

# Acme Packet 3950/4900

## Hardware Installation and Maintenance Guide



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Acme Packet 3950/4900 Hardware Installation and Maintenance Guide,

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# About This Guide

**! Important:**

This guide uses the phrase "Acme Packet 4900" throughout, but all the procedures and images are applicable to both the Acme Packet 4900 and the Acme Packet 3950, except where noted.

The Acme Packet 4900 system (Compliance Model Number: LCMN1AD) is a high performance, high capacity Session Border Controller that optimally delivers interactive communications — voice, video, and multimedia sessions — across wireline, wireless, and cable IP network borders. With its compact single unit 1U design the Acme Packet 4900 system provides exceptional functionality in a tightly integrated system. This chapter provides an introduction and overview of the main components of the Acme Packet 4900 system.

- Safety
- Component overview
- Installation
- Startup
- Maintenance
- Specifications

This guide is written for network administrators, telecommunications equipment installers and technicians. It provides information related to the hardware components, features, installation, start-up, and operation of the Acme Packet 4900 system. Only experienced and authorized personnel should perform installation, configuration, and maintenance tasks.

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# Revision History

This section contains a revision history for this document.

Date	Description
Aug 2021	<ul style="list-style-type: none"><li>Initial release</li><li>Upgrade to S-CZ9.0.0p1 for all the features described in this document.</li></ul>
Oct 2021	<ul style="list-style-type: none"><li>Adds images</li><li>Clarifies text</li></ul>
April 2023	<ul style="list-style-type: none"><li>Corrects wiring table and image for DC power</li></ul>
June 2023	<ul style="list-style-type: none"><li>Updates for TDM refresh</li></ul>
Oct 2023	<ul style="list-style-type: none"><li>Adds warning about lifting device from sides.</li></ul>
January 2025	<ul style="list-style-type: none"><li>Updates T1/E1 cabling section</li><li>Adds <i>Critical Setup Steps for Acme Packet Platforms with DSPs</i> topic to Startup chapter</li></ul>



# 1

## Safety

This chapter provides an overview of the recommended safety precautions for installing the Acme Packet 4900 System.

Before you install your Acme Packet 4900 System, Oracle recommends that you review the contents of this chapter and the Installation chapter. Both chapters provide information intended to protect you and your Acme Packet 4900 System from experiencing any harm during the installation process. These chapters also provide information that helps to keep your Acme Packet 4900 System functioning properly and prevent damage.

## Environmental, Safety, and Regulatory Certifications

For information regarding safety and regulatory certifications applicable to the Acme Packet 4900, refer to the Acme Packet Platforms Safety and Compliance Guide.

## General Safety Precautions

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

### Fan Module

To avoid overheating the system, do not block the air inlets or the fan module, or otherwise obstruct airflow to the system. Keep the area around the Acme Packet 4900 System clean and clutter-free.

### Unit Maintenance

Aside from the fan module, power supply, air filter, transcode module, TDM module and mainboard, there are no user-serviceable parts inside the Acme Packet 4900 chassis. Only professionals trained to maintain, adjust, or repair the Acme Packet 4900 System may provide these services.

### Fiber Optic Cable

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

### Environmental Specifications

Adhere to the stated environmental specifications for the Acme Packet 4900.

### Using This Guide

Read and understand all notes of warning and caution included in the Acme Packet 4900 System documentation. These warnings and cautions are designed to keep you safe and protect the Acme Packet 4900 System from damage.

## Precautions

To protect yourself from harm and the Acme Packet 4900 System from damage, follow these electrical safety precautions:

### Precautions

- Note the location of the emergency power circuit breaker for the power to the equipment rack and the room where the Acme Packet 4900 is located.
- If your unit or system has a System Power switch, note its location.
- If an electrical accident occurs, remove power from the system immediately by unplugging the chassis.
- Always disconnect the power from the system when removing an Acme Packet 4900 from its rack.
- When disconnecting power:
  - 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 the Acme Packet 4900.
- 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 4900 in an equipment rack, always make the ground connection first and disconnect it last when removing it.
- Use shielded Category 5e or 6, RJ45 cables for all 10/100/1000 Ethernet connections to protect the Acme Packet 4900 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 4900.
- Remove jewelry before working on the Acme Packet 4900.

## Battery Warning

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

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

## ESD Safety

To protect the Acme Packet 4900's delicate electronic components from damage from static electricity, always follow the appropriate ESD procedures and wear the proper protective devices (such as an ESD wrist strap) when handling any and all Acme Packet 4900 hardware and while performing any Acme Packet 4900 hardware procedures.

## Precautions

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

- Ensure that the Acme Packet 4900 is properly grounded.
- If you are grounding your Acme Packet 4900 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 or ankle strap when working on the Acme Packet 4900 to prevent static discharge.
- To avoid damaging ESD-sensitive hardware, discharge all static electricity from your body before working directly with the Acme Packet 4900 chassis by touching a grounded object.

# 2

## Component Overview

### Chassis

The Acme Packet 4900 is contained in a 1U rack-mounted chassis. It can be front- or center mounted in standard 19" wide racks (20" to 32" deep), with options for 23" wide racks.

### Mounting Hardware

The Acme Packet 4900 is supported by a pair of cabinet slides that are affixed to an equipment rack by front and rear mounting flanges. The cabinet slides are adjustable for equipment racks of various depths.

### Equipment Rack Installation Hardware

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

When installing the chassis, the user can easily slide the chassis along the slide rails until a locking clip on each chassis-mounted rail locks the chassis into the slide rails. Pressing this clip will then allow the chassis to be fully installed into the equipment rack. Once inserted into the equipment rack, the Acme Packet 4900 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.



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 4900.



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 latch on the chassis slide rail meets the hole in the rack slide rail, the rails lock together. Push the locking latch in to continue to slide the chassis into the rack rails.



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



## System Processor

### Processor

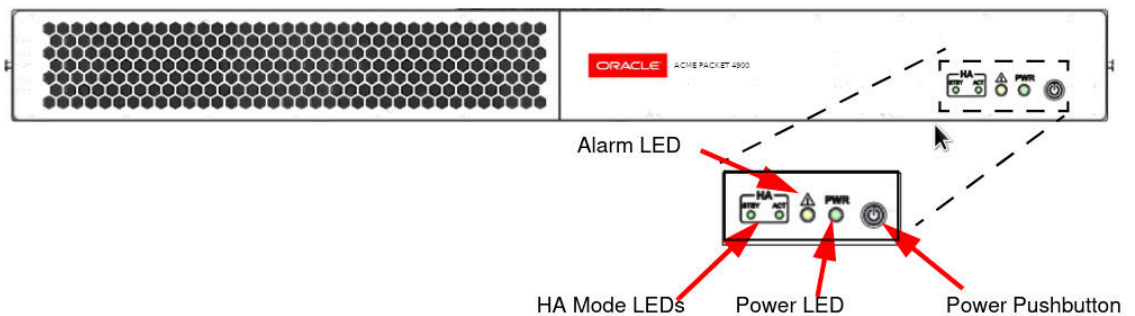
The Acme Packet 4900 processor is located on the main board. This processor handles the management and signal processing within the unit as well as performing call and media control.

## Control Panels

This section describes the front and rear control panels of the Acme Packet 4900.

### Front Panel

The Acme Packet 4900 front control panel provides easy access to several unit components. You can access the power pushbutton and view the power LED, the alarm LED, and the high availability LEDs. The following is a close up of the front control panel.



### High Availability Mode LEDs

If you configure the Acme Packet 4900 as part of a High Availability pair, these LEDs will specify the current HA mode for the unit; whether the unit is in Standby or Active Mode. If the unit is not part of an HA pair these LEDs will not be lit.

### Alarm LED

The Alarm LED will be lit when the unit is in alarm mode.

### Power LED

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

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

### Power Pushbutton

The front panel Power Pushbutton has two functions:

- Short press—Start a graceful shutdown
- Long press—Force a hard shutdown

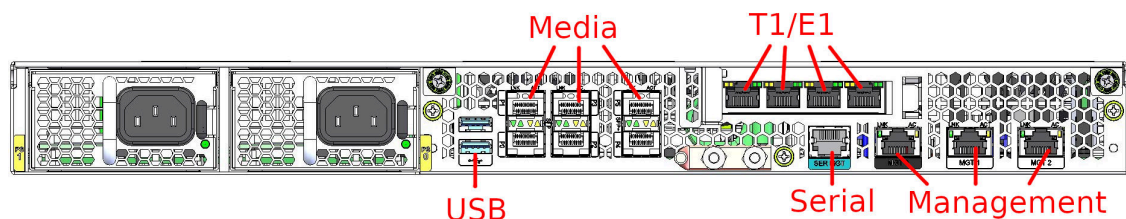
### NOT\_SUPPORTED:

The short press only works as described when running Release 9.0p1 and later.

Forcing a hard shut down can result in loss of data.

## Rear Panel

The Acme Packet 4900 comes with the Rear Panel as a permanent part of the chassis. All the Signaling, Media and Network Management ports are located on the Rear Panel of the chassis.



## T1/E1 Ports

The Acme Packet 3950, but not the Acme Packet 4900, supports T1/E1 ports.

In centralized SIP trunking topologies, this T1/E1 module preserves voice services in the event of a corporate WAN connectivity failure. In distributed SIP trunking topologies the module preserves dialout voice services in the event of a local SIP trunk interface failure.

The RJ48C connector looks very similar to an RJ45 connector found on a typical CAT5 cable, but they are very different. A RJ48C connector is fastened on to a STP (Shielded Twisted Pair)

cable, not the standard UTP (Unshielded Twisted Pair) CAT-(1-6) cable. A RJ48C connector also uses a different pin out arrangement, voltage level, and line capacitance than a RJ45 connector.

## Serial Management Port

The serial management port on the Acme Packet 4900 rear panel provides console access to the unit over an RS-232C serial connection. The serial management port is useful for customers who want permanent console access, and provides a layer of physical security for the unit if access to the site is controlled.

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 4900
- Accessing and using all functionality available via the ACLI
- Performing in-lab unit maintenance

### Serial Management Port Pin-out

The Acme Packet 4900 console port features one RJ45 port on the unit console. Because the Acme Packet 4900 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)

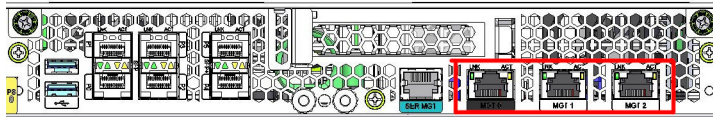
### Console Adapter

A standard RJ45 to DB-9 serial console adapter is shipped with the Acme Packet 4900. This adapter converts the RJ45 plug on a straight-through Ethernet cable to a standard DB-9 serial port jack, found on a PC or laptop. Any straight-through Ethernet cable can be used between the Acme Packet 4900 and the console adapter.



## Network Management Ports

The Acme Packet 4900 has three network management ports located on the rear left side of the chassis, labeled Mgmt 0, Mgmt 1, and Mgmt 2. These 10/100/1000 Base-T Ethernet ports are used for EMS control, RADIUS accounting, CLI management, SNMP queries and traps, and other management functions.



## Ethernet LED

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



## Link LED

The link LED is located to the top left side of the network management Ethernet port. This LED illuminates yellow when a link has been established between the link partner device and the Acme Packet 4900.

## 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 4900, the network management Ethernet ports are not configured. You must first connect to the Acme Packet 4900 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 *Configuration Guide* for details.

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

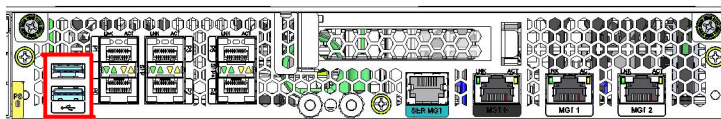
- Maintenance activities
- Application log retrieval
- Software upgrades
- System configuration
- SSH, SNMP and SFTP connections
- RADIUS CDR transmission

Oracle recommends that you use shielded CAT5e or CAT6 Ethernet cables with RJ45 plugs for connecting to the rear-panel Acme Packet 4900 Ethernet interfaces. These Ethernet interfaces have a distance limitation of 328 feet (100 m), as defined by the FAST Ethernet standard, IEEE 802.3.

## USB3 Ports

The two USB3 ports, located on the Acme Packet 4900 rear panel, are reserved for software-enabled applications, such as software updates.

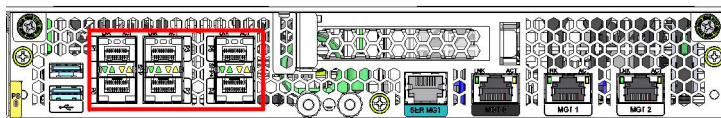




## Signaling and Media Interfaces

The signaling and media interfaces provide network connectivity for signaling and media traffic. The Acme Packet 4900 has 4 SFP ports (P0-P3) which operate at 1 Gbps and 2 SFP ports (P4-P5) which operate at 10Gbps. You may use either P0-P3 ports or P4-P5 ports, but the Acme Packet 4900 does not support using both.

The optical ports can accept an LC fiber connector using either single mode or multimode cable. These signaling ports require a transceiver to be installed which can be of three types: Single Mode, Multi Mode, and Copper.



## Media Cables

This section describes the media signaling interface, fiber optic and copper cables used on the Acme Packet 4900 network interfaces. Each transceiver type — multi mode and single mode — take a different fiber optic cable. You must use the proper fiber optic cable for each transceiver. Cables may be ordered from Oracle, or you may get them elsewhere.

### Cable Information

Three different fiber optic cables used on the Acme Packet 4900 include:

- Multi-mode transceivers — use an orange fiber optic cable.
- Single-mode transceivers — use a yellow fiber optic cable.
- Copper transceiver — use a Cat 5 or 6 ethernet cable.

### Cable Identification

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



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



A copper transceiver uses Category 5 or 6 Ethernet cable.

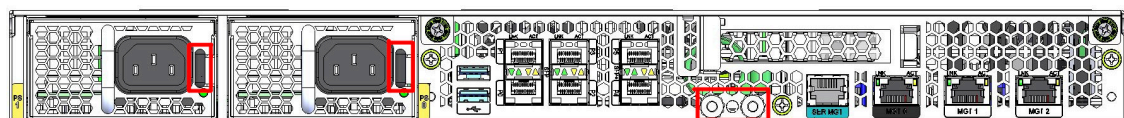


## Power Components

Oracle offers AC or DC power options for the Acme Packet 4900. The power supplies are user-replaceable, hot swappable components. Each power supply is accessed from the rear panel of the Acme Packet 4900. The power supply located at right is designated as power supply 0 (PS0) while the power supply located at left is designated as power supply 1 (PS1).

## Power Supply Redundance

During normal operation, the Acme Packet 4900 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 4900 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 4900 starts up with only one power supply, the alarm LED will blink continuously.



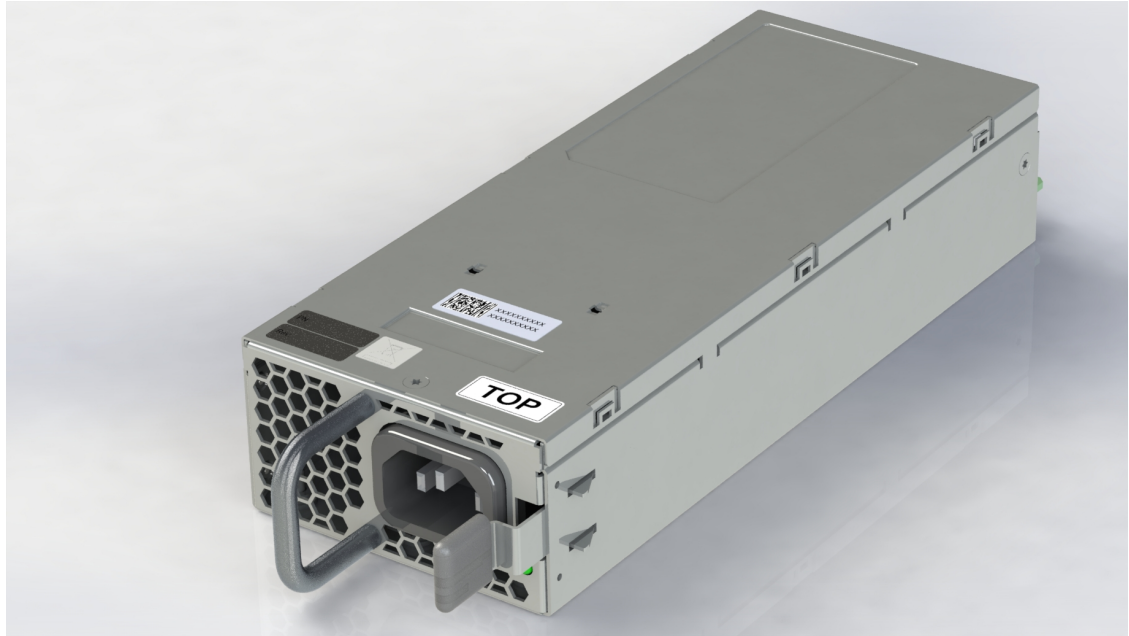
Locking tab

Grounding terminal

The grounding terminals are used to attach the Acme Packet 4900 chassis to a local earth ground. The terminals are located between media ports and the Serial Management port on the Acme Packet 4900 rear panel. The Acme Packet 4900 is shipped with nuts attached to the terminals along with a pre-made ground cable.

## AC Power

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



### AC Power Cords

Oracle ships one region-specific power cord with each AC-power supply.

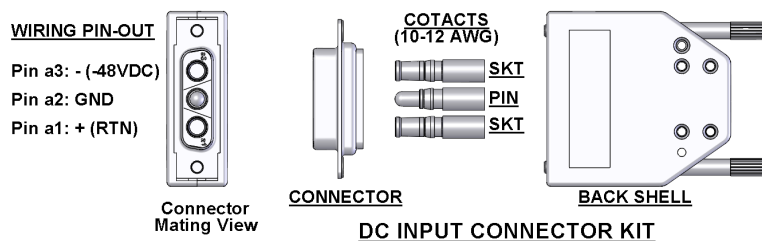
## DC Power

The Acme Packet 4900 can be powered by central office –48 VDC operations with a DC-DC supply. The handle on the front panel of the power supply is used to remove the power supply from the chassis. Move the grey locking handle from right to left to unlock the power supply. A removable terminal block on the DC power supply serves as the DC power interconnect. The terminal block must be removed before the grey locking handle can be moved to free the power supply.



### DC Power Cords

The mating connector kit includes components to create your own customized cable. You must supply both the wire and the terminations.



Connector Pin	Lead Designation	Suggested Wire Color (10AWG)
A3	- (-48VDC)	Black
A2	Chassis Ground	Green or Green/Yellow
A1	+ (RTN)	Red

## Cooling Components

The Acme Packet 4900 must remain well ventilated for reliable and continuous operation. The cooling features of the chassis include:

- Fan module

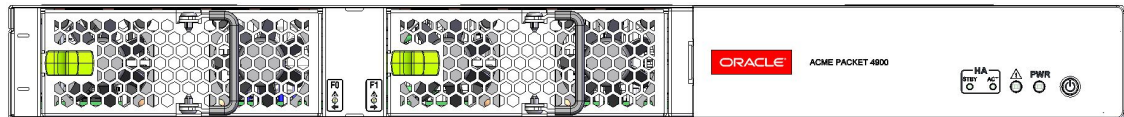
- Fan Filter

## Fans

### Cooling Fans

The Acme Packet 4900 chassis pulls cool ambient air into the chassis through two 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 unit in any way.

Each individual fan attaches to the chassis with a sliding latch, and is powered by a connector that joins the fan to the motherboard when fully installed into the chassis.



### Intake Fans

The intake fans are hot-pluggable and are covered by an air filter that prevents excess dust and contaminants from entering the system. The air filter is retained by the removable front bezel.

The Acme Packet 4900 automatically adjusts the fan speed based on the current operational status and environmental conditions. Fan speed regulation is an automated process that requires no user intervention. You can monitor the status of the fan speed from the Environment menu.

Each fan module is a user-replaceable, hot-swappable component. If the Acme Packet 4900 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 4900 foam air filter removes airborne particles before they are drawn into the system chassis. The air filter, which is located behind the front bezel, can be easily removed for maintenance. The air filter is a field replaceable unit that should be replaced once every three months.

# 3

## Installation

This chapter provides information about how to install the Acme Packet 4900 and its associated components.

### Shipped Parts

Each Acme Packet 4900 ships in one box. Inside this box is the Acme Packet 4900 chassis and the accessory kit. The ordered modules are already installed in the chassis.

**Table 3-1 Shipping Contents**

Location	Item
Main Shipping Box	Acme Packet chassis
Accessory Kit	<ul style="list-style-type: none"><li>• Console adapter</li><li>• AC Power Cords or DC Connector Kit, one per power supply</li><li>• Grounding cable</li><li>• Slide Rail Mounting Kit</li></ul>

### Installation Tools and Parts

The following tools and parts are required to install the Acme Packet 4900 into your equipment rack:

- #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

Oracle 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 4900 must have access to reliable power and cooling. When choosing a location for your Acme Packet 4900, follow the guidelines listed in this section.

## Environmental Guidelines

When preparing to install your Acme Packet 4900:

- Ensure that the equipment rack location complies with the environmental specifications (e.g., temperature, relative humidity, and maximum altitude) of the Acme Packet 4900 described in the chapter on Specifications.
- Locate the Acme Packet 4900 in a clean and well-ventilated room. This location should also be far from areas where heat, electrical noise, and electromagnetic fields are present.

### **Caution:**

This equipment is not suitable for use in locations where children are likely to be present.

### **Caution:**

The Acme Packet 4900 should be installed only in a restricted access location.

## Power Guidelines

When preparing to install your Acme Packet 4900, 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 4900 two power supplies.
- The Acme Packet 4900 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 4900.
- Use grounded, 3-conductor circuits.
- A local earth ground must be available.

### **Note:**

Connect each of the Acme Packet 4900 power supplies to a separate circuit. If both supplies are connected to outlets on the same circuit, the Acme Packet 4900 will lose power to both supplies if that circuit loses power. In that case, the whole Acme Packet 4900 would lose power.

## Mounting Guidelines

When preparing to install your Acme Packet 4900, please ensure you follow these mounting guidelines:

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

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

## Other Safety Guidelines

When preparing to install your Acme Packet 4900, ensure you follow these safety guidelines:

- Review all safety precautions with respect to the Acme Packet 4900 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 4900 from power surges, voltage spikes, and power failures.
- For AC power installations, ensure that your UPS can supply power for enough time to save your system data and shut down the system gracefully.

## Mounting Installation

This section explains how to unpack and install your Acme Packet 4900 into a telecommunications or server equipment rack. The Acme Packet 4900 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 4900 ships with hardware for mounting in a 4-post, tapped-hole equipment rack or square-hole equipment rack. The Acme Packet 4900 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 4900. To prevent personal injury, Oracle recommends that two people lift and install the chassis into the equipment rack.

### Unpacking the Acme Packet 4900

To unpack the Acme Packet 4900:

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

#### **WARNING:**

Only grasp the system from the sides. Failure to do so may inadvertently remove the front bezel and disconnect the LED's.

3. Unpack the contents of the Acme Packet 4900 shipment.
4. Locate the packing list on the outside of the Acme Packet 4900 shipment box.



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

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

### Mounting Hardware

The hardware used for the Acme Packet 4900 mounting procedures include the following:

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



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



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



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



- Nut Bar (4)



- Mounting Spacer (2)



- Phillips screws and a flat head screw
- Center mounting flanges (2) for a 2-post rack



## Cabinet-style 4-Post Chassis Installation

The following sections explain how to mount the Acme Packet 4900 in a cabinet-style, 4-post equipment rack.

### Mounting System

Oracle provides flexible mounting options for your Acme Packet 4900 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 4900 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 4900 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 equipment rack slide rail can expand and contract to accommodate equipment racks of various depths up to 32".

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

### Installing Slide Rails into a Tapped-Hole Rack

This section explains how to mount the Acme Packet 4900 slide rail assembly into a tapped-hole equipment rack.

 **Note:**

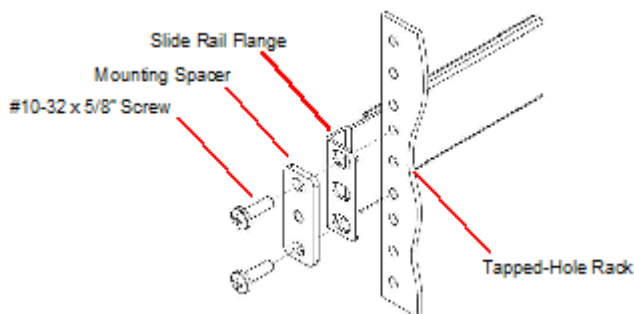
The following procedure presumes that the tapped hole size is #10-32. If alternate tapped holes are used, the customer must supply the proper screws.

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 equipment rack slide rail with an appropriate mount point on the front of the equipment rack.



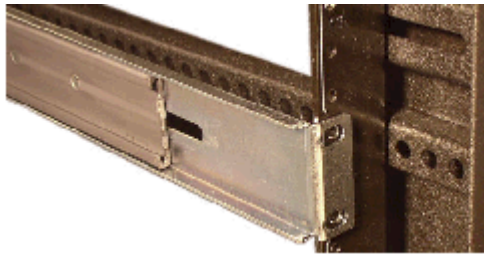
3. For both holes in the flange, place one #10-32 x 5/8" screw through the mounting spacer, then through the slide rail flange and into the tapped hole.



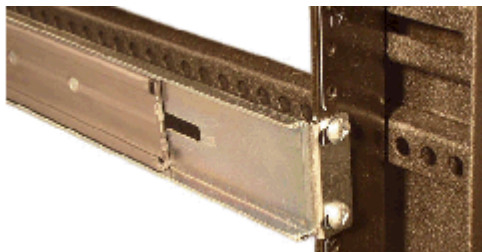
- Using a #2 Phillips head screwdriver, tighten the screws to secure the slide rail to the equipment rack. Do not completely torque the screws; leave a small amount of play at this time.



- Expand and line up the equipment rack slide rail on the outside of the rear rack slide rail at the same height used for the front mount point.



- 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.



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



## Installing Slide Rails into a Square-Hole Rack

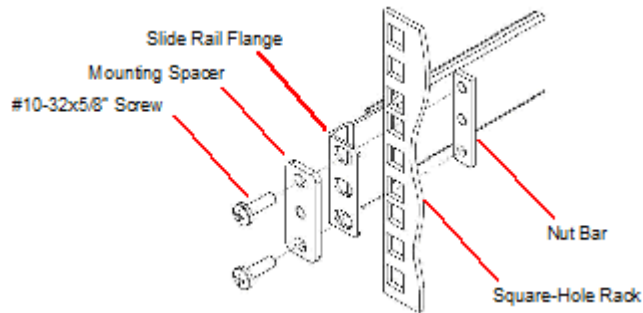
This section explains how to mount the Acme Packet 4900 slide rail assembly into a square-hole equipment rack. The customer can use #10-32, 1/4-20, M5 or M6 cage nuts as an alternative, but the cage nuts will be customer-supplied along with the associated mounting screws for the cage nut selected.

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

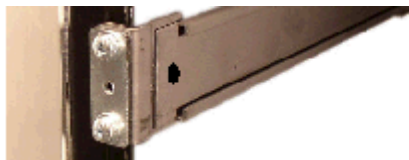
1. Locate the following components included in the rail kit box:
  - Equipment rack slide rails (2)
  - #10-32 x 5/8" screws (8)
  - Mounting spacers (2)
  - Nut bars (2)
2. Line up the painted side of the stationary rail with an appropriate mount point on the front of the equipment rack.



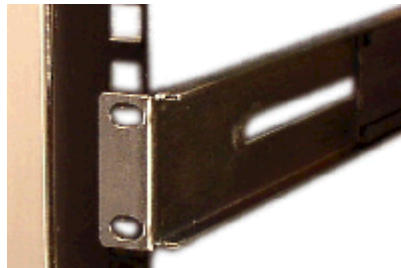
3. For each of the two holes in the slide rail flange, place a #10-32 screw through the mounting spacer, then through the slide rail flange, and finally through the square hole in the rack rail.



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

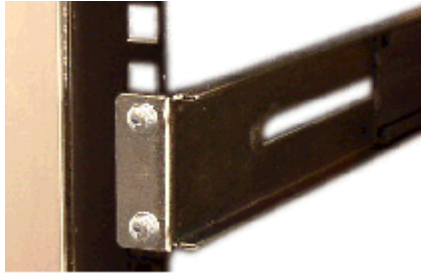


6. Expand and line up the unpainted side of the stationary rail flange on the outside of the rear rack rail at the height used for the front mount point.



7. Hold the nut bar behind the rear rack slide rail.

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



- Torque the screws on the front and back of the rail slide.
- 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 4900 chassis.

To install the chassis rail slides on the Acme Packet 4900 chassis:

- Locate the following components:
  - #6-32 x 1/4" flat head screws (6) (in accessory kit box)
  - Front-mounting flanges (2) (in accessory kit box)
  - #6-32 x 5/16" pan head screws (6) (in rail kit box)
  - Chassis slide rails (2) (in rail kit box)
  - #2 Phillips screwdriver
- Line up one chassis flange with the tapped holes. Position the chassis flange's spring-loaded thumbscrew toward the front panel of the system.



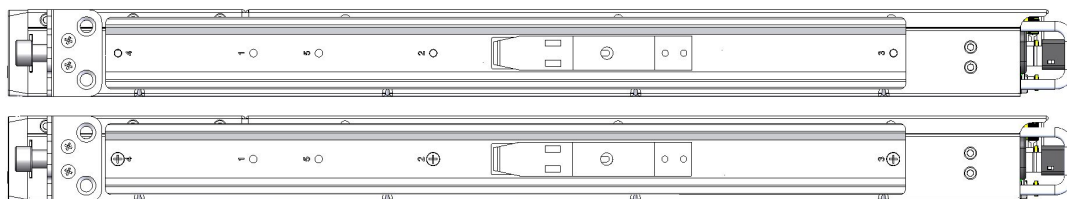
- Insert 2 x #6-32 x 5/16" flat head screws into the flange and chassis, and using a #2 Phillips screwdriver, tighten the screws to secure the flange to the chassis.



- Line up the chassis slide rail with the Acme Packet 4900 side panel. Position hole #4 closest to the flange at the front of the Acme Packet 4900 chassis. Line up the keyhole slot on the slide rail with the keyhole button on the side of the Acme Packet 4900 and slide the rail slightly backwards to secure the slide. When you do this, holes #4, #2, and #3 on the slide will line up with the corresponding tapped holes on the chassis.



- Use #6-32 x 5/16" screws to secure the chassis slide rail to the side of the Acme Packet 4900.



6. Repeat this procedure for the other side of the Acme Packet 4900 chassis.

## Installing the Chassis in the Rack

The Acme Packet 4900 is now ready to be installed into a 4-post equipment rack. To prevent personal injury or damage to the Acme Packet 4900, 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 4900 chassis remains supported until you have completely installed it into the equipment rack.

To install the Acme Packet 4900 chassis into the equipment rack:

1. Lift the Acme Packet 4900 into the correct position to prepare to be installed into the equipment rack.
2. Line up the chassis slide rails in back of the chassis with the guides in front of the equipment rack slide rails.



3. If necessary, press in the latches on either side of the Acme Packet 4900 in order for the assembly to slide into the guides.
4. Push the Acme Packet 4900 fully into the equipment rack.
5. Line up the chassis-mounted thumbscrews with the threads on the Acme Packet 4900 mounting spacer. You may have to adjust the spacer locations before they line up with the Acme Packet 4900's captive screws.



6. Once correctly positioned, hand-tighten the thumbscrews into the mounting spacer and secure the chassis in the rack.
7. Torque the two captive thumbscrews using a #2 Phillips screwdriver.
8. 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 4900 into a 2-post equipment rack.



### Installing the Center-Mount Hardware

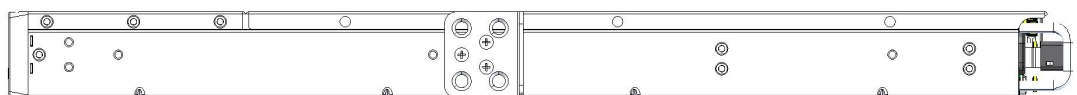
Center-mounting flanges are attached to each side of the Acme Packet 4900. These mounting flanges are reversible, and are not mated to a specific side of the chassis. While the Acme Packet 4900 is shipped with all mounting hardware for attaching the rack flanges to the chassis, you must obtain and use the appropriate hardware recommended by the equipment rack manufacturer for mounting the system in the rack.

To install your Acme Packet 4900 in a center-mount configuration:

1. Locate the following components:
  - Center-mounting flanges (2)
  - #6-32 x 1/4" flat head screws (6)
2. Line up one chassis flange with the three tapped holes found along the center of the side of the Acme Packet 4900 chassis. The three screw holes of the chassis flange will only align in one direction.



3. Using a Phillips head screwdriver, tighten the three #6-32 x 1/4" flat head screws to secure the flange to the chassis.



4. Repeat this procedure for the other side of the Acme Packet 4900 chassis.



## Installing the Chassis in the Rack

The Acme Packet 4900 chassis is now ready to be installed into a 2-post equipment rack. To prevent personal injury or damage to the Acme Packet 4900 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 4900 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 4900 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 4900 and into the equipment rack. One person should hold the Acme Packet 4900 in the correct position while the other person screws the Acme Packet 4900 in place.
  4. Ensure that the Acme Packet 4900 chassis remains supported until you have completely installed it into the equipment rack.

## Ground and Power Cable Installation

The Acme Packet 4900 must be properly grounded to ensure efficient performance. Grounding your Acme Packet 4900 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 4900 if it is not properly grounded. If your Acme Packet 4900 chassis is not properly grounded, the unit can exhibit unpredictable problems such as:

- Garbled output
- 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 4900 and its components. Bodily harm may also result under some circumstances.

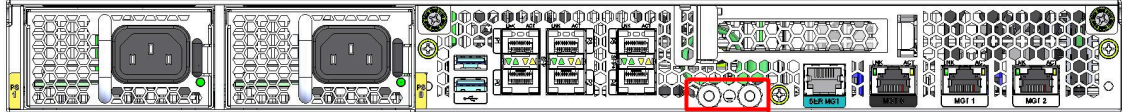
### **Caution:**

The Acme Packet 4900 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 chassis grounding terminals are located on the rear of the Acme Packet 4900 chassis, to the left of the Serial Management port. The Acme Packet 4900 ships with 2 keps nuts screwed onto the ground terminals. Use an 11/32" nut driver to remove and install these keps nuts.



This section shows you how to install the grounding cable on your Acme Packet 4900.

### ! Important:

Acme Packet 4900 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 4900:

1. Using an 11/32" nut driver, unscrew and remove the two keps nuts from the grounding posts located on the rear of the Acme Packet 4900. Place them aside.
2. Place the lug on the end of the grounding cable onto the grounding terminals.
3. Using an 11/32" nut driver, tighten the two keps 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 keps nuts.
4. Connect the other end of the grounding wire to a suitable grounding point at your site.

### ✎ Note:

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

## AC Power Cord Installation

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



**Note:**

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



**Note:**

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

To install the AC power cords in the Acme Packet 4900:

1. Locate the two AC power cords shipped with your Acme Packet 4900. Choose one power supply to work on first.
2. 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.
3. 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.
4. Route the AC power cords through your rack and cabling system to the power outlets.
5. Plug the supply end of each power cord into its own circuit.

The Acme Packet 4900 will start to boot.



**Note:**

To remove AC power cables from the Acme Packet 4900, reverse the previous steps in this procedure.

## DC Power Cord Installation

This section explains how to install a DC power cord on the Acme Packet 3950 or Acme Packet 4900.



**Important:**

This equipment is intended for installation in network telecommunication facilities.



**Caution:**

Use a 10 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.

1. Locate the DC connector kits shipped with your Acme Packet 4900. Use this connector to fabricate a power cord that meets your requirements. Choose one power supply to work on first.

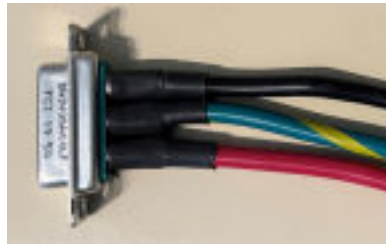
The mating connector kit includes components to create your own customized cable. You must supply both the wire and the supply side terminations.

2. Strip the end of the wire, insert the wire into the barrel end, and apply enough pressure with the crimping tool to indent the barrel. Gently tug the wire to confirm the barrel is adequately crimped.

Your crimping tool should accommodate an 8AWG wire. The contact crimp barrel diameter is 0.216 inch or 5.50mm.

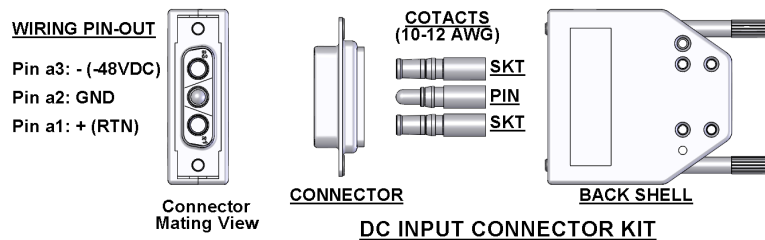


Because the crimp may expand the width of the contact barrel, you may want to use a protective sleeve over the last 3/4" (or 19mm) of the wire to protect against shorts.



3. Slide the crimped terminals into the back side of the connector until the contact clicks into place.

Use the following diagram to construct your DC power supply.



Connector Pin	Lead Designation	Suggested Wire Color (10AWG)
A3	- (-48VDC)	Black
A2	Chassis Ground	Green or Green/Yellow

Connector Pin	Lead Designation	Suggested Wire Color (10AWG)
A1	+ (RTN)	Red

4. Connect the plug from a 3-conductor power cord into the connector located on one of the DC power supplies.
5. Connect the plug from another 3-conductor power cord to the power connector located on the other DC power supply.
6. Route the DC power cords through your rack and cabling system to the power outlets.
7. Plug the supply end of each power cord into its own circuit.

 **Note:**

To remove DC power cables from the Acme Packet 4900, reverse the previous steps in this procedure.

## Cabling the Acme Packet System

After mounting the Acme Packet 4900 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.

Oracle recommends using fully shielded CAT5e or CAT6 Ethernet cables for media and management Ethernet connections to protect the Acme Packet 4900 from potential damage.

You can install and remove Ethernet and GbE optical cables while the Acme Packet 4900 is operational. Not every port needs to be utilized for proper operation. However, when a cable is disconnected and the link is lost, an alarm is generated.

 **Note:**

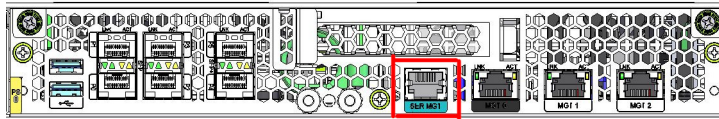
The intra-building ports of the equipment are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building ports of the equipment must not be metallically connected to interfaces that connect to the Outside Plant (OSP) or its wiring. These interfaces are designed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

 **Note:**

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

### Console Port

The Acme Packet 4900 has one console port located on the rear panel. The Acme Packet 4900 ships with a console adapter that allows you to connect a standard DB-9 serial port to the Acme Packet 4900's RJ45 console port.



## Chassis Console Cabling Procedure

This section explains how to create a serial connection to the Acme Packet 4900 console port. Use the serial management port for permanent connections to a terminal server or other serial device.

To connect a cable to the serial management port:

1. Locate a twisted pair console cable to connect to the Acme Packet 4900.
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 serial management port. The release tab on the RJ45 jack clicks into place when you insert it properly.
4. Lead the cable neatly away from the rear panel toward a terminal server or other component where this serial connection terminates.

## Cabling the T1/E1 Port

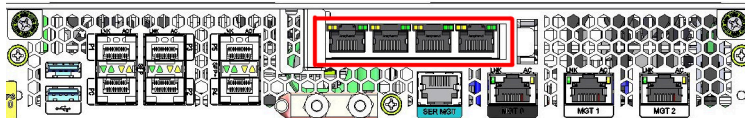
While the Acme Packet 4900 does not include a T1/E1 interface, the Acme Packet 3950 has an optional T1/E1 interface.

If you purchased the optional one-port or four-port T1/E1 interface module for TDM, you must cable the T1/E1 port. In centralized SIP trunking topologies this module preserves voice services in the event of a corporate WAN connectivity disruption. In distributed SIP trunking topologies the module preserves voice services in the event of a local SIP trunk interface disruption.

### Note:

The RJ48C connector looks very similar to an RJ45 connector found on a typical CAT5 cable, but they are very different. A RJ48C connector is fastened on to an Shielded Twisted Pair (STP) cable, not the standard Unshielded Twisted Pair (UTP) CAT-(1-5) cable. An RJ48C also uses a different pin out arrangement, voltage level, and line capacitance than an RJ45.

To create a physical T1 or E1 connection to the Acme Packet 4900 T1/E1 port, use the rear port or ports marked T1/E1 for a permanent connection to Wide Area Network (WAN).



1. Insert the RJ48C connectors on the end of the cable into the T1/E1 ports.
2. Lead the cable neatly away from the rear panel toward the component where this connection terminates.

## Management Network Ports

Standard shielded CAT5e or CAT6 (or higher) Ethernet cables with RJ45 jacks are used for connecting the Acme Packet 4900 management Ethernet ports to your network. These ports support 10/100/1000 Mbps speeds.

All management ports can be used to connect the Acme Packet to your LAN. If you are going to use High Availability (HA), use ports 1 and 2.

 **Note:**

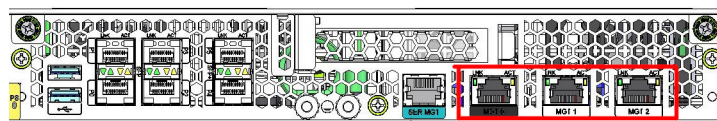
Keep Ethernet cables separated from power cables by at least 60mm where possible and never run them in the same channel of a trunking system without segregation.

 **Note:**

As a rule, Mgmt0 should be reserved as the boot/maintenance interface. Mgmt1 and Mgmt2 are available for high availability.

To connect Ethernet cables to the rear panel Ethernet ports:

1. Locate the Ethernet cables you plan to connect to the Acme Packet 4900.
2. Insert the RJ45 connector on the end of the Ethernet cable into one of the 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 4900. 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 4900.

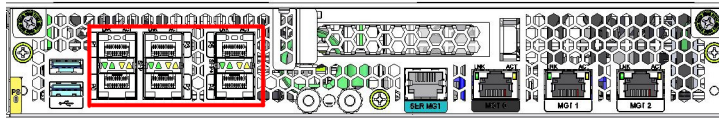


## Media and Signaling Network Interfaces

The rear panel is available with either copper or optical SFP Ethernet connectors. For media and signaling, you may use either (a) any combination of P0, P1, P2, and P3 ports or (b) the P4 and P5 ports.

 **Note:**

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



## Ethernet Cable Procedure

The Acme Packet 4900 may be configured with Ethernet interfaces. Shielded CAT 5e or CAT 6 (or higher) Ethernet cables with RJ45 jacks are used for connecting the Acme Packet 4900 to your network.

On the Acme Packet 4900 you may use either the 1Gb ports (P0-P3) or the 10Gb ports (P4-P5); both cannot be used simultaneously.

To connect Ethernet cables to the signaling and media ports:

1. Locate the Ethernet cables you plan to connect to the Acme Packet 4900.
2. Insert the RJ45 connector on the end of the Ethernet cable into one of the 1GbE copper NIU media and signaling ports. The release tab on the RJ45 jack will click into place when you insert it properly.
3. Route the cable away from the Acme Packet 4900. Make sure that the Ethernet cables are not stretched tightly or subjected to extreme stress.
4. Repeat Steps 1 through 3 for each additional Ethernet cable you connect to your Acme Packet 4900.

## Fiber Optic Cable Procedure

The Acme Packet 4900 may be configured with optical interfaces. Standard single mode or multimode fiber optic cabling with duplex LC connectors are used to connect the Acme Packet 4900 to your network.

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.
- Use only the 1GbE port or the 10GbE port.

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

1. Locate the fiber optic cables you plan to connect to the Acme Packet 4900.
  - P0 - P3 are 1GbE ports
  - P4 - P5 are 10GbE ports
2. Connect the optical cables to their corresponding ports.
3. Route the cable away from the Acme Packet 4900. Make sure that the fiber optic cables are not stretched tightly or subjected to extreme stress.



4. Repeat Steps 1 through 3 for each additional fiber optic cable you connect to your Acme Packet 4900.

## Cabling for HA Deployments

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

### HA Cabling

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

## Rear Panel Cabling

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

- Mgmt0 should be reserved as the boot/maintenance interface.
- Mgmt1 and Mgmt2 are available for sharing HA information.

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

1. Insert one end of an Ethernet cable into either Mgmt1 or Mgmt2 on the rear panel of the Acme Packet 4900 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 4900 B. The release tab on the RJ45 jack clicks into place when you insert it properly. If you use Mgmt1 on Acme Packet 4900 A, then you will connect it to Mgmt1 on Acme Packet 4900 B.
3. Refer to the configuration procedures located in the High Availability chapter of the Configuration Guide.

## Dual Rear Interface Support

To cable Acme Packet 4900s 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 4900 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 4900 B.
3. Insert one end of a second Ethernet cable into Mgmt2 on the rear panel of Acme Packet 4900 A.
4. Insert the other end of the cable into Mgmt2 on the rear panel of Acme Packet 4900 B.
5. Refer to the configuration procedures located in the HA Nodes chapter of the Configuration Guide.

## Media Cabling for HA Nodes

Media cabling in an HA node depends on network topology. After a switchover between the two Acme Packet 4900s 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.

# 4

## Startup

This chapter describes Acme Packet 4900 startup that involves two tasks:

- Powering on the Acme Packet 4900
- Creating the first console connection to the Acme Packet 4900

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 4900 goes online.

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

### **NOT\_SUPPORTED:**

Immediately after powering on the system, upgrade to Release 9.0p1 or later to receive the latest fixes for the Acme Packet 4900.

## 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 4900, you must configure the terminal hardware and software appropriately.

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

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

## Creating a Console Connection

To create a console connection:

1. Set the terminal application's parameters to match the Acme Packet 4900 default parameters.
2. The Acme Packet 4900 console port is located on the rear panel. You should connect to the console port when initially booting the Acme Packet 4900.

3. If the Acme Packet 4900 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 4900, you can watch the boot process as it displays on your screen.

## Powering On the Acme Packet

This section explains how to power on your Acme Packet 4900.

### Prerequisites

The following procedure presumes that you know how to connect your Acme Packet 4900 to either AC or DC power.

### Powering On

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

 **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.

 **Note:**

When operating with a single power supply, the LED on the power supply will flash continuously. The device has properly noted the absence of the other power supply and is logging it.

### Initial Log On

Once you have established the console connection, powered on the Acme Packet 4900 and a runtime image has been loaded, you are ready to login and begin configuring the system. After the Acme Packet 4900 has initialized, the ACLI login prompt appears in your terminal application as follows:

```
User Access Verification
Password:
```

If the Acme Packet 4900 completed booting before you connected to the console port, press the Enter key on the console keyboard a few times to activate the console connection.

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

```
Password:
%
% Only alphabetic (upper or lower case), numeric and punctuation
```

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

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

From the User prompt you can view various configuration states and operating statistics on the Acme Packet 4900 and perform configuration tasks.

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

```
ACMEPACKET> enable  
Password:
```

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

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

```
ACMEPACKET#
```

4. You can now begin configuring your Acme Packet 4900. Refer to the Configuration Guide to learn how to establish an IP address.

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

## Critical Setup Steps for Acme Packet Platforms

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

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

- S-Cz8.4.0 and all patches
- S-Cz9.0.0 and all patches
- S-Cz9.1.0 and all patches

- S-Cz9.2.0 to S-Cz9.2.0p9
- S-Cz9.3.0 to S-Cz9.3.0p4

Complete the following steps promptly after platform power on:

1. Configure bootparam. Bootparam changes are optional, so the hardware can boot without making a change.
2. Set system passwords.
3. Set up product.
4. Set up entitlements.

 **Note:**

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

# 5

## Maintenance

This chapter explains Acme Packet 4900 hardware maintenance procedures.

Although several user-replaceable components of the Acme Packet 4900 are hot-swappable, some limited Acme Packet 4900 maintenance procedures require that you shut down the system.

Examples of maintenance procedures which require you to shut down the unit include:

- Removing the unit from the equipment rack for any reason
- Removing the cover from the chassis
- Replacing transcoder DSP modules
- Replacing the T1/E1 TDM card.

General caveats for Acme Packet 4900 maintenance:

- Always observe correct ESD procedures.
- Before you start any maintenance procedure which includes parts replacement, make sure you have the correct part on-hand. Any user-replaceable components may be ordered in advance from Oracle.
- Oracle recommends stocking replacement parts for:
  - Air filters
  - Fans
  - Power supplies
  - Optical transceivers
  - TCM modules

## System Shutdown

Before you shut down or restart the Acme Packet 4900, ensure that there are no active calls in progress. The command to show active calls is “show sessions.”

```
ACMEPACKET# show sessions
```

Procedures to reroute call and network traffic around the Acme Packet 4900 are outside the scope of this guide.

You can set the Acme Packet 4900 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 4900. Shutting down the system is appropriate when you are replacing a power supply or are removing the Acme Packet 4900 from the equipment rack.

## Rejecting Incoming Calls

To reject all incoming calls on the Acme Packet 4900:

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

```
ACMEPACKET# show sessions
```

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

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

## Shut Down the Acme Packet

1. In Superuser mode, type **halt**.
2. To confirm the halt request, type **Y**.
3. Power down the system by a long press of the power button.
4. Confirm that all fans are off.
5. Remove the power cords if servicing the system.

## Rebooting, Resetting, and Power Cycling

### Reboot

Rebooting the Acme Packet 4900 shuts down the system in an orderly fashion and then automatically restarts it. The operating system gracefully shuts down as processes are terminated and the file system is stopped. While the system and its processes are stopped, all call processing is immediately halted. You may therefore wish to perform tasks that call for a reboot during off-peak maintenance hours.

Rebooting the Acme Packet 4900 is required every time you upgrade with a new version of the software.

Save your configurations before rebooting. 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.

To reboot:

1. Type **save-config** to save any configuration changes you made.

```
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. Type **reboot**.

```
ACMEPACKET# reboot
```

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

3. Type **Y** at the confirmation prompt to proceed with the reboot.

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

## Power Cycling

Power cycling the Acme Packet 4900 is the process of turning the chassis off and then on again. When power cycling, it is imperative that you wait at least 20 seconds between power down and power up to ensure that all components are completely powered down before restarting the system.

## Standby State for HA Nodes

When performing hardware maintenance on the Acme Packet 4900, it is best to minimize any risk of interrupting network traffic or losing data. If the Acme Packet 4900s are configured as an HA node, you should only work on the node that is in standby state.

There are two ways to determine the HA state of each Acme Packet 4900 in an HA pair.

1. If you are in the same physical location as the Acme Packet 4900 you can view the HA LEDs on the front bottom right. A standby unit lights the STBY LED, while an active unit lights the ACT LED.
2. If you are not in the same physical location as the Acme Packet 4900, you can use the ACLI *show health* command. The output of this command indicates the current HA state of the Acme Packet 4900.

Once you have determined that the Acme Packet 4900 due for maintenance is in standby state, you can continue with the appropriate procedures to replace a part.

If you need to perform maintenance on the active Acme Packet 4900 you need to manually force the two Acme Packet 4900s to switch HA states. Forcing a switchover renders the currently active Acme Packet 4900 in Standby state, and the current standby Acme Packet 4900 will assume all traffic processing and forwarding as the active system.

 **Note:**

This procedure is only applicable to an HA deployment.

To force a Acme Packet 4900 into the standby HA state:

1. Use the **show health** command to verify the State attribute has the value "Active".

```
SBC1# 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-49002: 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 Becoming Standby
Jun 25 19:04:54.684: Standby to Becoming Active
```

```
SBC2# 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-49001: v3, Active,
health=100, max silence=1050
                               last received from 169.254.2.1 on
wancom2:0
```

2. Use the **display-current-cfg-version** command to verify the configuration version is the same on both the active and standby nodes.

```
SBC1# display-current-cfg-version
Current configuration version is 5

SBC2# display-current-cfg-version
Current configuration version is 5
NETNETSBC2#
```

 **Note:**

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

3. Use the **display-current-cfg-version** command to verify the running configuration version is the same on both the active and standby nodes.

```
SBC1# display-running-cfg-version
Running configuration version is 5
```

```
SBC2# display-running-cfg-version
Running configuration version is 5
NETNETSBC2#
```

 **Note:**

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

4. Use the **notify berpd force** command to initiate a switchover from the active to the standby node.

```
SBC1# notify berpd force
```

5. Wait for the other Acme Packet 4900 to transition to the standby state. Confirm that it is in the standby state with the **show health** command.

```
SBC2# show health
```

Refer to the Upgrade section of the *Maintenance and Troubleshooting Guide* for more information.

## Maintenance With Power

Some maintenance tasks may be performed without powering down the system.

- Clean air inlets in the front left bezel
- Replace air filters
- Clean fan modules
- Replace fans
- Replace power supplies
- Replace optical transceivers

## Maintaining the Cooling Components

The Acme Packet 4900 air filter removes airborne particles before they are drawn into the Acme Packet 4900 chassis. To prevent system malfunction and prolong the life of the system's cooling components, do these things:

- Replace the fan filter every three months
- Clean the air inlets once a week.

Cooling maintenance encompasses cleaning the fan module and cleaning the air inlets on the front of the Acme Packet 4900 chassis. Cleaning the fan module requires that you remove the module itself. If you are not shutting down the Acme Packet 4900, this procedure must be performed quickly or else the system may overheat and cause packet processing to stop.

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

## Fan and Air Filter Maintenance

This section explains how to remove a fan and replace the air filter on your Acme Packet 4900.

### Note:

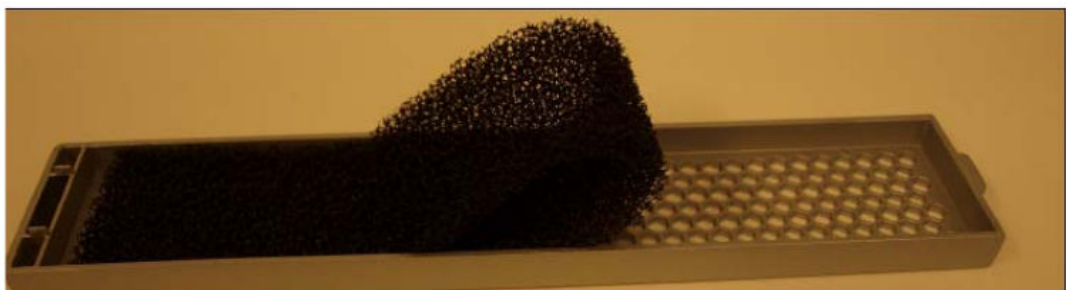
You can perform routine maintenance on the Acme Packet 4900 front panel fans and air filter with the unit normally installed in the equipment rack. Also, you do not need to remove the the power from the chassis.

## Clean the Air Inlets

1. Remove the bezel from the chassis by gripping the two left corners and pulling on it. The bezel is held on magnetically.



2. Remove the air filter.



3. Clean the bezel by gently wiping it with a clean, dry cloth or by blowing compressed air through it.
4. Install a clean air filter on the bezel.
5. Attach the bezel to the unit by hooking the bezel's right side into its slots and pivoting until the magnet catches the chassis.

## Replace a Fan

To maintain unit operations, you must be able to remove the malfunctioning fan and quickly replace it with a functioning one to prevent the unit from overheating. To obtain a replacement fan, contact Oracle customer support.

1. Remove the bezel.
2. Pull the fan out of the chassis.  
Move the fan to an ESD-safe location.
3. Reinsert the fan module and slide in until the latch engages with an audible click.
4. Re-attach the bezel.

## Power Supply Removal and Replacement

You can replace malfunctioning power supplies yourself.

 **Note:**

Ground yourself first using appropriate ESD grounding equipment such as a wrist strap.



 **Note:**

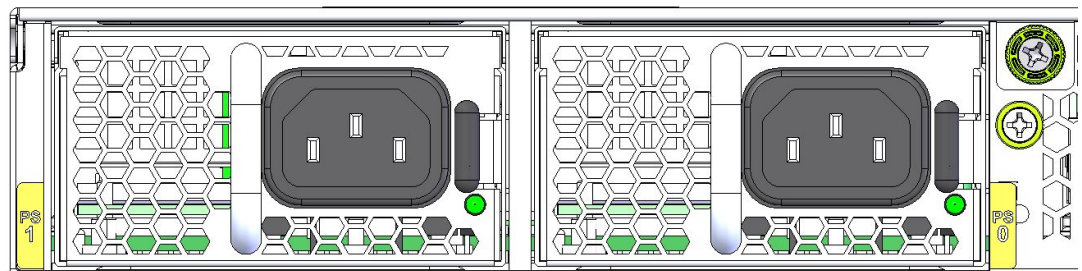
Power supplies can be removed from the chassis while it is still installed in the rack and while the second power supply is providing system power; this is called a warm swap.

 **Note:**

After unplugging a power supply, disconnect it from the power source before you remove or install it in the chassis.

To remove a power supply from the chassis:

1. Remove the power cables from the power supplies.



2. With your thumb, push the locking tab to unlock the power supply from the chassis.
3. Holding the handle, pull the power supply until it is completely out of the chassis.

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

## Installing a Power Supply

To install a power supply in the Acme Packet 4900 chassis:

1. Insert the power supply into the empty power supply slot located on the rear panel of the chassis.

The labels on the power supply face upward.

### **NOT\_SUPPORTED:**

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

2. Push the power supply handle until the power supply is engaged with the motherboard.
3. Connect the power cord to the power supply.

## Optical Transceiver Removal and Replacement

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

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

Optical transceivers are hot swappable and may be replaced while the Acme Packet 4900 is powered on.

To obtain a replacement optical transceiver, contact customer support.

### **Note:**

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

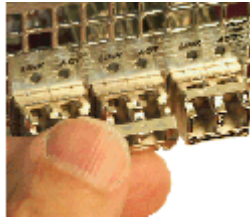
## Removing an Optical Transceiver

To remove the transceiver from an NIU transceiver port:

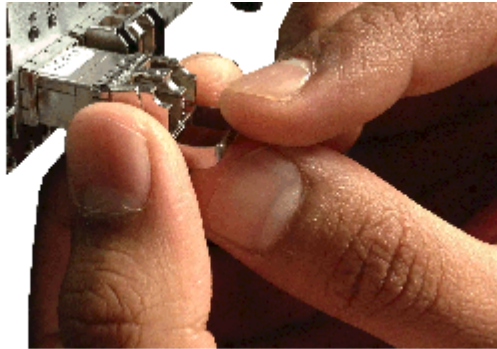
1. Unplug all fiber optic cables from the optical transceiver to be replaced.



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



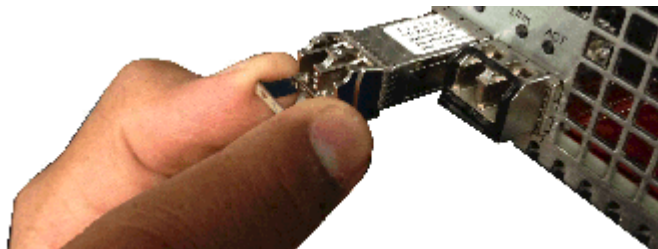
3. Holding the extended bale clasp latch, pull the optical transceiver fully out of its socket of the physical interface card.



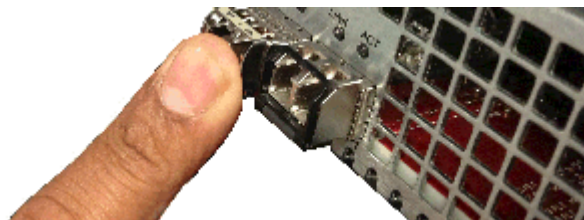
## Install an Optical Transceiver

To install an optical transceiver:

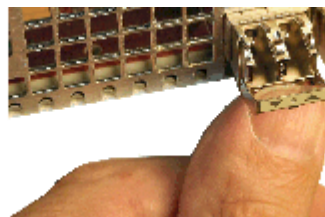
1. Slide the replacement optical transceiver into the socket on the rear panel.



2. Press on the face of the optical transceiver to seat it in the socket.

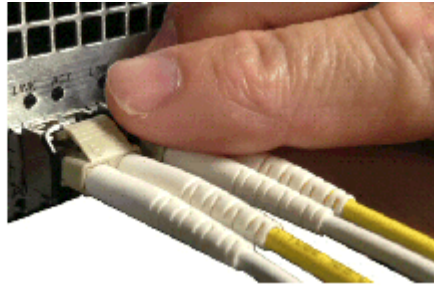


3. Flip the bale clasp latch back into the rest position.



4. Reconnect the optical cables to their corresponding ports.





## Copper Transceivers

Copper transceivers are also available for the Acme Packet 4900 System. They are removed and replaced similarly to the optical transceivers.

## Maintenance Without Power

Some maintenance tasks must be performed after powering down the system.

- Remove and replace the front bezel
- Remove the chassis from an equipment rack
- Remove the chassis cover
- Remove and replace transcoder DSP modules
- Remove and replace T1/E1 TDM modules
- Replace the main board (motherboard)

## Remove and Replace the Front Bezel

The bezel is attached magnetically.

1. To remove the bezel, pull on its left corner.
2. To replace the bezel, hook the right to its slots and press the left side forward until the magnet catches.

## Removing the Unit from an Equipment Rack

1. Power down the unit gracefully using the ACLI commands.
2. Depress the power pushbutton.
3. Remove the two power cords from the power supplies in the rear of the system.
4. Remove and label all attached network cables and console cable from their respective ports on the chassis.
5. Loosen the thumbscrews that secure the Acme Packet 4900 to the equipment rack slide rails.
6. Slide the unit forward.



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.

7. Push the locking clip latches on both sides of the chassis inwards to unlock the slide rails from each other.



8. Pull the the Acme Packet 4900 chassis completely from the slide rails.
9. Pull the unit with the slide rails still attached out of the equipment rack, and move it to an ESD-safe location.

 **Note:**

One person should support the Acme Packet 4900 from below while the other person removes the chassis from the equipment rack.

## Remove the Chassis Cover

 **Caution:**

Always gracefully power down the Acme Packet 4900 and then disconnect the power supplies from the power source when removing the chassis cover.

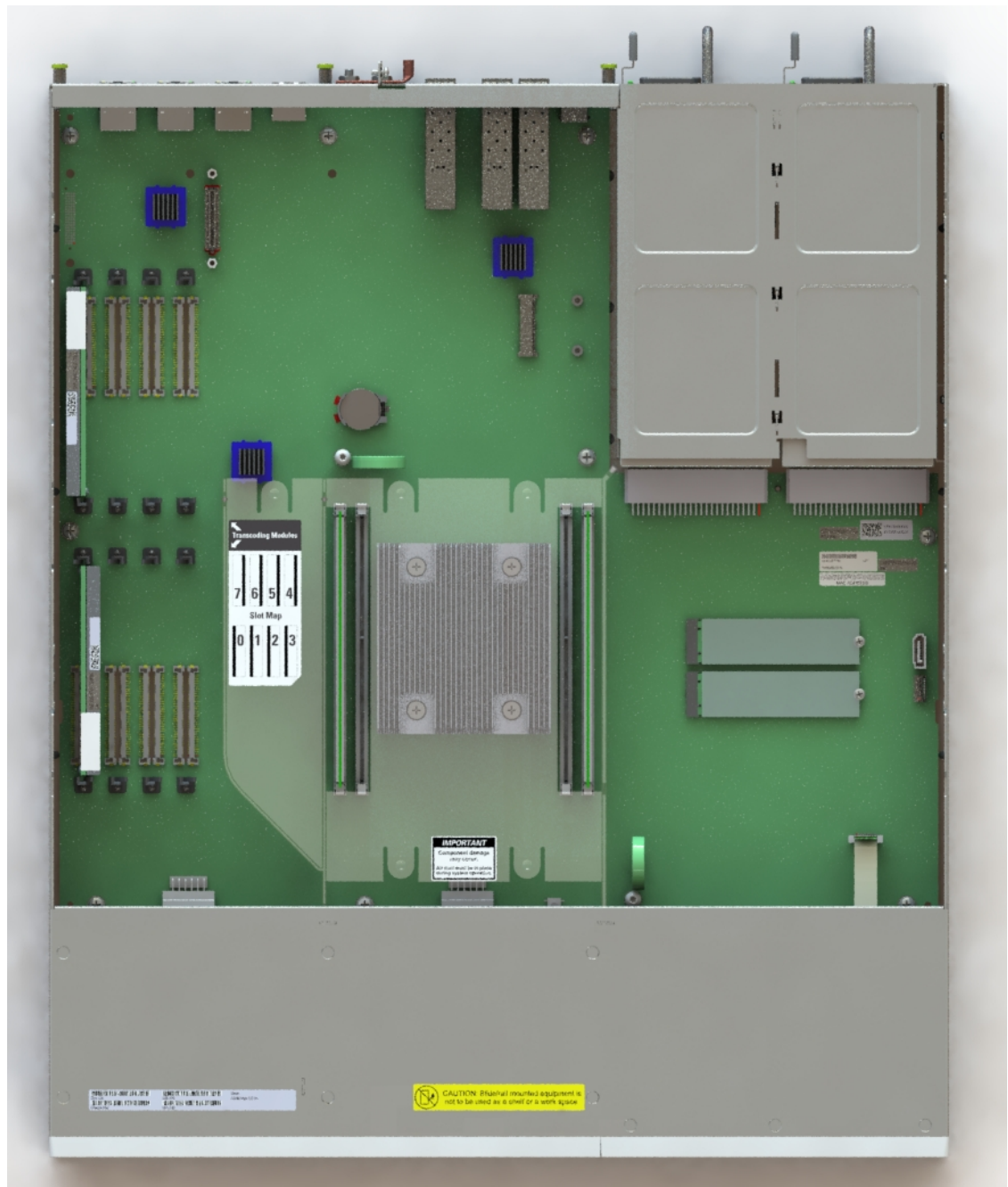
1. Remove Acme Packet 4900 from the rack.
2. Push the chassis cover backwards about ½ inch.
3. Lift the cover up until it is free of the chassis.

## Replacing Transcoder Modules

Up to 8 transcoder modules may be installed on the Acme Packet 4900 printed circuit board (PCB).



The Acme Packet 4900 PCB includes slots for installing the transcoder TCM modules. The slots are numbered 0-7. Slot 0 is in the bottom row and closest to the edge of the unit when looking at it from the front of the chassis. Transcoder TCM modules should be installed consecutively in numerical order, starting with slot 0.



## Guidelines

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

- The transcoder module can be installed only in the designated location.
- Ground yourself and follow proper ESD grounding procedures.
- Remove the transcoder module from the shipped packaging.
- The installation of these modules should be performed during low-traffic periods or during times of scheduled maintenance.
- Follow industry-standard procedures to ensure ESD protection.

- When installing or removing a TCM module, move the card to an ESD-safe location.

 **Note:**

Before handling any components, follow the proper ESD grounding procedures. Failure to do so could damage the card and its components.

### Required Parts

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

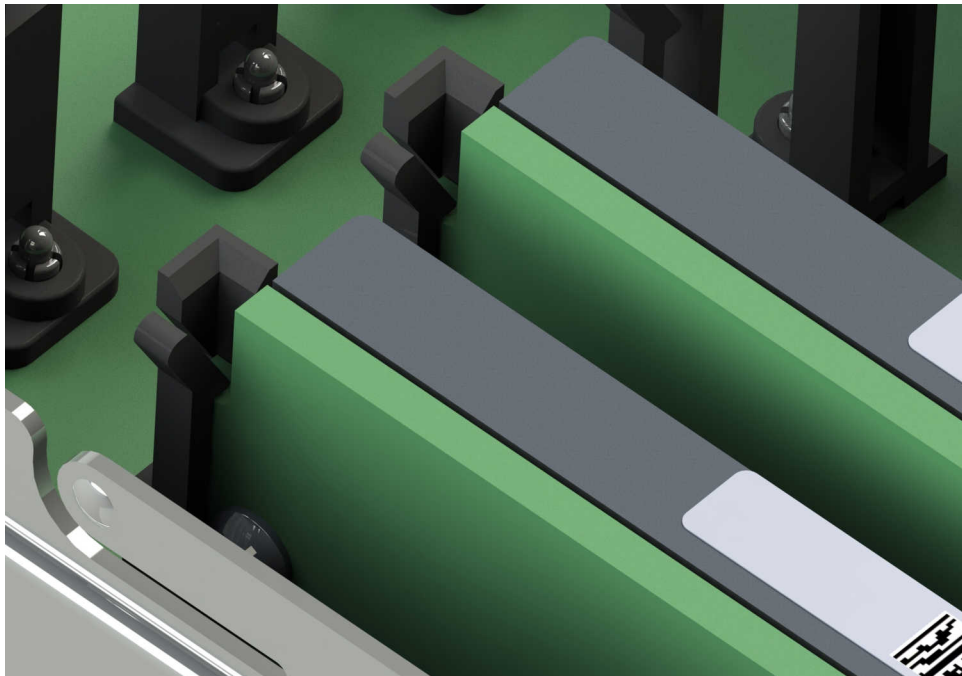
- ESD wrist strap
- ESD-safe location
- Transcoder TCM module

## Removing the Transcoder Module

The following procedure describes how to remove the transcoder module.

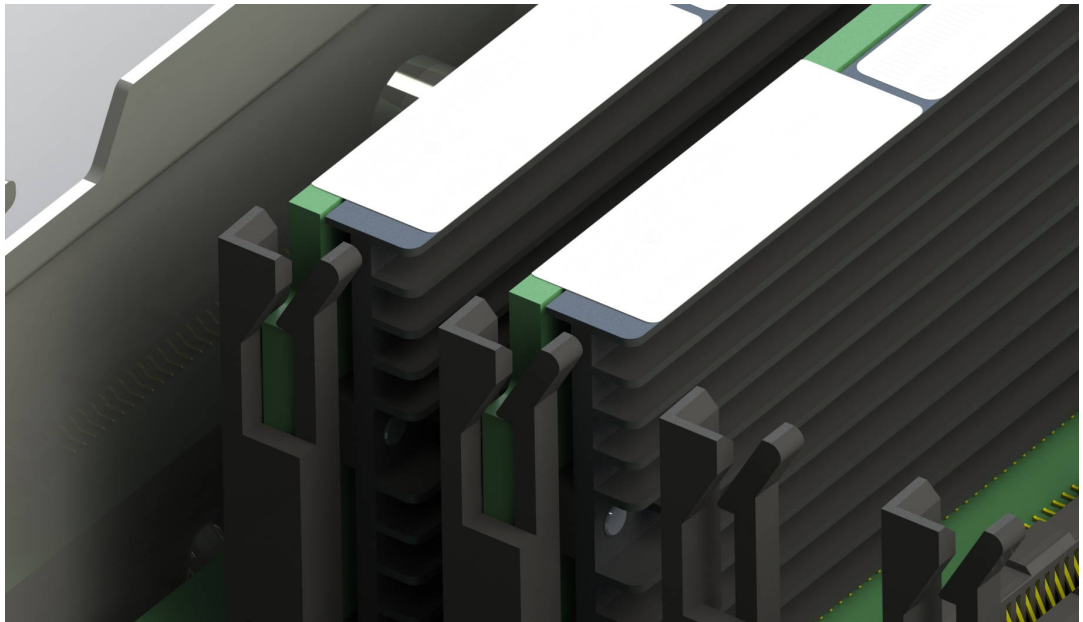
Prerequisites:

- Provide an ESD-safe location to place the transcoder module.
  - Wear an ESD wrist strap.
  - Remove the chassis cover.
1. Use a fingertip to release the catch holding either end of the transcoder module.



2. Once the fasteners are detached from both sides of the transcoder module, hold the center of the module between your finger and thumb and slowly remove the module.

Be careful to keep the module level while removing it and guide it smoothly through the guide slots on either side.



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

## Installing the Transcoder Module

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

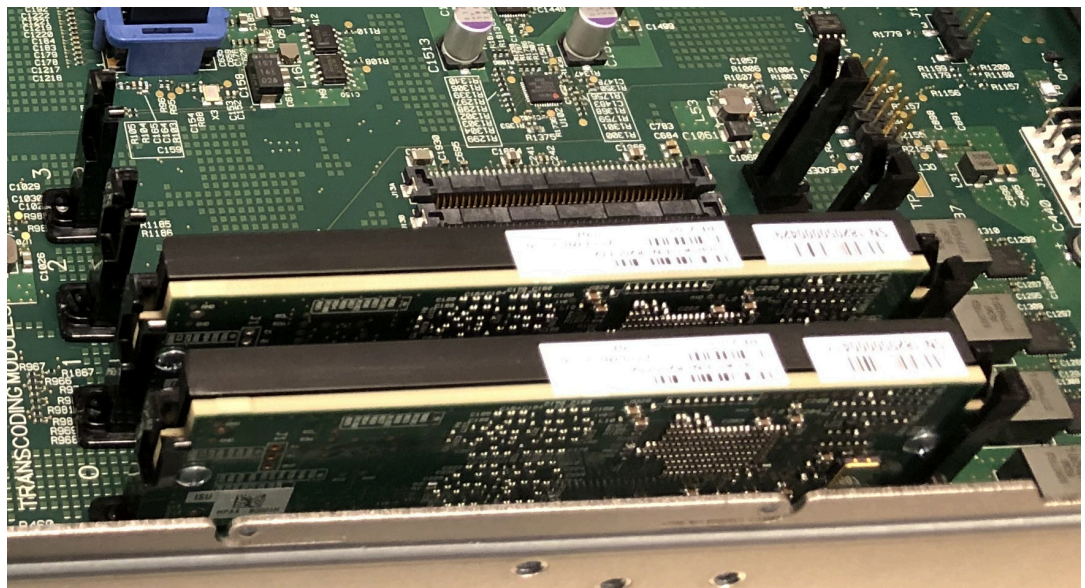
Prerequisites:

- Place the new transcoder module in an ESD-safe location.
  - Wear an ESD wrist strap.
1. Grasp the transcoder module between your thumb and index finger and line up both sides of the module with the slot guides attached to the PCB.



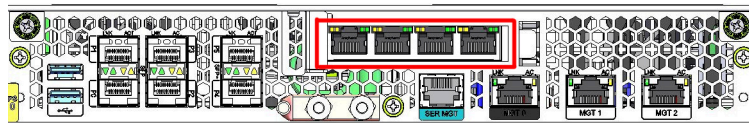
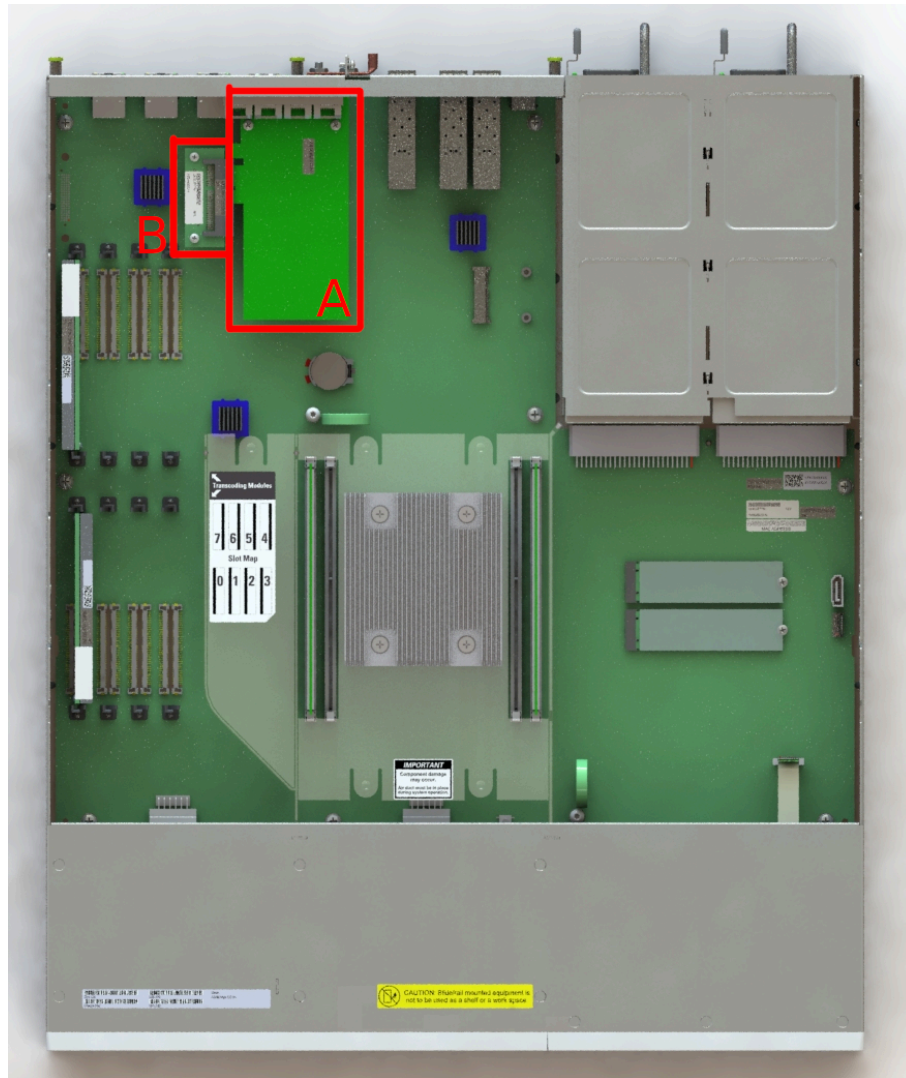
2. Using your thumb on your other hand, guide the module evenly into the slot guides located on each side as you lower the component into the connector. Press evenly across the top of the connector to fully seat the transcoder module on the PCB.

The module is fastened to the connector at one end while at the other end, the board rests on two standoffs attached to the PCB.



## Removing and Replacing the T1/E1 Module

The T1/E1 module (A) is located near the rear of the board. It plugs into the rear panel as well as a raised PCI Express connector (B).



## Guidelines

Read and follow these guidelines prior to installing or removing the TDM module:

- Ground yourself and follow proper ESD grounding procedures.
- Remove the transcoder TDM module from the shipped packaging.

 **Note:**

In the box with the new T1/E1 TDM modules, there will be a Telecom label in a plastic envelope. Attach the Telecom label to the chassis cover as described below.





**Note:**

The installation of these modules should be performed during low-traffic periods or during times of scheduled maintenance.



**Caution:**

Before handling any components, follow the proper ESD grounding procedures. Failure to do so could damage the card and its components.

### Required Parts

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

- ESD wrist strap
- ESD-safe location
- New or replacement TDM module
- Telecom label to attach to the chassis cover

### Required BIOS and Software Upgrade

Before replacing a Digium TDM card with a Sangoma TDM card, you must:

1. RMA the device to Oracle.
2. Upgrade to a software patch that supports the new card.  
The following releases and newer support the Sangoma TDM card:
  - 9.2p1
  - 9.1p7

## Remove the TDM Module

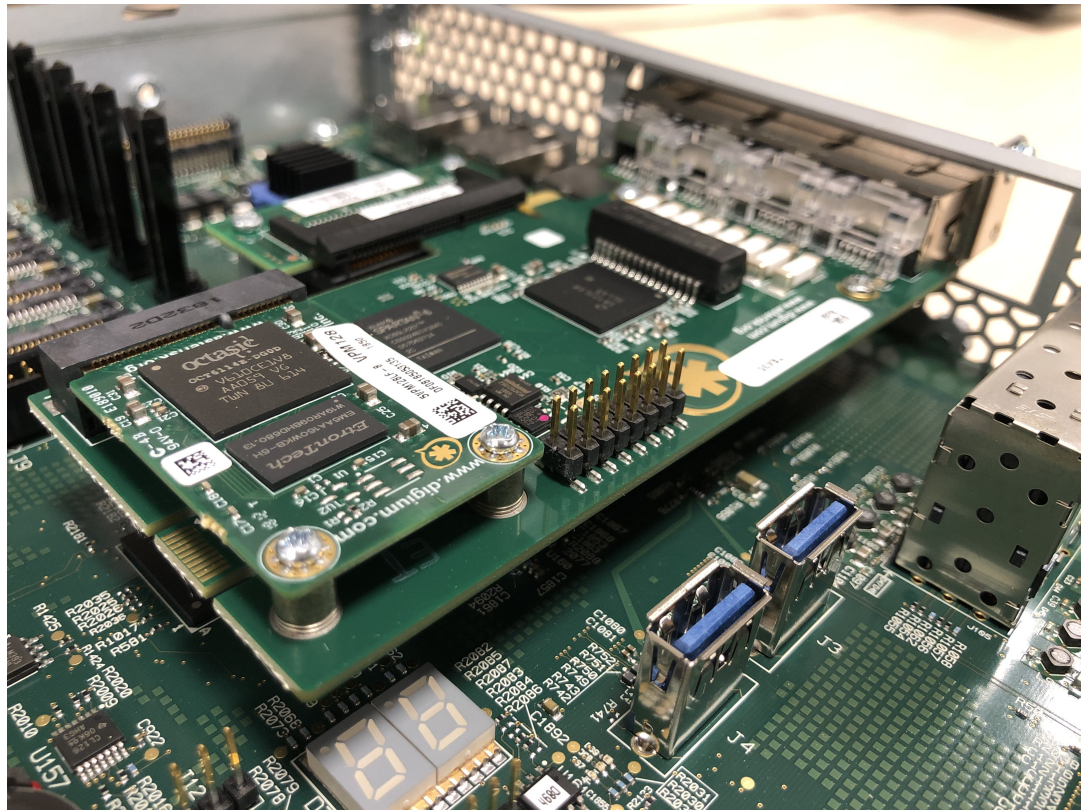
1. Remove the Acme Packet 3950 cover.

The T1/E1 TDM module is installed into the rear panel of the chassis and attached through a PCI Express x4 connector. The module is raised about a quarter of an inch off of the chassis PCB.



**Note:**

Your TDM card may vary from that in the picture.



Part of the module is a piece of metal connected at 90 degrees to the module PCB. This piece contains the four T1/E1 ports visible when looking at the rear panel of the chassis. The metal extends on either side of the port area. When looking from the inside of the chassis, the part of the metal to the left of the ports continues straight and is attached to the inside of the rear panel. To the right of the ports, the metal bends 90 degrees towards the rear of the chassis, and is inserted through the rear panel.

2. Remove the screw on the outside of the chassis that holds the module seated against the rear panel of the chassis.
3. Grasp the module by its edges. Pull the right side of the module out of the rear panel slot, and, at the same time, slide the left side of the piece of metal from the rear panel.
4. Pull the module laterally out of the plug and away from the rear panel of the chassis. You may have to work the module back and forth as you pull, in order to disengage the module from the two directions.

Note that there is a gap in the edge connector of the module PCB. There are metal bands on either side of the gap. The left-most part of the connector section is outside of the plug.

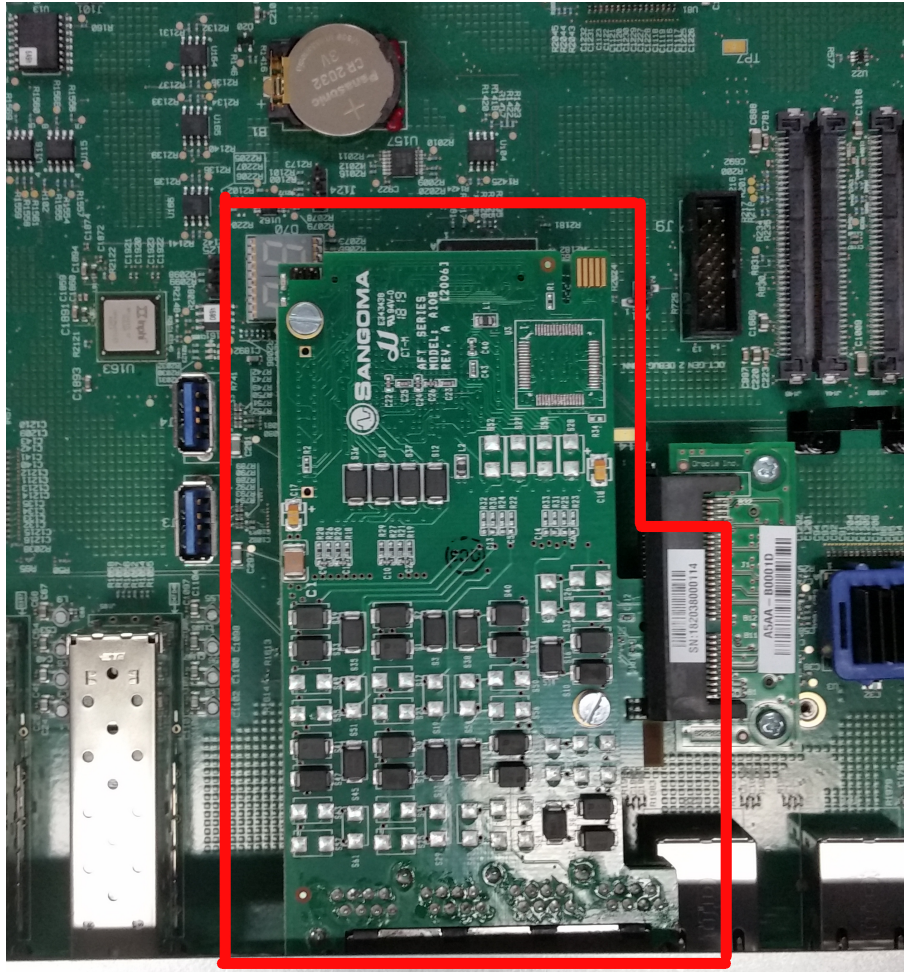
5. When the module is fully disengaged, remove it from the chassis area to an ESD-safe location.

## Install the TDM Module

1. Grasp the module by its edges. Orient it towards the plug and the rear panel of the chassis as you found the original module.
2. Push the right side of the module into the chassis rear panel slot, and, at the same time, slide the left side of the piece of metal into the rear panel.
3. Push the module laterally into the plug and toward the rear panel of the chassis. You may have to work the module back and forth as you pull, in order to secure the module from the two directions.

Note that there is a gap in the edge connector of the module PCB. There are metal bands on either side of the gap. The left-most part of the connector section is outside of the plug.

4. Attach the screw that secures the piece of metal attached to the module to the rear panel.
5. After you finish installing the module, replace the cover of the unit.
6. If this is not a replacement T1/E1 card, affix the Telecom label to the top cover.



If you returned your device to Oracle to replace a Digium TDM card with a Sangoma TDM card, the new port numbers are reversed. So port number 1 on the Digium card is now port 4 on the Sangoma card. Use **show tdm spans** to view the span information.

**Table 5-1 Port Numbers**

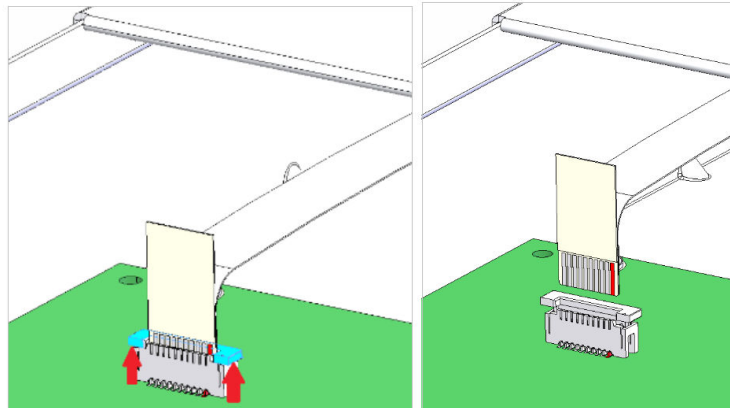
Digium port number	Sangoma port number
1	4
2	3
3	2
4	1

## Remove and Replace the Main Board

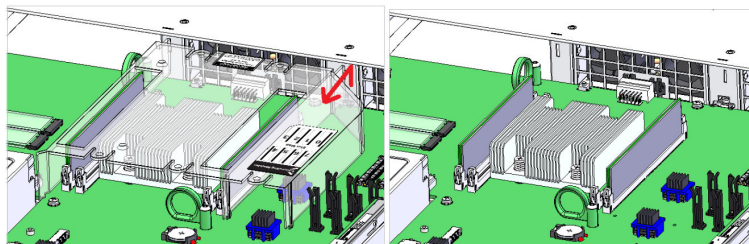
Use this procedure to remove and replace the main board.

## Remove the Main Board

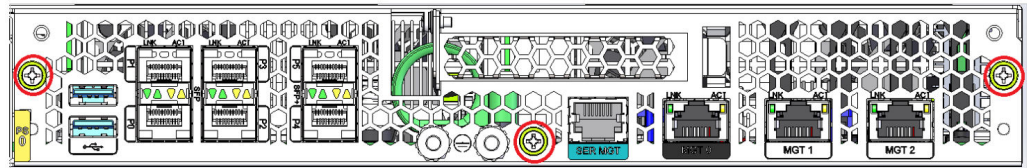
1. Remove the front bezel and air filter.
2. Remove both fan modules.
3. Remove both power supplies.
4. Remove the top cover.
5. Remove the following optional components if they are included with your system:
  - Transcoding modules
  - TDM card (AP3950 only)
6. Unplug the front panel cable connection.
7. Unplug the front panel cable connection.
  - a. Gently pull up on the top ring of the connector.
  - b. Using the pull tab on the cable, pull the cable out of the connector.



8. Remove the clear plastic air diverter.
  - a. Gently pull the air diverter straight up approximately  $\frac{1}{4}$  of an inch.
  - b. Slide the air diverter towards the rear of the system to remove the plastic tabs from their slots.
  - c. Lift the air diverter out of the system



9. Remove the rear panel.
  - a. Loosen the three captive screws.
  - b. Pull the panel straight back to disengage it from around the connectors.

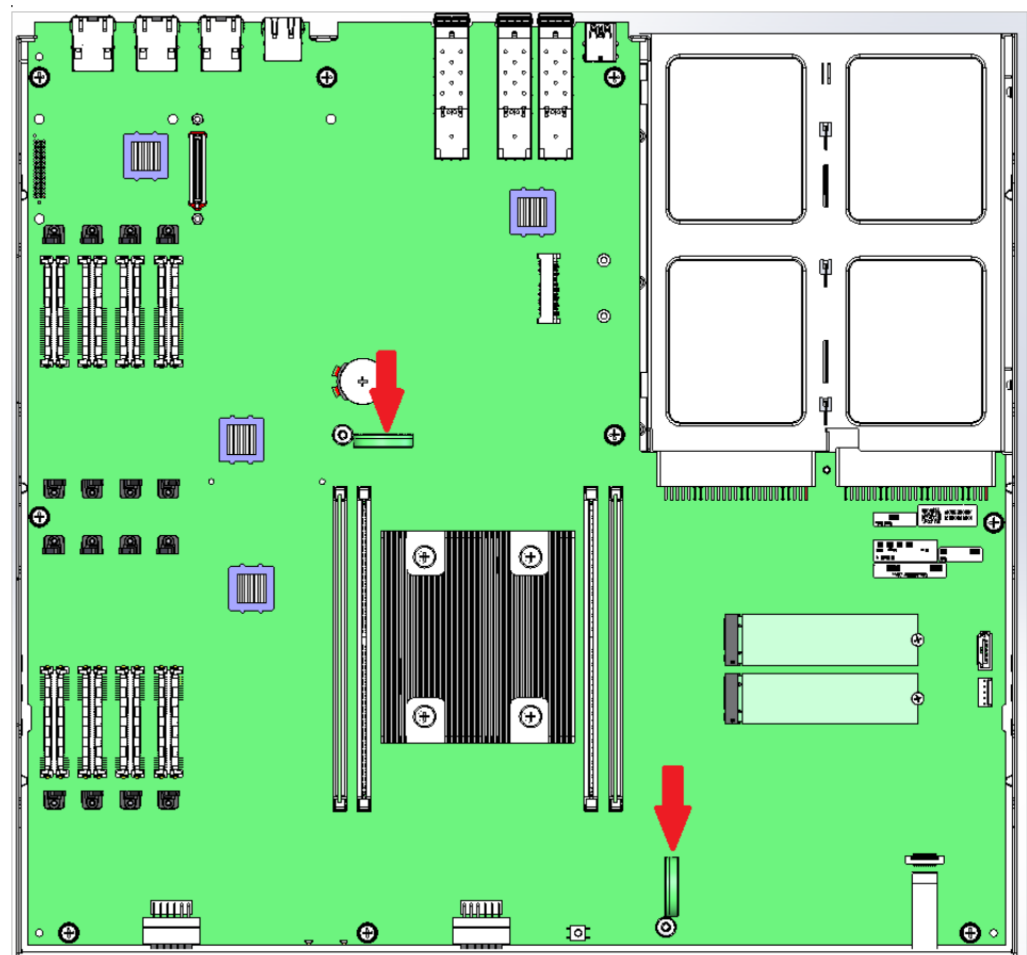


10. Remove the main board.
  - a. Grab hold of the 2 green rings on the main board.
  - b. Slide the main board toward the rear until it stops.
  - c. Gently lift the main board out of the system.

## Replace the Main Board

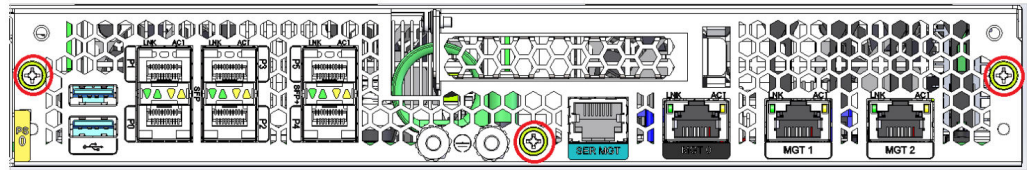
1. Install the new main board.
  - a. Grab the main board by the 2 green rings.
  - b. Place the main board on to the system floor.

Make sure the board engages with all the buttons on the bottom. Also make sure the front panel cable is not trapped under the main board.
  - c. Slide the main board toward the front of the system until it stops.

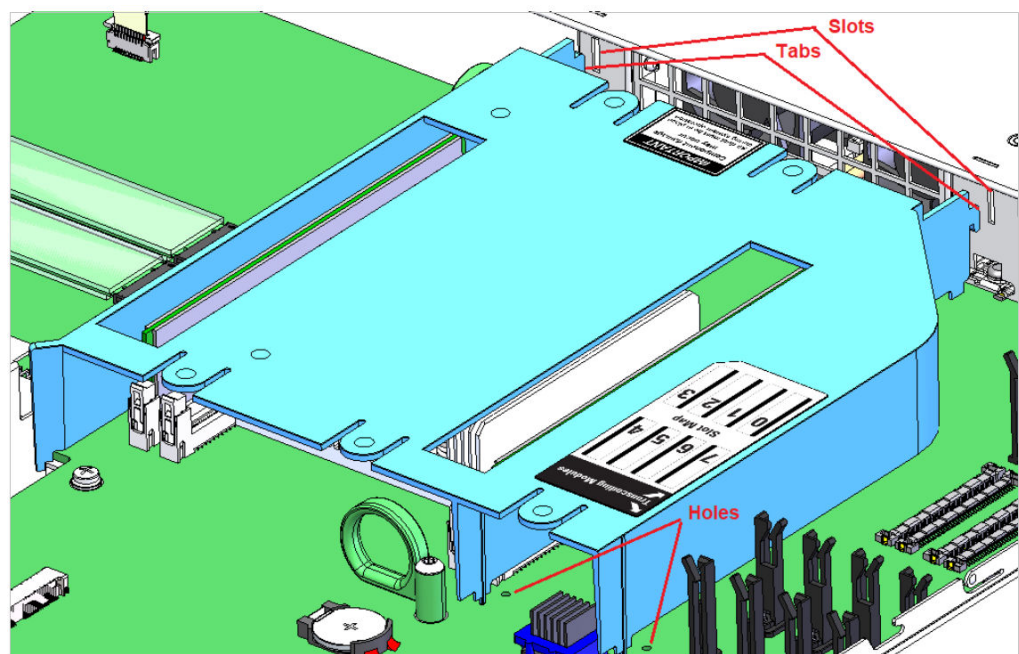


2. Reinstall the rear panel.

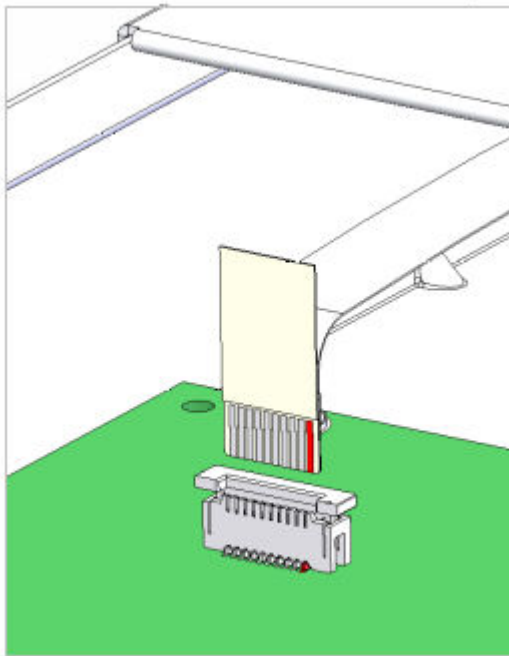
- a. Place the rear panel so that the connectors pass through the openings.
- b. Press into the chassis until the panel sits against the chassis.
- c. Tighten the 3 captive screws.



3. Reinstall the clear plastic air diverter.
  - a. Guide the front hook tabs into the rectangular slots in the chassis.
  - b. Lower the air diverter onto the main board, making sure the small pins go into the holes in the main board.



4. Plug the front panel cable back into the main board.



5. Reinstall the following optional components if included in your system:
  - TDM card (3950 only)
  - Transcoding modules
6. Reinstall the top cover.
7. Reinstall the power supplies.
8. Reinstall the fan modules.
9. Reinstall the front bezel.

# 6

## Specifications

This chapter provides information regarding the physical, electrical, environmental, and connector specifications of the Acme Packet 4900.

### Environmental, Safety, and Regulatory Certifications

For information regarding safety and regulatory certifications applicable to the Acme Packet 4900, refer to the Acme Packet Platforms Safety and Compliance Guide.

### Physical Specifications

#### System Chassis Specifications

This table lists the physical dimensions and weight of the Acme Packet 4900 chassis.

Specification	Description
Height	1.72" (4.37 cm) (1U)
Width	17.10" (43.43 cm) (+ mounting ear width: 19" (48.26 cm))
Depth	20.4" (51.8 cm) (+ mounting slide bar depth)
Weight	approximately 22.80 lbs (10.34 kg), fully loaded

#### AC Power Supply Physical Dimensions

This table lists the physical dimensions and weight of the Acme Packet 4900 AC power supply.

Specification	Description
Height	1.53" (3.90 cm)
Width	2.89" (7.35 cm)
Depth	8.75" (22.20 cm)
Weight	1.62lbs (0.74kg)

**Note:**

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

#### DC Power Supply Physical Dimensions

This table lists the physical dimensions and weight of the Acme Packet 4900 DC power supply.



Specification	Description
Height	1.53" (3.90cm)
Width	2.89" (7.35cm)
Depth	8.75" (22.20cm)
Weight	1.76lbs. (0.80kg)

**Note:**

This equipment is intended for installation in Network Telecommunication Facilities.

## Fan Module Specifications

This table lists the fan module specifications for the Acme Packet 4900.

Specification	Description
Number of Fans	4 (2 per fan module)
Total Maximum Airflow	104 CFM

## Electrical Specifications

Refer to the following tables for information regarding the electrical specifications.

### Power Supply Input Circuit Fuse Requirements

This table lists the input circuit fuse and cable size requirements.

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

## Environmental Specifications

Oracle recommends that you follow the environmental guidelines in the following table.

Specification	Description
Temperature	The Acme Packet 4900 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 4900 is required to operate below the maximum altitude of 10,000 feet.
Air Flow	104 CFM front to back

Specification	Description
Power Dissipation	220W typical, 340W maximum

## Connector Specifications

Refer to the following table for information about the 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.
RS232/Serial Port	The RS232 serial port uses an 8-pin RJ45 connector that supports RS232 protocol.
1 GbE Media Ports	The four 1GbE fiber optic connection ports (P0-P3) are implemented as SFP sockets. Duplex LC or copper SFPs may be used.
DC Input Connector	The Input connector on each DC power supply is a 3-circuit plug.
RJ48C T1/E1 Ports (An option only on the Acme Packet 3950)	Mechanical Arrangement: 4 Miniature 8-position jacks. Usage: 1.544 Mbps digital services. Electrical Network Connection: T&R, T1 R1, conductors 7 and 8 provide cable shield integrity.

## Optical Transceiver Interface Module Specification

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

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