



LN1000-V™ Mobile Secure Router

Hardware Guide



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Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

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Writing: Mary Schatzkin
Editing: Benjamin Mann
Illustration: Nathaniel Woodward
Cover Design: Edmonds Design

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About the Documentation

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JUNOS Documentation and Release Notes

For a list of related JUNOS documentation, see
<http://www.juniper.net/techpubs/software/junos/>.

If the information in the latest release notes differs from the information in the documentation, follow the *JUNOS Release Notes*.

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at
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Objectives

This documentation describes hardware components, installation, basic configuration, and basic troubleshooting procedures for the Juniper Networks LN1000-V Mobile Secure Router. It explains how to prepare your site for router installation, unpack and install the hardware, power on the router, perform initial software configuration, and perform routine maintenance. After completing the installation and basic configuration procedures covered in this documentation, see the Junos OS configuration guides for information about further Junos OS configuration.



NOTE: For additional information about Juniper Networks routers and the Physical Interface Cards (PICs) they support—either corrections to or information that might have been omitted from this guide—see the hardware release notes at
<http://www.juniper.net/>.

Audience

This documentation is designed for network administrators who are installing and maintaining a Juniper Networks router or preparing a site for router installation. To use the documentation, you need a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. Any detailed discussion of these concepts is beyond the scope of this hardware documentation.

Documentation Conventions

Table 1 on page xiv defines the notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2 on page xiv defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (<i>string1</i> <i>string2</i> <i>string3</i>)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols>Ospf .

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- Document or topic name
- URL or page number
- Software release version (if applicable)

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- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

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For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html> .

PART 1

Overview of the LN1000-V Mobile Secure Router

- LN1000-V Mobile Secure Router Overview on page 3
- Unpacking and Inspecting the LN1000-V Mobile Secure Router Hardware on page 7
- Installing the LN1000-V Mobile Secure Router on page 9
- Troubleshooting Router Boot-Up and Operation on page 13
- Safety Requirements, Warnings, and Guidelines on page 15
- Specifications on page 17
- Contacting Customer Support and Returning Hardware on page 19

CHAPTER 1

LN1000-V Mobile Secure Router Overview

- LN1000-V Mobile Secure Router Description on page 3
- LN1000-V Mobile Secure Router Features on page 4

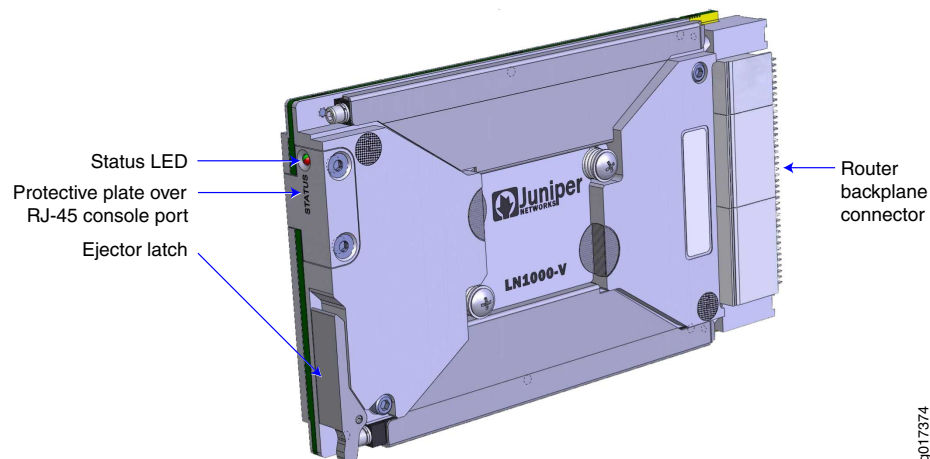
LN1000-V Mobile Secure Router Description

The LN1000-V Mobile Secure Router is an embedded router that operates in both wire-line and wireless environments with communication nodes that are either mobile or stationary. The router provides reliable and secure data, voice, and video services. The LN1000-V processes WAN and LAN routing functions. The router offers multiple DiffServ classes and can interleave lower priority real-time data (voice traffic) with higher priority non-real-time data. It is developed on 3U compact node slot interface (VITA) architecture as defined in the VITA 46.0 IEEE 1101.2 specifications and runs Junos OS for routing, forwarding, and security.

The LN1000-V Mobile Secure Router can be used effectively in the following environments:

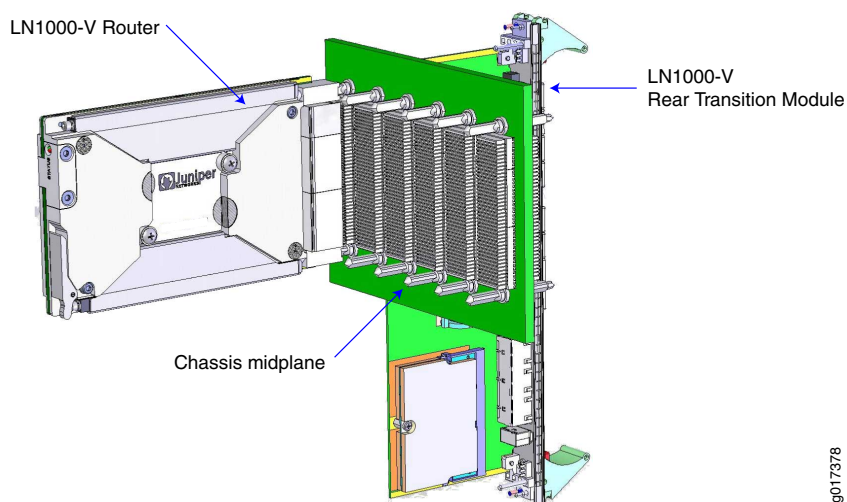
- Defense communities
- Public sector safety organizations, such as first responders

Figure 1: LN1000-V Mobile Secure Router



You can install the LN1000-V router in a standard VITA 46.0-compliant chassis. Optionally, you can install it in a VITA 46.0-compliant chassis with a midplane and an LN1000-V rear transition module.

Figure 2: LN1000-V Mobile Secure Router Installed with an LN1000-V Rear Transition Module



- Related Topics**
- LN1000-V Mobile Secure Router Features on page 4
 - Installing the LN1000-V Router on page 10
 - LN1000-V Rear Transition Module Description on page 23

LN1000-V Mobile Secure Router Features

- Router Backplane Connector on page 4
- Ethernet Ports on page 5
- IPMI Interface on page 5
- Router Console Port on page 5
- Tamper-Evident Seals on page 5

Router Backplane Connector

An external interface, located on the back of the LN1000-V router, connects the router to the VITA 46.0-compliant chassis. The router's P0, P1, and P2 connectors plugging into the backplane are VITA 46.0-compatible for a 3U peripheral slot with specific key definitions. The P0 and P2 connectors are keyed per the VITA 46.12 specification. Power to the LN1000-V router is provided through the P0 connector.

- Related Topics**
- LN1000-V Mobile Secure Router Description on page 3

Ethernet Ports

The LN1000-V router supports up to eight ports of gigabit Ethernet traffic with up to 1024 logical interfaces. The router supports most Layer 2 and Layer 3 protocols, route redistribution, tunneling, multicast, routine quality of service (QoS), and security.

The eight gigabit Ethernet ports on the LN1000-V router are 1000Base-X interfaces with autonegotiation on by default. The Ethernet ports on the router interface with the chassis in which it is installed or with the LN1000-V rear transition module, if installed in a chassis.

- Related Topics**
- LN1000-V Mobile Secure Router Description on page 3

IPMI Interface

The LN1000-V router supports the Intelligent Platform Management Interface (IPMI) in accordance with the VITA 46.0 specification. The IPMI controller on the LN1000-V router is a secondary controller while the IPMI Shelf Manager operates as the primary controller. The IPMI Shelf Manager is not supplied by default; it is available as an option.

- LN1000-V Mobile Secure Router Description on page 3

Router Console Port

The router's RS-232 console port has a baud rate of 9600 8N1 and is located on the left side of the LN1000-V router's front panel. The console port is used primarily for depot repair. It is covered by a protective aluminum plate that prevents access to the port. When the LN1000-V router is operational and installed in a chassis, even though you can remove the protective aluminum plate to access the console port on the router, typically you access the console port using one of the following methods:

- On the chassis backplane when the router is installed in VITA 46.0-compliant chassis
- On the front panel of the rear transition module when the router is installed in a VITA 46.0-compliant chassis with a LN1000-V rear transition module

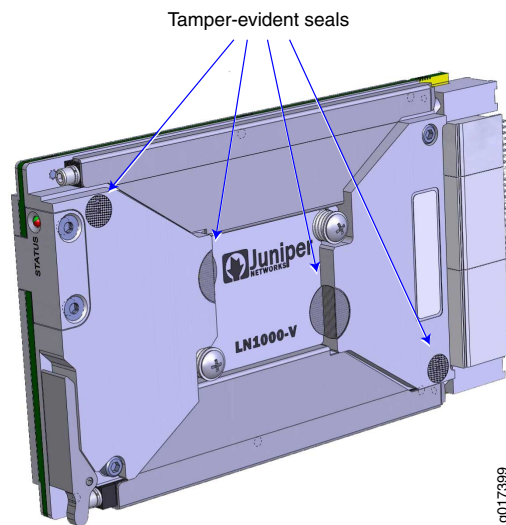
Tamper-Evident Seals

Four tamper-evident seals are affixed to the router to show evidence of tampering with the router's internal components. Two small silver disks, which have two small holes in them, are located over the top-left and bottom-right screws that hold the router assembly together. Two larger, bright silver seals span the processor backer plate and primary side cover.



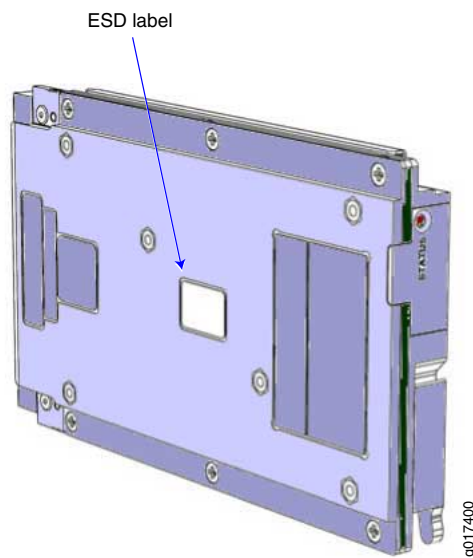
WARNING: If any of these seals are removed or peeled off the router, the router's internal components can be exposed to electrostatic discharge (ESD), compromising the integrity of the router, which voids the router's warranty.

Figure 3: Tamper-Evident Seals



An ESD warning label is located on the back of the router.

Figure 4: ESD Warning Label



Related Topics • [LN1000-V Mobile Secure Router Description on page 3](#)

CHAPTER 2

Unpacking and Inspecting the LN1000-V Mobile Secure Router Hardware

- Unpacking the LN1000-V Router on page 7
- Inspecting the Hardware on page 7
- If You Detect or Suspect Damage on page 8

Unpacking the LN1000-V Router

The router is shipped in a cardboard carton, secured with packing material.

Before you begin unpacking the router, be sure you have a utility knife to open the box.



NOTE: Be sure to retain all packaging materials in the event that you need to return items for repair.

To unpack the LN1000-V router:

1. Open the box from the top to access the router in its protective package.
2. Remove the router and its protective package from the box.
3. Remove the protective packaging from the router.

Related Topics • Before You Install the LN1000-V Router on page 9

Inspecting the Hardware

After you remove the equipment from the shipping container:

- Confirm the contents of the container.
- Inspect all external surfaces and external connectors for visible signs of damage.
- Inspect all accessories shipped with each unit.
- Document any damage noted during your inspection.

Related Topics • If You Detect or Suspect Damage on page 8

If You Detect or Suspect Damage

If you detect or suspect damage to any equipment:

- Contact the shipper responsible for delivery, and formally report the damage.
- Contact your Juniper Networks sales representative or reseller.

Related Topics • Information You Might Need to Supply to JTAC on page 19

CHAPTER 3

Installing the LN1000-V Mobile Secure Router

- Before You Install the LN1000-V Router on page 9
- Installing the LN1000-V Router on page 10
- Removing the LN1000-V Mobile Secure Router on page 10
- Powering On the LN1000-V Mobile Secure Router on page 11
- Configuring and Operating the Router on page 12

Before You Install the LN1000-V Router

Before installing the LN1000-V router, be sure you have:

- A 3/32 Allen wrench with a torque of 5 inch-pounds (in-lb).
- Copper or fiber optic Ethernet cables (up to nine for each router)



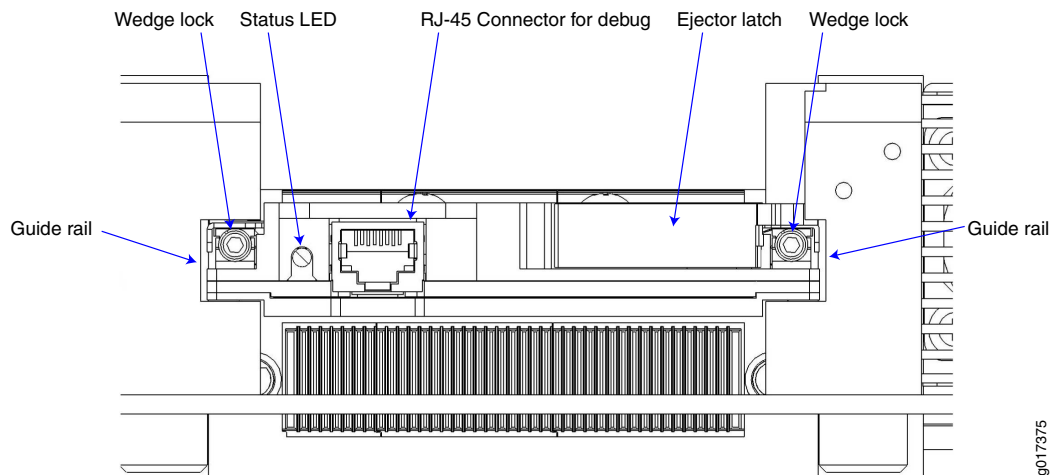
NOTE: You must provide up to nine Ethernet cables.

- Power to the chassis turned off

Related Topics • LN1000-V Mobile Secure Router Description on page 3

Installing the LN1000-V Router

Figure 5: LN1000-V Mobile Secure Router — Front Panel



To install the LN1000-V router in a VITA 46.0-compliant chassis:

1. Insert the router into the guide rails located on the front of the chassis.
2. Slide the router forward until the connector on the router's back panel contacts the connector in the chassis.
3. Push in the injector/ejector latch on the right side of the router front panel to complete the installation. If your chassis is not equipped to utilize the injector/ejector latch to assist in insertion, press the front surface of the LN1000-V router until its connector is fully seated in the chassis.
4. Using the 3/32 Allen wrench, tighten the two wedge locks to a torque of 5 in-lb.



CAUTION: The guide rails provide cooling to the conduction-cooled router. If you do not properly tighten the wedge locks, the router can overheat and fail.

Related Topics

- Before You Install the LN1000-V Router on page 9
- Powering On the LN1000-V Mobile Secure Router on page 11

Removing the LN1000-V Mobile Secure Router

The LN1000-V router is hot-swappable; power can be left on while you remove or replace a router module without damage to the router or backplane.

To remove the router from the chassis:

1. Using a 3/32 Allen wrench, loosen the two wedge locks on the front panel of the LN1000-V router.

2. Lift the injector/ejector latch on the right side of the router front panel to disengage the connector on the router from the backplane connector.
3. Slide the router out of the guide rails.

Related Topics • LN1000-V Mobile Secure Router Description on page 3

Powering On the LN1000-V Mobile Secure Router

The LN1000-V router derives its power from the chassis in which it is installed; it automatically powers on when inserted into the connector in the VITA 46.0-compliant chassis.

Monitor router startup on the console and the LED on the front panel of the LN1000-V router to verify that the router is booting properly.

As a standard part of the boot process, the router runs startup power-on self test (SPOST) and then power-on self test (POST) diagnostics. A successful startup looks similar to the following example:

```
CPU Memory (Data32: 00000000-0007ffff) test completed, 1 pass, 0 errors
CPU Memory (Data32: 0f000000-0fffffff) test completed, 1 pass, 0 errors
CPU Memory (Addr32: 00000000-0007ffff) test completed, 1 pass, 0 errors
CPU Memory (Addr32: 0f000000-0fffffff) test completed, 1 pass, 0 errors
```

```
Boot Flash: 16 MB in 131 Sectors (portwidth: 16bit chipwidth: 16bit)
OCTEON CN56XX pass 2.0, Core clock: 600 MHz, DDR clock: 266 MHz
```

Initializing USB

```
Device 1:
  Product      DOTG Root Hub
Device 2:
  Manufacturer
  Product      USB Flash Memory
  SerialNumber 00147808E485C92043770566
```

Initializing IDE

```
Initializing FPGA
Programming /cf/usr/share/pfe/firmware/563-029572.bit: 2067590 bytes
Programmed successfully (time: 883475051 ticks)
Checking for init_data
No init_data
PCIE: Waiting for port 0 link
PCIE: Port 0 link active, 1 lanes
Probing PCIE port 0
0:00:00.0 0x003b1304
PCIE port 0 had 1 busses
HWA FPGA Version 0x0004090900000013
PCIE: Waiting for port 1 link
PCIE: Port 1 link active, 4 lanes
Probing PCIE port 1
1:00:00.0 0x0009184e
PCIE port 1 had 1 busses
IDP Revision Date-Time: 05/28/08-18:00:00
```

Enumeration took 0 reboots

Juniper LN1000-V revision 2.0, Serial# *****
Juniper Part # 710-027379 Bootstrap version 10.0I

Build: 10.0B3.7 #0: 2009-09-25 16:36:56 UTC
builder@ormonth.juniper.net

SDRAM: 1024 MB
Boot flash: 16 MB @ 0x1fc00000
IDE flash: 977.4 MB (2001888 x 512)
USB: 1.8 GB (3911616 x 512)
current_dev: ide
coremask: 0xffff (12 cores)
resetmask: 0xffe (1 cores running)
reset: Hard
NVMRO: Write-enabled
watchdog: Armed
FPGA: Enabled

Hit any key to stop autoboot: 10
IPMC test
IPMC test completed, 1 pass, 0 errors, 0 warnings

BOOT >

For normal operation, allow the autoboot to proceed. Full POST diagnostics then run, and the system starts Junos OS normally. If detailed diagnostics must be run, or if alternate media (for example, a USB storage device) must be booted, press ENTER during the 10-second count-down. The following bootstrap prompt is displayed:

BOOT>

If POST diagnostics or the bootstrap sequence fails, this prompt is redisplayed, and the front panel LED lights red.

- Related Topics**
- LN1000-V Router Power Requirements on page 17
 - Diagnostic Tests on page 13
 - LN1000-V Rear Transition Module Front Panel Status LEDs on page 33

Configuring and Operating the Router

You are now ready to configure routing on your system. For specific routing configuration options available for the router, see the *LN1000 Mobile Secure Router User Guide*.

CHAPTER 4

Troubleshooting Router Boot-Up and Operation

- Diagnostic Tests on page 13
- LN1000-V Mobile Secure Router Status LED on page 13

Diagnostic Tests

Startup power-on self test (SPOST) and power-on self test (POST) diagnostic tests run automatically on the LN1000-V Mobile Secure Router as part of the boot-up process at every poweron, reset, or warm reboot. SPOST diagnostics consist of a limited suite of quick diagnostics that ensure that system components required for Boot Loader and diagnostics relocation and execution from RAM are working without error. POST diagnostics consist of a suite of quick diagnostics that ensure that components of the system are working without error before trying to load and execute Junos OS. PASS/FAIL test results for the SPOST and POST diagnostics are reported by means of the front panel LED, console port, and IPMI.

In the event that SPOST, POST, or the bootstrap sequence reports a failure and the front panel LED lights red, extended diagnostic tests are available.

For information about running extended diagnostic tests, contact Juniper Networks.

- Related Topics**
- LN1000-V Mobile Secure Router Status LED on page 13

LN1000-V Mobile Secure Router Status LED

Upon initial power-on, the components of the router run boot code, go through a series of self-diagnostic tests, and synchronize with each other. When the tests are complete, use the LED on the router front panel to determine the status of the router.

Table 3: LN1000-V Router LED Status

Color	Meaning
Off; No color	Power is off.
Steady Red	Error condition.

Table 3: LN1000-V Router LED Status (*continued*)

Color	Meaning
Steady Green	Ready for operation. The router is powered on and has successfully booted and run SPOST and POST diagnostics.
Blinking Green	Powering on and then running SPOST and POST diagnostics, or running individual diagnostics, or performing an upgrade.

Related Topics • Access the Extended Diagnostic Tests

CHAPTER 5

Safety Requirements, Warnings, and Guidelines

The router module is designed to protect against the risk of electrical shock and other hazards during installation, operation, and maintenance, and under likely fault conditions, including human error. It complies with grounding requirements of NFPA 70-93, article 250. As a precautionary measure to avoid harm to yourself as you install and maintain the router module, follow the guidelines for working near and with electrical equipment, as well as the safety procedures for working with Internet routers.

CHAPTER 6

Specifications

- LN1000–V Mobile Secure Router Physical Specifications on page 17
- LN1000–V Router Power Requirements on page 17

LN1000–V Mobile Secure Router Physical Specifications

Table 4: LN1000–V Router Physical Specifications

Category	Specification
Height	100 mm/3.937 inches
Card pitch	0.85 inch pitch (4.25 HP)
Length	160 mm/6.3 inches
Size	VITA 48.2, 3U format
Maximum power dissipation	35W
Weight	0.68 kg/1.5 lb

Related Topics • LN1000–V Router Power Requirements on page 17

LN1000–V Router Power Requirements

Power for the LN1000–V Mobile Secure Router is supplied by the chassis in which it is installed when the power to the chassis is turned on. The chassis delivers 5.0 V and 3.3 V power to the LN1000–V router through a standard IDE 4-pin connector.

Related Topics • Powering On the LN1000–V Mobile Secure Router on page 11

CHAPTER 7

Contacting Customer Support and Returning Hardware

- Information You Might Need to Supply to JTAC on page 19
- Packing Instructions for Returning an LN1000-V Router on page 19

Information You Might Need to Supply to JTAC

When requesting technical support from the JTAC by phone, be prepared to provide the following information:

- Priority level
- Indication of what activity was being performed on the router when the problem occurred
- Problem detail and configuration data, obtained by these commands:
 - **show version**
 - **show chassis hardware**
 - **show chassis environment**
 - **show configuration**

When a new request for technical support is submitted, the JTAC engineer:

- Opens a case and assigns a number
- Begins troubleshooting, diagnostics, and problem replication (if appropriate)
- Provides you with periodic updates on problem status and escalates the problem as appropriate according to escalation management guidelines
- Closes the case when you agree that the problem has been resolved

Packing Instructions for Returning an LN1000-V Router

If possible, use the original shipping containers and packing materials in which the LN1000-V hardware was originally shipped. If these materials are unavailable, use

comparable shipping materials, or contact your Juniper Networks representative for information on approved packaging material.

To pack the LN1000-V hardware for shipment, follow these steps:

1. Issue the proper shutdown commands to halt your system.
2. Switch all power switches to the OFF position.
3. Remove the router from the chassis.
4. Place the router in its protective container and then place the router in a box, placing packing foam around the router.

PART 2

LN1000–V Rear Transition Module

- LN1000–V Rear Transition Module Overview on page 23
- Unpacking and Inspecting the LN1000–V Rear Transition Module on page 27
- Installing the LN1000–V Rear Transition Module on page 29

CHAPTER 8

LN1000–V Rear Transition Module Overview

- LN1000–V Rear Transition Module Description on page 23
- LN1000–V Rear Transition Module Features on page 23

LN1000–V Rear Transition Module Description

The LN1000–V rear transition module is a fully compatible, carrier-grade VITA 46.10-compliant I/O rear transition module for the LN1000–V Mobile Secure Router. The 6 rack unit (6RU) form factor, single-slot rear transition module is fully compliant with the PICMG 2.0 Revision 3.0 specification.

The LN1000–V rear transition module requires an VITA 46.0-compliant chassis with a midplane that accommodates front and rear board installations. The primary purpose of this module is to provide rear access connections to the LN1000–V router in a test or repair environment.

LN1000–V Rear Transition Module Features

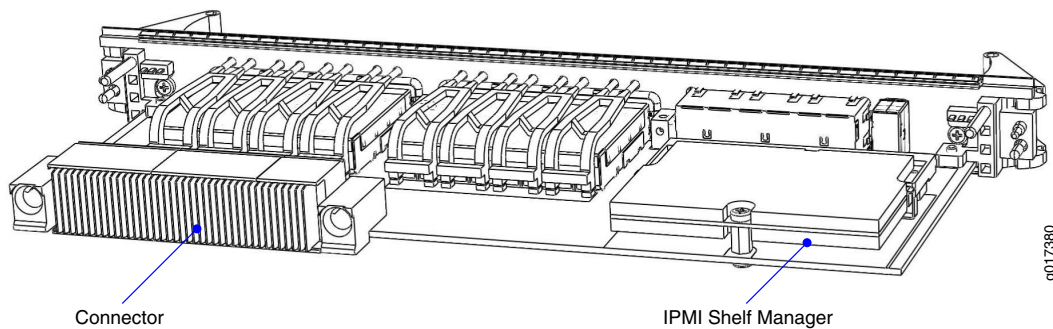
- LN1000–V Rear Transition Module Backplane Connector on page 23
- LN1000–V Rear Transition Module Console Ports on page 24
- IPMI Shelf Manager on page 25
- LN1000–V Rear Transition Module Ethernet Ports on page 25
- LN1000–V Rear Transition Module Switch Settings on page 25

LN1000–V Rear Transition Module Backplane Connector

The connector on the LN1000–V rear transition module provides the ability to configure the router. It also provides:

- Console port access
- IPMI signals
- USB port access
- Ethernet port access

Figure 6: LN1000-V Rear Transition Module — Back View



LN1000-V Rear Transition Module Console Ports

The shMM console port is the console port for the optional shMM module on the RTM. The settings are baud rate of 19200 8N1, no flow control. You can use this port to send and receive debug console commands to and from the shelf manager.

The IPMC console port is the console port for the IPMC controller on the LN1000-V board. The settings are baud rate of 115200 8N1, no flow control. This is a debug output only port.

The RS-232 console port, labeled NPU, accepts an RJ-45 connector and is located on the front panel of the LN1000-V rear transition module. The settings are baud rate of 9600 8N1, no flow control. You can use this console port to monitor system startup and for system repair. This console port is also available from the front panel of the LN1000-V router. See “Router Console Port” on page 4 for more information.

Figure 7: LN1000-V Rear Transition Module — Front Panel

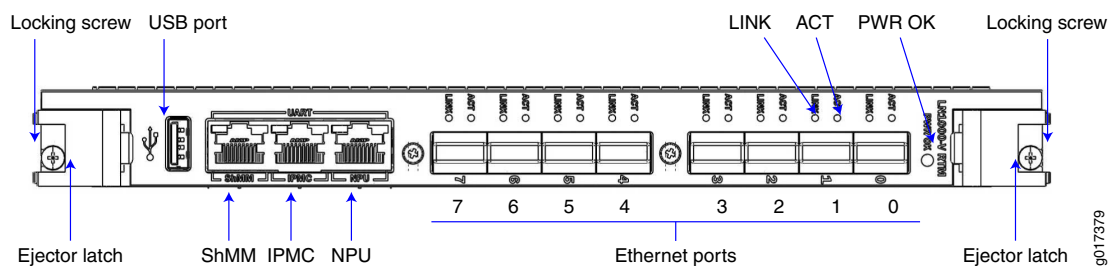


Table 5: Pinouts for the RJ-45 (NPU), shMM, and IPMC Console Port Connectors

Pin	Setting	Description
1	NC	No connect.
2	RXD	Transmit data into the LN1000-V router.
3	TXD	Transmit data out from the LN1000-V router.
4	NC	No connect.
5	GND	Ground.

Table 5: Pinouts for the RJ-45 (NPU), shMM, and IPMC Console Port Connectors (*continued*)

Pin	Setting	Description
6	NC	No connect.
7	NC	No connect.
8	NC	No connect.

IPMI Shelf Manager

The optional IPMI shelf management module provides intelligent management functions for the rear transition module, including sensing the presence of the LN1000-V router, and configuring and booting the router when it is installed in the LN1000-V rear transition module.



NOTE: The IPMI shelf manager is not installed in the LN1000-V rear transition module by default.

The IPMI shelf manager:

- Is implemented as a Small Outline Dual Inline Memory Module (SODIMM) form factor
- Is installed in a board-mounted SODIMM connector on the LN1000-V rear transition module
- Complies with the PICMG 3.0 R2.0 and IPMI v1.5 and implements the IPMI v1.5 functionality on the LN1000-V rear transition module
- Communicates with the IPMI controller on the LN1000-V router

LN1000–V Rear Transition Module Ethernet Ports

The LN1000-V rear transition module includes eight gigabit Ethernet ports to provide Ethernet connectivity. These eight ports connect directly to the chassis midplane, enabling you to connect directly to the Ethernet ports on the LN1000-V router. Ethernet Port 0 is typically used as the management port. Ports 1 through 7 are typically used for data transfer.



NOTE: There is no dedicated management port on the LN1000-V router.

LN1000–V Rear Transition Module Switch Settings

The switch banks on the rear transition module are set as follows:

Switch Bank	Description
S1	No user control. All switches are off for normal operation.

Switch Bank	Description
S2	<ul style="list-style-type: none">• Switch 1, WD_INH_L. This switch has no effect.• Switch 2: NVMRO. This signal controls the ability to write to the system non-volatile memory. This switch is off to allow read-only access to system non-volatile memory. Set this switch to on to enable writing to non-volatile memory. If you set the NVRMO switch to off, note the following precautions:<ul style="list-style-type: none">• Do not boot from USB storage device; router performance will be degraded.• Do not use J-Web; unpredictable results may occur.• Do not use the CLI command request system software add; unpredictable results may occur.• Switches 3 and 4 must be off for normal operation.

CHAPTER 9

Unpacking and Inspecting the LN1000–V Rear Transition Module

- Unpacking the LN1000–V Rear Transition Module on page 27

Unpacking the LN1000–V Rear Transition Module

Before you begin unpacking the LN1000–V rear transition module, be sure you have a utility knife to open the box.



NOTE: Be sure to retain all packaging materials in the event that you need to return items for repair.

To unpack the LN1000–V rear transition module:

1. Open the outer box from the top.
2. Remove the accessories from the box.

The accessories are located between the outer box and the inner box that contains the LN1000–V rear transition module. Accessories include an RJ-45-to-DB-9 adapter.

3. Remove the inner box that contains the LN1000–V rear transition module.
4. Remove the LN1000–V rear transition module from the box and place it in the location you selected.

CHAPTER 10

Installing the LN1000–V Rear Transition Module

- Installing the LN1000–V Rear Transition Module on page 29
- Installing an SFP Transceiver in an LN1000–V RTM on page 30
- Removing an SFP from an LN1000–V RTM on page 32
- LN1000–V Rear Transition Module Front Panel Status LEDs on page 33

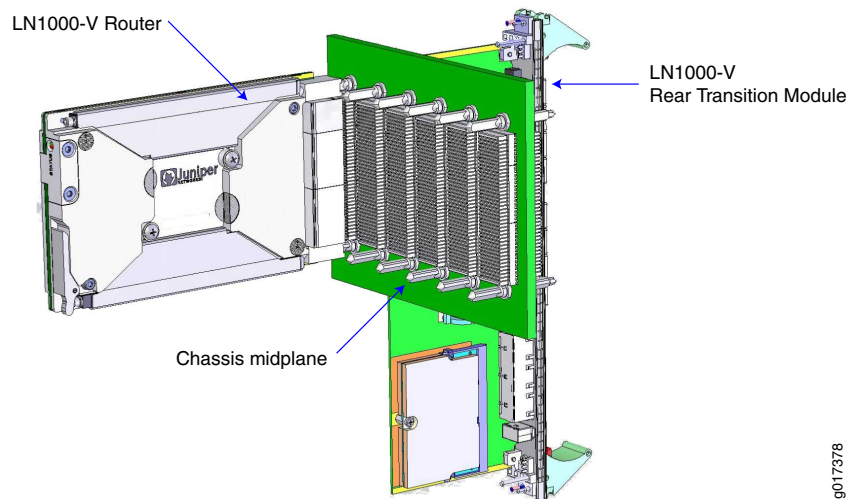
Installing the LN1000–V Rear Transition Module

To install the LN1000–V rear transition module into a VITA 46.0-compliant chassis:

1. Verify that you have taken the necessary antistatic precautions.
2. On the back of the VITA 46.0-compliant chassis, choose an appropriate slot for the rear transition module.

The LN1000–V rear transition module must be installed inline behind the designated location where you plan to install the LN1000–V router. For example, if the LN1000–V router is to be installed in slot 3, the rear transition module must be installed in the back of the chassis in slot 3.

Figure 8: Location of the Rear Transition Module in Relation to the LN1000-V Router



3. Remove the slot filler panel from the selected node board slot, if necessary.
4. Prepare the rear transition module by manually loosening the locking screws and opening the injector/ejector latches at the top and bottom of the rear transition module.
5. Carefully align the edges of the module with the guides in the appropriate slot.
6. Taking care to keep the module aligned in the guides, slide the module in until the injector/ejector latches engage in the chassis retention bars.
7. Simultaneously push in the rear transition module and rotate the injector/ejector mechanisms inward to their closed positions to seat the midplane connectors.
8. Tighten the module retention screws to ensure that the rear transition module is secured into the shelf.

Installing an SFP Transceiver in an LN1000-V RTM

You can install up to eight SFP transceivers in the LN1000-V rear transition module (RTM). The SFP transceivers are hot—removable and hot-insertable. You can remove and replace them without powering off the LN1000-V router or disrupting router functions.



WARNING: Do not look directly into transceivers or into the ends of fiber-optic cables connected to a transceiver. Fiber-optic transceivers emit laser light that can damage your eyes.

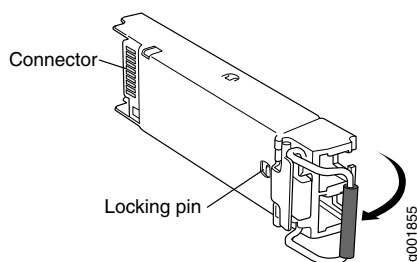


CAUTION:

When handling fiber-optic transceivers and fiber-optic cable, observe the following precautions:

- Do not leave a fiber-optic transceiver uncovered except when inserting or removing cable. The safety cap keeps the port clean and prevents accidental exposure to laser light.
- Do not bend fiber-optic cable beyond its minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.
- Do not let fiber-optic cable hang free from the connector. Do not allow fastened loops of cable to dangle, which stresses the cable at the fastening point.

Figure 9: Small Form-Factor Pluggable (SFP)



To install an SFP transceiver in the LN1000–V RTM:

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 a rubber safety cap covers the SFP transceiver, installing one if necessary.
3. Orient the SFP over the port in the RTM so that the connector end will enter the slot first and the SFP connector faces the appropriate direction:
4. Slide the SFP into the slot. If there is resistance, remove the SFP and flip it so that the connector faces the other direction.
5. Remove the rubber safety cap from the transceiver and the end of the cable, and insert the cable into the transceiver.
6. Arrange the cable in the cable management system to prevent the cable from dislodging or developing stress points. Secure the cable so that it is not supporting its own weight as it hangs to the floor. Place excess cable out of the way in a neatly coiled loop in the cable management system. Placing fasteners on the loop helps to maintain its shape.
7. Verify that the SFP is installed by entering the CLI **show chassis hardware detail** command. Output will display as follows:

```
root@spencer# run show chassis hardware
Hardware inventory:
Item      Version Part number Serial number Description
Chassis           BF1809AG0055  LN1000-v
```

Routing Engine	REV 06	710-027379	DY7841	LN1000-V
FPC 0			FPC	
PIC 0			8x GE Base PIC	
Xcvr 0	REV 01	740-026948	UFA03J9	SFP-T
Xcvr 1	REV 01	740-026948	UFA03L0	SFP-T
Xcvr 2	REV 01	740-027085	UFA03UW	SFP-T
Xcvr 3	REV 01	740-011782	PB82D10	SFP-SX
Xcvr 4	REV 01	740-011782	PB82D13	SFP-SX
Xcvr 5	REV 01	740-011613	AM0819S9RPK	SFP-SX
Xcvr 6	REV 01	740-011613	AM0821SA1UL	SFP-SX
Xcvr 7	REV 01	740-011613	AM0819S9RPC	SFP-SX
Power Supply 0				

Removing an SFP from an LN1000-V RTM



WARNING: Do not look directly into transceivers or into the ends of fiber-optic cables connected to a transceiver. Fiber-optic transceivers emit laser light that can damage your eyes.

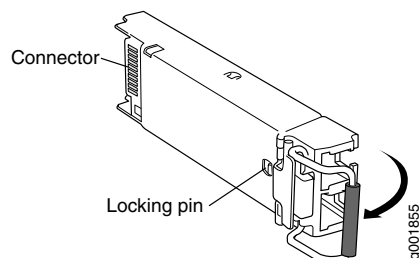


CAUTION:

When handling fiber-optic transceivers and fiber-optic cable, observe the following precautions:

- Do not leave a fiber-optic transceiver uncovered except when inserting or removing cable. The safety cap keeps the port clean and prevents accidental exposure to laser light.
- Do not bend fiber-optic cable beyond its minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.
- Do not let fiber-optic cable hang free from the connector. Do not allow fastened loops of cable to dangle, which stresses the cable at the fastening point.

Figure 10: Small Form-Factor Pluggable (SFP)



To remove an SFP:

1. Place an electrostatic bag or antistatic mat on a flat, stable surface to receive the SFP. Have ready a rubber safety cap for the SFP transceiver and the cable.
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. Label the cable connected to the SFP so that you can later reconnect it to the correct SFP.
4. Disconnect the cable from the SFP. Immediately cover the transceiver and the end of the cable with a rubber safety cap.
5. Arrange the cable to prevent it from dislodging or developing stress points. Secure the cable so that it is not supporting its own weight as it hangs to the floor. Place excess cable out of the way in a neatly coiled loop. Placing fasteners on the loop helps to maintain its shape.
6. Pull the ejector handle away from the SFP faceplate to unseat the SFP from the RTM. Pull the SFP out of the RTM and place it on the antistatic mat or in the electrostatic bag.



CAUTION: After removing a transceiver from the chassis, wait at least 30 seconds before reinserting it or inserting a transceiver into a different slot. Issue the `show chassis hardware detail` command to verify the installed transceivers.

LN1000–V Rear Transition Module Front Panel Status LEDs

The LN1000–V rear transition module includes LEDs on the front panel to provide status information.

Table 6: LN1000–V Router LED Status

LED	Color	Meaning
PWR OK	Off; No color	Power is off.
	Steady Green	Ready for operation. The router is powered on and has successfully run POST diagnostics.
LINK	Off; No color	No link on associated port.
	Steady Green	On: Link established.
ACT	Off; No color	No activity.
	Blinking Green	Traffic Activity

PART 3

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