Acme Packet 4600

Hardware Installation and Maintenance Guide

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About This Guide

Overview

The Acme Packet 4600 System is a high performance, high capacity session border controller that optimally delivers interactive communications — voice, video, and multimedia sessions — across wireline, wireless, and cable IP network borders. With its compact single unit 1U design the Acme Packet 4600 System provides exceptional functionality in a tightly integrated system. This chapter provides an introduction and overview of the main components of the Acme Packet 4600 System.

The Acme Packet 4600 System Hardware Installation Guide describes:

- Component overview
- Graphic display and its usage
- System installation
- Startup
- Maintenance
- Safety
- Glossary

Audience

This guide is written for network administrators, telecommunications equipment installers and technicians. It provides information related to the hardware components, features, installation, start-up, and operation of the Acme Packet 4600 System. Only experienced and authorized personnel should perform installation, configuration, and maintenance tasks.

Revision History

This section contains a revision history for this document.

Date	Description
October 2014	Initial Release
January 2015	Renamed the document Acme Packet 4600 Installation and Maintenance Guide.
	Removed Regulatory Specifications and Certifications from Chapter 7- Specifications.
	Inserted reference to Acme Packet Platforms Safety and Compliance Guide.
	Removed section of the Maintenance Chapter on removing and installing SODIMMs.
March 2015	Added a section on the installation of transceivers on the signalling and media ports,
	Corrected ambiguities concerning the speeds of the signalling and media ports.
April 2015	Entered notes pointing out that after you initially install the Acme Packet 4600 or replace the Solid State Drive (SSD), you must format the drive.
	Inserted caveats to confirm that Acme Packet 6300 hardware installation documentation satisfies NEBS (Network Equipment-Building System) requirements.
July 2020	Updated NIU Removal and Installation sections to clarify procedures.
December 2020	Adds note about multiple sensors reporting alarms with the same Alarm ID.
January 2025	Adds Critical Setup Steps for Acme Packet Platforms with DSPs topic to Startup chatper.

1
Safety

This chapter provides an overview of the recommended safety precautions for installing the Acme Packet 4600 System.

Before you install your Acme Packet 4600 System, Oracle recommends that you review the contents of this chapter and the Installation chapter. Both chapters provide information intended to protect you and your Acme Packet 4600 System from experiencing any harm during the installation process. These chapters also provide information that helps to keep your Acme Packet 4600 System functioning properly and prevent damage.

Environmental, Safety, and Regulatory Certifications

For information regarding safety and regulatory certifications applicable to the Acme Packet 4600, refer to the Acme Packet Platforms Safety and Compliance Guide.

General Safety Precautions

To ensure general safety, follow the safety precautions listed in this section.

Fan Module

To avoid overheating the system, do not block the air inlets or the fan module, or otherwise obstruct airflow to the system. Keep the area around the Acme Packet 4600 System clean and clutter-free.

System Maintenance

Aside from the fan module, power supply, air filter and NIUs, there are no user-serviceable parts inside the Acme Packet 4600 System chassis. Only professionals trained to maintain, adjust, or repair the Acme Packet 4600 System may provide these services.

Fiber Optic Cable

Looking into a fiber optic cable can cause eye damage. Never look directly into the end of the fiber optic cables. Instead, use a fiber optic power meter to determine if power is present.

Environmental Specifications

Adhere to the stated environmental specifications for the Acme Packet 4600.

Using This Guide

Read and understand all notes of warning and caution included in the Acme Packet 4600 System documentation. These warnings and cautions are designed to keep you safe and protect the Acme Packet 4600 System from damage.

Precautions

To protect yourself from harm and the Acme Packet 4600 System from damage, follow these electrical safety precautions:

Precautions

- Note the locations of the System Power switch on the Acme Packet 4600 and the location of the emergency power-off switch for the room where the Acme Packet 4600 is located.

- If an electrical accident occurs, remove power from the system immediately by unplugging the chassis.

- Always disconnect the power from the system when removing a Acme Packet 4600 System from its rack.

- When disconnecting power:
    - Turn the System Power switch to the Stby position.
    - Disconnect the circuit breaker at the rack.
    - Unplug or unscrew the power cords from the power supplies.

- Use grounded AC power cords that are plugged into grounded electrical outlets.

- Never use extension cords to power a Acme Packet 4600.

- Ensure that the installation facilities have proper grounding systems and include a grounded rack structure or local grounding bus bar.

- When installing the Acme Packet 4600 System in an equipment rack, always make the ground connection first and disconnect it last when removing it.

- Use shielded Category 5e or 6, RJ45 cables for all 10/100/1000 Ethernet connections to protect the Acme Packet 4600 System from potential damage.

- To avoid making a complete circuit (which causes electrical shock), use only one hand when working with powered-on electrical equipment.

- Use caution when using electrically conductive tools around the Acme Packet 4600 System.

- Remove jewelry before working on the Acme Packet 4600 System.

Battery Warning

There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Perchlorate Material — Special handling may apply. See http://www.dtsc.ca.gov/hazardouswaste/perchlorate.

ESD Safety

To protect the Acme Packet 4600 System's delicate electronic components from damage from static electricity, always follow the appropriate ESD procedures and wear the proper protective devices (such as an ESD wrist strap) when handling any and all Acme Packet 4600 System hardware and while performing any Acme Packet 4600 System hardware procedures.

Precautions

To protect your equipment from ESD, follow these ESD safety precautions:

- Ensure that the Acme Packet 4600 System is properly grounded.

- If you are grounding your Acme Packet 4600 System to an electrically conductive, grounded rack, check to see whether or not the rack is painted. Paint can hinder proper grounding. If your equipment rack is painted, you should ground the system to some other reliable place or remove a small portion of paint for proper grounding.

- Use a grounded ESD wrist strap when working on the Acme Packet 4600 System to prevent static discharge.

- To avoid damaging ESD-sensitive hardware, discharge all static electricity from your body before working directly with the Acme Packet 4600 System chassis by touching a grounded object.

2

Component Overview

Chassis

The Acme Packet 4600 System is contained in a 1U rack-mounted chassis. It can be front- or center mounted in standard 19" wide racks (up to 28" deep), with options for 23" wide racks.
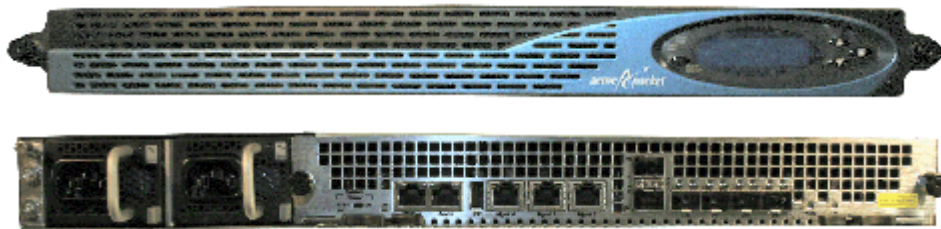
Mounting Hardware

The Acme Packet 4600 System is supported by a pair of cabinet slides that are affixed to an equipment rack by front and rear mounting flanges. The cabinet slides are adjustable for equipment racks of various depths.

Equipment Rack Installation Hardware

For equipment rack installations, the system chassis is outfitted with left and right chassis-mounted slide rails. One rail is secured to each side of the chassis, that slides into another rail that is attached to the inner posts on both sides of the equipment rack. This two-piece mounting system simplifies chassis installation and removal.

When installing the chassis, the user can easily slide the chassis along the slide rails until a locking clip on each chassis-mounted rail locks the chassis into the slide rails. Pressing this clip will then allow the chassis to be fully installed into the equipment rack. Once inserted into the equipment rack, the Acme Packet 4600 is secured in place with two captive thumbscrews.

The locking clip is also a safety mechanism for removing the chassis from the equipment rack. When removing the chassis, the locking clip engages to prevent the chassis from being overextended and requiring the user to unlock the clip to intentionally remove the chassis.

Locking Clip

- The slide rails that are bolted to either side of the chassis or equipment rack are reversible and can be used on either side of the Acme Packet 4600.

- Once the slide rails are installed on the chassis and on the equipment rack, the chassis can be installed in the rack by inserting the chassis slide rails into the tracks of the slide rails already mounted on the equipment rack. When the locking clip pin on the chassis slide rail meets the hole in the rack slide rail, the rails lock together. Push the locking clip pin in to continue to slide the chassis into the rack rails.
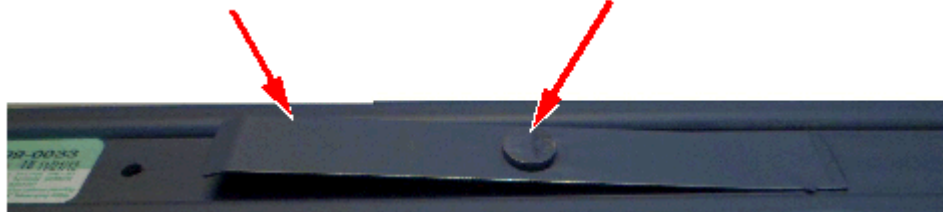
Once the chassis has been fully inserted into the rack, turning the captive thumbscrews clockwise will lock the chassis securely into the rack.
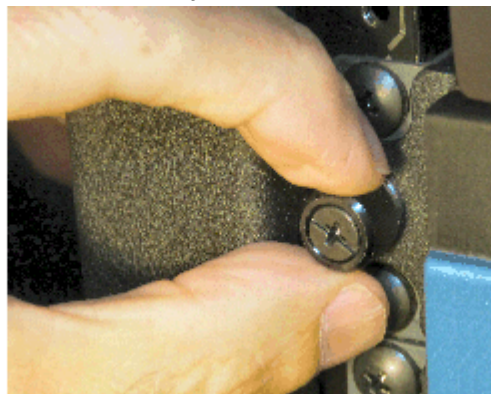
System Processor

Processor Module (CPU)

The Acme Packet 4600 processor module (CPU) is located on the main board of the Acme Packet 4600. This processor module handles both the management and signal processing within the system. The CPU interacts with the Network Processor (NP) to perform call and media control.

System Control Panels

This section describes the front and rear control panels of the Acme Packet 4600.

Front Control Panel

The Acme Packet 4600 front control panel provides easy access to several system components. You can access the graphic display, navigation buttons, reset button, alarm LED, alarm silence button, console port, and USB port. The following is a close up of the front control panel.
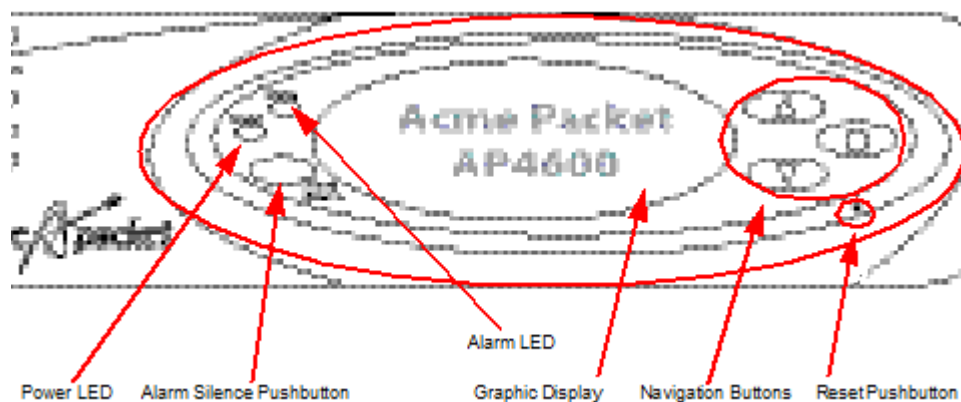
Reset Pushbutton

Pressing the front panel reset pushbutton will perform a hard reset of the Acme Packet 4600, immediately rebooting the Acme Packet 4600. After the reset button is released, the Acme Packet 4600 begins its boot sequence and loads the configured software file.

The Acme Packet 4600 reset pushbutton button is recessed and can only be pressed by inserting a thin wire (such as a paper clip) through the reset button channel. Accidentally pressing the reset button can result in the loss of software data or your configuration.

Alarm LED

The alarm LED on the front control panel indicates when alarms are active on the Acme Packet 4600. The LED can be in any of thee states that each indicate the severity of the alarms:

- Unlit — indicates the system is fully functional without any faults.

- Amber — indicates that a major alarm has been generated.

- Red — indicates that a critical alarm has been generated.

Alarm Silence Button

The alarm silence button clears the alarm table internally and opens the alarm circuits connected to the network interface unit's alarm port.

Graphic Display

The graphic display is a four-line VFD display window on the Acme Packet 4600 front control panel that reports real-time status, alarms, and general system information.

Navigation Buttons

Use the navigation buttons to navigate through the menus and information visible on the graphic display.

Intake Fans

Five individual intake fans keep the Acme Packet 4600 cool by blowing air through the front panel and exhausting heated air through the rear of the chassis. The intake fans are hot-pluggable and are covered by a particle filter that prevents excess dust and contaminants from entering the system. The particle filter is attached to the rear of the front bezel.
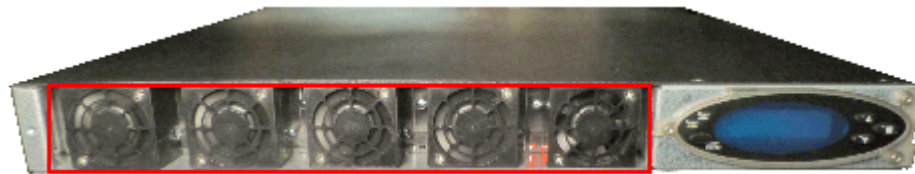
Rear Panel

Power supplies and the network interface unit are located on the rear chassis panel. Rear panel components are described in subsequent sections of this chapter.

Network Interface Unit

The single, hot-pluggable network interface unit (NIU) contains all of the Acme Packet 4600 media and management interfaces. The NIU is located on the Acme Packet 4600 rear panel. The Signaling, Media and Network Management interfaces are located on the front panel of
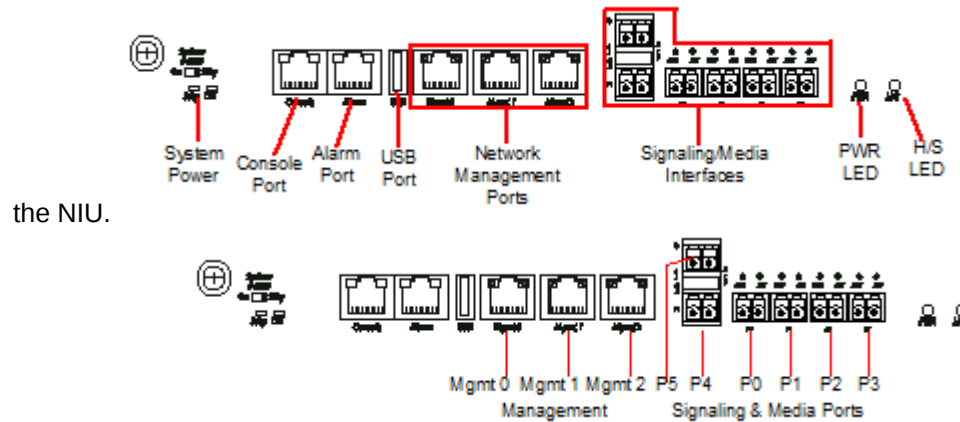
the NIU.

Without powering down the hot-swappable Acme Packet 4600 you can exchange an NIU by removing and replacing it. Upon removal of the NIU, the Acme Packet 4600 enters an Out-of-Service state. After you reinsert the NIU and connect to the ACLI, you must reboot the system to return to service. This causes a soft reboot rather than a system power cycle.

Each of the NIU front panel components are described in the following subsections.

System Power Switch - ON/STBY

The System Power switch enables you to control the power to the Acme Packet 4600. This is useful when it is desirable to shut off power to the Acme Packet 4600 without having to unplug the power cord. The Acme Packet 4600 has no other power switches. The System Power switch, located on the front panel of the NIU, has the following switch settings:

- STBY — when selected, the Acme Packet 4600 powers down. While the system is in standby mode, the power supply remains active, and the fans inside of the power supply run as necessary. The fans in the front of the chassis do not run. This convenient feature enables the system to be shut down without having to withdraw the power supply or disconnect the power supply cord.

- Standby mode (STBY) is not the same as standby state. Standby state refers to the system state of a Acme Packet 4600 that is part of a high availability pair (HA pair).

- ON — applies power to the Acme Packet 4600. This switch position is used during normal operation.

> ✏ **Note:**
>
> The System Power switch should remain in the ON position at all times. Do not touch a System Power switch unless specifically instructed to do so by your customer support representative or you are following instructions in this guide.

Two LEDs are present under the System Power switch:

- STBY — This LED is enabled when the system is in standby power mode. The LED is inactive when the system is powered up and running.

- DIS — This LED is enabled when the console serial port is disabled via software. The LED is inactive when the serial console port is enabled.
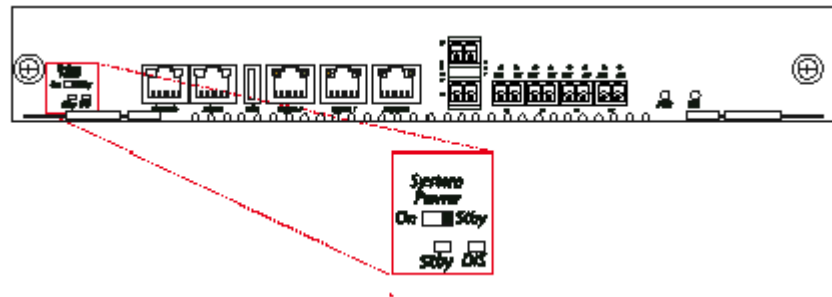
Console Port

The console port on the NIU provides console access to the Acme Packet 4600 System over an RS-232C serial connection. The Acme Packet 4600 System supports only one active serial console connection at a time. The rear console port is useful for customers who want permanent console access.
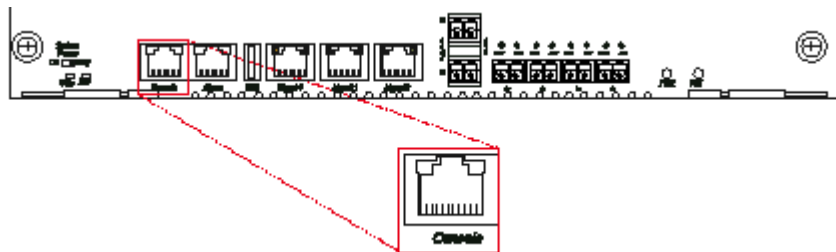
Console port communication is used for administration and maintenance purposes from a central office (CO) location. Tasks conducted over a console port include:

- Creating the initial connection to the Acme Packet 4600 System

- Accessing and using all functionality available via the ACLI

- Performing in-lab system maintenance

Console Port Pin-out

The Acme Packet 4600 console port features one RJ45 jack on the system console. Because the Acme Packet 4600 does not employ any type of flow control on its RS-232 ports, only the RX, TX, and GND pins are used. The following table identifies the pin assignments and signal names/descriptions for the console connector.

Table 2-1   Console Port Pin-Out

Pin Number	Signal Name/Description
3	Receive Data (RX)
4	Ground (GND)
6	Transmit Data (TX)

Console Adapter

A standard RJ45 to DB-9 serial console adapter is shipped with the Acme Packet 4600. This adapter converts the RJ45 plug on the twisted pair cable to a standard DB-9 serial port jack, found on a PC or laptop. Any standard twisted pair cable can be used between the Acme

Packet 4600 and the console adapter.

PWR LED

The green PWR LED indicates the operational state of the NIU.

Possible states of the PWR LED include:

- on — indicates that power is being applied to the NIU.
- off — indicates that power is not being applied to the NIU.

H/S LED

The blue H/S LED indicates whether the NIU is seated properly.

Possible states of the H/S LED include:

- on/blinking — indicates that the NIU is not seated properly. When this occurs, ensure that you remove power to the platform and attempt to properly lock the NIU to the chassis. Then apply power to the chassis. If the H/S LED is no longer lit, proceed with normal operations.
- off — when the PWR LED is on, this indicates that the NIU is seated properly in the chassis.

Alarm Port

The alarm port on the NIU is a flexible interface that closes a circuit when a specific alarm level becomes active on the Acme Packet 4600. The Acme Packet 4600 features an alarm control signal interface that can be used in a CO location to indicate when internal alarms are generated. The Acme Packet 4600 uses alarm levels that correspond to three levels of service-disrupting incidents. When any of the three alarm levels is generated, the corresponding circuit for that level on the alarm port is closed. The alarm port uses a standard

RJ45 connector.
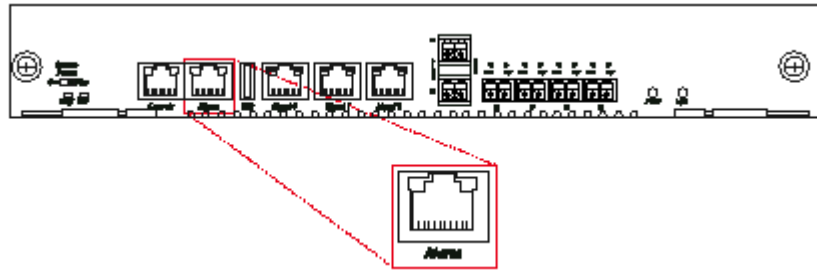
Alarm Levels

There are three alarm types that each indicate various severity levels.

Alarm Type	Description
Minor	Functionality has been impaired to a small degree (e.g., a single fan has failed)
Major	Pending failures or unexpected events (e.g., a loss of signal)
Critical	Catastrophic condition has occurred (e.g., the system is overheating)

Alarm Port Pin-out

The alarm port has pins for ground as well as each alarm level (minor, major and critical).

Pin Number	Signal Name/Description
1	Minor Alarm (Pin 1)
2	Minor Alarm (Pin 2)
3	Major Alarm (Pin 1)
4	Major Alarm (Pin 2)
5	Critical Alarm (Pin 1)
6	Critical Alarm (Pin 2)
7	Ground
8	Ground

USB Port

The USB port, located on the Acme Packet 4600 front panel, is reserved for software-enabled
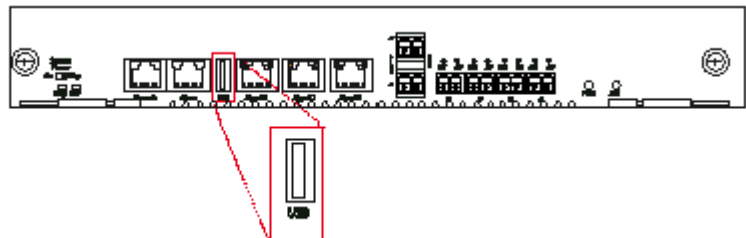
applications.

Network Management Ports

The Acme Packet 4600 has three network management ports located on the left side of the chassis, labeled Mgmt 0 Mgmt 1 Mgmt 2. These 10/100/1000 Base-T Ethernet ports are used for EMS control, RADIUS accounting, CLI management, SNMP queries and traps, and other management functions.
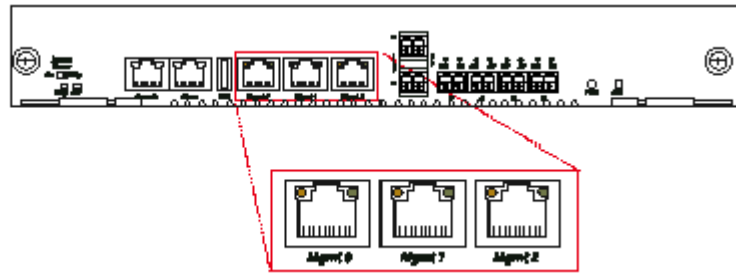
Ethernet LED

Each network management Ethernet port has two integrated LEDs: one LED indicates Link, and the other indicates Activity. The LED pair is located directly above its associated port.
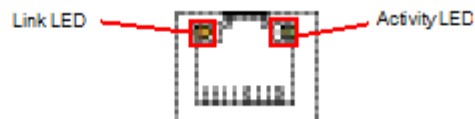
Link LED

The link LED is located to the top left side of the network management Ethernet port. This LED illuminates yellow when a link has been established between the link partner device and the Acme Packet 4600.

Activity LED

The activity LED is located at the top right side of the network management Ethernet port. The activity LED illuminates green when an Ethernet connection has either transmit or receive packet activity.

Upon initial bootup of the Acme Packet 4600, the network management Ethernet ports are not configured. You must first connect to the Acme Packet 4600 over a serial connection before you can configure the management Ethernet ports for use. Set up the management interfaces using the physical and network interface configuration elements. Refer to the System Configuration chapter of the Acme Packet Configuration Guide for details.

Once the network management interface is configured, it should be reserved for the following uses:

- Maintenance activities
- Application log retrieval
- Software upgrades
- System configuration
- Telnet, SSH, SNMP and SFTP connections
- RADIUS CDR transmission

Oracle recommends that you use shielded CAT5e or CAT6 Ethernet cables with RJ45 plugs for connecting to the rear-panel Acme Packet 4600 Ethernet interfaces. These Ethernet interfaces have a distance limitation of 328 feet (100 m), as defined by the FAST Ethernet standard, IEEE 802.3.

Signaling and Media Interfaces

The signaling and media interfaces provide network connectivity for signaling and media traffic. The 4600 has 4 SFP ports (P0-P3) which operate at 1 Gb speed and 2 SFP+ ports (P4-P5) which operate at 10GbE speed. Either may be used.

The optical 10GbE ports can accept an LC fiber connector using either single mode or multimode cable.
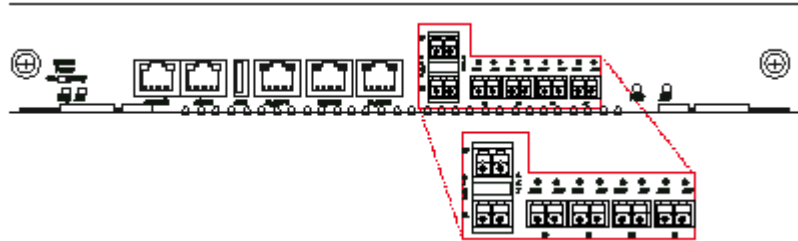
SFP/SFP+ Transceivers

This section describes the small form factor transceivers used for the signaling and media interfaces.

SFP/SFP+ Information

Only transceivers qualified by Oracle can be used in the Acme Packet 4600. Mixed transceiver types are unsupported. Both transceiver locations must be populated with the same SFP or SFP+ type based on compliance testing. The transceivers are inserted into the NIU.

The following SFP/SFP+ transceiver types are used:

- Multi Mode (SX)
- Single Mode (LX)

SFP/SFP+ Identification

The multi mode SFP+ transceiver for the Acme Packet 4600 features a silver clasp latch. The label on the back of this SFP+ reads 850nm LASER PROD. This transceiver features a silver

bale clasp latch.

Media Cables

2-11
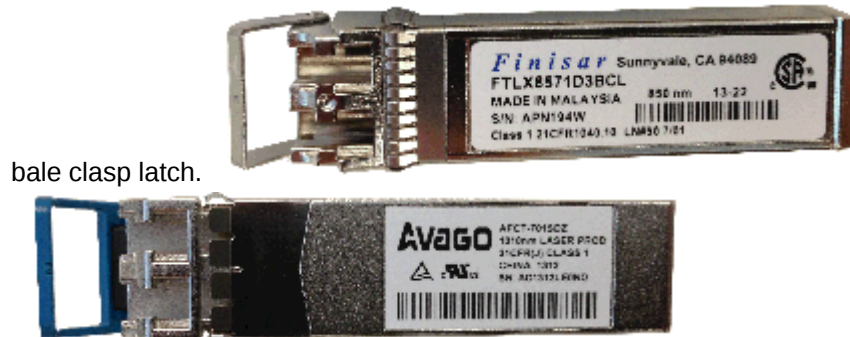
This section describes the media signaling interface, fiber optic and copper cables used on the Acme Packet 4600 network interface module. Each transceiver type — multi mode, and single mode — take a different fiber optic cable. You must use the proper fiber optic cable for each transceiver. The fiber optic cables only ship from Oracle if you order them.

Cable Information

Three different fiber optic cables used on the Acme Packet 4600 media cards include:

• Multi-mode transceivers — use an orange fiber optic cable.

• Single-mode transceivers — use a yellow fiber optic cable.

• Copper transceiver — use a Cat 5 or 6 ethernet cable.

Cable Identification

A Multi Mode SX transceiver uses an orange colored fiber optic cable.

A Single Mode LX transceiver uses yellow colored fiber optic cable.

A copper transceiver uses Category 5 or 6 Ethernet cable.

Power Components

Oracle offers AC or DC power options for the Acme Packet 4600. The power supplies are user-replaceable, hot swappable components. When servicing your power components, make sure to read the *Acme Packet 4600 Service Manual* .

Each power supply is accessed from the rear panel of the Acme Packet 4600. The power supply located at right is designated as power supply A while the power supply located at left is designated as power supply B.
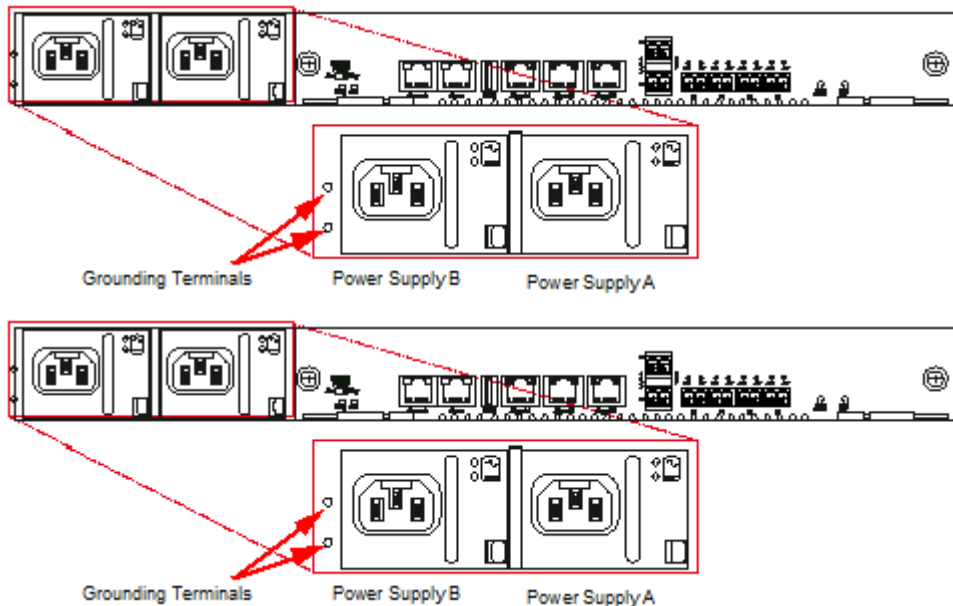
Power Supply Redundance

During normal operation, the Acme Packet 4600 is load-balanced and draws power from both supplies. The two power supplies also provide hardware redundancy. If a power supply fails, the Acme Packet 4600 can rely on only one functional power supply to sustain normal operation. A malfunctioning power supply must be removed and replaced as soon as possible. If the Acme Packet 4600 starts up with only one power supply, it will not generate an alarm.

AC Power

The auto-sensing AC power supply is rated at 110-240 VAC, 50-60 Hz, and is supplied with an IEC connector. The handle on the front panel of the power supply is used to remove the power supply from the chassis. The gray locking handle, when moved from right to left, unlocks the power supply from the chassis when removing the power supply.

AC Power Cords

All AC-powered systems ship with two 2.5m power cords. Each power cord connects to the IEC-320 C14 receptacle on the power supply.

DC Power

The Acme Packet 4600 can be powered by central office –48 VDC operations with a DC-DC supply. The handle on the front panel of the power supply is used to remove the power supply from the chassis. The gray locking handle, when moved from right to left, unlocks the power supply from the chassis when removing the power supply A terminal block on the DC power supply serves as the DC power interconnect.
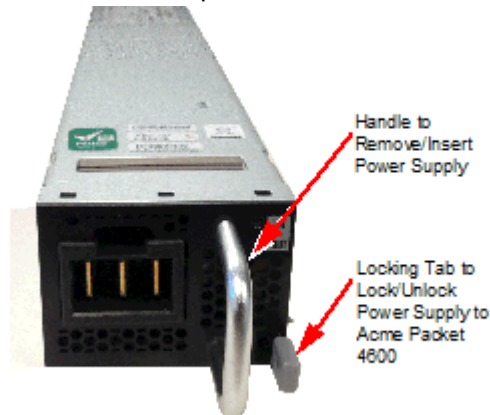
DC Power Cords

A DC power cord with mating connectors ships with each DC power supply.

Wire Color	Lead Designation (DC Power Supply)	Alternate Lead Designation (DC Power Supply)
Red	RTN	-48 VDC

Wire Color	Lead Designation (DC Power Supply)	Alternate Lead Designation (DC Power Supply)
Green/Yellow	GND	GND
Black	-48 V	RTN

Grounding Terminals

The grounding terminals are used to attach the Acme Packet 4600 chassis to a local earth ground. The terminals are located to the left of Power Supply B on the rear of the Acme Packet 4600. The Acme Packet 4600 is shipped with a lug and mounting nuts attached to the chassis along with a pre-made ground cable. A loose lug is included with the shipment so that the user has the potential to crimp the lug to a custom cable if desired.

Cooling Components

The Acme Packet 4600 System must remain well ventilated for reliable and continuous operation. The cooling features of the chassis include:

- Fan module

- Fan Filter

When servicing your cooling components, make sure to read the *Acme Packet 4600 Service Manual* .

Fans

The Acme Packet 4600 chassis pulls cool ambient air into the chassis through five front-installed intake fans and exhausts heated air through perforated air outlets located along the rear of the chassis. To avoid overheating the system, do not block the air intake or exhaust or otherwise obstruct airflow to the system in any way.

Each individual fan attaches to the chassis with two captive screws, and is powered by a connector that joins the fan to the motherboard when screwed into the chassis.
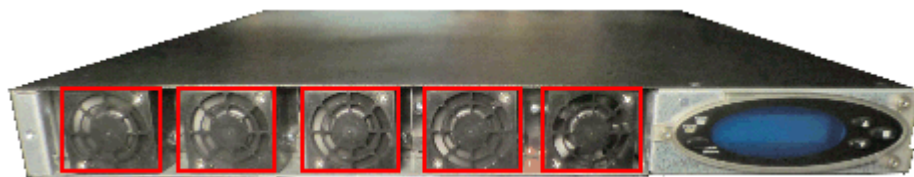
The Acme Packet 4600 automatically adjusts the fan speed based on the current operational status and environmental conditions. Fan speed regulation is an automated process that requires no user intervention. You can monitor the status of the fan speed from the Environment menu of the graphic display.

Each fan is a user-replaceable, hot-swappable component. If the Acme Packet 4600 experiences a fan malfunction and generates an alarm, you must remove the existing fan and replace it with a fully functioning fan.

Air Filter

The Acme Packet 4600 foam air filter removes airborne particles before they are drawn into the system chassis. The air filter, which is located behind the front bezel that attaches to the front of the Acme Packet 4600, can be easily removed for maintenance. The air filter is a field

replaceable unit that should be replaced once every three months.
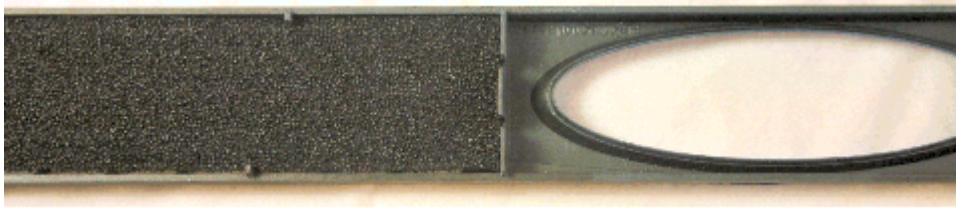
3

Graphic Display

The four-line graphic display located on the Acme Packet 4600 front control panel is visible at all times. The buttons used to navigate the display are accessible as well. The graphic display reports real-time status, alarms, and general system information. You can view this information without using a console, Telnet, or SSH connection into the Acme Packet 4600.

Graphic Display Navigation

Three navigation buttons are located to the right of the display. These are used to scroll through display menus and select the information to view on the graphic display.
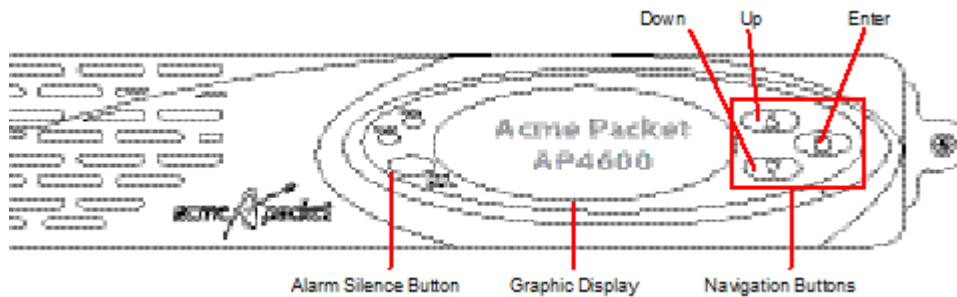
Each graphic display button has a special purpose.

Button	Description
Up	Scrolls up through the previous menu or display items, one line at a time.
Down	Scrolls down through the next menu or display items, one line at a time.
Enter	Selects the menu or display item that appears in the graphic display window.

Display Modes

The Acme Packet 4600 graphic display defaults to one of two display modes:

- Base display is the default and indicates a properly-functioning Acme Packet 4600.

- Alarm mode becomes the default display mode when any alarms are active on the Acme Packet 4600. Active fault information is continuously displayed on the graphic display.

Base Display

The base display shows the type of Acme Packet 4600 running. This information appears when the system first starts up and when the graphic display times out at any menu level.

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The base display of a Acme Packet 4600 in an HA node includes additional information applicable to its HA state.

Alarm Display

The alarm display replaces the base display during an alarm condition. The alarm display informs you of what symptoms are currently causing alarms. The number and type of alarms appear on the Acme Packet 4600 graphic display, which indicates either a link alarm or a hardware alarm. For example, if there are two link alarms present on the Acme Packet 4600, the display appears like this:

2 LINK ALARMS

If the graphic display indicates an alarm condition, you can use the ACLI *display-alarms* command to display the details of the alarm. When an alarm condition is cleared, the base display replaces the alarm display. To clear an alarm, you must execute the ACLI *clear-alarm* command or resolve the cause of the alarm.

Graphic Display Menus

The Acme Packet 4600 System graphic display lets you access the five display menus for quick access to the system's current status.

Top Menu

The top menu provides top-level access to information in distinct categories of system functionality. To access the top menu from the base display or alarm display:

1. Press the **Enter** button. The first entry in the top menu appears.

2. Press the **Up** and **Down** buttons to scroll through the top menu categories. The top menu rolls over when you reach the top or bottom of the menu. The top menu displays only one category at a time. Press the **Enter** button to select a displayed category and show its submenu information.

After 30 seconds of displaying a menu option or submenu information without any user input, the system automatically returns to the base display during normal operating conditions or to the alarm display during an alarm condition.
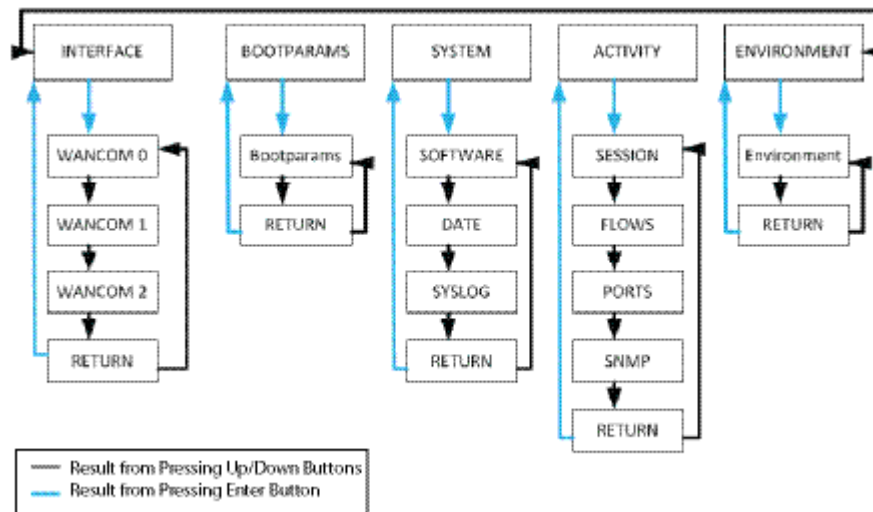
Interface Menu

The INTERFACE menu allows you to scroll through a list of all configured physical interfaces, including the management and media physical interfaces and the loopback interface.

The following information is displayed for each configured interface to which you scroll:

- Interface slot and port: interface status

- Input packets, output packets

- Input error packets, output error packets: Slot 1: Port0 UP PKT IN: 1,001K OUT: 223K ERR IN: 0 OUT: 0

To use the INTERFACE menu in the graphic display:

1. From the top menu of the graphic display, press the **Enter** button.

2. Press the **Up** or **Down** button to scroll to the INTERFACE selection.

3. Press the **Enter** button.

4. Press the **Up** or **Down** button to scroll through the list of configured physical interfaces.

5. Press the **Enter** button to refresh the display.

6. Press the **Up** or **Down** button to scroll to the RETURN selection.

7. Press the **Enter** button to return to the Top Menu.

BOOT PARAMS Menu

The BOOT PARAMS menu allows you to view the same information configured in the *bootparam* ACLI configuration. The BOOT PARAMS selection displays the IP information necessary to connect to the Mgmt 0 Ethernet interface, located on the rear of the Acme Packet 4600. This interface is used primarily for maintenance, configuration, and downloading software images.

The following information for Mgmt 0 is displayed under the BOOT PARAMS menu:

- IP address

- Netmask in hexadecimal format

- Gateway IP address

  - inet: 192.168.0.2

  - mask: ffff0000

  - gw: 192.168.0.1

To use the BOOT PARAMS menu in the graphic display:

1. From the top menu of the graphic display, press the **Enter** button..

2. Press the **Up** or **Down** button to scroll to the BOOT PARAMS selection.

3. Press the **Enter** button. The BOOT PARAMS information is displayed.

4. Press the **Up** or **Down** button to scroll to the RETURN selection.

5. Press the **Enter** button to return to the Top Menu.

SYSTEM Menu

The SYSTEM menu allows you to view system software, current time, and syslog information. The following information displays over three screens in the graphic display in the order listed:

- Screen 1 — Acme Packet 4600 software version and creation date:
  - Software:

    ACME OS 7.2.0

    03/01/2014

- Screen 2 — Current time of day, uptime, memory utilization:
  - Time 18:33:21

    UPTIME 10, 10:23:20

    MEMORY 65%

- Screen 3 — Syslog information (IP address:port of the syslog server and the netmask in dotted decimal notation):
  - Syslog:

    192.168.121.12:514

    255.255.255.0

To use the SYSTEM menu in the graphic display:

1. From the top menu of the graphic display, press the **Enter** button.

2. Press the **Up** or **Down** button to scroll to the SYSTEM selection.

3. Press the **Enter** button. The first screen in the SYSTEM menu is displayed.

4. Press the **Up** or **Down** button to scroll through the three SYSTEM screens. You can press the **Enter** button on the Time screen to update its display.

5. Press the **Up** or **Down** button to scroll to the RETURN selection.

6. Press the **Enter** button to return to the Top Menu.

(Optional) Enter the result of the procedure here.

ACTIVITY Menu

The ACTIVITY menu allows you to scroll through current Acme Packet 4600 traffic statistics. These statistics provide a real-time snapshot of the capacity at which the system is operating.

The following information is displayed on the Acme Packet 4600 ACTIVITY display in the order listed:

- Screen 1 — Number of sessions, sessions per minute, sessions per hour:
  - 200 Sessions

    40 Sessions/Minute

    180 Sessions/Hour

- Screen 2 — Number of flows, flows per minute, flows per hour:
  - 400 Flows

    80 Flows/Minute

360 Flows/Hour

- Screen 3 — Number of used ports, number of free ports:
  - 1000 Used Ports

    2000 Free Ports

- Screen 4 — SNMP information: number of SNMP packets received, number of SNMP traps sent out:
  - SNMP:

    PKTs in :20

    TRAPs out :10

To use the ACTIVITY menu in the graphic display:

1. From the top menu of the graphic display, press the **Enter** button.

2. Press the **Up** or **Down** button to scroll to the ACTIVITY selection.

3. Press the **Enter** button. The first screen in the ACTIVITY menu is displayed.

4. Press the **Up** or **Down** button to scroll through the three ACTIVITY screens. You can press the **Enter** button on any of the screen to update the display with the most recent statistics.

5. Press the **Up** or **Down** button to scroll to the RETURN selection.

6. Press the **Enter** button to return to the Top Menu.

ENVIRONMENT Menu

The ENVIRONMENT menu allows you to view information about the hardware's operational status. The graphic display presents the following information in the order listed:

- Screen 1 — Hardware alarms and Link Alarms:
  - HW ALARM : 0

    LINK ALARM : 2

- Screen 2 — System temperature and fan speeds:
  - TEMPERATURE: 38.00 C

    FAN SPEEDS:

    100% 100% 100% 100%

- Screen 3 — System voltages:
  - VOLTAGES (V):

    1.099, 1.186

    1.488, 1.790

    2.458, 3.278, 4.982

To use the ENVIRONMENT menu in the graphic display:

1. From the top menu of the graphic display, press the **Enter** button.

2. Press the **Up** or **Down** buttons to scroll to the ENVIRONMENT selection.

3. Press the **Enter** button. The ENVIRONMENT information is displayed.

4. Press the **Up** or **Down** button to scroll to the RETURN selection.

5. Press the **Enter** button to return to the Top Menu.

RETURN

Pressing the *Enter* button for the RETURN selection returns you to the base display during normal operating conditions or to the alarm display during an alarm condition.

Graphic Display Output for HA Nodes

The information included in this section only applies to high availability Acme Packet 4600 System nodes.

The graphic display on a Acme Packet 4600 in an HA node indicates the current HA state. Five state indications can be displayed on the graphic display. Only the Standby and Active state indications appear in the graphic display for more than a few seconds. An explanation and example of each HA state follows.

Initial State Displays

The following example shows the output in the graphic display window of a Acme Packet 4600 in the initial state:

NET - NET

SESSION DIRECTOR (I)

Out-Of-Service State Displays

The following example shows the output in the graphic display window of an out-of-service Acme Packet 4600:

NET - NET

SESSION DIRECTOR (O/S)

Becoming Standby State Displays

The following example shows the output in the graphic display window of a becoming standby Acme Packet 4600:

NET - NET

SESSION DIRECTOR (B/S)

Standby State Displays

The following example shows the output in the graphic display window of a standby Acme Packet 4600:

NET - NET

SESSION DIRECTOR (S)

Active State Displays

Acme Packet 4600 Systems in the active state use the default graphic display. The following example shows the display of an active Acme Packet 4600:

NET - NET

SESSION DIRECTOR

4

System Installation

This chapter provides information about how to install the Acme Packet 4600 System and its associated components, includes cabling information.

Shipped Parts

Each Acme Packet 4600 ships in one box. Inside this box is the Acme Packet 4600 chassis and the accessory kit. The ordered NIU and power supplies are already installed in the chassis.

Table 4-1   Acme Packet 4600 Shipping Contents

Location	Item
Main Shipping Box	Acme Packet 4600 chassis
Accessory Kit	Console adapter
	AC or DC power cords, one per power supply
	Grounding cable with lug
	Slide Rail Mounting Kit

Installation Tools and Parts

The following tools and parts are required to install the Acme Packet 4600 into your equipment rack:

- #1 Phillips-head screwdriver
- #2 Phillips-head screwdriver
- Small flat-head screwdriver
- Rack and associated mounting hardware
- Shielded Ethernet CAT5e or CAT6 RJ45 cables
- 11/32" nut driver

Recommended Tools and Parts

Acme Packet recommends that you have the following parts on hand:

- Cable labels
- UPS for AC installations
- ESD wrist or heel straps
- ESD-safe location

Pre-Installation Guidelines

The Acme Packet 4600 must have access to reliable power and cooling. When choosing a location for your Acme Packet 4600, follow the guidelines listed in this section.

Environmental Guidelines

When preparing to install your Acme Packet 4600:

- Ensure that the equipment rack location complies with the environmental specifications (e.g., temperature, relative humidity, and maximum altitude) of the Acme Packet 4600 described in the chapter on Specifications.

- Locate the Acme Packet 4600 in a clean and well-ventilated room. This location should also be far from areas where heat, electrical noise, and electromagnetic fields are present.

Power Guidelines

When preparing to install your Acme Packet 4600, please ensure you do the following:

- Ensure that the installation location has access to adequate power and grounding. Separate circuits should be available for each of the Acme Packet 4600 two power supplies.

- The Acme Packet 4600 may only be powered by AC or DC circuits at one time; mixed power configurations are unsupported.

- Never use extension cords when powering a Acme Packet 4600.

- Use grounded, 3-conductor circuits.

- A local earth ground must be available.

> **✎ Note:**
>
> Connect each of the Acme Packet 4600 power supplies to a separate circuit. If both supplies are connected to outlets on the same circuit, the Acme Packet 4600 will lose power to both supplies if that circuit loses power. In that case, the whole Acme Packet 4600 would lose power.

Mounting Guidelines

When preparing to install your Acme Packet 4600, please ensure you follow these mounting guidelines:

- Leave enough clearance, approximately 8" (20 cm), behind the equipment rack to allow adequate air ventilation, for ease in cabling, and to access the console connector, reset button, graphic display buttons, and physical interface card slots.

- Do not block the air inlets or the fan module, or obstruct airflow to the system in any way.

- Position the equipment to allow for serviceability. This will aid in chassis removal, and prevent the need to remove or loosen other equipment in the rack.

- Remember that the Ethernet interfaces are limited to 328 feet/100 meters as defined by the FAST Ethernet standard, IEEE 802.3.

Other Safety Guidelines

When preparing to install your Acme Packet 4600, ensure you follow these safety guidelines:

- Review all safety precautions with respect to the Acme Packet 4600 before beginning installation.

- Ensure that the equipment rack is securely bolted to the floor and that the equipment rack and components are properly grounded.

- For AC power installations, use a regulating UPS to protect the Acme Packet 4600 from power surges, voltage spikes, and power failures.

- For AC power installations, ensure that your UPS can supply power for enough time to save your system data and shut down the system gracefully.

Mounting Installation

This section explains how to unpack and install your Acme Packet 4600 into a telecommunications or server equipment rack. The Acme Packet 4600 standard mounting hardware is used for installation in a 4-post, 19" cabinet-style equipment rack. Mounting hardware for a 23" equipment rack is available by special order.

Mounting Options

The Acme Packet 4600 ships with hardware for mounting in a 4-post, tapped-hole equipment rack or square-hole equipment rack. The Acme Packet 4600 also ships with hardware for mounting in a 2-post, center-mount equipment rack. This section explains the procedures for each mounting option.

> **Note:**
>
> Failure to follow the instructions outlined in this section might compromise the proper function of the Acme Packet 4600. To prevent personal injury, Acme Packet recommends that two people lift and install the chassis into the equipment rack.

Unpacking the Acme Packet 4600

To unpack the Acme Packet 4600:

1. Inspect the external packing materials and note if they are damaged in any way.

2. Open the exterior box.

3. Unpack the contents of the Acme Packet 4600 shipment.

4. Locate the packing list on the outside of the Acme Packet 4600 shipment box.

5. Confirm that all of the components listed in the packing list are present and in good condition.

If you discover that any of the parts are missing or were damaged in shipment, contact customer support.

Mounting Hardware

The hardware used for the Acme Packet 4600 mounting procedures include the following:

Front mounting flanges (2) for use with mounting slide rails, used to secure the chassis into the
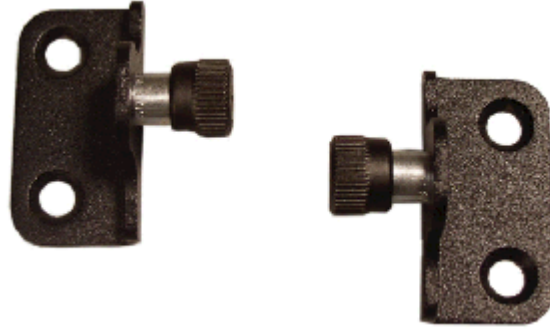
rack

Slide rail assembly (2), as shipped, with the chassis slide rail inserted into the equipment rack
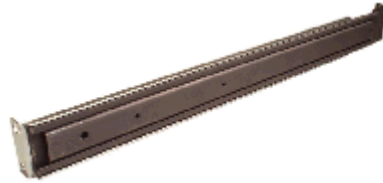
slide rail.

Equipment rack slide rail (part of the slide rail assembly).

Chassis slide rail (part of the slide rail assembly)

Nut Bar (4)

Mounting Spacer (2)

Phillips screws and a flat head

#2 Phillips Screw #10-32 x 5/8" (8 x shipped):

#2 Phillips Screw #6-32 x 5/16" (6 x shipped)

Flat Head Screw #10-32 x 5/16" (6 x shipped)

screw
Center mounting flanges (2) for a 2-post rack

Cabinet-style 4-Post Chassis Installation

The following sections explain how to mount the Acme Packet 4600 in a cabinet-style, 4-post equipment rack.

Mounting System

Acme Packet provides flexible mounting options for your Acme Packet 4600 equipment rack installation.

The mounting system consists of a slide rail mounted on each side of an equipment rack and a chassis slide rail mounted on each side of the Acme Packet 4600 chassis. Once the slide rails are installed on the equipment rack and chassis, the chassis can be slid into place by aligning the installed chassis slide rails along the guides on the equipment rack slide rails. When the Acme Packet 4600 is fully inserted into the equipment rack, it is secured in place with two captive thumbscrews.

Installing the Equipment Rack Slide Rails

In the first stage of system installation, secure the equipment rack slide rail to the equipment rack. The painted end of the equipment rack slide rail attaches to the front of the equipment rack and the bare steel side attaches to the rear of the equipment rack. The equipment rack

slide rail can expand and contract to accommodate equipment racks of various depths up to 32".

You can mount the equipment rack slide rail to both tapped hole rack and square rack. Follow the appropriate procedure below.

Installing Slide Rails into a Tapped-Hole Rack

This section explains how to mount the Acme Packet 4600 slide rail assembly into a tapped-hole equipment rack.

> **✎ Note:**
>
> The following procedure presumes that the tapped hole size is #10-32. If alternate tapped holes are used, the customer must supply the proper screws.

To install the slide rails to the front of a tapped-hole equipment rack:

1. Locate the following components: Assembled equipment rack slide rails (2), #10-32 x 5/8" screws (8), Mounting spacers (2)

2. Line up the painted side of the equipment rack slide rail with an appropriate mount point on the front of the equipment rack.
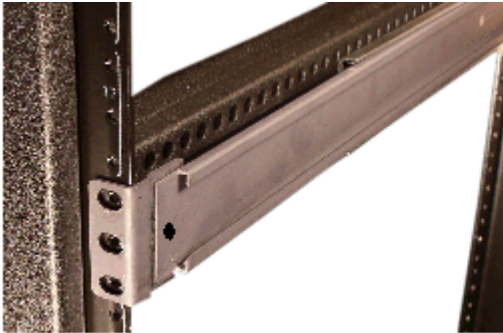
3. For both holes in the flange, place one #10-32 x 5/8" screw through the mounting spacer, then through the slide rail flange and into the tapped hole.
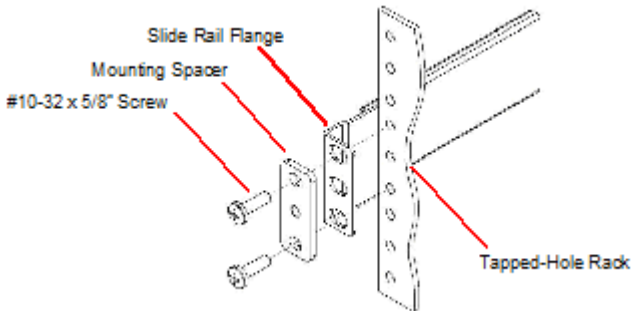
4. Using a #2 Phillips head screwdriver, tighten the screws to secure the slide rail to the equipment rack. Do not completely torque the screws; leave a small amount of play at this time.

5. Expand and line up the unpainted side of the equipment rack slide rail on the outside of the rear rack slide rail at the same height used for the front mount point.
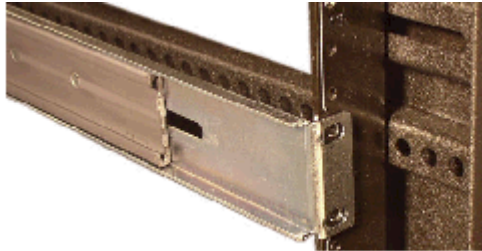
6. For both holes in the slide rail flange, place one #10-32 x 5/8" screw through the flange and into the tapped hole, and screw them into place.
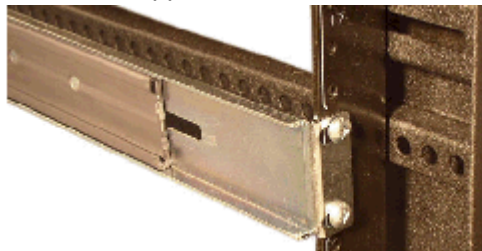
7. Repeat Steps 2 and 6 for the other test equipment slide rail.

Installing Slide Rails into a Square-Hole Rack

This section explains how to mount the Acme Packet 4600 slide rail assembly into a square-hole equipment rack. The customer can use #10-32, 1/4-20, M5 or M6 cage nuts as an alternative, but the cage nuts will be customer-supplied along with the associated mounting screws for the cage nut selected.

To install the slide rails on the front of a square-hole equipment rack:

1. Locate the following components: Equipment rack slide rails (2), #10-32 x 5/8" screws (8), Mounting spacers (2), Nut bars (2)

2. Line up the painted side of the stationary rail with an appropriate mount point on the front

   of the equipment rack.

3. For each of the two holes in the slide rail flange, place a #10-32 screw through the
   mounting spacer, then through the slide rail flange, and finally through the square hole in
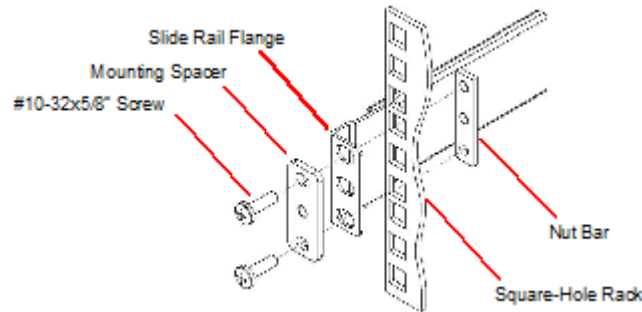
   the rack rail.

4. Hold the nut bar behind the front rack rail.

5. Using a #2 Phillips head screwdriver, tighten the screws to secure the slide rail to the
   equipment rack. Do not completely torque the screws; leave a small amount of play at this

   time.

6. Expand and line up the unpainted side of the stationary rail flange on the outside of the
   rear rack rail at the height used for the front mount point.
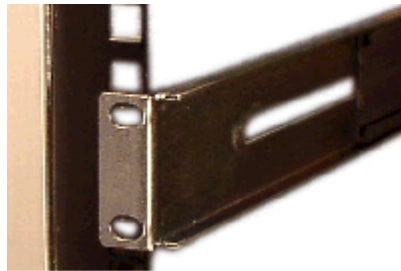
7. Hold the nut bar behind the rear rack slide rail.

8. Place one #10-32 screw through each of the holes in the slide rail flange, then through the
   square hole in the rack, and finally into the nut bar.

9. Using a #2 Phillips head screwdriver, tighten the screws securely into place.

10. Torque the screws on the front and back of the rail slide.

11. Repeat this procedure for the other slide rail.

Installing the Chassis Flanges and Slide Rails

In this second portion of system installation, two chassis flanges and two chassis slide rails are secured to the Acme Packet 4600 chassis.

To install the chassis rail slides on the Acme Packet 4600 chassis:

1. Locate the following components: #10-32 x 5/16" flat head (black) screws (4), Front-mounting flanges (2), #6-32 x 5/16" screws (6), #2 Phillips screwdriver, Chassis slide rails (2)

2. Line up one chassis flange with the tapped holes. Position the chassis flange's spring-loaded thumbscrew toward the front panel of the system.

3. Insert 2 x #10-32 x 5/16" flat head screws into the flange and chassis, and using a #2 Phillips screwdriver, tighten the screws to secure the flange to the chassis.

4. Line up the chassis slide rail with the Acme Packet 4600 side panel. Position the large marker hole in the slide rail at the front of the Acme Packet 4600 chassis. The remaining three tapped holes in the Acme Packet 4600 chassis will line up with the slide rail holes.

5. Use 3 x #6-32 x 5/16" screws to secure the chassis slide rail to the side of the Acme Packet 4600. Notice that the large hole in the slide is positioned toward the front of the Acme Packet 4600 chassis.

large hole

6. Repeat this procedure for the other side of the Acme Packet 4600 chassis.

Installing the Chassis in the Rack

The Acme Packet 4600 is now ready to be installed into a 4-post equipment rack. To prevent personal injury or damage to the Acme Packet 4600, follow these guidelines:

• This installation requires two people and should not be attempted otherwise.

• Follow your organization's best practices for lifting and installing heavy components into an equipment rack.

• Ensure that the Acme Packet 4600 chassis remains supported until you have completely installed it into the equipment rack.

To install the Acme Packet 4600 chassis into the equipment rack:

1. Lift the Acme Packet 4600 into the correct position to prepare to be installed into the equipment rack.

2. Line up the chassis slide rails in back of the chassis with the guides in front of the

    equipment rack slide rails.

3. Push the Acme Packet 4600 fully into the equipment rack.
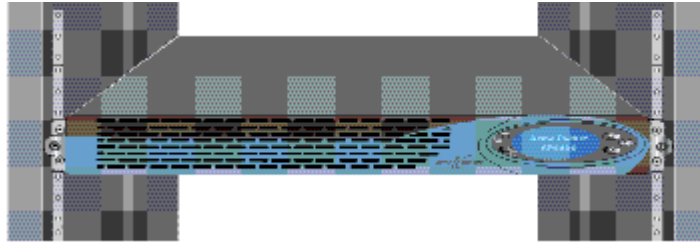
4. Line up the chassis-mounted thumbscrews with the threads on the Acme Packet 4600 mounting spacer. You may have to adjust the spacer locations before they line up with the Acme Packet 4600's captive screws.
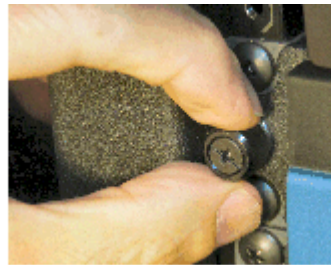
5. Once correctly positioned, hand-tighten the thumbscrews into the mounting spacer and secure the chassis in the rack.

6. Torque the two captive thumbscrews using a #2 Phillips screwdriver.

7. Torque all four #10-32 x 5/8" front screws that hold the slide rails to the rack.

Center-Mount 2-Post Chassis Installation

The following sections explain how to center mount your Acme Packet 4600 into a 2-post

equipment rack.
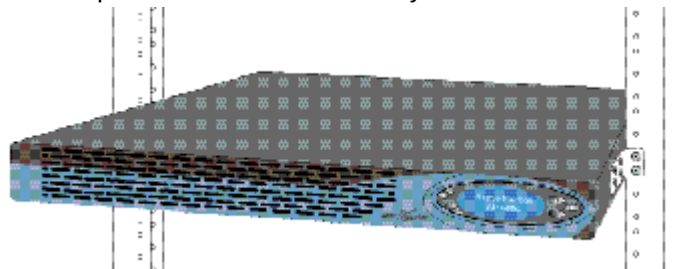
Installing the Center-Mount Hardware

Center-mounting flanges are attached to each side of the Acme Packet 4600. These mounting flanges are reversible, and are not mated to a specific side of the chassis. While the Acme

Packet 4600 is shipped with all mounting hardware for attaching the rack flanges to the chassis, you must obtain and use the appropriate hardware recommended by the equipment rack manufacturer for mounting the system in the rack.

To install your Acme Packet 4600 in a center-mount configuration:

1. Locate the following components: Center-mounting flanges (2), #10-32 x 5/16" flat head (black) screws (6)

2. Line up one chassis flange with the three tapped holes found along the center of the side of the Acme Packet 4600 chassis. The three screw holes of the chassis flange will only align in one direction.

3. Using a Phillips head screwdriver, tighten the three #10-32 x 5/16" Phillips head (black) screws to secure the flange to the chassis.

4. Repeat this procedure for the other side of the Acme Packet 4600 chassis.

Installing the Chassis in the Rack

The Acme Packet 4600 chassis is now ready to be installed into a 2-post equipment rack. To prevent personal injury or damage to the Acme Packet 4600 follow these guidelines:

• This installation requires two people and should not be attempted otherwise.

• Follow your organization's best practices for lifting and installing heavy components into an equipment rack.

• Ensure that the Acme Packet 4600 chassis remains supported until you have completely installed it into the equipment rack.

1. Locate the following components: Equipment rack screws (4)

2. Lift the Acme Packet 4600 into the correct position in the equipment rack.

3. Use a #2 Phillips screwdriver to secure two screws through the mounting flanges on the Acme Packet 4600 and into the equipment rack. One person should hold the Acme Packet 4600 in the correct position while the other person screws the Acme Packet 4600 in place.
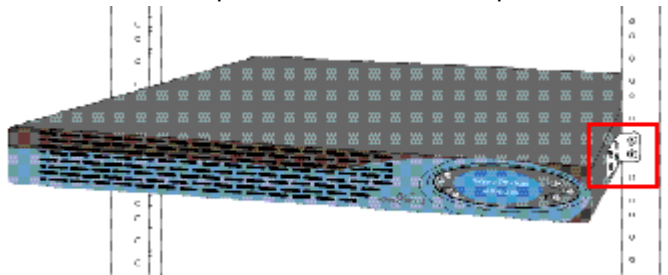
4. Ensure that the Acme Packet 4600 chassis remains supported until you have completely installed it into the equipment rack.

# Fan Module Installation

The fan module is pre-installed in the Acme Packet 4600 chassis when it ships. There is no need to remove the fan module prior to installation. In the event that this part needs service or replacement, you can remove and replace it with a functioning one.

Ground and Power Cable Installation

The Acme Packet 4600 must be properly grounded to ensure efficient system performance. Grounding your Acme Packet 4600 chassis is an extremely important part of the installation and maintenance procedures. Physical harm or problems with system functionality may occur on the Acme Packet 4600 if it is not properly grounded. If your Acme Packet 4600 chassis is not properly grounded, the system can exhibit unpredictable problems such as:

* Garbled output on the console display
* Sudden crashes
* Physical damage to the Acme Packet chassis and its hardware components

> **Note:**
>
> Failure to ground the chassis properly can result in permanent damage to the Acme Packet 4600 and its components. Bodily harm may also result under some circumstances.

> **Note:**
>
> The Acme Packet 4600 does not support mixing AC and DC power supplies in the same chassis. A mixed power configuration is prohibited.

Your equipment rack location must have a local earth ground. This ground can be either an unpainted spot on the grounded equipment rack frame, or a grounded bus bar in the equipment room.

Grounding Cable Installation

The ground terminals are located to the left of power supply B on the rear of the Acme Packet 4600 chassis. The Acme Packet 4600 ships with 2 kep nuts screwed onto the ground terminals. Use an 11/32" nut driver to remove and install these kep nuts.

This section shows you how to install the grounding cable on your Acme Packet 4600.

> **Note:**
>
> Acme Packet 4600 equipment is suitable for installation as part of a Common Bonding Network (CBN).

> **Note:**
>
> The Common Bonding Network (CBN) is a term used for the connection of building steel, water pipes, cable racks, vertical and horizontal equalizer conductors, bonding conductors and electrical metallic raceways within a building, when they are bonded together by either deliberate or incidental connections. The CBN is also connected to the building's grounding electrode system. Connections to the CBN are usually made from equipment frames to reduce voltage differences to acceptable levels when current flows through these frames, either during fault occurrences in the AC or DC power systems, or when lightning strikes.

To install the grounding cable on the Acme Packet 4600:

1. Using an 11/32" nut driver, screw and remove the two kep nuts from the grounding posts located on the rear of the Acme Packet 4600. Place them aside.
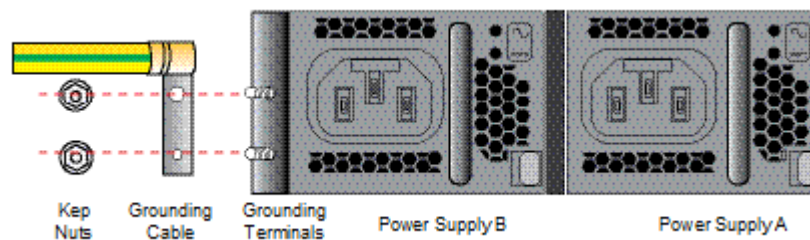
2. Place the lug on the end of the grounding cable onto the grounding posts.
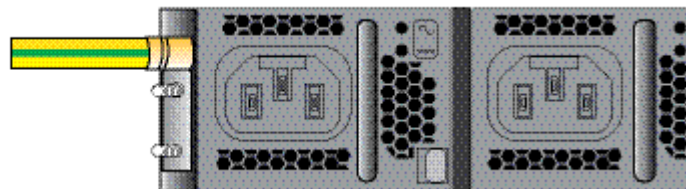
3. Using an 11/32" nut driver, tighten the two kep nuts onto the grounding post, securing the grounding lug in place. When attached correctly, the grounding lug fits snugly between the chassis's rear panel and the kep nuts.
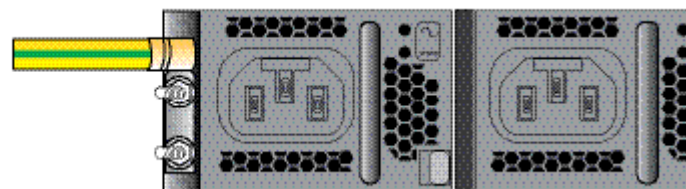
4. Connect the other end of the grounding wire to a suitable grounding point at your site.

> **Note:**
>
> Always make the ground connection first and disconnect it last when installing or removing the system from an equipment rack.

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AC Power Cord Installation

This section explains you how to install an AC power cord.

> **Note:**
>
> Use a 15 Amp fused circuit for each AC power supply.

> **Note:**
>
> This equipment is intended for installation in locations where National Electrical Code (NEC) applies.

To install the AC power cords in the Acme Packet 4600:

1. Set the System Power switch to the Stby position to cut off power to the Acme Packet
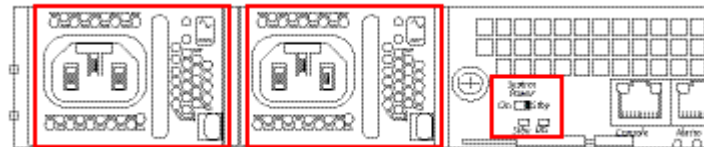
    4600.

2. Locate the two AC power cords shipped with your Acme Packet 4600. Choose one power supply to work on first.

3. Connect one power cord to the power supply by inserting the 3-lead IEC-60320 plug into the IEC connector located on the power supply.
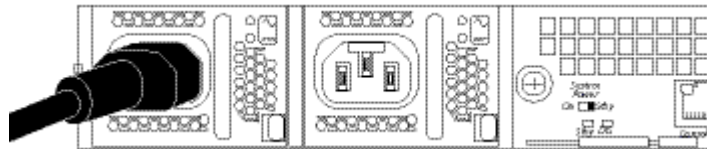
4. Connect the other power cord to the power supply by inserting the 3-lead IEC-60320 C13 plug into the IEC-60320 C14 IEC connector located on the power supply.
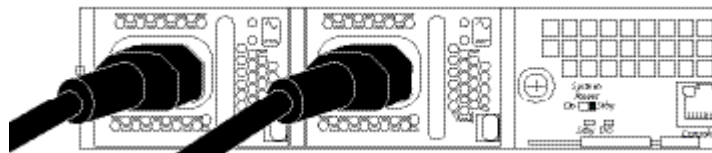
5. Route the AC power cords through your rack and cabling system to the power outlets.

6. Plug the supply end of each power cord into its own circuit.

7. To remove AC power cables from the Acme Packet 4600, reverse the previous steps in this procedure.

8. Set the System Power switch to the On position to provide power to the Acme Packet 4600. The Acme Packet 4600 will start to boot.

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DC Power Cord Installation

This section explains you how to install a DC power cord.

> **Note:**
>
> This equipment is intended for installation in Network Telecommunication Facilities.

> **Note:**
>
> Use a 30 Amp fused circuit for each DC power supply.

> **Note:**
>
> Refer to the power supply's polarity label when connecting it to a power source. Failure to do so can result in equipment damage or serious injury.

To install the DC power cords in the Acme Packet 4600:

1. Set the System Power switch to the Stby position to cut off power to the Acme Packet
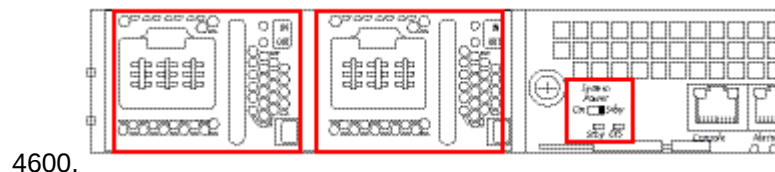
   4600.

2. Locate the two DC power cords shipped with your Acme Packet 4600. Choose one power supply to work on first.

3. Connect the plug from a 3-conductor power cord into the connector located on one of the

   DC power supplies.
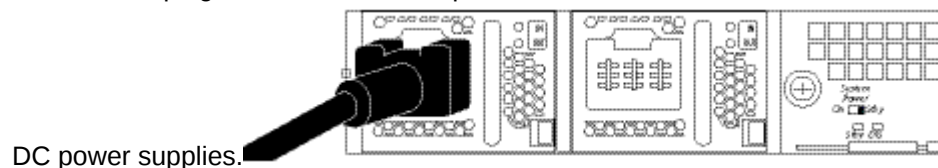
4. Connect the plug from another 3-conductor power cord to the power connector located on

   the other DC power supply.
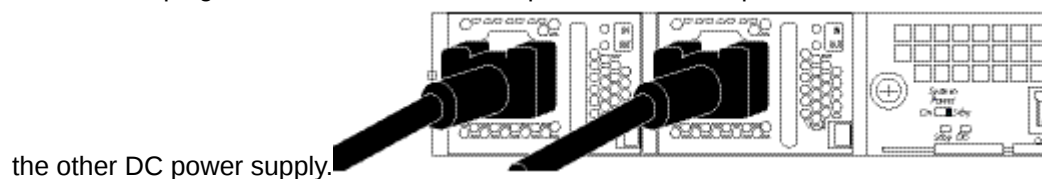
5. Route the DC power cords through your rack and cabling system to the power outlets.

6. Plug the supply end of each power cord into its own circuit.

7. To remove DC power cables from the Acme Packet 4600, reverse the previous steps in this procedure.

8. Set the System Power switch to the On position to provide power to the Acme Packet 4600. The Acme Packet 4600 will start to boot.

Cabling the Acme Packet 4600 System

After mounting the Acme Packet 4600 in an equipment rack and installing all components into the chassis, connect all appropriate data cables to the ports before powering the system up and configuring it.

Acme Packet recommends using fully shielded CAT5e or CAT6 Ethernet cables for NIU media and management Ethernet connections to protect the Acme Packet 4600 from potential damage.

You can install and remove Ethernet and GbE optical cables while the Acme Packet 4600 is operational. Not every port needs to be utilized for proper operation. However, when a cable is disconnected and the link is lost, an alarm is generated.

> **Note:**
>
> The intra-building ports of the equipment are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building ports of the equipment must not be metallically connected to interfaces that connect to the Outside Plant (OSP) or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports, as described in GR-1089–CORE, Issue 6) and requires isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

> **Note:**
>
> Intra-building ports include Media and Signaling Network Interfaces, Network Management Ports, Alarm Ports, and Console Port.

Console Port

The Acme Packet 4600 has one console port located on the rear-facing NIU. The Acme Packet 4600 ships with a console adapter that allows you to connect a standard DB-9 serial port to the Acme Packet 4600's RJ45 console port. Only one console port on the Acme Packet 4600 can be used at a time.

Chassis Console Cabling Procedure

This section explains how to create a serial connection to the Acme Packet 4600 console port. Use the console port for permanent connections to a terminal server or other serial device.

To connect a console cable to the console port:

1. Locate a twisted pair console cable to connect to the Acme Packet 4600.

2. Remove the rubber dust cap from the Chassis console port if present.

3. Insert the RJ45 connector on the end of the console cable into the console port labeled Console . The release tab on the RJ45 jack clicks into place when you insert it properly.
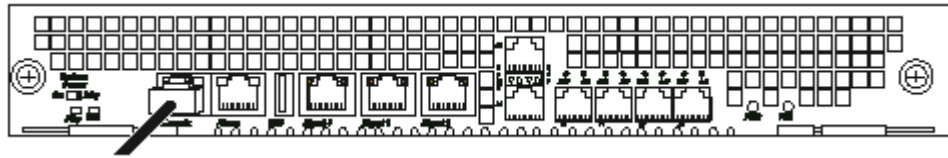
4. Lead the console cable neatly away from the rear panel toward a terminal server or other component where this serial connection terminates.

Alarm Port Cabling

You can use the alarm port to indicate electrically when an alarm has been generated on the Acme Packet 4600. The alarm port contains leads for three circuits, each of which closes to signify a corresponding alarm.

To connect the alarm port cable to the NIU alarm port:

1. Locate the alarm contact cable you plan to connect to the Acme Packet 4600.

2. Insert the RJ45 connector on the end of the alarm port cable into the alarm port labeled Alarm . The release tab on the RJ45 jack clicks into place when you insert it properly.
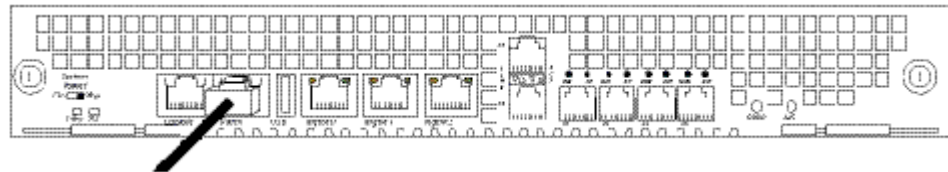
3. Lead the alarm cable neatly away from the rear panel toward any alarm monitoring equipment.

Management Network Ports

Standard shielded CAT5e or CAT6 (or higher) Ethernet cables with RJ45 jacks are used for connecting the Acme Packet 4600 management Ethernet ports to your network. These ports support 10/100/1000 Mbps speeds.

Keep Ethernet cables separated from power cables by at least 60mm where possible and never run them in the same channel of a trunking system without segregation.

To connect Ethernet cables to the rear panel Ethernet ports:

1. Locate the Ethernet cables you plan to connect to the Acme Packet 4600.

2. Insert the RJ45 connector on the end of the Ethernet cable into one of the NIU management Ethernet ports. These ports are labeled Mgmt0 , Mgmt1 , and Mgmt2 . The release tab on the RJ45 jack will click into place when you insert it properly.

3. Route the cable away from the Acme Packet 4600. Make sure that the Ethernet cables are not stretched tightly or subject to extreme stress.

4. Repeat Steps 1 through 3 for each additional management Ethernet cable you will connect to your Acme Packet 4600.

Media and Signaling Network Interfaces

This section explains how to cable the NIU for media and signaling. The NIU is available with either copper or optical SFP Ethernet connectors. The media and signaling ports that can be configured are either any combination of P0, P1, P2, and P3, or P4 and P5; not a mixture of the 1GbE and 10GbE ports.

> **Note:**
>
> Perform all cabling procedures according to the established standards for your organization.

1GbE Copper Cabling Procedure

Shielded CAT 5e or CAT 6 (or higher) Ethernet cables with RJ45 jacks are used for connecting the Acme Packet 4600 1GbE copper NIUs to your production network over the signaling and media network ports.

To connect 1GbE Copper cables to the signaling and media ports:

1. Locate the Ethernet cables you plan to connect to the Acme Packet 4600.

2. Insert the RJ45 connector on the end of the Ethernet cable into one of the 1GbE copper NIU media and signaling ports. The release tab on the RJ45 jack will click into place when you insert it properly.

P5 P4 P0 P1 P2 P3
Signaling & Media (P=port)

3. Route the cable away from the Acme Packet 4600. Make sure that the Ethernet cables are not stretched tightly or subjected to extreme stress.

4. Repeat Steps 1 through 3 for each additional Ethernet cable you connect to your Acme Packet 4600.

SFP Optical Cabling Procedure

This section explains how to cable a Acme Packet 4600 configured with a GbE optical NIU. Standard single mode or multimode fiber optic cabling with duplex LC connectors are used to connect the Acme Packet 4600 SFP-based NIUs to your network.

Fiber Optic Cable Handling

When handling a fiber optic cable:

- Never touch the polished end of fiber cable.

- To prevent serious eye damage, never look directly into a fiber optic cable connector or mating adapter.

- Clean all fiber optics before installing them into your network according to prescribed procedures.

- Ensure that the bend radius of your fiber cables is kept to a minimum of 3" or that specified by the fiber cable manufacturer.

- Perform all cabling procedures according to the established standards for your organization.

To connect network optical cabling to the optical physical interface cards:

1. Locate the fiber optic cables you plan to connect to the Acme Packet 4600. You can choose from either P5 and P4 (10GbE), or P0, P1, P2 and P3 (1GbE).

P5 P4 P0 P1 P2 P3
Signaling & Media (P=port)

2. Slide the optical transceiver into the socket on the NIU.
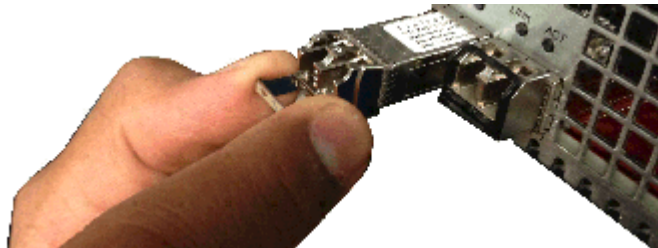
3. Press on the face of the optical transceiver to seat it in the socket.
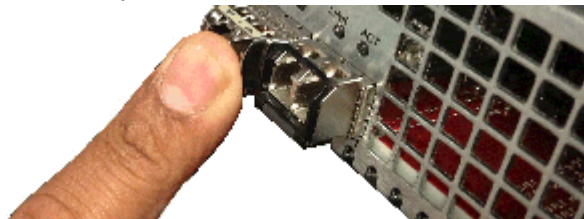
4. Flip the bale clasp latch back into the rest position.
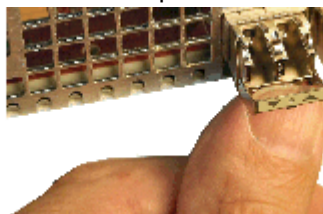
5. Connect the optical cables to their corresponding ports.
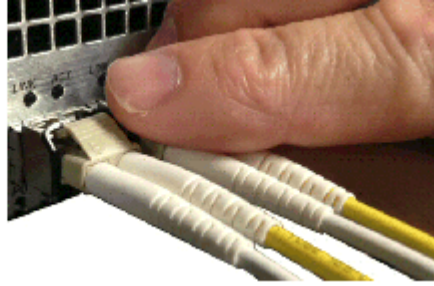
6. Route the cable away from the Acme Packet 4600. Make sure that the fiber optic cables are not stretched tightly or subjected to extreme stress.

7. Repeat Steps 1 through 6 for each additional fiber optic cable you connect to your Acme Packet 4600.

Copper Transceivers

Copper transceivers are also available for the Acme Packet 4600 System. They are removed and replaced similarly to the optical transceivers.

1. Insert the duplex LC connector on the end of the fiber cable into one of the NIU's SFP optical transceivers. The connector should click and lock in place when you insert it properly. The example shows GbE fiber optic cables connected to media and signaling ports (left to right) P0 , P1 , P2 , and P3 .
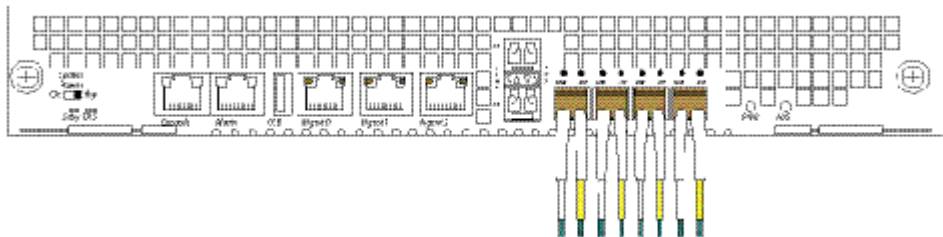
2. Route the cable away from the Acme Packet 4600. Make sure that the fiber optic cables are not stretched tightly or subjected to extreme stress.

3. Repeat Steps 1 and 2 for each additional fiber optic cable you connect to your Acme Packet 4600.

Cabling for HA Deployments

The information and instructions in this section explain how to cable an HA node.

HA Cabling

Category 5 (or higher) shielded Ethernet cables are required for cabling two HA nodes together.

Rear Panel Cabling

You can use one or two connections for HA redundancy support between the two members of an HA node. Using two rear interfaces for sharing redundancy information provides a high level of reliability. As a rule, network management ports should be used in this way:

• Mgmt0 should be reserved as the boot/maintenance interface.

- Mgmt1 and Mgmt2 are available for sharing HA information.

Management network ports feature automatic crossover negotiation so that a crossover cable is not necessary for HA cabling.

To cable Acme Packet 4600 in an HA configuration using single rear interface support:

1. Insert one end of an Ethernet cable into either Mgmt1 or Mgmt2 on the rear panel of the Acme Packet 4600 A. The release tab on the RJ45 jack clicks into place when you insert it properly.

2. Insert the other end of the Ethernet cable into the corresponding management interface on the rear panel of the Acme Packet 4600 B. The release tab on the RJ45 jack clicks into place when you insert it properly. If you use Mgmt1 on Acme Packet 4600 A, then you will connect it to Mgmt1 on Acme Packet 4600 B.

3. Refer to the configuration procedures located in the HA Nodes chapter of the Acme Packet Configuration Guide .

Dual Rear Interface Support

To cable Acme Packet 4600 Systems in an HA configuration using dual rear interface support:

1. Insert one end of an Ethernet cable into Mgmt1 on the rear panel of Acme Packet 4600 A. The release tab on the RJ45 jack clicks into place when you insert it properly.

2. Insert the other end of the cable into the Mgmt1 port on the rear panel of Acme Packet 4600 B.

3. Insert one end of a second Ethernet cable into Mgmt2 on the rear panel of Acme Packet 4600 A.

4. Insert the other end of the cable into Mgmt2 on the rear panel of Acme Packet 4600 B.

5. Refer to the configuration procedures located in the HA Nodes chapter of the Acme Packet Configuration Guide .

Media Cabling for HA Nodes

NIU media port cabling in an HA node depends on network topology. After a switchover between the two Acme Packet 4600 s in an HA node, the standby system sends out an ARP message using a configured virtual MAC address, establishing that MAC on another physical port on the same Ethernet switch.

5

Startup

This chapter describes Acme Packet 4600 startup that involves two tasks:

- Powering on the Acme Packet 4600
- Creating the first console connection to the Acme Packet 4600

You can perform these actions in any order. However, if your console connection is configured first, you can observe the booting processes as your Acme Packet 4600 goes online.

The last section of this chapter explains how to login to your system.

Creating a Console Connection

This section explains how to create a console connection.

Prerequisites

In order to create a console connection to the Acme Packet 4600, you must configure the terminal hardware and software appropriately.

Serial Connection Parameter	Setting
Baud Rate	115,200 bps
Date Bits	8
Parity	No
Stop Bit	1
Flow Control	None

Your terminal application and serial port MUST be capable of operating at 115.2 Kbps for creating a console session.

Creating a Console Connection

To create a console connection:

1. Set the terminal application's parameters to match the Acme Packet 4600 default parameters.

2. The Acme Packet 4600 console port is located on the Acme Packet 4600 NIU. You must connect to the console port when initially booting the Acme Packet 4600 .

3. If the Acme Packet 4600 is already powered on, press the Enter key a few times to activate the console connection. When ACLI text is displayed on the screen, the console connection has been successfully created.

4. If you have created the console connection before powering up the Acme Packet 4600, you can watch the boot process as it displays on your screen.

Powering On the Acme Packet 4600 System

This section explains how to power on your Acme Packet 4600 System.

Prerequisites

The following procedure presumes that you know how to connect your Acme Packet 4600 to either AC or DC power.

Powering On the Acme Packet 4600 System

To power on the Acme Packet 4600 hardware:

1. Plug in the appropriate AC or DC power cords for your device.

2. Place the System Power switch in the On position. The system starts to boot.
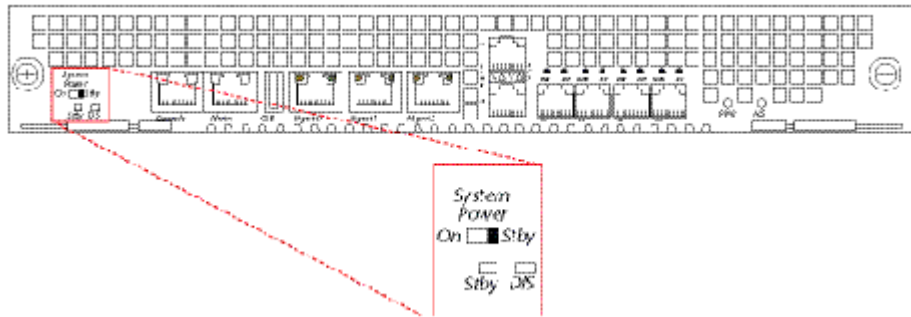
> **Note:**
>
> When operating with redundant power supplies, both power supplies must be plugged in either simultaneously or within a few seconds of each other. If the second power supply is on long enough after the first, an alarm is generated.

3. The graphic display on the front control panel begins to display information when the system boots.

Critical Setup Steps for Acme Packet Platforms

For any Acme Packet platform with Digital Signal Processors (DSPs), you must set up specific configurations in a timely manner after power on because failure to do so can lead to a system crash.

For Acme Packet 1100, 3950/4900, 4600, and 6300/6350 platforms that use the identified software versions, ensure system stability by configuring boot parameters, setting up passwords, setting up the product, and setting up entitlements within an hour or two of unit power on:

• S-Cz8.4.0 and all patches

• S-Cz9.0.0 and all patches

• S-Cz9.1.0 and all patches

• S-Cz9.2.0 to S-Cz9.2.0p9

- S-Cz9.3.0 to S-Cz9.3.0p4

Complete the following steps promptly after platform power on:

1. Configure bootparam. Bootparam changes are optional, so the hardware can boot without making a change.

2. Set system passwords.

3. Set up product.

4. Set up entitlements.

> **Note:**
>
> If a system crash occurs, initiate recovery by typing reboot at the shell prompt, or by power cycling the system.

Initial Log On

Once you have established the console connection, powered on the Acme Packet 4600 and a runtime image has been loaded, you are ready to login and begin configuring the system. After the Acme Packet 4600 has initialized, the ACLI login prompt appears in your terminal application as follows:

```
User Access Verification
Password:
```

If the Acme Packet 4600 completed booting before you connected to the console port, press the Enter key on the console keyboard a few times to activate the console connection.

1. Enter the string "acme" and press Enter to set the user account password.

```
Password:
%
% Only alphabetic (upper or lower case), numeric and punctuation
% characters are allowed in the password.
% Password must be 8 - 64 characters,
% and have 3 of the 4 following character classes :
%     - lower case alpha
%     - upper case alpha
%     - numerals
%     - punctuation
%
Enter New Password:
Confirm New Password:

Password is acceptable.


Notifications:
- No Valid License Present! (aid: 327702, tid: 2465)
- Product not initialized; Please use 'setup product' (aid: 327725, tid:
2465)
ORACLE>
```

From the User prompt you can view various configuration states and operating statistics on the Acme Packet 4600 and perform configuration tasks.

2. Type **enable** to enter Superuser mode.

```
ACMEPACKET> enable
Password:
```

3. Enter the string "packet" and press Enter to set the admin account password.

The system prompt will end with a pound sign instead of a closed-angle-bracket to let you know are in Superuser mode.

```
ACMEPACKET#
```

4. You can now begin configuring your Acme Packet 4600. Refer to the Configuration Guide to learn how to establish an IP address.

If you have any questions about booting or powering on your system, please contact customer support.

Formatting the Solid State Drive

After the initial log on to the device, you must format the Solid State Drive. Details on file system designs and the formatting procedure may be found in Chapter 9, *File System Maintenance* of the *Maintenance and Troubleshooting Guide* for your software release.

6
Maintenance

This chapter explains Acme Packet 4600 System hardware maintenance procedures. This chapter also provides hardware alarm information.

System Shutdown

Alhough several user-replaceable components of the Acme Packet 4600 are hot-swappable, some limited Acme Packet 4600 maintenance procedures require that you shut down the system.

Before you shut down or restart the Acme Packet 4600, ensure that there are no active calls in progress. The command to show active calls is "show sessions."

```
ACMEPACKET# show sessions
```

Procedures to reroute call and network traffic around the Acme Packet 4600 are outside the scope of this guide.

You can set the Acme Packet 4600 to reject all incoming calls from your system with the *set-system-state* command. When set to offline, this command lets calls in progress continue uninterrupted, but no new calls are admitted.

After all call processing has stopped, you can power off your Acme Packet 4600. Shutting down the system is appropriate when you are replacing a physical interface card, power supply, or are removing the Acme Packet 4600 from the equipment rack.

Rejecting Incoming Calls

To reject all incoming calls on the Acme Packet 4600 System:

1. In Superuser mode, type **show sessions** to see all the current calls.

    ```
    ACMEPACKET# show sessions
    ```

2. Type **set-system-state offline** and press <Enter>.

    ```
    ACMEPACKET# set-system-state offline
     Setting system state to going-offline, process will complete when all
    current calls have completed
     ACMEPACKET#
    ```

Shutting Down the Acme Packet 4600 System

To shut down the Acme Packet 4600 System hardware:

1. In Superuser mode, type halt and then press <Enter>.

2. To confirm the halt request, type Y and then press <Enter>.

3. When the console indicates shutdown is completed, unplug the AC power cords from the power supplies on the rear panel of the Acme Packet 4600.

4. Confirm that the graphic display is dark and all fans are off.

Rebooting, Resetting, and Power Cycling

Reboot

Rebooting the Acme Packet 4600 shuts down the system in an orderly fashion and then automatically restarts it. The operating system gracefully shuts down as processes are terminated and the file system is stopped. While the system and its processes are stopped, all call processing is immediately halted. You may therefore wish to perform tasks that call for a reboot during off-peak maintenance hours.

Rebooting the Acme Packet 4600 is required every time you upgrade with a new version of the Acme Packet 4600 software.

Save your configurations before rebooting the Acme Packet 4600. Refer to the *Maintenance and Troubleshooting Guide* for a full explanation of this procedure. The *save-config* command is used to save the configuration in the example below.

For a full explanation and all options for the *reboot* command used in the example below, refer to the *ACLI Reference Guide* .

To reboot the Acme Packet 4600:

1. Save any configuration changes you have made in the ACLI while in Superuser mode by typing **save-config** <Enter>.

```
ACMEPACKET# save-config
 Save-Config received, processing.
 waiting 1200 for request to finish
 Request to 'SAVE-CONFIG' has Finished,
 Save complete
 Currently active and saved configurations do not
 match!
 To sync & activate, run 'activate-config' or 'reboot
 activate'.
 ACMEPACKET#
```

2. Execute the reboot command at the Superuser prompt by typing reboot and then pressing <Enter>.

```
ACMEPACKET# reboot

---------------------------------------
WARNING: you are about to reboot this SD!
```

3. Type **Y** and then press <Enter> at the confirmation prompt to proceed with the reboot.

```
Reboot this SD [y/n]?: y
```

System Reset

Resetting the Acme Packet 4600 via the reset pushbutton on the front of the chassis performs a cold reboot. This action is the equivalent of disconnecting the power from the system and then reconnecting it. There is no orderly termination of tasks, and the system shuts down abruptly. You should only reset the Acme Packet 4600 when it becomes unstable and no other means of gaining administrative control is possible.

During a system reset, certain files are not closed properly, and they may become corrupted. If an unclean shutdown is detected, filesystem recovery/repair will be run to ensure the system returns to a stable state. Filesystem verification also runs every 30 boots as a precautionary measure.

> **Note:**
>
> Always try to first reboot the Acme Packet 4600 from the ACLI before performing a cold reset. Only reset the system as a last resort.

To reset the Acme Packet 4600:

- Insert a rigid paperclip-sized tool into the small hole on the front of the chassis beneath the graphic display. The system immediately resets and begins its initialization and boot sequence.

Power Cycling

Power Cycling the Acme Packet 4600 is the process of turning the chassis off and then on again. Unplugging the power cords from the power supplies means to remove power from the system. When power cycling, it is imperative that you wait at least 10 seconds between power down and power up to ensure that all components are completely powered down before restarting the system.

Standby State for HA Nodes

When performing hardware maintenance on the Acme Packet 4600, it is best to minimize any risk of interrupting network traffic or losing data. If the Acme Packet 4600s are configured as an HA node, you should only work on the Acme Packet 4600 that is in standby state.

There are two ways to determine the HA state of each Acme Packet 4600 in an HA pair.

1. If you are in the same physical location as the Acme Packet 4600 you can view the graphic display on the front panel. The display will indicate the HA state. A standby system displays (S) while an active system does not display (S).

2. If you are not in the same physical location as the Acme Packet 4600, you can use the ACLI *show health* command. The output of this command indicates the current HA state of the Acme Packet 4600.

Once you have determined that the Acme Packet 4600 due for maintenance is in standby state, you can continue with the appropriate procedures to replace a part.

If you need to perform maintenance on the active Acme Packet 4600 you need to manually force the two Acme Packet 4600s to switch HA states. Forcing a switchover renders the currently active Acme Packet 4600 in Standby state, and the current standby Acme Packet 4600 will assume all traffic processing and forwarding as the active system.

> **Note:**
>
> This procedure is only applicable to Acme Packet 4600 in an HA deployment.

To force a Acme Packet 4600 into the standby HA state:

1. Confirm that the relevant Acme Packet 4600 systems on active and standby are synchronized with the show health command. Type **show health** and press <Enter> on

each system as shown in the following.
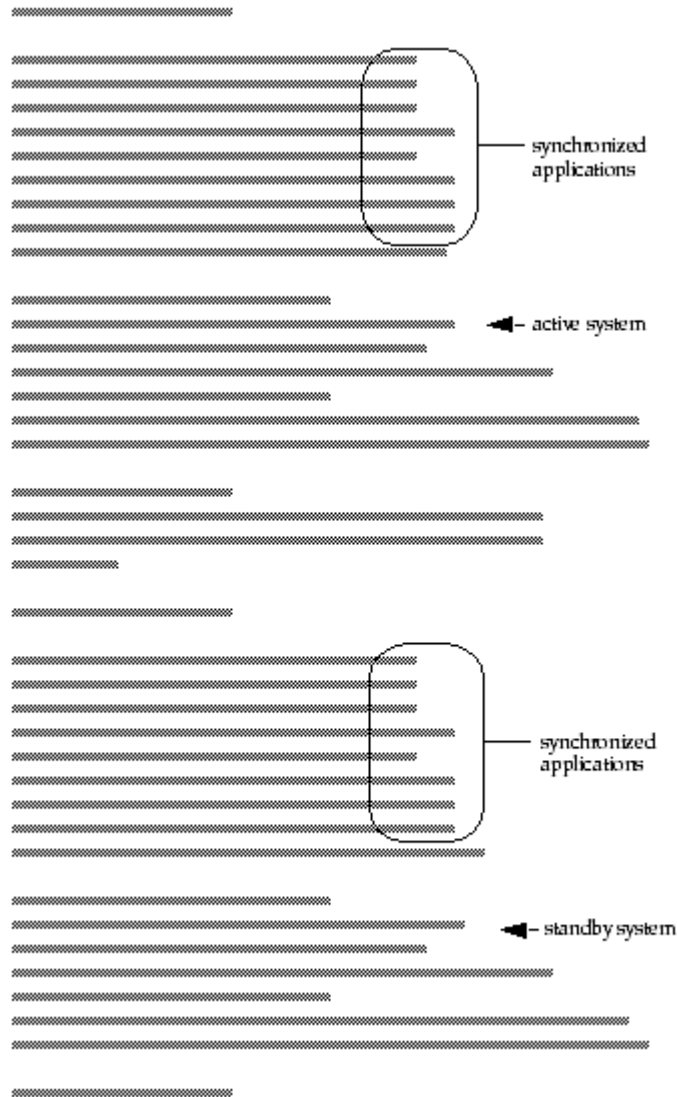
2. Confirm that current configurations of both the active and standby Acme Packet 4600 match by typing **display-current-cfg-version** and press <Enter> at the ACLI prompt.

```
NETNETSBC1# display-current-cfg-version
 Current configuration version is 5
 NETNETSBC1#
 NETNETSBC2# display-current-cfg-version
 Current configuration version is 5
 NETNETSBC2#
```

> **Note:**
>
> While the two current configuration version numbers on the two systems do not need to match each other, they MUST match the shared running configuration version.

3. Confirm that running configurations of the active and standby Acme Packet 4600 match by typing **display-current-cfg-version** and press <Enter> at the ACLI prompt.

```
NETNETSBC1# display-running-cfg-version
Running configuration version is 5
NETNETSBC1#
NETNETSBC2# display-running-cfg-version
Running configuration version is 5
NETNETSBC2#
```

> **Note:**
>
> While the two running configuration version numbers on the two systems do not need to match each other, they MUST match the shared current configuration version.

4. Initiate a switchover between active and standby Acme Packet 4600s by typing **notify berpd force** on the standby Acme Packet 4600 and then pressing <Enter> at the ACLI prompt.

```
NETNETSBC1# notify berpd force
```

5. Wait for the other Acme Packet 4600 to transition to the standby state. Confirm that it is in the standby state by typing **show health** and pressing <Enter> at the ACLI prompt.

```
NETNETSBC2# show health
```

Refer to the Upgrade section of the *Maintenance and Troubleshooting Guide* (400-0063-40A) for more information.

Replacing an NIU in an HA Node

When replacing the NIU in an HA node, refer to the following procedure:

1. Prepare all equipment connected to the NIU for the NIU's removal from the network.
2. Force the system into standby state.
3. Remove the NIU as described in this document.
4. Log in to the ACLI via a console connection.
5. Reboot the system from the ACLI.

When this Acme Packet 4600 returns online, it will synchronize its HA state with the active HA node using the new NIU. You can confirm the system state by using the *show health* command.

Chassis Removal

This section explains how to remove the Acme Packet 4600 from an equipment rack. To prevent injury, Acme Packet recommends that any time a Acme Packet 4600 is installed or removed from an equipment rack, two people complete the procedure.

> **Note:**
>
> You must first review the safety precautions for the Acme Packet 4600 prior to removing from an equipment rack.

> **Note:**
>
> Always disconnect the Acme Packet 4600 power supplies from the power source when removing a chassis from an equipment rack

Removing the Acme Packet 4600 System from an Equipment Rack rack

To remove the Acme Packet 4600 from an equipment:

1. Set the System Power switch to the Stby position to cut off power to the Acme Packet
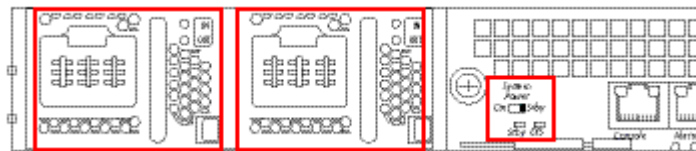
   4600.

2. Remove the two power cords from the power supplies in the rear of the system. (There are no on/off switches on these power supplies).

3. Remove all power cables from the Acme Packet 4600.

4. Remove and label all attached network cables, alarm cable, and console cables from their respective ports on the chassis.

5. Loosen the thumbscrews that secure the Acme Packet 4600 to the equipment rack slide rails. This may require using a #2 Phillips screwdriver.

> **Note:**
>
> Beginning in this step, one person should support the Acme Packet 4600 from below while the other person removes the system chassis from the equipment rack.

6. Pull the Acme Packet 4600 forward and out of the equipment rack.

7. When mounted in slide rails, the chassis will stop when the locking clip pin on the chassis slide rail engages with the equipment rack slide rail.

8. Push on the locking clip pin and locking clip latch to unlock the slide rails from each other.
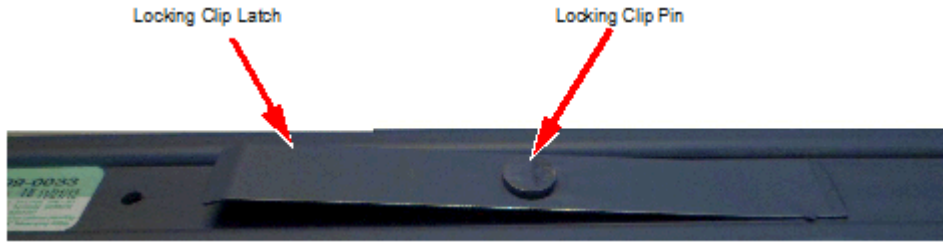
9. Remove the chassis completely from the slide rails.

10. Lift the Acme Packet 4600 out of the equipment rack, and move it to an ESD-safe location.

Power Supply Removal and Replacement

This section explains how to remove and replace the power supplies in the Acme Packet 4600 chassis.

> **Note:**
>
> After physically unplugging a power supply, disconnect it from the power source before you remove or install it in the chassis.

The power supply is a user-replaceable component. If an Acme Packet 4600 power supply malfunctions, you should remove the malfunctioning power supply and replace it.

> **Note:**
>
> Power supplies can be removed from the chassis while it is still installed in the rack and while the second power supply is providing system power; this is called a warm swap.

> **Note:**
>
> When removing and replacing a power supply, remember to first ground yourself using appropriate ESD grounding equipment such as a wrist strap.

To remove a power supply from the Acme Packet 4600 chassis:

1. Remove the power cables from the power supplies.
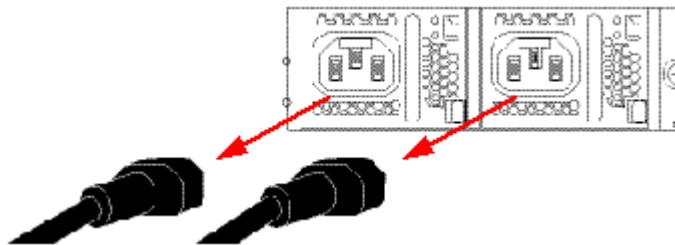
2. With your thumb, push the grey locking tab to the left to unlock the power supply from the
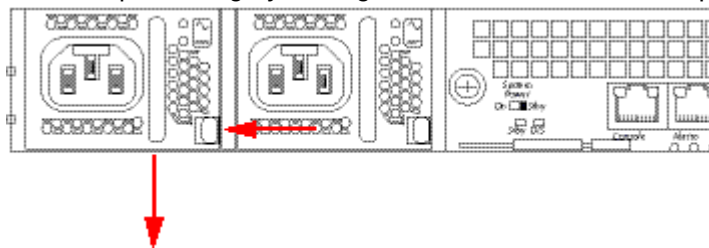
chassis.

3. Holding the handle, pull the power supply towards you. This will disengage the power supply from the midplane and the chassis.

4. Continue pulling the power supply towards you until it is completely out of the chassis.

5. Move the power supply to an ESD-safe location.

> **✎ Note:**
>
> NEVER power up a power supply before it is installed in the Acme Packet 4600 chassis.

6. Ground yourself with an ESD wrist strap before installing a power supply.

Installing a Power Supply

To install a power supply in the Acme Packet 4600 chassis:

1. Locate the power supply to be installed.

2. Locate the empty power supply slot in the chassis.

3. Insert the power supply into the empty power supply slot located on the rear panel of the Acme Packet 4600 chassis. The labels on the power supply face upward.
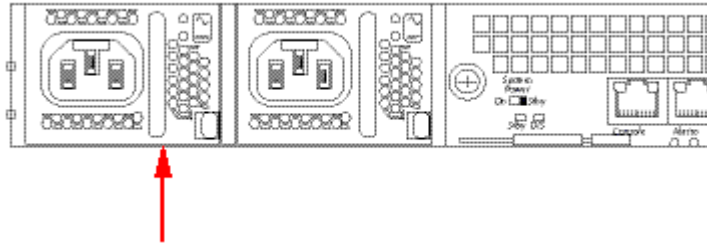
4. Push the power supply handle until the power supply is engaged with the mid plane.

5. The power supply is installed in the Acme Packet 4600 chassis.
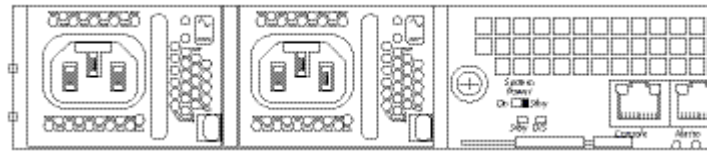
6. Connect the power cord to the inserted power supply.

NIU Removal and Replacement

Prior to removing an NIU (Network Interface Unit), the platform in which it is installed must be in standby state if it is part of a HA pair before powering down the chassis and removing the NIU. The following procedure describes how to remove an NIU.

> **Note:**
>
> Make sure you are properly grounded with an ESD strap before removing the NIU.

NIU Removal

To remove an NIU:

1. If the target Acme Packet 4600 is part of a HA pair, ensure that it is in standby state. For more information, see See Standby State for HA Nodes.

2. Set the System Power Switch to STBY to power down the chassis. See See DC Power Supplies (left) and System Power Switch (right).

3. Unplug all network and management cables from the NIU you plan to remove from the Acme Packet 4600.

> **Note:**
>
> This will cause a link loss on all connections.

4. Using a #2 Phillips screwdriver or your hands, unscrew the two captive thumbscrews located on each side of the NIU. The screws are spring-loaded and will push forward, but

they will not fall out of the NIU.
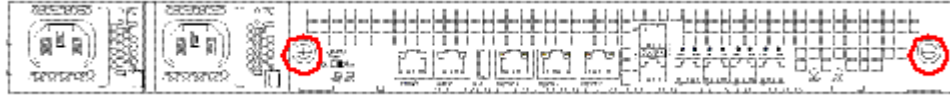
5. With thumb and index finger slide ejector levers inward prior to pivoting ejectors.

> ✎ **Note:**
>
> Failure to follow this step may cause damage to the NIU ejectors:

6. Slide the lever catch and pivot the two ejection levers outward at the same time, pulling the card out of its connection to the motherboardand away from the system chassis. This action disengages the NIU from the system, severing all electrical contact to the processing unit.
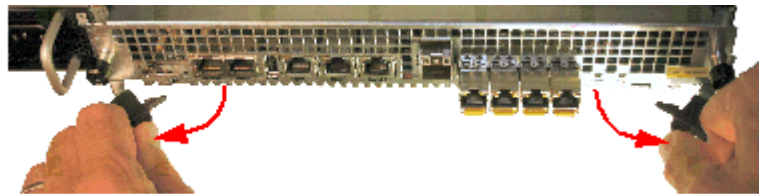
7. Remove the loosened NIU out of the Acme Packet 4600 by holding and pulling on each side of the NIU's front panel.

8. Place the NIU in an antistatic bag while it remains outside of the Acme Packet 4600 System chassis.

NIU Installation

To install an NIU into the Acme Packet 4600 chassis:

1. Locate the NIU.

2. Ensure that the ejection levers on the front of the card are in the open and extended position.

3. Hold the NIU by its sides with the front panel bezel facing you.

4. Note the two flared guide rails that the NIU rides as it is inserted into the Acme Packet 4600. The guide rails lead the NIU to engage with the bus connector squarely.
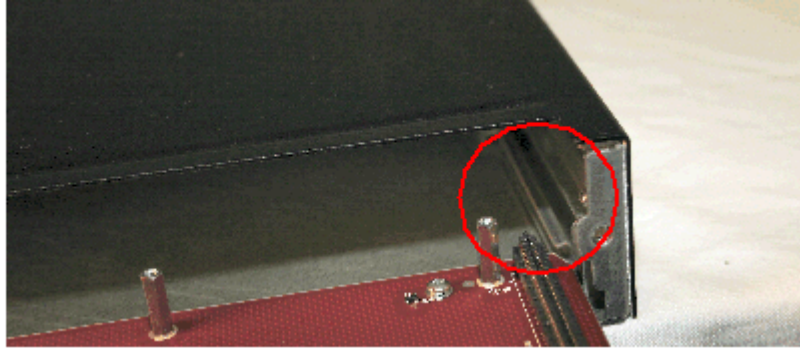
5. Slide the card into the Acme Packet 4600. The physical interface card circuit board slides into the guide rails in the NIU bay of the system chassis.
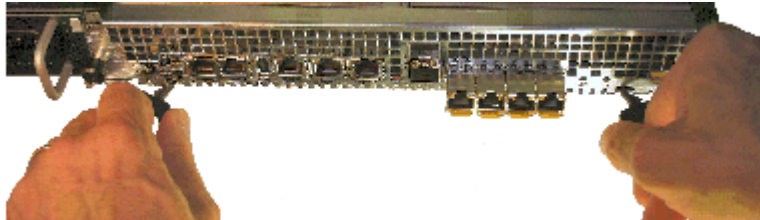
6. Continue sliding the card into the chassis until the ejection levers meet the chassis and start to fold inward as the NIU is inserted into the chassis.

7. Fold both ejection levers inward toward the card to complete the NIU connection to the motherboard. Pushing the ejection levers inward draws the physical interface card toward the system chassis and completes the connection.
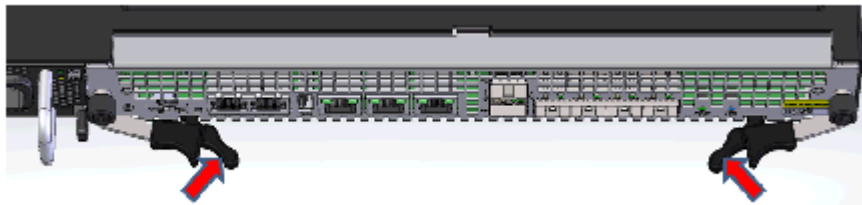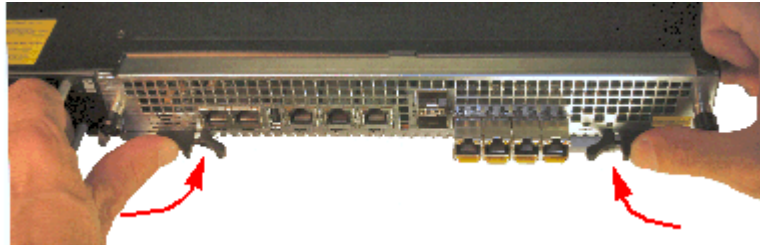
Ensure pressure is applied to the ends of the ejector (not the sliding section) when seating the NIU/TCU.

8. Verify the lever catch is fully engaged with the bezel.

9. Screw the NIU into the chassis with a #2 Phillips screwdriver. This creates the final connection between the interface unit and the chassis.
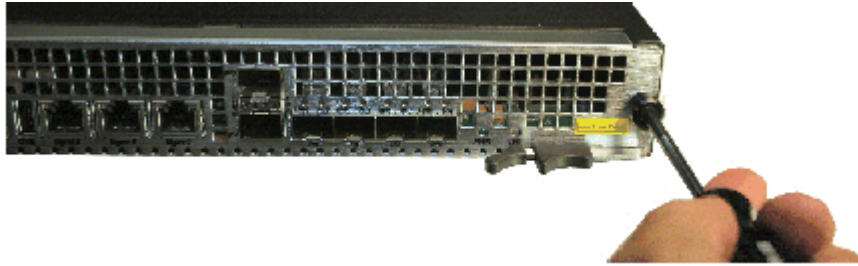
10. Replace all network and management cabling.

11. Set the System Power switch to ON to power up the chassis. The system boots up.

12. If the H/S LED lights in either a steady or flashing state, the NIU is not seated properly. If the H/S LED is lit, follow these steps:

a. Set the System Power switch to STBY to power down the chassis.

b. Push the ejection levers inward to draw the physical interface card toward the system chassis and complete the connection. The latches must engage to complete NIU insertion and lock to the chassis.

c. Set the System Power switch to ON to apply power to the chassis. The system boots up.

d. When the NIU PWR LED lights and the H/S LED is extinguished, proceed with normal operations. Otherwise, contact customer support for further assistance.

Replacing the SSM3 Module

The SSM3 module that provides TLS security functionality to the Acme Packet 4600 is installed on the NIU PCB as shown below. There is a single connector located on the edge of the NIU into which the SSM3 module plugs; this connector supports one side of the module while the other side of the SSM3 module rests on four standoff posts.

Pre-Installation Guidelines

Please read and follow these pre-installation guidelines prior to replacing the SSM3 module:

• The SSM3 module can be installed only in the designated location.

• Note the installation location of the SSM3 module on the NIU PCB.

• Ground yourself and follow proper ESD grounding procedures.

• Remove the SSM3 from the shipped packaging.

• Install the SSM3 according to the procedure below.

• This upgrade should be performed during low-traffic periods or during times of scheduled maintenance.

• Follow industry-standard procedures to ensure ESD protection.

• When installing or removing an NIU card, move the card to an ESD-safe location.

> **✎ Note:**
>
> Before handling a Acme Packet 4600 Transcoding NIU card, follow the proper ESD grounding procedures. Failure to do so could damage the NIU card and its components.

Required Parts

The following parts are required to replace the SSM3 module:

- ESD wrist strap
- ESD safe location
- SSM3 Module
- NIU Card

Removing the SSM3 Module

The following procedure describes how to remove the SSM3 module located on the Acme Packet NIU card.

Prerequisites:

- Provide an ESD-safe location to place the SSM3 and NIU card.
- Wear an ESD wrist strap or take similar equivalent actions to prevent static damage to the NIU card or other ESD-sensitive components.
- Note the location of the SSM3 module connector on the NIU card.
- #2 Phillips screwdriver

1. Remove the NIU card as directed in this guide.
2. Place the NIU card on an ESD-safe mat or other similar location.
3. Using the Phillips screwdriver, remove the four standoff screws from the SSM3 module and
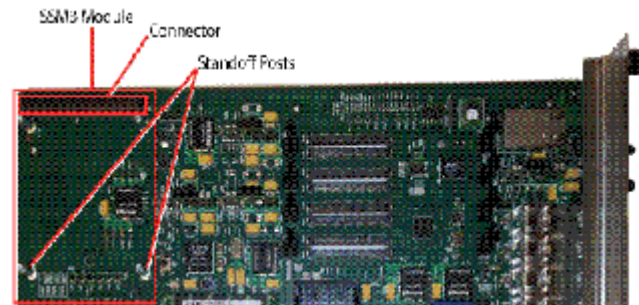
   store them for later reuse.
4. To remove the module (shown below), grasp the SSM3 module along either side of the connector between your thumb and index finger and pull up on one side of the connector until the module is fully disconnected from the connector. Place the module on an ESD-

   safe surface.
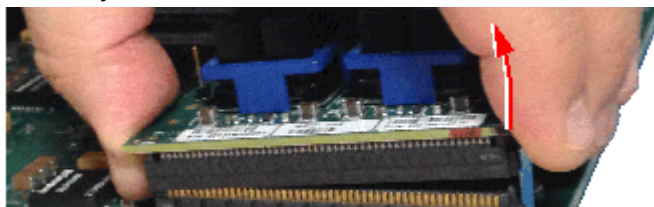
Installing the SSM3 Module

The following procedure describes how to install the SSM3 module onto the Acme Packet NIU card.

Prerequisites:

*   Wear an ESD wrist strap or take similar equivalent actions to prevent static damage to the NIU card or other ESD-sensitive components.

*   Place the new SSM3 module in an ESD-safe location.

*   Note the location of the SSM3 module connector on the NIU card.

*   #2 Phillips screwdriver

*   Standoff screws (stored after removing the SSM3 module or available with the new SSM3 module)

1. Grasp the SSM3 module along either side of the connector between your thumb and index finger and join the module connector to the NIU connector by pressing evenly across the connector until the module is fully seated (see below).
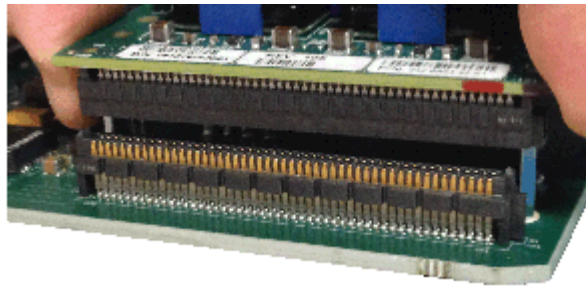
2. Press evenly across the top of the connector to fully seat the SSM3 module on the NIU PCB as shown below. Note that the SSM3 is fastened to the connector at one end while at the other end, the board rests on two standoffs attached to the NIU as shown in the figures
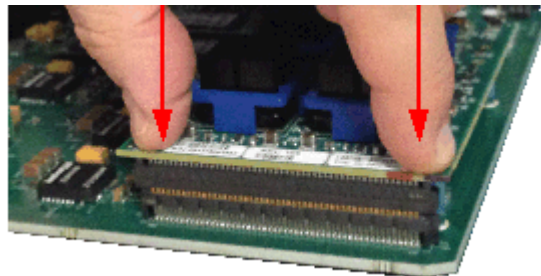
    below.

3. Using the Phillips screwdriver, insert and tighten the four standoff screws to secure the SSM3 module to the PCB.

4. Replace the NIU in the Acme Packet 4600 chassis.
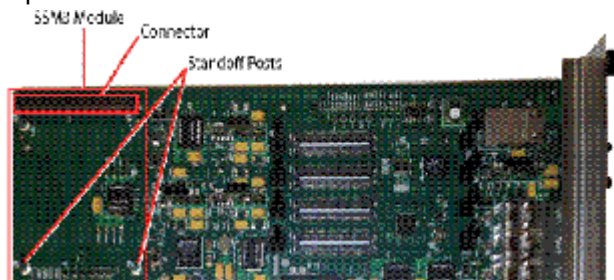
Replacing Transcoder DSP Modules

Up to twelve transcoder DSP modules that provide transcoding functionality to the Acme Packet 4600 are installed on the NIU printed circuit board in slots 0 through 11.

> **Note:**
>
> Never remove the heatsink from the transcoder DSP modules.

There are slots for installing the transcoder DSP modules in two locations on the PCB (two groups - the first of eight slots, and the second of four slots- See Figure 6 - 122). Transcoder DSP modules should be installed consecutively in numerical order, starting with slot 0.
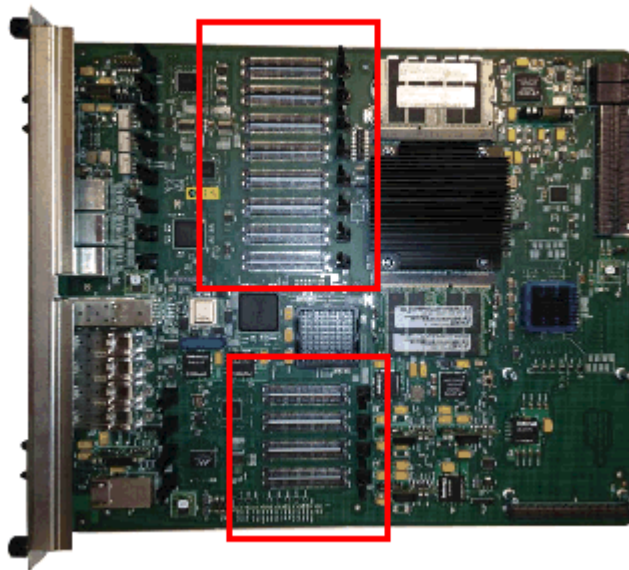
Installation and Removal Guidelines

Please read and follow these guidelines prior to installing or removing the transcoder DSP module:

- The transcoder DSP module can be installed only in the designated location.
- Note the installation locations of the transcoder DSP modules on the NIU PCB.
- Ground yourself and follow proper ESD grounding procedures.
- Remove the transcoder DSP module from the shipped packaging.
- Remove and install the transcoder DSP module according to the procedures below.

- The installation of these modules should be performed during low-traffic periods or during times of scheduled maintenance.
- Follow industry-standard procedures to ensure ESD protection.
- When installing or removing an NIU card, move the card to an ESD-safe location.

> **Note:**
>
> Before handling a Acme Packet 4600 NIU card, follow the proper ESD grounding procedures. Failure to do so could damage the NIU card and its components.

Required Parts

The following parts are required to replace the transcoder DSP module.

- ESD wrist strap
- ESD-safe location
- Transcoder DSP module
- NIU Card

Removing the Transcoder DSP Module

The following procedure describes how to remove the transcoder DSP module from the NIU PCB.

Prerequisites:

- Provide an ESD-safe location to place the transcoder DSP module and NIU card.
- Wear an ESD wrist strap or take similar equivalent actions to prevent static damage to the NIU card or other ESD-sensitive components.
- Note the location of the transcoder DSP module connector on the NIU card.

1. Remove the NIU card as directed in this guide. See See NIU Removal and Replacement.
2. Place the NIU card in an ESD-safe location.
3. To remove the module (as shown in the photos below), use a fingertip to release the catch holding either end of the transcoder DSP module.
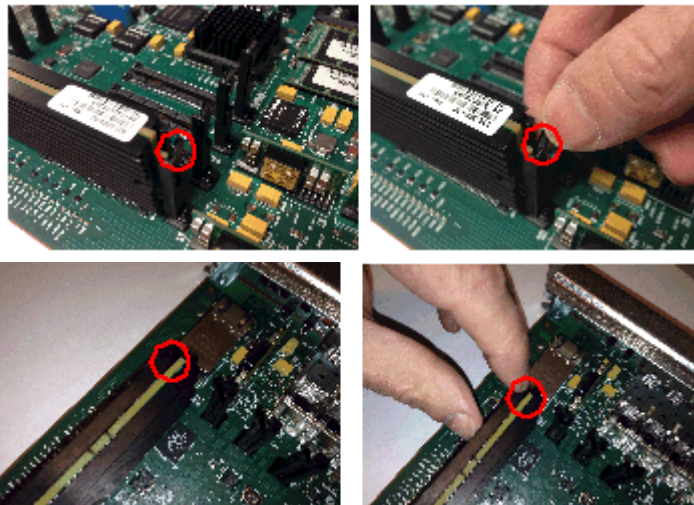
4. Once the fasteners are detached from both sides of the transcoder DSP module, hold the center of the module between your finger and thumb and slowly remove the module. Be careful to keep the module level while removing it and guide it smoothly through the guide
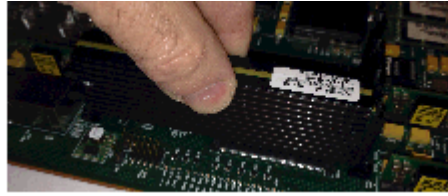
slots on either side.

5. Place the transcoder DSP module on an ESD-safe antistatic surface.

Installing the Transcoder DSP Module

The following procedure describes how to install the transcoder DSP module onto the NIU PCB.

Prerequisites:

• Place the new transcoder DSP module in an ESD-safe location.

• Wear an ESD wrist strap or take similar equivalent actions to prevent static damage to the NIU card or other ESD-sensitive components.

• Note the location of the transcoder DSP module connector on the NIU card.

1. Grasp the transcoder DSP module between your thumb and index finger and line up both sides of the module with the slot guides attached to the NIU PCB (see below).
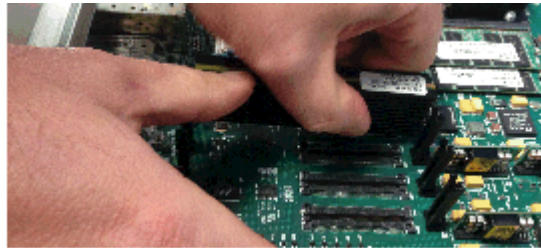
2. Using your thumb on your other hand, guide the module evenly into the slot guides located on each side as you lower the component into the connector. Press evenly across the top of the connector to fully seat the transcoder DSP module on the NIU PCB as shown below. Note that the module is fastened to the connector at one end while at the other end, the board rests on two standoffs attached to the NIU as shown in the figures below.
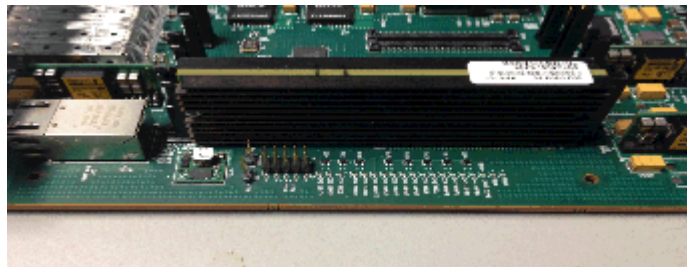
Upgrading or Replacing a Solid State Drive

This section explains how to upgrade or replace the Solid State Drive (SSD) in your Acme Packet 4600. The SSD upgrade or replacement order consists of the drive itself with mounting brackets and 4 pan head screws (M3 x 5mm) attached.

Installation Tools and Parts

The following tools and parts are required to install a Solid State Drive in your Acme Packet 4600:

- Solid State Drive
- #1 Phillips-head screwdriver
- #2 Phillips-head screwdriver
- ESD wrist strap
- Cable labels

Pre-removal

Perform the following logical and physical preparations before you remove the Solid State Drive (SSD) from your Acme Packet 4600.

Removing the Logical System from the Network

Be mindful of all systems and network entities that may be affected by removing an Acme Packet 4600 from your network. In addition to routing calls around the Acme Packet 4600, you must also prepare network monitoring and health systems to accommodate the loss of a network element.

Specific procedures for removing the Acme Packet 4600 from your network may be found earlier in this document.

Removing the Physical System from the Equipment Rack

After logically removing the Acme Packet 4600 from your network, the following procedures must be completed before you can replace the SSD. These are:

- Disconnection of all media network, management network, alarm and console cabling from the Acme Packet 4600
- Disconnection of all power and ground system cabling
- Removal of the Acme Packet 4600 from the equipment rack

Removing the Data Cabling

Labeling all existing data cables will ease reconnecting the Acme Packet 4600 to the network.

1. Label each cable noting which port on the Acme Packet 4600 it connects to.
2. Attach the appropriate label to each cable. Remember to label all media network cables , maintenance cabling, and console and alarm cables.
3. Disconnect all data cables from the Acme Packet 4600.

Removing Power and Ground Cabling

Take care in removing power from the Acme Packet 4600. Refer to the Safety chapter in this document for complete safety guidelines.

The following is an overview of the power and ground cabling removal process:

- Shut off power to the Acme Packet 4600 at the circuit breaker or power source.
- Remove the power cable(s) from the Acme Packet 4600's power supplies.
- Unscrew the two kep nuts that secure the grounding cable lug to the Acme Packet 4600.

- Remove the ground cable. Put the kep nuts in a safe place.

Removing the Chassis

The Acme Packet 4600 is heavy, and personal injury can result while removing and installing the chassis in an equipment rack. To prevent injury or damage to the Acme Packet system, follow these guidelines:

> **✎ Note:**
>
> To prevent personal injury, we recommend that two people lift and install the chassis into the equipment rack.

Follow your organization's best practices for lifting and installing heavy components into an equipment rack.

Ensure that the Acme Packet 4600 remains supported as you remove it from the equipment rack.

The following is an overview of the chassis removal process. Please refer to the procedure earlier in this chapter for detailed instructions

- Use a workbench or other supportive surface, and place it nearby to set the Acme Packet 4600 on after it is removed from the equipment rack.
- Support the chassis before and while removing it from the equipment rack.
- Remove the Acme Packet 4600 from the rack. The number of points to unscrew depends upon whether the Acme Packet system is installed in a front- or center-mount configuration.
- Place the chassis on a workbench.

Removing Hardware in Center-Mount Configurations

The rack ears must be removed before you can open the chassis.
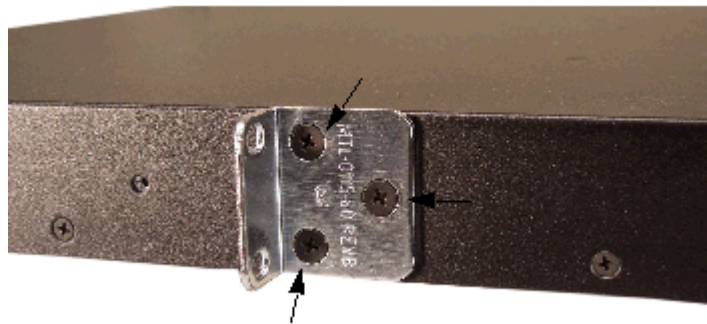
To remove center-mount equipment rack hardware:

1. Remove the left rack ear by using a #1 Phillips-head screwdriver.
2. Remove the right rack ear by unscrewing the three screws.
3. Set the rack ears and screws aside.

Removing Hardware in Front-Mount Configurations

The chassis slides and rack ears must be removed before you can open the chassis.

To remove front-mount equipment rack hardware:

1. Remove the left chassis slide by using a #2 Phillips-head screwdriver.

2. Remove the left rack ear by unscrewing the three screws.
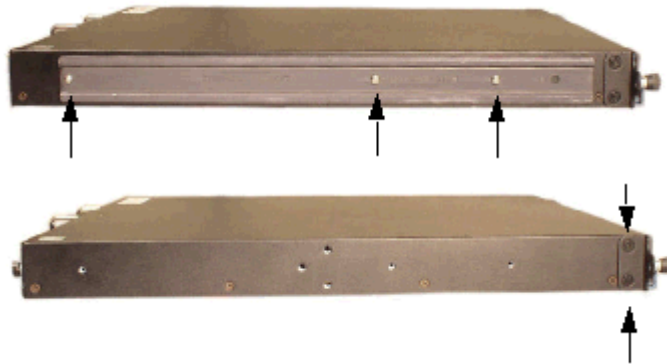
3. Remove the the two countersunk screws on the left rear side by using a #1 Phillips-head screwdriver.

4. Repeat steps 1 - 3 on the right side of the Acme Packet 4600.

5. Set the rack ears and screws aside

Opening the Chassis

The chassis lid is secured to the chassis by 15 screws. Remove the screws and lift the chassis lid off the chassis.

> **Note:**
>
> Before opening the Acme Packet 4600, ground yourself using an ESD wrist strap or other comparable grounding system. Failure to do so could damage the Solid State Drive and the Acme Packet 4600.

> **Note:**
>
> Use a #2 Phillips-head screwdriver for all chassis cover and side screws.

ORACLE®

1. Unscrew the four countersunk screws on each side of the Acme Packet 4600 that hold the

LEFT SIDE

RIGHT SIDE

chassis cover to the chassis.

REAR   FRONT
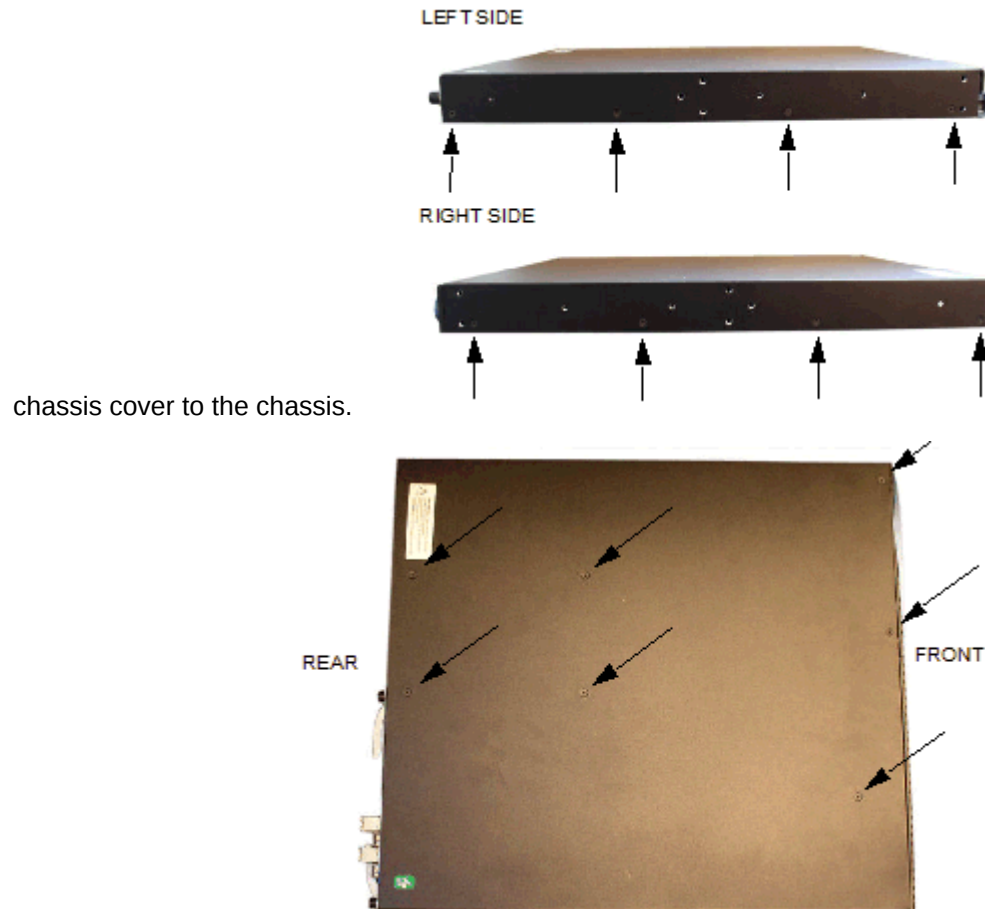
2. Set these screws aside.

3. Unscrew the seven countersunk screws on the top of the Acme Packet 4600 that hold the chassis cover to the chassis. The following is an image of the top of the chassis.

4. Set the lid and screws aside.

5. Lift the chassis lid off of the chassis and set aside.

Removing and Replacing the Solid State Drive

> **Note:**
>
> Before handling the Solid State Drive, ground yourself using an ESD wrist strap or other comparable grounding system. Failure to do so could damage the Solid State Drive or the Acme Packet 4600.

Identifying the Solid State Drive

Once the Acme Packet 4600 is open, replacement is straightforward. The Solid State Drive (SSD) attaches electrically to the Acme Packet 4600 motherboard by a standard 2.5" SATA connector. In addition, it is secured to the motherboard by four screws.

The SSD is located at the front of the motherboard, on the left side as you view it from the rear of the chassis. The SSD has brackets on each side, with four screws attaching it to the

motherboard.
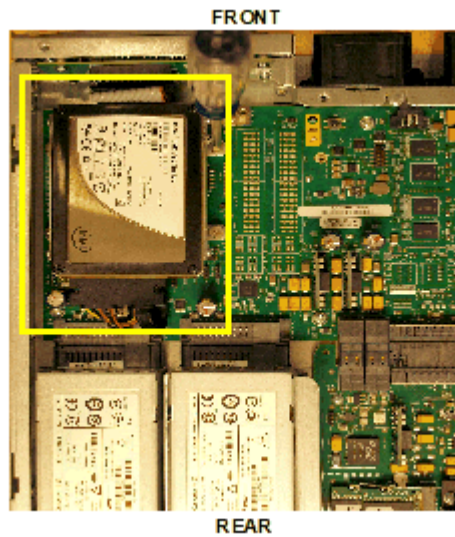
1. Identify the four screws that attach the SSD to the motherboard.

2. Identify the SATA connector attached to the SSD.
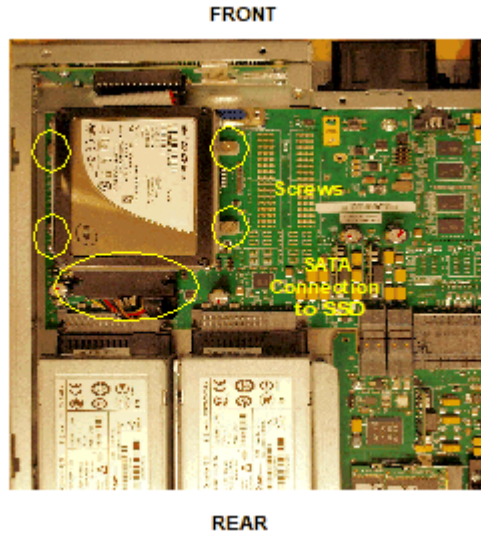
3. Using a number 1 Phillips screwdriver, unscrew the four screws attaching the SSD to the motherboard.

4. Hold the SSD in one hand, and the SATA connector in the other, and gently disconnect the two. Note that the SATA cable should remain attached to the motherboard.
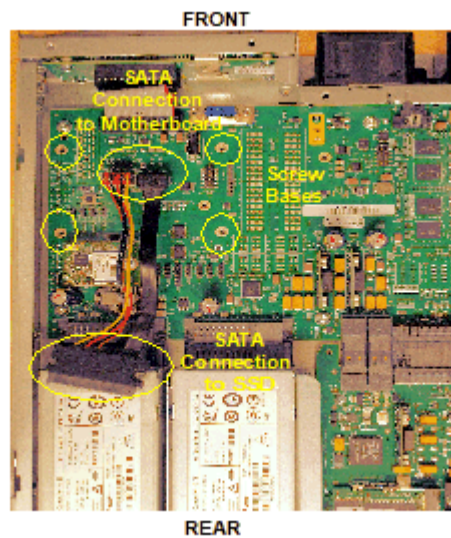
Replacing the Solid State Drive

1. Exchange the current SSD for the replacement, then re-attach the SSD to the SATA cable. The connector is keyed, so make sure the gap in the connector is lined up with the key in the SSD.

2. Push down on the part of the SATA connecter attached to the motherboard to check to make sure the SATA cable is seated properly to the motherboard.

3. Line up the screw mounts on the SSD with the screw bases, and tighten the screws. Be careful not to over-tighten the screws.

Postinstallation

After the Solid State Drive has been installed in the Acme Packet 4600, you can close the chassis and reinstall it in the equipment rack.

Attaching the Lid

Use a #2 Phillips-head screwdriver for all chassis cover and side screws.

1. Set the lid on top of the Acme Packet 4600 chassis. The stickers are positioned at the chassis rear.

2. Screw the eight countersunk screws into the top of the Acme Packet 4600 to secure the chassis cover to the chassis. The following is an image of the top of the chassis without
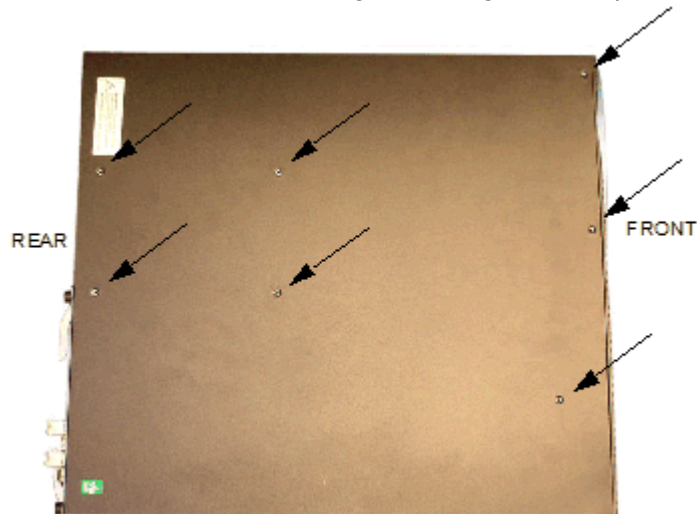
any screws.

3. Continue securing the chassis lid with four screws on each side.
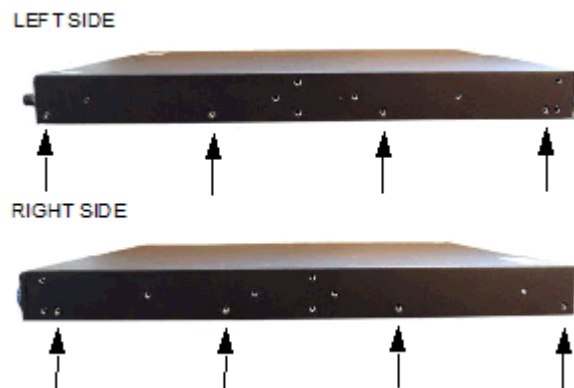
Installing the Chassis in the Rack

Perform the reverse of the operations in the Physical System Removal section of this document.

Please refer to earlier sections of this document for full rack installation procedures.

Validating the SSD

Oracle recommends that you validate the Solid State Drive installation by running Acme Packet Session Director diagnostics. All versions from nnCX_diags110.gz and later include the appropriate tests for validating the SSD. Please refer to the diagnostics documentation for more information. In the following procedure, after booting into diagnostics, this preliminary check ensures that the system recognizes the Solid State Drive.

```
Password: ******



-> dc
/boot/  - Volume is OK
243 MB

/code/  - Volume is OK
245 MB
/sata/  - Drive Present
476940 MB

Starting Diagnostic Executive...
Comm Express MCH 945 Present.
AHCI Support is Enabled.

Acme Packet Net-Net 4600
Diagnostic Executive Version 1.10
Creation date: Nov 25 2014 11:08:02
Board Level Diagnostics
Date & Time: TUE NOV 25 14:56:01 2014


[diag_proc] ->
```

Formatting the SSD

After installing the Solid State Drive, you must format it. Details on file system designs and the formatting procedure may be found in Chapter 9, File System Maintenance of the Maintenance and Troubleshooting Guide for your software release.

Fan and Air Filter Maintenance

This section explains how to remove a fan and replace the air filter on your Acme Packet 4600.

Removing and Replacing Individual Fans

The individual fan is a user-serviceable, hot-swappable component. There are five individual fans in the Acme Packet 4600. If the Acme Packet 4600 experiences a fan malfunction, you must remove the existing fan and replace it with a functional one.

The hot-swappable fan removal and replacement procedures require that you have a replacement fan on hand. In order to maintain system operations, you must be able to remove

the malfunctioning fan and quickly replace it with a functioning one to prevent the system from overheating.

The Acme Packet 4600 air filter is located behind the front bezel and is a Field Replaceable Unit (FRU).

> **✎ Note:**
>
> An over temperature condition can stop packet processing.

If you do not have a replacement fan nearby, always shut down the system and disconnect the power before removing the malfunctioning fan to replace at a later time.

When removing and replacing a fan, remember to first ground yourself using appropriate ESD grounding equipment such as a wrist or heel strap.

To remove a fan:

1. Press two fingers against the left end of the plastic fan bezel and pull it directly toward you. The fan bezel comes off the chassis. Set the fan bezel aside. The individual fans are now
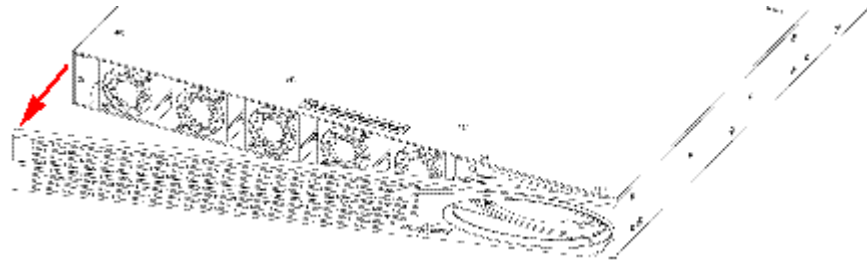
   exposed.

2. Using a small bladed screwdriver, unscrew the two captive screws at each upper left and lower right corners of the individual fan you are replacing.

3. Pull the individual fan you just unscrewed directly toward you, out of the chassis. Move the fan to an ESD-safe location.
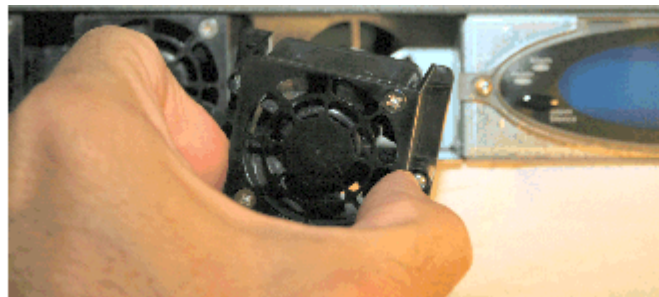
Install Individual Fans

To obtain a replacement fan, contact customer support.

Replacing the fan is the reverse process as removing it.

To install a fan:

> ✎ **Note:**
>
> The power connector should be on the lower side of the module when inserted into the Acme Packet 4600 chassis.

1. Carefully align the pins on the back of the fan with the holes in the chassis midplane and install the fan into the slot.
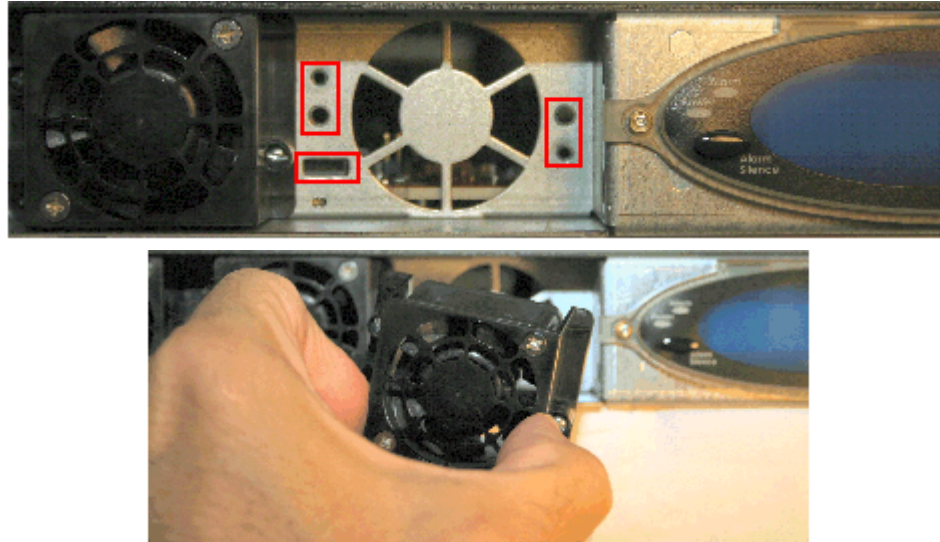
2. Using a small bladed screwdriver, tighten the two captive screws to hold the fan into place.
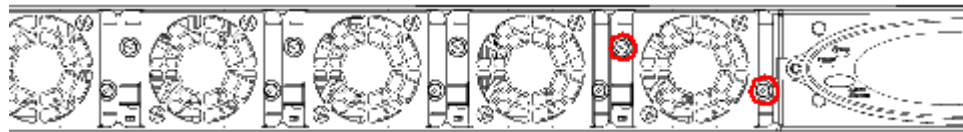
3. Install the front bezel onto the Acme Packet 4600 by hooking the right side of the bezel onto the chassis and then pivoting the bezel to the left until the magnet catches the chassis. You may need to push on the left side of the display opening to fully seat the

To Seat the Bezel
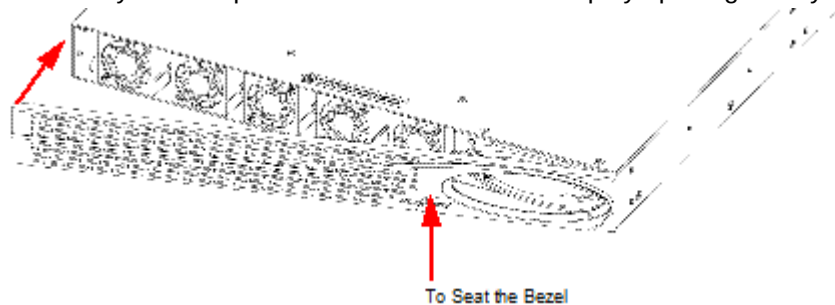
bezel.

4. The replacement fan and Bezel are installed onto the Acme Packet 4600.

Maintaining the Cooling Components

The Acme Packet 4600 air filter removes airborne particles before they are drawn into the Acme Packet 4600 chassis. To prevent system malfunction and prolong the life of the system's cooling components, do these things:

- Replace the fan filter every three months

- Clean the air inlets once a week.

Cooling maintenance encompasses cleaning the fan module and cleaning the air inlets on the front of the Acme Packet 4600 chassis. Cleaning the fan module requires that you remove the module itself. If you are not shutting down the Acme Packet 4600, this procedure must be performed quickly or else the system may overheat and cause packet processing to stop.

This maintenance should be performed alongside other preventive maintenance to take place within a planned maintenance or downtime window, during off-peak hours.

Cleaning the Cooling Components

To clean the fan module:

1. Remove the fan module from the chassis.

2. Spray compressed air into the fan module to dislodge and blow away any contaminants and clean out the fans.

3. Replace the fan module.

4. To clean the perforated air inlets: Remove the bezel from the chassis by gripping the two corners and pulling on it. The bezel is held on magnetically.
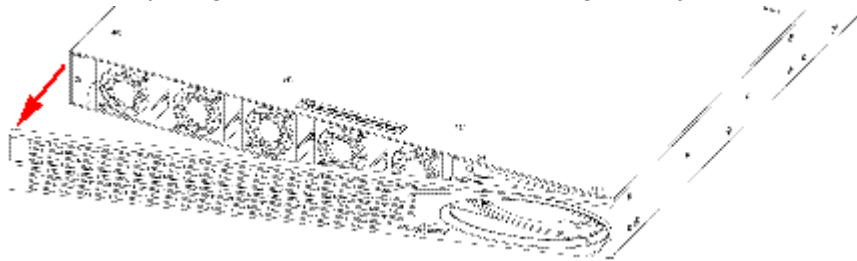
5. Place the bezel face down.

6. On the back of the bezel, pull off the air filter.
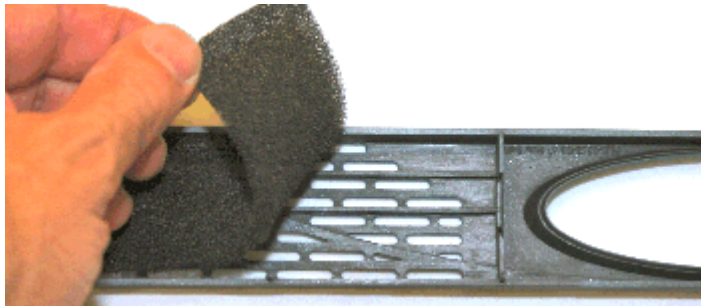
7. Replace the air filter with a new one. Do not reuse the worn air filter.

8. Gently wipe the front fan bezel that contains the perforated air inlets with a clean, dry cloth. You can alternatively remove the fan bezel from the system and use compressed air to clean out the perforated air inlets.

9. Install the air filter carefully in place behind the front bezel.
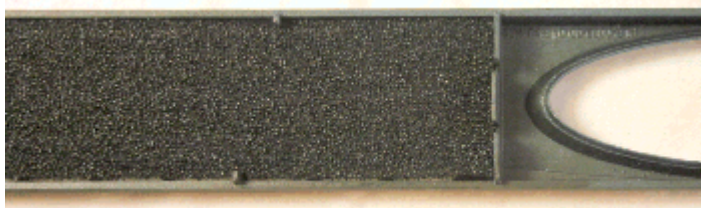
> **Note:**
>
> Only the removable fan bezel has vent holes that require cleaning.

> **Note:**
>
> To prevent damage to the painted finish, do not use any solvents or liquids to clean the perforated air inlets on the front of the chassis.

10. Install the front bezel onto the Acme Packet 4600 by hooking the right side of the bezel onto the chassis and then pivoting the bezel to the left until the magnet catches the chassis. You may need to push on the left side of the display opening to fully seat the

To Seat the Bezel

bezel.
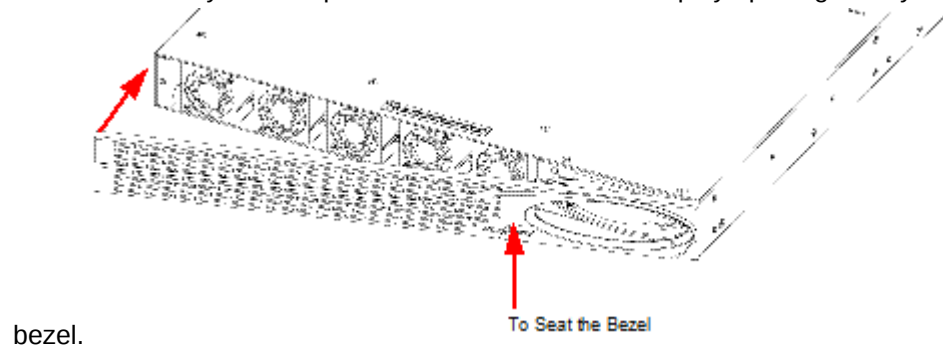
Optical Transceiver Removal and Replacement

Your troubleshooting and diagnostics might reveal that the optical transceiver component of an optical physical interface card needs to be replaced. The optical transceiver serves two functions:

- Converts electrical signals into optical signals used to communicate with other optical networking equipment.
- Serves as the receptacle for the LC duplex fiber optic connectors.

Optical transceivers are hot swappable and may be replaced while the Acme Packet 4600 is powered on. Leave the NIU installed in the Acme Packet 4600 as you extract the optical transceiver.

To obtain a replacement optical transceiver, contact customer support.

> **Note:**
>
> To prevent damage to the optical lens, Acme Packet recommends that the protective dust cover stay on the optical transceiver port when the physical interface card is not cabled.

Removing an Optical Transceiver

To remove the transceiver from an NIU transceiver port:

1. Unplug all fiber optic cables from the optical transceiver to be replaced.
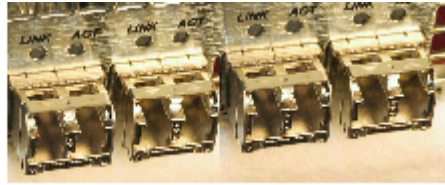
2. Pull the bale clasp latch out and down. It will pivot downwards on its hinge.
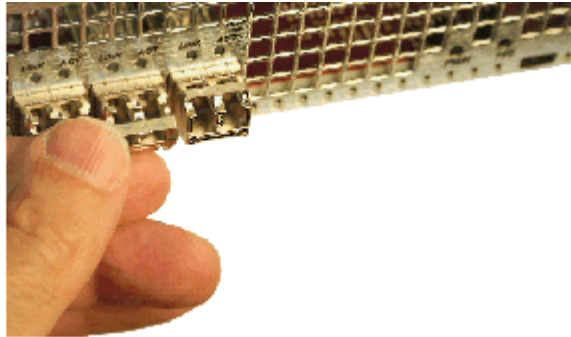
3. Holding the extended bale clasp latch, pull the optical transceiver fully out of its socket of the physical interface card.
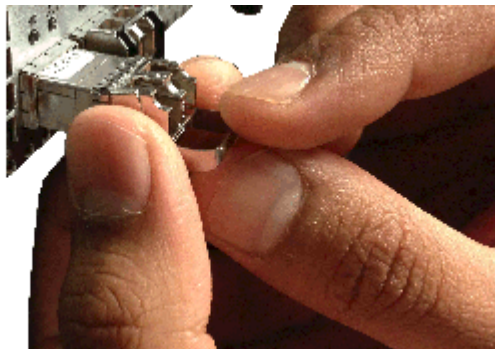
Install an Optical Transceiver

To install an optical transceiver:

1. Slide the replacement optical transceiver into the socket on the NIU.
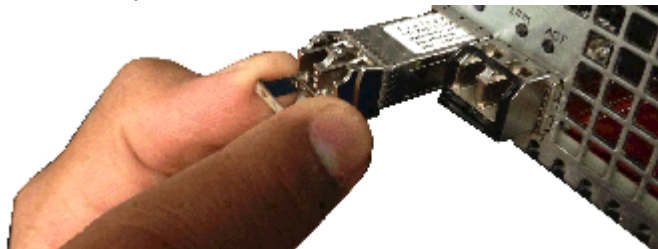
2. Press on the face of the optical transceiver to seat it in the socket.
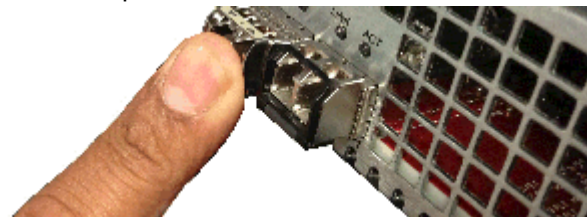
3. Flip the bale clasp latch back into the rest position.
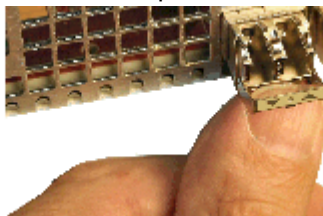
4. Reconnect the optical cables to their corresponding ports.
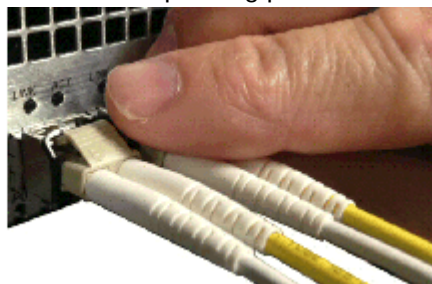
Copper Transceivers

Copper transceivers are also available for the Acme Packet 4600 System. They are removed and replaced similarly to the optical transceivers.

Alarms

The Acme Packet 4600 generates internal alarms that correspond to internal hardware fault conditions. Hardware faults are divided into two types:

• Hardware and environmental

• Media link

Each alarm is assigned a severity level, depending on the details of the fault.

Alarm Severity	Description
Minor	Functionality is impaired to a small degree (e.g., a single fan has failed)
Major	Pending failures or unexpected events are imminent (e.g., an LOS)
Critical	Catastrophic condition has occurred (e.g., the system is overheating)

The Acme Packet 4600 polls its hardware components to ensure they are functioning properly. If it encounters a fault condition, it will report alarms in these categories:

• Hardware temperature

• Fan speed

• Environmental sensor

• Power supply

• Voltage

• Physical interface cards

> **⊘ Important:**
>
> If different sensors report two or more events of the same severity with the same Alarm ID, only the first alarm gets reported.

Hardware and Environmental Alarms

This section provides details about hardware and environmental alarms.

Hardware Temperature Alarm

The following table lists the hardware temperature alarm.

Alarm Name	Alarm ID	Alarm Severity	Causes	Example Log Message	Graphic Display Window Message
TEMPERATURE HIGH	65538	CRITICAL: >105°C MAJOR: >100°C MINOR: >95°C	Fans are obstructed or stopped. The room is abnormally hot.	Temperature: XX.XXC (where XX.XX is the temperature in degrees)	Temperature X C (where X is the temperature in degrees)
If this alarm occurs, the Acme Packet 4600 turns the fan speed up to the fastest possible speed.					

Fan Speed Alarms

The following table lists the fan speed alarm.

Alarm Name	Alarm ID	Alarm Severity	Causes	Example Log Message	Graphic Display Window Message
FAN STOPPED	65537	CRITICAL: any fan speed is <50%. Or speed of two or more fans is >50% and <75%. MAJOR: speed of two or more fans is > 75% and < 90%. Or speed of one fan is >50% and <75% and the other two fans are at normal speed. MINOR: speed of one fan> 75% and <90%, the other two fans are at normal speed	Fan failure.	Fan speed: XXXX XXXX XXXX where xxxx xxxx xxxx is the revolutions per minute (RPM) of each fan on the fan module	Fan stopped

If this alarm occurs, the Acme Packet 4600 turns the fan speed up to the fastest possible speed.

Environmental Sensor Alarm

The following table lists the environmental sensor alarm.

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Window Message
ENVIRONMENTAL SENSOR FAILURE	65539	CRITICAL	The environmental sensor component cannot detect fan speed and temperature.	Hardware monitor failure! Unable to monitor fan speed and temperature!	HW Monitor Fail

Power Supply Alarms

The following table lists the power supply alarms.

Alarm	Alarm ID	Alarm Severity	Causes	Log Message	Graphic Display Window Message
PLD POWER A FAILURE	65540	MINOR	Power supply A has failed.	Back Power Supply A has failed!	X HW ALARMS: (where X is the number of hardware alarms
PLD POWER A UP	65541	MINOR	Power supply A is now present and functioning.	Back Power Supply A is present!	X HW ALARMS: (where X is the number of hardware alarms
PLD POWER B FAILURE	65542	MINOR	Power supply B has failed.	Back Power Supply B has failed!	X HW ALARMS: (where X is the number of hardware alarms
PLD POWER B UP	65543	MINOR	Power supply B is now present and functioning.	Back Power Supply B is present!	X HW ALARMS: (where X is the number of hardware alarms

Voltage Alarms

The following table lists the voltage alarms.

Alarm	Alarm ID	Alarm Severity	Cause(s)	Log Message	Graphic Display Window Message
PLD VOLTAGE ALARM 2P5V (2.5 Volt Rail)	65544	*MINOR* EMERGENCY	A PLD exceeds a predetermined threshold	Voltage 2.5V CPU has minor alarm Voltage 2.5V CPU has emergency alarm, the system should shut down	X HW ALARMS: (where X is the number of hardware alarms
PLD VOLTAGE ALARM 3P3V (3.3 Volt Rail)	65545	*MINOR* EMERGENCY	A PLD exceeds a predetermined threshold	Voltage 3.3V has minor alarm Voltage 3.3V has emergency alarm, the system should shut down	X HW ALARMS: (where X is the number of hardware alarms

Alarm	Alarm ID	Alarm Severity	Cause(s)	Log Message	Graphic Display Window Message
PLD VOLTAGE ALARM 5V (5 Volt Rail)	65546	*MINOR* *EMERGENCY*	A PLD exceeds a predetermined threshold	Voltage 5V has minor alarm Voltage 5V has emergency alarm, the system should shut down	X HW ALARMS: (where X is the number of hardware alarms
PLD VOLTAGE ALARM CPU (Host Voltage)	65547	*MINOR* *EMERGENCY*	A PLD exceeds a predetermined threshold	Voltage CPU has minor alarm Voltage CPU has emergency alarm, the system should shut down	X HW ALARMS: (where X is the number of hardware alarms

NIU Alarms

The following table lists the NIU alarms. PHY0 and PHY1 are both located on the same NIU. PHY0 encompasses S0P0 and S0P1, while PHY1 encompasses S1P0 and S1P1. Therefore, both insertion and both removal alarms will be activated at the same time when the NIU is inserted or removed from the Acme Packet 4600.

Alarm	Alarm ID	Alarm Severity	Cause(s)	Log Message
PHY0 Removed	65550	*MAJOR*	NIU S0Px was removed	Physical interface card 0 has been removed
PHY0 Inserted	65552	*MAJOR*	NIU S0Px was inserted	None
PHY1 Removed	65553	*MAJOR*	NIU S1Px was removed	Physical interface card 1 has been removed
PHY1 Inserted	65554	*MAJOR*	NIU S1Px was inserted	None

Link and SDP Alarms

Link alarms are generated when a network cable is plugged into or unplugged from a configured network interface. For each possible network interface, an alarm exists that indicates whether the link goes up or down.

The following tables list detailed information about the Acme Packet 4600 NIU link alarms, including their ID assignments, severities, causes, log messages, and messages printed in the graphic display window.

Media Ethernet Link Alarms

The following table lists the NIU GbE and 10GbE interface link up/link down alarms.

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Message
LINK UP ALARM GIGPORT	131073	MAJOR	1GbE S0P0 link up	Slot 0 port 0 UP	X LINK ALARMS (where X is number of alarming links)
LINK DOWN ALARM GIGPORT	131074	MINOR	1GbE S0P0 link down	Slot 0 port 0 DOWN	X LINK ALARMS
LINK UP ALARM GIGPORT	131075	MAJOR	1GbE S0P1 link up	Slot 0 port 1 UP	X LINK ALARMS
LINK DOWN ALARM GIGPORT	131076	MINOR	1GbE S0P1 link down	Slot 0 port 1 DOWN	X LINK ALARMS
LINK UP ALARM GIGPORT	131077	MINOR	1GbE S0P2 link up	Slot 0 port 2 UP	X LINK ALARMS
LINK DOWN ALARM GIGPORT	131078	MINOR	1GbE S0P2 link down	Slot 0 port 2 DOWN	X LINK ALARMS
LINK UP ALARM GIGPORT	131079	MINOR	1GbE S0P3 link up	Slot 0 port 3 UP	X LINK ALARMS
LINK DOWN ALARM GIGPORT	131080	MINOR	1GbE S0P3 link down	Slot 0 port 3 DOWN	X LINK ALARMS
LINK UP ALARM GIGPORT	131081	MINOR	10GbE S0P4 link up	Slot 0 port 4 UP	X LINK ALARMS
LINK DOWN ALARM GIGPORT	131082	MINOR	10GbE S0P4 link down	Slot 0 port 4 DOWN	X LINK ALARMS
LINK UP ALARM GIGPORT	131083	MINOR	10GbE S0P5 link up	Slot 0 port 5 UP	X LINK ALARMS
LINK DOWN ALARM GIGPORT	131084	MAJOR	10GbE S0P5 link down	Slot 0 port 5 DOWN	X LINK ALARMS

Management Ethernet Link Alarms

The following table lists the NIU management Ethernet port alarms.

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Message
LINK UP ALARM VXINTF	131077	MINOR	Mgmt0 link up	Port 0 UP	X LINK ALARMS
LINK UP ALARM VXINTF	131078	MINOR	Mgmt1 link up	Port 1 UP	X LINK ALARMS

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Message
LINK UP ALARM VXINTF	131079	MINOR	Mgmt2 link up	Port 2 UP	X LINK ALARMS
LINK DOWN ALARM VXINTF	131080	MAJOR	Mgmt0 link down	Port 0 DOWN	X LINK ALARMS
LINK DOWN ALARM VXINTF	131081	MAJOR	Mgmt1 link down	Port 1 DOWN	X LINK ALARMS
LINK DOWN ALARM VXINTF	131082	MAJOR	Mgmt2 link down	Port 2 DOWN	X LINK ALARMS

SFP Presence Alarms

The following table lists the alarms that reflect when an SFP module is inserted or removed from an NIU.

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Message
SFP REMOVED GIGPORT 0	65568	CRITICAL	S0P0 SFP Removed	Slot 0 Port 0 SFP Removed	X HW ALARMS: (where X is the number of hardware alarms
SFP INSERTED GIGPORT 0	65569	CRITICAL	S0P0 SFP Inserted	Slot 0 Port 0 SFP Inserted	X HW ALARMS: (where X is the number of hardware alarms
SFP REMOVED GIGPORT 1	65570	CRITICAL	S0P1 SFP Removed	Slot 0 Port 1 SFP Removed	X HW ALARMS: (where X is the number of hardware alarms
SFP INSERTED GIGPORT 1	65571	CRITICAL	S0P1 SFP Inserted	Slot 0 Port 1 SFP Inserted	X HW ALARMS: (where X is the number of hardware alarms
SFP REMOVED GIGPORT 2	65572	CRITICAL	S0P2 SFP Removed	Slot 0 Port 2 SFP Removed	X HW ALARMS: (where X is the number of hardware alarms

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Message
SFP INSERTED GIGPORT 2	65573	CRITICAL	S0P2 SFP Inserted	Slot 0 Port 2 SFP Inserted	X HW ALARMS: (where X is the number of hardware alarms
SFP REMOVED GIGPORT 3	65574	CRITICAL	S0P3 SFP Removed	Slot 0 Port 3 SFP Removed	X HW ALARMS: (where X is the number of hardware alarms
SFP INSERTED GIGPORT 3	65575	CRITICAL	S0P3 SFP Inserted	Slot 0 Port 3 SFP Inserted	X HW ALARMS: (where X is the number of hardware alarms
SFP REMOVED 10GIGPORT 4	65576	CRITICAL	S0P4 SFP Removed	Slot 0 Port 4 SFP Removed	X HW ALARMS: (where X is the number of hardware alarms
SFP INSERTED 10GIGPORT 4	65577	CRITICAL	S0P4 SFP Inserted	Slot 0 Port 4 SFP Inserted	X HW ALARMS: (where X is the number of hardware alarms
SFP REMOVED 10GIGPORT 5	65578	CRITICAL	S0P5 SFP Removed	Slot 0 Port 5 SFP Removed	X HW ALARMS: (where X is the number of hardware alarms
SFP INSERTED 10GIGPORT 5	65579	CRITICAL	S0P5 SFP Inserted	Slot 0 Port 5 SFP Inserted	X HW ALARMS: (where X is the number of hardware alarms

When an SFP module is inserted or removed from an NIU, there is no impact on system health.

7
Specifications

This chapter provides information regarding the physical, electrical, environmental, and connector specifications of the Acme Packet 4600 System.

Environmental, Safety, and Regulatory Certifications

For information regarding safety and regulatory certifications applicable to the Acme Packet 4600, refer to the Acme Packet Platforms Safety and Compliance Guide.

Physical Specifications

Acme Packet 4600 System Chassis Specifications

This table lists the physical dimensions and weight of the Acme Packet 4600 chassis.

Specification	Description
Height	1.72" (4.37 cm) (1U)
Width	17.10" (43.43 cm) (+ mounting ear width: 19" (43.18 cm))
Depth	20" (48.26 cm) (+ mounting slide bar depth)
Weight	approximately 20.5 lbs (9.30 kg), fully loaded

AC Power Supply Physical Dimensions

This table lists the physical dimensions and weight of the Acme Packet 4600 AC power supply.

Specification	Description
Height	1.575" (4.00 cm)
Width	2.146" (5.45 cm)
Depth	13.26" (33.68 cm)
Weight	2lbs., 5 oz. (1.05 kg)

> ✏ **Note:**
>
> This equipment is intended for installation in locations where National Electrical Code (NEC) applies.

DC Power Supply Physical Dimensions

This table lists the physical dimensions and weight of the Acme Packet 4600 DC power supply.

Specification	Description
Height	1.575" (4.00 cm)
Width	2.146" (5.45 cm)
Depth	13.26" (33.68 cm)
Weight	2lbs., 5 oz. (1.05 kg)

> ✎ **Note:**
>
> This equipment is intended for installation in Network Telecommunication Facilities.

Fan Module Specifications

This table lists the fan module specifications for the Acme Packet 4600.

Specification	Description
Number of Fans	5
Total Maximum Airflow	100 CFM

Electrical Specifications

Refer to the following tables for information regarding the electrical specifications of the Acme Packet 4600 System.

Power Supply Input Circuit Fuse Requirements

This table lists the input circuit fuse and cable size requirements for the Acme Packet 4600.

Power Circuit	Fuse Rating	Power Cable Size
120 VAC	15 AMP	18 AWG
240 VAC	7.5 AMP	18 AWG
-48 VDC	30 AMP	10 AWG

Alarm Port Dry Contact Current Limits

This table lists the electrical characteristics of the Acme Packet 4600 alarm port.

Specification	Value
Max AC switching current	0.3 A @ 125 VAC
Max DC switching current	1 A @ 30 VDC

Environmental Specifications

For the Acme Packet 4600 to function properly, Acme Packet recommends that you follow the environmental guidelines in the following table.

Specification	Description
Temperature	The Acme Packet 4600 is required to operate within the temperature range of:
	0° C to +40° C, 32° F to 104° F (operating)
	-20° C to +65° C, -4° F to 149° F (storage)
Relative Humidity	Operating conditions of 10% to 85% humidity under non-condensing operating conditions
Maximum Altitude	The Acme Packet 4600 is required to operate below the maximum altitude of 10,000 feet.
Air Flow	50 CFM front to back
Power Dissipation	250W typical 350W maximum (base system with 2 x 10GbE NIU)

Connector Specifications

Refer to the following table for information about the connector specifications for the Acme Packet 4600.

Specification	Description
AC Connector Port	The IEC lead connector port on each power supply accepts a 3-lead IEC-60320 C14 connector for AC power installations (2).
RJ45/Management Ethernet Ports	The 3 x 8-pin RJ45 10/100/1000BaseT ports are compliant with IEEE's 802.3, 802.3u, and 802.3ab.
RJ45/Alarm Contact Port	Any alarms generated by the system are accessible via the 8-pin RJ45 alarm contact port.
RS232/Serial Port	The RS232 serial port uses an 8-pin RJ45 connector that supports RS232 protocol.
1 GbE/10GbE Port(s)	The four 1 GbE fiber optic connection ports (P0-P3) and the two 10GbE fiber optic connection ports (P4-P5) use duplex LC connectors (2).
Terminal Block Connections	The terminal block connections accept a bare (tinned) wire for DC power installations on each DC power supply (2).

Optical Transceiver Interface Module Specification

Refer to the following table for information about the optical specifications of the optical transceivers for the Acme Packet 4600.

Specification	Single Mode (SX) Fiber Module	Multi Mode (LX) Fiber Module
Wavelength λ	1310 nm	850 nm
Laser Type	VCSEL	VCSEL
Fiber type / Transmission Distance	0.5 to 550 m — 50 µm MMF 0.5 to 550 m — 62.5 µm MMF	300 m

8

Acronyms, Definitions, and Terms

ACLI — Acme Command Line Interface is the command line interface used by Acme Packet to configure, maintain, and monitor Acme Packet SBCs and other Acme Packet products.

AC — Alternating Current refers to the 120-volt electricity delivered by power utilities to three-pin power outlets. This type of power is called "alternating current" because the polarity of the current alternates between plus and minus, 60 times per second.

AWG — American Wire Gauge is a United States standard set of non-ferrous wire conductor sizes. The gauge means the diameter.

DC — Direct Current refers to the flow of electrons in one direction within an electrical conductor, such as a wire.

ESD — Electrostatic Discharge is the rapid discharge of static electricity from one conductor with an electrical charge to another of a different electrical charge.

CE — European Compliance

EN — European Norm

FG — Frame ground

Flash memory — Flash memory is a solid-state, non-volatile, rewritable memory that functions like a combination of RAM and a hard disk drive.

FQME — Flow Quality Measurement Engine is responsible for monitoring, measuring, and maintaining statistics (e.g., latency, jitter, flow stoppage, flow creation, etc.) on a flow-by-flow basis.

1GbE — Gigabit Ethernet is an Ethernet type that supports data transfer rates of 1 gigabit per second.

10GbE — 10GbE is an Ethernet type that supports data transfer rates of 10 gigabits per second.

IEEE — Institute of Electrical and Electronics Engineers is an organization composed of engineers, scientists, and students. The IEEE is best known for developing standards for the computer and electronics industry.

IEC — International Electrotechnical Commission

IP — Internet Protocol is the method by which data is sent from one computer to another on the Internet.

LED — Light Emitting Diode is an electronic device that lights up when electricity is passed through it.

LAN — Local Area Network is a group of computers and associated devices that share a common communications line within a small geographic area.

LOS — Loss of Signal occurs when the signal level falls below an acceptable level. LOS is a physical layer error and typically results in an alarm.

NIC — Network Interface Card is an expansion board you insert into a computer so the computer can be connected to a network.

NIU — The NIU provides network connectivity for management, signaling, and media traffic to and from the Acme Packet 4600 System.

NVRAM — Non-volatile Random Access Memory is a type of memory that retains its contents when power is turned off.

Optical Transceiver — The fiber connection to the Acme Packet 4600 System plugs into an optical transceiver. Through this connection, light energy is converted into electrical energy.

PCMCIA — Personal Computer Memory Card International Association is an organization consisting of approximately 500 companies that has developed a standard for small, credit-card sized devices (PC cards). This standard is designed for attaching input/output devices such as network adaptors, fax/modems, or hard drives to notebook computers.

Physical Interface Card — The physical interface card is synonymous with the network interface cards on the Acme Packet 4600 System.

PROM — Programmable Read-only Memory is a memory chip on which data can only be written once. A PROM is non-volatile; it is a memory chip on which data can be written only once.

QoS — Quality of Service is a networking term that refers to the capability of a network to provide better service to selected network traffic over various technologies.

RAM — Random Access Memory is a type of computer memory that can be accessed randomly. RAM is the same as main memory.

RS-232 — Recommended Standard 232 is a standard interface approved by the Electronic Industries Association for connecting serial devices.

RJ45 — Registered Jack 45 is an eight-wire connector commonly used to connect computers onto a LAN.

SNMP — Simple Network Management Protocol is a set of protocols used for managing complex networks and network devices.

SDRAM — Synchronous Dynamic Random Access Memory is a type of DRAM that can run at much higher clock speeds than conventional memory.

Telnet — Telnet is a standard terminal emulation program that allows remote login and connection to systems/servers on a network. Telnet uses a single TCP/IP network connection to provide this remote login, control, and communication functionality.

TCP — Transmission Control Protocol provides a reliable stream delivery and virtual connection service to applications through the use of sequenced acknowledgment with the retransmission of packets when necessary.

UPS — Uninterruptible Power Supply is a power supply that can run off of a backup battery when primary power is lost.

UDP — User Datagram Protocol provides a simple, but unreliable message service for transaction-oriented services. Each UDP header carries both a source port identifier and a destination port identifier, allowing high-level protocols to target specific applications and services among hosts.

VFD — Vacuum Fluorescent Display is used on the graphic display window of the Acme Packet 4600 System chassis's front control panel.

VLAN — Virtual Local Area Network refers to a network of computers are connected to a single physical segment of a wire but behave as if they are connected to the physically diverse LANs.

VAC — Volts Alternating Current

VDC — Volts Direct Current

VCCI — Voluntary Control Council for Information Technology Equipment (Japan)

WAN—Wide Area Network is a computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more LANs.