Oracle Acme Packet 6100

Hardware Installation and Maintenance Guide

April 2015

ORACLE

Contents

About This Guide

Overview

The Acme Packet 6100 is a session border controller (SBC) platform that supports other product configurations. With its compact single unit design the Acme Packet 6100 provides exceptional functionality in a tightly integrated system. This chapter provides an introduction and overview of the Acme Packet 6100 main components.

Please read this user guide in its entirety prior to installing the Acme Packet 6100 or any components.

The *Acme Packet 6100 Hardware Installation and Maintenance Guide* describes:

- Component Overview
- Graphic Display and its Usage
- System Installation
- Start-up
- Maintenance
- Safety
- Specifications
- 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, operation, and maintenance of the Acme Packet 6100. 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
February 2014	• GA Release
October 2014	• Clarified that the speed of the Media Ports is 10Gb/sec. • Updated the Heat and Power Dissipation specifications. • Updated the title page to Oracle standards.
January 2015	• Changed book title and footer. • Inserted a paragraph referring the reader to the Safety and Compliance Guide for details on the topic. • Removed copyright "C" from Title Page. • Inserted a new copyright page for 2015.
April 2015	• Inserted statements pointing out that after you initially log on to the Acme Packet 6100 or replace the Solid State Drive (SSD), you must format the drive. • Inserted caveats to confirm that Acme Packet 6100 hardware installation documentation satisfies NEBS (Network Equipment-Building System) requirements.

1 Safety

Introduction

This chapter provides an overview of the recommended safety precautions for installing the Acme Packet 6100.

Before you install your Acme Packet 6100, read this entire manual. This document provides information intended to protect you and your Acme Packet 6100 from experiencing any harm during the installation process. These chapters also provide information that helps to keep your Acme Packet 6100 functioning properly and keep it from damage.

Safety and Regulatory Certifications

For information regarding safety and regulatory certifications applicable to the Acme Packet 6100, refer to the *Acme Packet Platforms Safety and Compliance Guide* in addition to this chapter.

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 6100 clean and clutter-free.

System Maintenance

Aside from the fan module, fan filter, power supply, and NIUs, there are no user-serviceable parts inside the Acme Packet 6100. Only professionals trained to maintain, adjust, or repair the Acme Packet 6100 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 6100.

Using This Guide

Read and understand all notes of warning and caution included in the Acme Packet 6100 documentation. These warnings and cautions are designed to keep you safe and protect the Acme Packet 6100 from damage.

Electrical Safety Precautions

To protect yourself from harm and the Acme Packet 6100 from damage, follow these electrical safety precautions:

Precautions

- Note the locations of the System Power switch on the Acme Packet 6100 and the location of the emergency power-off switch for the room where the Acme Packet 6100 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 6100 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 6100.
- 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 6100 in an equipment rack, always make the ground connection first and disconnect it last upon un installation.
- Use shielded Category 5e or 6, RJ45 cables for all 10/100/1000 Ethernet connections to protect the Acme Packet 6100 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 6100.
- Remove jewelry before working on the Acme Packet 6100.

Battery Warning

Caution: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERY ACCORDING TO THE INSTRUCTIONS.

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

ESD Safety

To protect the Acme Packet 6100 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 6100 hardware and while performing any Acme Packet 6100 hardware procedures.

Precautions

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

- Ensure that the Acme Packet 6100 is properly grounded.
- If you are grounding your Acme Packet 6100 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 6100 to prevent static discharge.
- To avoid damaging ESD sensitive hardware, discharge all static electricity from your body before working directly with the Acme Packet 6100 chassis by touching a grounded object.

Figure 1 - 1. ESD Strap

2 Component Overview

Chassis

The Acme Packet 6100 is contained in a 1U rack-mounted chassis. It can be front- or center mounted in standard 19″ wide racks (up to 32″ deep), with options for 23″ wide racks.

The front view of the Acme Packet 6100.

Figure 2 - 2. Acme Packet 6100 - Front Panel

The rear view of the Acme Packet 6100.

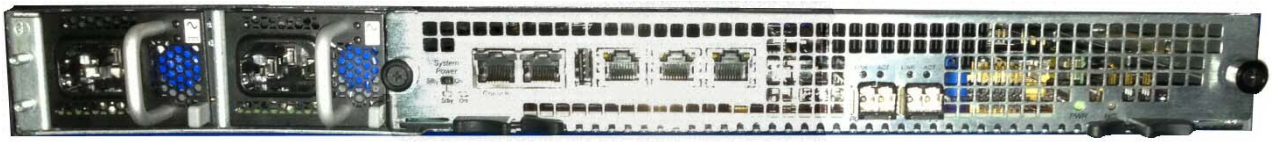


Figure 2 - 3. Acme Packet 6100 - Rear Panel

Mounting Hardware

The Acme Packet 6100 is supported by a pair of slide rails that are affixed to an equipment rack by front and rear mounting flanges. The slide rails 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, which 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.

Figure 2 - 4. Assembled Acme Packet 6100 Slide Rail

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 6100 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.

Figure 2 - 5. Slide Rail Locking Clip and Vertical Orientation

- 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 6100.

Figure 2 - 6. Rack-Mounted Slide Rail (rear mounting point at left)

Figure 2 - 7. Chassis-Mounted Slide Rail

- 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.

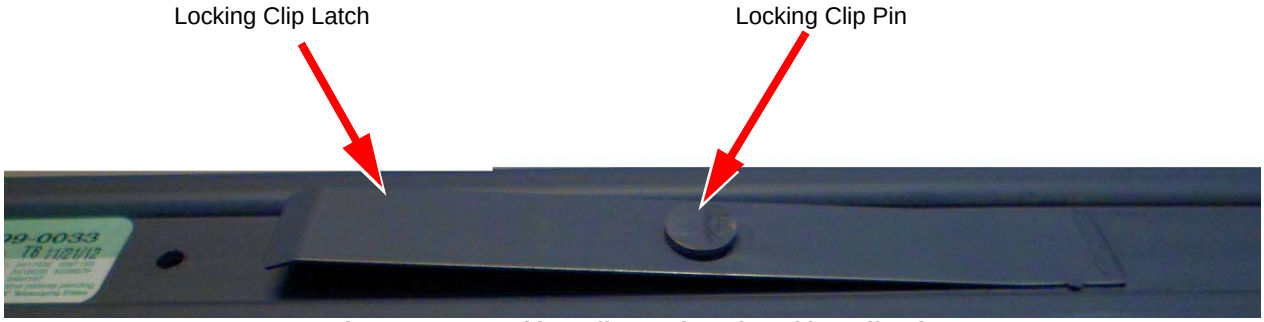


Figure 2 - 8. Locking Clip Latch and Locking Clip Pin

Figure 2 - 9. Locking Clip Fastens the Chassis and Rack Slide Rails

Once the chassis has been fully inserted into the rack, turning the captive thumbscrews clockwise will lock the chassis securely into the rack.

Figure 2 - 10. Locking the Chassis to the Rack

System Processor

Processor Module (CPU)

The Acme Packet 6100 processor module (CPU) is located on the main board of the Acme Packet 6100. 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 Acme Packet 6100 front and rear control panels.

Front Control Panel

The Acme Packet 6100 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.

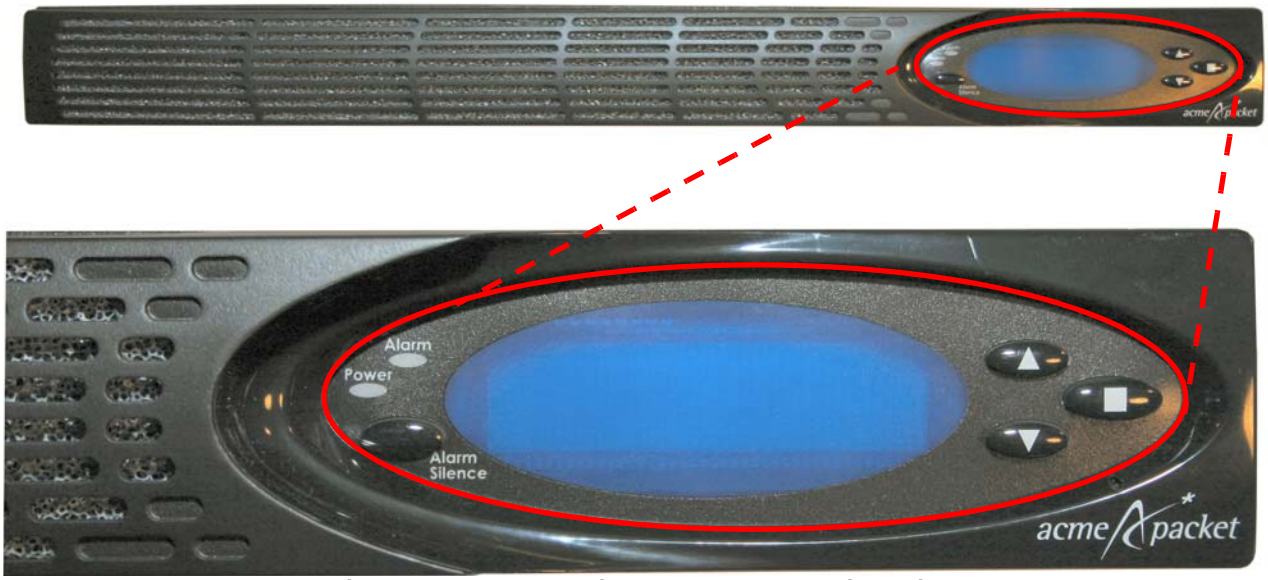


Figure 2 - 11. Acme Packet 6100 Front Control Panel

Reset Pushbutton

Pressing the front panel reset pushbutton will perform a hard reset of the Acme Packet 6100, immediately rebooting the Acme Packet 6100. After the reset button is released, the Acme Packet 6100 begins its boot sequence and loads the configured software file.

The Acme Packet 6100 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.

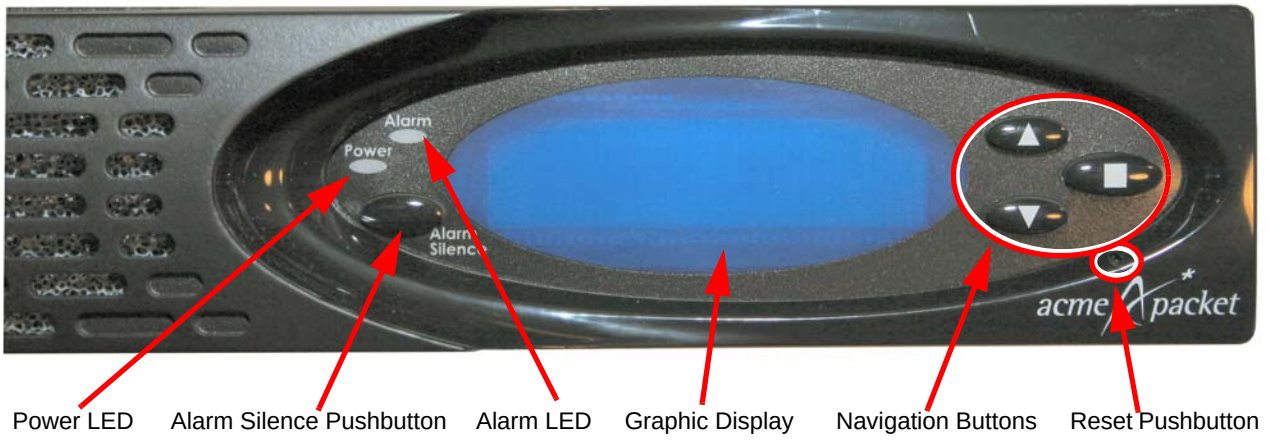


Figure 2 - 12. Reset Pushbutton

Alarm LED

The alarm LED on the front control panel indicates if any alarms are active on the Acme Packet 6100. The LED can be three potential colors to 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 6100 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 6100 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.

Figure 2 - 13. Intake Fans (shown with front bezel removed)

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.

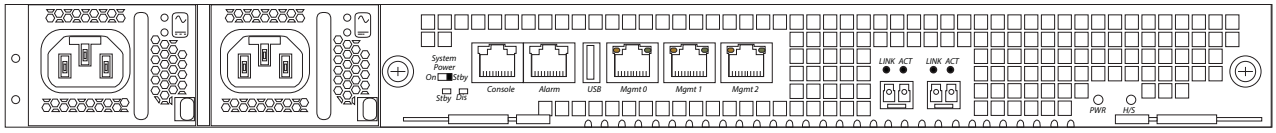


Figure 2 - 14. Acme Packet 6100 - Rear Panel with AC Power Supplies

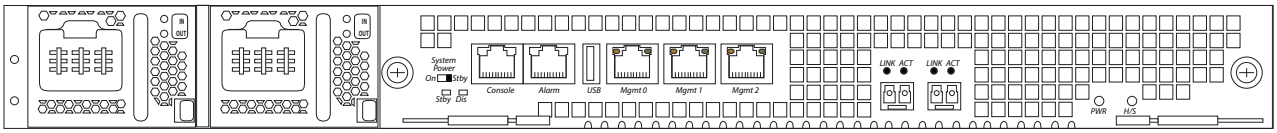


Figure 2 - 15. Acme Packet 6100 - Rear Panel with DC Power Supplies

Network Interface Unit

The single, hot-pluggable network interface unit (NIU) contains all of the Acme Packet 6100 media and management interfaces. The NIU is located on the Acme Packet 6100 rear panel. The Signaling, Media and Network Management interfaces are located on the front panel of the NIU.

Figure 2 - 16. Network Interface Unit - Top View

Without powering down the hot-swappable Acme Packet 6100 you can exchange an NIU by removing and replacing it. Upon NIU removal, the Acme Packet 6100 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.

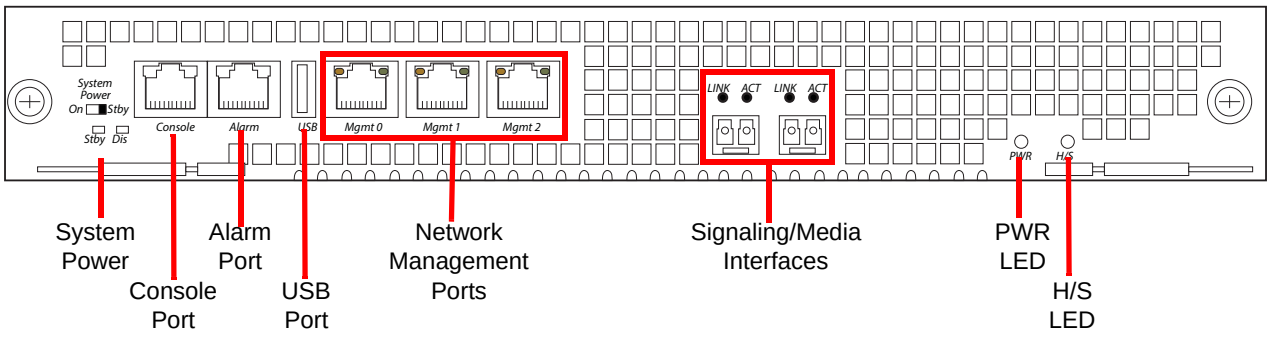


Figure 2 - 17. Network Interface Unit - Front Panel

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

System Power Switch - STBY/ON

The System Power switch enables you to control the power to the Acme Packet 6100. This is useful when it is desirable to shut off power to the Acme Packet 6100 without having to unplug the power cord. The Acme Packet 6100 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 6100 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.
- ON — applies power to the Acme Packet 6100. This switch position is used during normal operation.

Caution

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.

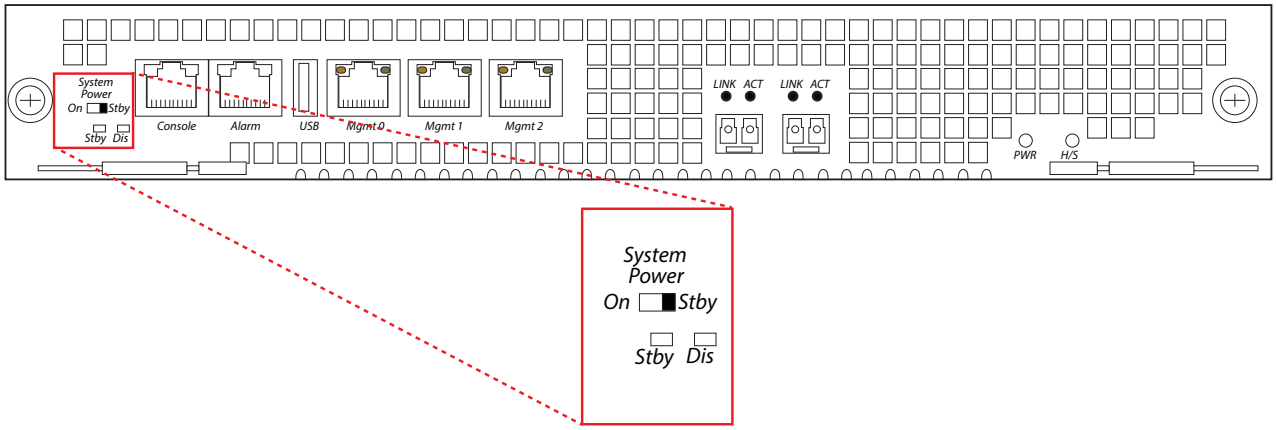


Figure 2 - 18. System Power Settings on the NIU Front Panel

USB Port

The USB port, located on the Acme Packet 6100 front panel, is reserved for software-enabled applications.

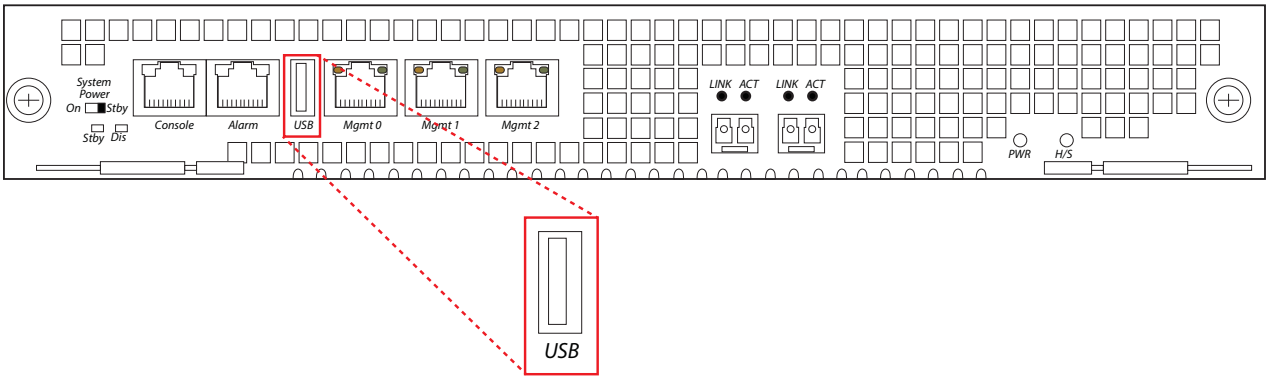


Figure 2 - 19. USB Port

Console Port

The console port, located on the Acme Packet 6100 front panel, provides access to the Acme Packet 6100 over an RS-232C serial connection. The Acme Packet 6100 supports only one active serial console connection at a time. The console port is useful for customers who want permanent console access.

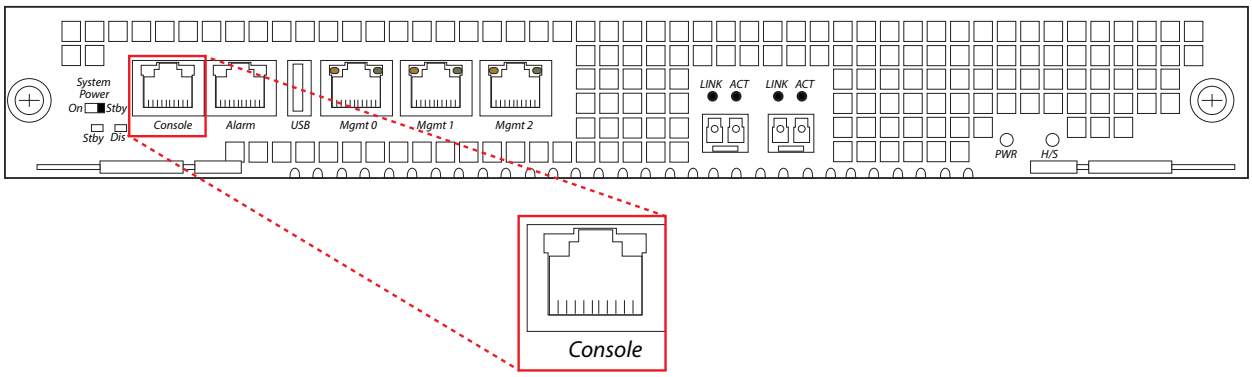


Figure 2 - 20. Console Port

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 6100
- Accessing and using all functionality available via the ACLI
- Performing in-lab system maintenance

Console Port Pin-out

The Acme Packet 6100 console port features one RJ45 jack on the system console. Because the Acme Packet 6100 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 6100. This adapter converts the RJ45 plug on the Ethernet cable to a standard DB-9 serial port jack, found on a PC or laptop. Any standard Ethernet cable can be used between the Acme Packet 6100 and the console adapter.

Figure 2 - 21. Console Adapter

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 6100. The Acme Packet 6100 features an alarm control signal interface that can be used in a CO location to indicate when internal alarms are generated. The Acme Packet 6100 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.

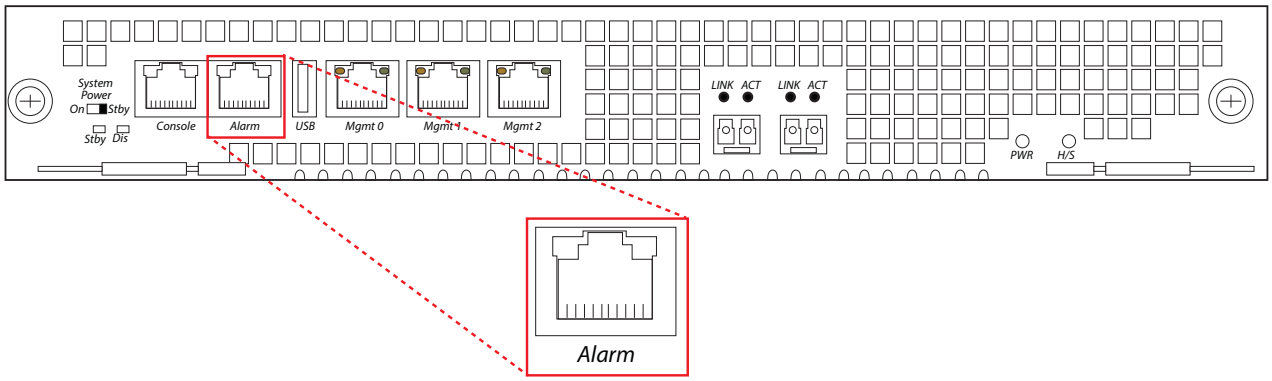


Figure 2 - 22. Alarm Port

Alarm Levels

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

Table 2 - 2. Alarm 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).

Table 2 - 3. Acme Packet 6100 Alarm Port Pin-Outs

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)

Table 2 - 3. Acme Packet 6100 Alarm Port Pin-Outs *(Continued)*

Pin Number	Signal Name/Description
7	Ground
8	Ground

Network Management Ports

The Acme Packet 6100 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.

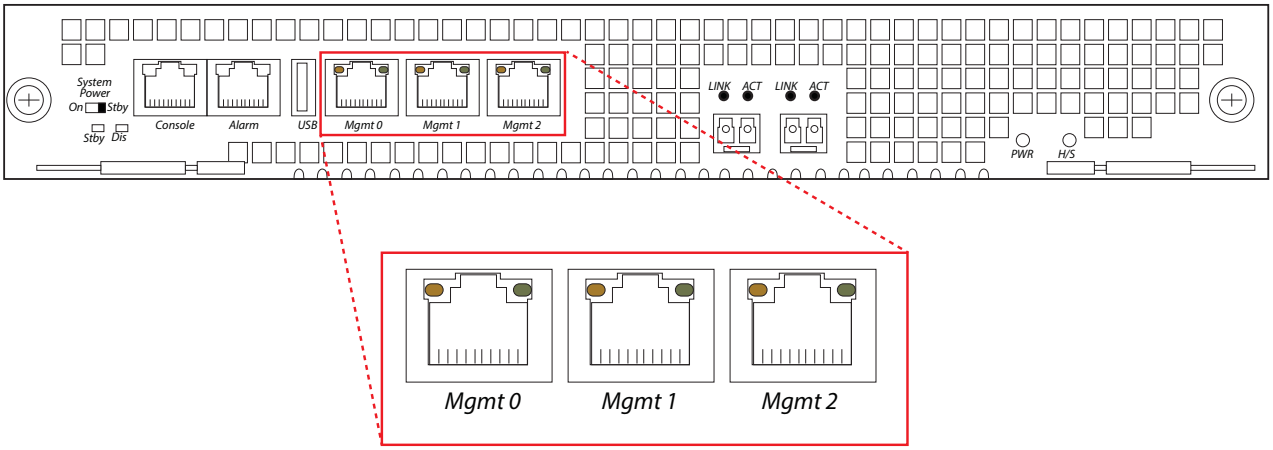


Figure 2 - 23. Acme Packet 6100 Network Management Ports

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.

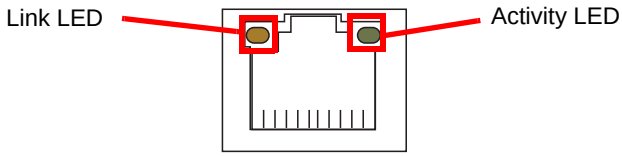


Figure 2 - 24. Acme Packet 6100 Network Management Ethernet Port

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 6100.

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 6100, the network management Ethernet ports are not configured. You must first connect to the Acme Packet 6100 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, FTP, and SFTP connections
- RADIUS CDR transmission

Acme Packet recommends that you use shielded CAT5e or CAT6 Ethernet cables with RJ45 plugs for connecting to the rear-panel Acme Packet 6100 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. Each interface can connect to a network over optical modules at 10 Gigabit Ethernet (10GbE) speeds.

The NIU is available in a 2-port 10GbE configuration. The NIU can be populated with different 10Gb SFP+ optical modules.

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

Mixed transceiver types are unsupported on SFP-based NIUs; both ports are required to be populated with identical SFPs, based on compliance testing.

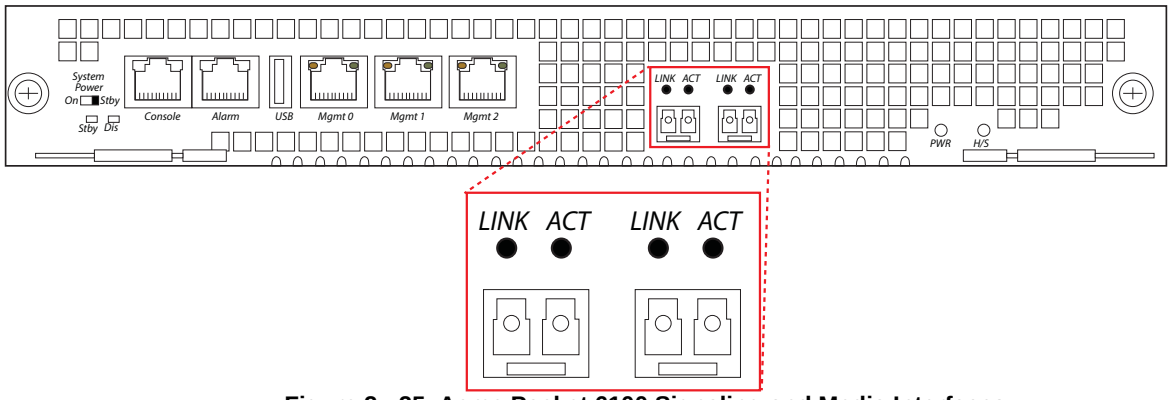


Figure 2 - 25. Acme Packet 6100 Signaling and Media Interfaces

PWR LED

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

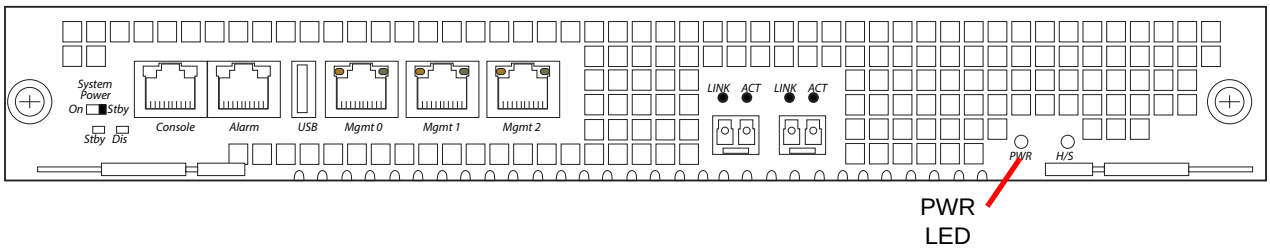


Figure 2 - 26. PWR LED

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.

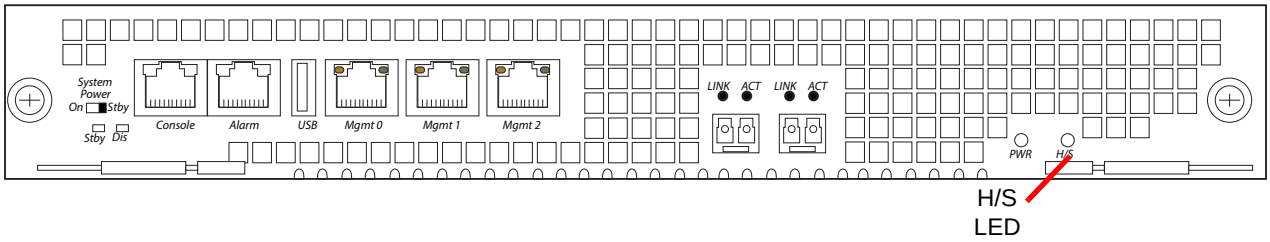


Figure 2 - 27. H/S LED

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.

Power Components

Acme Packet offers AC or DC power options for the Acme Packet 6100. The power supplies are user-replaceable, hot swappable components.

Each power supply is accessed from the rear panel of the Acme Packet 6100. 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.

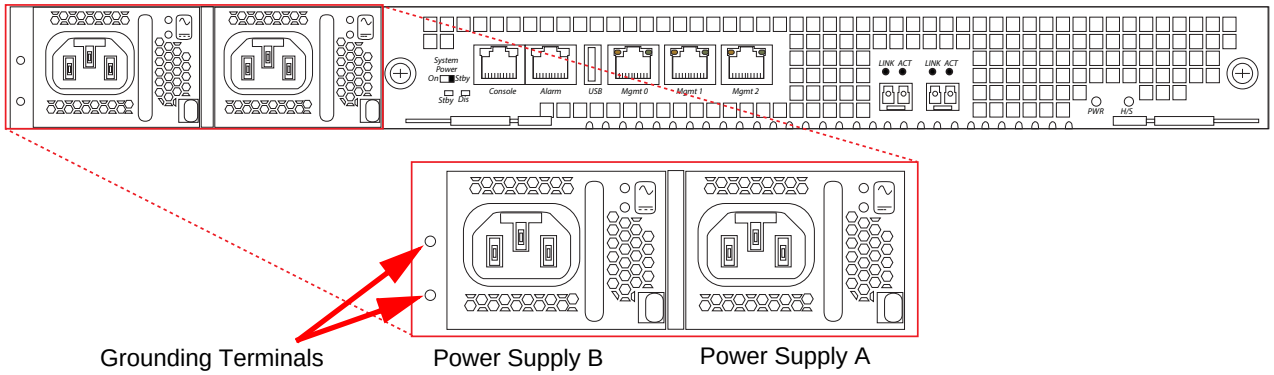


Figure 2 - 28. Acme Packet 6100 Dual AC Power Supplies and Grounding Posts

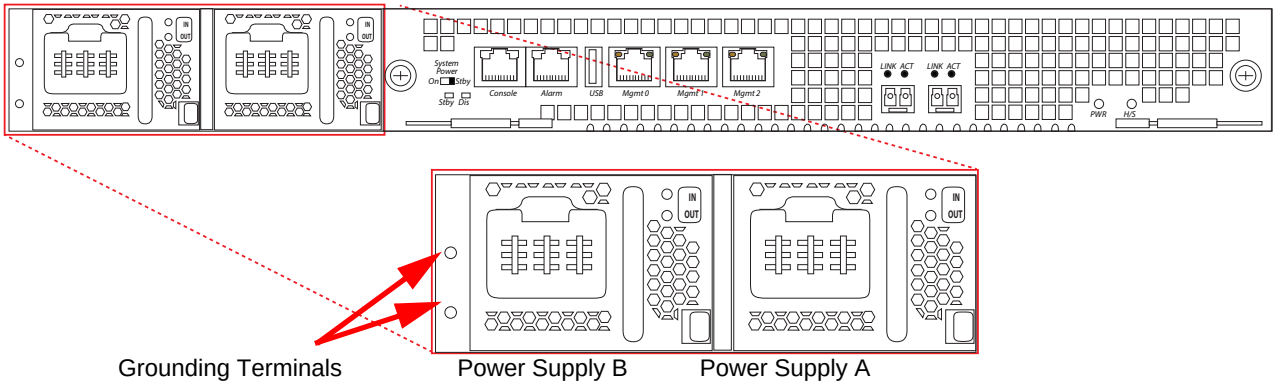


Figure 2 - 29. Acme Packet 6100 Dual DC Power Supplies and Grounding Posts

Power Supply Redundancy

During normal operation, the Acme Packet 6100 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 6100 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 6100 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 insert and remove the power supply from the chassis. The

grey locking handle, when moved from right to left, unlocks the power supply from the chassis.

Figure 2 - 30. Acme Packet 6100 AC Power Supply

AC Power Cords

Acme Packet ships each AC-powered Acme Packet 6100 with one 2 meter, 3-conductor 18 AWG power cord for each power supply. The power cord, fitted with an IEC-60320 C13 connector, connects to the IEC- 60320 C14 receptacle on the power supply.

DC Power

The Acme Packet 6100 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 insert and remove the power supply from the chassis. The locking handle is used to lock/unlock the power supply from the chassis. A terminal block on the DC power supply serves as the DC power interconnect.

Figure 2 - 31. Acme Packet 6100 DC Power Supply

DC Power Cords

A DC power cord ships with each DC power supply. A DC power cord must be 3-conductor, 10 AWG minimum rated for at least 140° F (60° C).

Table 2 - 4. Acme Packet 6100 DC Power Cord Wire Markings

Wire Color	Lead Designation (style-A DC Power Supply)	Lead Designation (style-B DC Power Supply)
Red	Return	+
Green/Yellow	Frame Ground	
Black	-48 VDC	-

Grounding Terminals

The grounding terminals are used to attach the Acme Packet 6100 chassis to a local earth ground. The terminals are located to the left of Power Supply B on the rear of the Acme Packet 6100. The Acme Packet 6100 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 6100 must remain well ventilated for reliable and continuous operation. The cooling features of the chassis include:

- Five individual fans
- Fan Filter

Fans

The Acme Packet 6100 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.

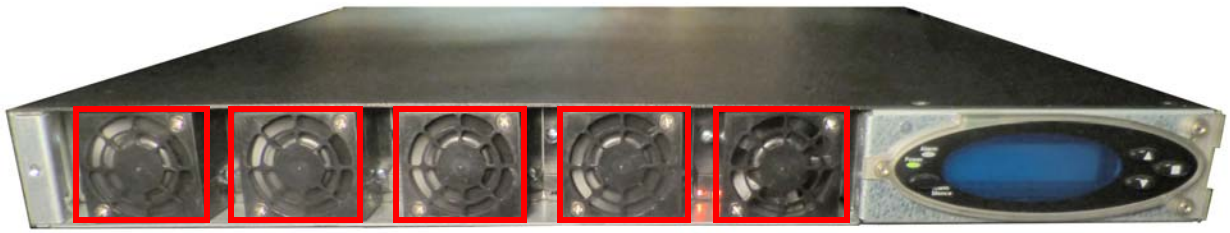


Figure 2 - 32. Acme Packet 6100 Cooling Fans

The Acme Packet 6100 automatically adjusts 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 6100 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 6100 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 6100, can be easily removed for maintenance.

Figure 2 - 33. Acme Packet 6100 Air Filter Behind Front Bezel

Acme Packet 6100 Series Hardware Architecture

The Acme Packet 6100 series hardware is purpose-built for SBC applications and relies on state-of-the-art network processing and traffic management components to deliver security and scalable media processing.

The network processing subsystem is comprised of the network processors, traffic management. This subsystem hosts the media control module and is completely hardware-based. Adjacent to the network processing components are the QoS engine for monitoring bearer QoS metrics.

The signaling processor subsystem is comprised of the host processor subsystem and associated memory. The session control functions - including the session signaling layer, call routing and management elements - are hosted on the signaling processor subsystem.

The separation of signaling and media processing is necessary for the following reasons:

- To guarantee that media processing will never overwhelm signaling processing. Signaling processing performance is not impacted by media processing load as it is with single more monolithic solutions based on general purpose computing platforms.
- To protect the signaling processing subsystem from overload and DoS attacks. When DoS attacks are detected, these attacks are policed and isolated in the hardware.

Graphic Display

The four-line graphic display located on the Acme Packet 6100 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 6100.

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.

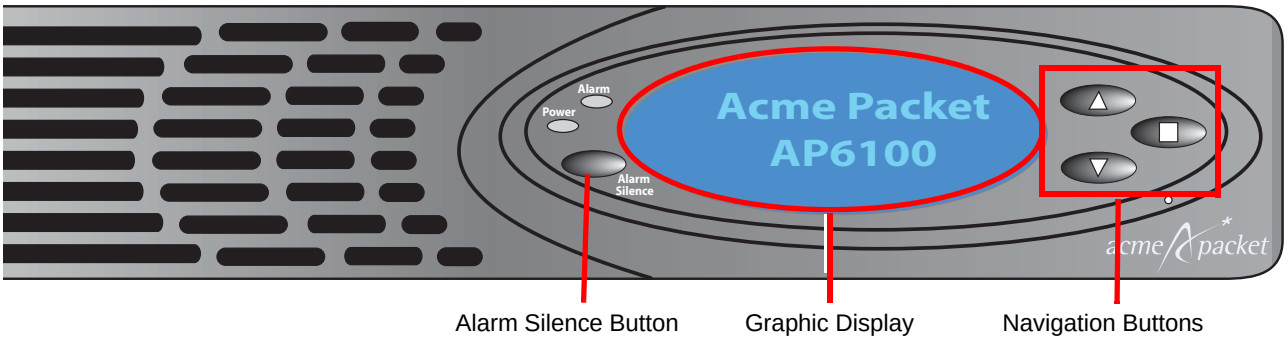


Figure 3 - 34. Acme Packet 6100 Graphic Display and Control

Each graphic display button has a special purpose.

Table 3 - 5. Acme Packet 6100 Graphic Display Button Functions

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 6100 graphic display defaults to one of two display modes:

- Base display is the default and indicates a properly-functioning Acme Packet 6100.
- Alarm mode becomes the default display mode when any alarms are active on the Acme Packet 6100. Active fault information is continuously displayed on the graphic display.

Base Display

The base display shows the type of Acme Packet 6100 running. This information appears when the system first starts up and when the graphic display times out at any menu level.

```
   NET - NET
SESSION DIRECTOR
```

The base display of a Acme Packet 6100 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 6100 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 6100, 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 6100 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.

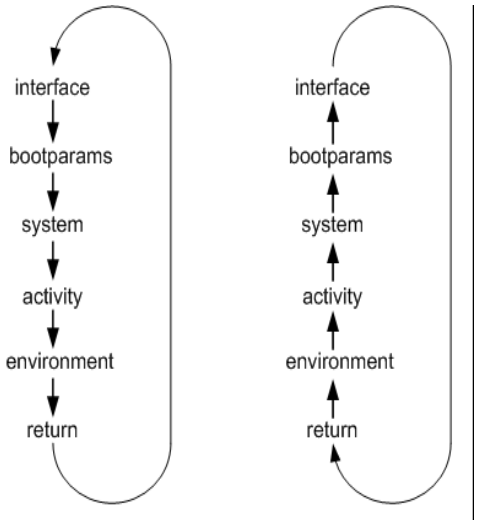


Figure 3 - 35. Scrolling Through Menu Categories on the Graphic Display

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.

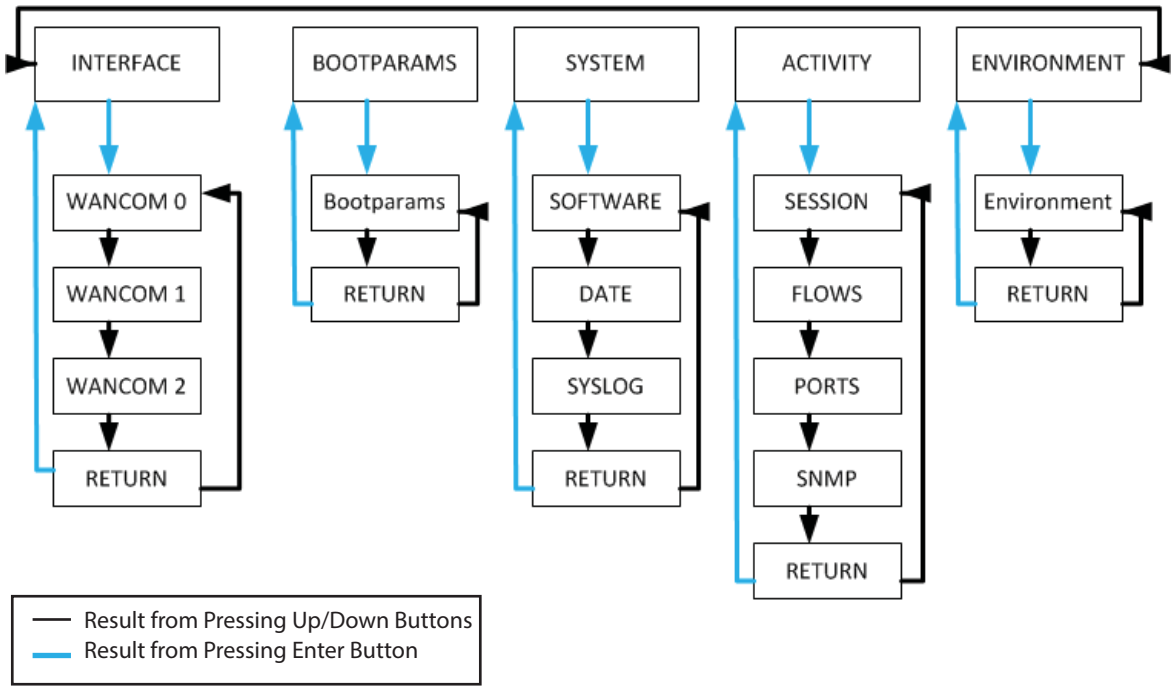


Figure 3 - 36. Acme Packet 6100 Menu Options (Exploded View)

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 6100. 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 6100 software version and creation date:

  Software:
  ACME OS 6.0.0
  01/01/2008

- 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.

ACTIVITY Menu

The ACTIVITY menu allows you to scroll through current Acme Packet 6100 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 6100 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 6100 System nodes.

The graphic display on a Acme Packet 6100 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 6100 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 6100:

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 6100:

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 6100:

NET - NET
SESSION DIRECTOR (S)

Active State Displays

Acme Packet 6100 Systems in the active state use the default graphic display. The following example shows the display of an active Acme Packet 6100:

NET - NET
SESSION DIRECTOR

4 System Installation

Introduction

This chapter provides information about how to install the Acme Packet 6100 and its associated components, including cabling information.

Shipped Parts

Each Acme Packet 6100 ships in one box. Inside this box is the Acme Packet 6100 chassis and the accessory kit. The ordered NIU and power supplies are already installed in the chassis.

Table 4 - 6. Acme Packet 6100 Shipping Contents

Location	Item
Main Shipping Box	Acme Packet 6100 chassis
Accessory Kit	Console adapter AC or DC power cords (one per power supply) Grounding cable with lug Slide rail mounting brackets kit

Installation Tools and Parts

The following tools and parts are required to install the Acme Packet 6100 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 6100 must have access to reliable power and cooling. When choosing a location for your Acme Packet 6100, follow the guidelines listed in this section.

Environmental Guidelines

When preparing to install your Acme Packet 6100.

- Ensure that the equipment rack location complies with the environmental specifications (e.g., temperature, relative humidity, maximum altitude, and air flow) of the Acme Packet 6100.
- Locate the Acme Packet 6100 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 6100, 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 6100 two power supplies.
- The Acme Packet 6100 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 6100.
- Use grounded, 3-conductor circuits.
- A local earth ground must be available.

Caution

Connect each of the Acme Packet 6100 power supplies to a separate circuit. If both supplies are connected to outlets on the same circuit, the Acme Packet 6100 will lose power to both supplies if that circuit loses power. In that case, the whole Acme Packet 6100 would lose power.

Mounting Guidelines

When preparing to install your Acme Packet 6100, 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 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 6100, ensure you follow these safety guidelines:

- Review the all safety precautions with respect to the Acme Packet 6100 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 6100 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

Overview

This section explains how to unpack and install your Acme Packet 6100 into a telecommunications or server equipment rack. The Acme Packet 6100 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 6100 ships with hardware for mounting in a 4-post, tapped-hole equipment rack or square-hole equipment rack. The Acme Packet 6100 also ships with hardware for mounting in a 2-post, center-mount equipment rack. This section explains the procedures for each mounting option.

Caution

Failure to follow the instructions outlined in this section might compromise the proper function of the Acme Packet 6100. To prevent personal injury, Acme Packet recommends that two people lift and install the chassis into the equipment rack.

Unpacking the Acme Packet 6100

To unpack the Acme Packet 6100:

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 6100 shipment.
4. Locate the packing list on the outside of the Acme Packet 6100 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, send an email to tac@acmepacket.com to request assistance.

Mounting Hardware

The hardware used for the Acme Packet 6100 mounting procedures include the following:

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

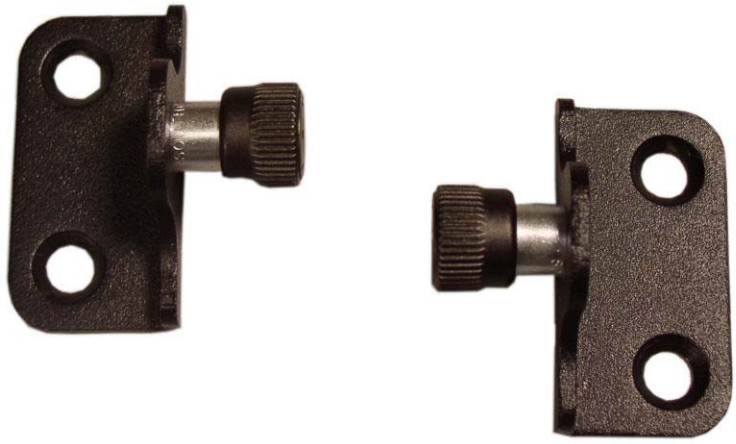


Figure 4 - 37. Front Mounting Flanges

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

Figure 4 - 38. Slide Rail Assembly

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

Figure 4 - 39. Equipment Rack Slide Rail

- Chassis slide rail (part of the slide rail assembly)

Figure 4 - 40. Chassis Slide Rail

- Nut Bar (4)

Figure 4 - 41. Nut Bar

- Mounting Spacer (2)

Figure 4 - 42. Mounting Spacer

- Phillips screws and flat head screws

Phillips Screw #10-32 x 5/8” (8):

Phillips Screw #6-32 x 5/16” (6)

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

Figure 4 - 43. Phillips Screws and Flat Head Screws

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

Figure 4 - 44. Center Mounting Flanges

Cabinet-Style 4-Post Chassis Installation

The following sections explain how to mount the Acme Packet 6100 in a cabinet-style, 4-post equipment rack.

Mounting System

Acme Packet provides flexible mounting options for your Acme Packet 6100 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 6100 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 6100 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 rails and square rack rails. Follow the appropriate procedure below.

Installing Slide Rails into a Tapped-Hole Rack

This section explains how to mount the Acme Packet 6100 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.

Figure 4 - 45. Aligning the Slide Rail Front Mount Point in a Tapped-Hole 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.

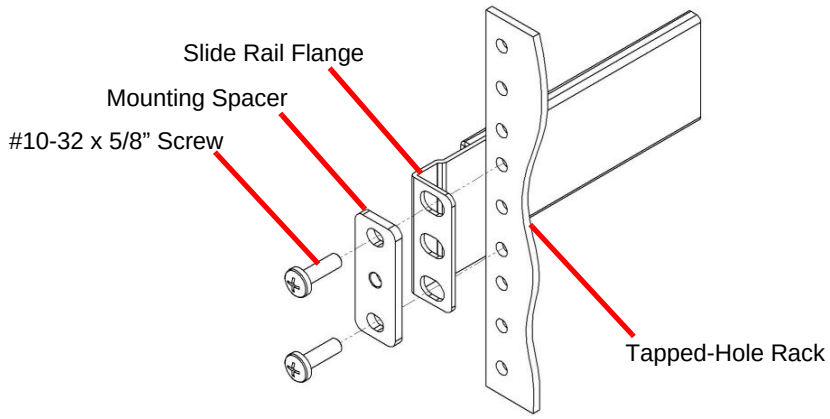


Figure 4 - 46. Attaching the Slide Rail to a Tapped-Hole Rack

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.

Figure 4 - 47. Installed Slide Rail in a Tapped-Hole Rack - Front Mount Point

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.

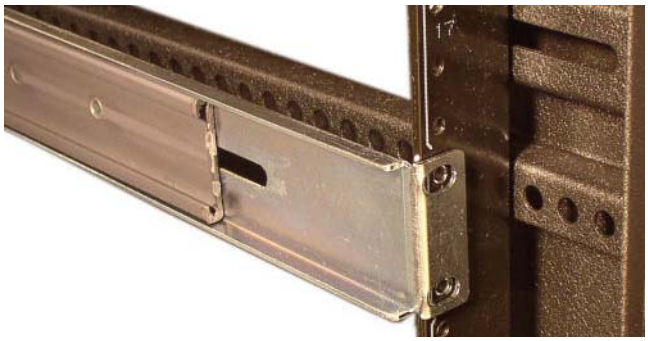


Figure 4 - 48. Aligning Rear Mount Points of the Slide Rail in a Tapped-Hole Rack

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.

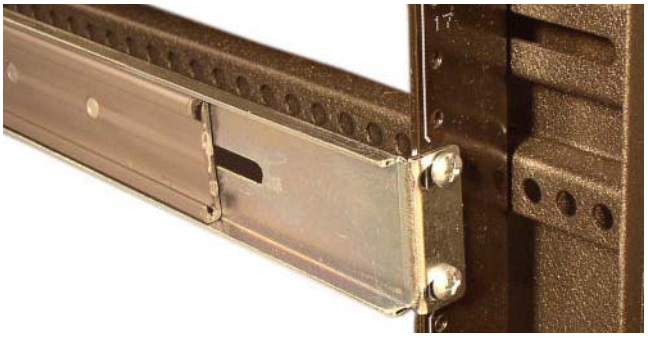


Figure 4 - 49. Installed Slide Rail in a Tapped-Hole Rack - Rear Mount Point

7. Repeat Steps 2 and 6 for the other test equipment slide rail.

Figure 4 - 50. Installed Slide Rails in a Tapped-Hole Rack - Front Mount Points

Figure 4 - 51. Installed Slide Rails in a Tapped-Hole Rack - Rear Mount Points

Installing Slide Rails into a Square-Hole Rack

This section explains how to mount the Acme Packet 6100 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 are 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.

Figure 4 - 52. Aligning the Slide Rail Front Mount Point in a Square-Hole 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.

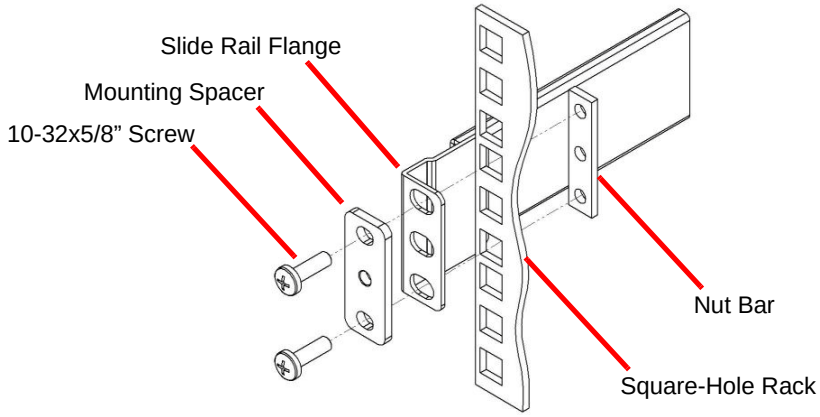


Figure 4 - 53. Attaching the Slide Rail to a Square-Hole Rack

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.

Figure 4 - 54. Installed Slide Rail in a Square-Hole Rack - Front Mount Point

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.

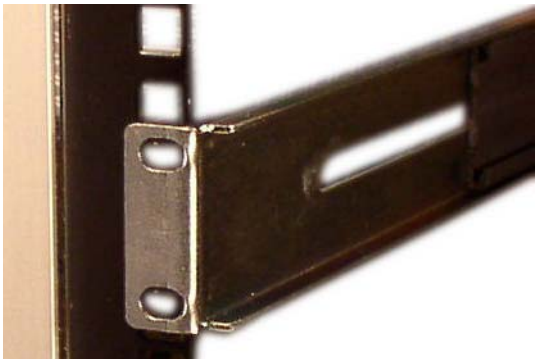


Figure 4 - 55. Aligning the Slide Rail Rear Mount Point in a Square-Hole Rack

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.

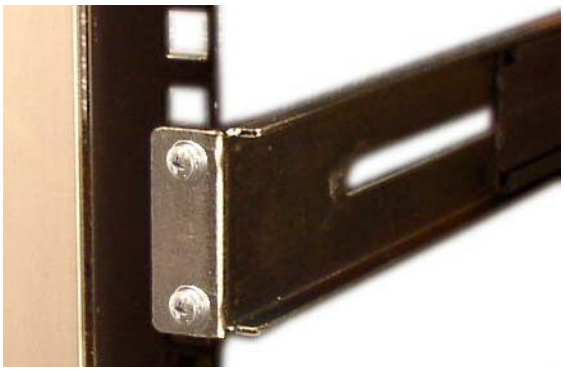


Figure 4 - 56. Installed Slide Rail in a Square-Hole Rack - Rear Mount Point

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 6100 chassis.

To install the chassis rail slides on the Acme Packet 6100 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 Philips 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.

Figure 4 - 57. Tapped Holes to Accommodate Front-Mounting Flange

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

Figure 4 - 58. Acme Packet 6100 With Front-Mounting Flange Installed

4. Line up the chassis slide rail with the Acme Packet 6100 side panel. Position the large marker hole in the slide rail at the front of the Acme Packet 6100 chassis. The remaining three tapped holes in the Acme Packet 6100 chassis will line up with the slide rail holes.

Figure 4 - 59. Tapped Holes to Accommodate Chassis Slide Rail

5. Use 3 x #6-32 x 5/16″ screws to secure the chassis slide rail to the side of the Acme Packet 6100. Notice that the large hole in the slide is positioned toward the front of the Acme Packet 6100 chassis.

Figure 4 - 60. Acme Packet 6100 with Installed Chassis Slide Rail

6. Repeat this procedure for the other side of the Acme Packet 6100 chassis.

Installing the Chassis in the Rack

The Acme Packet 6100 is now ready to be installed into a 4-post equipment rack. To prevent personal injury or damage to the Acme Packet 6100 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 6100 chassis remains supported until you have completely installed it into the equipment rack.

To install the Acme Packet 6100 chassis into the equipment rack:

1. Lift the Acme Packet 6100 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.

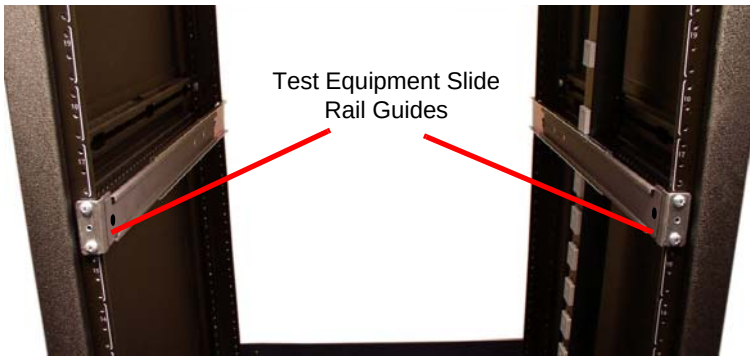


Figure 4 - 61. Equipment Rack Slide Rail Guides

3. Push the Acme Packet 6100 fully into the equipment rack.

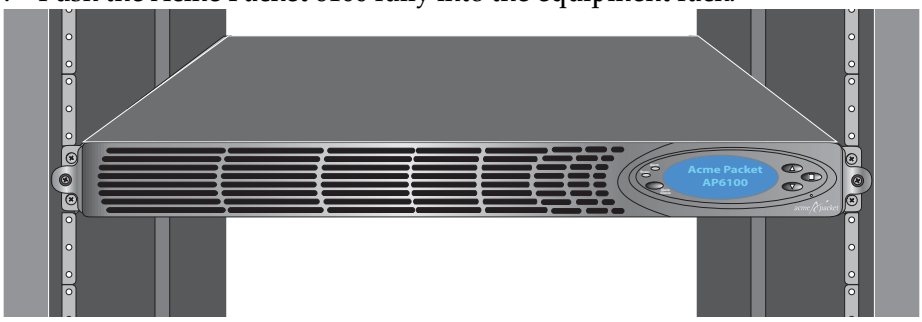


Figure 4 - 62. Acme Packet 6100 Inserted Into the Chassis Slide Rails

4. Line up the chassis-mounted thumbscrews with the threads on the Acme Packet 6100 mounting spacer. You may have to adjust the spacer locations before they line up with the Acme Packet 6100 's captive screws.

Figure 4 - 63. Tightening the Thumbscrews

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 Philips 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 6100 into a 2-post equipment rack.

Figure 4 - 64. Acme Packet 6100 Center-Mounted in a Two-Post Rack

Installing the Center-Mount Hardware

Center-mounting flanges are attached to each side of the Acme Packet 6100. These mounting flanges are reversible, and are not mated to a specific side of the chassis. While the Acme Packet 6100 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 6100 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 6100 chassis. The three screw holes of the chassis flange will only align in one direction.

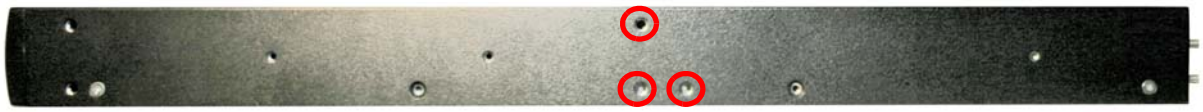


Figure 4 - 65. Tapped Holes to Accommodate Center-Mounting Flange

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

Figure 4 - 66. Center-Mounted Flange Installed

4. Repeat this procedure for the other side of the Acme Packet 6100 chassis.

Installing the Chassis into the Rack

The Acme Packet 6100 chassis is now ready to be installed into a 2-post equipment rack. To prevent personal injury or damage to the Acme Packet 6100 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 6100 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 6100 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 6100 and into the equipment rack. One person

should hold the Acme Packet 6100 in the correct position while the other person screws the Acme Packet 6100 in place.

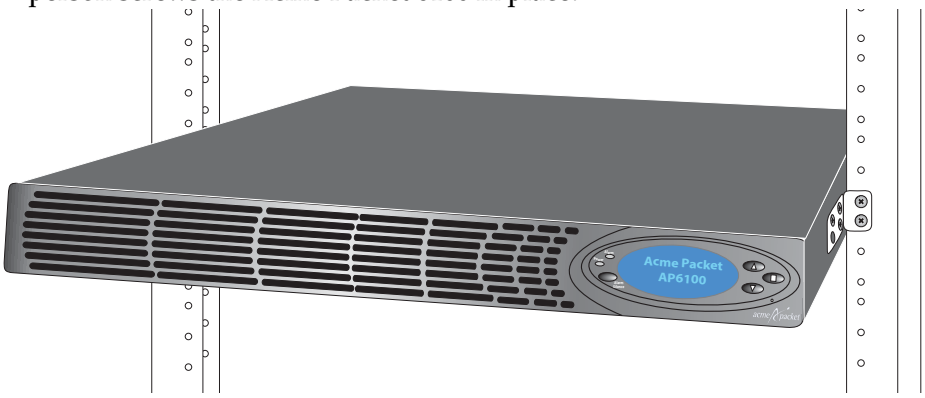


Figure 4 - 67. Attaching the Acme Packet 6100 to a 2-Post Equipment Rack

4. Ensure that the Acme Packet 6100 chassis remains supported until you have completely installed it into the equipment rack.

Fan Module Installation

The fan module is preinstalled in the Acme Packet 6100 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 6100 must be properly grounded to ensure efficient system performance. Grounding your Acme Packet 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 6100 if it is not properly grounded. If your Acme Packet 6100 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

Caution

Failure to ground the chassis properly can result in permanent damage to the Acme Packet 6100 and its components. Bodily harm may also result under some circumstances.

Caution

The Acme Packet 6100 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 6100 chassis. The Acme Packet 6100 ships with 2 kep nuts screwed onto the ground terminals. You 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 6100.

Important: Acme Packet 6100 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 6100:

1. Unscrew and remove the two kep nuts from the grounding posts located on the rear of the Acme Packet 6100. Place them aside.

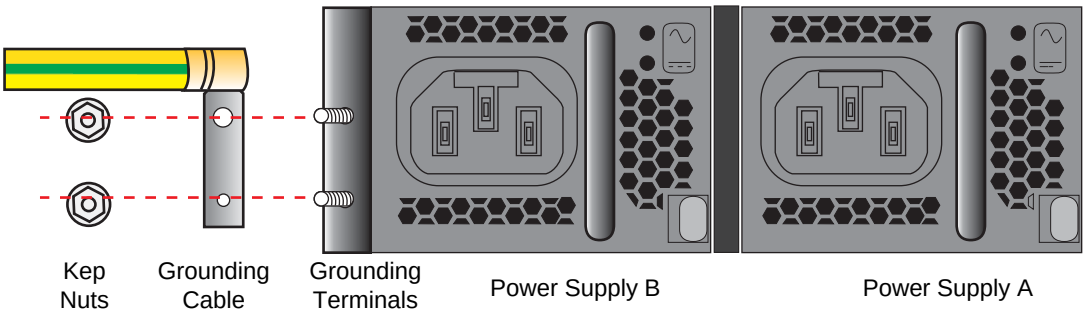


Figure 4 - 68. Acme Packet 6100 Dual AC Power Supplies and Grounding Posts

2. Place the lug on the end of the grounding cable onto the grounding posts.

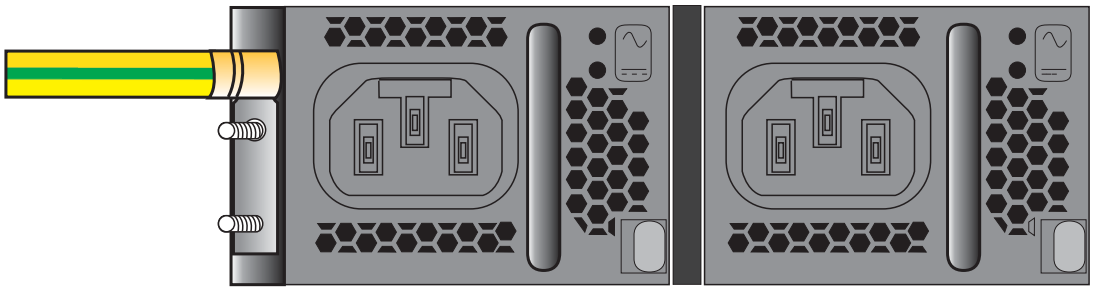


Figure 4 - 69. Grounding Cable Over the Grounding Terminals

3. Screw 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.

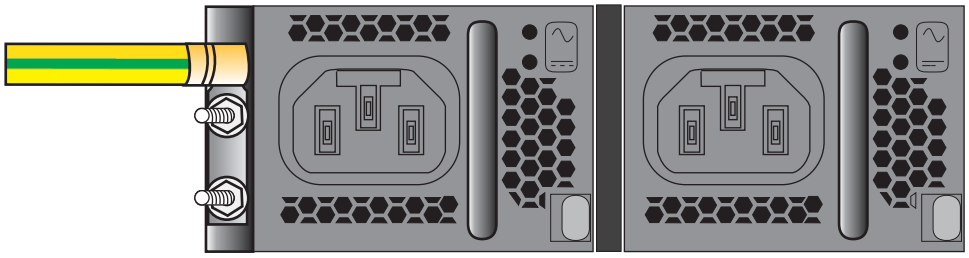


Figure 4 - 70. Kep Nuts Securing Grounding Cable to Grounding Terminals

4. Connect the other end of the grounding wire to a suitable grounding point at your site.

Caution

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

AC Power Cord Installation

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

Caution

Use a 15 Amp fused circuit for each AC power supply.

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

To install the AC power cords in the Acme Packet 6100:

1. Set the System Power switch to the Stby position to cut off power to the Acme Packet 6100.

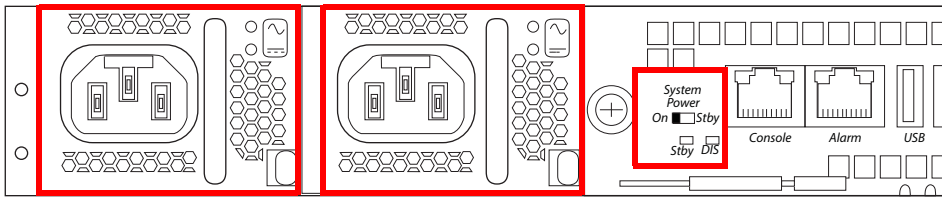


Figure 4 - 71. AC Power Supplies (left) and System Power Switch (right)

2. Locate the two AC power cords shipped with your Acme Packet 6100. 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.

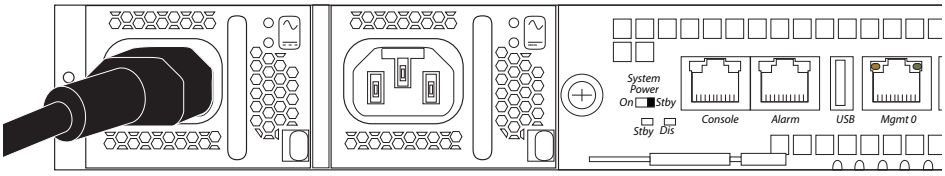


Figure 4 - 72. Plug in One AC Power Cord

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.

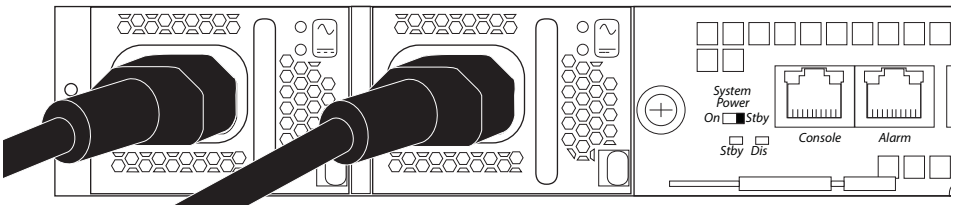


Figure 4 - 73. Plug in the Second AC Power Cord

5. Route the AC power cords through your rack and cabling system to the power outlets.
6. There is no on/off switch on these power supplies. When you plug them in the power is on and the system will start to boot.
7. Plug the supply end of each power cord into its own circuit.

   Note: To remove AC power cables from the Acme Packet 6100 reverse the previous procedure.

8. Set the System Power switch to the On position to provide power to the Acme Packet 6100.

DC Power Cord Installation

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

Caution

Use a 30 Amp fused circuit for each DC power supply.

Caution

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.

Important: This equipment is intended for installation in Network Telecommunication Facilities.

To install the DC power cords in the Acme Packet 6100:

1. Set the System Power switch to the Stby position to cut off power to the Acme Packet 6100.

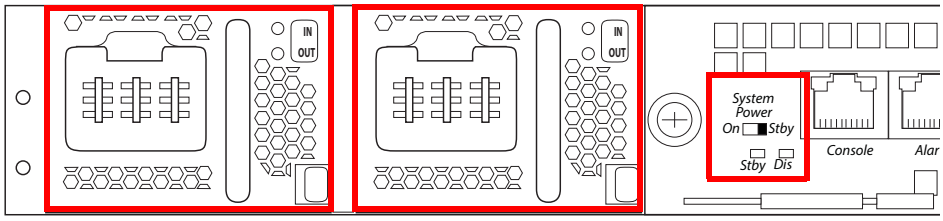


Figure 4 - 74. DC Power Supplies (left) and System Power Switch (right)

2. Locate the two DC power cords shipped with your Acme Packet 6100. 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.

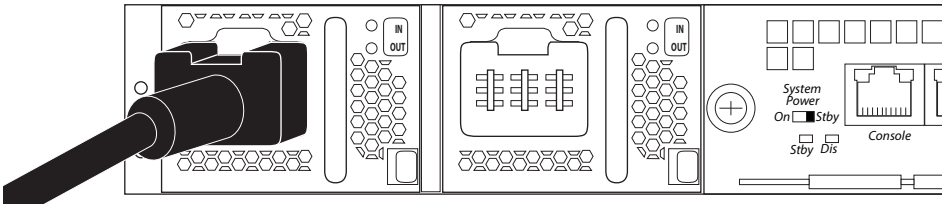


Figure 4 - 75. Plug in One DC Power Cord

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

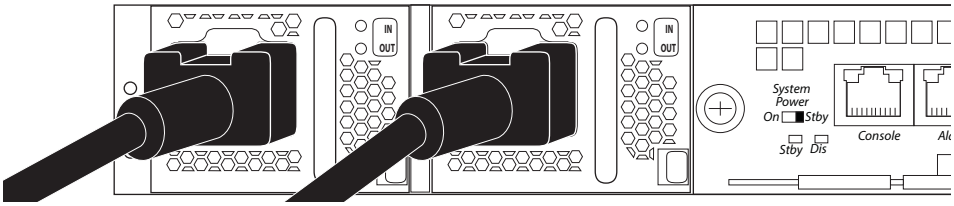


Figure 4 - 76. Plug in the Second DC Power Cord

5. Route the DC power cords through your rack and cabling system to the power outlets.
6. There is no on/off switch on these power supplies. When you plug them in the power is on and the system will start to boot.
7. Plug the supply end of each power cord into its own circuit.

   Note: To remove DC power cables from the Acme Packet 6100 reverse the previous procedure.

8. Set the System Power switch to the On position to provide power to the Acme Packet 6100.

Cabling the Acme Packet 6100

After mounting the Acme Packet 6100 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 6100 from potential damage.

You can install and remove Ethernet and 10GbE optical cables while the Acme Packet 6100 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.

Warning: 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 6100 has one console port located on the rear-facing NIU. The Acme Packet 6100 ships with a console adapter that allows you to connect a standard DB-9 serial port to the Acme Packet 6100 's RJ45 console port.

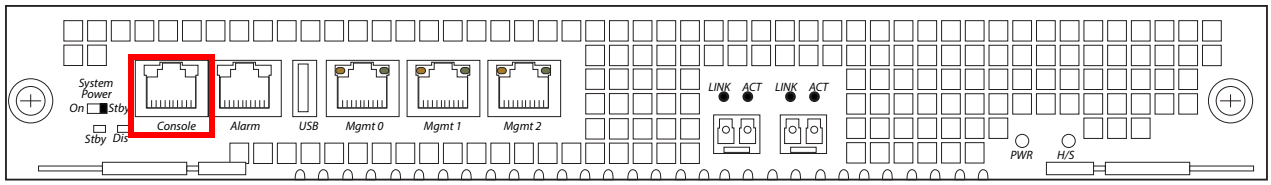


Figure 4 - 77. Console Port

Chassis Console Cabling Procedure

This section explains how to create a serial connection to the Acme Packet 6100 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 shielded CAT5e or CAT6 console cable to connect to the Acme Packet 6100.
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.

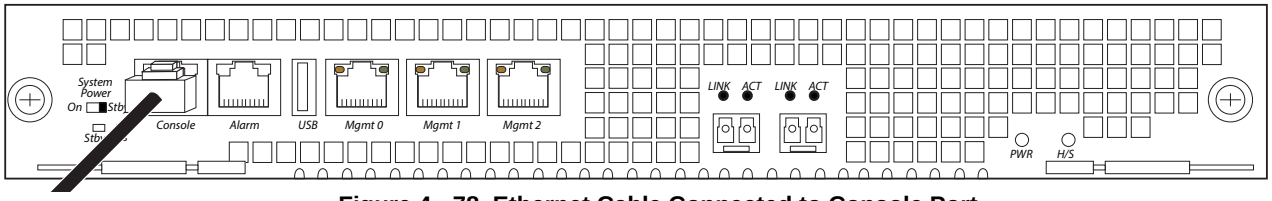


Figure 4 - 78. Ethernet Cable Connected to Console Port

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 6100. The alarm port contains leads for three circuits, each of which closes to signify a corresponding alarm.

Cabling Procedure

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 6100.

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.

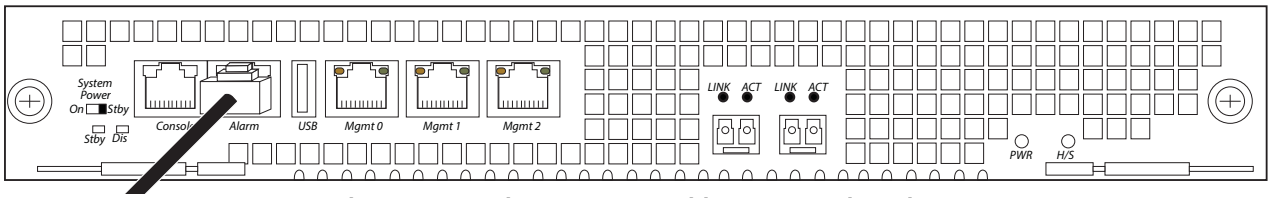


Figure 4 - 79. Alarm Contact Cable Connected to Alarm Port

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 6100 management Ethernet ports to your network. These ports support 10/100/1000 Mbps speeds.

Note: 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.

Cabling Procedure

To connect Ethernet cables to the rear panel Ethernet ports:

1. Locate the Ethernet cables you plan to connect to the Acme Packet 6100.
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 6100. 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 6100.

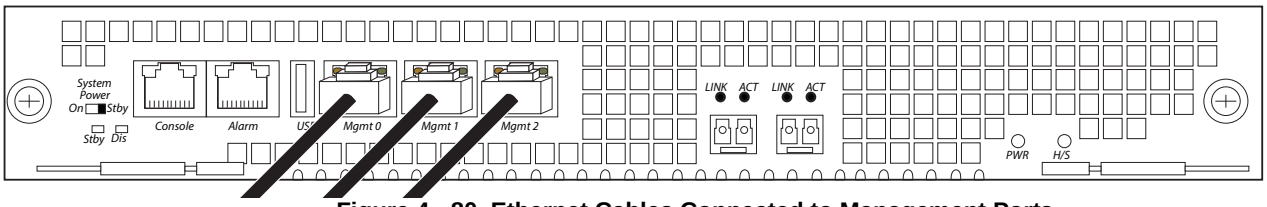


Figure 4 - 80. Ethernet Cables Connected to Management Ports

Media and Signaling Network Interfaces

This section explains how to cable the NIU for media and signaling. The NIU is available with either 10GbE copper or optical SFP Ethernet connectors.

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

10GbE SFP Optical Cabling Procedure

This section explains how to cable a Acme Packet 6100 configured with 10GbE optical NIUs. Standard single mode or multimode fiber optic cabling with duplex LC connectors are used to connect the Acme Packet 6100 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 10GbE optical cabling to the 10GbE optical physical interface cards:

1. Locate the 10GbE fiber optic cables you plan to connect to the Acme Packet 6100.

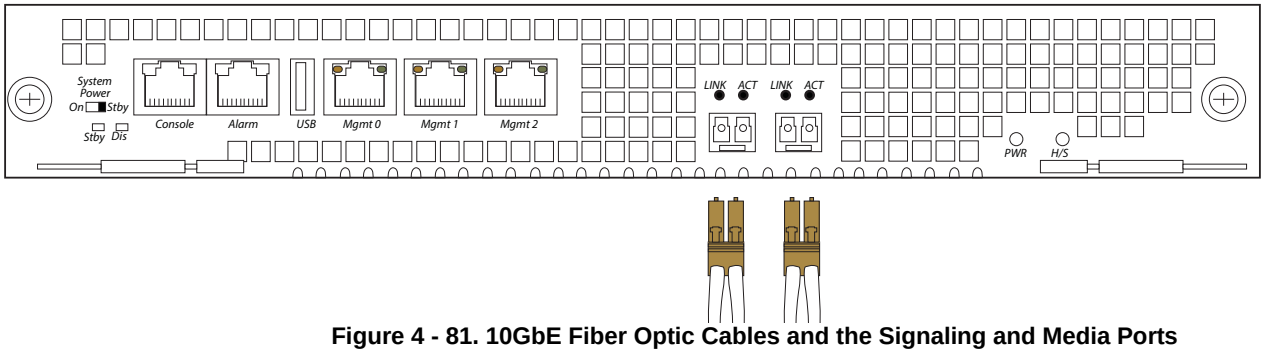


Figure 4 - 81. 10GbE Fiber Optic Cables and the Signaling and Media Ports

2. 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. These media and signaling ports from left to right are *P0* and *P1*.

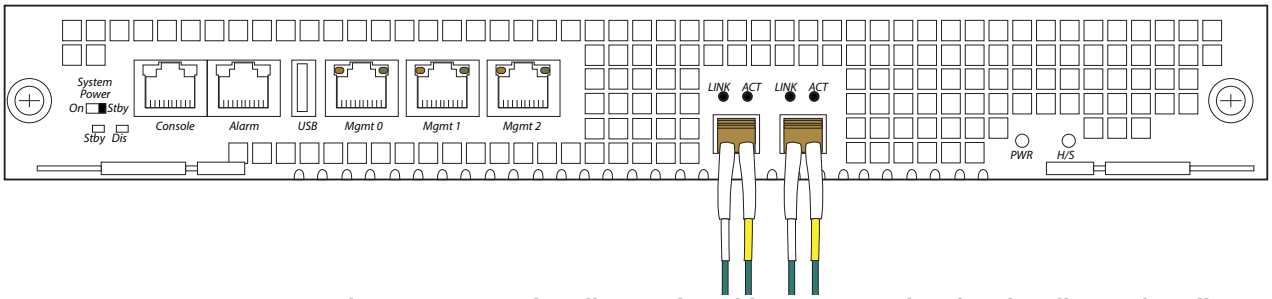


Figure 4 - 82. 10GbE Fiber Optic Cables Connected to the Signaling and Media Ports

3. Route the cable away from the Acme Packet 6100. Make sure that the fiber optic cables are not stretched tightly or subjected to extreme stress.

4. Repeat Steps 1 through 2 for each additional fiber optic cable you connect to your Acme Packet 6100.

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, *Mgmt0* should be reserved as the boot/maintenance interface. This leaves *Mgmt1* and *Mgmt2* available for sharing HA information.

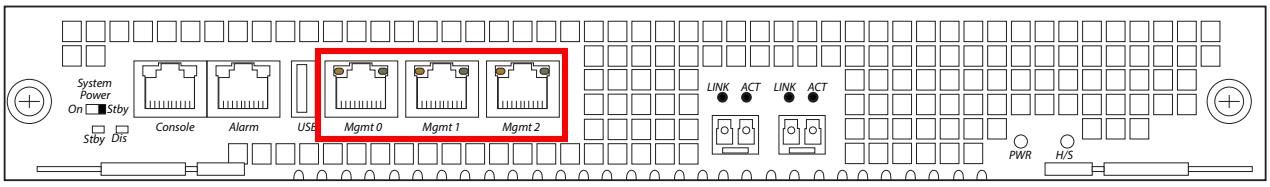


Figure 4 - 83. Network Management Ports

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

To cable Acme Packet 6100 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 6100 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 6100 B. The release tab on the RJ45 jack clicks into place when you insert it properly. If you use *Mgmt1* on Acme Packet 6100 B, then you will connect it to *Mgmt1* on Acme Packet 6100 B.

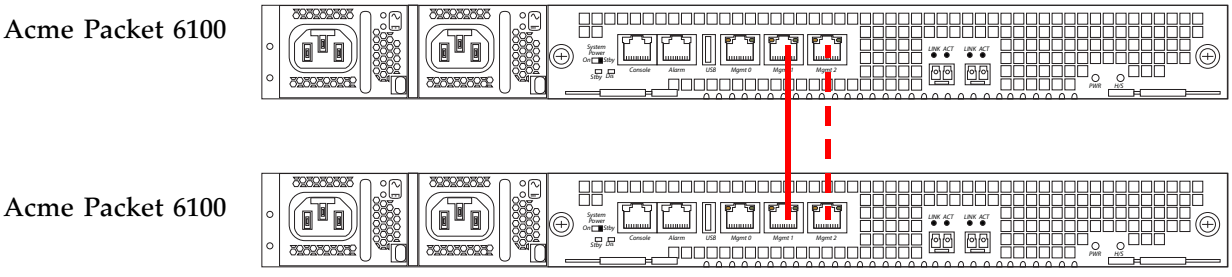


Figure 4 - 84. HA Configuration (Either of the Displayed Connections Can Be Used

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

To cable Acme Packet 6100 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 6100 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 6100 B. The release tab on the RJ45 jack clicks into place when you insert it properly.
3. Insert one end of a second Ethernet cable into *Mgmt2* on the rear panel of Acme Packet 6100 A. The release tab on the RJ45 jack clicks into place when you insert it properly.
4. Insert the other end of the cable into *Mgmt2* on the rear panel of Acme Packet 6100 B. The release tab on the RJ45 jack clicks into place when you insert it properly.

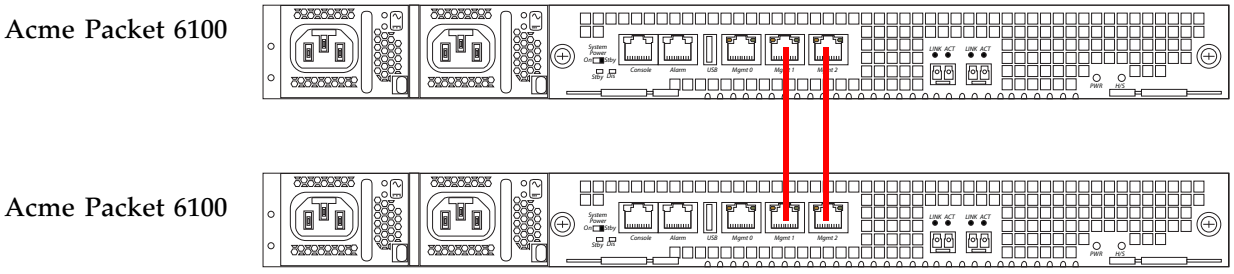


Figure 4 - 85. HA Configuration (Both of the Displayed Connections Must Be Used

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 6100 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

Introduction

This chapter describes Acme Packet 6100 startup which involves two tasks:

- Powering on the Acme Packet 6100.
- Creating the first console connection to the Acme Packet 6100.

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 6100 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 6100, you must configure the terminal hardware and software appropriately.

Table 5 - 7. Terminal Application Serial Settings for Use with Console Port

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

Note: 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 6100 default parameters.
2. The Acme Packet 6100 console port is located on the Acme Packet 6100 NIU. You must connect to the console port when initially booting the Acme Packet 6100.
3. If the Acme Packet 6100 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 6100, you can watch the boot process as it displays on your screen.

Powering On the Acme Packet 6100

This section explains how to power on your Acme Packet 6100.

Prerequisites

The following procedure presumes that you know how to connect your Acme Packet 6100 to either AC or DC power.

To power on the Acme Packet 6100 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.

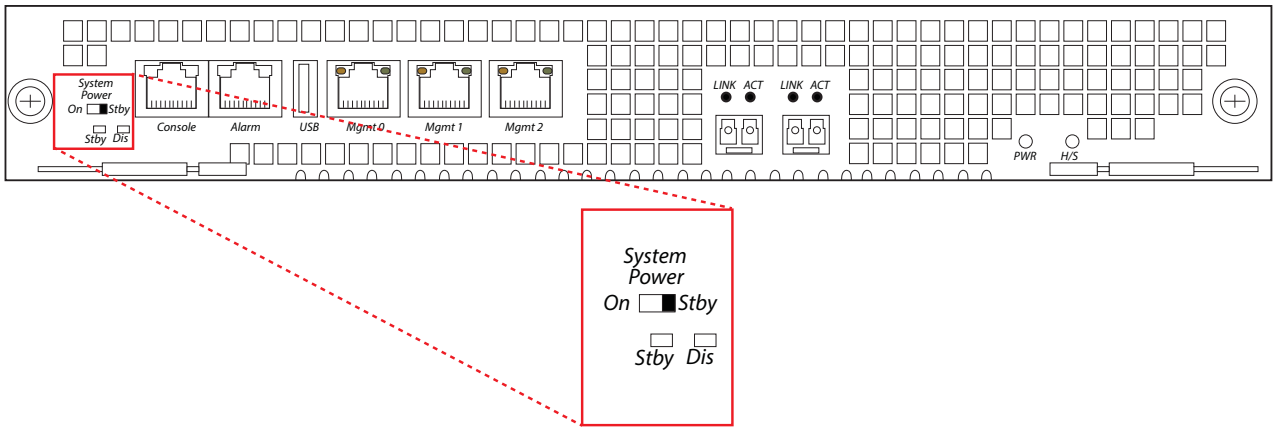


Figure 5 - 86. System Power Switch

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.

Initial Log On

Once you have established the console connection, powered on the Acme Packet 6100 and a runtime image has been loaded, you are ready to login and begin configuring the system. After the Acme Packet 6100 has initialized, the ACLI login prompt appears in your terminal application as follows:

```
User Access Verification
Password:
```

If the Acme Packet 6100 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.

System access in the following procedure uses the default User and Superuser passwords. If you do not have the default passwords, please send an email to tac@acmepacket.com.

1. At the ACLI Password prompt, enter the default system User password and press <return>. Your entries are not echoed on the screen.

   ```
   User Access Verification

   Password:
   ACMEPACKET>
   ```

   From the User prompt you can view various configuration states and operating statistics on the Acme Packet 6100 and perform configuration tasks.

2. Type enable and press <return> to enter Superuser mode. The prompt to enter the superuser password appears.

   ```
   ACMEPACKET> enable
   Password:
   ```

3. Enter the Superuser password and press <return>. The system prompt will ends with a pound sign instead of a closed-angle-bracket to let you know are in Superuser mode.

   ```
   Password:
   ACMEPACKET#
   ```

4. You can now begin configuring your Acme Packet 6100. Refer to the *Acme Packet Configuration Guide* to learn how to establish an IP address for your Acme Packet 6100.

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

Formatting the Solid State Drive

After the initial log on to the Acme Packet 6100, 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 Introduction

Introduction

This chapter explains Acme Packet 6100 hardware maintenance procedures and hardware alarm information.

System Shut Down

Although several user-replaceable components of the Acme Packet 6100 are hot-swappable, some limited Acme Packet 6100 maintenance procedures require that you shut down the system.

Before you shut down or restart the Acme Packet 6100, ensure that there are no active calls in progress. Procedures to reroute call and network traffic around the Acme Packet 6100 are outside the scope of this guide.

You can set the Acme Packet 6100 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 6100. Shutting down the system is appropriate when you are replacing a physical interface card, power supply, or are removing the Acme Packet 6100 from the equipment rack.

Rejecting Incoming Calls

To reject all incoming calls on the Acme Packet 6100:

1. In Superuser mode, 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 6100

To shut down the Acme Packet 6100 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 6100.
4. Confirm that the graphic display is dark and all fans are off.

Rebooting, Resetting, and Power Cycling

Reboot

Rebooting the Acme Packet 6100 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 files 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 6100 is required every time you upgrade with a new version of the Acme Packet 6100 software.

Save your configurations before rebooting the Acme Packet 6100. 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 6100:

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 6100 via the reset pushbutton on the front of the chassis performs a cold reboot. This is the equivalent to 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 6100 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. Depending on what files become damaged, the system might become completely unusable.

Caution

Always try to first reboot the Acme Packet 6100 from the ACLI before performing a cold reset. Only reset the system as a last resort.

To reset the Acme Packet 6100:

1. 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.

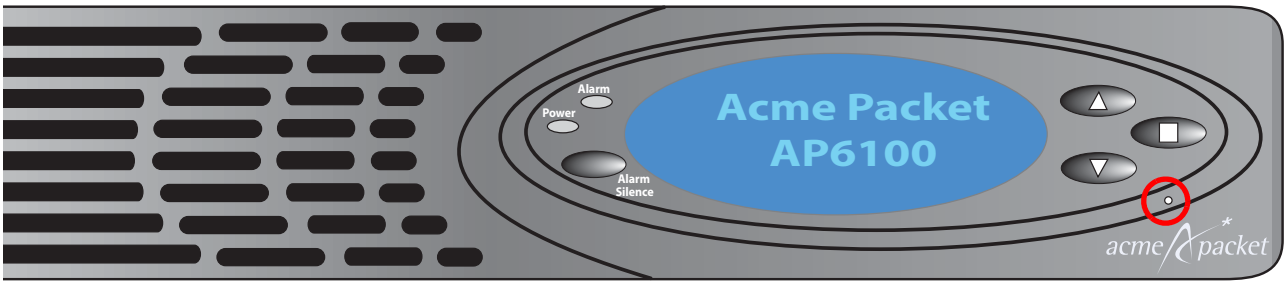


Figure 6 - 87. Reset Pushbutton

Power Cycling

Power Cycling the Acme Packet 6100 is the process of turning the chassis off and then on again. Unplugging the AC power cords from the power supplies means to remove power from the system. 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 Mode for HA Nodes

When performing hardware maintenance on the Acme Packet 6100, it is best to minimize any risk of interrupting network traffic or losing data. If the Acme Packet 6100s are configured as an HA node, you should only work on the Acme Packet 6100 that is in standby mode.

There are two ways to determine the HA state of each Acme Packet 6100 in an HA pair.

1. If you are in the same physical location as the Acme Packet 6100 you can view the graphic display on the front panel. The display will indicate HA state. There is no (S) designation for an active system, but there is for a standby system.
2. If you are not in the same physical location as the Acme Packet 6100, you can use the ACLI *show health* command. The output of this command indicates the current HA state of the Acme Packet 6100.

Once you have determined that the Acme Packet 6100 due for maintenance is in standby mode, you can continue with the appropriate procedures to replace a part.

If you need to perform maintenance on the active Acme Packet 6100 you need to manually force the two Acme Packet 6100s to switch HA states. Forcing a switchover renders the currently active Acme Packet 6100 standby, and the currently standby Acme Packet 6100 will assume all traffic processing and forwarding as the active system.

Caution

This procedure is only applicable to Acme Packet 6100 in an HA deployment.

To force a Acme Packet 6100 into the standby HA state:

1. Confirm that the relevant systems on active and standby Acme Packet 6100 are synchronized with the *show health* command. Type *show health* and press <Enter> on each system.

```
NETNETSBC1# show health

        Media Synchronized          true
        SIP Synchronized            true
        MGCP Synchronized           true
        H248 Synchronized           disabled
        Config Synchronized         true
        Collect Synchronized        disabled
        Radius CDR Synchronized     disabled
        Rotated CDRs Synchronized   disabled
        Active Peer Address         0.0.0.0

Redundancy Protocol Process (v3):
        State                         Active
        Health                        100
        Lowest Local Address          169.254.1.1:9090
        1 peer(s) on 2 socket(s):
        SML-STIC-2: v3, Standby, health=100, max silence=1050
                      last received from 169.254.1.2 on wancom1:0

        Switchover log:
        Jun 25 19:03:02.029: Active to BecomingStandby
        Jun 25 19:04:54.684: Standby to BecomingActive
NETNETSBC1#

NETNETSBC2# show health

        Media Synchronized          true
        SIP Synchronized            true
        MGCP Synchronized           true
        H248 Synchronized           disabled
        Config Synchronized         true
        Collect Synchronized        disabled
        Radius CDR Synchronized     disabled
        Rotated CDRs Synchronized   disabled
        Active Peer Address         169.254.2.1

Redundancy Protocol Process (v3):
        State                         Standby
        Health                        100
        Lowest Local Address          169.254.1.2:9090
        1 peer(s) on 2 socket(s):
        SML-STIC-61001: v3, Active, health=100, max silence=1050
                      last received from 169.254.2.1 on wancom2:0

        Switchover log:
```

synchronized applications

active system

synchronized applications

standby system

Figure 6 - 88. Show Health Command (Example)

2. Confirm that current configurations of both the active and standby Acme Packet 6100 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 MUST match each other, they do not have to match the shared running configuration version.

3. Confirm that running configurations of the active and standby Acme Packet 6100 match by typing *display-current-cfg-version* and press <Enter> at the ACLImatch by typing *display-running-cfg-version* and pressing <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 MUST match each other, they do not have to match the shared current configuration version.

4. Initiate a switchover between active and standby Acme Packet 6100s by typing *notify berpd force* on the standby Acme Packet 6100 and then pressing <Enter> at the ACLI prompt.

```
NETNETSBC1# notify berpd force
```

5. Wait for the other Acme Packet 6100 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. Replace 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 6100 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 6100 from an equipment rack. To prevent injury, Acme Packet recommends that any time a Acme Packet 6100 is installed or removed from an equipment rack, two people complete the procedure.

Caution

Always disconnect the Acme Packet 6100 power supplies from the power source when removing a chassis from an equipment rack.

Removing the Acme Packet 6100 from an Equipment Rack

You must first review the safety precautions for the Acme Packet 6100 prior to proceeding.

To remove the Acme Packet 6100 from an equipment rack:

1. Remove the two AC/DC power cords from the power supplies in the rear of the system. (There are no on/off switches on these power supplies).
2. Remove all power cables from the Acme Packet 6100.
3. Remove and label all attached network cables, alarm cable, and console cables from their respective ports on the chassis.
4. Unscrew the thumb screws that secure the Acme Packet 6100 to the equipment rack slide rails. This may require using a #2 Phillips screwdriver.

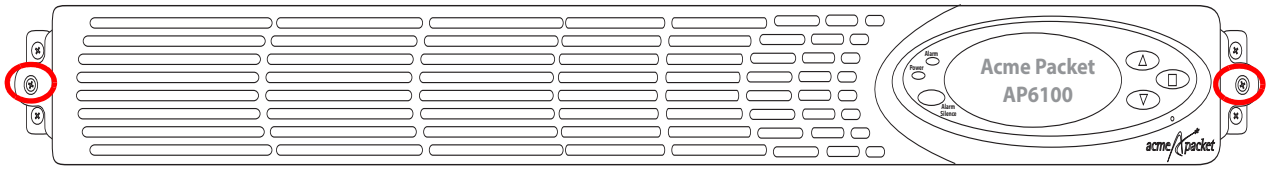


Figure 6 - 89. Loosening Thumbscrews

Caution

Beginning in this step, one person should support the Acme Packet 6100 from below while the other person removes the system chassis from the equipment rack.

5. Pull the Acme Packet 6100 forward and out of the equipment rack.

6. 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.

Figure 6 - 90. Locking Clip Fastens the Chassis and Rack Slide Rails

7. Push on the locking clip pin and locking clip latch to unlock the slide rails from each other.

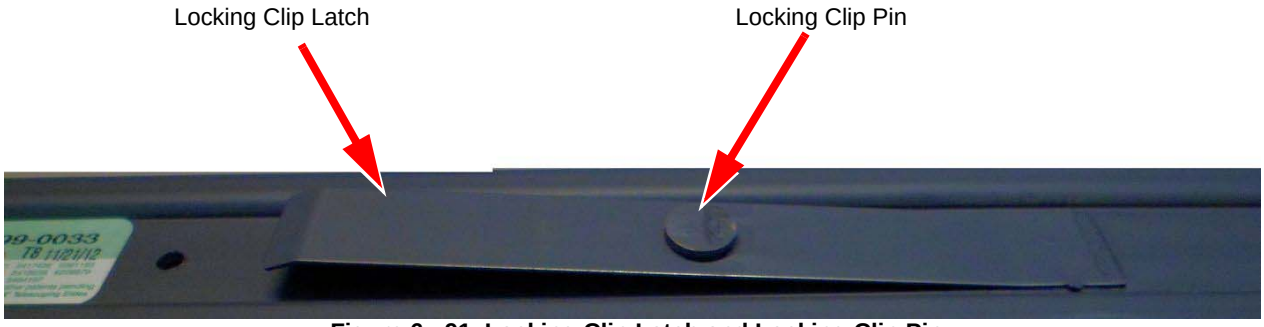


Figure 6 - 91. Locking Clip Latch and Locking Clip Pin

8. Remove the chassis completely from the slide rails.
9. Lift the Acme Packet 6100 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 6100 chassis.

The power supply is a user-replaceable component. If a Acme Packet 6100 power supply malfunctions, you should remove the malfunctioning power supply and replace it. The power supply can be removed from the chassis while still installed in the rack and while the second power supply is providing system power; this is called a warm swap. When removing and replacing a

power supply, remember to first ground yourself using appropriate ESD grounding equipment such as a wrist strap.

Figure 6 - 92. ESD Grounding Strap

To remove a power supply from the Acme Packet 6100 chassis:

1. Remove the AC or DC power cables from the power supplies.

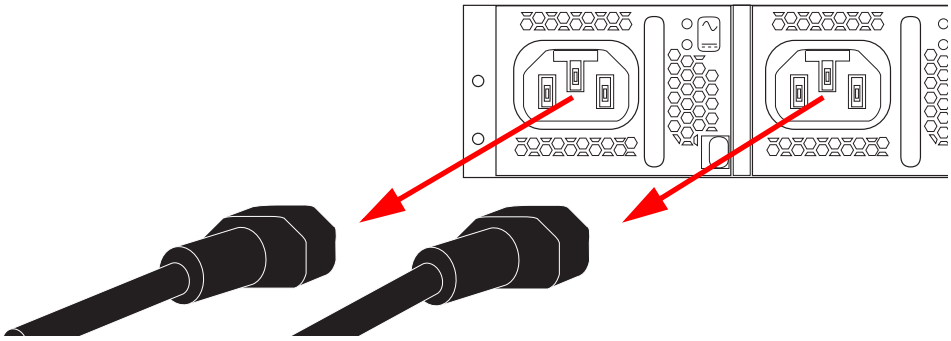


Figure 6 - 93. Removing the Power Cords

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

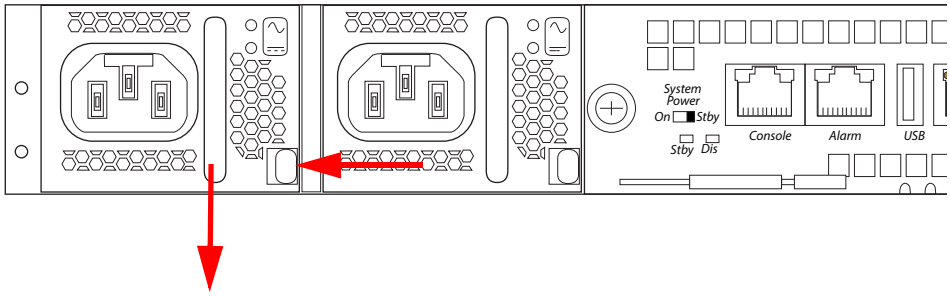


Figure 6 - 94. Releasing the Locking Tab

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.

Caution

NEVER power up a power supply before it is installed in the Acme Packet 6100 chassis.

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

To install a power supply in the Acme Packet 6100 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 6100 chassis. The labels on the power supply face upward.

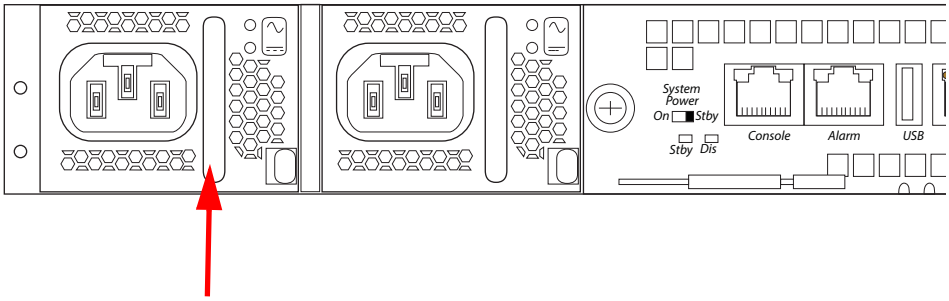


Figure 6 - 95. Installing the Power Supply

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 6100 chassis.

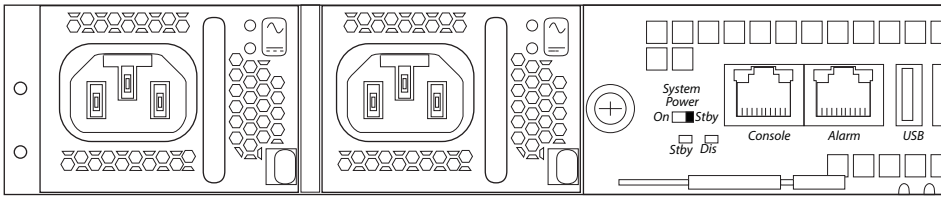


Figure 6 - 96. Installed Power Supplies

Note: Connect the power cord to the inserted power supply.

NIU Removal and Replacement

Prior to removing an NIU, the platform in which it is installed must be in standby before powering down the chassis and removing the NIU. The following procedure describes how to remove an NIU.

Caution

Make sure you are properly grounded with an ESD strap before removing the NIU.

NIU Removal

To remove an NIU:

1. Ensure that the Acme Packet 6100 on which the NIU is being replaced is in standby mode by following the steps described elsewhere in this document.
2. Set the System Power switch to STBY to power down the chassis.
3. Unplug all network and management cables from the NIU you plan to remove from the Acme Packet 6100.
4. Using a #2 Phillips screwdriver, 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.

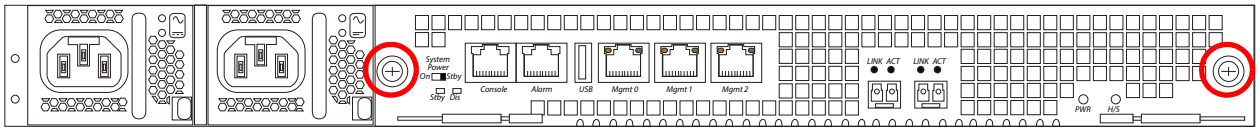


Figure 6 - 97. Loosening NIU Captive Thumbscrews

5. Pivot the two ejection levers outward at the same time, pulling the card out of its connection to the motherboard and away from the system chassis. This action disengages the NIU from the system, severing all electrical contact to the processing unit.

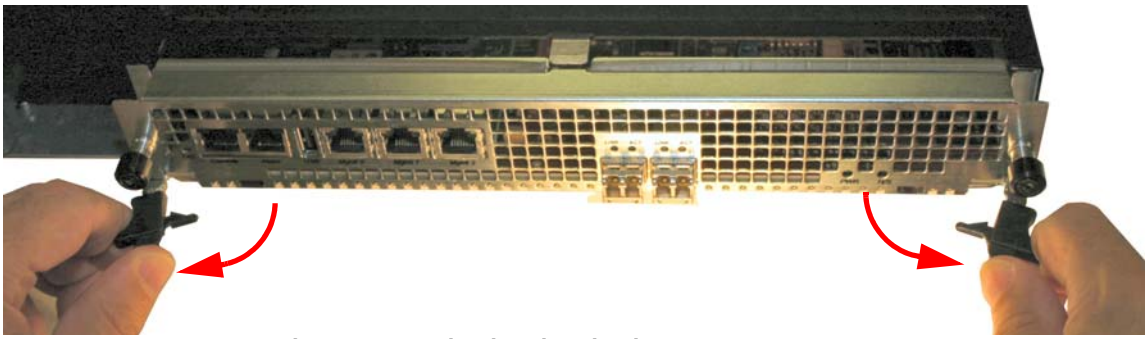


Figure 6 - 98. Pivoting the Ejection Levers

6. Pull the loosened NIU out of the Acme Packet 6100 by holding each side of the NIU's front panel.

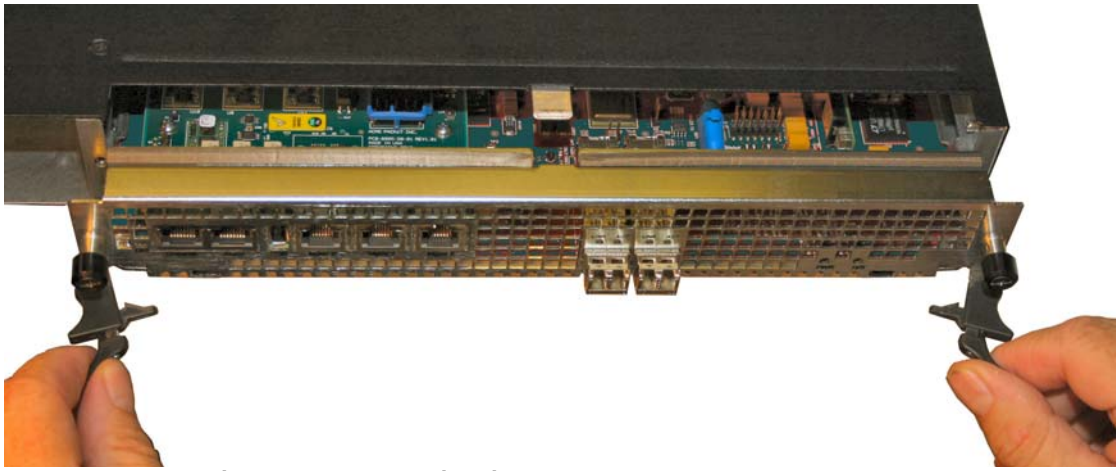


Figure 6 - 99. Removing the NIU

7. Place the NIU in an antistatic bag while it remains outside of the Acme Packet 6100.

NIU Replacement

To install an NIU into the Acme Packet 6100 chassis:

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

Figure 6 - 100. Extending the NIU Ejection Levers

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 6100. The guide rails lead the NIU to engage with the bus connector squarely.

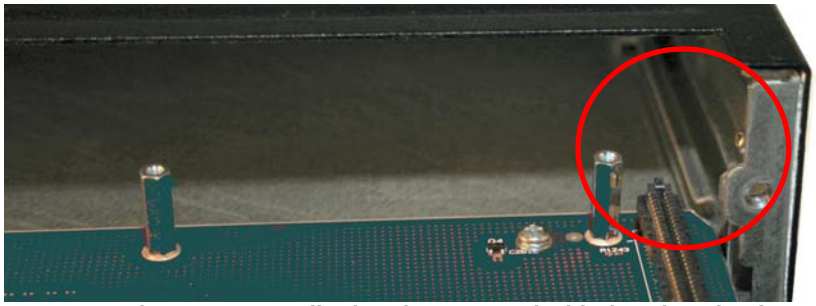


Figure 6 - 101. Aligning the NIU Card with the Chassis Slot Guides

5. Slide the card into the Acme Packet 6100. The physical interface card circuit board slides into the guide rails in the NIU bay of the system chassis.

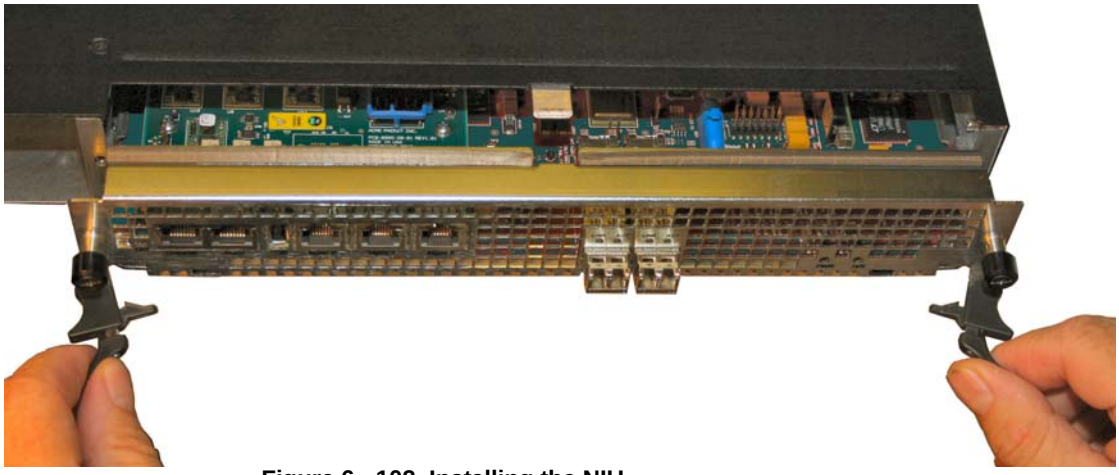


Figure 6 - 102. Installing the NIU

6. Continue sliding the card into the chassis until the ejection levers catch the chassis. At this point, the ejection levers will start to fold inward as the NIU is inserted into the chassis.
7. Fold both ejection levers inward toward the card to complete the connection to the motherboard. Pushing the ejection levers inward draws the physical interface card toward the system chassis and completes the connection. The latches must engage to complete NIU insertion.

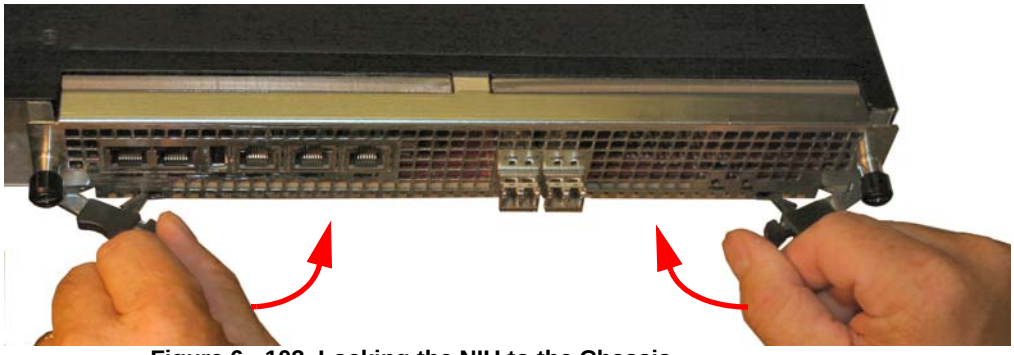


Figure 6 - 103. Locking the NIU to the Chassis

8. Screw the NIU into the chassis with a #2 Phillips screwdriver. This creates the final connection between the interface unit and the chassis.

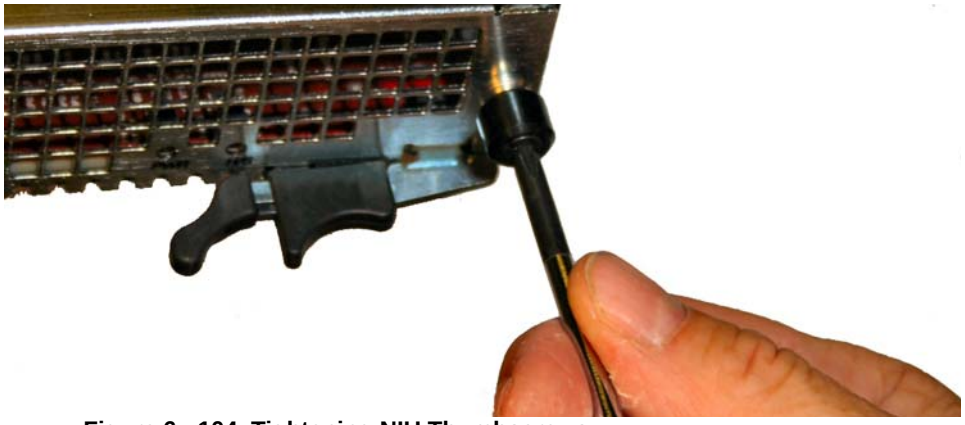


Figure 6 - 104. Tightening NIU Thumbscrews

9. Replace all network and management cabling.
10. Set the System Power switch to ON to power up the chassis. The system boots up.
11. 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:
    - 11a. Set the System Power switch to STBY to power down the chassis.
    - 11b. 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.
    - 11c. Set the System Power switch to ON to apply power to the chassis. The system boots up.
    - 11d. 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 6100 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.

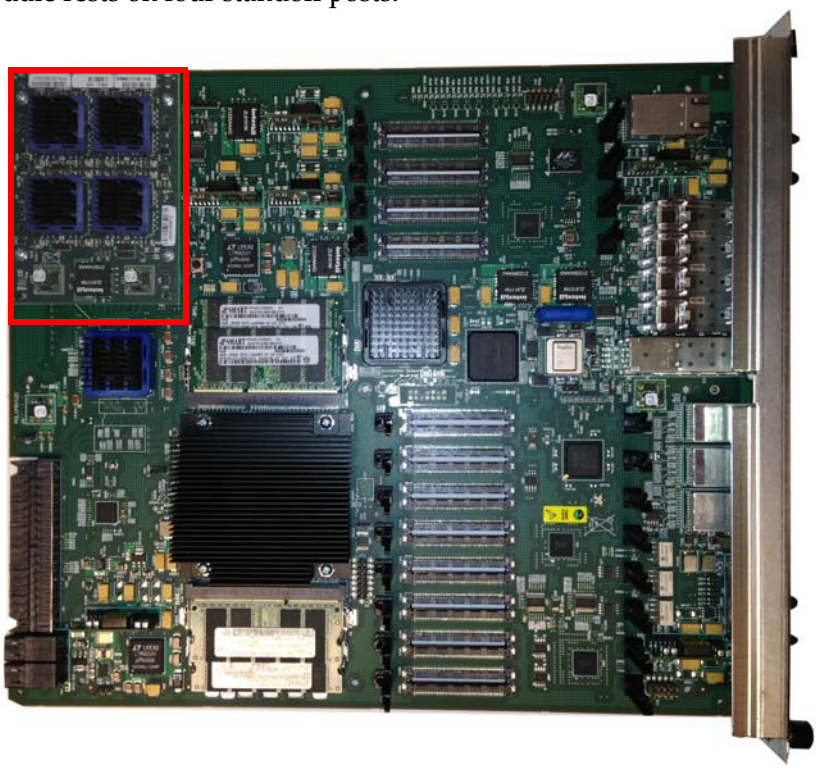


Figure 6 - 105. Location of the SSM3 Module

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.

Caution

Before handling a Acme Packet 6100 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

To remove the SSM3 module:

1. Remove the NIU card as directed in the *Acme Packet 6100 Service Manual*.
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.

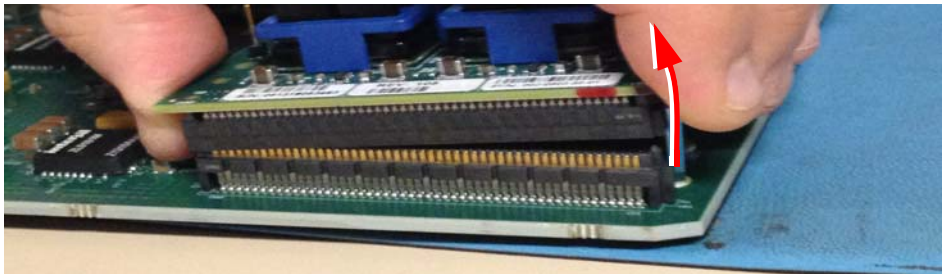


Figure 6 - 106. Removing the SSM3 Module

Installing the SSM3 Module

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

Prerequisites:

- Place the new SSM3 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 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)

To install the 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).

Figure 6 - 107. Installing the SSM3 Module

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.

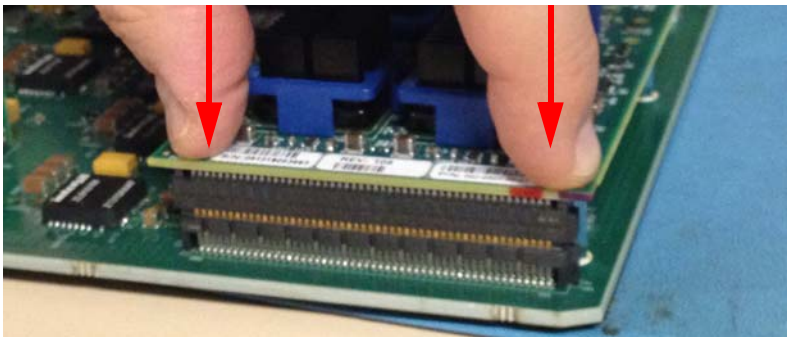


Figure 6 - 108. Fully Seating the SSM3 Module Connector

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

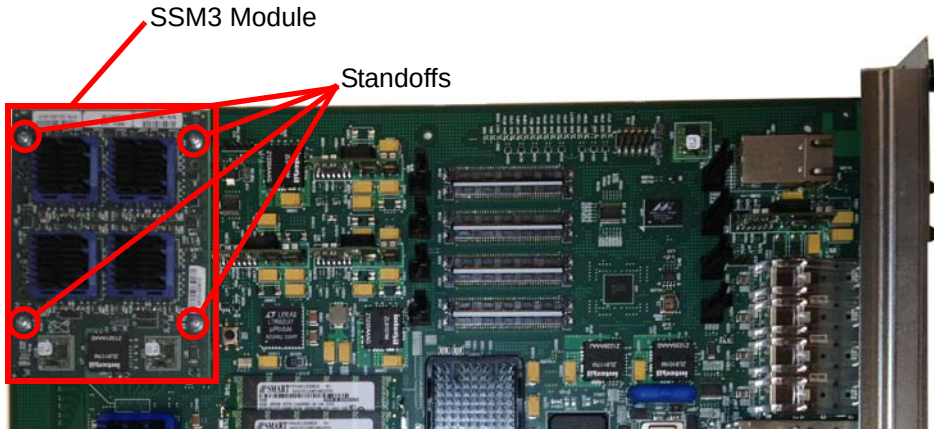


Figure 6 - 109. Location of the SSM3 Module Standoff Posts

Installing SODIMMs

The small outline dual in-line memory modules (SODIMMs) that expand the memory functionality of the Acme Packet 6100 are installed on the NIU PCB. The two SODIMM connectors are installed centrally on the NIU, one partially above the other, fastened by industry-standard SODIMM socket connectors.

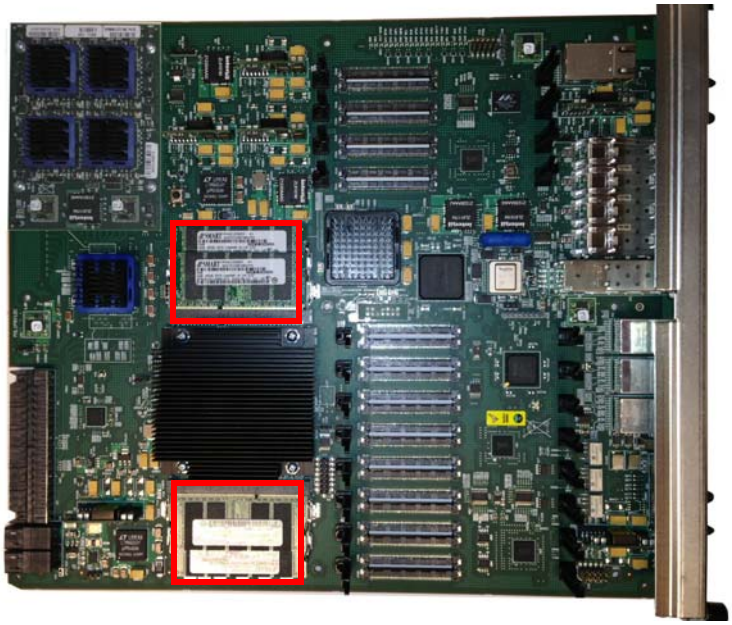


Figure 6 - 110. Location of the Installed SODIMMs

Each SODIMM is installed into the industry-standard socket on a 25-degree angle into spring-loaded clips before being locked into place by downward pressure on the SODIMM. A procedure describing the step-by-step installation of the SODIMMs is presented in the next section.

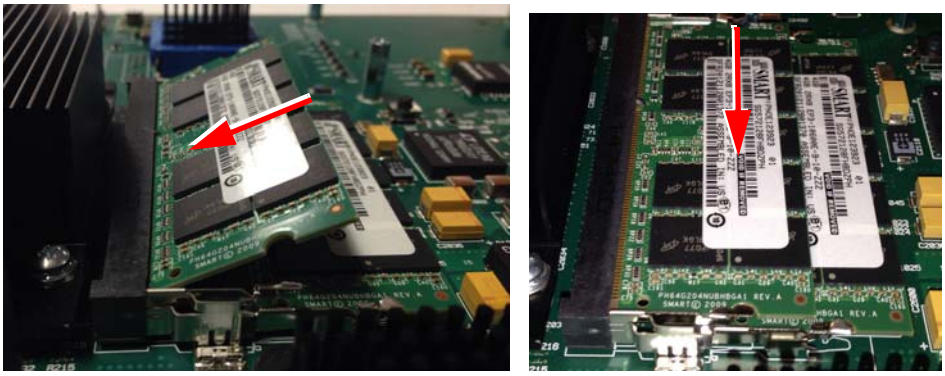


Figure 6 - 111. Process for Installing the SODIMM (l-r)

Pre-Installation Guidelines

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

- The SODIMMs can be installed only in the designated location as described previously in this manual.
- Note the installation location of the SODIMMs on the NIU PCB.
- Ground yourself and follow proper ESD grounding procedures.
- Remove the SODIMM(s) from the shipped packaging.
- Install the SODIMM(s) according to the procedure below.
- This procedure 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 a NIU card, move the card to an ESD-safe location.

Caution

Before handling an Acme Packet 6100 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 SODIMM(s) module.

- ESD wrist strap
- ESD safe location
- SODIMM(s)
- NIU Card

Removing the SODIMM(s)

The following procedure describes how to remove the SODIMM(s) from the Acme Packet NIU card.

Prerequisites:

- Place the new SODIMM(s) 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 SODIMM connectors on the NIU card.

To remove the SODIMMs:

1. Remove the NIU card as directed in the *Acme Packet 6100 Service Manual*.
2. Place the NIU card on an ESD-safe mat or other similar location.
3. Using both thumbs, in the upper slot press the spring-loaded clips away from the SODIMM to release the clips from the installed component as shown below.

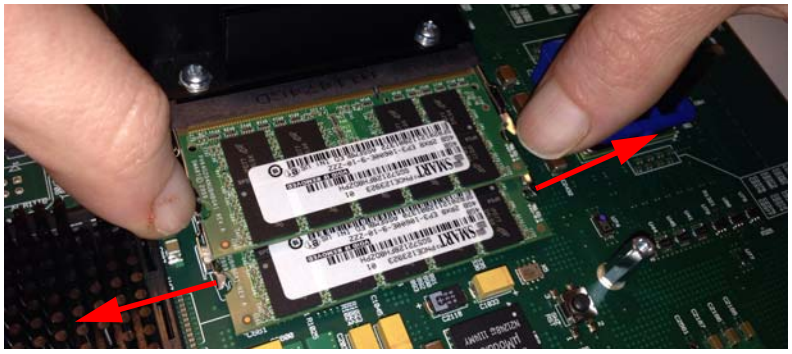


Figure 6 - 112. Releasing the Spring-Loaded Clips

4. When the spring-loaded clips are released, the SODIMM pops up and is seated at a 25-degree angle.

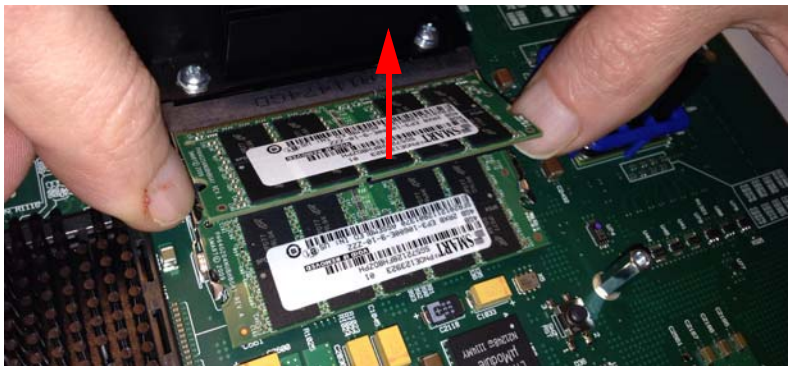


Figure 6 - 113. Releasing Spring-Loaded SODIMM Clips

5. Grasping the SODIMM between your thumb and index finger, pull the component out of the slot as shown in the series of images below.

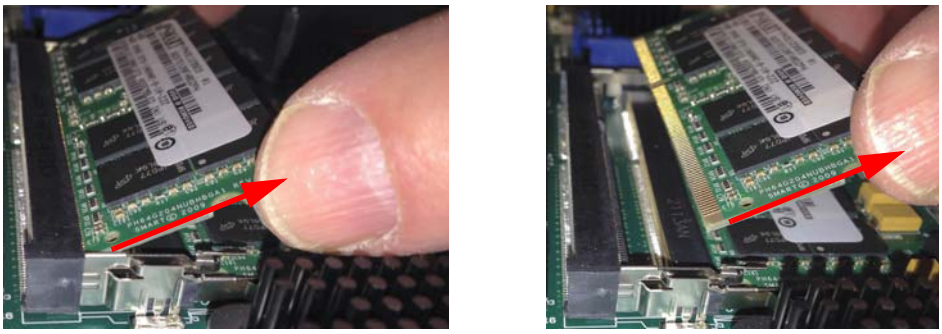


Figure 6 - 114. Removing the SODIMM (l-r)

6. Place the SODIMM in an ESD-safe location.
7. Repeat steps 3 through 6 to remove the SODIMM from the bottom slot.

Installing the SODIMM(s)

The following procedure describes how to install the SODIMM(s) onto the Acme Packet NIU card.

Prerequisites:

- Place the new SODIMM(s) 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 SODIMM connectors on the NIU card.

To install the SODIMMs:

1. Remove the NIU card as directed in this guide.
2. Place the NIU card onto an ESD-safe location.
3. Orient the replacement SODIMM so that the key on the component is lined up as highlighted in red in the following.

Figure 6 - 115. SODIMM Key Location

4. As shown below, slide the component into the SODIMM slot at a 25-degree angle by grasping the SODIMM between your thumb and index finger and pushing the component into the slot until the SODIMM is firmly and completely seated.

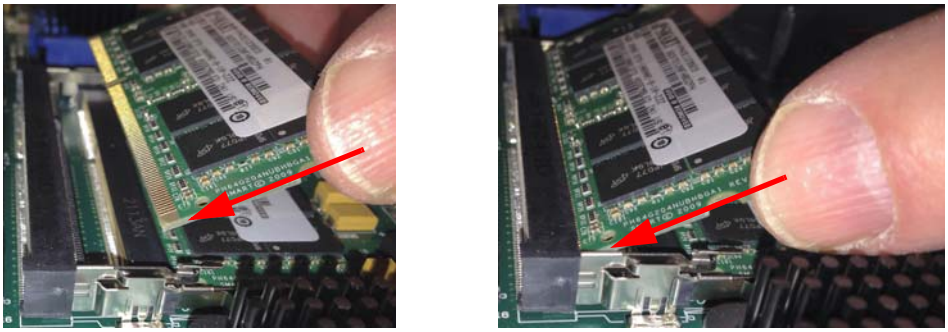


Figure 6 - 116. Installing the SODIMM (l-r)

5. Using the index finger and thumb of your hand, press straight down on both sides of the SODIMM to lock it into place as shown below.

6. The SODIMM should be seated parallel to the NIU PCB.

Upgrading or Replacing a Solid State Drive

This section explains how to upgrade or replace the Solid State Drive (SSD) in your Acme Packet 6100.

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 6100:

- 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 6100.

Removing the Logical System from the Network

Be mindful of all systems and network entities that may be affected by removing an Acme Packet 6100 from your network. In addition to routing calls around the Acme Packet 6100, you must also prepare network monitoring and health systems to accommodate the loss of a network element.

Specific procedures for removing the Acme Packet 6100 from your network may be found earlier in this document.

Removing the Physical System from the Equipment Rack

After logically removing the Acme Packet 6100 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 6100
- Disconnection of all power and ground system cabling
- Removal of the Acme Packet 6100 from the equipment rack

Removing the Data Cabling

Labeling all existing data cables will ease reconnecting the Acme Packet 6100 to the network.

1. Label each cable noting which port on the Acme Packet 6100 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 6100.

Removing Power and Ground Cabling

Take care in removing power from the Acme Packet 6100. 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:

1. Shut off power to the Acme Packet 6100 at the circuit breaker or power source.
2. Remove the power cable(s) from the Acme Packet 6100's power supplies.
3. Unscrew the two kep nuts that secure the grounding cable lug to the Acme Packet 6100.
4. Remove the ground cable. Put the kep nuts in a safe place.

Removing the Chassis

The Acme Packet 6100 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:

Caution

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 6100 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

1. Use a workbench or other supportive surface, and place it nearby to set the Acme Packet 6100 on after it is removed from the equipment rack.

   Support the chassis before and while removing it from the equipment rack.
2. Remove the Acme Packet 6100 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.
3. Place the chassis on a workbench.

Removing Hardware in Center-Mount Configurations

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

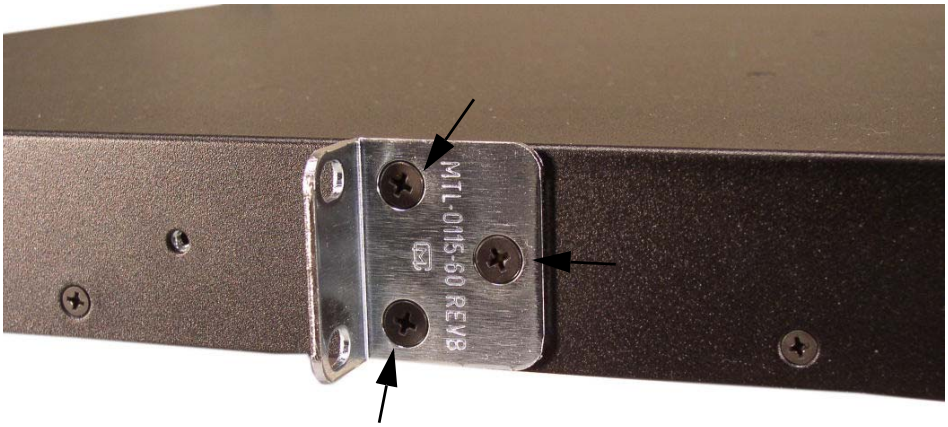


Figure 2 - 33 Left rack ear.

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.

Figure 6 - 117: 2 - 34: Left chassis slide.

Figure 6 - 118: Figure 2 - 35: Left chassis slide.

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 6100.
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.

Caution

Before opening the Acme Packet 6100, 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 6100.

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

1. Unscrew the four countersunk screws on each side of the Acme Packet 6100 that hold the chassis cover to the chassis.

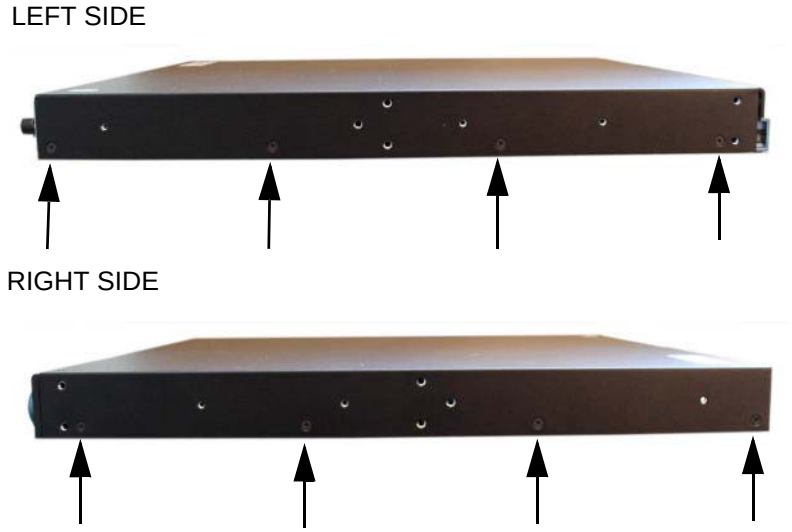
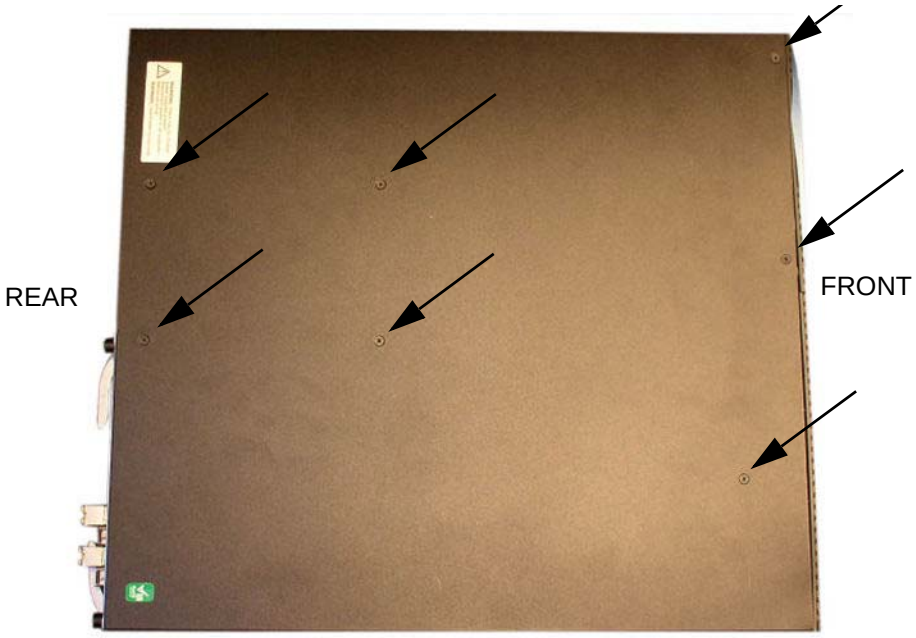


Figure 6 - 119: Figure 2-36: Countersunk screws on the sides.

2. Set these screws aside.



3. Unscrew the seven countersunk screws on the top of the Acme Packet 6100 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

Caution

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 6100.

Identifying the Solid State Drive

Once the Acme Packet 6100 is open, replacement is straightforward. The Solid State Drive (SSD) attaches electrically to the Acme Packet 6100 motherboard by a standard 2.5" SATA connector. In addition, it is secured to the motherboard by four screws.

1. 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.

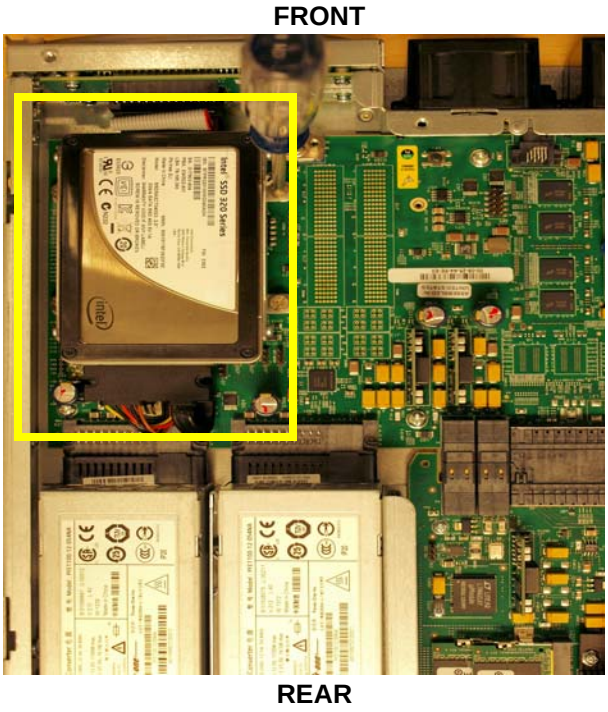


Figure 6 - 120: Close-up of installed SSD

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

3. Identify the SATA connector attached to the SSD.

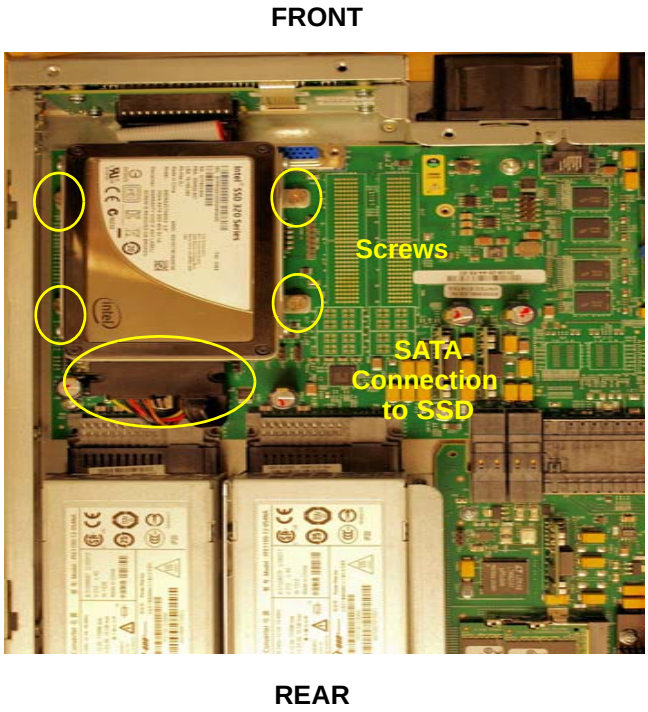


Figure 6 - 121: Positions of screws and the SSD SATA cable connector

4. Using a number 1 Phillips screwdriver, unscrew the four screws attaching the SSD to the motherboard.

5. 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.

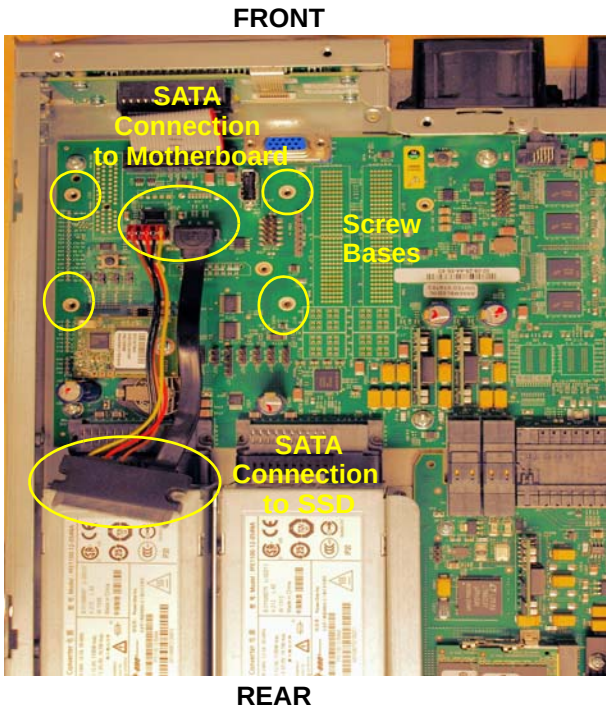


Figure 6 - 122: After SSD removal

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.

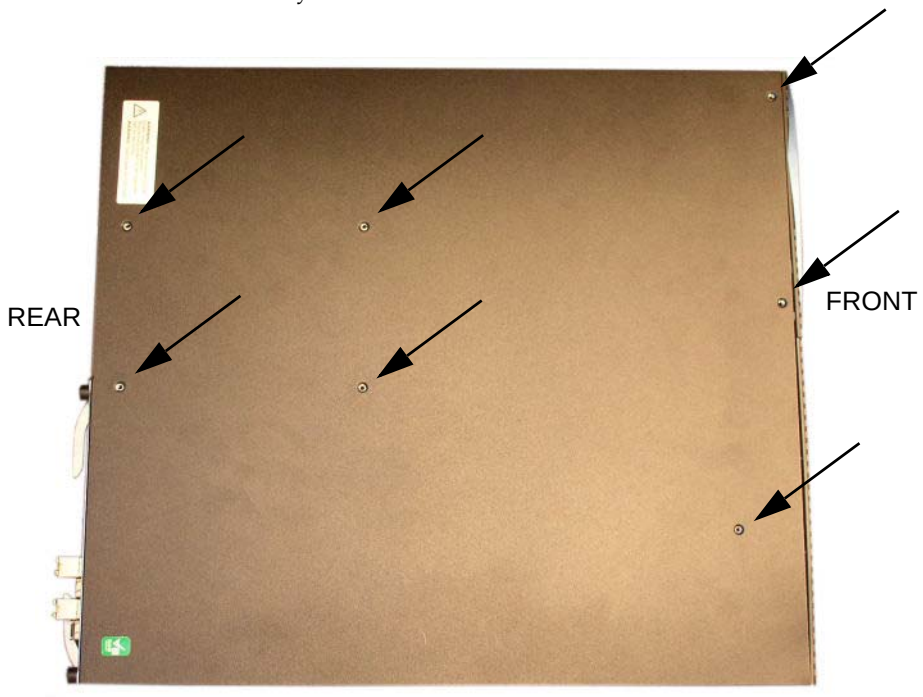
Postinstallation

After the Solid State Drive has been installed in the Acme Packet 6100, you can close the chassis and reinstall it in the equipment rack.

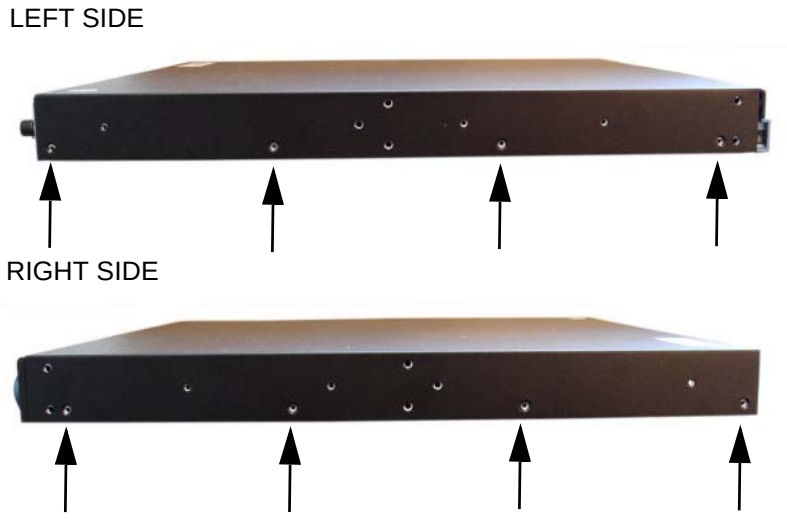
Attaching the Lid

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

1. Set the lid on top of the Acme Packet 6100 chassis. The stickers are positioned at the chassis rear.
2. Screw the eight countersunk screws into the top of the Acme Packet 6100 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 1100 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 6100
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.

Optical Transceiver Removal and Replacement

Your troubleshooting and diagnostics might reveal that the optical transceiver component of a 10GbE 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 6100 is powered on. Leave the NIU in the Acme Packet 6100 as you extract the optical transceiver.

To obtain a replacement optical transceiver, contact your sales representative directly.

SFP Media Signaling Interfaces

This section describes the media signaling interfaces. The signaling and media interface, provide network connectivity for the signaling (1GbE) and media (10GbE) traffic.

SFP+ Information

Only transceivers qualified by Acme Packet can be used in the Acme Packet 6100. Mixed transceiver types are unsupported. Both transceiver locations must be populated with the same SFP+ type based on compliance testing. The transceivers are inserted into the NIU.

The following SFP+ transceiver types are used:

- Multi Mode (SX) — the label on the back of this SFP+ reads 850nm LASER PROD. This transceiver features a black bale clasp latch.
- Single Mode (LX) — the label on the back of this SFP+ reads 1310nm LASER PROD. This transceiver features a blue bale clasp latch.

SFP+ Identification

The multi mode SFP+ transceiver for the Acme Packet 6100 features a black clasp latch.

Figure 6 - 123. 10 Gigabit Multi Mode SFP+ Transceiver (Black Bale Clasp Latch)

The single mode SFP+ transceiver for the Acme Packet 6100 features a blue clasp latch.

Figure 6 - 124. 10 Gigabit Single Mode SFP+ Transceiver (Blue Bale Clasp Latch)

Media Cables

This section describes the media signaling interface fiber optic cable types used on the NIU. Each transceiver type (multi mode and single mode) are used with a different fiber optic cable. The fiber optic cables only ship from Acme Packet if you order them.

Cable Identification

The following different 10 gigabit fiber optic cables are used on the Acme Packet 6100 media cards:

- Multi-mode SX transceivers use an aqua fiber optic cable
- Single-mode LX transceivers use a yellow fiber optic cable

Figure 6 - 125. 10 Gb Aqua Fiber Optic Cable for Use with SX Transceivers

Figure 6 - 126. 10 Gb Yellow Fiber Optic Cable for Use with LX Transceivers

Caution

To prevent damage to the optical lens, Acme Packet recommends that the protective dust cover stay on the optical transceiver port when the 10GigE physical interface card is not cabled.

Removing an Optical Transceiver

To remove the SFP+ transceiver from an NIU transceiver port:

1. Unplug all 10GbE fiber optic cables from the optical transceiver to be replaced.

Figure 6 - 127. NIU Transceiver Port

2. Pull the bale clasp latch out and down. It will pivot downwards on its hinge.

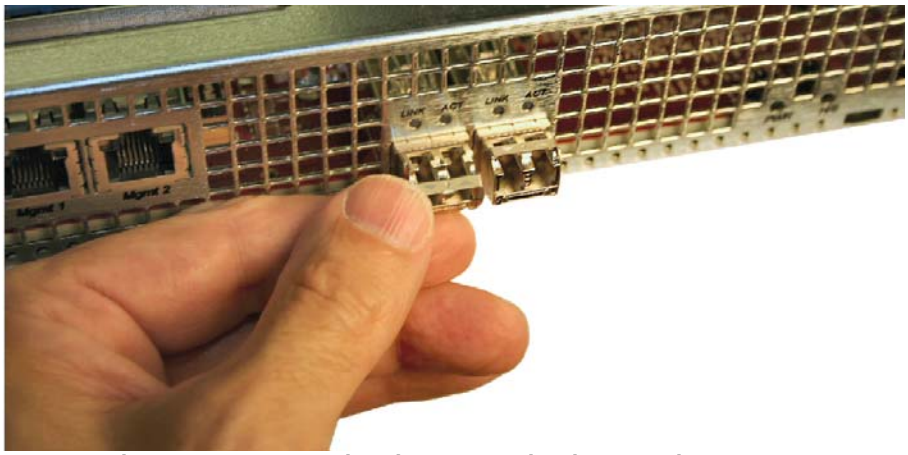


Figure 6 - 128. Lowering the FSP+ Bale Clasp Latch

3. Holding the extended bale clasp latch with one hand, use your other hand to pull the optical transceiver fully out of its socket in the physical interface card.

Figure 6 - 129. Removing the Optical Transceiver

Install an Optical Transceiver

To install an optical transceiver:

1. Slide the replacement optical transceiver into the SFP socket on the NIU.

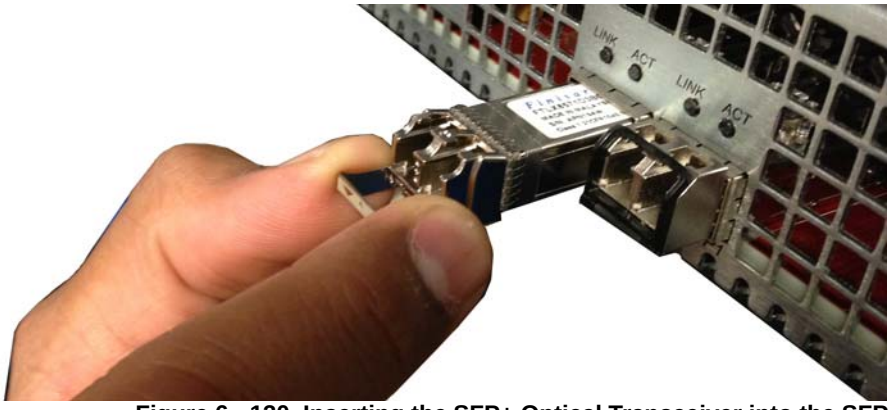


Figure 6 - 130. Inserting the SFP+ Optical Transceiver into the SFP+ Socket

2. Press on the face of the SFP+ optical transceiver to seat it with the socket.

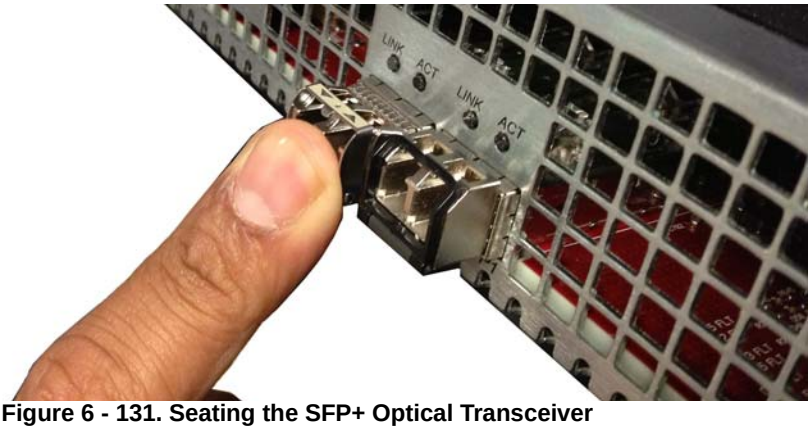


Figure 6 - 131. Seating the SFP+ Optical Transceiver

3. Flip the bale clasp latch back into the rest position.

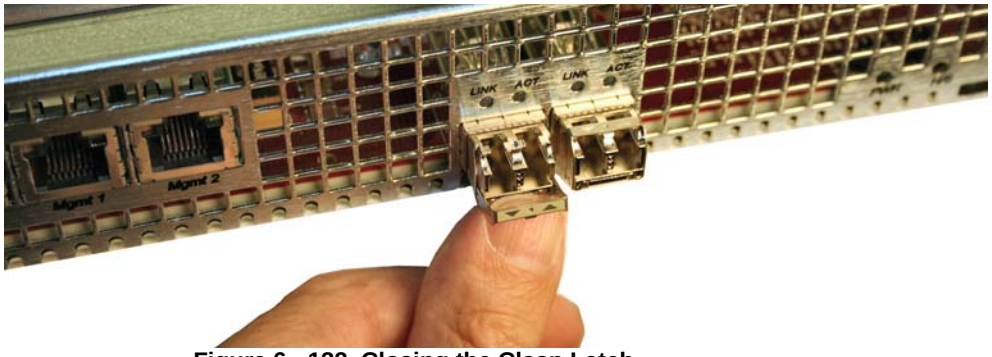


Figure 6 - 132. Closing the Clasp Latch

4. Reconnect the optical cables to their corresponding ports.

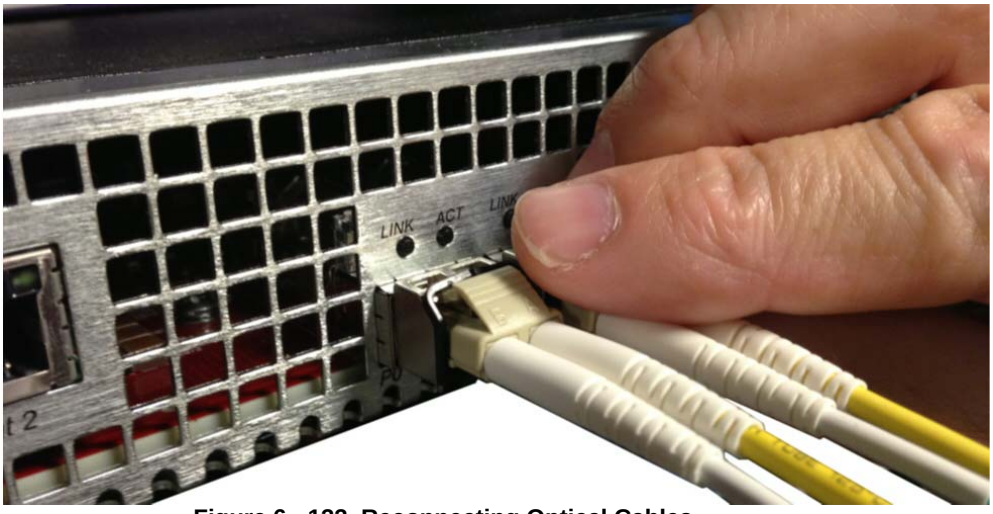


Figure 6 - 133. Reconnecting Optical Cables

Fan and Filter Maintenance

This section explains how to remove a fan and replace the filter on your Acme Packet 6100.

Removing and Replacing Individual Fans

The individual fan is a user-serviceable, hot-swappable component. There are five individual fans in the Acme Packet 6100. If the Acme Packet 6100 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 6100 air filter is located behind the Bezel and is a Field Replaceable Unit.

Caution — 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 one of the five individual fans:

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

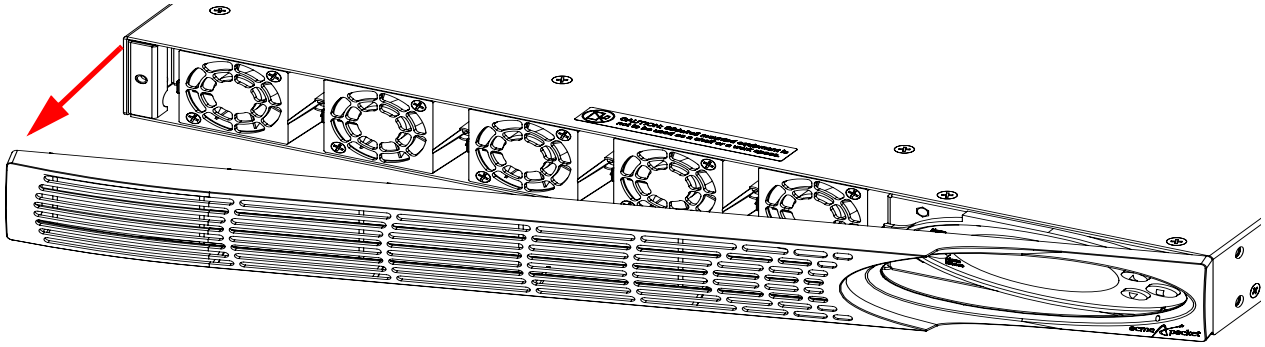


Figure 6 - 134. Removing the Front Bezel

2. Using a small bladed screwdriver, unscrew the two captive screws at each corner of the individual fan you are replacing.

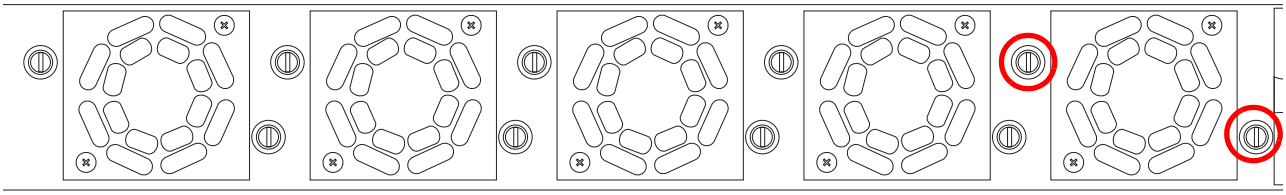


Figure 6 - 135. Loosening Fan-Fastening Screws

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

Figure 6 - 136. Removing the Fan

Install Individual Fans

To obtain a replacement fan, contact your customer support representative.

Replacing the fan is the reverse process as removing it.

To install one of the five individual fans:

Note: The power connector should be on the lower left side of the module when inserted into the Acme Packet 6100 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.

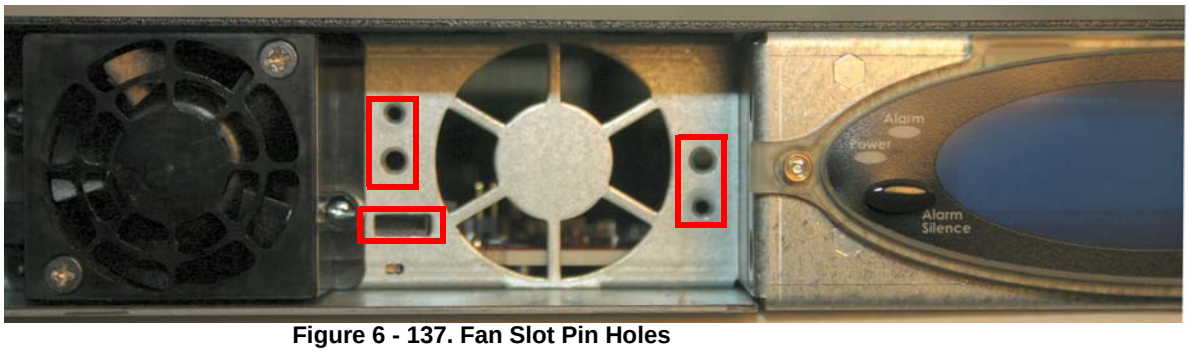


Figure 6 - 137. Fan Slot Pin Holes

Figure 6 - 138. Inserting the Fan into the Chassis Slot

2. Using a small bladed screwdriver, tighten the two captive screws to hold the fan into place.

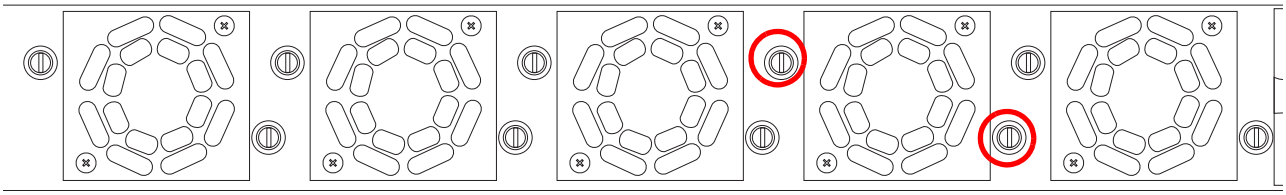


Figure 6 - 139. Tightening Fan-Fastening Screws

3. Install the front bezel onto the Acme Packet 6100 by attaching the magnetic bezel to one side of the chassis front and then pivot the other side of the bezel until the other magnetic side attaches.

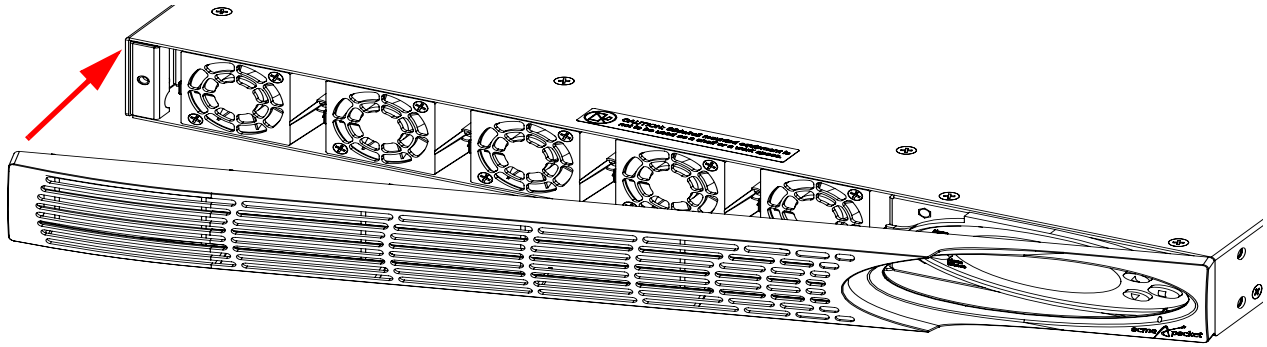


Figure 6 - 140. Replacing the Front Bezel

4. The replacement fan and bezel are installed into the Acme Packet 6100.

Maintaining the Cooling Components

The Acme Packet 6100 air filter removes airborne particles before they are drawn into the Acme Packet 6100 chassis. To prevent system malfunction and prolong the life of the system's cooling components:

- 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 6100 chassis. Cleaning the fan module

requires that you remove the module itself. If you are not shutting down the Acme Packet 6100, 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 preventative 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 four fans.
3. Replace the fan module.

To clean the perforated air inlets:

1. Press two fingers against the left end of the plastic fan bezel and pull directly toward you.

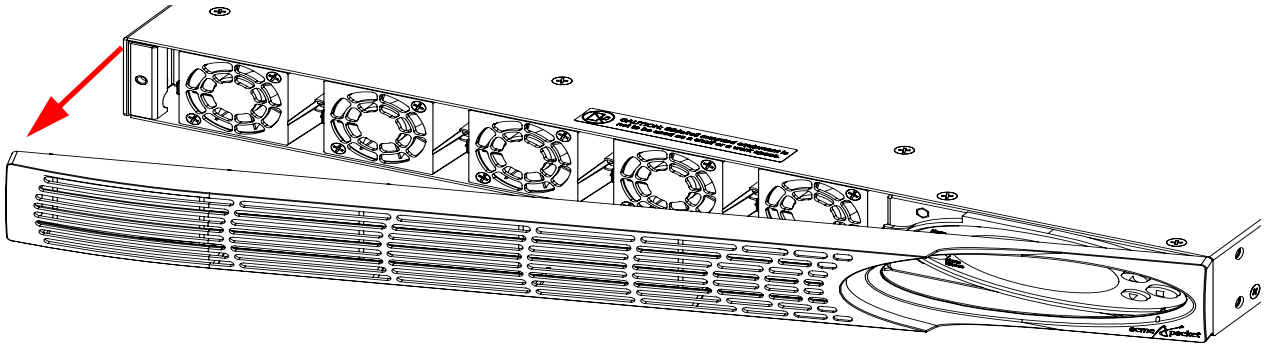


Figure 6 - 141. Removing the Front Bezel

2. Place the bezel face down.
3. On the back of the bezel, pull on the wire retainer covering the air filter to remove it.

Figure 6 - 142. Removing the Air Filter Wire Retainer from Behind the Front Bezel

4. Remove the air filter.

Figure 6 - 143. Removing the Air Filter from Behind the Front Bezel

5. Replace the air filter with a new one. Do not reuse the used air filter.
6. 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.
7. Install the new air filter carefully in place behind the front bezel.

Figure 6 - 144. Removing the Air Filter from Behind the Front Bezel

8. Place the air filter bracket behind the air filter, ensuring that the bracket locks into place in the holes against the inside of the front bezel.

Figure 6 - 145. Replacing the Air Filter Bracket Behind the Air Filter

Note: Only the removable fan bezel has vent holes that require cleaning.

Caution

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.

9. Install the front bezel onto the Acme Packet 6100 by attaching the magnetic bezel to one side of the chassis front and then pivot the other side of the bezel until the other magnetic side attaches.

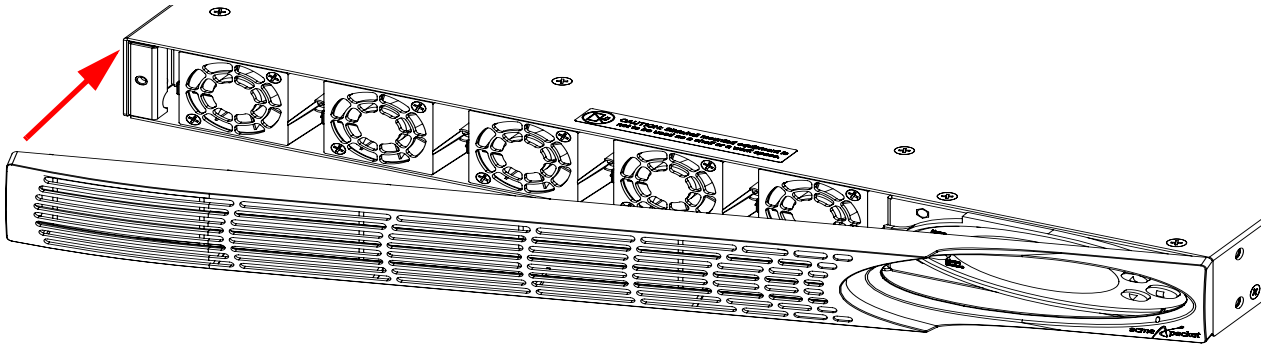


Figure 6 - 146. Replacing the Front Bezel

Alarms

The Acme Packet 6100 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

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

Table 6 - 8. Descriptions of Alarm Severity Levels

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)

Hardware and Environmental Alarms

This section provides details about hardware and environmental alarms.

Hardware Temperature Alarm

The following table lists the hardware temperature alarm.

Table 6 - 9. Hardware Temperature Alarm Information

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 6100 turns the fan speed up to the fastest possible speed.					

Fan Speed Alarms

The following table lists the fan speed alarm.

Table 6 - 10. Fan Speed Alarm[1] Information

Alarm Name	Alarm ID	Alarm Severity[2]	Causes	Example Log Message	Graphic Display Window Message
FAN STOPPED	65537	CRITICAL: any fan speed is operating at <50%. Or speed of two or more fans are operating at >50% and ≤75%. MAJOR: speed of two or more fans is operating at >75% and ≤90%. Or speed of one fan is operating between >50% and ≤75% and the other two fans are operating at normal speed. MINOR: speed of one fan is operating between >75% and ≤90%, while the other two fans are operating 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

1. If the fan speed alarm occurs, the Acme Packet 6100 turns the fan speed up to the fastest possible speed.
2. The stated percentages are relative to the fan operating speed. Fan speeds adapt to the load as necessary.

Environmental Sensor Alarm

The following table lists the environmental sensor alarm.

Table 6 - 11. Environmental Sensor Alarm Information

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.

Table 6 - 12. Power Supply Alarm Information

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!	
PLD POWER A UP	65541	MINOR	Power supply A is now present and functioning.	Back Power Supply A is present!	
PLD POWER B FAILURE	65542	MINOR	Power supply B has failed.	Back Power Supply B has failed!	
PLD POWER B UP	65543	MINOR	Power supply B is now present and functioning.	Back Power Supply B is present!	

Voltage Alarms

The following table lists the voltage alarms.

Table 6 - 13. Voltage Alarm Information

Alarm	Alarm ID	Alarm Severity	Cause(s)	Log Message	Graphic Display Window Message
PLD VOLTAGE ALARM 2P5V (2.5 Volt Rail)	65544	MINOR EMERGENCY		• Voltage 2.5V CPU has minor alarm • Voltage 2.5V CPU has emergency alarm, the system should shutdown	
PLD VOLTAGE ALARM 3P3V (3.3 Volt Rail)	65545	MINOR EMERGENCY		• Voltage 3.3V has minor alarm • Voltage 3.3V has emergency alarm, the system should shutdown	
PLD VOLTAGE ALARM 5V (5 Volt Rail)	65546	MINOR EMERGENCY		• Voltage 5V has minor alarm • Voltage 5V has emergency alarm, the system should shutdown	
PLD VOLTAGE ALARM CPU (Host Voltage)	65547	MINOR EMERGENCY		• Voltage CPU has minor alarm • Voltage CPU has emergency alarm, the system should shutdown	

NIU Alarms

The following table lists the NIU alarms.

Table 6 - 14. NIU Card Alarm Information

Alarm	Alarm ID	Alarm Severity	Cause(s)	Log Message	Graphic Display Window 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	

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 6100 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 10GbE link up/link down alarms.

Table 6 - 15. Media Ethernet Link Alarm Information

Alarm Name	Alarm ID	Alarm Severity	Cause(s)	Example Log Message	Graphic Display Message
LINK UP ALARM 10GIGPORT	131073	MINOR	10GbE S0P0 link up	Slot 0 port 0 UP	X LINK ALARMS (where X is number of alarming links)
LINK DOWN ALARM 10GIGPORT	131075	MAJOR	10GbE S0P0 link down	Slot 0 port 0 DOWN	X LINK ALARMS
LINK UP ALARM 10GIGPORT	131109	MINOR	10GbE S0P1 link up	Slot 0 port 1 UP	X LINK ALARMS
LINK DOWN ALARM 10GIGPORT	131111	MAJOR	10GbE S0P1 link down	Slot 0 port 1 DOWN	X LINK ALARMS

Management Ethernet Link Alarms

The following table lists the NIU management Ethernet port alarms.

Table 6 - 16. Management Ethernet Link Alarm Information

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 (where X is number of alarming links)
LINK UP ALARM VXINTF	131078	MINOR	Mgmt1 link up	Port 1 UP	X LINK ALARMS
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.

Table 6 - 17. SFP Presence Alarm Information

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	
SFP INSERTED GIGPORT 0	65564	CRITICAL	S0P0 SFP Inserted	Slot 0 Port 0 SFP Inserted	

Table 6 - 17. SFP Presence Alarm Information

SFP REMOVED GIGPORT 1	65569	CRITICAL	S0P1 SFP Removed	Slot 0 Port 1 SFP Removed
SFP INSERTED GIGPORT 1	65565	CRITICAL	S0P1 SFP Inserted	Slot 0 Port 1 SFP Inserted

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

7 Specifications

Introduction

This chapter provides information regarding the physical, electrical, environmental, and connector specifications of the Acme Packet 6100.

Safety and Regulatory Certifications

For information regarding safety and regulatory certifications applicable to the Acme Packet 6100, refer to the *Acme Packet Platforms Safety and Compliance Guide* in addition to this chapter.

Physical Specifications

.Acme Packet 6100 Specifications

This table lists the Acme Packet 6100's physical dimensions and weight.

Table 7 - 18. Acme Packet 6100 Physical Specifications

Specification	Description
Height	1.72" (4.37 cm) (1U)
Width	17.10" (43.43 cm) (+ mounting ear width: 19" (48.26 cm))
Depth	20" (50.8 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 6100 AC power supply.

Table 7 - 19. Acme Packet 6100 Physical Dimensions

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)

Important: 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 6100 DC power supply.

Table 7 - 20. Acme Packet 6100 DC Power Supply Physical Dimensions

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)

Important: This equipment is intended for installation in Network Telecommunication Facilities.

Fan Module Specifications

This table lists the fan module specifications for the Acme Packet 6100.

Table 7 - 21. Acme Packet 6100 Fan Module Specifications

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 6100.

Power Supply Input Circuit Fuse Requirements

This table lists the input circuit fuse and cable size requirements for the Acme Packet 6100.

Table 7 - 22. Acme Packet 6100 Power Supply Input Circuit Fuse Requirements

Power Circuit	Fuse Rating	Power cable size
120 VAC	15 AMP	18 AWG
240 VAC	10 AMP	18 AWG
-48 VDC	30 AMP	12 AWG

Alarm Port Dry Contact Current Limits

This table lists the alarm port electrical characteristics of the Acme Packet 6100.

Table 7 - 23. Acme Packet 6100 Alarm Port Dry Contact Current Limits

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

Device Ratings

This table lists the alarm device ratings of the Acme Packet 6100.

Table 7 - 24. Acme Packet 6100 Device Ratings

Specification	Value
AC	100- 240 VAC, 50-60 Hz, 5A (X2)
DC	-48 VDC, 10 A (x2)

Environmental Specifications

For the Acme Packet 6100 to function properly, Acme Packet recommends that you follow the environmental guidelines in the following table.

Table 7 - 25. Acme Packet 6100 Environmental Specifications

Specification	Description
Temperature	The Acme Packet 6100 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 6100 is required to operate below the maximum altitude of 10,000 feet.
Air Flow	100 CFM
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 6100.

Table 7 - 26. Acme Packet 6100 Connector Specifications

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-C protocol.

Table 7 - 26. Acme Packet 6100 Connector Specifications

Specification	Description
GigE Port(s)	The GigE fiber optic connection ports 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 GigE SFP optical transceivers for the Acme Packet 6100.

Table 7 - 27. Acme Packet 6100 Optical Transceiver Interface Module Specifications

Specification	Multi Mode (SX) Fiber Module	Single Mode (LX) Fiber Module
Wavelength λ	850 nm	1330 nm
Laser Type	VCSEL	FP
Fiber type / Transmission Distance	-0.5 to 550 m -50 µm -0.5 to 550 m -62.5 µm	-0.5 m to 10 km

8 Glossary

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.

BTU — British Thermal Unit

CSA — Canadian Standards Association is a non-profit, independent organization that operates a listing service for electrical and electronic materials and equipment.

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

EMC — Electromagnetic Compatibility is the ability of equipment or systems to be used in their intended environment within designed efficiency levels without causing or receiving degradation due to unintentional electromagnetic interference.

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

FCC — Federal Communications Commission

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.

GigE — Gigabit Ethernet is an Ethernet type that supports data transfer rates of 1 gigabit 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.

ICES — Interference-causing Equipment Standard

IEC — International Electrotechnical Commission

IETF — Internet Engineering Task Force is the main standards organization for the Internet.

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.

NEBS — Network Equipment Building Standards defines a rigid and extensive set of performance, quality, environmental, and safety requirements developed by Bellcore.

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 6100 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 6100 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 6100 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 6100 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.

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