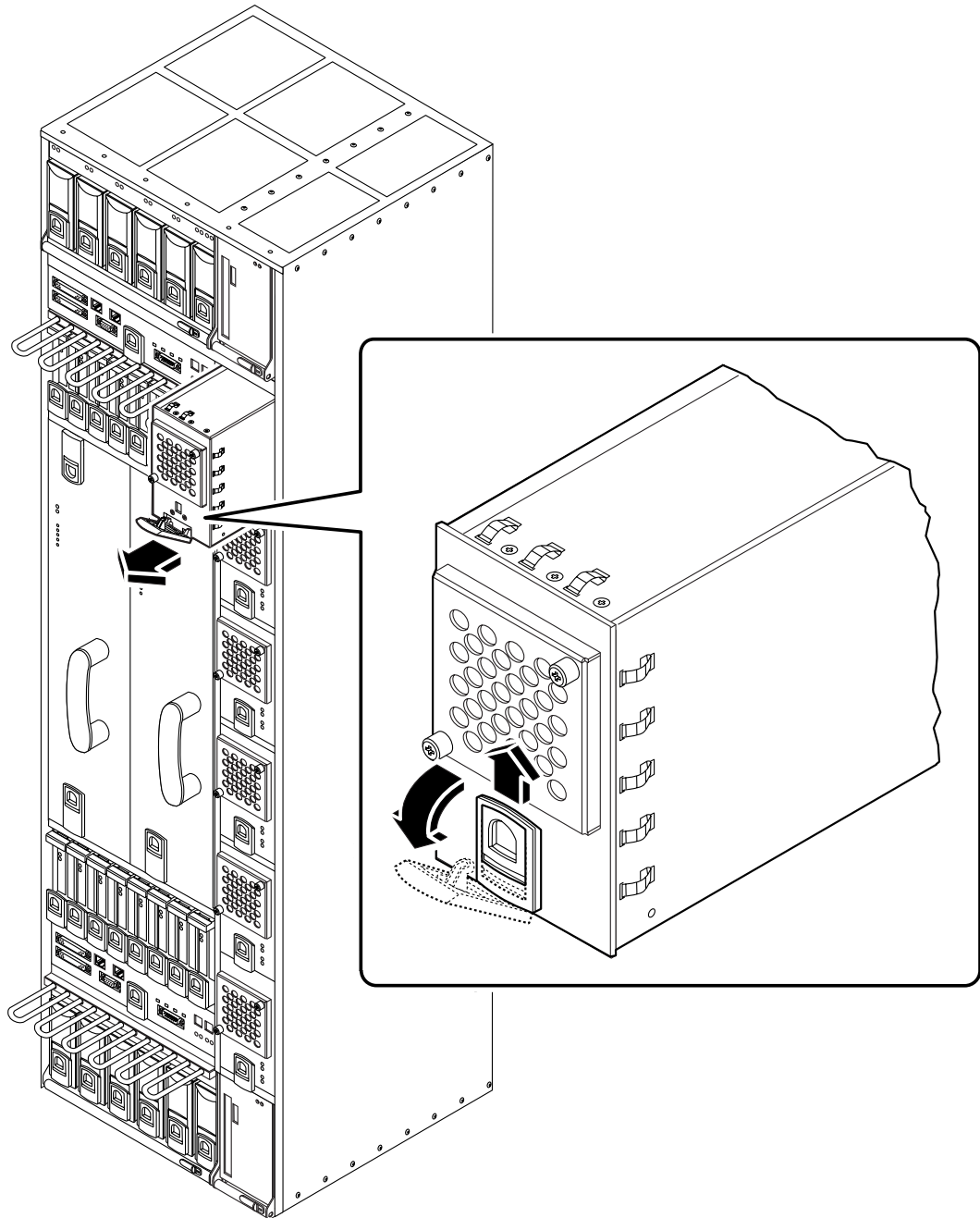
FIGURE 2-15 Removing a Power Supply

▼ To Replace a Module

1. Slide the module into its slot but not fully home.

A module will not fit into a slot designed for a different class of module.

2. When the lever engages with the chassis, raise it to push the module fully home.

3. Move the slide in the lever into the engaged position.

Replacing an RMM

RMM modules have a slide with an actuator microswitch on an ejector handle. The slide controls the electrical connection to the motherboard. When the slide is closed (to the right), the electrical connection is engaged; when it is open (to the left), the electrical connection is disengaged. The handle is lifted to disengage the module physically, and lowered to engage it.

▼ To Remove the RMM

1. Slide the latch in the handle of the RMM to the left (towards the 'unlocked' symbol).

2. Lift the handle.

3. Slide the RMM out of its slot.
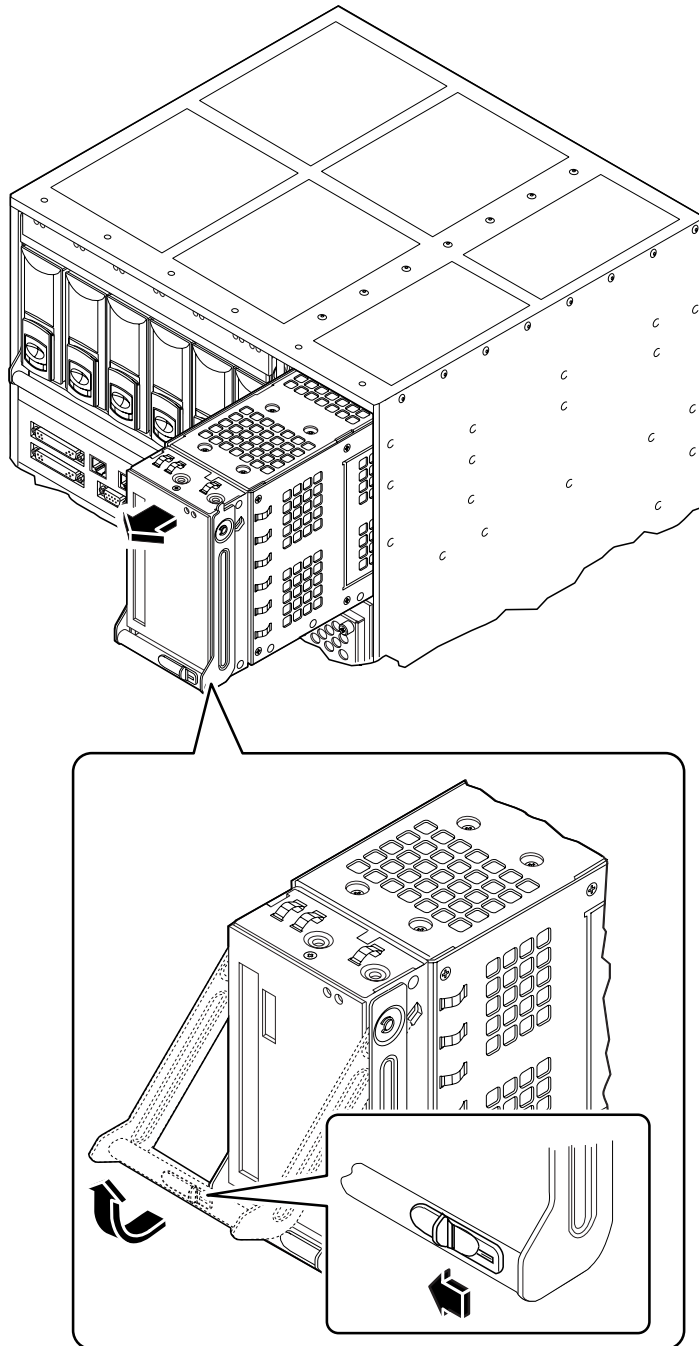
FIGURE 2-16 Removing an RMM Module

▼ To Replace the RMM

1. Slide the RMM into its slot until it is almost completely home.

A module will not fit into a slot designed for a different class of module.

2. Lower the handle to engage the RMM fully in its slot.

3. Slide the latch in the handle to the right (towards the 'locked' symbol).

Replacing a Disk Chassis

DSK modules have a slide on an ejector handle. The handle is lifted to disengage the module physically, and lowered to engage it.

▼ To Remove the Disk Chassis

1. Remove any HDD modules (hard disks) in the disk chassis.

Refer to FIGURE 2-17 on page 33.

Caution – Always remove all hard disk drive modules before removing a disk chassis. Always put a hard disk back in the same location from which you removed it.

---

2. Slide the latch in the handle of the disk chassis to the left (towards the 'unlocked' symbol).

3. Lift the handle.

4. Slide the disk chassis out of its slot.
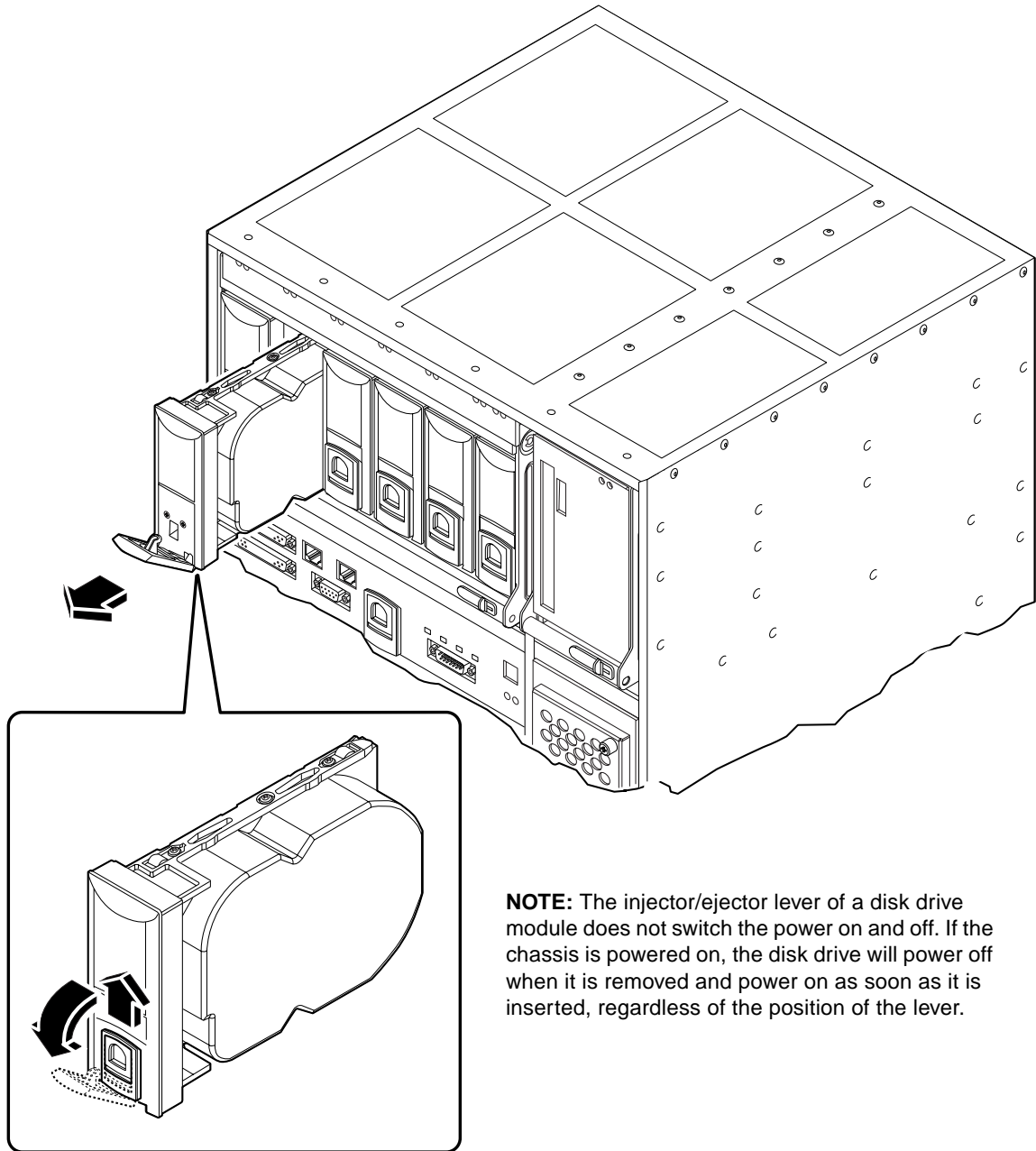
NOTE: The injector/ejector lever of a disk drive module does not switch the power on and off. If the chassis is powered on, the disk drive will power off when it is removed and power on as soon as it is inserted, regardless of the position of the lever.

FIGURE 2-17 Removing a Disk Drive
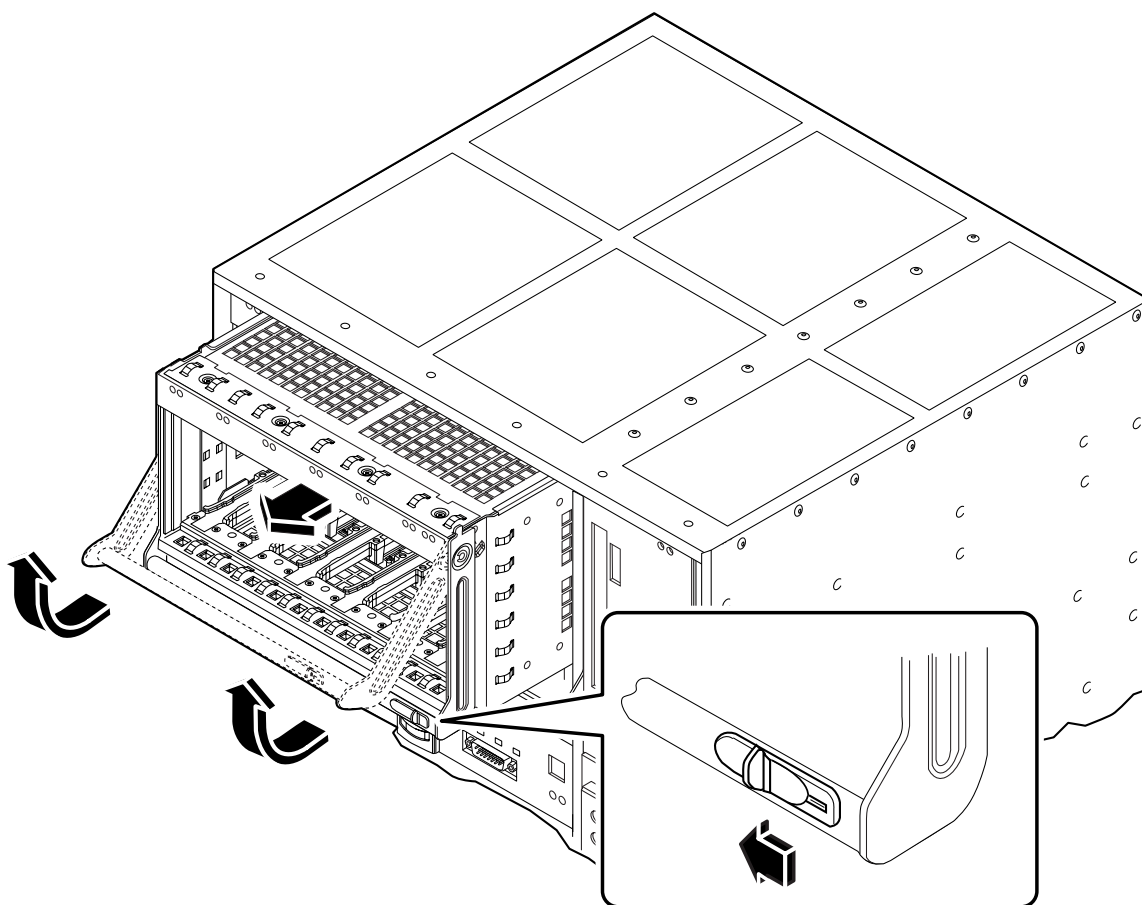
FIGURE 2-18 Removing a DSK Module

▼ To Replace the Disk Chassis

1. **Slide the disk chassis into its slot until it is almost completely in.**

2. **Lower the handle to engage the disk chassis fully in its slot.**

3. **Slide the latch in the handle to the right (towards the 'locked' symbol).**

4. **Replace the hard disk drives.**

Flexible Module Cabling

The cable management shelf is illustrated in FIGURE 2-19.
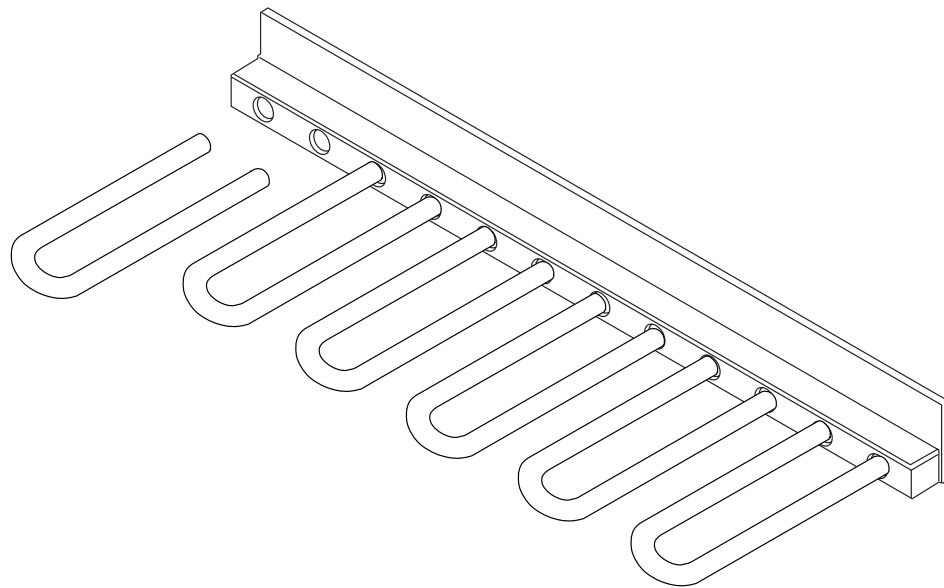
FIGURE 2-19 Cable Management Shelf

The cable management shelf adjacent to the PCI card locations is flexible and can be used in a number of different configurations. The holes are equidistant, and the hooks can be inserted in whatever position is required. The hooks are a firm push-fit into the holes.

Installing the Filter Trays

The Netra ft 1800 has three filter trays, two large and one small.

▼ To Install the Filter Trays
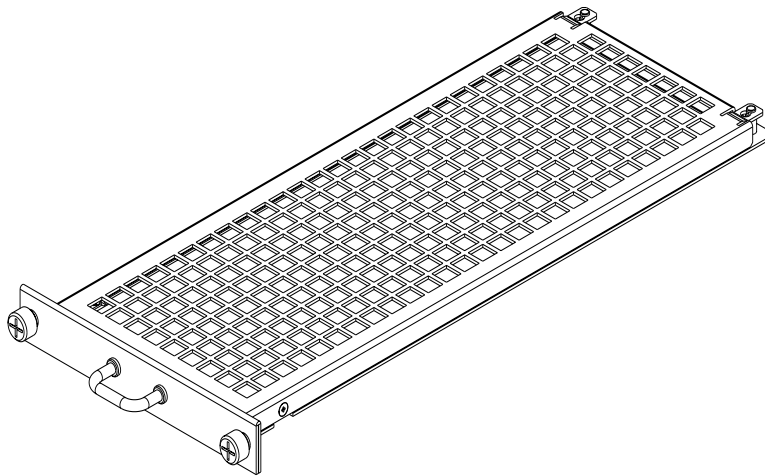
FIGURE 2-20 Large Filter Tray
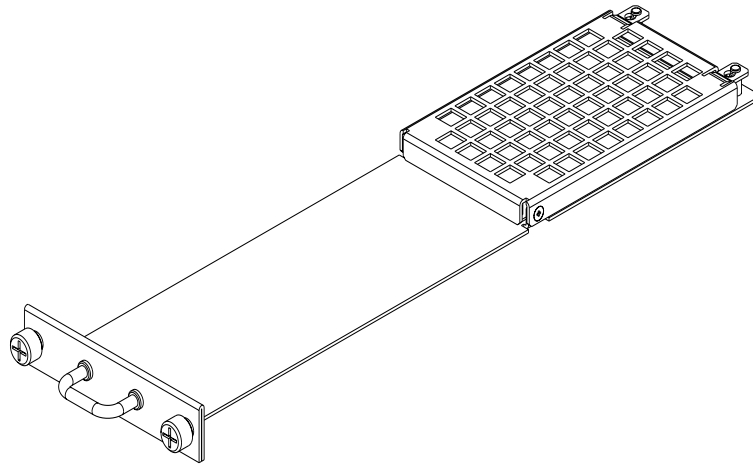
FIGURE 2-21 Small Filter Tray

1. **Insert the trays into the appropriate apertures at the base of the chassis; the two large trays are fitted on the left and the small tray on the right.**

   It is unimportant which way up the trays are fitted.

2. **Push the trays securely home and hand-tighten the two thumbscrews on each.**

   The thumbscrews are inserted into the tapped threads exposed by removal of the sacrificial mounting plinth.

CAF External I/O Connections

The Netra ft 1800 system has the following connectors on each CAF module:

- Female 25-pole D-type connectors for the system console and modem ports (RS232).
- A male 9-pole D-type connector for the Remote Control Processor (RCP) ports.
- A male 15-pole D-type connector for the alarm relay/reset signals.
- Two RJ45 Ethernet ports.
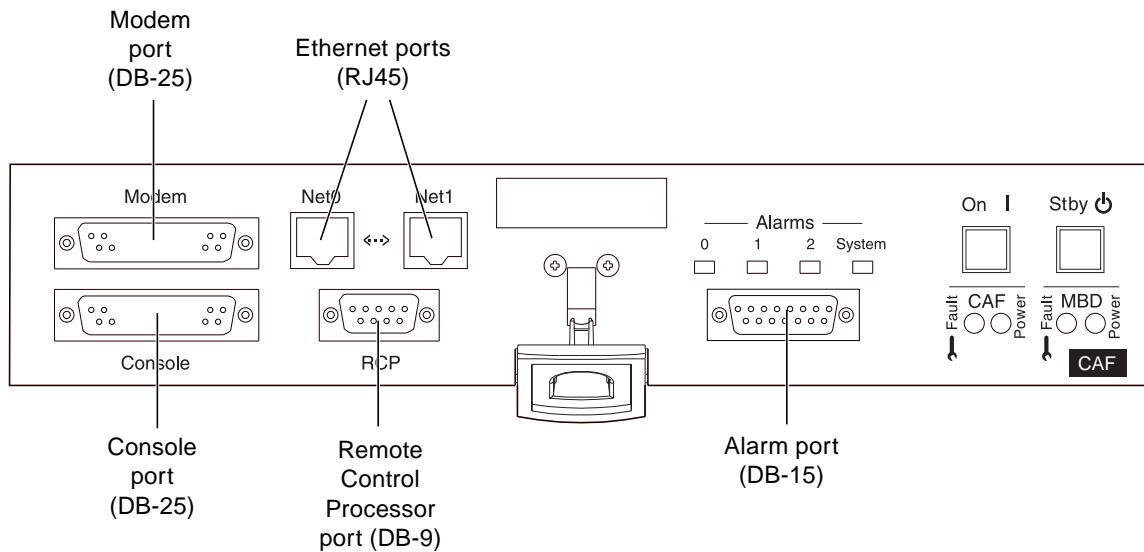
FIGURE 2-22 External I/O Connections on CAF Module

System Console Terminal Connections

The system console and modem connections are provided on separate 25-pole female D-type connectors. TABLE 2-4 shows the pin allocation on these connectors.

TABLE 2-4 Console Connector Pinout

Pin	Function	Description
1	GND	Chassis ground
2	TxD	Output data
3	RxD	Input data
7	SREF	Signal reference
Shield		Chassis ground

Except for pin 1, all pins of the console and modem connectors are isolated from the frame ground of the Netra ft 1800 system.

The connectors have two screw-threaded mounting pillars with 4-40 UNC threads. You should secure the cable headshell in place with the screws engaged in these pillars. If you use a cable headshell without securing the screws, make sure that the pillars do not prevent full engagement of the connector. This can happen with some types of cable headshell where screw heads can foul against the mounting pillars.

You must also secure the other end of the cable to the console terminal if the terminal provides some means of locking.

Note – To ensure EMC compliance always use a high quality screened cable that has metal connector shells.

TABLE 2-5 shows the console terminal configuration parameters for both console and modem ports. You can modify these parameters using Solaris utilities.

TABLE 2-5 Console and Modem Port Parameters

Parameter	Setting
Transmit rate	9600 baud
Receive rate	9600 baud
Data bits	8

TABLE 2-5   Console and Modem Port Parameters *(Continued)*

Parameter	Setting
Stop bits	1
Parity enable/sense	off/off
XON/XOFF protocol	on

System consoles can be connected only to the CAF module.

Modem Port Connections

The modem port pinout is described in TABLE 2-6.

TABLE 2-6   Modem Port Pinout

Pin	Function	Description
1	GND	Chassis ground
2	TxD	Output data
3	RxD	Input data
4	RTS	Output handshake
5	CTS	Input handshake
7	SREF	Signal reference
8	DCD	Input status
20	DTR	Output status
Shield		Chassis ground

Alarms Port Connections

The alarms port pinout is described in TABLE 2-7.

TABLE 2-7   Alarms Port Pinout

Pin	Description	Pin	Description
1	RESET0+	9	ALARM0-NC
2	RESET0-	10	ALARM0-COM
3	RESET1+	11	ALARM1-NO
4	RESET1-	12	ALARM1-NC
5	SYSTEM-NO	13	ALARM1-COM
6	SYSTEM-NC	14	ALARM2-NO
7	SYSTEM-COM	15	ALARM2-COM
8	ALARM0-NO		

Electrical Supply Installation

This chapter provides information about the Netra ft 1800 system switches and the installation of the electrical supply. See the *Netra ft 1800 Hardware Reference Manual* for full details of the electrical supply hardware.

The Netra ft 1800 has six power input feed pairs, three for each side, which plug in to the back of the system. These must be assembled by the user, as described in "Connecting the Power Leads" on page 51.

Note – This equipment is only intended for installation in a Restricted Access Location as defined by UL1950, 3rd Edition, and EN60950: 1992 ⁄ A11: 1997.

Note – In NORWAY, this requirement does not apply to permanently connected equipment or pluggable equipment type B, installed in areas where equipotential bonding has been applied, e.g. a telecommunications Central Office.

System Switch

The Netra ft 1800 in fault tolerant mode consists of two *sides*: processors and associated modules which function and are powered as separate systems. The system switches of the Netra ft 1800 function as standby devices for their respective sides, enabling and disabling the power supply units (PSU) outputs. The system switches are push, momentary switches. They are located on the CAF module on each side of the system.

The system does not contain any integral circuit breakers. The only means of isolating the system from power is by means of external circuit breakers, to be provided by the user.

Note – The system On and Stby switches handle low voltage signals only; the high-power circuits do not pass through these switches.

DC Source Site Requirements

The DC source site requirements are as follows:

- Suitable for use in –48 Vdc ((classified SELV) nominal or –60 Vdc (classified TNV-2) nominal systems.
- The supply source must be electrically isolated by double or reinforced insulation from any hazardous AC or DC source.
- The DC source must be reliably connected to earth (that is, battery room positive bus is connected to the grounding electrode).
- The DC source must be capable of providing up to 925W of continuous power per feed pair. The sum of all three feeds on one side will be less than 1500W for single-feed and 3000W for dual feed.

Overcurrent Protection Requirements

Overcurrent protection devices must be provided as part of each host equipment rack.

Circuit breakers meeting the requirements shown in TABLE 3-1 must be fitted between the DC source and the Netra ft 1800.

TABLE 3-1   Overcurrent Protection Requirements

Current rating	30A maximum
Voltage	Maximum 60 Vdc rated in –48 Vdc power systems Maximum 75 Vdc rated in –60 Vdc power systems
Type	Fast trip
Protection	Double pole breaking (both grounded and ungrounded conductor open on fault)
Contact gap	Minimum 3 mm
Nuisance tripping	Circuit breaker must not operate when presented with an inrush current of 27 amps and a duration of 2.5 microseconds
Quantity	One per feed, up to 12 per system

Caution – Double pole circuit breakers are required on each rail for DC installations. This is necessary because the return path of the current is not isolated in the PSU.

FIGURE 3-1 on page 3-46 shows the required arrangement for single power rails. FIGURE 3-2 on page 3-47 shows the required arrangement for dual power rails.

Note – Overcurrent devices must meet applicable national and local electrical safety codes and be approved for the intended application.
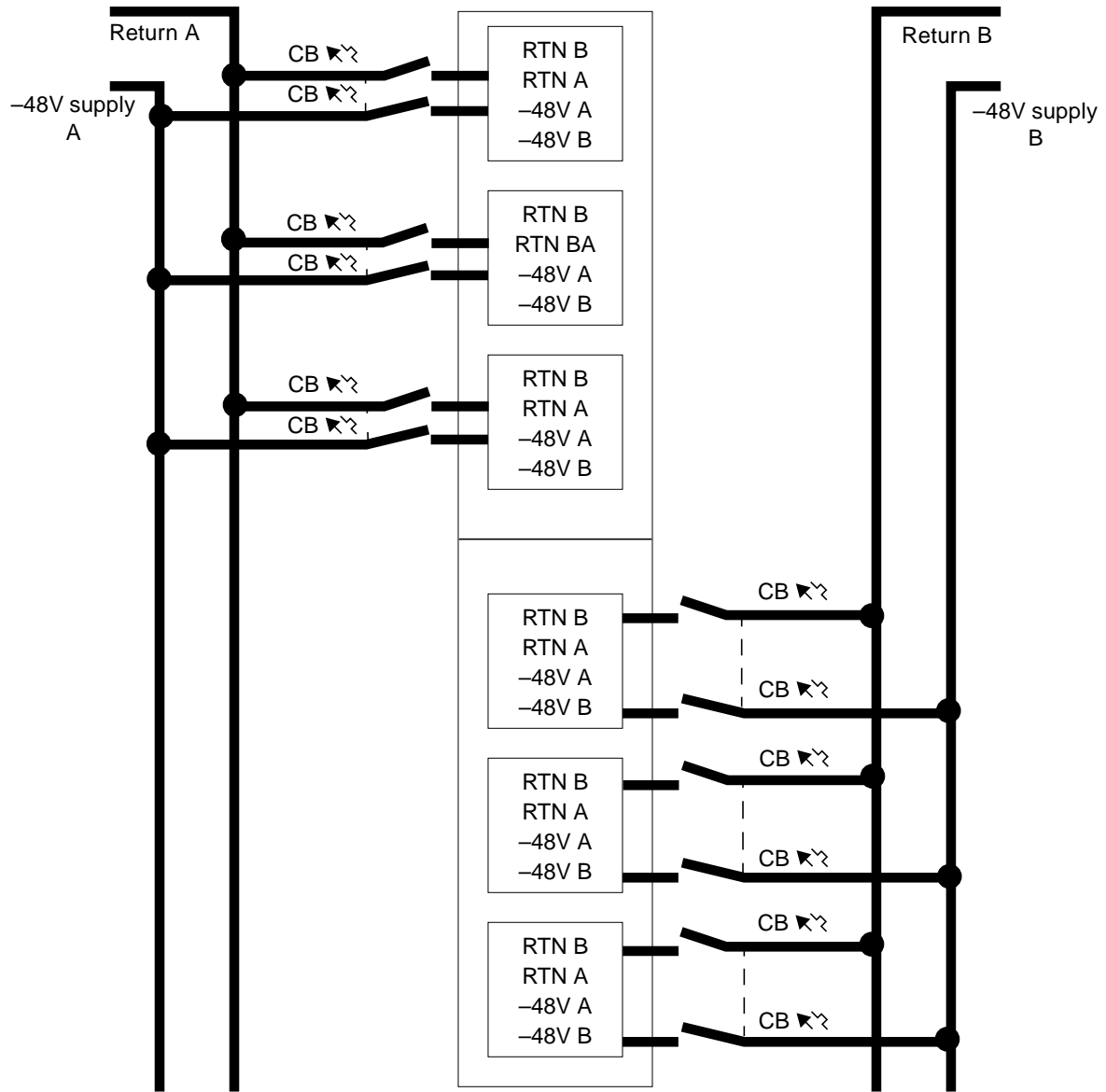
FIGURE 3-1   Circuit Breakers for Single Power Rails

Text within figure:

Return A

CB
CB

−48V supply
A

RTN B
RTN A
−48V A
−48V B

CB
CB

RTN B
RTN BA
−48V A
−48V B

CB
CB

RTN B
RTN A
−48V A
−48V B

Return B

−48V supply
B

RTN B
RTN A
−48V A
−48V B

CB

CB

RTN B
RTN A
−48V A
−48V B

CB

CB

RTN B
RTN A
−48V A
−48V B
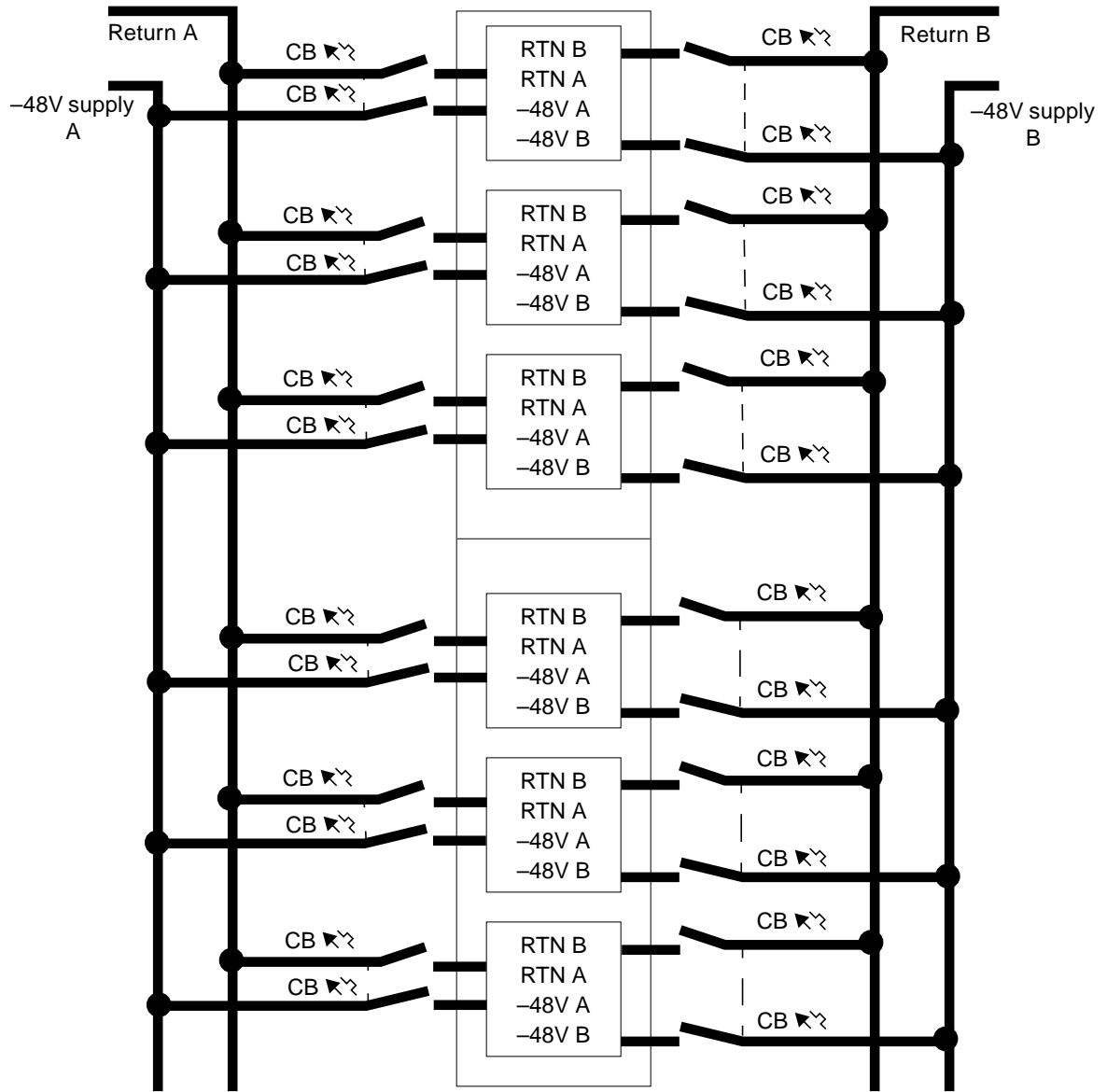
CB

CB

FIGURE 3-2   Circuit Breakers for Dual Power Rails

Required Connection Materials

DC branch circuits:

- The required number of field wiring kits are supplied in the shipkit with each system, according to configuration.

Grounding:

- One Thomas & Betts two-hole lug (part number: 54204-UB) suitable for 8 AWG conductor or UL/CSA approved equivalent having 5/8-inch pitch; torque value: 3.5 Nm maximum.
- A Thomas & Betts crimping tool (part number: TBM 5-S), or approved equivalent to secure the lug on to the cable.
- A grounding bus bar that is near the equipment and easily accessible.

Dual Grounding Environment:

- Additional Thomas & Betts two-hole lug for logic 0V studs.

Caution – External filtering and/or surge suppression devices may be required on the power feeds where branch circuit electromagnetic characteristics are unknown.

DC Supply and Ground Conductor

The requirements are:

- Suitable conductor material: copper only.
- Supply conductors: 8 AWG (6 mm^2) (between the Netra ft 1800 and the circuit breaker).
- Ground conductor: 8 AWG.
- Cable insulation rating: minimum 75 degrees Celsius, Low Smoke Fume (LSF), Flame Retardant.
- Cable type must be one of:
    - UL style 1028 or other UL 1581 compliant equivalent.
    - IEEE 383 compliant.
    - IEEE 1202-1991 compliant or classified.
- Branch circuit cable insulation color: per applicable national electrical codes.
- Grounding cable insulation color: green/yellow.

Dual Grounding Environment

Caution – To be compatible with grounding environments requiring isolation between logic 0V and chassis ground, the fitted grounding bridge plate must be removed and individual connections made to logic 0V and chassis ground studs. The grounding bridge plate is located on the middle rear left edge of the unit between the motherboards. The grounding studs at the base of the chassis are M5 studs with appropriate nuts already installed.

Before installation for dual grounding systems, remove the link from the chassis to logic 0V. This exposes a 2-hole lug with tapped M5 threads (refer to FIGURE 3-3).

Caution – The use of certain PCI cards causes the frame and logic grounds to be commoned. Refer to the documentation supplied with the PCI card.

▼ To Connect the Ground Lead

1. **Strip 9mm of insulation from each end of the grounding lead.**

2. **Insert the lead into the Thomas & Betts two-hole lug provided (part no. 52024-UB).**

   Ensure that both the conductor and its insulation are gripped by the lug.

3. **Position the lug and grounding lead assembly over the grounding studs.**

   Refer to FIGURE 3-3 on page 3-50. Tighten the two M5 nuts over the locking washers provided.

4. **Make the connection to the earthing bar at the end of the grounding lead.**

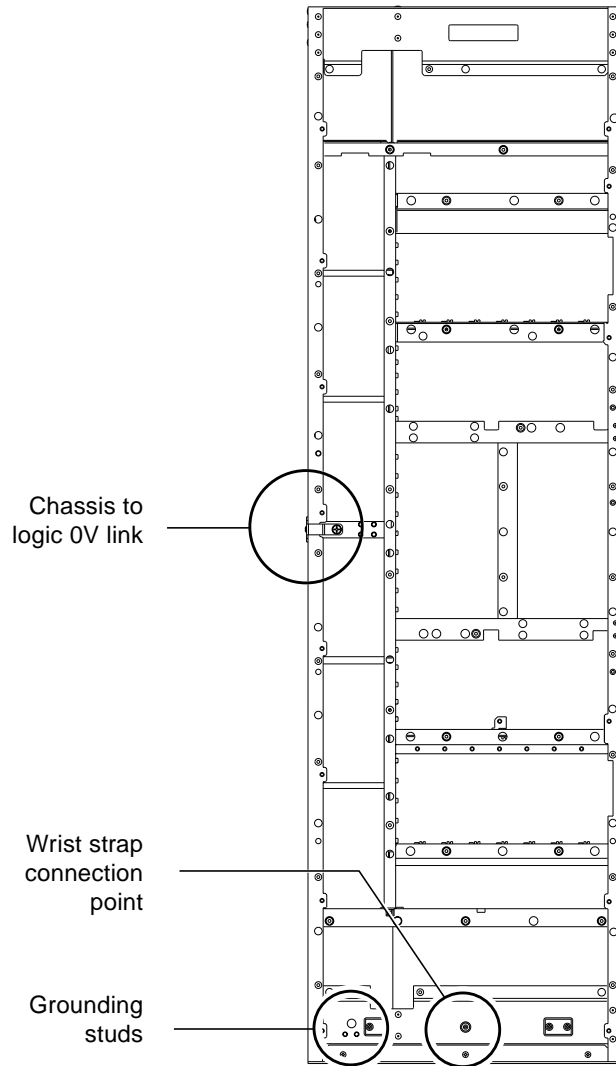   Ensure there is adequate strain relief for the cable.

Chassis to
logic 0V link

Wrist strap
connection
point

Grounding
studs

FIGURE 3-3 Location of Chassis-to-Logic-0V Link and Grounding Points, and Wrist Strap
Connection Point

Connecting the Power Leads

The inlet power filter must be plugged into the power sockets on the motherboards at the back of the Netra ft 1800, then the six power leads must be attached to the input power filter.

Note – Disengage all the PSUs before you insert the power connectors. Inserting the connectors with the PSUs engaged can damage the connectors.
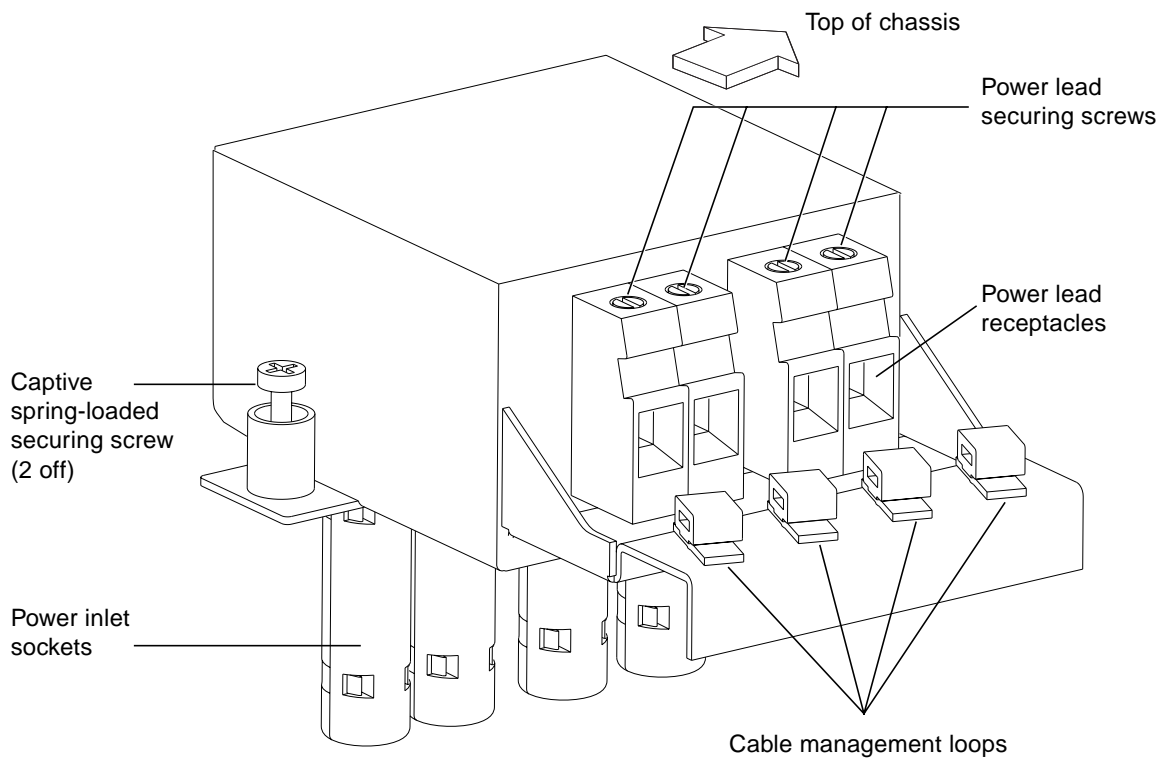

Top of chassis

Power lead
securing screws

Power lead
receptacles

Captive
spring-loaded
securing screw
(2 off)

Power inlet
sockets

Cable management loops

FIGURE 3-4   Power Inlet Filter

▼ To Assemble the Power Inlet and Leads

1. **Insert the socket in the appropriate slot on the motherboard.**

   The socket can only be inserted one way round. The label on the front of the filter indicates the correct orientation.

2. **Tighten the captive spring-loaded screws, preferably finger-tight only.**

   If you use a screwdriver, these screws should be tightened no more than 6 in-lbf (0.68 Nm). Refer to FIGURE 3-5.
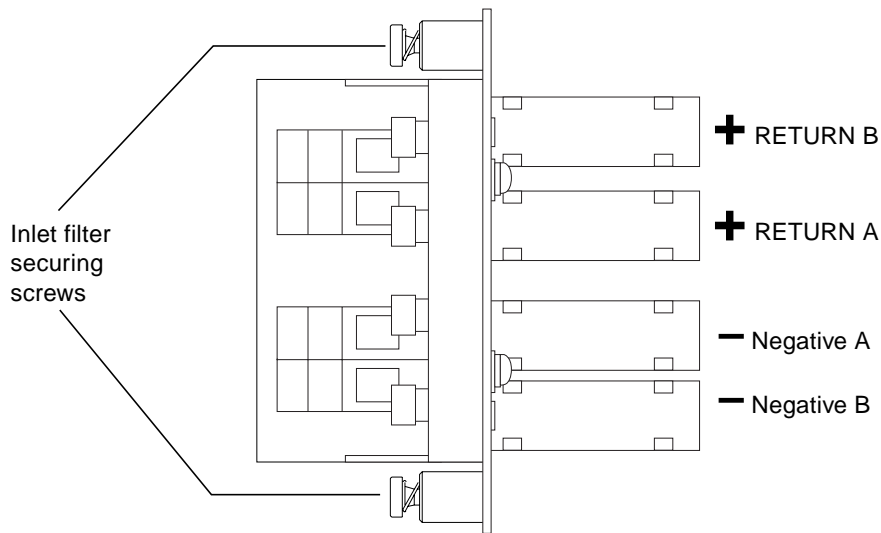

FIGURE 3-5   Power Connector Wiring Polarity and Securing Screws

3. **Strip 9mm of insulation from boths ends of each power lead.**

   The connectors will not accommodate leads of greater than 8 AWG (6 mm^2).

4. Insert the leads into the appropriate receptacles in the terminal block.

Refer to FIGURE 3-6.
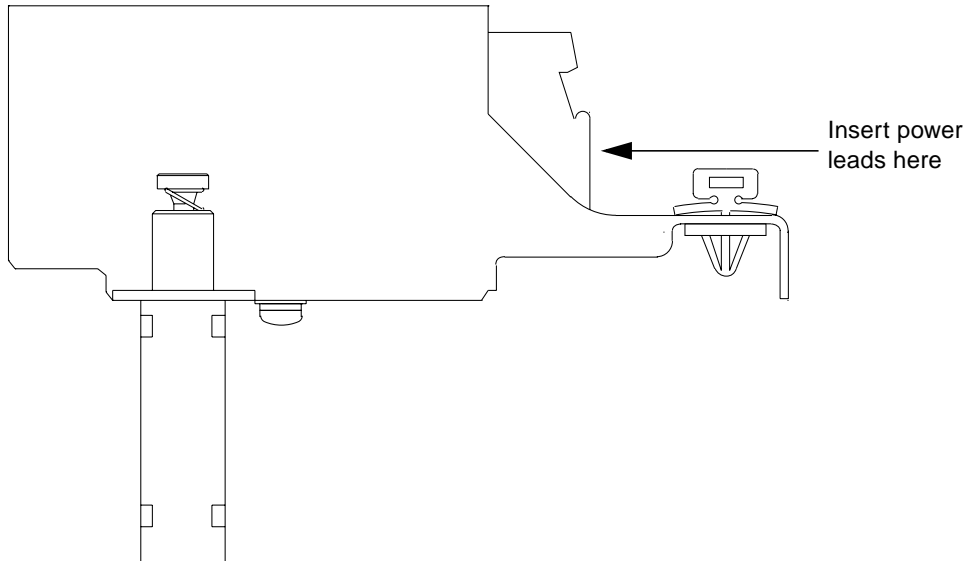

Insert power leads here

FIGURE 3-6   Power Lead Receptacles

5. Tighten the terminal block power lead M4 securing screws to 1.5-1.8 Nm.

Refer to FIGURE 3-7.

Power lead securing screws
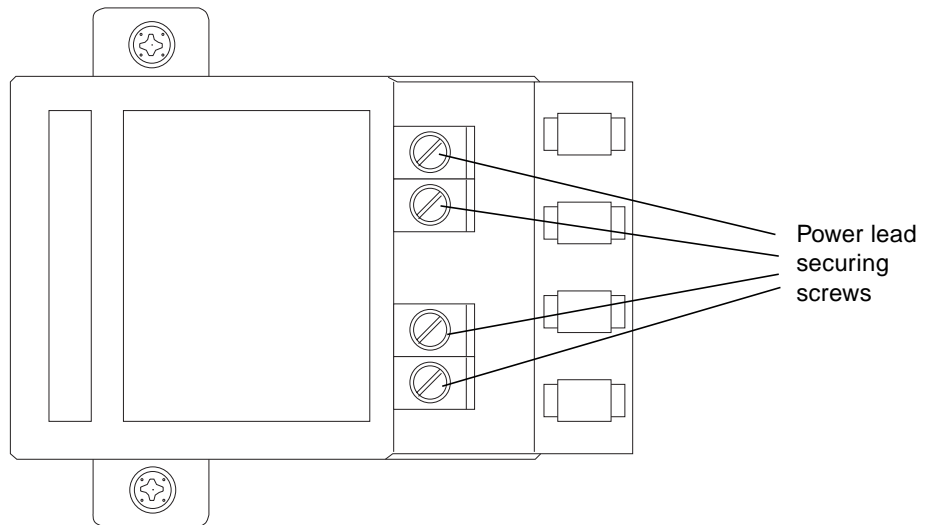
FIGURE 3-7   Power Lead Securing Screws

6. Use cable ties to secure the wires to the swivel loops in the mounting bracket (see FIGURE 3-8).

The loops can be rotated to a convenient position. This strain relief method *must* be implemented.

⚠️ **Caution –** Observe correct working practices regarding the termination of cable ties.

RTN   A   B

−48V   A

B

Cable tie

FIGURE 3-8   Power Cable Arrangement for Strain Relief

7. Ensure the circuit breakers are open, then connect the other ends of the leads to the circuit breakers.

Secure the cables using adequate strain relief.

Powering on the System

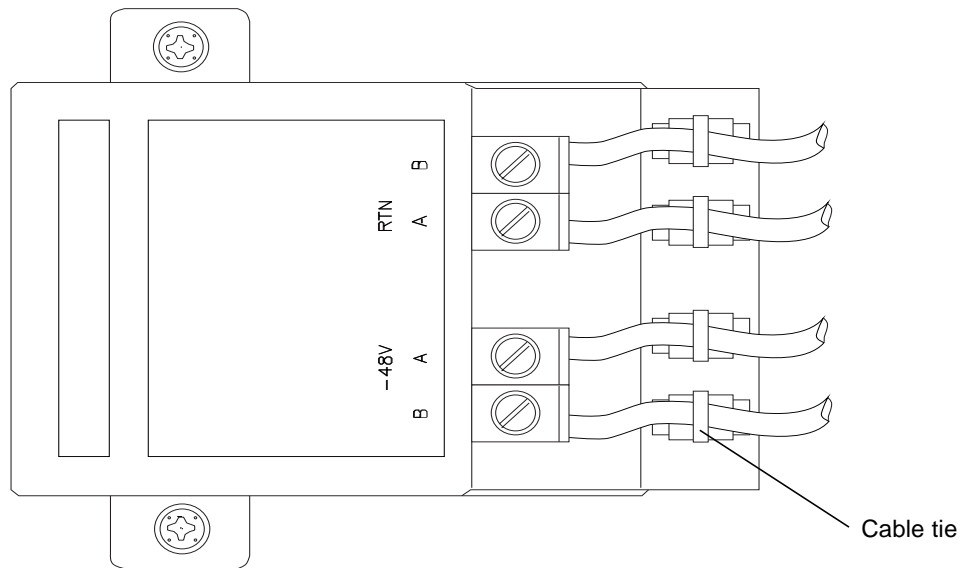This chapter describes the procedure for powering on the Netra ft 1800.

▼ To Power On the System

1. **Prior to powering on, inspect the supply conductors for mechanical security.**

2. **Activate the external circuit breakers.**

   Note – The power supply units (PSUs) remember their last requested state. They are shipped in the ON state. Because the external circuit breaker is activated when the last state of the PSU was ON, the PSU will power up at this point.

3. **Push the On system switch on either CAF.**

4. Push the other On system switch (on the other CAF front panel).

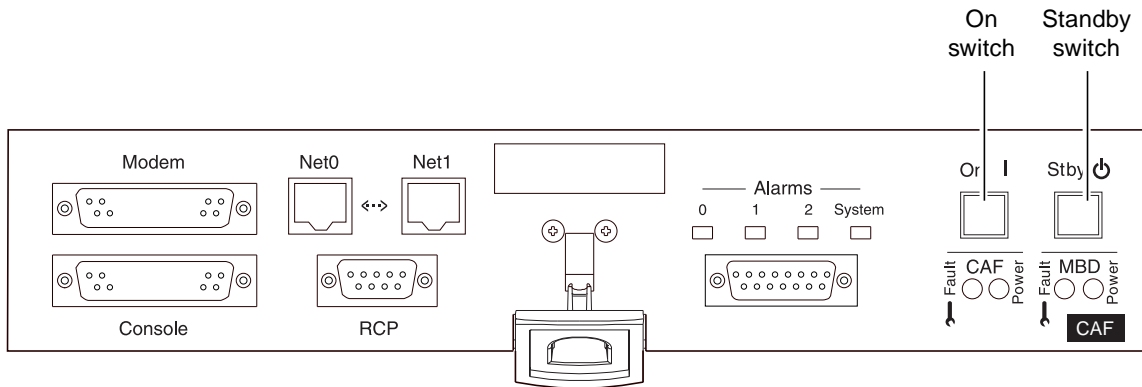**FIGURE 4-1**   System Switches (Front Panel)

The PSU, CPUset and CAF *Power* LEDs will successively light, and the terminal will display the output from the Power On Self Test (POST). The POST sequence may take some time.

The CPUset LEDs will perform their own test sequence towards the end of the POST procedure, then the *Target* LED on one of the CPUsets will flash as the OBP `ok` prompt appears.

Software and Operating Environment Installation

This chapter describes all the steps necessary to install a software and operating environment release for the Netra ft 1800. To perform the steps described here, you should be familiar with the Solaris operating environment.

Netra ft 1800 Install Media

The release software consists of the following:

■ Netra ft 1800 Full Installation containing Solaris and Netra ft 1800 install software.
■ Sun StorEdge Volume Manager 2.5 media kit and Sun StorEdge Volume Manager patches.
■ Supplemental CD, which contains PCI card drivers, SunVTS and other utilities.

Disk Space Requirement

Netra ft 1800 release software occupies approximately 540 Mbytes of disk space.

Installation Methods

The Netra ft 1800 supports two types of installation: *local*, from a local CD-ROM drive; or *network*, from a machine set up as a Solaris installation server. The requirements for these two types of installation are described in the following subsections.

You must install the Sun StorEdge Volume Manager package when the Netra ft 1800 installation is complete in order to implement fault tolerant operation. See Chapter 6 "Installing and Configuring Sun StorEdge Volume Manager" for more details.

You should install patches after the Netra ft 1800 software installation. Recommended Solaris patches are included on the Netra ft 1800 Installation CD-ROM. Any recommended patches should be installed immediately after the reboot at the end of the installation.

The local and network installation procedures differ only in their initial steps. Otherwise, the procedure is the same for both types of installation.

Note – Inadvertent keyboard use during installation can abort installation.

Local Installation

To perform a local installation of the Netra ft 1800 software, you must have an RMM module that contains a CD-ROM drive in slot A-RMM or B-RMM of the Netra ft 1800 to be installed.

Local installation involves booting the Netra ft 1800 from one of its CD-ROM drives while an installation CD-ROM is in the drive.

Note – The CD-ROM cannot be loaded into the CD-ROM drive unless the drive is powered on. Do not attempt to load the CD-ROM unless the module's *Power* LED is lit.

Network Installation

To perform a network installation of the Netra ft 1800 software, you must ensure the following:

- Access to a SPARC server on which the Netra ft 1800 software can be installed. (A CD-ROM drive is needed for the initial server installation but need not be present for the network installation.) In the following instructions, this will simply be referred to as the *server*.
- That the Netra ft 1800 system to be installed is on the same subnet as the server. In the following instructions, this will be simply referred to as the *client*.

Before You Start

> **Caution –** Before inserting a CD-ROM disk into your system read "Handling and Taking Care of your CD-ROM Disks" in the *Netra ft 1800 Compliance and Safety Manual*. In some circumstances if your CD-ROM disk does not have a clean data surface your system may fail to boot.

1. **Establish the following:**

   ■ The system *Ethernet address* (displayed in the BOOT PROM messages at system startup, which you can display with the `banner` utility, invoked from the `ok` prompt).
   ■ The system *IP address* (see your system administrator).
   ■ The *machine name* (see your system administrator).
   ■ The *netmask* (see your system administrator).
   ■ The *name service* (for example, NIS or NIS+; see your system administrator).

2. **You need to be at the OBP `ok` prompt in order to perform the installation.**

▼ To Install the Software

This section describes the steps necessary to install a Netra ft 1800 system with the Solaris operating environment and Netra ft 1800 software.

> **Note –** It is recommended that you install Solaris on one hard disk only in order to optimize the performance of the Volume Manager.

1. **Disengage all the hard disk drive modules except the one in the location on which you wish to install the operating environment.**

   See FIGURE 2-17 on page 2-33. You do not need to remove the modules from their slots completely.

2. **If the system is powered down, power on the system.**

   See "To Power On the System" on page 55.

3. **Perform Step a for network installation or Step b for local installation.**

   a. **Set up an install server with the Netra ft 1800 CD-ROM**

      Follow the procedures outlined in Chapter 7 of the *Solaris Advanced Installation Guide* (part number 802-5740-10).

b. Insert the Netra ft 1800 CD-ROM in the drive on side A, at the top of the system, or the drive on side B at the bottom of the system.

Check that the *Power* LED is lit on the RMM that contains the CD-ROM drive.

4. Boot the system.

a. For local installation, type:

```
ok boot a-cdrom0
```

if you inserted the CD in the CD-ROM drive on side A, or

```
ok boot b-cdrom0
```

if you inserted the CD in the CD-ROM drive on side B.

b. For network installation, go to the OBP ok **prompt and type:**

```
ok boot a-net0
```

The *Target* LED on one CPUset will flash rapidly, and the *Diag* LED on the other CPUset will flash at approximately half the speed.

Wait for booting to complete. The Netra ft 1800 software installation program then starts.

5. Install the Solaris operating environment.

Refer to the Solaris 2.6 documentation for full details of installing the operating environment. The following Solaris installation documents are shipped with Netra ft 1800:

■ "Start Here" (a fold-out card) part number 805-3866-10

■ *Solaris 2.6 Hardware: 3/98*, Chapter 1, part number 805-3540-10

■ *Solaris Advanced Installation Guide*, part number 802-5740-10

In the course of Solaris installation, follow the instructions on the screen, using the following information:

a. Accept the device offered by the system as the default disk.

b. Choose Manual Layout.

You must leave two free slices for Sun StorEdge Volume Manager. The disk layout should have a maximum of five slices, plus the overlap slice, similar to the following:

TABLE 5-1   Suggested Disk Layout

Slice	Size
/	3000
swap	512 (rounds up to 513)
overlap	no change
/export	2000
/opt	2000
/var	1050

There will be some rounding differences.

You must also leave 1024 sectors, or 512K, free for Sun StorEdge Volume Manager within the total space available. This space is required for the allocation of an on-disk database to allow the disk to be encapsulated. See the *Sun StorEdge Volume Manager Release Notes* for full details.

6. **Select Manual Reboot.**

7. **After Solaris has finished booting, set the default boot device:**

```
# eeprom boot-device=a-dsk0 diag-device=a-dsk0
```

This sets the boot device to the disk in location A-DSK0. If you installed on a disk drive in a different location, replace `a-dsk0` with the location that corresponds to the default device that you set during Solaris installation.

8. **Re-engage the HDD modules which you removed before installation, and remove the CD from the drive if you installed locally.**

Eject the CD using `vold`.

9. **Reboot the system by typing:**

```
# reboot
```

A few minutes after the system has rebooted to the system prompt, the *Sync* LEDs on the CPUsets will illuminate and remain steadily lit, indicating that the system is now running in synchronization.

10. **Install the appropriate patches.**

    Refer to the Release Notes accompanying the CD.

11. **Install the required PCI drivers and, if desired, SunVTS.**

    Refer to the Release Notes accompanying the CD.

5.1 Finishing Installation

Finishing installation includes:

- Appending the path to the Netra ft 1800 CMS utilities to the `PATH` variable;
- Setting the `MANPATH` environment variable to include path to the man pages shipped with the Netra ft 1800 software.

5.1.1 Setting up Access to Netra ft 1800 CMS Utilities

To allow access to Netra ft 1800 CMS utilities, append the following path to your `PATH` variable in your shell start-up file.

For a C-shell, in your `$HOME/.cshrc` file type:

```
setenv PATH ${PATH}:/usr/platform/SUNW,Ultra-4FT/SUNWcms/sbin
```

For a Bourne or Korn shell, in your `$HOME/.profile` file type:

```
PATH=${PATH}:/usr/platform/SUNW,Ultra-4FT/SUNWcms/sbin:
export PATH
```

5.1.2 Setting the MANPATH Variable

To obtain access to the Netra ft 1800 man pages, you must assign or append `/opt/SUNWsms/mfs/lib` to the `MANPATH` environment variable.

For a C-shell, in your `$HOME/.cshrc` file type:

```
setenv MANPATH ${MANPATH}:/opt/SUNWftm
```

For a Bourne or Korn shell, in your `$HOME/.profile` file type:

```
MANPATH=${MANPATH}:/opt/SUNWftm
export MANPATH
```

Installing and Configuring
Sun StorEdge Volume Manager

This section contains guidelines for installing Sun StorEdge Volume Manager to provide fault tolerant mass storage on the Netra ft 1800 system.

The main steps involved are:

1. **Using** `pkgadd` **to load the Volume Manager packages, and install any required patches.**

2. **Configuring the Volume Manager software as described in "Setting up the Volume Manager Environment" on page 68.**

3. **Initializing the Volume Manager disk storage as described in "Initializing the Volume Manager" on page 69.**

Refer to the Sun StorEdge Volume Manager documentation for full information about installing and using the Volume Manager, and to the *Netra ft 1800 User's Guide* for information about using the `cmsconfig` utility. (You use `cmsconfig` to obtain the device name of the root disk when you add disks to your server.)

You perform all of the steps in this chapter as root.

Before You Install Sun StorEdge
Volume Manager

Sun StorEdge Volume Manager is installed on the Netra ft 1800 system in the same way as other applications.

In the following procedure, you use `cmsconfig` to obtain the `Disk` attribute of the HDD module and the `Funct_0` attribute of the CD-ROM drive (plus `Funct_1` if you have an additional drive).

To identify the device name of the root disk:

1. **Start** `cmsconfig`:

```
# /usr/platform/SUNW,Ultra-4FT/SUNWcms/sbin/cmsconfig
```

2. **Locate the HDD modules in the list.**

You can press `p` to page down to see second and subsequent pages.

3. **For each HDD module in the list:**

   a. **Enter the number next to the module.**

   The attributes of the module are displayed.

   b. **Note the** `Disk` **attribute of the module.**

   This is a normal Solaris device name.

   c. **Press** `q` **to return to the list of modules**

4. **For each RMM module in the list:**

   a. **Enter the number next to the module.**

   The attributes of the module are displayed.

   b. **Note the** `Funct_0` **attribute of the module.**

   This is the device name of the CD-ROM drive. It is a normal Solaris device name.

   If there is a second CD-ROM drive in the module, note the `Funct_1` attribute. This is the device name of the second CD-ROM drive. It is a normal Solaris device name.

   c. **Press** `q` **twice to exit** `cmsconfig`**.**

You will need this information when you initialize the Volume Manager. It can be useful for other purposes, so you may wish to keep it.

You should install the Volume Manager after the Netra ft 1800 software and any required patches, and before other applications. You should also configure the Volume Manager volumes before you install other applications.

Before you install Sun StorEdge Volume Manager, copy the file `/etc/vfstab` to `/etc/vfstab.prevm`. This standard practice helps Sun support engineers to recover a system in the very rare event of serious system failure.

> ⚠ **Caution –** Failures during the Sun StorEdge Volume Manager boot disk encapsulation process could result in loss of data on the root file system.

> ⚠ **Caution –** Encapsulation of the boot disk will require that the installed system is shutdown and rebooted several times.

Installing the Volume Manager Software

This section describes the special requirements when you install the Volume Manager on the Netra ft 1800. You must install Sun StorEdge Volume Manager and patches specified in the Release Notes.

See the *Sun StorEdge Volume Manager Installation Guide* for full details of the Volume Manager installation.

Mounting the CD-ROM Manually

If the Solaris daemon `vold` is running (the default situation), you can simply refer to the path to the CD-ROM, `/cdrom/cdrom0/netra_ft1800`. If, for some reason, `vold` is not running, mount the CD-ROM with the command:

```
# mount -F hsfs -r /dev/dsk/drive_id /cdrom
```

Replace *drive_id* with the correct value for the CD-ROM drive on your system.

Running the Installation

Follow the instructions in the *Sun StorEdge Volume Manager Installation Guide* and any instructions in the Sun StorEdge Volume Manager and Netra ft 1800 Release Notes to run the installation.

You use `pkgadd` to load the standard set of packages for Sun StorEdge Volume Manager. You must also follow any instructions in the Release Notes to obtain and install Volume Manager patches required for the Netra ft 1800.

Setting up the Volume Manager Environment

When you have loaded the Volume Manager software, and before you run
`vxinstall` to initialize it, you must configure the software to run as required on the
Netra ft 1800. This involves the following:

- Setting default volume creation to mirror disks by default when they are created
- Configuring the Volume Manager to deal with stale boot disks
- Configuring the Volume Manager's recovery behavior when a physical disk fails
- Enabling boot disk detection

Setting Default Volume Creation

Note – Disk mirroring in Volume Manager provides the fault tolerance for the disk
storage of the Netra ft 1800. This step is essential to ensure that all disks are
mirrored.

To mirror disks by default when they are created, enter the following:

```
$ echo "mirror=yes" > /etc/default/vxassist
```

Note – If the `vxassist` file already exists, resolve any differences between the
contents of the file and the line `mirror=yes`. The resulting file must contain the line
`mirror=yes`.

The preceding command creates the `/etc/default/vxassist` file with the
required line in it. This sets the tunable parameters used by the Volume Manager
`vxva` GUI. (These parameters can be overriden via the command line.) See the
Sun StorEdge Volume Manager documentation for full details.

Dealing with Stale Boot Disks

To prevent the system from stopping when it encounters a stale boot plex during the
boot sequence, enter the following:

```
# mkdir -p /etc/vx/sbin
# echo '/sbin/uadmin 2 1 "stale"' > /etc/vx/sbin/vxaltstale
# chmod +x /etc/vx/sbin/vxaltstale
```

These commands create a startup script that enables the Volume Manager to exit back to the OBP upon encountering a stale boot plex, allowing the Volume Manager to try alternative boot disks.

Enabling Recovery Behavior and Boot Disk Detection

To enable correct recovery behavior and boot disk detection, make the following changes to the startup file `/etc/rc2.d/S95vxvm-recover`:

```
# vxrelocd root & commenting out this line enables correct recovery behavior
# start the boot disk utility the following line enables boot disk detection
/usr/platform/SUNW,Ultra-4FT/SUNWcms/lib/vxbootcheck &
```

Make the edits exactly as shown, commenting out the `vxrelocd` line and with the complete path to `vxbootcheck`. Be sure to append an ampersand to the `vxbootcheck` line.

The default behavior of Sun StorEdge Volume Manager when a physical disk fails is not compatible with the hot-plug of HDD modules on the Netra ft 1800. By default, when the Volume Manager detects I/O failure on mirrored volumes, it restores redundancy by relocating the objects to spare disks. This is called *hot relocation*. You need to disable this default behavior. By commenting out the `vxrelocd` line, as shown above, you prevent hot relocation.

You must repeat all these modifications after system upgrades.

Initializing the Volume Manager

When you have loaded the Sun StorEdge Volume Manager, run `vxinstall` as described in the *Sun StorEdge Volume Manager Installation Guide*. This section describes the special actions you must take to initialize the Volume Manager for the Netra ft 1800.

Note – Volume Manager mirroring provides the fault tolerance for disk storage on the Netra ft 1800. This is provided by default when you add a disk to the Volume Manager provided you have added the required line to `/etc/default/vxassist` as described in "Setting Default Volume Creation" on page 68.

Setting up Boot Disks

You must encapsulate the boot disk for Sun StorEdge Volume Manager to be able to mirror it. You are strongly recommended to do the following to ensure that the boot disk is configured for the Netra ft 1800:

- Assuming that A-DSK0 is the Solaris install disk, you should have entered the command shown below at the end of the Solaris installation. See eeprom (1) for details on using eeprom command to change the boot device.

```
# eeprom boot-device=a-dsk0 diag-device=a-dsk0
```

- Encapsulate the boot disk when the vxinstall process asks whether you want to do so.
- To mirror this root disk, add another disk, for example, b-dsk0, as a new disk.

  See the *Sun StorEdge Volume Manager Installation Guide* for details of how to do this during the vxinstall process.

The vxinstall process proposes the rootdg disk group by default. Accept this to add the boot disk and disks intended to mirror the boot disk to this group.

When the vxinstall process is complete, use the vxdiskadm utility to make the new disk a mirror of the boot disk, for example, make b-dsk0 a mirror of a-dsk0.

To start vxdiskadm:

```
# vxdiskadm
```

Select option 6, Mirror volumes on a disk.

See the *Sun StorEdge Volume Manager System Administrator's Guide* for full details of using vxdiskadm.

Note – To assist recovery of data in the event of disk failure, use the boot disk only for data required to boot the system. Do not add user-data disks to the rootdg group.

Setting up Other Disks

Use vxdiskadm to add disks other than the boot disks to the system as new Volume Manager disks after the vxinstall process is complete. Select option 1, Add or initialize disks.

See the *Sun StorEdge Volume Manager System Administrator's Guide* for full details of using vxdiskadm.

See the *Netra ft 1800 User's Guide* for details of adding disks that are not already in the system.

Note – You should plan to store all non-boot data on disks in groups other than rootdg.

▼ To Add a New Disk

1. **Use the** cmsconfig **utility to check that the disk is enabled.**

   The disk must be physically present and enabled.

2. **Check that the disk is known to the Volume Manager:**

   ```
   # vxdisk list
   ```

3. **Add the disk to a disk group.**

   See the *Sun StorEdge Volume Manager User's Guide* for details of creating and adding disks to disk groups.

   Create new disk groups for user data with names other than rootdg.

Note – If the new disk is not visible to the Volume Manager, enter the command: vxdctl enable

---

Configuring Storage

Once a disk belongs to a disk group, you can allocate storage using any of the methods described in the *Sun StorEdge Volume Manager User's Guide* or the *Sun StorEdge Volume Manager System Administrator's Guide.*

Boot Disk Aliases

Sun StorEdge Volume Manager boot disk aliases are not automatically updated when a disk is physically relocated. You must update boot aliases manually using the `eeprom` command when you relocate an HDD module.

You might prefer to use the aliases defined by the PROM, for example, `a-dsk1`. These aliases, however, reflect the location of disks, rather than the specific virtual disk. See the *OpenBoot 3.x Command Reference Manual* (Part Number 802-5837-10) for details.

Note – Be sure that the EEPROM variable `use-nvramrc` is set to `true`. Use of the NVRAM startup file (`NVRAMRC`) is required for correct operation of the Volume Manager software.

Note – There is a limit to the number of characters that can be stored in the `NVRAMRC`. Therefore, there is a limit on the number of boot disk aliases that can be recorded in it.

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