Security Products

NetScreen-5000 Series Hardware
Installation and Configuration Guide
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About This Guide

The Juniper Networks NetScreen-5000 Series consists of purpose-built, high-performance security systems that provide IPSec VPN and firewall services for large-scale carrier, enterprise, and data-center networks. Built around NetScreen’s third- and fourth-generation ASIC technology and distributed system architecture, the NetScreen-5000 Series offers excellent scalability and flexibility.

The NetScreen-5000 Series includes the following device models:

- NetScreen-5200, a chassis-based, two-slot network security device
- NetScreen-5400, a chassis-based, four-slot network security device

NetScreen-5000 Series architecture features multiple processing modules. These include a management module that provides overall system control, and security processing modules that allow a variety of port configurations. Together, these modules provide a wide range of performance and security gateway configurations. Because the modules can work in many combinations, you can customize the NetScreen-5000 Series to accommodate the specific requirements of your organization.

The NetScreen-5000 Series also employs a switch fabric for data exchange and a separate multi-bus channel for control information, thus delivering scalable performance for the most demanding environments.

NOTE: The configuration instructions and examples in this document are based on the functionality of a device running ScreenOS Release 6.1.0. Your device might function differently depending on the ScreenOS version you are running. For the latest device documentation, refer to the Juniper Networks Technical Publications website at www.juniper.net/techpubs/hardware. To see which ScreenOS versions are currently available for your device, refer to the Juniper Networks Support website at http://www.juniper.net/customers/support/.
Guide Organization

This manual contains the following sections:

- Chapter 1, “Overview,” provides a detailed overview of the system, its modules, Fast Ethernet (FE) connectors and Small Form factor Pluggable (SFP) sockets, power supplies, and fan tray.

- Chapter 2, “Installing the Device,” details how to rack mount the NetScreen-5000 Series, connect the power supplies, and connect the modules to the network in addition to providing desktop site requirements and guidelines for rack mounting.

- Chapter 3, “Configuring the Device,” details how to obtain an IP address for an interface on one of the modules and how to aggregate ports on one of the modules.

- Chapter 4, “Servicing the Device,” provides procedures on how to replace your module and power supplies.

- Appendix A, “Specifications,” provides a list of physical specifications about the NetScreen-5000 Series, the modules, and power supplies.

- Appendix B, “Port Descriptions and LED Status,” provides descriptions of port and LED behavior.

Web User Interface Conventions

In the Web user interface (WebUI), the set of instructions for each task is divided into navigational path and configuration settings. To open a WebUI page where you can enter configuration settings, you navigate to it by clicking on a menu item in the navigation tree on the left side of the screen, then on subsequent items. As you proceed, your navigation path appears at the top of the screen, each page separated by angle brackets.

The following example shows the WebUI path and parameters for defining an address:

Policy > Policy Elements > Addresses > List > New: Enter the following, then click OK:

- Address Name: addr_1
- IP Address/Domain Name: IP/Netmask: (select), 10.2.2.5/32
- Zone: Untrust

To open online Help for configuration settings, click on the question mark (?) in the upper left of the screen.

The navigation tree also provides a Help > Config Guide configuration page to help you configure security policies and Internet Protocol Security (IPSec). Select an option from the dropdown menu and follow the instructions on the page. Click the ? character in the upper left for Online Help on the Config Guide.
Command Line Interface Conventions

The following conventions are used to present the syntax of command line interface (CLI) commands in examples and in text.

In examples:

- Anything inside square brackets [ ] is optional.
- Anything inside braces { } is required.
- If there is more than one choice, each choice is separated by a pipe ( | ). For example:

  ```
  set interface { ethernet1 | ethernet2 | ethernet3 } manage
  ```

  means "set the management options for the ethernet1, the ethernet2, or the ethernet3 interface."

- Variables are in italic type:

  ```
  set admin user name1 password xyz
  ```

In text:

- Commands are in boldface type.
- Variables are in italic type.

**NOTE:** When entering a keyword, you only have to type enough letters to identify the word uniquely. For example, typing `set adm u ang j12fmt54` is enough to enter the command `set admin user angel j12fmt54`. Although you can use this shortcut when entering commands, all the commands documented here are presented in their entirety.

Technical Documentation and Support

To obtain technical documentation for any Juniper Networks product, visit [www.juniper.net/techpubs/](http://www.juniper.net/techpubs/).

For technical support, open a support case using the Case Management link at [http://www.juniper.net/customers/support/](http://www.juniper.net/customers/support/) or call 1-888-314-JTAC (from the United States, Canada, or Mexico) or 1-408-745-9500 (from elsewhere).

If you find any errors or omissions in this document, contact Juniper Networks at techpubs-comments@juniper.net.
Chapter 1
Overview

This chapter provides detailed descriptions of the NetScreen-5000 Series devices, modules, power supplies, and fan assemblies. It includes the following sections:

- “NetScreen-5000 Series” on page 9
  - “NetScreen-5200” on page 9
  - “NetScreen-5400” on page 10
- “Power Supplies” on page 11
  - “NetScreen-5200 Power Recommendations” on page 11
  - “NetScreen-5400 Power Recommendations” on page 11
  - “DC Power Supply” on page 11
  - “AC Power Supply” on page 12
- “Fan Modules” on page 13
- “NetScreen-5000 Modules” on page 13
  - “Management Modules” on page 14
  - “Secure Port Modules” on page 15

NetScreen-5000 Series

This section describes NetScreen-5000 Series devices, which include the NetScreen-5200 and the NetScreen-5400.

NetScreen-5200

The NetScreen-5200 is a chassis-based, two-slot network security device with a 2U (rack unit) chassis. Slot 1 is for the management module and Slot 2 is for the Secure Port Module (SPM). The device has two hot-swappable power supplies for power redundancy and a removable fan module.
Figure 1 shows a NetScreen-5200 with a management module in slot 1 (top) and an SPM in slot 2 (bottom).

**Figure 1: NetScreen-5200 Front Panel**

The NetScreen-5400 is a chassis-based, four-slot network security device with a 5U (rack unit) chassis. The top slot (slot 1) holds the management module, and the bottom slots (slots 2-4) hold up to three Secure Port Modules (SPMs) for flexible, high-density port configurations. The device has three hot-swappable power supplies for power redundancy and a removable fan module.

Figure 2 shows a NetScreen-5400 fully populated with a management module in slot 1 (top) and SPMs in slots 2 through 4.

**Figure 2: NetScreen-5400 Front Panel**
Power Supplies

The NetScreen-5000 Series can use AC or DC power supplies. The slots for these power supplies are located in the back of the NetScreen-5200 and on the front of the NetScreen-5400.

NOTE: You can order a NetScreen-5000 Series that runs on DC power. For DC-powered units, the power supply has a DC terminal block with three sockets.

When two or more power supplies are in service, they share the power load equally. The power supplies are hot-swappable, so you can remove one and replace it without affecting device operation. Each power supply is intended to receive power from separate feeds.

When one power supply fails, the other(s) automatically assume the full load and the device logs a system alarm. This alarm is viewable through the WebUI or a console accessing the ScreenOS CLI. The Alarm LED on the management module glows red in response to any power supply failure.

WARNING: You must replace the failed power supply as soon as possible; otherwise, system damage can occur. See “Servicing the Device” on page 45 for instructions on how to replace a power supply.

NetScreen-5200 Power Recommendations

Although the NetScreen-5200 can run with one power supply, it is advisable to install both. This practice minimizes the likelihood of system failure due to individual power supply failure.

When either power supply fails, the Alarm LED on the management module glows red. If both are operational, then the Alarm LED is off. For more information on power supply LEDs, see “Port Descriptions and LED Status” on page 61.

NetScreen-5400 Power Recommendations

When the NetScreen-5400 contains only two modules, it can operate with one power supply. However, if the system contains three or four modules, the system requires at least two power supplies. In either case, it is advisable to install all three power supplies. This practice minimizes the likelihood of system failure caused by individual power supply failure.

When any power supply fails, the Alarm LED on the management module glows red. While all three are operational, the Alarm LED is off. For more information on power supply LEDs, see “Port Descriptions and LED Status” on page 61.

DC Power Supply

The DC power supply weighs about three pounds. The faceplate contains a power LED, a power switch, a cooling fan vent, and three DC power terminal blocks that connect to power cables.
Figure 3 shows the NetScreen-5200 DC power supply.

Figure 3: NetScreen-5200 DC Power Supply

AC Power Supply

The AC power supply weighs about three pounds. The faceplate contains a power LED, a power switch, a male power outlet, and a cooling fan vent.

Figure 4 shows the NetScreen-5200 AC power supply.

Figure 4: NetScreen-5200 AC Power Supply
Fan Modules

The NetScreen-5200 has a three-fan module and the NetScreen-5400 has a two-fan module. You can access the fan module from the left front side of each chassis.

- To remove the NetScreen-5200 fan module, turn the fan knob in the unlock position, then gently pull the fan module lever toward you to slide the module out.

- To remove the NetScreen-5400 fan module, loosen the two thumb screws that secure the fan module, then gently slide the module out.

If a fan stops operating due to failure or removal, then the system continues to run and generates an alarm. When you replace the fan, do not leave the fan tray empty for more than two minutes. See “Replacing the Fan Module” on page 48 for more information.

NetScreen-5000 Modules

The NetScreen-5000 Series systems support two module types:

- NetScreen-5000 management modules
- NetScreen-5000 Secure Port Modules (SPMs)

Table 1 shows the modules supported by each slot.

<table>
<thead>
<tr>
<th>Device</th>
<th>Slot 1</th>
<th>Slot 2</th>
<th>Slot 3</th>
<th>Slot 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>NetScreen-5200</td>
<td>Management module</td>
<td>SPM</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NetScreen-5400</td>
<td>Management module</td>
<td>SPM</td>
<td>SPM</td>
<td>SPM</td>
</tr>
</tbody>
</table>

Table 2 shows the configurations for each management module and SPM and shows whether the firmware version is included on the management module or if it needs to be downloaded.

<table>
<thead>
<tr>
<th>Configuration 1</th>
<th>Configuration 2</th>
<th>Configuration 3</th>
<th>Configuration 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management module</td>
<td>5000-M</td>
<td>5000-M2</td>
<td>5000-M2</td>
</tr>
<tr>
<td>SPMs</td>
<td>5000-8G and/or 5000-2G24FE</td>
<td>5000-8G and/or 5000-2G24FE</td>
<td>5000-8G2 and/or 5000-2XGE</td>
</tr>
<tr>
<td>Software version</td>
<td>Software is installed on the shipping management module</td>
<td>Software is installed on the shipping management module</td>
<td>Must download from the support site</td>
</tr>
</tbody>
</table>
Management Modules

The management module provides general-purpose CPU delivery and contains dedicated high availability (HA) and management interfaces. It handles tasks such as management access, session setup and termination, and Internet Key Exchange (IKE) negotiation.

The management module assists other system elements, primarily with non-flow related tasks. It provides overall management and control of the system. Although it performs system management, the primary function of the management module is to support the other modules.

Table 3: Netscreen 5000-series Management Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Processor</th>
<th>Minimum ScreenOS Version</th>
<th>Certifications</th>
<th>Supported SPMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000-M</td>
<td>600-MHz</td>
<td>5.4</td>
<td>▪ FIPS</td>
<td>▪ 5000-8G</td>
</tr>
<tr>
<td></td>
<td>PowerPC</td>
<td></td>
<td>▪ NEBS</td>
<td>▪ 5000-2G24FE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Common Criteria</td>
<td></td>
</tr>
<tr>
<td>5000-M2</td>
<td>Dual 1GHz</td>
<td>5.4</td>
<td>Pending</td>
<td>▪ 5000-8G</td>
</tr>
<tr>
<td></td>
<td>PowerPC</td>
<td></td>
<td></td>
<td>▪ 5000-8G2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>▪ 5000-2XGE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>▪ 5000-2G24FE</td>
</tr>
<tr>
<td>5000-MGT3</td>
<td>Dual 1.4GHz</td>
<td>6.1</td>
<td>Pending</td>
<td>▪ 5000-8G2-G4</td>
</tr>
<tr>
<td></td>
<td>PowerPC</td>
<td></td>
<td></td>
<td>▪ 5000-2XGE-G4</td>
</tr>
</tbody>
</table>

Features of the management module include:

▪ A management port, for WebUI management or CLI sessions

▪ An RJ-45 console port, for connecting serial terminal emulation programs such as HyperTerminal

▪ Two HA ports

▪ A modem port

The management module also has port Link and Activity LEDs, CPU utilization indicators, a high availability (HA) LED, an Alarm LED, a Status LED, a Flash LED, and a Power LED. In addition, it has a compact flash slot for flash memory card installation. See “Port Descriptions and LED Status” on page 61 for descriptions of the LED lights.
Secure Port Modules

Secure Port Modules (SPMs) perform general packet processing and device connection tasks for devices that communicate with the NetScreen-5000 Series.

SPMs handle packets as they enter and exit the system, providing packet parsing, classification, and flow-level processing. SPMs also provide encryption, decryption, Network Address Translation (NAT), and session lookup features. When packets require processing beyond that provided by an SPM, the NetScreen-5000 Series hands them off to the management module for further processing.

There are currently three families of SPMs:

- The 5000-8G, 5000-8G2, and 5000-8G2-G4 SPMs provide eight 1-Gigabit Small Form factor Pluggable (SFP) sockets. These SPMs are supplied with SX gigabit fiber SFP transceivers.
- The 5000-2XGE and 5000-2XGE-G4 SPMs provides two 10-Gigabit Form factor Pluggable (XFP) Sockets. You must purchase transceivers for this SPM separately.
- The 5000-2G24FE SPM provides two SFP sockets and 24 10/100 Ethernet ports. This SPM is supplied with two SX gigabit fiber SFP transceivers.

**5000-8G, 5000-8G2 and 5000-8G2-G4 SPMs**

The 5000-8G, 5000-8G2 and 5000-8G2-G4 SPMs provide eight 1-Gigabit SFP sockets for hot-swappable transceivers. These modules are also capable of supporting a total of four aggregate interfaces, with up to four ports for each aggregate interface.
Table 4: Capacities and Management Modules, 5000-8G, 5000-8G2 and 5000-8G2-G4 SPMs

<table>
<thead>
<tr>
<th>SPM Type</th>
<th>Firewall Capacity</th>
<th>VPN Capacity</th>
<th>Interface Aggregation</th>
<th>Management module</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000-8G</td>
<td>4 Gbps</td>
<td>2 Gbps</td>
<td>4 aggregate interfaces of up to 2 ports each</td>
<td>5000-M or 5000-M2</td>
</tr>
<tr>
<td>5000-8G2</td>
<td>8 Gbps</td>
<td>4 Gbps</td>
<td>4 aggregate interfaces of up to 2 ports each</td>
<td>5000-M2 Only</td>
</tr>
<tr>
<td>5000-8G2-G4</td>
<td>8 Gbps</td>
<td>4 Gbps</td>
<td>4 aggregate interfaces of up to 4 ports each</td>
<td>5000-MGT3 Only</td>
</tr>
</tbody>
</table>

(For details on connecting or removing a SFP transceivers and connecting and disconnecting Gigabit Ethernet cables, see “Servicing the Device” on page 45.)

The 5000-8G SPM provides port Link and Activity LEDs in addition to Power and Status LEDs.

Figure 6: 5000-8G Secure Port Module (5000-8G2 and 5000-8G2-G4 Similar)

5000-2XGE and 5000-2XGE-G4 SPMs

The 5000-2XGE and 5000-2XGE-G4 SPMs provide two 10-Gigabit XFP sockets for hot-swappable transceivers. You cannot mix this SPM with the 5000-8G or 5000-2G24FE SPMs.

Table 5: Capacities and Management Modules, 5000-2XGE and 5000-2XGE-G4 SPMs

<table>
<thead>
<tr>
<th>SPM Type</th>
<th>Firewall Capacity</th>
<th>VPN Capacity</th>
<th>Management module</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000-2XGE</td>
<td>10 Gbps</td>
<td>5 Gbps</td>
<td>5000-M2 Only</td>
</tr>
<tr>
<td>5000-2XGE-G4</td>
<td>10 Gbps</td>
<td>5 Gbps</td>
<td>5000-MGT3 Only</td>
</tr>
</tbody>
</table>

(For details on inserting or removing SFP transceivers and connecting and disconnecting Gigabit Ethernet cables, see “Servicing the Device” on page 45.)

The 5000-2XGE SPM provides port Link and Activity LEDs in addition to Power and Status LEDs.
Table 6 shows the transceivers that are available with the 5000-2XGE SPM.

### Table 6: Available Transceivers for NetScreen-5000-2XGE SPM

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Distance</th>
<th>Fiber Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS-SYS-GBIC-MXSR</td>
<td>Transceiver, 300m 10 G, XFP</td>
<td>Short Reach</td>
<td>Multi-Mode Fiber</td>
</tr>
<tr>
<td>NS-SYS-GBIC-MXLR</td>
<td>Transceiver, 10km 10 G, XFP</td>
<td>Long Reach</td>
<td>Single-Mode Fiber</td>
</tr>
</tbody>
</table>

### 5000-2G24FE SPM

The 5000-2G24FE SPM provides two 1-Gigabit Ethernet SFP sockets and 24 Fast Ethernet (FE) ports with up to 2 Gbps of firewall and up to 1 Gbps of VPN process capacity. This module supports a total of six aggregate interfaces. This total consists of one aggregate interface for the two 1-Gigabit SFP Sockets, and five aggregate interfaces for the 24 10/100 Ethernet ports. Only similar ports can be aggregated together. For example, you cannot aggregate a Gigabit SFP port to a 10/100 FE port.

The 5000-2G24FE SPM is only supported by the 5000-M and 5000-M2 management modules. Also, you cannot mix this SPM with the 5000-8G2 or 5000-2XGE SPMs.

The 5000-2G24FE provides port Link and Activity LEDs, in addition to Power and Status LEDs.

SFP transceivers are hot-swappable. For details on inserting or removing SFP transceivers and connecting or disconnecting Gigabit Ethernet cables, see “Servicing the Device” on page 45.
Chapter 2
Installing the Device

This chapter describes how to install a NetScreen-5000 Series in an equipment rack or on a desktop and how to configure the device on a network. This chapter includes the following sections:

- “General Installation Guidelines” on page 19
- “Equipment Rack Installation Guidelines” on page 20
- “Mounting the NetScreen-5000 Series” on page 21
  - “NetScreen-5200 Front-and-Rear Mount” on page 21
  - “NetScreen-5200 Center-Mount” on page 23
  - “NetScreen-5400 Front-Mount” on page 24
- “Installing and Connecting an AC Power Supply” on page 25
- “Installing and Wiring a DC Power Supply” on page 26
- “Establishing a High Availability Connection” on page 27
- “Connecting the NetScreen-5000 Series to a Router or Switch” on page 28

General Installation Guidelines

Observing the following precautions can prevent injuries, equipment failures, and shutdowns:

- Never assume that the power supply is disconnected from a power source. Always check first.
- Room temperature might not be sufficient to keep equipment at acceptable temperatures without an additional circulation system. Ensure that the room in which you operate the NetScreen-5000 Series has adequate air circulation.
- Do not work alone if potentially hazardous conditions exist.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
Equipment Rack Installation Guidelines

The location of the chassis and the layout of your equipment rack or wiring room are crucial for proper system operation.

Use the following guidelines while configuring your equipment rack:

- Enclosed racks must have adequate ventilation. An enclosed rack should have louvered sides and a fan to provide cooling air.

- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or exhaust ports. If you install the chassis on slides, then check the position of the chassis when it is seated all the way into the rack.

- In an enclosed rack with a ventilation fan in the top, equipment higher in the rack can draw heat from the lower devices. Always provide adequate ventilation for equipment at the bottom of the rack.

- Baffles can isolate exhaust air from intake air. The best placement of the baffles depends on the airflow patterns in the rack.

You can mount the device in a standard 19-inch equipment rack. Rack mounting requires the following tools:

- Phillips screwdriver
- Rack-compatible screws
- The included rear slide kit (for the front-and-rear mount method) on the NetScreen-5200
- Front-mount brackets

There are two ways to rack-mount the NetScreen-5200:

- Front-and-rear mount (recommended)
- Center-mount

You can only front-mount the NetScreen-5400.

NOTE: Although you can place the NetScreen-5000 Series on a desktop for operation, we do not recommend deploying it in this manner.

To prevent abuse and intrusion by unauthorized personnel, it is extremely important to install the security device in a locked-room environment.
Mounting the NetScreen-5000 Series

The following sections describe how to rack-mount the NetScreen-5000 Series:

- “NetScreen-5200 Front-and-Rear Mount” on page 21
- “NetScreen-5200 Center-Mount” on page 23
- “NetScreen-5400 Front-Mount” on page 24

NetScreen-5200 Front-and-Rear Mount

To mount the NetScreen-5200 with support from the front and rear, you need four fitted screws, a phillips screwdriver, the rear slide kit, and brackets.

To front-and-rear mount the device:

1. Use the screws provided to install the slides and rack mount brackets to the sides of the chassis as shown in Figure 9.

Figure 9: Installing the NetScreen-5200 Slides and Rack Mount Brackets
2. Use the screws to attach the rear mount bracket to the rear rack posts.

3. Slip the slides into the rear mount brackets, then push the NetScreen-5200 forward until the left and right brackets contact the front rack posts, as shown in Figure 10.

Figure 10: Rack Mounting the NetScreen-5200

4. Use the screws to attach the left and right brackets to the rack.
**NetScreen-5200 Center-Mount**

To center-mount the NetScreen-5200, you need four fitted screws, a phillips screwdriver, and brackets.

To center-mount the device:

1. Use the screws to attach the left and right brackets to the middle of each side of the chassis, as shown in Figure 11.

*Figure 11: Installing NetScreen-5200 Rack Brackets for Center Mounting*

2. Use the screws to attach the left and right brackets to the rack, as shown in Figure 12.

*Figure 12: Center-mounting the NetScreen-5200*
**NetScreen-5400 Front-Mount**

To front-mount the NetScreen-5400, you need four fitted screws, a Phillips screwdriver, and brackets.

To front-mount the device:

1. Use the screws to attach the front-mount bracket to the front of the chassis as shown in Figure 13.

**Figure 13: Installing NetScreen-5400 Rack Brackets**
2. Use the screws to attach the left and right brackets to the rack.

Figure 14: Rack Mounting the NetScreen-5400

---

Installing and Connecting an AC Power Supply

To install and connect an AC power supply to the NetScreen-5000 Series device:

1. On the NetScreen-5200, slide the power supply into one of the power compartments in the back of the system.
   
   On the NetScreen-5400, slide the power supply into one of the power compartments on the front of the system.

2. Fasten the power supply to the system by tightening the corner screws into the eyelets on the sides of the power supply.

3. If you want to install two power supplies in the NetScreen-5200 or three power supplies in the NetScreen-5400, then repeat steps 1 and 2 for the remaining power supplies.

4. Connect the female end of a standard power cord to the male connector on the back of each power supply.

5. Connect each power cord to a standard 100-240-Volt power outlet.
6. Turn the power switches on.

NOTE: Whenever you deploy two or more power supplies to a NetScreen-5000 Series system, connect each to a different power source. Each power supply is intended to receive power from separate feeds.

NOTE: If there are multiple power supplies in the NetScreen-5000 Series system and any of them are off, then the Alarm LED on the management module glows red. This alarm indicates that maximum system stability requires all installed power supplies to be operational.

Installing and Wiring a DC Power Supply

To install and connect the DC power supply to the NetScreen-5000 Series system:

1. On the NetScreen-5200, slide the power supply into one of the power compartments in the back of the system.

   On the NetScreen-5400, slide the power supply into one of the power compartments on the front of the system.

2. Fasten the power supply to the system by tightening the corner screws into the eyelets on the sides of the power supply.

3. If you want to install two power supplies in the NetScreen-5200 or three power supplies in the NetScreen-5400, then repeat steps 1 and 2 for the remaining power supplies.

The DC power supply, power switch, grounding screw, and terminal blocks, are located on the faceplate of the power supply unit.
Establishing a High Availability Connection

To ensure continuous traffic flow in the event of a system failure, you can cable and configure two security devices in a redundant cluster, with one device acting as a master and the other as its backup. The master propagates all its network, configuration and session information to the backup. Should the master fail, the backup is promoted to master and takes over the traffic processing.

To physically connect the master and backup devices, the management modules provide a pair of high availability (HA) ports. To connect the NetScreen-5000 Series systems, you can use the provided Gigabit Ethernet SFP cable. Use this cable to connect the HA1 port on one system to the HA1 port on another system. Though you cannot connect HA ports between 5000-M and 5000-M2 management modules, you can connect HA ports between the same type of management module. For example, a 5000-M management module to another 5000-M management module.

For information on setting up HA configurations, refer to the Concepts & Examples ScreenOS Reference Guide.

NOTE: If there are multiple power supplies in the NetScreen-5000 Series system and any of them are off, then the Alarm LED on the management module glows red. This alarm indicates that maximum system stability requires all installed power supplies to be operational.
Connecting the NetScreen-5000 Series to a Router or Switch

You can establish a high-speed connection to a router or switch, and provide firewall and general security for your network, by connecting a Secure Port Module (SPM) to a fiber-optic or copper wire backbone. There are two ways to create this connection:

- Connect a fiber-optic cable from one of the SFP ports to the router (or switch).
- Connect an unshielded twisted pair (UTP) CAT5 cable from an FE port to the router (or switch).
Chapter 3
Configuring the Device

This chapter describes how to perform initial configuration on the NetScreen-5000 Series once you have mounted it in a rack or desktop, plugged in the necessary cables, and turned the power on. Topics in this chapter include:

- “Operational Modes” on page 30
  - “Transparent Mode” on page 30
  - “Route Mode” on page 30
- “NetScreen-5000 Interfaces” on page 31
  - “NetScreen-5200 Interfaces” on page 31
  - “NetScreen-5400 Interfaces” on page 32
  - “Configurable Interfaces” on page 33
- “Performing Initial Connection and Configuration” on page 33
  - “Establishing a Terminal Emulator Connection” on page 33
  - “Upgrading the Firmware During the Startup Process” on page 35
  - “Changing Your Admin Name and Password” on page 36
  - “Setting Port and Interface IP Addresses” on page 36
- “Configuring the Device for Telnet and WebUI Sessions” on page 38
  - “Starting a Console Session Using Telnet” on page 38
  - “Starting a Console Session Using Dialup” on page 39
  - “Establishing a GUI Management Session” on page 39
Operational Modes

The NetScreen-5000 Series supports two operational modes: Transparent and Route. The default mode is Route.

Transparent Mode

In Transparent mode, a NetScreen-5000 Series system operates as a Layer-2 bridge. Because the device cannot translate packet IP addresses, it cannot perform Network Address Translation (NAT). Consequently, for the device to access the Internet, any IP address in your trusted (local) networks must be routable and accessible from untrusted (external) networks.

In Transparent mode, the IP addresses for the Layer-2 Trust and Untrust zones are 0.0.0.0, thus making the NetScreen-5000 Series system invisible to the network. However, the device can still perform firewall, VPN, and traffic management according to configured security policies.

Route Mode

In Route mode, a NetScreen-5000 Series system operates at Layer 3. Because you can configure each interface using an IP address and subnet mask, you can configure individual interfaces to perform NAT.

- When the interface performs NAT services, the NetScreen-5000 Series system translates the source IP address of each outgoing packet into the IP address of the untrusted interface. It also replaces the source port number with a randomly generated value.

- When the interface does not perform NAT services, the source IP address and port number in each packet header remain unchanged. Therefore, to reach the Internet your local hosts must have routable IP addresses.

For more information on NAT, refer to the Concepts & Examples ScreenOS Reference Guide.
**NetScreen-5000 Interfaces**

Each Secure Port Module (SPM) for the NetScreen-5000 Series system provides 2, 8, or 26 physical Ethernet ports. Each of these ports can serve as a physical interface. In addition, you can configure the Ethernet ports to host multiple virtual (logical) interfaces.

**NetScreen-5200 Interfaces**

A NetScreen-5200 contains one management module (in slot 1) and one SPM. In Figure 15, the device contains one 5000-8G SPM.

---

**NOTE:** Not all SPMs are supported by every management module. See Table 3, “Netscreen 5000-series Management Modules,” on page 14 for more information.

---

**Figure 15: NetScreen-5200 Interfaces**
NetScreen-5400 Interfaces

A NetScreen-5400 contains one management module (in slot 1) and up to three SPMs. In Figure 16, the device contains three 5000-8G SPMs.

NOTE: Not all SPMs are supported by every management module. See Table 3, “Netscreen 5000-series Management Modules,” on page 14 for more information.
**Configurable Interfaces**

Table 7 shows the configurable interfaces available on the NetScreen-5000 Series.

<table>
<thead>
<tr>
<th>Interface Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td><strong>ethernet</strong>(n1/n2) specifies a physical Ethernet interface, denoted by an interface module in a slot (n1) and a physical port (n2) on the module</td>
</tr>
<tr>
<td></td>
<td><strong>ethernet</strong>(n1/n2,n3) specifies a logical interface, denoted by an interface module in a slot (n1), a physical port (n2) on the module, and a logical interface number (n3). You create logical interfaces using the <strong>set interface</strong> command.</td>
</tr>
<tr>
<td>Layer-2</td>
<td><strong>vlan1</strong> specifies the interface used for management and VPN while the NetScreen-5000 Series system is in Transparent mode</td>
</tr>
<tr>
<td>Tunnel</td>
<td><strong>tunnel.(n)</strong> specifies a tunnel interface. Use this interface for VPN traffic</td>
</tr>
<tr>
<td>Function</td>
<td><strong>mgt</strong> specifies a dedicated management interface bound to the MGT zone</td>
</tr>
<tr>
<td></td>
<td><strong>ha1</strong> and <strong>ha2</strong> specify the names of the dedicated HA ports</td>
</tr>
</tbody>
</table>

**Performing Initial Connection and Configuration**

To establish the first console session with the NetScreen-5000 Series system, use a vt100 terminal emulator program through the provided RJ-45/DB9 serial port connector.

**Establishing a Terminal Emulator Connection**

To establish an initial console session:

1. Plug the DB-9 end of the supplied RJ-45/DB-9 serial cable into the serial port of your workstation. (Be sure that the DB-9 is seated properly and secured with the screws.)

2. Plug the RJ-45 end of the cable into the Console port of the NetScreen-5000 Series system. (Be sure that the RJ-45 clip snaps into the port and is seated properly.)
3. Launch a CLI session between your workstation and the NetScreen-5000 Series system using a standard serial terminal emulation program such as Hilgraeve HyperTerminal (provided with the Microsoft Windows operating system). The settings should be as follows:

- Baud Rate to 9600
- Parity to No
- Data Bits to 8
- Stop Bit to 1
- Flow Control to none

4. At the HyperTerminal window, press Enter to display the login prompt.

5. At the login prompt, enter netscreen.

6. At the password prompt, enter netscreen.

**NOTE:** Use lowercase letters only. The username and password are both case-sensitive.

7. (Optional) By default, the console times out and terminates automatically after 10 minutes of idle time. To change this timeout interval, use the following command:

```
set console timeout number
```

where *number* is the length of idle time in minutes before session termination. To prevent any automatic termination, specify a value of 0.
Upgrading the Firmware During the Startup Process

1. Connect your computer to the NetScreen-5000 Series system:
   a. Using a serial cable, connect the serial port on your computer to the 
      console port on the NetScreen-5000 Series system. This connection, in 
      combination with a terminal application, enables you to manage the 
      security device.
   b. Using an Ethernet cable, connect the network port on your computer to the 
      management port on the NetScreen-5000 Series system. This connection 
      enables the transfer of data between the computer, the TFTP server, and 
      the security device.

2. Make sure that you have the new ScreenOS image file stored in the TFTP server 
   directory on your computer. For information on obtaining the new firmware, 
   refer to the Concepts & Examples ScreenOS Reference Guide.

3. Run the TFTP server on your computer by double-clicking on the TFTP server 
   application. You can minimize its window but it must be active in the 
   background.

4. Log into the NetScreen-5000 Series system using a terminal emulator such as 
   HyperTerminal. See “Establishing a Terminal Emulator Connection” on 
   page 33. Log in as the root admin or an admin with read-write privileges.

5. Power on or reboot the NetScreen-5000 Series system.

6. Keep your eyes on the terminal emulator screen, then when you see “Hit any 
   key to load new firmware,” press any key on your computer keyboard to 
   interrupt the startup.

7. At the Boot File Name prompt, enter the filename of the ScreenOS firmware 
   you want to load.

8. At the Self IP Address prompt, enter the IP address of the NetScreen-5000 
   Series system that is used to communicate to the TFTP server.

9. At the TFTP IP Address prompt, enter the IP address of the TFTP server.
   If the firmware is loading successfully, you will see a series of “rtatatatata...” 
   characters running on the terminal emulator screen and a series of symbols 
   running on the TFTP server window. When the firmware installation is 
   complete, a message informs you of the success of the installation.

10. Enter y (yes) to the following question: “Program to on-board flash” ([y]/n)” 
    Entering yes saves the firmware you installed to flash memory.

11. Enter y (yes) to the following question: “Run downloaded program? ([y]/n)”
Entering **yes** instructs the NetScreen-5000 Series system to start running the new ScreenOS firmware.

### Changing Your Admin Name and Password

Because all Juniper Networks security products use the same admin name and password (**netscreen**), it is highly advisable to change your admin name and password immediately. Enter the following commands:

```
set admin name name_str
set admin password pswd_str
save
```

For information on creating different levels of administrators, refer to the *Concepts & Examples ScreenOS Reference Guide*.

### Setting Port and Interface IP Addresses

Through the CLI, you can use commands that set IP address and subnet mask values for most of the physical interfaces.

#### Viewing Current Interface Settings

To begin the configuration process, it is advisable to view existing port settings with the following command:

```
get interface
```

This command displays current port names, IP addresses, MAC addresses, and other useful information.

### Setting the IP Address of the Management Interface

The default IP address and subnet mask settings for the MGT interface are 192.168.1.1 and 255.255.255.0, respectively. To access the MGT interface, you must change the IP address and subnet mask of the MGT interface to match your current network. We recommend using the MGT interface exclusively for out-of-band management.

To set the IP address of the MGT interface:

1. Choose an unused IP address within the current address range of your LAN.
2. Set the MGT interface to this unused IP address with the following command:

```
set interface mgt ip ip_addr/mask
```

For example, to set the IP address and subnet mask of the MGT interface to 10.100.2.183 and 16, respectively:

```
set interface mgt ip 10.100.2.183/16
```
3. To confirm the new port settings, use the following command:

   \texttt{get interface mgt}

\section*{Setting the IP Address for the Trust Zone Interface}

The NetScreen-5000 Series system usually communicates with your protected network through an interface bound to the Trust zone. To allow an interface to communicate with internal devices, you must assign it the IP address and subnet mask for your protected network.

To set up the \texttt{ethernet2/2} interface to communicate with your trusted network:

1. Determine the IP address and subnet mask of your trusted network.
2. Set the \texttt{ethernet2/2} interface to the Trust zone with the following command:

   \texttt{set interface ethernet2/2 zone trust}

3. Set the IP address and subnet mask with the following command:

   \texttt{set interface ethernet2/2 ip ip\_addr/mask}

   where \texttt{ip\_addr} is the IP address and \texttt{mask} is the subnet mask. For example, to set the IP address and subnet mask of the \texttt{ethernet2/2} interface to 10.250.2.1/16:

   \texttt{set interface ethernet2/2 ip 10.250.2.1/16}

4. (Optional) To confirm the new port settings, use the following command:

   \texttt{get interface ethernet2/2}

\section*{Setting the IP Address for the Untrust Zone Interface}

The NetScreen-5000 Series system usually communicates with external (untrusted) devices through an interface bound to the Untrust zone. To allow an interface to communicate with external devices, you must assign it a public IP address.

To set up the \texttt{ethernet2/3} interface to communicate with external devices:

1. Choose an unused public IP address and subnet mask.
2. Set the \texttt{ethernet2/3} interface to the Untrust zone with the following command:

   \texttt{set interface ethernet2/3 zone untrust}

3. Set the IP address and subnet mask with the following command:

   \texttt{set interface ethernet2/3 ip ip\_addr/mask}

   where \texttt{ip\_addr} is the IP address and \texttt{mask} is the subnet mask. For example, to set the IP address and subnet mask of the \texttt{ethernet2/3} interface to 172.16.20.1/16:

   \texttt{set interface ethernet2/3 ip 172.16.20.1/16}
4. (Optional) To confirm the new interface settings, use the following command:

    get interface ethernet2/3

**Allowing Outbound Traffic**

By default, the NetScreen-5000 Series system does not allow inbound or outbound traffic, nor does it allow traffic to or from the DMZ. To permit (or deny) traffic, you must create access policies.

The following CLI command creates an access policy that permits all kinds of outbound traffic, from any host in your trusted LAN to any device on the untrusted network.

    set policy from trust to untrust any any any permit

Save your access policy configuration with the following command:

    save

---

**Configuring the Device for Telnet and WebUI Sessions**

In addition to terminal emulator programs, you can use Telnet (or dialup) to establish console sessions with a NetScreen-5000 Series system. You can also start management sessions using the ScreenOS WebUI, a web-based GUI management application.

**Starting a Console Session Using Telnet**

To establish a Telnet session with the NetScreen-5000 Series system:

1. Connect an RJ-45 cable from the MGT interface to the internal switch, router, or hub in your LAN.

2. Open a Telnet session, specifying the current MGT interface IP address. For example, in Windows, click **Start > Run**, enter `telnet ip_addr` (where `ip_addr` is the address of the MGT interface), then click **OK**.

   For example, if the MGT interface has an address of 10.100.2.183, use the following command:

   `telnet 10.100.2.183`

3. At the Username prompt, enter your username (the default is `netscreen`).

4. At the Password prompt, enter your password (the default is `netscreen`).
5. (Optional) By default, the console times out and terminates automatically after 10 minutes of idle time. To change this timeout interval, use the following command:

   `set console timeout number`

   where `number` is the length of idle time in minutes before session termination. To prevent any automatic termination, specify a value of 0.

---

**Starting a Console Session Using Dialup**

Each NetScreen-5000 Series system provides a modem port that allows you to establish a remote console session using a dialup connection through a 9600 bps modem. Dialing into the modem establishes a dialup console connection.

**NOTE:** The Terminal type for dialup sessions must be vt100. For example, in Hilgreave HyperTerminal (a standard terminal application), select the **File** menu, select **Properties**, select the **Settings** tab, and then under the **Emulation** dropdown menu, select **VT100**.

---

**Establishing a GUI Management Session**

To access a NetScreen-5000 Series system with the WebUI management application:

1. Connect your computer (or your LAN hub) to the MGT interface using a Category-5 Ethernet cable. (The MGT interface is on the management module, which always resides in slot 1.)

2. Launch your browser, enter the IP address of the MGT interface in the URL field, and then press **Enter**.

   For example, if you assigned the MGT interface an IP address of 10.100.2.183/16, then enter:

   `http://10.100.2.183`

   The ScreenOS WebUI software displays the login prompt.
3. Enter `netscreen` in both the Admin Name and Password fields, then click Login. (Use lowercase letters only. The Admin Name and Password fields are both case-sensitive.)

The ScreenOS WebUI application window appears.

### Configuring the Chassis Alarm

The NetScreen-5000 Series system allows you to configure the chassis alarm, an audible warning that sounds when a system failure or hazardous event occurs. To determine which failures and events trigger the chassis alarm:

1. Configure the audible alarms with the following command:

   ```
   set chassis audible-alarm string
   ```

   where `string` can be any of the following keywords:

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Enables all chassis alarms.</td>
</tr>
<tr>
<td>battery</td>
<td>Sets the chassis alarm to sound when a battery fails.</td>
</tr>
<tr>
<td>fan-failed</td>
<td>Sets the chassis alarm to sound when a fan fails.</td>
</tr>
<tr>
<td>power-failed</td>
<td>Sets the chassis alarm to sound when a power supply fails.</td>
</tr>
<tr>
<td>temperature</td>
<td>Sets the chassis alarm to sound when the temperature goes outside of the acceptable range.</td>
</tr>
</tbody>
</table>

2. After configuring the alarm, it is advisable to view alarm environment information with the following command:

   ```
   get chassis
   ```

### Configuring Jumbo Frames

The 5000-8G2 and 5000-2XGE SPMs support jumbo frames that are up to 9,830 bytes. To set jumbo frames, use the `set environment max-frame-size = 9830` CLI command. You must reboot the system before this feature can take effect.
Configuring Aggregate Interfaces

The NetScreen-5000 Series system allows you to combine two or more physical ports on an SPM into a single virtual port. This virtual port is known as an aggregate interface. Only Secure Port Modules (SPMs) support this feature. Table 8 describes the aggregate interfaces supported on the various SPMs.

### Table 8: Aggregate Interface Support per SPM

<table>
<thead>
<tr>
<th>SPM Type</th>
<th>Maximum number of aggregate interfaces</th>
<th>Maximum number of ports per aggregate interface</th>
<th>Supported Aggregations</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000-8G</td>
<td>4</td>
<td>2</td>
<td>Only the following port combinations: 1 and 2, 3 and 4, 5 and 6, 7 and 8</td>
</tr>
<tr>
<td>5000-8G2 and 5000-8G2-G4</td>
<td>4</td>
<td>4</td>
<td>Any combination of ports 1 through 4, or any combination of ports 5 through 8. You cannot aggregate ports 1 through 4 with ports 5 through 8.</td>
</tr>
<tr>
<td>5000-2G24FE</td>
<td>6 (5 for FE ports and 1 for SFP ports)</td>
<td>8</td>
<td>Any combination of up to 8 FE ports per aggregate interface. You can also aggregate the two SFP ports together. You cannot aggregate FE ports and SFP ports together.</td>
</tr>
</tbody>
</table>

You assign the aggregate interface a name of the format `aggregate1` through `aggregateN`, where `N` is the total of the maximum number of aggregate interfaces supported by all of the SPMs in the chassis.

In the following example, you combine two SFP ports, each running at 1 Gbps, into an aggregate interface running at 2 Gbps. The aggregate interface consists of Ethernet ports 1 and 2 on a 5000-8G SPM (residing in slot 2).

To create the aggregate interface:

1. (Optional) To see what physical ports are available on your NetScreen-5000 Series system:
   ```
   get interface
   ```
2. To create an aggregate interface name:
   ```
   set interface string zone zonename
   ```
   where `string` is a legal aggregate interface name.

   For example, to create the aggregate interface name `aggregate1`:
   ```
   set interface aggregate1 zone zonename
   ```
3. To assign ports ethernet2/1 and ethernet2/2 to the `aggregate1` interface name:
set interface ethernet2/1 aggregate aggregate1
set interface ethernet2/2 aggregate aggregate1

4. (Optional) To see the updated port list and details about the new aggregate interface:

   get interface
   get interface aggregate1

   Notice that the listing contains aggregate1, an aggregate interface comprised of ethernet2/1 and ethernet2/2. This aggregate interface runs with a throughput rate of 2 Gbps. Use the following command to bind the aggregate interface, aggregate1, to the trust zone:

   set interface aggregate1 zone trust

---

**NOTE:** As with most other interfaces, you must assign the aggregate interface an IP address so that other nodes on the network can reach it.

---

**Using CLI Commands to Reset the Device**

If you lose the admin password, then you can use the following procedure to reset the NetScreen-5000 Series system to its default settings. This procedure destroys any existing configurations, but restores access to the device. To perform this operation, you need to make a console connection, as described in “Establishing a Terminal Emulator Connection” on page 33.

---

**WARNING:** Resetting the NetScreen-5000 Series system deletes all existing configuration settings, and the firewall and VPN services is rendered inoperative.

---

**NOTE:** After you successfully reset and reconfigure the NetScreen-5000 Series, you should back up the new configuration setting. As a precaution against lost passwords, you should back up a new configuration that contains the ScreenOS default password. This will ensure a quick recovery of a lost configuration. You should change the password on the system as soon as possible. For detailed information about configuration backups, refer to the *Concepts & Examples ScreenOS Reference Guide*.

By default, the device recovery feature is enabled. You can disable it with the following CLI command: `unset admin device-reset`.

---

1. At the login prompt, enter the serial number of the NetScreen-5000 Series system.

2. At the password prompt, enter the serial number again. The following message appears:

   !!! Lost Password Reset !!! You have initiated a command to reset the device to factory defaults, clearing all current configuration, keys and settings. Would you like to continue? y/[n]
3. Press **y**.

   The following message appears:
   
   ```
   !! Reconfirm Lost Password Reset !! If you continue, the entire configuration of the device will be erased. In addition, a permanent counter will be incremented to signify that this device has been reset. This is your last chance to cancel this command. If you proceed, the device will return to factory default configuration, which is: System IP: 192.168.1.1; username: netscreen; password: netscreen. Would you like to continue? y/[n]
   ```

4. Press **y** to reset the device.

   You can now log in using **netscreen** as the default admin name and password.
Chapter 4
Servicing the Device

This chapter details service and maintenance of various components in your NetScreen-5000 Series system. Topics in this chapter include:

- “Removing and Reseating Modules” on page 45
- “Replacing a DC Power Supply” on page 47
- “Replacing an AC Power Supply” on page 48
- “Replacing the Fan Module” on page 48
- “Connecting and Disconnecting Gigabit Ethernet Cables” on page 54
- “Removing and Installing SFP and XFP Transceivers” on page 55

Removing and Reseating Modules

Although NetScreen-5000 Series modules are preinstalled before shipping, you may find it necessary to remove or reseat modules to suit the special security needs of your network.

**WARNING:** Always be sure the chassis power switch is off before you remove or install a Secure Port Module (SPM) or management module.

To remove a module from a NetScreen-5000 Series system:

1. Release the module from the chassis by loosening the screws.
2. Rotate the ejector/injector levers to disengage the module from the backplane.
3. Gently slide the module card out of the chassis.

To install a module in a NetScreen-5000 Series system:

1. Be sure the module is right-side-up and the ejector/injector levers are extended.

2. Slide the module into the appropriate slot of the chassis, until it is seated in the backplane.

3. To secure the module in the chassis, close the ejector/injector levers by pushing on them toward the center of the module.
Replacing a DC Power Supply

**WARNING:** Before replacing a power supply, you must shut off current to the DC feed wires that lead to the power supply. Also, be sure that the power switch is in the off position (right side pressed in).

To replace a DC power supply:

1. Turn off the power supply.
2. Loosen the retaining screws on the terminal block.
3. Remove the feed wires.
4. Turn the thumbscrew counterclockwise to release the power supply.
5. Lift and grip the lever, and then gently pull the power supply straight out.
6. Insert the new power supply into the bay.
7. Secure the power supply in place by tightening the thumbscrew clockwise.
8. Reconnect the wires as explained in “Installing and Wiring a DC Power Supply” on page 26.
Replacing an AC Power Supply

To replace an AC power supply:

1. Turn off the power supply.
2. Lift the AC power cord retainer clip.
3. Unplug the cord from the power supply.
4. Turn the thumbscrew counterclockwise to release the power supply.
5. Lift and grip the lever, and then gently pull the power supply straight out.
6. Insert the new power supply into the bay.
7. Secure the power supply in place by tightening the thumbscrew clockwise.
8. Lift the retainer clip, and then plug the power cord into the power supply.
9. Press the retainer clip over the cord, securing it in place.

Replacing the Fan Module

The front panel of each device includes an air vent for cooling purposes. The NetScreen-5000 Series fan modules differ according to the device model:

- The NetScreen-5200 fan module has three fans.
- The NetScreen-5400 fan module has two fans.

When a fan or fan module fails, the Fan LED glows red, and the system generates an event alarm and a SNMP trap. Although a NetScreen-5000 Series system can operate with a fan out of service, it is advisable to replace the fan module as soon as possible.

When you remove the fan module, you must reinstall it (or replace it) within two minutes, or system failure can occur.

If the temperature alarm continues to display, we recommend inspecting the fan filter. To remove a filter cover and replace a filter, use the procedures described in this section.

⚠️ WARNING: If the device becomes too hot, then the system shuts down automatically.
NOTE: During the one-year warranty period, you can obtain a replacement fan module by contacting Juniper Networks Technical support. After the warranty period, contact the Juniper Networks Sales department to renew your support contract.

Depending on the working environment where the device is located, we recommend changing the fan filter every six months. The fan filter SKU number is NS-5200-FLTR or NS-5400-FLTR.

**NetScreen-5200 Fan Module**

Figure 20 shows the location of the fan lever on the NetScreen-5200.

**Figure 20: NetScreen-5200 Fan Module**

To remove the fan module on a NetScreen-5200, perform the following steps:

1. Pull the fan lever until it is fully extended.
2. Grip the sides, then gently slide the assembly straight out.

**WARNING:** Do not remove the fan module while the fans are still spinning.
3. Insert the new fan module in the fan bay, then push it straight in.

4. Secure the fan module in place by pushing the fan lever flat against the front panel.

**NetScreen-5200 Fan-Tray Filter**

Before you replace the fan-tray filter, make sure you have the following tools:

- Flashlight or other light source
- 18-inch wooden ruler

To replace the fan-tray filter:

1. Remove the fan tray (see “NetScreen-5200 Fan Module” on page 49).
2. Pull the front edge of the filter from the Velcro backing.
3. Insert a wooden ruler between the filter and the chassis wall.
4. Push the wooden ruler toward the back of the chassis, gently lifting the filter as you proceed.

5. Once the filter is separated from the Velcro backing, use your fingers to pull the filter out of the fan-tray slot.

**Figure 23: Removing a NetScreen-5200 Fan-Tray Filter**

6. Carefully insert a new filter into the chassis. Use the wooden ruler as an aid to guide the back edge of the filter to reach the end of the Velcro wall.

7. Once the filter is fully inserted, push the wooden ruler against the filter's surface several times to ensure that the filter is secure against the chassis wall.

**NOTE:** Make sure that the filter is secure against the Velcro wall; otherwise, the filter will tear when you reinstall the fan.

8. Insert the fan tray into the chassis.

9. Lock the fan lever.
To replace the fan module on a NetScreen-5400:

1. Loosen the top and bottom thumbscrews with a phillips screwdriver, turning them counterclockwise.

2. Grip the screws, and then gently slide the fan module out.

**WARNING:** Do not remove the fan module while the fans are still spinning.

3. Align the new fan module in the fan bay, and then push it straight in.
4. Secure the fan module in place by tightening the thumbscrews clockwise.

**NetScreen-5400 Fan-Tray Filter**

To replace the fan-tray filter:

1. Remove the fan tray (see “NetScreen-5400 Fan Module” on page 52).

2. Lay the fan-tray on a table filter-side up.

3. Pull the filter from the Velcro backing.
4. Replace the filter.

5. Align the new fan module in the fan bay, and then push it straight in.

6. Secure the fan module in place by tightening the thumbscrews clockwise.

**Connecting and Disconnecting Gigabit Ethernet Cables**

To connect a Gigabit Ethernet cable to a Small Form factor Pluggable (SFP) connector transceiver port:

1. Hold the cable clip firmly but gently between your thumb and forefinger, with your thumb on top of the clip and your finger under the clip. (Do not depress the clip ejector on top of the clip.)

2. Slide the clip into the transceiver port until it clicks into place. Because the fit is close, you may have to apply some force to seat the clip. Apply force evenly and gently to avoid clip breakage.

To remove the cable from the transceiver port:

1. Make sure the black transceiver ejector under the port is not pressed in; otherwise, when you attempt to remove the cable, the transceiver might come out with the cable still attached.

2. Hold the cable clip firmly but gently between your thumb and forefinger, with your thumb on top of the clip and your finger under the clip.

3. Use your thumb to gently press the clip ejector on top of the clip, first down and then forward. This action loosens the clip from the transceiver port.

4. Pull the clip from the transceiver port.
Removing and Installing SFP and XFP Transceivers

To remove an SFP or XFP transceiver from a module:

1. Push in the black ejector (located on the underside of the transceiver) until it locks into place, disengaging the transceiver.

2. Grasp the transceiver at both sides, and then pull the transceiver toward you to remove it from the module.

To install an SFP or XFP transceiver into a module:

1. Grasp the transceiver with the label facing up, and then insert it into the transceiver slot until seated.

2. Check to see if the black transceiver ejector extends fully out to the front of the ejector slot, flush with the port portion of the transceiver.
Removing and Installing SFP and XFP Transceivers
Appendix A

Specifications

This appendix provides general system specifications for the NetScreen-5000 Series security devices.

- “Physical” on page 57
- “Electrical” on page 58
- “Environmental” on page 58
- “Certifications” on page 58
- “Connectors” on page 59

**Physical**

Table 9 lists the physical specifications for NetScreen-5000 Series devices.

<table>
<thead>
<tr>
<th>Specification</th>
<th>NetScreen-5200</th>
<th>NetScreen-5400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>3.4 inches (8.6 cm)</td>
<td>8.62 inches (21.89 cm)</td>
</tr>
<tr>
<td>Depth</td>
<td>19.5 inches (49.5 cm)</td>
<td>14 inches (35 cm)</td>
</tr>
<tr>
<td>Width</td>
<td>17.5 inches (44 cm)</td>
<td>17.5 inches (44.5 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>32 pounds (15 kg) without power supply</td>
<td>42 pounds (19 kg) without power supply</td>
</tr>
</tbody>
</table>
**Electrical**

Table 10 lists the electrical specifications for the NetScreen-5000 Series device.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC voltage</td>
<td>100-240 VAC +/- 10%</td>
</tr>
<tr>
<td>AC Watts</td>
<td>150</td>
</tr>
<tr>
<td>DC Watts</td>
<td>150</td>
</tr>
<tr>
<td>Fuse Rating</td>
<td>AC: 3.15 Amps/240 Volts DC: 6 Amps / 250 Volts (NetScreen-5200) and 12 Amps / 250 Volts (NetScreen-5400)</td>
</tr>
</tbody>
</table>

**Environmental**

Table 11 lists the environmental specifications for the NetScreen-5000 Series device.

<table>
<thead>
<tr>
<th>Environment</th>
<th>Operating</th>
<th>Nonoperating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>32-105°F, 0°-40°C</td>
<td>-40°-158°F, -40°-70°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10-90%</td>
<td>5-95%</td>
</tr>
<tr>
<td>Noncondensing</td>
<td>10-90%</td>
<td>5-95%</td>
</tr>
</tbody>
</table>

The maximum normal altitude is 12,000 ft. (0-3,660 m).

**Certifications**

Table 12 provides the certifications available for the NetScreen-5000 Series device.

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEBS</td>
<td>Level 3 NetScreen-5200 with DC power supply:</td>
</tr>
<tr>
<td></td>
<td>■ GR-63-Core: NEBS, Environmental Testing</td>
</tr>
<tr>
<td></td>
<td>■ GR-1089-Core: EMC and Electrical Safety for Network Telecommunications Equipment</td>
</tr>
<tr>
<td>Safety</td>
<td>UL, CUL, CSA, CE, CB</td>
</tr>
<tr>
<td>EMI</td>
<td>FCC class A, CE class A, C-Tick, VCCI class A</td>
</tr>
</tbody>
</table>

1 NEBS certification is currently not available on the 5000-M2 or 5000-MGT3 management modules.
Connectors

The RJ-45 twisted-pair ports are compatible with the IEEE 802.3 Type 10/100 Base-T standard.

The mini-Gigabit transceivers used in NetScreen-5000 Series modules are Shortwave or SX type, so they are capable of distances up to 550 meters. (This varies by manufacturer.) The limit is 850 meters for the optic LC-type connector. The mini-Gigabit transceivers are compatible with the IEEE 802.3z Gigabit Ethernet standard.

Table 13 lists the 1-Gigabit media types and distances for the different types of connectors used with the NetScreen-5000 Series systems.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Media Type</th>
<th>Mhz/Km Rating</th>
<th>Maximum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 Base-SX</td>
<td>50/125µm Multimode Fiber</td>
<td>400</td>
<td>500 m</td>
</tr>
<tr>
<td></td>
<td>50/125µm Multimode Fiber</td>
<td>500</td>
<td>550 m</td>
</tr>
<tr>
<td></td>
<td>62.5/125µm Multimode Fiber</td>
<td>160</td>
<td>220 m</td>
</tr>
<tr>
<td></td>
<td>62.5/125µm Multimode Fiber</td>
<td>200</td>
<td>275 m</td>
</tr>
<tr>
<td>1000 Base-LX</td>
<td>50/125µm Multimode Fiber</td>
<td>400</td>
<td>550 m</td>
</tr>
<tr>
<td></td>
<td>62.5/125µm Multimode Fiber</td>
<td>500</td>
<td>550 m</td>
</tr>
<tr>
<td></td>
<td>9/125µm Single-mode Fiber</td>
<td></td>
<td>10,000 m</td>
</tr>
<tr>
<td>100 Base-TX</td>
<td>Category 5 and higher Unshielded Twisted Pair (UTP) Cable</td>
<td></td>
<td>100 m</td>
</tr>
</tbody>
</table>

Table 14 lists the 10-Gigabit media types and distances for the different types of connectors used with the NetScreen-5000 Series systems.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Media Type</th>
<th>Mhz/Km Rating</th>
<th>Maximum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 Base-SR</td>
<td>62.5/125µm Multimode Fiber</td>
<td>160</td>
<td>220 m</td>
</tr>
<tr>
<td></td>
<td>62.5/125µm Multimode Fiber</td>
<td>200</td>
<td>275 m</td>
</tr>
<tr>
<td>1000 Base-LR</td>
<td>9/125µm Single-mode Fiber</td>
<td></td>
<td>10,000 m</td>
</tr>
</tbody>
</table>
Appendix B
Port Descriptions and LED Status

This appendix provides detail on port descriptions and LED status for the NetScreen-5000 Series modules.

- “Module Port Descriptions” on page 61
- “Module LED Descriptions” on page 62
- “Status LED States” on page 62
- “Power Supply LEDs” on page 64
- “Fan LED” on page 65

Module Port Descriptions

Table 15 details the ports on the 5000-M, 5000-M2, and 5000-MGT3 management modules.

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
<th>Type</th>
<th>Speed/Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Console</td>
<td>Enables a serial connection, to establish terminal sessions with the system. Used for launching CLI sessions.</td>
<td>RJ-45</td>
<td>9600 Bps/RS-232</td>
</tr>
<tr>
<td>Modem</td>
<td>Enables a serial modem connection for establishing dial-up sessions.</td>
<td>RJ-45</td>
<td>9600 Bps/RS-232</td>
</tr>
<tr>
<td>MGT</td>
<td>Enables a connection for establishing out-of-band management sessions from outside of the network.</td>
<td>RJ-45</td>
<td>10/100 Mbps/Ethernet</td>
</tr>
<tr>
<td>HA1</td>
<td>Enables connection with another device in a redundancy cluster, where one device serves as the master (primary) device, and the other serves as the backup (secondary) device.</td>
<td>SFP</td>
<td>1 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td>HA2</td>
<td>Enables connection with another device in a redundancy cluster, where one device serves as the master (primary) device, and the other serves as the backup (secondary) device.</td>
<td>SFP</td>
<td>1 Gbps/Gigabit Ethernet</td>
</tr>
</tbody>
</table>
Table 16 details the ports on the 5000-8G, 5000-8G2 and 5000-8G2-G4 Secure Port Modules (SPMs).

Table 16: NetScreen-5000 Series Secure Port Module Ports

<table>
<thead>
<tr>
<th>SPM Type</th>
<th>Port</th>
<th>Description</th>
<th>Type</th>
<th>Speed/Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000-8G</td>
<td>Network Ports 1-8</td>
<td>Eight 1 Gigabit ports with an aggregate throughput of 4Gbps.</td>
<td>SFP</td>
<td>1 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td>5000-8G2</td>
<td>Network ports 1</td>
<td>Eight 2-Gigabit ports with an aggregate throughput of 8 Gbps.</td>
<td>SFP</td>
<td>2 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>through 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000-8G2-G4</td>
<td>Network ports 1</td>
<td>Eight 2-Gigabit ports with an aggregate throughput of 8 Gbps.</td>
<td>SFP</td>
<td>2 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>through 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000-2G24FE</td>
<td>Network ports 1 and</td>
<td>Two high-speed network ports for general connection to the network.</td>
<td>SFP</td>
<td>1 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Network ports 3</td>
<td>Twenty-four network ports for general connection to the network.</td>
<td>RJ-45</td>
<td>10/100 Mbps/Ethernet</td>
</tr>
<tr>
<td></td>
<td>through 26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000-2XGE</td>
<td>Network ports 1 and</td>
<td>Two 10-Gigabit Ethernet XFPs with a throughput of 10 Gbps.</td>
<td>XFP</td>
<td>10 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000-2XGE-G4</td>
<td>Network ports 1 and</td>
<td>Two 10-Gigabit Ethernet XFPs with a throughput of 10 Gbps.</td>
<td>XFP</td>
<td>10 Gbps/Gigabit Ethernet</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Module LED Descriptions

This section provides descriptions of the LEDs on NetScreen-5000 Series modules. Two types of LEDs exist on the modules:

- **Status LEDs.** These LEDs reflect certain conditions that exist on the system at large and do not explicitly refer to a given port.
- **Port LEDs.** These LEDs reflect basic conditions (for example, a link connection status) that exist for a specific port.

Status LED States

This section describes Status LED states on all modules.

Interpreting Status LEDs for the Management Modules

The Status LEDs indicate whether the management module is operating properly. Table 17 describes the status possibilities for each.

Table 17: Management Module Status LEDs  (Page 1 of 2)

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Green</td>
<td>Consists of an array of five LEDs that indicate the current level of CPU utilization. Utilization is defined as the amount of traffic detected on the device at any given time. The CPU utilization LEDs represent the following percentages of possible utilization: 5%, 10%, 25%, 50%, and 90%.</td>
</tr>
<tr>
<td>Off</td>
<td></td>
<td>When all are off, indicates less than 5 percent CPU use.</td>
</tr>
</tbody>
</table>
Table 17: Management Module Status LEDs (Page 2 of 2)

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Green</td>
<td>The system is receiving power.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The system is not receiving power.</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>The power has a problem.</td>
</tr>
<tr>
<td>STATUS</td>
<td>Blinking green</td>
<td>The system is operational.</td>
</tr>
<tr>
<td></td>
<td>Blinking amber</td>
<td>The system is booting up.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The module is not operational.</td>
</tr>
<tr>
<td>HA</td>
<td>Green</td>
<td>The module is a master in a redundancy cluster.</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>The module is ineligible to be a backup.</td>
</tr>
<tr>
<td></td>
<td>Amber</td>
<td>The module is a backup in a redundancy cluster.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No HA activity has been defined.</td>
</tr>
<tr>
<td>ALARM</td>
<td>Red</td>
<td>An alarm that could mean a system failure.</td>
</tr>
<tr>
<td></td>
<td>Blinking red</td>
<td>A self-test failure occurred during startup.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The system has not detected an event or error at the current time.</td>
</tr>
<tr>
<td>FLASH</td>
<td>Green</td>
<td>The flash card is installed.</td>
</tr>
<tr>
<td></td>
<td>Blinking green</td>
<td>Flash card activity.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No flash card is loaded in the flash card slot.</td>
</tr>
</tbody>
</table>

Interpreting Status LEDs for the Secure Port Module

The Status LEDs indicate whether the Secure Port Module is operating properly. Table 18 describes the status possibilities for each.

Table 18: Secure Port Module Status LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Green</td>
<td>The system is receiving power.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The system is not receiving power.</td>
</tr>
<tr>
<td></td>
<td>Amber</td>
<td>The system has initially received power.</td>
</tr>
<tr>
<td>STATUS</td>
<td>Blinking green</td>
<td>The system is up and operational and that the power source is working properly.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>The system has a problem.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The Secure Port Module is not operational.</td>
</tr>
</tbody>
</table>
**Interpreting Ethernet Port Status LEDs for All Modules**

The port Status LEDs indicate whether any of the ports on the modules are operating properly. Table 19 describes the status possibilities for each.

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINK</td>
<td>Green</td>
<td>A successful link has been established.</td>
</tr>
<tr>
<td></td>
<td>Blinking green</td>
<td>The port is attempting to establish a link.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The port has not established a link with another device.</td>
</tr>
<tr>
<td>TX/RX</td>
<td>Green</td>
<td>The port is successfully passing packets back and forth to a destination device.</td>
</tr>
<tr>
<td></td>
<td>Blinking green</td>
<td>The port is attempting to pass packets back and forth to a destination device.</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>The port does not have a device connected to it.</td>
</tr>
</tbody>
</table>

**Power Supply LEDs**

The following tables describe LED behaviors on the 5000-M and 5000-M2 for different combinations of functioning power supplies.

**Interpreting Power Supply LED Status for the NetScreen-5200**

Table 20 details the LED behaviors on the 5000-M and 5000-M2 for different combinations of functioning power supplies on the NetScreen-5200.

<table>
<thead>
<tr>
<th>Power Supply 1 Present</th>
<th>Power Supply 2 Present</th>
<th>Power LED</th>
<th>Alarm LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Green</td>
<td>Off</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes (not functioning or turned off)</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Green</td>
<td>Off</td>
</tr>
</tbody>
</table>

**Interpreting Power Supply LED Status for the NetScreen-5400**

The status of the Power and Alarm LEDs depends upon whether the NetScreen-5400 contains a single Secure Port Module (SPM) or multiple SPMs.

**Single SPM Installed**

Table 21 describes the LED behaviors for different combinations of functioning power supplies when there is only one SPM installed.
Table 21: LED Behaviors As Affected by Power Supplies (NetScreen-5400)

<table>
<thead>
<tr>
<th>Power Supply 1 Present</th>
<th>Power Supply 2 Present</th>
<th>Power Supply 3 Present</th>
<th>Power LED</th>
<th>Alarm LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Green</td>
<td>Off</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes (not functioning or turned off)</td>
<td>No</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Green</td>
<td>Off</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes (not functioning or turned off)</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Green</td>
<td>Off</td>
</tr>
</tbody>
</table>

**Fan LED**

Table 22 describes the Fan LED on both the NetScreen-5200 and NetScreen-5400 chassis.

Table 22: Fan LED on NetScreen-5200 and NetScreen-5400

<table>
<thead>
<tr>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Fans are operating</td>
</tr>
<tr>
<td>Off</td>
<td>Power is off</td>
</tr>
</tbody>
</table>
### Index

#### Numerics

<table>
<thead>
<tr>
<th>Item</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000-2G24FE</td>
<td>17</td>
</tr>
<tr>
<td>5000-2XGE</td>
<td>16</td>
</tr>
<tr>
<td>5000-2XGE-G4</td>
<td>16</td>
</tr>
<tr>
<td>5000-8G</td>
<td>15</td>
</tr>
<tr>
<td>5000-8G2</td>
<td>16</td>
</tr>
<tr>
<td>5000-8G2-G4</td>
<td>64</td>
</tr>
<tr>
<td>5000-M</td>
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