MAG Series Pulse Secure Gateways Hardware Guide

MAG2600

MAG4610

MAG6610

MAG6611
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About this Guide

Documentation

For a list of related MAG-series documentation, see https://www.pulsesecure.net/techpubs. If the information in the latest Release Notes differs from the information in the documentation, follow the Release Notes.

Obtaining Documentation

To obtain the most current version of all Pulse Secure technical documentation, see the products documentation page on the Pulse Secure web site at https://www.pulsesecure.net/techpubs.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

• Document name
• Page number
• Software release version

Requesting Technical Support

Technical product support is available through the Pulse Secure Technical Assistance Center at https://www.pulsesecure.net/support/.

For product warranty information, visit https://www.pulsesecure.net/support/warranty.
System Overview and Specifications

Pulse Secure Gateway Hardware Overview

The MAG Series Pulse Secure Gateways are a family of modular, purpose-designed gateways that provide a single point of convergence for the SSL VPN, mobile device security and management, pervasive application acceleration and network access control (NAC) needs. The modular design allows the MAG Series modules to be mixed and matched within a single chassis to suit your requirements.

Pulse Secure Gateway Models

The Pulse Secure Gateway is available in the following models.

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAG2600</th>
<th>MAG4610</th>
<th>MAG6610</th>
<th>MAG6611</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed/module design</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Modular, up to 2 service modules</td>
<td>Modular, up to 4 service modules</td>
</tr>
<tr>
<td>Functionality supported</td>
<td>SSL VPN or Pol Sec; both modes cannot be used at the same time</td>
<td>SSL VPN or Pol Sec; both modes cannot be used at the same time</td>
<td>SSL VPN or Pol Sec per service module</td>
<td>SSL VPN or Pol Sec per service module</td>
</tr>
<tr>
<td>Service Modules</td>
<td>None</td>
<td>None</td>
<td>MAG-SM160 MAG-SM360</td>
<td>MAG-SM160 MAG-SM360</td>
</tr>
<tr>
<td>Management module</td>
<td>None</td>
<td>None</td>
<td>Optional MAG-CM060 chassis management module</td>
<td>Optional MAG-CM060 chassis management module</td>
</tr>
</tbody>
</table>
## Pulse Secure Gateway Features and Functions

This table lists the hardware features supported on the Pulse Secure Gateway.

<table>
<thead>
<tr>
<th>Features</th>
<th>MAG2600</th>
<th>MAG4610</th>
<th>MAG6610</th>
<th>MAG6611</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (WxHxD)</td>
<td>1U, 4.31 x 1.65 x 7.73 in</td>
<td>1U, 8.63 x 1.75 x 21.50 in</td>
<td>1U, 17.31 x 1.75 x 27.25 in</td>
<td>1U, 17.31 x 1.75 x 27.25 in</td>
</tr>
<tr>
<td></td>
<td>(10.95 x 4.2 x 19.64 cm)</td>
<td>(21.92 x 4.45 x 54.61 cm)</td>
<td>(43.97 x 4.45 x 69.22 cm)</td>
<td>(43.97 x 4.45 x 69.22 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.98 lb (900 g)</td>
<td>11.5 lb (5.2 kg)</td>
<td>21 lb (9.5 kg)</td>
<td>31 lb (14.1 kg)</td>
</tr>
<tr>
<td>Rack mountable</td>
<td>Yes, optional tray</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Power supply/PEM</td>
<td>100-240 VAC, 1A 50-60 Hz, 30 W maximum (external power supply adapter)</td>
<td>100-240 VAC, 1A 50-60 Hz, 70 W maximum</td>
<td>MAG-PS661 power supply: 100-240 VAC, 8A 50-60 Hz, 560 W maximum</td>
<td>MAG-PS662 power supply: 100-240 VAC, 10A 50-60 Hz, 750 W maximum</td>
</tr>
<tr>
<td>Material</td>
<td>Aluminum</td>
<td>Steel</td>
<td>Steel</td>
<td>Steel</td>
</tr>
<tr>
<td>Slots</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Fans</td>
<td>1</td>
<td>1</td>
<td>Up to 4 fan trays (each tray contains 2 fans)</td>
<td>Up to 8 fan trays (each tray contains 2 fans)</td>
</tr>
<tr>
<td>LEDs</td>
<td>Power, HDD activity, hardware</td>
<td>Power, HDD activity, hardware</td>
<td>On MAG service module: power, HDD activity</td>
<td>On MAG service module: power, HDD activity</td>
</tr>
<tr>
<td>Network interface</td>
<td>2 1GbE</td>
<td>3 1GbE</td>
<td>3 1GbE per service module</td>
<td>3 1GbE per service module</td>
</tr>
<tr>
<td>Interfaces</td>
<td>• RJ45 serial (console port)</td>
<td>• RJ45 serial (console port)</td>
<td>On MAG Series service module: • RJ45 serial (console port)</td>
<td>On MAG Series service module: • RJ45 serial (console port)</td>
</tr>
<tr>
<td></td>
<td>• 2 RJ45 Ethernet 10/100/1000 (traffic)</td>
<td>• 3 RJ45 Ethernet 10/100/1000 (traffic)</td>
<td>• 3 RJ45 Ethernet 10/100/1000 (traffic)</td>
<td>• 3 RJ45 Ethernet 10/100/1000 (traffic)</td>
</tr>
<tr>
<td></td>
<td>• USB</td>
<td>• USB</td>
<td>• USB</td>
<td>• USB</td>
</tr>
</tbody>
</table>
Environmental Parameters

Operating temperature: 41° through 104° F (5° through 40° C)

Storage temperature: -40° through 158° F (-40° through 70° C)

Relative humidity (operating): 8% - 90% (non condensing)

Relative humidity (storage): 5% - 95% (non condensing)

Altitude (operating): 10,000 ft (maximum)

Altitude (storage): 40,000 ft (maximum)

Safety certificates: EN 60950-1: 2006 (2nd Edition); CAN/CSA-C22.2 No. 60950-1 (2007); UL 60950-1 (2nd Ed.)

Emissions certificates:


Accessing the Pulse Secure Gateway

User interfaces are available for monitoring, configuring, troubleshooting, and managing the Pulse Secure Gateway:

- **Web interface**—Web-based graphical interface that allows you to operate a Pulse Secure Gateway without commands. Available only if the optional chassis management card (CMC) is installed on the MAG6610 and MAG6611.

- **Pulse Secure command-line interface (CLI)**—Pulse Secure command shell that runs on top of a UNIX-based operating system kernel. The CLI is a straightforward command interface. On a single line, you type commands that are executed when you press the **Enter** key. The CLI provides command Help and command completion. Available only if the optional CMC is installed on the MAG6610 and MAG6611.

- **Integrated Access Service Module interface**—Web-based graphic interface that allows you to operate the Integrated Access Service Module without commands. This interface provides access to all module-related functions and features. This is the same web-based interface used with the SA Series SSL VPN appliances, the Unified Access Control appliances or the WX Series appliances.
Front and Back Panel Views

Pulse Secure Gateway MAG2600 Front Panel

The following figure shows the front panel of the MAG2600. The MAG2600 is a single service module packaged into a compact chassis.

The following list describes the front panel components of the MAG2600:

- USB port
- Console port
- Ethernet ports 0 and 1
- LEDs (power, activity, alarm)
- Power button
Pulse Secure Gateway MAG2600 Back Panel

The next figure shows the back panel of the MAG2600:

![Back Panel of MAG2600](image)

The retention clip provides support to hold the power cord on to the power supply point.

Pulse Secure Gateway MAG4610 Front Panel

The next figure shows the front panel of the MAG4610:

![Front Panel of MAG4610](image)

Front panel components of the MAG4610:

- Blank faceplate
- Console port
- USB port
- Ethernet ports 0, 1 and 2
- LEDs (power, activity, alarm)
Pulse Secure Gateway MAG4610 Back Panel

The next figure shows the back panel of the MAG4610:

Back panel components of the MAG4610:

- Power switch
- Power supply

Pulse Secure Gateway MAG6610 Front Panel

The front panel of the MAG6610 contains four horizontal slots in which you can install cards. The slots are numbered from 0 through 3, left to right. The following table provides the physical specifications of the device.

<table>
<thead>
<tr>
<th>Slot / FPC</th>
<th>Integrated Access Service Module</th>
<th>Reserved</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>1</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>3</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

The following figure shows the front panel of a populated MAG6610.

The following lists the front panel components of the MAG6610:

- Chassis management card
- Service module
- Module removal lever
- Blank faceplate
Pulse Secure Gateway MAG6610 Back Panel

The following figure shows the back panel of a populated MAG6610:

The back panel components of the MAG2600 are as follows:

- Power switch
- Fan
- Power supply
- Hard drive

Pulse Secure Gateway MAG6611 Front Panel

The front panel of the MAG6611 contains eight horizontal slots in which you can install cards:

The slots are numbered 0 through 7, from left to right and top to bottom.

<table>
<thead>
<tr>
<th>Slot / FPC</th>
<th>Integrated Access Service Module</th>
<th>Reserved</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>1</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>3</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>5</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>7</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

The front panel components of the populated MAG6611 are as follows:

- Chassis management card
- Service modules
- Blank faceplates
• Module removal lever
• Service module

Pulse Secure Gateway MAG6611 Back Panel

The following figure shows the back panel of a populated MAG6611:

![Back Panel Image]

The back panel components of the populated MAG6611 are as follows:

• Power supply
• Fan Power supply (empty) tray
• Power switch
• Hard drive
Component Descriptions

Field-Replaceable Units in the Pulse Secure Gateway

Field-Replaceable units (FRUs) are components that you can replace at your site. The FRUs in the Pulse Secure Gateway are:

- Power supplies
- Fan trays
- Integrated access service modules
- Chassis management card
- Hard drives for the MAG-SM360 (can be ordered separately if one drive fails)

Hot-swappable items are those items that can be removed and installed while the Pulse Secure Gateway is powered up without affecting the Pulse Secure Gateway's capabilities. The following FRUs are hot-swappable:

- Fan trays on the MAG6610 and MAG6611
- Power supplies on the MAG6611 (does not affect gateway capabilities if two power supply units are installed and only one fails)
- Hard drives on the MAG-SM360 (does not affect gateway capabilities only if one of the two installed hard drives fails and the MAG-SM360 is still functioning correctly)

NOTE: Service modules are not hot-swappable. Please power down the service module prior to removing it.

All Pulse Secure Gateways are shipped with an AC power supply. Except for the MAG2600, all power supplies are internal to the chassis. The MAG2600 uses an external brick power supply.

MAG6611 AC Power Supplies

You can add one additional power supply to the MAG6611. A cover panel is installed in the optional power supply slot.

When multiple power supplies are present, they share power almost equally in a fully populated system. Two AC power supplies provide full power redundancy. If one power supply fails or is removed, the remaining power supply redistributes the electrical load without interruption. The device reassesses the power required to support its configuration and issues errors if the available power is insufficient.
Power supplies are installed at the rear of the chassis in slots labeled 0 and 1 for the MAG6610 and MAG6611.

Each AC power supply weighs approximately 3 lb (1.3 kg) and has an independent 12 A rated AC appliance inlet on its front. Each inlet requires a dedicated AC power feed. Each AC power supply has a fan, a bicolor LED on the faceplate that indicates the status of the power supply, and a colored ejector lever.

Figure: MAG6611 With a Single AC Power Supply

Each AC power supply has an ejector lever that holds the power supply in place. The ejector lever locks into the corresponding hole in the chassis on the left side of the AC appliance inlet.

Each AC power supply comes with a power cord retainer that holds the power cord in place.

Each power supply has its own fan and is cooled by its own internal cooling system. The airflow for a power supply is from the front of the power supply to the back.

Cooling System and Airflow in the MAG6610 and MAG6611

The cooling system in a Pulse Secure Gateway MAG6610 or MAG6611 consists of one or more fan trays. Each fan tray contains two fans. All fans and fan trays are a hot-insertable and hot-removable field-replaceable unit (FRU).

You remove and replace the fan tray from the rear of the chassis.

The Pulse Secure Gateway continues to operate for a limited time (15 seconds) during the replacement of the fan tray without thermal shutdown. The fan tray provides front-to-back airflow. The air intake to cool the chassis is located on the front of the chassis. Air is pulled into the chassis and pushed toward the fan tray. Hot air exhausts from the rear of the chassis.

Temperature sensors in the chassis monitor the temperature in the chassis. The fan tray used in the Pulse Secure Gateway comes with load-sharing redundancy that can tolerate a single fan failure at room temperature (below 113 °F/45 °C) to continue to provide sufficient cooling.

Under normal operating conditions, the fans in the fan tray run at less than full speed. If a fan fails or the ambient temperature rises above the threshold 113 °F (45 °C), the speed of the remaining fans is automatically adjusted to keep the temperature within the acceptable range, 32 °F (0 °C) through 113 °F (45 °C).
The system raises an alarm if the fan fails or if the ambient temperature inside the chassis rises above the acceptable range. If the temperature inside the chassis rises above the threshold temperature, the system shuts down automatically.

You can check the status of fans and the chassis temperature from the Web interface if you have a chassis management card (CMC) installed.

You cannot replace a single fan. If one or more fans fail, you must replace the entire fan tray.

NOTE: Faceplates are required for proper airflow and cooling. If you remove a chassis management card or service module and do not intend to replace it, cover the opening with the supplied faceplate.

**Integrated Access Service Modules**

The MAG-SM160 and MAG-SM360 service modules provide SSL VPN connectivity, mobile device security and management, and network access control (NAC). They can change personality so that administrators can reconfigure from one mode of operation to another. For example, today the service module could be an NAC module and tomorrow it could be set up as an SSL VPN. This allows for hardware reuse versus dedicated hardware engine blades.

The MAG-SM160 and MAG-SM360 can be installed only in the MAG6610 and MAG6611.

The MAG-SM161 and MAG-SM361 service modules provide application acceleration platform in the data path between a switch and a router.

Two service modules can be installed in the MAG6610 and four in the MAG6611 gateways. One service module is installed in the MAG2600 and MAG4610.

The MAG-SM160, MAG-SM161, MAG-SM360 and MAG-SM361 service modules are paired with fan trays and hard drives. When moving a service module to a different slot, you must move the associated fan trays and hard drives to the new location as well.

A recessed reset button is located on the front of each service module and can be used to power on/off the service module without having to power down the entire Pulse Secure Gateway.

NOTE: The MAG-SM360-PROFILER service module has similar hardware but is different from a MAG-SM360 service module. It is not an integrated service module. The MAG-SM360-PROFILER can be installed into a MAG6610 or MAG6611 chassis. It has Great Bay Software Beacon Endpoint Profiler software preinstalled. You cannot boot a different software image to change the personality of the MAG-SM360-PROFILER service module.
Chassis Management Card Overview

The Pulse Secure Gateway Chassis Management Card (CMC) is an optional management module that you can install on a MAG6610 and MAG6611. No more than one CMC is ever installed on a Pulse Secure Gateway. The CMC runs the OS.

The CMC provides a visual representation of the Pulse Secure Gateway chassis and all installed modules. You can view all installed modules using either the CLI or the Web interface.

Another benefit of the CMC is that it provides SSO to all modules through a single IP address and launches that module’s administrative user interface.

Figure: Web Interface

The CMC uses a dedicated reserved slot in the MAG6610 or MAG6611 chassis. At most one CMC should be installed per chassis.

The following lists the CMC front panel components.

- Console
- Ethernet ports 0 (em0) and 1 (em1) • USB port
- LEDs (power, activity, alarm)
- Power button
Status LEDs on the Pulse Secure Gateway

Power, activity, and alarm LEDs are located on the front panel of the service modules. These LEDs can be monitored to view the current status of the module. In addition, the MAG6610 and MAG6611 have hard drive and RAID status LEDs located on the back panel.

Ethernet Port LEDs on the Pulse Secure Gateway

Each Gigabit Ethernet port has two LEDs:

![Ethernet Port LED Diagram]

Table: Ethernet Port LEDs.

<table>
<thead>
<tr>
<th>Number</th>
<th>Function</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Link/Activity</td>
<td>Blinking Green</td>
<td>Link is active. Data communication is taking place.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green</td>
<td>Link is active. No data communication is taking place.</td>
</tr>
<tr>
<td>2</td>
<td>Link Speed</td>
<td>Yellow</td>
<td>1 Gbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green</td>
<td>100 Mbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>10 Mbps</td>
</tr>
</tbody>
</table>
Installation and Rack Mounting

Site Preparation Checklist

Here is a summary of the tasks you'll need to perform to prepare a site for installing the Pulse Secure Gateway.

1. **Environment**—Verify that environmental factors such as temperature and humidity do not exceed device tolerances.

2. **Power**—Measure the distance between the external power source and the device installation site. Identify the system grounding plan.

3. **Rack and cabinet installation**—Verify that your rack meets the minimum requirements. Plan track location, including required space clearances. Secure the rack to the floor and building structure.

4. **Cables**—Acquire cables and connectors. Review the maximum distance allowed for each cable. Choose the length of cable based on the distance between the hardware components being connected. Plan the cable routing and management.

General Site Guidelines

The following precautions help you plan an acceptable operating environment for your Pulse Secure Gateway and avoid environmentally caused equipment failures:

- For the cooling system to function properly, the airflow around the chassis must be unrestricted. Allow sufficient clearance between the front and back of the chassis and adjacent equipment. Ensure that there is adequate circulation in the installation location.

- Follow the ESD procedures to avoid damaging equipment. Static discharge can cause components to fail completely or intermittently over time.

- Ensure that the blank faceplate panel is installed in the empty slot to prevent any interruption or reduction in the flow of air across the internal components.

NOTE: Install the device only in restricted areas, such as dedicated equipment rooms and equipment closets, in accordance with Articles 110–16, 110–17, and 110–18 of the National Electrical Code, ANSI/NFPA 70.
Electrical and Power Requirements

There are factors you must consider while planning the electrical wiring and power availability at your site. These factors include the following:

- Power specifications and requirements for the device
- Electrical wiring guidelines for the device installation site
- Power, connection, and power cord specifications for the device • Grounding guidelines and specifications for the device

The power requirements vary greatly depending upon your configuration. Use the following AC power specifications as a general rule.

Table: Power Specifications for an AC Power Supply

<table>
<thead>
<tr>
<th>Item</th>
<th>MAG2600</th>
<th>MAG4610</th>
<th>MAG6610</th>
<th>MAG6611</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage range</td>
<td>100 through 240</td>
<td>100 through 240</td>
<td>100 through 240</td>
<td>100 through 240</td>
</tr>
<tr>
<td>AC input line</td>
<td>50 through 60 Hz</td>
<td>50 through 60 Hz</td>
<td>50 through 60 Hz</td>
<td>50 through 60 Hz</td>
</tr>
<tr>
<td>frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC input current</td>
<td>1A</td>
<td>1A</td>
<td>8A</td>
<td>10A</td>
</tr>
<tr>
<td>rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC output power</td>
<td>30-W</td>
<td>70-W</td>
<td>560-W</td>
<td>750-W</td>
</tr>
</tbody>
</table>

Rack Requirements

The Pulse Secure Gateway can be installed in a rack. Many types of racks are acceptable, including front-mount racks and four-post (telco) racks.

Rack requirements pertain to:

- Rack size
- Mounting bracket hole spacing
- Rack connection to the building structure

The next table provides the rack size, clearance, and airflow requirements.
<table>
<thead>
<tr>
<th>Rack Requirement</th>
<th>Specification</th>
</tr>
</thead>
</table>
| Rack type                            | • Use a two-post rack or a four-post rack. You can mount the Pulse Secure Gateway on any two-post or four-post rack that provides bracket holes or hole patterns spaced at 1-U (1.75-in. or 4.45-cm) increments and that meets the size and strength requirements to support the weight.  
• A U is the standard rack unit defined in Cabinets, Racks, Panels, and Associated Equipment (document number EIA-310-D) published by the Electronics Industry Association ([http://www.eia.org](http://www.eia.org)).  
• The rack must meet the strength requirements to support the weight of the chassis. |
| Rack size                             | • A 19-in. (48.3-cm) rack as defined in Cabinets, Racks, Panels, and Associated Equipment (document number EIA-310-D) published by the Electronics Industry Association ([http://www.eia.org](http://www.eia.org)). |
| Rack requirements                     | • The outer edges of the mounting brackets extend the width of either chassis to 19-in. (48.3-cm).  
• The front of the chassis extends approximately 0.50-in. (1.27-cm) beyond the mounting ears.  
• The maximum permissible ambient temperature when two devices are placed side by side in a 19-in. rack is 104 °F or 40 °C. |
| Spacing of mounting bracket flange holes | • The holes within each rack set are spaced at 1-U [1.75-in. (4.5 cm)]. The device can be mounted in any rack that provides holes or hole patterns and spaced at 1-U (1.75-in., or 4.5-cm) increments.  
• The mounting brackets and front-mount flanges used to attach the chassis to a rack are designed to fasten to holes spaced at rack distances of 1-U (1.75 in., or 4.5-cm).  
• The mounting holes in the mounting brackets provided with the device are spaced 1.25 in. (3.2 cm) apart (top and bottom mounting holes). |
| Connection to the building structure  | • Always secure the rack in which you are installing the services gateway to the structure of the building. If your geographical area is subject to earthquakes, bolt the rack to the floor. For maximum stability, also secure the rack to ceiling brackets. |
Cabinet Requirements

You can mount the Pulse Secure Gateway (except for the MAG2600) in a cabinet that contains a 19-in rack. There are requirements for:

- Cabinet size
- Cabinet clearance
- Cabinet airflow

Table: Cabinet Requirements and Specifications

<table>
<thead>
<tr>
<th>Cabinet Requirement</th>
<th>Guidelines</th>
</tr>
</thead>
</table>
| Cabinet size        | • You can mount the Pulse Secure Gateway in a cabinet that contains a 19-in. rack as defined in Cabinets, Racks, Panels, and Associated Equipment (document number EIA-310-D) published by the Electronics Industry Association (http://www.eia.org).  
  • The rack must meet the strength requirements to support the weight of the Pulse Secure Gateway.  
  • The minimum cabinet size must be accommodate the maximum external dimensions of the Pulse Secure Gateway. |
| Cabinet clearance   | • The outer edges of the mounting brackets extend the width of the chassis to 19-in. (48.3-cm).  
  • The minimum total clearance inside the cabinet is 30-in. (76.2-cm) between the inside of the front door and the inside of the rear door. |
<table>
<thead>
<tr>
<th>Cabinet Requirement</th>
<th>Guidelines</th>
</tr>
</thead>
</table>
| Cabinet airflow     | • When you mount the Pulse Secure Gateway in a cabinet, ensure that ventilation through the cabinet is sufficient to prevent overheating.  
• Ensure adequate cool air supply to dissipate the thermal output of the Pulse Secure Gateway.  
• Ensure that the cabinet allows the chassis hot exhaust air to exit the cabinet without recirculating into the Pulse Secure Gateway. An open cabinet (without a top or doors) that employs hot air exhaust extraction from the top allows the best airflow through the chassis. If the cabinet has a top or doors, perforations in them can help remove the hot air exhaust.  
• Install the Pulse Secure Gateway in the cabinet in a way that maximizes the open space on the side of the chassis with the hot air exhaust. This maximizes the clearance for critical airflow.  
• Route and dress all cables to minimize the blockage of airflow to and from the chassis.  
• Ensure that the spacing of rails and adjacent cabinets allows for proper clearance around the Pulse Secure Gateway and cabinet.  
• A cabinet larger than the minimum required provides better airflow and reduces the chance of overheating. |

### Clearance Requirements

When planning the installation site for the Pulse Secure Gateway, you need to allow sufficient clearance around the rack or cabinet where you are planning to install the device.

When planning the installation site for the Pulse Secure Gateway, consider the following:

- For the cooling system to function properly, the airflow around the chassis must be unrestricted.
- For service personnel to remove and install hardware components, there must be adequate space at the front and back of the device. Allow at least 24 in. (61 cm) both in front of and behind the device.
- If you are mounting the device in a rack with other equipment, or if you are placing it on the desktop near other equipment, ensure that the exhaust from the other equipment does not blow into the intake vents of the chassis.

The following table provides the clearance requirements for maintaining optimum airflow.
<table>
<thead>
<tr>
<th>Location</th>
<th>Recommended Clearance</th>
<th>Requirement for Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front of the chassis</td>
<td>2.5 in. (6.35 cm)</td>
<td>Space for service personnel to remove and install hardware components.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NOTE: More space is required for installing and removing Mini-PIMs.</td>
</tr>
<tr>
<td>Rear of the chassis</td>
<td>2.5 in. (6.35 cm)</td>
<td>Space for service personnel to remove and install hardware components</td>
</tr>
<tr>
<td>Between the front-mounting flange and the</td>
<td>2.5 in. (6.35 cm)</td>
<td>Space for cable management and organization.</td>
</tr>
<tr>
<td>rack or cabinet edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between the front-mounting flange and the</td>
<td>2.5 in. (6.35 cm)</td>
<td></td>
</tr>
<tr>
<td>rack or cabinet edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between the side of the chassis and any</td>
<td>2.5 in. (6.35 cm)</td>
<td>Space for the cooling system to function properly and for maintaining unrestricted airflow around the chassis.</td>
</tr>
<tr>
<td>devices that have fans or blowers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AC Power Cord Specifications**

Each AC power supply for the MAG6610 and MAG6611 Pulse Secure Gateway has a single AC appliance inlet located on the power supply that requires a dedicated AC power feed. Most sites distribute power through a main conduit that leads to frame-mounted power distribution panels, one of which can be located at the top of the rack that houses the Pulse Secure Gateway. An AC power cord connects each power supply to the power distribution panel.

Each detachable AC power cord is 2.5 m (approximately 8 ft) long. The appliance coupler at the female end of the cord inserts into the AC appliance inlet on the faceplate of the AC power supply. The coupler type is C13, as described by the International Electrotechnical Commission (IEC) standard 60320. The plug at the male end of the power cord fits into the power source outlet that is standard for your geographical location.

NOTE: In North America, AC power cords must not exceed 4.5 m (approximately 15 ft) in length, to comply with National Electrical Code (NEC) Sections 400-8 (NFPA 75, 5.2.2) and 210-52 and Canadian Electrical Code (CEC) Section 4-010(3). The cords shipped with the Pulse Secure Gateway are in compliance.

Country-specific power cords are shipped with each device.
CAUTION: The AC power cord for the Pulse Secure Gateway is intended for use with the Pulse Secure Gateway only and not for any other use. This warning is also localized in Japanese.

Figure: Power Cable Warning (Japanese)

WARNING: The switch is pluggable type A equipment installed in a restricted-access location. It has a separate protective earthing terminal provided on the chassis in addition to the grounding pin of the power supply cord. This separate protective earthing terminal must be permanently connected to earth ground.

Installation Overview

After you have prepared your installation site, you are ready to unpack and install the Pulse Secure Gateway. It is important to proceed through the installation as follows:

1. Review the safety guidelines
2. Verify that you have prepared your site for installation using the checklist
3. Unpack the Pulse Secure Gateway and verify that all the parts are received
4. Prepare the Pulse Secure Gateway for installation
5. Install the Pulse Secure Gateway
6. Connect cables to external devices
7. Connect the grounding cables
8. Power on the Pulse Secure Gateway
9. Perform the initial configuration
Required Tools and Parts

The following table lists the tools and equipment required to install and maintain the Pulse Secure Gateway.

<table>
<thead>
<tr>
<th>Task</th>
<th>Tool</th>
</tr>
</thead>
</table>
| Installing the Pulse Secure Gateway | • Phillips (+) screwdriver, number 2  
|                                | • Tie wrap                                                            |
| Connecting the Pulse Secure Gateway | • Electrostatic discharge (ESD) grounding wrist strap               |
| Grounding the Pulse Secure Gateway | • Phillips (+) screwdriver, number 1                                |
| Packing the Pulse Secure Gateway | • Blank panel to cover module slot  
|                                | • Electrostatic bag or antistatic mat for each component  
|                                | • ESD grounding wrist strap                                          |

Installing Components

Removing and Installing Faceplates

Faceplates for the MAG6610 and MAG6611 are held in place by tabs. To remove a faceplate, gently pry the faceplate from the chassis using your fingers or a flat-blade screwdriver. To install a faceplate, line up the faceplate with the open slot and push gently until it clicks into place.

NOTE: Faceplates are required for proper airflow. If you remove a service module and do not intend to replace it, cover the opening with a faceplate.

Installing the MAG-SM160 Kit

The MAG-SM160 kit includes:

• One MAG-SM160 service module
• Two fan trays
• One hard drive

The cover plate on the left can be removed to accommodate the MAG-CM060 Chassis Management Card.

NOTE: RAID is not supported with the MAG-SM160.

The basic steps for installing the MAG-SM160 kit are:

1. Remove the face plate on the Pulse Secure Gateway corresponding to the slot where you want to install the MAG-SM160.
2. Service modules include an additional serial number. Remove this serial number and place it on the back panel of the Pulse Secure Gateway, directly behind the slot where you are installing the MAG-SM160.

Service modules are paired with fan trays and hard drives. Hard drives have a serial number sticker that matches the associated service module. Placing the service module serial number sticker on the back panel of the Pulse Secure Gateway ensures that you have the correct hard drive paired with the service module.

3. Install the MAG-SM160 in the open slot.

4. Remove the blank fan tray covers on the back panel of the Pulse Secure Gateway directly behind the MAG-SM160 and install the fan trays in the slots.

   NOTE: It is important that you install the fan trays directly behind the MAG-SM160 to ensure proper airflow across the service module.

5. Remove the blank hard drive cover on the back panel of the Pulse Secure Gateway directly behind the MAG-SM160 and install the hard drive.

   NOTE: Hard drives must be installed directly behind their corresponding service module. They are labeled with the same serial number as their paired service module to ensure they are installed in the correct slot. Do not interchange them.

   If you do not install the hard drive in the correct slot, it will not be recognized by the MAG-SM160 and you will receive a drive error when powering up the Pulse Secure Gateway.

   If the hard drive or MAG-SM160 service module fails, the entire kit must be replaced. Since the hard drive is paired to the specific hardware ID, a failure of the hard drive or the service module requires a full replacement rather than individual component troubleshooting.

   NOTE: If you later move the MAG-SM160 service module to a different slot, you must move its fan tray and hard drive to the new location as well.

Installing the MAG-SM360 Kit

The MAG-SM360 kit includes:

- One MAG-SM360 service module
- Two fan trays
- Two hard drives (RAID 1 configuration)

The cover plate on the left can be removed to accommodate the MAG-CM060 Chassis Management Card.

To perform the initial installation of the MAG-SM360 kit:

1. Remove the faceplate on the Pulse Secure Gateway corresponding to the service module slot where you want to install the MAG-SM360.

2. Remove the service module serial number sticker and install the MAG-SM360 in the open slot.
3. Place the service module serial number sticker on the back panel of the Pulse Secure Gateway chassis, directly behind the service module slot where you have installed the MAG-SM360.

Service modules are paired with fan trays and hard drives. Hard drives have a serial number label that matches the associated service module. Placing the service module serial number sticker on the back panel of the Pulse Secure Gateway chassis helps you ensure that you have the correct hard drive paired with the service module.

4. Remove the blank fan tray covers on the back panel of the Pulse Secure Gateway directly behind the MAG-SM360 and install both fan trays in the slots.

5. NOTE: It is important that you install the fan trays directly behind the MAG-SM360 to ensure proper airflow across the service module.

6. Remove the blank hard drive covers on the back panel of the Pulse Secure Gateway directly behind the MAG-SM360 and install both hard drives.

Vertical slot order does not matter for the MAG-SM360 RAID1 drives. As long as the drive signatures match the blade’s RAID 1 configuration, it accepts both drives regardless of the slots in which they are installed, assuming they are paired with the appropriate service module.

NOTE: Hard drives must be installed directly behind their corresponding service module. They are labeled with the same serial number as their paired service module to help ensure they are installed in the correct slots. Do not interchange them with other service modules.

If you do not install the hard drive in a slot associated with the appropriate service module, it is not recognized by the MAG-SM360, and you receive a drive error when powering up the Pulse Secure Gateway.

If you later move the MAG-SM360 service module to a different slot, you must move its fan tray and hard drives to the new location as well.

Installing the MAG-SM161 Kit

The MAG-SM161 kit includes:

- One MAG-SM161 service module
- Two fan trays
- One hard drive

The cover plate on the left can be removed to accommodate the MAG-CM060 Chassis Management Card. NOTE: RAID is not supported with the MAG-SM161.

The basic steps for installing the MAG-SM161 kit are:

1. Remove the face plate on the Pulse Secure Gateway corresponding to the slot where you want to install the MAG-SM161.

2. Service modules include an additional serial number. Remove this serial number and place it on the back panel of the Pulse Secure Gateway, directly behind the slot where you are installing the MAG-SM161.
Service modules are paired with fan trays and hard drives. Hard drives have a serial number sticker that matches the associated service module. Placing the service module serial number sticker on the back panel of the Pulse Secure Gateway ensures that you have the correct hard drive paired with the service module.

3. Install the MAG-SM161 in the open slot.

4. Remove the blank fan tray covers on the back panel of the Pulse Secure Gateway directly behind the MAG-SM161 and install the fan trays in the slots.

5. NOTE: It is important that you install the fan trays directly behind the MAG-SM161 to ensure proper airflow across the service module.

6. Remove the blank hard drive cover on the back panel of the Pulse Secure Gateway directly behind the MAG-SM161 and install the hard drive.

   NOTE: Hard drives must be installed directly behind their corresponding service module. They are labeled with the same serial number as their paired service module to ensure they are installed in the correct slot. Do not interchange them.

   If you do not install the hard drive in the correct slot, it will not be recognized by the MAG-SM161 and you will receive a drive error when powering up the Pulse Secure Gateway.

   If the hard drive or MAG-SM161 service module fails, the entire kit must be replaced. Since the hard drive is paired to the specific hardware ID, a failure of the hard drive or the service module requires a full replacement rather than individual component troubleshooting.

   NOTE: If you later move the MAG-SM161 service module to a different slot, you must move its fan tray and hard drive to the new location as well.

### Installing the MAG-SM361 Kit

The MAG-SM361 kit includes:

- One MAG-SM361 service module
- Two fan trays
- Two hard drives

The cover plate on the left can be removed to accommodate the MAG-CM361 Chassis Management Card.

The basic steps for installing the MAG-SM361 kit are:

1. Remove the face plate on the Pulse Secure Gateway corresponding to the slot where you want to install the MAG-SM361.

2. Service modules include an additional serial number. Remove this serial number and place it on the back panel of the Pulse Secure Gateway, directly behind the slot where you are installing the MAG-SM361.

Service modules are paired with fan trays and hard drives. Hard drives have a serial number sticker that matches the associated service module. Placing the service module serial number sticker on the back panel of the Pulse Secure Gateway ensures that you have the correct hard drive paired with the service module.
3. Install the MAG-SM361 in the open slot.

4. Remove the blank fan tray covers on the back panel of the Pulse Secure Gateway directly behind the MAG-SM361 and install the fan trays in the slots.

   NOTE: It is important that you install the fan trays directly behind the MAG-SM361 to ensure proper airflow across the service module.

5. Remove the blank hard drive covers on the back panel of the Pulse Secure Gateway directly behind the MAG-SM361 and install both hard drives.

   Hard drives for the MAG-SM361 are slot dependent. The boot drive (labeled “bottom slot drive”) must be placed in the lower slot. The second drive (labeled “top slot drive”) must be placed in the upper slot.

   NOTE: Hard drives must be installed directly behind their corresponding service module. They are labeled with the same serial number as their paired service module to ensure they are installed in the correct slot. They are also labeled with their slot location (top or bottom). Do not interchange them.

   If you do not install the hard drives in the correct slots, they will not be recognized by the MAG-SM361 and you will receive a drive error when powering up the Pulse Secure Gateway.

   If the hard drives or MAG-SM361 service module fails, the entire kit must be replaced. Since the hard drives are paired to the specific hardware ID, a failure of the hard drives or the service module requires a full replacement rather than individual component troubleshooting.

   NOTE: If you later move the MAG-SM361 service module to a different slot, you must move its fan tray and hard drives to the new location as well.

Installing an AC Power Supply in the MAG6610 and MAG6611

Before you install an AC power supply in the Pulse Secure Gateway, make sure that you understand how to prevent ESD damage.

NOTE: Each power supply must be connected to a dedicated power source outlet.

The power supply in the Pulse Secure Gateway MAG6611 is a hot-removable and hot-insertable field-replaceable unit (FRU). If you have two power supplies already installed, you can remove and replace one of the power supplies without powering off the Pulse Secure Gateway.

The AC power supply is neither a hot-removable nor a hot-insertable FRU on the MAG6610. You must power off the MAG6610 before replacing the AC power supply. The MAG6610 is shipped with the power supply pre-installed. Follow these instructions only if you need to replace the power supply on the MAG6610.

To install a power supply in the Pulse Secure Gateway:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

2. If the power supply slot has a cover panel on it, pull the handle of the cover panel outward and remove the panel. Save the cover panel for later use.
3. Taking care not to touch power supply pins, leads, or solder connections, remove the power supply from the bag.

4. Using both hands, place the power supply in the power supply slot on the rear panel of the chassis, and slide it in until it is fully seated. You will hear a distinct click when the power supply is fully seated in the chassis.

Installing a Fan Assembly in the MAG6610 and MAG6611

The fan tray is a hot-insertable and hot-removable field-replaceable unit (FRU) for the MAG6610 and MAG6611. You can remove and replace the fan tray while the Pulse Secure Gateway is running without turning off the power to the Pulse Secure Gateway. Fans are located on the back of the Pulse Secure Gateway chassis.

NOTE: On the MAG6611, service modules are paired with fan trays and hard drives. When moving a service module to a different slot, you must move the associated fan trays and hard drives to the new location as well.

Before you install a fan tray in the Pulse Secure Gateway, make sure that you understand how to prevent ESD damage.

To install a fan tray in a Pulse Secure Gateway MAG6610 or MAG6611:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

2. Remove the fan tray blank panel where you intend to install the fan tray.

3. Hold the handles of the fan tray, and align the tray with the fan tray guides on the fan tray slot.

4. Slide in the fan tray until it is fully seated in the chassis.

Installing a Hard Drive in the MAG6610 or MAG6611

The hard drive is a hot-insertable and hot-removable field-replaceable unit (FRU) on the MAG-SM360 only.

NOTE: Service modules are paired with fan trays and hard drives. When moving a service module to a different slot, you must move the associated fan trays and hard drives to the new location as well.

The MAG-SM160 uses only one hard drive. The hard drive and service module are mated together through the chassis midplane. When replacing the hard drive, insert the drive in either the upper or lower slot where the service module is located. A drive cover should be placed over the unused slot to maintain proper airflow.

To install a hard drive in a Pulse Secure Gateway:

1. Press the lever release button on the front of the hard drive carrier, and extend the lever to its fully open position.

2. Slide the hard drive carrier assembly into the slot until it stops. Do not push the drive into the slot any farther.
3. Close the lever until it locks and is flush with the front of the carrier.

This action pushes the hard drive carrier assembly into the slot and engages the connector on the hard drive with the connector on the chassis backplane.

**Installing the Integrated Access Service Modules Overview**

To install the MAG-SM160, MAG-SM360, MAG-SM161 and MAG-SM361 service modules in the Pulse Secure Gateway MAG6610 and MAG6611:

1. Remove the blank faceplate.
2. Pull the ejector lever outward until it is fully open.
3. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the grounding point on the back of the device.
4. Remove the service module from the electrostatic bag.
5. Grasp the faceplate and align the notches in the connector at the rear of the service module with the notches in the in the Pulse Secure Gateway.
6. Slide the service module in until it lodges firmly in the device.
7. Close the release lever until it locks and is flush with the front of the chassis.

**NOTE:** The MAG-SM160, MAG-SM360, MAG-SM161 and MAG-SM361 service modules are paired with hard drives. When moving a service module from one slot in the chassis to another, you must move the corresponding hard drive from the old slot to the new slot as well.

Before using the MAG-SM160 and MAG-SM360 service modules, you must configure basic network and machine information through the serial console to make the service module accessible to the network.

**Installing a MAG-CM060 Chassis Management Card**

The MAG-CM060 chassis management card (CMC) can be installed in an even-numbered slot (for example, slot 0 or slot 2) in an installed service module.

To install a MAG-CM060 in a MAG6610 or MAG6611:

1. Power off the device by pressing and holding the power switch located on the back of the Pulse Secure Gateway chassis for 5 to 10 seconds.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the grounding point on the back of the device.
3. Gently pry the blank faceplate from the chassis using your fingers or a flat-blade screwdriver.
4. Using a Phillips screwdriver, remove the two screws retaining the metal faceplate, and then remove the metal faceplate.
5. Grasp the faceplate of the MAG-CM060, and align the notches in the connector at the rear of the MAG-CM060 with the notches in the service module.

6. Slide in the MAG-CM060 until it lodges firmly in the chassis.

7. Tighten the thumbscrews until they are finger tight.

Connect the MAG-CM060 to a management console before powering up the Pulse Secure Gateway. Connect a serial cable to the port labeled CONSOLE on the MAG-CM060 front panel, and connect the other end of the serial cable to the serial port on the management device.
Rack Mounting

Installing the Pulse Secure Gateway in a Rack

The Pulse Secure Gateway is shipped in a cardboard carton that also contains an accessory box.

NOTE: The device is maximally protected inside the shipping carton. Do not unpack it until you are ready to begin installation.

Store the shipping carton box and packing material in case you need to return or move the device at a later time.

You can mount the MAG4610, MAG6610, or MAG6611 as follows:

1. On four posts in a 19-in. rack or cabinet by using the mounting brackets provided with the Pulse Secure Gateway:

   ![Diagram of Pulse Secure Gateway mounted on four posts in a rack]

   NOTE: Due to the size and weight of the Pulse Secure Gateway, Pulse Secure recommends that you four-post mount the chassis and not front mount only.

2. In a position recessed 2 in. from the front of a 19-in. rack or cabinet by using the mounting brackets provided with the Pulse Secure Gateway. You can mount the chassis in this recessed position on four-post racks and cabinets.

   The holes in the mounting brackets are placed at 1-U (1.75-in., or 4.45-cm) apart so that the Pulse Secure Gateway can be mounted in any rack or cabinet that provides holes spaced at that distance.

   NOTE: If you are installing multiple devices in one rack, install the lowest one first and then proceed upward in the rack.
Using the MAG-RK1U Mounting Kit

The MAG-RK1U mounting kit contains the hardware for rail-mounting your MAG 6610 1-U Pulse Secure Gateway.

The kit includes:

- 2 front rails
- 2 rear rails
- 10 flat-head M4 screws
- 10 medium round-head screws
- 4 flat-head 6-32 screws

The MAG-RK1U package also includes a mid-ear mounting kit.

To attach your Pulse Secure Gateway to the MAG-RK1U mounting kit:

1. Remove all contents from the packaging and separate the front rails from the rear rails.
2. Place the Pulse Secure Gateway on a flat, stable surface.
3. Line up the gray ears on the front rails with the front of the Pulse Secure Gateway. The two screw holes on the front side of the Pulse Secure Gateway should line up with the front rail.
4. Secure the front rail to the front of the Pulse Secure Gateway using two of the flat-head 6-32 screws.
5. Attach the rear of the front rail using one of the flat-head M4 screws. You must use an M4 screw to allow the rear rail to slide smoothly onto the front rail.

6. Using the medium-sized screws, secure the remainder of the front rail to the Pulse Secure Gateway.

NOTE: Use the screws on the recessed portion of the front rail. Do not use the holes that protrude as those are for securing the rear rail.
7. Slide the rear rail onto the front rail. The ear of the rear rail should be facing the rear of the Pulse Secure Gateway chassis and pointing outward.

8. Measure your rack or cabinet to determine the distance between the ear on the front rail and the ear on the back rail and adjust your rear rail accordingly.

9. Secure the rear rail to the front rail using the flat-head M4 screws.

Using the MAG-RK2U Mounting Kit

The MAG-RK2U mounting kit contains the hardware for rail-mounting your MAG6611 2-U Pulse Secure Gateway.

The kit includes:

- 2 front rails
- 2 rear rails
- 18 round-head M4 screws
- 4 flat-head 6-32 screws
The MAG-RK2U package also includes a mid-ear mounting kit.

To attach your Pulse Secure Gateway to the MAG-RK2U mounting kit:

1. Remove all contents from the packaging and separate the front rails from the rear rails.
2. Place the Pulse Secure Gateway on a flat, stable surface.
3. Line up the gray ears on the front rails with the front of the Pulse Secure Gateway. The two screw holes on the front side of the Pulse Secure Gateway should line up with the front rail.

4. Secure the front rail to the front of the Pulse Secure Gateway using two of the flat-head 6-32 screws.
5. Attach the rear of the front rail using four flat-head M4 screws.

Use the screws on the recessed portion of the front rail. Do not use the holes that protrude as those are for securing the rear rail.

NOTE: The second recessed slot appears to require two screws, but actually requires only one.
6. Slide the rear rail onto the front rail. The ear of the rear rail should be facing the rear of the Pulse Secure Gateway chassis and pointing outward.

7. Measure your rack or cabinet to determine the distance between the ear on the front rail and the ear on the back rail and adjust your rear rail accordingly.

8. Secure the rear rail to the front rail using the flat-head M4 screws.

Using the MAG4610 Rack-Mounting Kit

A mounting kit is included with the MAG4610 Pulse Secure Gateway and has the following pieces:

- 2 front brackets
- 2 rear brackets
- 2 rails
- 8 silver medium length phillips drive screws and washers
- 8 black medium length phillips drive screws and washers
- 12 round-head silver phillips drive screws
- 2 small silver flat-head phillips drive screws
- 10 small silver flat-head phillips drive screws
To attach the mounting kit to your MAG4610:

1. Remove and separate the rails and brackets from the packaging.
2. Place the MAG4610 Pulse Secure Gateway on a flat, stable surface.
3. Line up the gray ear on the front bracket with the front of the Pulse Secure Gateway. The screw holes on the front side of the Pulse Secure Gateway should line up with the front bracket.

4. Use a flat-head screw from the 2-pc bag in the single hole at the front to attach the bracket to the MAG4610. Use flat-head screws from the 10-pc bag in the remaining two holes.

5. Position the rear bracket to the inside of the rail ear and fasten using the flat-head screws from the 10-pc bag. Screw from the outside of the rail ear inward.

6. Attach the rail to your Pulse Secure Gateway using the silver round-head screws. Do not tighten the screws yet.

7. Measure your rack or cabinet to determine the distance between the ear on the front bracket and the ear on the back bracket and adjust your rear bracket accordingly.

8. Tighten the screws on the rail to secure it in place.
Using the MAG-RK1U2 Mounting Kit

The MAG-RK1U2 mounting kit contains the hardware for rack-mounting two MAG4610 1U Pulse Secure Gateways side by side in a rack or cabinet:

The MAG-RK1U2 mounting kit includes:

- One mounting tray
- Ten flat-head 8-32 screws

To attach your MAG4610 devices to the MAG-RK1U2 mounting kit:

1. Remove all contents from the packaging.
2. Place two MAG4610 devices upside down and side by side on a flat stable surface.
3. Turn the mounting tray upside down and place it over the two MAG4610 devices. Align the mounting ears with the front side of the devices.
4. Secure the MAG4610 devices to the bottom mounting tray using four 8-32 flat-head screws.
5. Secure the MAG4610 devices to the sides of the mounting tray using three 8-32 flat-head screws:

![Mounting screws](image)

NOTE: The MAG-RK1U2 is a front-only mount. It does not require rear rails. You must, however, use three screws on each mounting ear to ensure the mounting tray does not sag. The MAG4610 rail kit includes M5 and 10-32 Phillips round head screws that can be used if you do not have any mounting screws.

6. Secure the tray to the rack:

![Rack mount screws](image)
Using the Mid-Ear Mounts

The MAG-RK1U and MAG-RK2U mounting kits also contain mid-ear mounts. The mid-ear mount package includes:

- 4 mid-ear mounts
- 8 silver medium length screws
- 8 black medium length screws
- 12 sort round-head M4 screws

Use the round-head M4 screws to attach the mid-mount ears to the Pulse Secure Gateway. Use the medium length screws (either black or silver) to rack-mount your device.

Mid-Mounting a 1-U MAG6610 Pulse Secure Gateway:

Mid-Mounting a 2-U MAG6611 Pulse Secure Gateway:
Mounting on Four Posts in a Rack or Cabinet

You can mount a Pulse Secure Gateway on four posts of a 19-in. rack or cabinet by using the supplied rack-mount kit. (The remainder of this topic uses “rack” to mean “rack or cabinet.”)

NOTE: If you are mounting the Pulse Secure Gateway on four posts, ensure that the rack is 21.5-in. through 31.5-in. deep if you will mount the Pulse Secure Gateway flush with the rack front and that the rack is 23.5-in. through 32.5-in. deep if you will mount the Pulse Secure Gateway recessed 2-in. from the rack front, thus ensuring that the protective earthing terminal is accessible through the opening in the rear bracket.

Before mounting the Pulse Secure Gateway on four posts in a rack:

• Verify that the site meets the requirements.
• Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
• Read the Security Products Safety Guide located on the Pulse Secure website.
• Attach the mounting hardware to your Pulse Secure Gateway.

To mount the Pulse Secure Gateway on four posts in a rack:

1. Have one person grasp both sides of the Pulse Secure Gateway, lift the chassis, and position it in the rack, aligning the front bracket holes with the threaded holes in the front post of the rack. Align the bottom hole in both the mounting brackets with a hole in each rack rail, making sure that the chassis is level.

2. Have a second person secure the front of the chassis to the rack by using the appropriate screws for your rack.
3. If you have not already set the rear bracket length, slide the rear brackets in place and attach the rear brackets to the rear post by using the appropriate screws for your rack. Tighten the screws.

4. Ensure that the chassis is level by verifying that all the screws on the front of the rack are aligned with the screws at the back of the rack.

**Mounting in a Recessed Position in a Rack or Cabinet**

You can mount a Pulse Secure Gateway in a rack or cabinet such that the chassis is recessed inside the rack from the rack front by 2 in. Use the front brackets in the provided rack-mount kit to mount the chassis in a recessed position.

To mount the Pulse Secure Gateway in a recessed position on four posts, follow the same instructions as for mounting on four posts.

**NOTE:** You cannot mount the Pulse Secure Gateway in a recessed position in a two-post rack or cabinet.

**Installing the MAG2600 on a Desk**

Follow these guidelines when installing the MAG2600 on a desk:

- You can install the MAG2600 on a desk, table, or other level surface.
- The device is shipped with the rubber feet attached. The rubber feet stabilize the device on the desk.
- You can install the device in a horizontal position only.
Installing the MAG2600 in the MAG-RK1U4 Tray

You can front-mount the MAG2600 in a MAG-RK1U4 tray. Mid-mounting or rear-mounting is not required. Many types of racks are acceptable, including four-post (telco) racks, enclosed cabinets, and open-frame racks.

NOTE: The rack-mounting kit is not shipped with the device and must be ordered separately.

Up to four MAG2600 devices can be installed side-by-side using the rack-mounting kit:

To install a MAG2600 in the MAG-RK1U4 mounting tray:

1. Loosen the two thumbscrews and remove the front panel from the MAG-RK1U4 mounting tray.
2. Loosen the thumbscrew and remove the power supply holder located directly behind the slot where you want to place the MAG2600.

3. Place the power supply holder over the MAG2600 power supply and drape the power cord through the notch. You must properly orient the MAG2600 power supply so that it fits snugly in the holder. The power supply should be turned upside down so that the label is visible.

4. Place the MAG2600 power supply and power supply holder onto the MAG-RK1U4 mounting tray and tighten the thumbscrew using a number-1 Phillips screwdriver.

5. The MAG2600 power supply should slide under the lip located on the back of the MAG-RK1U4 mounting tray.

6. Route the cord through the opening located in the middle of the tray.
7. Remove the two rubber strips on the bottom of the MAG2600 and slide the MAG2600 back first into the MAG-RK1U4 mounting tray. The MAG2600 should be located directly in front of its power supply.

8. Plug the DC connector end of the cable into the power connector on the side of the MAG2600.

9. Use the cable tie holder to secure the cord on to the mounting tray.

10. Repeat Steps 2 through 8 for each MAG2600 you want to mount in this tray.

11. Replace the front panel and tighten the thumbscrews using a number-1 Phillips screwdriver.

12. Gently squeeze the powerclip holder and insert the tips into the holes located on the back of the mounting tray.

13. Gently lift the powerclip holder and plug the AC adapter into the power connector located on the back of the MAG2600 power supply.
To install the MAG-RK1U4 mounting tray in a rack:

1. Have one person grasp the sides of the device, lift it, and position it in the rack.

2. Align the bottom hole in each mounting bracket with a hole in each rack rail, making sure the mounting rack is level.

3. Have a second person install a mounting screw into each of the two aligned holes. Use a number-3 Phillips screwdriver to tighten the screws.

4. Install the second screw in each mounting bracket.

5. Verify that the mounting screws on one side of the rack are aligned with the mounting screws on the opposite side and that the device is level.
Connecting and Configuring

Tools and Parts Required for Grounding and Power

To ground and provide power to the Pulse Secure Gateway, you need the following tools and parts:

• Phillips (+) screwdrivers, numbers 1 and 2
• 2.5-mm flat-blade (-) screwdriver
• 7/16-in. hexagonal-head external drive socket wrench, or nut driver, with a torque range between 23 lb-in. (2.6 Nm) and 25 lb-in. (2.8 Nm) tightening torque, for tightening nuts to terminal studs on each power supply on a DC-powered Pulse Secure Gateway.
• Wire cutters
• Electrostatic discharge (ESD) grounding wrist strap

Grounding the Pulse Secure Gateway

NOTE: This step is not required for the MAG2600. Grounding is provided with the three-prong power cord.

You ground the device by connecting a grounding cable to earth ground and then attaching it to the chassis grounding points, using UNC 1/4-20 two screws. You must provide the grounding cables (the cable lugs are supplied with the device).

1. Verify that a licensed electrician has attached the cable lug provided with the device to the grounding cable.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to an approved site ESD grounding point. See the instructions for your site.
3. Ensure that all grounding surfaces are clean and brought to a bright finish before making grounding connections.
4. Connect the grounding cable to a proper earth ground.
5. Detach the ESD grounding strap from the site ESD grounding point.
6. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis.
7. Place the grounding cable lug over the grounding points on the upper rear of the chassis. The bolts are sized for UNC 1/4-20 bolts.
8. Secure the grounding cable lug to the grounding points, first with the washers, and then with the screws.

9. Dress the grounding cable, and verify that it does not touch or block access to device components, and that it does not drape where people could trip on it.

Connecting Power to an AC-Powered Pulse Secure Gateway

You connect AC power to the device by attaching power cords from the AC power sources to the AC appliance inlets located on the power supplies of the Pulse Secure Gateway.

The power cords are provided with the Pulse Secure Gateway.

To connect the AC power cords to the device for each power supply:

1. Locate or obtain the power cords you will use with the Pulse Secure Gateway. The power cords must have a plug appropriate for your geographical location.

2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis.

3. Insert the appliance coupler end of the power cord into the inlet on the power supply on the back panel of the Pulse Secure Gateway chassis.

4. Insert the power cord plug into an external AC power source receptacle.

   NOTE: Each power supply must be connected to a dedicated AC power feed and a dedicated external circuit breaker. We recommend that you use a 15 A (250 VAC) minimum, or as permitted by local code.

5. Dress the power cord appropriately. Verify that the power cord does not block the air exhaust or access to device components, and that it does not drape where people could trip on it.

6. Repeat Step 1 through Step 6 for the remaining power supplies.
Connecting to a Management Console

The Pulse Secure Gateway devices have a console port with an RJ-45 connector. Use the console port to connect the device to a management console or to a console server.

Connect each service module to a management console before powering up the Pulse Secure Gateway.

To connect a Pulse Secure Gateway to a management console:

1. Connect one end of the cable to the console port labeled CONSOLE on the Pulse Secure Gateway.
2. Connect the other end of the cable into the console server or management console:

When you connect a management console before powering up the Pulse Secure Gateway, you should see a message similar to this:

Please select a factory-reset personality:

[1] Pulse Secure Access Service 7.1 R1
[2] Pulse Access Control Service 4.1 R1

Choice:

If you do not see this message, make sure the management console is connected, and then cycle the power on the Pulse Secure Gateway.
Connecting to the Network

The MAG Series Pulse Secure Gateway has the port assignments described in the following table.

<table>
<thead>
<tr>
<th>Model</th>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAG2600</td>
<td>0</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>External</td>
</tr>
<tr>
<td>MAG4610</td>
<td>0</td>
<td>Reserved for management network</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>External</td>
</tr>
<tr>
<td>MAG-SM160</td>
<td>0</td>
<td>Reserved for management network</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>External</td>
</tr>
<tr>
<td>MAG-SM360</td>
<td>0</td>
<td>Reserved for management network</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>External</td>
</tr>
<tr>
<td>MAG-SM360-PROFILER</td>
<td>0</td>
<td>Beacon Endpoint Profiler management and traffic profiling</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>High availability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not used</td>
</tr>
</tbody>
</table>

If you are using Enterprise Guest Access, connect Port 1 (external port) to the guest network.

Connecting the MAG-CM060 CMC to a Network

The MAG-CM060 has two Ethernet ports:

- 0 (em0)
- 1 (em1) - reserved

Connect port 0 to your management network.

NOTE: Configure only port 0; do not connect anything to port 1 or configure port 1. Port 1 is currently reserved.

SSO requires a common subnet on the ethernet port 0 (em0) of the MAG-CM060 and certain service module ethernet ports. For Secure Access Service and Access Control Service, if the management port is enabled then the management port should be in the same subnet as that for em0. Otherwise the internal port of Secure Access Service or Access Control Service should be in the same subnet as that for em0. When this condition is met, the service module will automatically detect the em0's IP address and inter-chassis communication, including SSO, is possible.
Powering On an AC-Powered Pulse Secure Gateway

To power on an AC-powered Pulse Secure Gateway:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis.

2. Verify that the power supplies are fully inserted in the chassis.

3. Verify that each AC power cord is securely inserted into the appliance inlet.

4. Verify that an external management device is connected to the Pulse Secure Gateway CONSOLE port.

5. Turn on the power to the external management device.

6. Switch on the dedicated customer site circuit breakers for the power supplies. Follow the ESD and safety instructions for your site.

7. Turn on the AC power supply, and observe the status LEDs (where applicable) on each power supply faceplate. If an AC power supply is correctly installed and functioning normally, the AC OK and DC OK LEDs light steadily, and the PS FAIL LED is not lit.

To turn on the Pulse Secure Gateway:

• On the MAG2600, press the power button on the front panel.

• On the MAG4610, MAG6610, or MAG6611, press and hold the power button on the chassis back panel for 3 to 5 seconds.

8. If any of the status LEDs indicates that the Pulse Secure Gateway is not functioning normally, repeat the installation and cabling procedures.

   NOTE: After powering off a power supply, wait at least 60 seconds before turning it back on. After powering on a power supply, wait at least 60 seconds before turning it off.

   If the system is completely powered off when you power on the power supply, the Pulse Secure Gateway boots as the power supply completes its startup sequence.

   After a power supply is powered on, it can take up to 60 seconds for status indicators—such as the status LEDs on the power supply and the show chassis command display—to indicate that the power supply is functioning normally. Ignore error indicators that appear during the first 60 seconds.

9. On the external management device connected to the Pulse Secure Gateway, monitor the startup process to verify that the system has booted properly.
Powering Off

NOTE: After powering off a power supply, wait at least 60 seconds before turning it back on.

To power off the MAG2600, press the power button located on the front panel.

You can power off the MAG4610, MAG6610 and MAG6611 in one of the following ways:

- **Graceful shutdown**—Press the Power button and hold it 3 to 5 seconds. The device begins gracefully shutting down the operating system and then powers itself off.

- **Immediate shutdown**—Press the Power button and hold it 15 to 20 seconds. The device immediately powers itself off without shutting down the operating system.

The power button is located on the back panel of the chassis for the MAG4610, MAG6610 and MAG6611. Pressing the power button on the MAG-CM060 powers off only the MAG-CM060.

- **Graceful shutdown**—Momentarily press the Power button. The MAG-CM060 begins gracefully shutting down the operating system and then powers itself off.

- **Immediate shutdown**—Press the Power button on the MAG-CM060 and hold it 5 seconds. The MAG-CM060 immediately powers itself off.

Using the Reset Button on the Service Modules

If an installed service module becomes unresponsive, you can use the Reset button to reboot that specific module. Service modules operate independently, so that pressing the Reset button on one module does not interfere with any other installed service module.

NOTE: The Reset button is recessed to prevent it from being pressed accidentally.

To press the Reset button, insert a small probe (such as a straightened paper clip) into the pinhole on the front panel.
Configuring the MAG2600, MAG-SM160, and MAG-SM360 Service Modules

When you boot an unconfigured service module, you need to enter basic network and machine information through the serial console to make the service module accessible to the network. After entering these settings, you can continue configuring the service module through the administrator Web console.

During this basic setup process, you define the “personality” of the service module. For example, you can set up the service module to act as an SSL VPN device (like the SA Series SSL VPN Appliances) or as a network security policy management device (like the IC Series Unified Access Control Appliances). You can switch personalities at any time by reconfiguring the service module.

NOTE: The MAG-SM360-PROFILER service module has similar hardware but is different from a MAG-SM360 service module. It is not an integrated service module. The MAG-SM360-PROFILER can be installed into a MAG6610 or MAG6611 chassis. It has Great Bay Software Beacon Endpoint Profiler software preinstalled. You cannot boot a different software image to change the personality of the MAG-SM360-PROFILER service module. See Configuring the MAG-SM360-PROFILER Service Module for information on the basic setup for the MAG-SM360-PROFILER.

NOTE: The installation process may take up to 20 minutes. To perform basic setup:

1. Configure a console terminal or terminal emulation utility running on a computer, such as HyperTerminal, to use these serial connection parameters:
   - 9600 bits per second
   - 8-bit no parity (8N1)
   - 1 stop bit
   - No flow control

2. Connect the terminal or laptop to the serial cable plugged in to the service module’s console port, and press Enter until you are prompted by the initialization script.

3. Enter the number corresponding to the personality for which you want to configure the service module.

For example, if your screen looks like this:

   Please select a factory-reset personality:
   [1] Pulse Secure Access Service 7.1 R1
   [2] Pulse Access Control Service 4.1 R1

   Press 1 to install the Pulse Secure Access Service package. Press 2 to install the Pulse Access Control Service package.

4. Enter y to proceed, and then enter y to accept the license terms (or enter r to read the license first).
5. Follow the directions in the serial console, and enter the machine information for which you are prompted, including the following:

- IP address of the internal port (you configure the external port through the administrator Web console after initial configuration)
- Network mask
- Default gateway address
- Primary DNS server address
- Secondary DNS server address (optional)
- Default DNS domain name (for example, acmegizmo.com)
- WINS server name or address (optional)
- Administrator username
- Administrator password
- Common machine name (for example, connect.acmegizmo.com)
- Organization name (for example, Acme Gizmo, Inc.)

After you perform the basic setup, you are ready to license the software, verify accessibility, and complete the configuration process through the service module's administrator Web console.

Changing the Service Module Personality

You can change your MAG2600, MAG4610, MAG-5M160 or MAG-5M360 personality at any time.

NOTE: Changing a service module’s personality deletes all configuration files and system and user data. You must perform the basic setup again to reestablish network connectivity. The installation process may take up to 20 minutes.

To change the service module personality from the serial console:

1. Start a serial console session.
2. Select option 4, System Operations.
3. Select option 5, Factory reset.
4. Enter the number corresponding to the personality for which you want to configure the service module.

For example, if your screen looks like this:

Please select a factory-reset personality:

[1] Pulse Secure Access Service 7.1 R1
[2] Pulse Access Control Service 4.1 R1

Press 1 to install the Pulse Secure Access Service package. Press 2 to install the Pulse Access Control Service package.

5. Follow the prompts to complete your configuration.

To change the personality from the service module administrator Web console:

1. In the admin console, choose Maintenance > System > Change Personality.
2. Click **Browse** to select the service package to install.
3. Click **Change Now**.

**NOTE:** The MAG-SM360-PROFILER service module has similar hardware but is different from a MAG-SM360 service module. It is not an integrated service module. The MAG-SM360-PROFILER can be installed into a MAG6610 or MAG6611 chassis. It has Great Bay Software Beacon Endpoint Profiler software preinstalled. You cannot boot a different software image to change the personality of the MAG-SM360-PROFILER service module.
Replacing and Monitoring Components

Removing the MAG6610 and MAG6611 AC Power Supplies

The AC power supply is a hot-removable and hot-insertable field-replaceable unit (FRU) on the MAG6611. If you have two power supplies already installed, you can remove and replace one of the power supplies without powering off the Pulse Secure Gateway.

MAG6611 With a Single AC Power Supply:

The AC power supply is neither a hot-removable nor a hot-insertable FRU on the MAG6610. You must power off the MAG6610 before replacing the AC power supply.

Before you remove an AC power supply in the Pulse Secure Gateway, make sure that you understand how to prevent ESD damage.

Make sure that you have the following parts and tools available for removing the power supply from the Pulse Secure Gateway chassis:

- An antistatic bag or an antistatic mat
- Replacement power supply or a cover panel for the power supply slot

CAUTION: Do not leave the power supply slot empty for a long time while the Pulse Secure Gateway is operational. Either replace the power supply promptly or install a cover panel over the empty slot.

To remove a power supply from the Pulse Secure Gateway:

1. Place the antistatic bag or the antistatic mat on a flat, stable surface.

2. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
3. (MAG6610) Power off the Pulse Secure Gateway and disconnect power by performing one of the following tasks:

   - If the AC power source outlet has a power switch, set it to the OFF (0) position.
   - If the AC power source outlet does not have a power switch, gently pull out the male end of the power cord connected to the power source outlet.

4. Turn the adjustment nut of the power cord retainer counterclockwise until you can see the power cord. Pull the power cord from the slot in the adjustment nut.

5. Remove the female end of the power cord from the AC appliance inlet on the power supply faceplate.

6. Push the power cord retainer clip to one side of the appliance inlet. Squeeze the two sides of the power cord retainer clip, and pull the L-shaped ends of the clip from the holes on each side of the AC appliance inlet to completely remove the power retainer clip.

7. Push the ejector lever until the power supply is unseated.

8. Grasp the power supply handle and pull firmly to slide the power supply halfway out of the chassis:

9. Taking care not to touch the power supply pins, leads, or solder connections, place one hand under the power supply to support it. Grasp the power supply handle with your other hand, and pull the power supply completely out of the chassis.

10. Place the power supply in the antistatic bag or on the antistatic mat on a flat, stable surface.

11. If you are not replacing the power supply, install the cover panel over the slot.
Removing the Fan Tray on the MAG6610 and MAG6611

The fan tray is a hot-removable and hot-insertable field-replaceable unit (FRU). You can remove and replace the fan tray while the Pulse Secure Gateway is running without turning off power to the Pulse Secure Gateway.

CAUTION: Do not remove the fan tray unless you have a replacement fan tray available.

Make sure that you have the following parts and tools available for removing a fan tray from the Pulse Secure Gateway chassis:

- Electrostatic discharge (ESD) grounding strap
- Replacement fan tray
- Antistatic bag or antistatic mat

CAUTION: The fan tray can be removed and replaced while the Pulse Secure Gateway is operating. However, the fan tray must be replaced within 30 seconds of removing the fan tray to prevent overheating of the chassis.

To remove a fan tray from the Pulse Secure Gateway MAG6610 and MAG6611 chassis:

1. Place the antistatic bag or the antistatic mat on a flat, stable surface.
2. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
3. Squeeze both handles of the fan tray to release the latches that lock the fan tray in the chassis.
   
   WARNING: To avoid injury, do not touch the fans with your hands or any tools as you slide the fan tray out of the chassis—the fans might still be spinning.
4. Grasp the handles on the fan tray and pull firmly to slide the fan tray halfway out of the chassis. When the fan stops spinning, slide the fan tray completely out of the chassis.
5. Place the fan tray in the antistatic bag or on the antistatic mat on a flat, stable surface.
Removing the Hard Drive

The hard drive is a hot-removable and hot-insertable field-replaceable unit (FRU) on the MAG-SM360 only.

The MAG-SM160 uses only one hard drive. When replacing the hard drive, insert the drive in the upper slot where the service module is located. The hard drive and service module are mated through the chassis midplane.

The MAG-SM360 uses two drives in RAID 1 formation. The order of the drives must be preserved if you remove and replace the hard drives. For example, the upper drive and the lower drive should not be switched if you replace a drive.

The MAG-SM361 drives are slot-dependent and are labeled either “top slot drive” and “bottom slot drive.” Ensure that you insert drives in their correct slot location.

To remove a hard drive from the Pulse Secure Gateway chassis:

1. Unlock the handle on the front of the hard drive assembly by pushing the handle release button. This action causes the handle to unlock and spring open.
2. To remove the hard drive, pull the drive out of the chassis using the handle. Do not remove the hard drive from the hard drive assembly.
3. Place the hard drive in the antistatic bag or on the antistatic mat on a flat, stable surface.

Removing an Integrated Access Service Module

Before you begin removing a service module from the Pulse Secure Gateway, make sure that you have taken the necessary precautions to prevent ESD damage.

NOTE: If you do not intend to replace the service module, install a faceplate over the open slot. Faceplates are required to ensure proper cooling and airflow in the Pulse Secure Gateway.

The MAG-SM160, MAG-SM360, MAG-SM161 and MAG-SM361 service modules are paired with fan trays and hard drives. When moving a service module to a different slot, you must move the associated fan trays and hard drives to the new location as well.

Before removing the service module, you must power down the service module.

- If a MAG-CM060 CMC is installed in the chassis, use the set chassis fpc number power off command. For more information, see set chassis fpc power on off.
- If a MAG-CM060 CMC is not installed in the chassis, you must turn off the entire Pulse Secure Gateway. To do this, press and hold the power button on the chassis back panel for 3 to 5 seconds.
To remove the MAG-SM160, MAG-SM360, MAG-SM161 and MAG-SM361 service module:

1. Pull the ejector lever, located under the service module, outward until it is fully open.
2. Gently pull on the service module front panel to slide it halfway out of the chassis.
3. Using both hands, hold the front edge of the service module, and slide it completely out of the chassis.
4. Place the service module in an antistatic bag or on an antistatic mat on a flat, stable surface.

NOTE: Faceplates are required for proper cooling and airflow. If you do not intend to replace the service module, cover the opening with a blank faceplate.

Maintaining Hardware Components

This table describes the common tasks for maintaining the hardware components of the Pulse Secure Gateway.

<table>
<thead>
<tr>
<th>Maintenance Procedure</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine maintenance procedures</td>
<td>To maintain optimum performance of the Pulse Secure Gateway, you should regularly perform the following preventive maintenance procedures:</td>
</tr>
<tr>
<td></td>
<td>• Inspect the installation site for moisture, loose wires or cables, and excessive dust.</td>
</tr>
<tr>
<td></td>
<td>• Make sure that the airflow is unobstructed around the device and into the air intake vents.</td>
</tr>
<tr>
<td></td>
<td>• Check the Status LED on the front panel of the MAG2600 or the service module on all other Pulse Secure Gateway models.</td>
</tr>
<tr>
<td>Maintaining the cooling system</td>
<td>The Pulse Secure Gateway cooling system works to maintain an optimal temperature for the device. If the fan controller fails, the device temperature will exceed the maximum working temperature, and the device will fail. Make sure that you maintain the recommended clearances behind the device to enable the cooling system to function optimally.</td>
</tr>
<tr>
<td>Maintaining the power supply</td>
<td>To maintain the power supply on the Pulse Secure Gateway:</td>
</tr>
<tr>
<td></td>
<td>• Make sure that the power and grounding cables are arranged so that they do not obstruct access to other device components.</td>
</tr>
<tr>
<td></td>
<td>• Periodically inspect the site to ensure that the grounding and power cables connected to the device are securely in place and that there is no moisture accumulating near the device.</td>
</tr>
</tbody>
</table>

CAUTION: We recommend using a surge protector for the power connection.
## Monitoring Components Using LEDs

This table describes the LED functions on the Pulse Secure Gateway components.

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Meaning</th>
<th>Possible Cause and Corrective Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Blinking yellow</td>
<td>The hard drive is being accessed.</td>
<td>Normal condition. No action is required</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The device is starting up.</td>
<td>Normal condition. No action is required.</td>
</tr>
<tr>
<td>Alarm</td>
<td>Red</td>
<td>The device detects a major alarm, such as overheating.</td>
<td>A major alarm indicates a critical situation on the gateway that requires immediate action. Contact Pulse Secure Technical Support.</td>
</tr>
<tr>
<td></td>
<td>Blinking red</td>
<td>The fan has stopped, or the fan tray has been removed.</td>
<td>Ensure that the fan tray is properly inserted into the back of the chassis. If the fan tray is properly inserted and is still not functioning, replace the fan tray. If you do not have a spare fan tray or if you need more assistance, contact Pulse Secure Technical Support.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The device is starting up.</td>
<td>Normal condition. No action is required.</td>
</tr>
<tr>
<td>Power</td>
<td>Green</td>
<td>The device is receiving power and is functioning normally.</td>
<td>Normal condition. No action is required.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The device is not receiving power</td>
<td>Normal condition if the Pulse Secure Gateway is switched off. No action is required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If you have not powered off the Pulse Secure Gateway, verify that the AC power cord from the power source to the device is not damaged, the socket is in working condition, and the device has an AC input voltage between 110 and 240 VAC.</td>
</tr>
</tbody>
</table>
On the MAG6610 and MAG6611, the hard drive and RAID status LEDs are located on the back panel. Hard drive LEDs on the MAG6610 and MAG6611:

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Meaning</th>
<th>Possible Causes or Corrective Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Green</td>
<td>Activity</td>
<td>No action is required.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No activity</td>
<td>No action is required.</td>
</tr>
<tr>
<td>RAID Status</td>
<td>Solid red</td>
<td>RAID drive has failed</td>
<td>Replace the RAID hard drive. Contact Pulse Secure Technical Support.</td>
</tr>
<tr>
<td></td>
<td>Blinking red</td>
<td>RAID activity</td>
<td>No action is required.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>RAID drive is functioning properly</td>
<td>No action is required.</td>
</tr>
</tbody>
</table>

An AC power supply has one bicolor LED on its faceplate. This LED displays information about the status of the power supply.

AC Power Supply LEDs in the MAG6611:

<table>
<thead>
<tr>
<th>LED State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlit</td>
<td>Indicates one of the following:</td>
</tr>
<tr>
<td></td>
<td>• The power supply is disconnected from the AC power feed.</td>
</tr>
<tr>
<td></td>
<td>• The AC power input voltage is not within the normal operating range</td>
</tr>
<tr>
<td></td>
<td>• There is no AC power input.</td>
</tr>
<tr>
<td>Green</td>
<td>On steadily—The power supply is functioning normally.</td>
</tr>
<tr>
<td>Amber</td>
<td>On steadily—The power supply is receiving power but is not supplying power to the chassis.</td>
</tr>
</tbody>
</table>

Audible Alerts

In addition to LEDs, the MAG6610 and MAG6611 have audible cues to alert you to possible errors. Failure of either the fan tray or power supply will result in audible beeps.

Pulse Secure Technical Assistance Center

If you need assistance while troubleshooting a Pulse Secure Gateway, see https://www.pulsesecure.net/support/.
Return Procedure for the Pulse Secure Gateway

If a problem cannot be resolved by the GLOBAL CUSTOMER SUPPORT technician, a Return Materials Authorization (RMA) is issued. This number is used to track the returned material at the factory and to return repaired or new components to the customer as needed.

NOTE: Do not return any component to Pulse Secure, Inc. unless you have first obtained an RMA number. Pulse Secure, Inc. reserves the right to refuse shipments that do not have an RMA. Refused shipments will be returned to the customer via collect freight.

To return a Pulse Secure Gateway or component to Pulse Secure for repair or replacement:

1. Determine the part number and serial number of the Pulse Secure Gateway or component.

2. Obtain a Return Materials Authorization (RMA) number from GLOBAL CUSTOMER SUPPORT.
   
   NOTE: Do not return the Pulse Secure Gateway or any component to Pulse Secure unless you have first obtained an RMA number. Pulse Secure reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the customer via collect freight.

3. Pack the Pulse Secure Gateway or component for shipping.
   
   NOTE: Service modules are paired with fan trays and hard drives. When you return a service module via RMA, you will receive a new service module, fan trays and hard drives. When you return the service module, you must also return the associated fan trays and hard drives.

If both MAG-SM360 drives fail and you cannot access the operating system or the MAG-SM360 service module fails, the entire kit must be replaced. If, however, only 1 drive fails (and the operating system is not impacted), then use the RMA process to replace the defective drive. Mirroring starts when the replacement drive is inserted.

For more information about return and repair policies, see the Global Customer Support webpage at https://www.pulsesecure.net/support/.
Locating Component Serial Numbers

<table>
<thead>
<tr>
<th>Model</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAG2600</td>
<td>Bottom of the chassis.</td>
</tr>
<tr>
<td>MAG4610</td>
<td>Back of the chassis.</td>
</tr>
<tr>
<td>MAG6610</td>
<td>Back of the chassis.</td>
</tr>
<tr>
<td>MAG6611</td>
<td>Back of the chassis.</td>
</tr>
<tr>
<td>Service modules</td>
<td>Top of the metal case:</td>
</tr>
<tr>
<td></td>
<td>• The MAG-SM160, MAG-SM360, MAG-SM161 and MAG-361 service modules include an additional serial number sticker that you can place on the back of the Pulse Secure Gateway chassis.</td>
</tr>
<tr>
<td></td>
<td>• The MAG-SM160, MAG-SM360, MAG-SM161 and MAG-361 service modules are paired with fan trays and hard drives. Hard drives have a serial number sticker that matches the associated service module.</td>
</tr>
</tbody>
</table>

Obtaining Return Materials Authorization

When requesting support from GLOBAL CUSTOMER SUPPORT by telephone, be prepared to provide the following information:

- Your existing case number, if you have one
- Details of the failure or problem
- Type of activity being performed on the Services Gateway when the problem occurred
- Configuration data displayed by one or more show commands
- Your name, organization name, telephone number, fax number, and shipping address

Contacting Global Customer Support

After you have located the serial numbers of the device or component, you can return the device or component for repair or replacement. For this, you need to contact Pulse Secure Technical Assistance Center.

You can contact GLOBAL CUSTOMER SUPPORT 24 hours a day, 7 days a week, on the web at https://www.pulsesecure.net/support/
Packing for Shipment

Tools and Parts

To remove components from the Pulse Secure Gateway or to remove the Pulse Secure Gateway from a rack, you need the following tools and parts:

- Flat-blade (−) screwdriver
- 7/16-in. (11-mm) nut driver
- Blank panels to cover empty slots
- Electrostatic bag or antistatic mat, for each component
- Electrostatic discharge (ESD) grounding wrist strap
- Mechanical lift, if available
- Phillips (+) screwdrivers, numbers 1 and 2
- Rubber safety cap for fiber-optic interfaces or cable
- Wire cutters

Packing the Pulse Secure Gateway

To pack the Pulse Secure Gateway for shipment:

1. Retrieve the shipping crate and packing materials in which the Pulse Secure Gateway was originally shipped. If you do not have these materials, contact your Pulse Secure representative about approved packaging materials.
2. Shut down the Pulse Secure Gateway software.
3. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to one of the ESD points on the chassis.
4. Shut down power to the Pulse Secure Gateway.
5. Disconnect power from the Pulse Secure Gateway.
6. Remove the cables that connect to all external devices.
7. Remove all field replaceable units (FRUs) from the Pulse Secure Gateway.
8. Remove the Pulse Secure Gateway chassis from the rack, using one of the following methods:
   - If you are using a mechanical lift, place the lift platform under the chassis, unscrew and remove the mounting screws from the rack, and move the chassis to the shipping crate.
• If you are not using a mechanical lift and the chassis weight is fully supported by a shelf or another device, unscrew and remove the mounting screws from the rack. Three people can then lift the chassis and move it to the shipping crate.

• If you are not using a mechanical lift and the chassis weight is not fully supported by a shelf or another device, three people should grasp the chassis while a fourth person unscrews and removes the mounting screws from the rack. The three lifters can then move the chassis to the shipping crate.

9. Place the Pulse Secure Gateway in the shipping crate or onto the pallet. If on a pallet, bolt the services gateway to the pallet.

10. Cover the Pulse Secure Gateway with an ESD bag and place the packing foam on top of and around the Pulse Secure Gateway.

11. Replace the accessory box on top of the packing foam.

12. Securely tape the box closed or place the crate cover over the Pulse Secure Gateway.

13. Write the RMA number on the exterior of the box to ensure proper tracking.

Packing Components

Follow these guidelines for packing and shipping individual components of the Pulse Secure Gateway:

• When you return a component, make sure that it is adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.

• Use the original shipping materials if they are available.

• Place each individual component in an electrostatic bag.

• Write the Return Materials Authorization (RMA) number on the exterior of the box to ensure proper tracking.

CAUTION: Do not stack any of the Pulse Secure Gateway components during packing.
Power and Cable Guidelines

Electrical Safety Guidelines and Warnings

In Case of Electrical Accident

If an electrical accident results in an injury, take the following actions in this order:

1. Use caution. Be aware of potentially hazardous conditions that could cause further injury.
2. Disconnect power from the Pulse Secure Gateway.
3. If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, and then call for help.

General Electrical Safety Guidelines and Warnings

• Install the Pulse Secure Gateway in compliance with the following local, national, or international electrical codes:
  • United States—National Fire Protection Association (NFPA 70), United States National Electrical Code
  • Canada—Canadian Electrical Code, Part 1, CSA C22.1
  • Other countries—International Electromechanical Commission (IEC) 60364, Part 1 through Part 7
  • Evaluated to the TN power system

• Locate the emergency power-off switch for the room in which you are working so that if an electrical accident occurs, you can quickly turn off the power.

• Do not work alone if potentially hazardous conditions exist anywhere in your workspace.

• Never assume that power is disconnected from a circuit. Always check the circuit before starting to work.

• Carefully look for possible hazards in your work area, such as moist floors, ungrounded power extension cords, and missing safety grounds.

• Operate the Pulse Secure Gateway within marked electrical ratings and product usage instructions.

• For the Pulse Secure Gateway and peripheral equipment to function safely and correctly, use the cables and connectors specified for the attached peripheral equipment, and make certain they are in good condition.
Grounded Equipment Warning

WARNING: The Pulse Secure Gateway is intended to be grounded. Ensure that the Pulse Secure Gateway is connected to earth ground during normal use.

Midplane Energy Hazard Warning

WARNING: High levels of electrical energy are distributed across the Pulse Secure Gateway midplane. Be careful not to contact the midplane connectors, or any component connected to the midplane, with any metallic object while servicing components installed in the Pulse Secure Gateway.

Multiple Power Supplies Disconnection Warning

WARNING: The Pulse Secure Gateway has more than one power supply connection. All connections must be removed completely to remove power from the unit completely.

Power Disconnection Warning

WARNING: Before working on the Pulse Secure Gateway or near power supplies, unplug the power cord from an AC-powered Pulse Secure Gateway; switch off the power at the circuit breaker on a DC-powered Pulse Secure Gateway.

TN Power Warning

WARNING: The Pulse Secure Gateway is designed to work with TN power systems.

Copper Conductors Warning

WARNING: Use copper conductors only.

DC Power Electrical Safety Guidelines and Warnings

When working with DC-powered equipment, observe the following guidelines and warnings:

• DC Power Electrical Safety Guidelines
• DC Power Disconnection Warning
• DC Power Grounding Requirements and Warning • DC Power Wiring Sequence Warning
• DC Power Wiring Terminations Warning
• DC Power Electrical Safety Guidelines

The following electrical safety guidelines apply to a DC-powered Pulse Secure Gateway:
A DC-powered Pulse Secure Gateway is equipped with a DC terminal block that is rated for the power requirements of a maximally configured Pulse Secure Gateway. To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 65 A @ –48 VDC for the system, or at least 48 A @ –48 VDC for each power supply. We recommend that the 48 VDC facility DC source be equipped with a circuit breaker rated at 60 A (–48 VDC) minimum, or as required by local code. Incorporate an easily accessible disconnect device into the facility wiring. In the United States and Canada, the –48 VDC facility should be equipped with a circuit breaker rated a minimum of 125% of the power provisioned for the input in accordance with the National Electrical Code in the USA and the Canadian Electrical Code in Canada. Be sure to connect the ground wire or conduit to a solid (earth) ground. A closed loop ring is recommended for terminating the ground conductor at the ground stud.

Run two wires from the circuit breaker box to a source of 48 VDC. Use appropriate gauge wire to handle up to 60 A.

A DC-powered Pulse Secure Gateway that is equipped with a DC terminal block is intended only for installation in a restricted access location. In the United States, a restricted access area is one in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code ANSI/NFPA 70.

NOTE: Primary overcurrent protection is provided by the building circuit breaker. This breaker should protect against excess currents, short circuits, and earth faults in accordance with NEC ANSI/NFPA70.

Ensure that the polarity of the DC input wiring is correct. Under certain conditions, connections with reversed polarity might trip the primary circuit breaker or damage the equipment.

For personal safety, connect the green-and-yellow wire to safety (earth) ground at both the Pulse Secure Gateway and the supply side of the DC wiring.

The marked input voltage of –48 VDC for a DC-powered Pulse Secure Gateway is the nominal voltage associated with the battery circuit, and any higher voltages are only to be associated with float voltages for the charging function.

Because the Pulse Secure Gateway is a positive ground system, you must connect the positive lead to the terminal labeled RETURN, the negative lead to the terminal labeled –48V, and the earth ground to the chassis grounding points.

**DC Power Disconnection Warning**

**WARNING:** Before performing any operations, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

**DC Power Grounding Requirements and Warning**

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors, but is identifiable by a green and yellow stripe wire, is installed as part of the branch circuit that supplies the unit. The grounding conductor is a separately derived system at the supply transformer or motor generator set.

**WARNING:** When installing the Pulse Secure Gateway, the ground connection must always be made first and disconnected last.
DC Power Wiring Sequence Warning

WARNING: Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, then −48 V to −48 V. When disconnecting power, the proper wiring sequence is −48 V to −48 V, +RTN to +RTN, then ground to ground. Note that the ground wire should always be connected first and disconnected last.

DC Power Wiring Terminations Warning

WARNING: When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor.

Cable and Wire Guidelines

Distance Limitations for Signaling

Improperly installed wires can emit radio interference. In addition, the potential for damage from lightning strikes increases if wires exceed recommended distances, or if wires pass between buildings. The electromagnetic pulse (EMP) caused by lightning can damage unshielded conductors and destroy electronic devices. If your site has previously experienced such problems, you might want to consult experts in electrical surge suppression and shielding.

Radio Frequency Interference

You can reduce or eliminate the emission of radio frequency interference (RFI) from your site wiring by using twisted-pair cable with a good distribution of grounding conductors. If you must exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.

Electromagnetic Compatibility

If your site is susceptible to problems with electromagnetic compatibility (EMC), particularly from lightning or radio transmitters, you might want to seek expert advice. Strong sources of electromagnetic interference (EMI) can destroy the signal drivers and receivers in the services gateway and conduct power surges over the lines into the equipment, resulting in an electrical hazard. It is particularly important to provide a properly grounded and shielded environment and to use electrical surge-suppression devices.

CAUTION: To comply with intrabuilding lightning/surge requirements, intrabuilding wiring must be shielded, and the shield for the wiring must be grounded at both ends.
Console Port Cable and Wire Specifications

Here are the specifications for the cable that connects a CONSOLE port on the Pulse Secure Gateway to a management console.

- RS-232 (EIA-232) serial cable
- One 6-ft (1.83-m) length with RJ-45/DB-9 connectors
- 6 ft (1.83 m)
- RJ-45/DB-9 male
Certification Statements

Japan

この装置はクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A

Class A Products: MAG6610, MAG6611
Class B Products: MAG2600, MAG4610

Israel

הווה

A. Class

שרידות יושן שמתשמחת, זה תרשים, יודר רוחמה והשדרה מורייה ותרשים, תרשים, הדכת

English translation:

Warning:

This product is Class A.

In residential environments, the product may cause radio interference, and in such a situation, the user may be required to take adequate measures.

Saudi Arabia

Complies with the CITC Technical Specification CITC GEN001, IT001.
South Korea

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며,
가정외의 지역에서 사용하는 것을 목적으로 합니다.

English translation:

Class A device (Broadcasting Communication Device for Office Use): This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

English translation:

Class B device (Broadcasting Communication Device for Home Use): This device obtained EMC registration mainly for home use (Class B) and may be used in all areas.

Taiwan

警告使用者: 這是甲類的資訊產品, 在居住的環境中使用時,
可能會造成射頻干擾, 在這種情況下, 使用者會被要求採取某
些適當的對策

English translation:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.