Junos® Space

JA1500 Appliance User Guide

Published: 2012-12-10
Revision 1

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

Junos Space Junos Space JA1500 Appliance

Revision History
December 2012— Juniper Networks Junos Space JA1500 Appliance, Release 12.3

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. The Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at http://www.juniper.net/support/eula.html. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

Table of Contents

List of Figures

List of Tables

About the Documentation

Junos Space Documentation and Release Notes

For a list of related Junos Space documentation, see http://www.juniper.net/techpubs/.

If the information in the latest release notes differs from the information in the documentation, follow the *Junos Space 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 http://www.juniper.net/techpubs/.

Juniper Networks supports a technical book program to publish books by Juniper Networks engineers and subject matter experts with book publishers around the world. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration using the Junos operating system (Junos OS) and Juniper Networks devices. In addition, the Juniper Networks Technical Library, published in conjunction with O'Reilly Media, explores improving network security, reliability, and availability using Junos OS configuration techniques. All the books are for sale at technical bookstores and book outlets around the world. The current list can be viewed at http://www.juniper.net/books .

Documentation Conventions

Table 1 on page xii 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.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at https://www.juniper.net/cgi-bin/docbugreport/ . If you are using e-mail, be sure to include the following information with your comments:

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

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- 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

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

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

PART 1

Overview

CHAPTER 1

Overview of the Junos Space JA1500 Appliance

Junos Space JA1500 Appliance Overview

The Junos Space JA1500 appliance is a Juniper Networks, dedicated, physical, hardware device that is engineered to provide the computing power and specific requirements needed to install and run the Junos Space application. The JA1500 appliance all-in-one design makes the Junos Space application deployment simpler by giving administrators a turnkey solution. You can power up a the JA1500 appliance, make required configuration changes, then start using the Junos Space application without concerning yourself with hardware and OS and application installation. (See Figure 1 on page 3).

Figure 1: Junos Space JA1500 Appliance

The JA1500 appliance allows administrators to migrate from a strategy of one large server in the corner, to distribute multiple servers based on load and geography. You can combine Junos Space appliances in clusters for high availability or increased throughput.

The JA1500 appliance ensures that consistent infrastructure is deployed across an organization, reducing complexity. The JA1500 appliance means that only one vendor—Juniper Networks—supports integrated components reducing complexity.

The administrator can also deploy and run the Junos Space application as a virtual appliance. The administrator can combine Junos Space appliances in clusters for high availability or increased throughput. The administrator can create a fabric of Junos Space appliances, Junos Space virtual appliances, or a combination of both appliances and virtual appliances.

Junos Space Application Overview

The Junos Space application, running on a JA1500 appliance, is a comprehensive platform for building and deploying applications for collaboration, productivity, and network infrastructure and operations management. The Junos Space application provides a runtime environment implemented as a fabric of virtual and physical appliances.

The Junos Space Network Application Platform (Platform) provides effective tools for automating network operations, including device discovery and management, topology visualization, device image deployment, job management, audit logging, user administration, and system administration. System administration tasks include managing the Junos Space fabric which comprises one or more IP-connected nodes, database, licenses, applications, troubleshooting, and tagging.

Junos Space applications:

- Allow service providers deliver secure connectivity services (SCS) over an MPLS network to their customers.
- Automatically detect problems on Juniper Networks devices running Junos and scripts and proactively collects the troubleshooting information needed to diagnose and fix the issue. Service Now allows operational personnel to open technical support cases with JTAC. JTAC resolves cases and provides the customer proactive information to minimize future problems.
- Allow network engineers to provide enterprise services like break, fix, and truck roll of networking gear and to quickly deploy networking gear in large number of branch offices accurately and easily.
- Allow security designers to design and provision the security aspect of the network and enable large enterprise customers to rapidly deploy firewalls and VPNs.

Other proprietary, OEM, and third-party application will be developed in subsequent Junos Space releases.

The Junos Space Platform > Administration > Manage Application workspace allows the administrator add, upgrade, and delete applications.

Related Documentation

- Parts of the Junos Space JA1500 Appliance on page 4

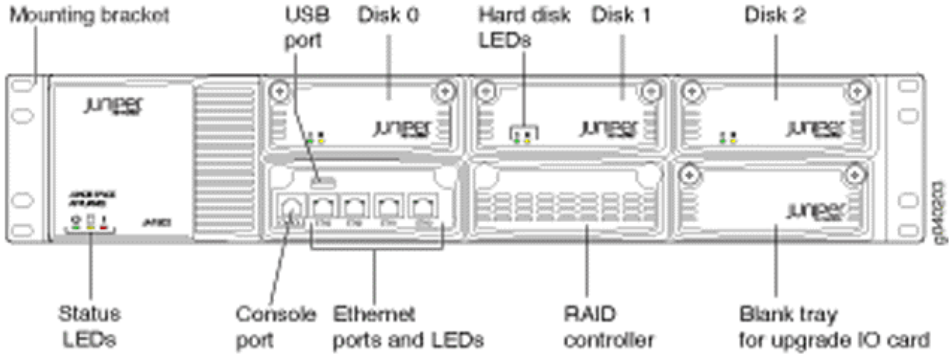
Parts of the Junos Space JA1500 Appliance

The dimensions of the Junos Space JA1500 appliance are 17.72in x 17.26in x 3.5in (450mm x 438.4mm x 88mm). Its front panel, rear panel, and LEDs are described in the sections that follow.

JA1500 Appliance Front Panel

Figure 2 on page 5 shows the front panel of the JA1500 appliance.

Figure 2: JA1500 Appliance Front Panel



Mounting Brackets

The JA1500 appliance includes front ears, rear mounting rails for mounting in a 4-post standard rack, and midpoint brackets for mounting in a 2-post, 19-inch equipment rack.

Chassis

The JA1500 appliance has a 2U rack-mountable chassis. The chassis includes the following:

- Three 1TB hard disks in hot-swappable RAID 5 array
- One RAID controller
- Four RJ-45 10/100/1000 Gigabit Ethernet ports
- One RJ-45 serial console port
- One USB interface
- Optional single IOC slot available for I/O card expansion
- One 250-watt cold-swappable power supply with an AC power receptacle; 1 optional dual-redundant, hot-swappable power supply
- One AC power switch
- Two cooling fans

Hard Disks

The JA1500 appliance includes three hard disk drives in RAID 5 array. The serial attached SCSI (SAS), hot-swappable drives are externally accessible in field-replaceable trays,

providing component high availablilty. If one drive fails, the system recovers by hot-swapping the failed drive, which is automatically rebuilt. The disks are labeled from left to right **Disk 0 , Disk 1, Disk 2**. Front panel LEDs indicate drive activity and failure.

Ports

The JA1500 Appliance includes the following ports:

- Four RJ-45 10/100/1000 Mbps network ports using an Intel Gigabit Ethernet controller. The ports are numbered from left to right: **ETH3, ETH2, ETH1, ETH0**.
- One RJ-45 serial console port labeled **CONSOLE**.
- One USB interface
- One optional single input/output card (IOC) slot available for expansion I/O ports. The JA1500 ships with a dummy tray that can be replaced with an upgrade I/O card.

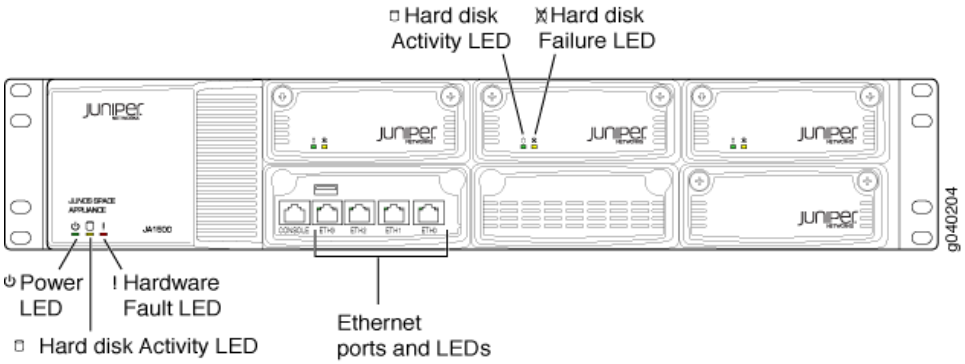
RAID Controller

The JA1500 appliance RAID controller manages the physical disk drives and presents them to the computer as logical units.

Status LEDs

The JA1500 Appliance LEDs are shown in Figure 3 on page 6.

Figure 3: JA1500 Appliance LEDs



The JA1500 chassis LEDs are described in Table 2 on page 6.

Table 2: JA1500 Appliance Front Panel LEDs

LEDs	Description
Chassis Status LEDs	• Power LED (green)—Indicates that the appliance is powered on • Hard Disk Activity LED (yellow)—Indicates the hard disk is in use (writing or reading data) • Hardware Fault (red)—Indicates that a fan, power supply, or temperature alarm has occurred

Table 2: JA1500 Appliance Front Panel LEDs *(continued)*

LEDs	Description

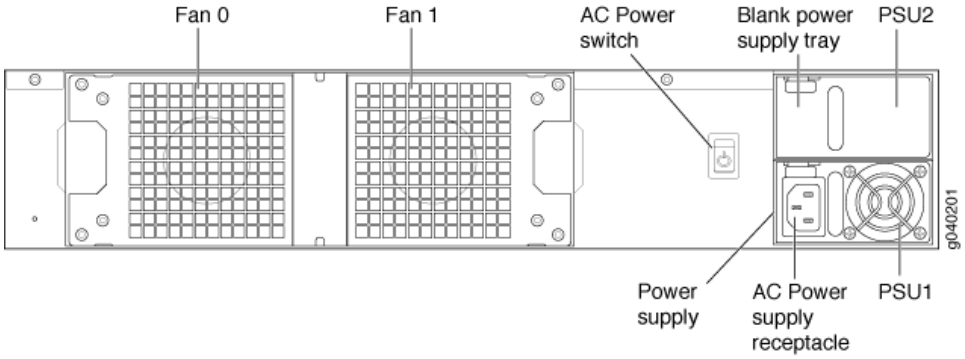
Ethernet Ports and LEDs	• Left Ethernet Port LED (green)—Indicates link and activity
	  ◦ On—indicates the link
	  ◦ Blinking—indicates activity
	• Right Ethernet Port LED—Indicates the link speed
	  ◦ Off—10 Mbps
	  ◦ Green—100 Mbps
	  ◦ Yellow–1000 Mbps or 1 Gbps

Hard Disk Activity/Failure LEDs	• LED 1 on left (green)—When lit, indicates disk activity • LED 2 on right (red)—When lit, indicates disk failure

JA1500 Rear Panel

Figure 4 on page 7 shows the rear panel of the JA1500 appliance.

Figure 4: Parts of the JA1500 Rear Panel



- Cooling System on page 7
- AC Power Switch on page 7
- Power Supply on page 7

Cooling System

The JA1500 appliance includes two rear-accessible, hot-swappable fans to cool the other components.

AC Power Switch

The AC power switch is between the fans on the left and the power supplies on the right.

Power Supply

The JA1500 appliance includes a cold-swappable, 250 W (90 to 264 V) autoranging power supply for all countries. The power supply is high efficiency and is 80 PLUS certified. The power supply includes an AC receptacle for a power cord. The JA1500 appliance is

upgradable to a redundant hot-swappable dual power supply. The power supplies are numbered from bottom to top: **PSU1, PSU2**.

If the JA1500 appliance includes two power supplies, plug each power cord into a separate power circuit to ensure that the device continues to receive power if one of the power circuits fails.

Related Documentation

- Junos Space JA1500 Appliance Overview on page 3

Understanding How Nodes Are Connected in a Fabric

Each Junos Space appliance (physical or virtual) that you install and configure is represented as a single node in the fabric. You can add nodes without disrupting the services that are running on the fabric. When you install and configure the first appliance, Junos Space automatically creates a fabric with one node. For each additional appliance you install and configure, you must add a node to logically represent the appliance in the fabric. You add nodes to the fabric from the Administration workspace in the Junos Space user interface. Each node that you add to the fabric increases the resource pool for the node functions to meet the scalability and availability requirements of your network. By default, Junos Space automatically enables node functionality across the nodes in the fabric to distribute workload. The nodes in the fabric work together to provide a virtualized resource pool for each of the node functions: load balancer, database, and application logic.

In a fabric comprising two or more nodes, Junos Space provides failover when a node functioning as the active server (load balancer server or database server) goes down. By default, Junos Space marks a particular node down and routes failover requests to the node that Junos Space designates as standby server. Junos Space uses a heartbeat mechanism to check whether the nodes in the fabric are running. When a node functioning as the active server fails (the appliance crashes or stops sending heartbeats), the node functioning as the standby server takes over all resources that were managed by the node functioning as active server. Nodes in a Junos Space fabric rely on IP multicast messages to discover each other, therefore ensure that IP multicast packets are reachable among all nodes in the Junos Space fabric.

To add, manage, and monitor the nodes in the fabric, a Junos Space user connects to a single Web IP address. The IP address of first (active) node and second (standby) node, and the Web (virtual) IP address must all be in the same subnet. The Web IP address must work on both the first and second node in the fabric. When both nodes are in same subnet, and the first (active) node goes down, the second (standby) node becomes the active node and packets continue to be directed from the router to the Junos Space Web IP address, and then to the second node. However, if the second (standby) node is configured in a different subnet from the first (active) node, and the first node goes down, the second node becomes the active node, but because the Web IP address now points to a different subnet address, packets originally destined for first node will not be received by the second node.

Related Documentation

- Fabric Management Overview on page 9
- Viewing Nodes in the Fabric on page 49

- Adding a Node in the Fabric on page 52

NTP Time Source For Each JA1500 Appliance

To ensure consistent behavior among all nodes in a multinode fabric, each node's time must be synchronized with every other node in the fabric. When you configure each Junos Space JA1500 appliance with an NTP server, you ensure that, if the first node (which is used to synchronize time for all nodes in the fabric) goes down, all other nodes in the fabric remain synchronized. To ensure this behavior, all nodes in a fabric must use the same external NTP source that you configure for the first appliance.

NOTE: **By default, Junos Space translates time so that the time displayed in the user interface corresponds to Junos Space server time, but is mapped to the local time zone of your client computer.**

The default system clock for a JA1500 appliance may not be precise enough for some networks. To ensure time synchronization across all nodes in the fabric, Juniper strongly recommends that you use the following guidelines:

- Add an NTP server to the first virtual appliance during initial setup.
- For each additional appliance, add the same NTP server that you specified for the first appliance.

NOTE: **You must add the NTP server before you add the first node to the fabric from the user interface.**

Related Documentation

- Fabric Management Overview on page 9
- Understanding How Nodes Are Connected in a Fabric on page 8
- Managing Nodes in the Fabric

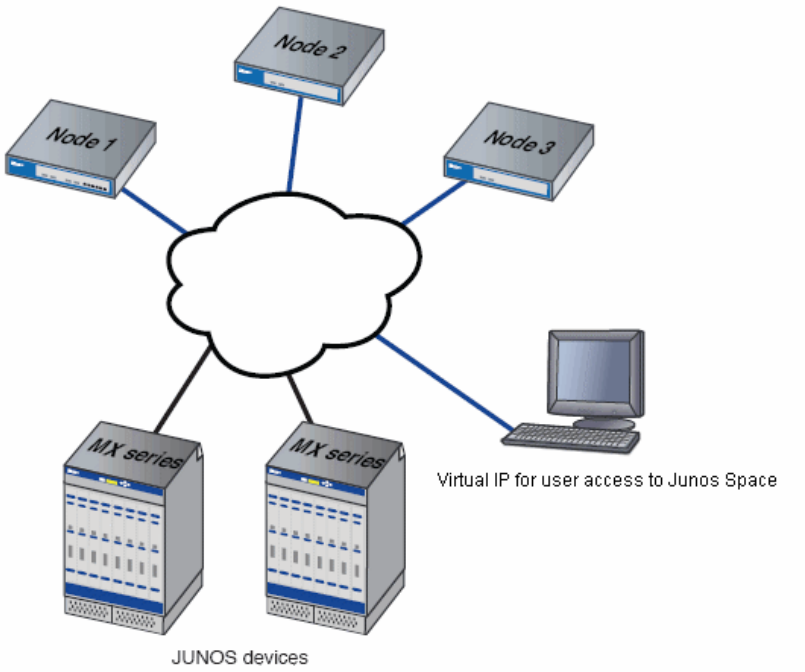
Fabric Management Overview

You can deploy Junos Space appliances to create a fabric that provides the scalability and availability that your managed network requires as you add more devices, services, and users.

A Junos Space fabric comprises one or more IP-connected nodes. A node is a logical object that represents a single Junos Space JA1500 appliance or Junos Space virtual appliance, its operating system, and the Junos Space software that runs on the operating system. Each Junos Space appliance or virtual appliance that you install and configure is represented as a single node in the fabric. You can add nodes without disrupting the services that are running on the fabric. When you add nodes to the fabric, you can manage and monitor the nodes from the Administration workspace. To add, manage, and monitor

nodes in the fabric, a fabric administrator connects to a single virtual IP address. See Figure 5 on page 10

Figure 5: Administrator Connects to a Single Virtual IP Address to Manage Fabric Nodes



Single Node Functionality

When the fabric comprises a single appliance, all devices in the managed network connect to the appliance. When you install and configure the first appliance, Junos Space automatically creates a fabric with one node. By default, a fabric that consists of a single node provides complete Junos Space management functionality. The following node functions are enabled for the node:

- Load Balancer— for processing HTTP requests from remote browsers and NBI clients
- Database— for processing database requests (create, read, update, and delete operations)
- Application Logic— for processing Junos Space service requests and Data Manipulation Language (DML) workload (device connectivity, device events, and logging)

NOTE: **A fabric that comprises a single node provides no workload balancing and no backup if the appliance goes down.**

Multinode Functionality

As your network expands with new devices, services, and users, you can add Junos Space appliances to handle the increased workload. When you install and configure the first appliance, Junos Space automatically creates a fabric with one node. For each additional appliance you install and configure, you must add a node to logically represent the appliance in the fabric. Each node that you add to the fabric increases the resource pool for the node functions to meet the scalability and availability requirements of your network. By default, Junos Space automatically enables node functionality across the nodes in the fabric to distribute workload. The nodes in the fabric work together to provide a virtualized resource pool for each of the node functions: load balancer, database, and application logic.

The Junos Space node functions distribute workload across operating nodes according to the following load-distribution rules:

- Load Balancer— When a node that functions as the active load balancer server is down, all HTTP requests are automatically routed to the standby load balancer server that is running on a separate node.
- Database— When a node that functions as the active database server is down, all database requests (create, read, update, and delete) are routed to the node that functions as the standby database server.
- Application Logic— Device connections and user requests are distributed among the nodes, and device-related operations are routed to the node to which the device is connected.

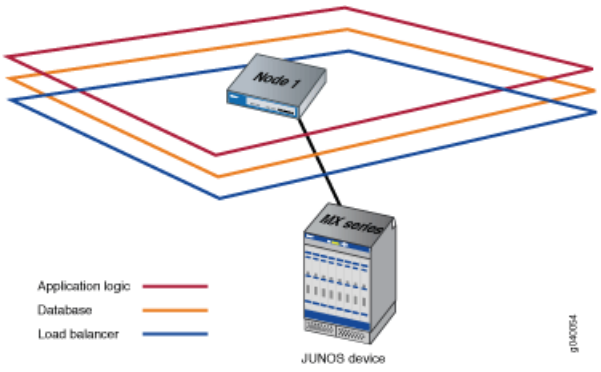
  Junos Space uses the following algorithm to ensure that the number of devices connected to a node does not exceed the threshold limit for each node:

  Threshold Limit = [(number of devices in database) / (number of nodes running)] + 2

The following workflow describes how the node functions are enabled across the fabric as nodes are added:

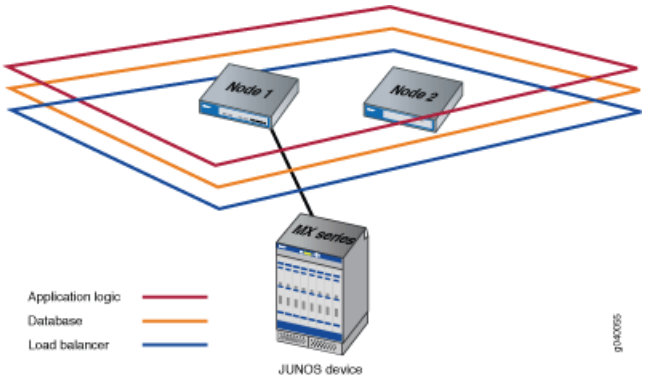
- First node: The load balancer, database, and application logic functions are enabled on the node. Each node function provides both scalability and high availability. Figure 6 on page 11 shows all functions enabled on a fabric comprising one node.

Figure 6: Functions Enabled on Fabric Containing One Node



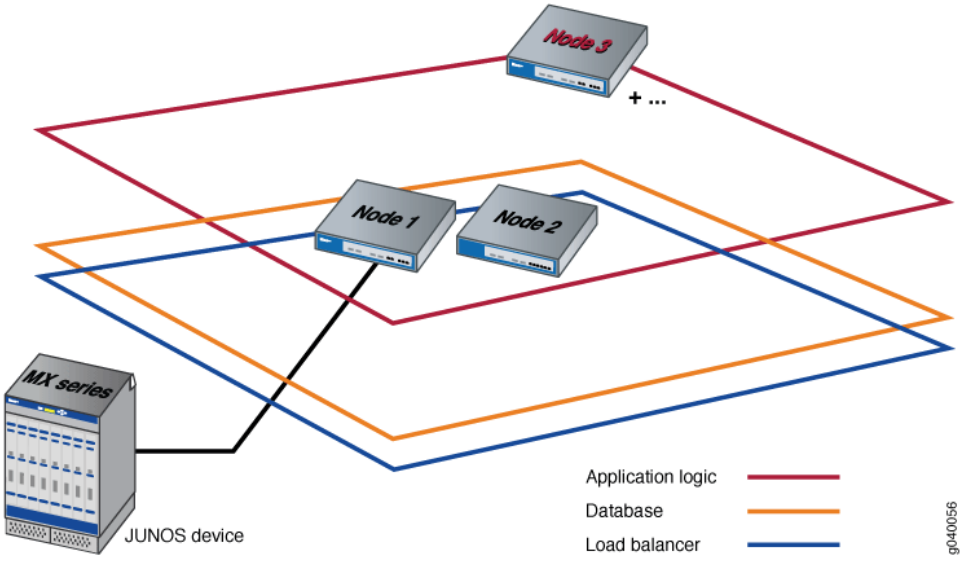
- Second node: When a second node is added to the fabric, the first node functions as the active load balancer server and active database server, and the second node functions as the standby load balancer server and standby database server. The load balancer and application logic node functions provide scalability and high availability. The database node function on the second node provides high availability only. Figure 7 on page 12 shows the functions enabled on a fabric comprising two nodes.

Figure 7: Functions Enabled on Fabric Containing Two Nodes



- Third and subsequent nodes: Only the application logic functionality is enabled on the third node to provide equal distribution of device connections and user requests across all nodes, and to route device-related operations to the node to which the device is connected. The application logic functionality provides both scalability and high availability. Figure 8 on page 12 shows the functions enabled on a fabric comprising three nodes.

Figure 8: Functions Enabled on Fabric Containing Three Nodes



NOTE: For the third node and each subsequent node added to the fabric, only the application logic functionality is enabled.

Node Function Availability

In a fabric comprising two or more nodes, Junos Space provides failover when a node functioning as the active server (load balancer server or database server) goes down. By default, Junos Space marks a particular node down and routes failover requests to the node that Junos Space designates as standby server. Junos Space uses a heartbeat mechanism to check whether the nodes in the fabric are running. When a node functioning as the active server fails (the appliance physically crashes or stops sending heartbeats), the node functioning as the standby server takes over all resources that were managed by the node functioning as the active server.

Related Documentation

- Adding a Node in the Fabric on page 52
- Viewing Nodes in the Fabric on page 49

PART 2

Planning

CHAPTER 2

Planning for the Junos Space JA1500 Appliance

Rack Requirements and Specifications for a Junos Space JA1500 Appliance

The Junos Space JA1500 appliance has a 2U rack-mountable chassis. It ships with 2-post and 4-post mounting hardware. The appliance can be installed in many types of racks, including four-post (telco) racks and open-frame racks. The dimensions of the Junos Space JA1500 appliance are 17.72in x 17.26in x 3.5in (450mm x 438.4mm x 88mm).

Table 3 on page 17 lists the rack requirements.

Table 3: JA1500 Appliance Rack Requirements

Rack Requirement	Guidelines
Rack type	Use a front-mount rack, four-post rack (telco), or a center-mount rack.
Rack size and strength	• Ensure that the rack complies with one of these standards: ◦ A 19-in. rack as defined in Cabinets, Racks, Panels, and Associated Equipment (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org). ◦ A 600-mm rack as defined in the four-part Equipment Engineering (EE); European telecommunications standard for equipment practice (document numbers ETS 300 119-1 through 119-4) published by the European Telecommunications Standards Institute (http://www.etsi.org). The horizontal spacing between the rails in a rack that complies with this standard is wider than the appliance's mounting brackets, which measure 19 in. (48.2 cm) from outer edge to outer edge. Use approved wing devices to narrow the opening between the rails as required. • Ensure that the spacing of rails and adjacent racks allow for the proper clearance around the appliance and rack.

Table 3: JA1500 Appliance Rack Requirements *(continued)*

Rack Requirement	Guidelines
Rack connection to building structure	• Secure the rack to the building structure. • If earthquakes are a possibility in your geographical area, secure the rack to the floor. • Secure the rack to the ceiling brackets as well as wall or floor brackets if maximum stability is required.

One pair of mounting brackets is supplied with the appliance. The holes in the mounting brackets are spaced at 1 U (1.75 in. or 4.445 cm), so the appliance can be mounted in any rack that provides holes spaced at that distance.

The outer edges of the mounting brackets extend the width of the chassis to 19 in. (48.2 cm), and the front of the chassis extends approximately 0.5 in. (1.27 cm) beyond the mounting brackets. The spacing of rails and adjacent racks must also allow for the clearances around the appliance and rack.

Related Documentation

- Environmental Requirements for the Junos Space JA1500 Appliance on page 18
- Power Requirements for a Junos Space JA1500 Appliance on page 19

Environmental Requirements for the Junos Space JA1500 Appliance

The appliance must be installed in a rack or cabinet housed in a dry, clean, well-ventilated, and temperature-controlled environment.

Ensure that these environmental guidelines are followed:

- The site must be as dust-free as possible, because dust can clog air intake vents and filters, reducing the efficiency of the appliance cooling system.
- Maintain ambient airflow for normal appliance operation. If the airflow is blocked or restricted, or if the intake air is too warm, the appliance might overheat. Table 4 on page 18 provides the required environmental conditions for normal appliance operation.

Table 4: JA1500 Appliance Operation Environmental Requirements

Description	Tolerance
Altitude	No performance degradation to 10,000 feet (3048 meters)
Relative humidity	Normal operation ensured in relative humidity range of 8% to 90%, noncondensing
Temperature	Normal operation ensured in temperature range of 41° F to 104° F (5° C to 40° C)

Table 5 on page 19 lists the environmental requirements for storing the appliance while nonoperational.

Table 5: Environmental Requirements for Appliance Storage

Description	Tolerance
Altitude	The appliance can be stored safely up to 40,000 feet (12,192 meters)
Relative Humidity	The appliance can be stored safely in relative humidity range of 5% to 95%, noncondensing
Temperature	The appliance can be stored safely in temperature range of –40° F to 158° F (-40° C to 70° C)

Table 6 on page 19 lists the network environmental requirements for the appliance.

Table 6: Network Environmental Requirements for the Appliance

Description	Requirements
IP addresses	One IP address per appliance and one additional IP address for the common Web GUI.
Cables	The network needs standard power cables with localized plugs for the US, UK, and Europe. The network requires copper cables not fiber cables.
HA link	None needed. The switches are connected through the eth0 interface.

Related Documentation

- General Safety Guidelines and Warnings for the Junos Space JA1500 Appliance on page 23
- Rack Requirements and Specifications for a Junos Space JA1500 Appliance on page 17
- Power Requirements for a Junos Space JA1500 Appliance on page 19

Power Requirements for a Junos Space JA1500 Appliance

A JA1500 appliance can be powered by an AC and DC electrical supply. Table 7 on page 19 shows the electrical power requirements for a JA1500 appliance with AC power supply.Table 8 on page 20 shows the electrical power requirements for a JA1500 appliance with DC power supply.

Table 7: JA1500 Appliance AC Power Requirements

Item	Requirement
AC input voltage	90 to 264 VAC
AC input line frequency	50 to 60 Hz
AC current rating	60 A

Table 7: JA1500 Appliance AC Power Requirements *(continued)*

Item	Requirement
Maximum output power	250 W (One AC power supply) 2x 250W (Two AC power supplies)

Table 8: JA1500 Appliance DC Power Requirements

Item	Requirement
DC power Supply info	560 watt
DC Power module	-38V to -72V
DC power supply Peak inrush	<60A
Power Module Max Efficiency	80Plus 560w AC, 80Plus 560w DC

Related Documentation

- Rack Requirements and Specifications for a Junos Space JA1500 Appliance on page 17
- Environmental Requirements for the Junos Space JA1500 Appliance on page 18
- General Safety Guidelines and Warnings for the Junos Space JA1500 Appliance on page 23

PART 3

Safety

CHAPTER 3

Safety and Compliance for the Junos Space JA1500 Appliance

General Safety Guidelines and Warnings for the Junos Space JA1500 Appliance

The following guidelines help ensure your safety and protect the appliance from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in the hardware documentation for this product. Make sure that only authorized service personnel perform other system services.
- Keep the area around the chassis clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip over them while walking.
- Do not wear loose clothing or jewelry, such as rings, bracelets, or chains, which could become caught in the chassis.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person to handle.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Operate the appliance only when it is properly grounded.
- Ensure that the separate protective earthing terminal provided on this product is permanently connected to earth.

- Replace fuses only with fuses of the same type and rating.
- Do not open or remove chassis covers or sheet-metal parts unless instructions are provided in the hardware documentation for this product. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the appliance. Such an action could cause electrical shock or damage the appliance.
- Avoid touching uninsulated electrical wires or terminals that have not been disconnected from their power source. Such an action could cause electrical shock.
- Always ensure that all modules, power supplies, and blanks are fully inserted and that the installation screws are fully tightened.

Related Documentation

- Fire Safety Requirements for the Junos Space JA1500 Appliance on page 24
- Environmental Requirements for the Junos Space JA1500 Appliance on page 18

Fire Safety Requirements for the Junos Space JA1500 Appliance

In the event of a fire emergency involving switches and other network equipment, the safety of people is the primary concern. You should establish procedures for protecting people in the event of a fire emergency, provide safety training, and properly provision fire-control equipment and fire extinguishers.

In addition, you should establish procedures to protect your equipment in the event of a fire emergency. Juniper Networks products should be installed in an environment suitable for electronic equipment. We recommend that fire suppression equipment be available in the event of a fire in the vicinity of the equipment, and that all local fire, safety, and electrical codes and ordinances be observed when installing and operating your equipment.

Fire Suppression

In the event of an electrical hazard or an electrical fire, you should first turn power off to the equipment at the source. Then use a Type C fire extinguisher, which uses noncorrosive fire retardants, to extinguish the fire.

Fire Suppression Equipment

Type C fire extinguishers, which use noncorrosive fire retardants such as carbon dioxide and Halotron™, are most effective for suppressing electrical fires. Type C fire extinguishers displace oxygen from the point of combustion to eliminate the fire. For extinguishing fire on or around equipment that draws air from the environment for cooling, you should use this type of inert oxygen displacement extinguisher instead of an extinguisher that leaves residues on equipment.

Do not use multipurpose Type ABC chemical fire extinguishers (dry chemical fire extinguishers). The primary ingredient in these fire extinguishers is monoammonium

phosphate, which is very sticky and difficult to clean. In addition, in the presence of minute amounts of moisture, monoammonium phosphate can become highly corrosive and corrodes most metals.

Any equipment in a room in which a chemical fire extinguisher has been discharged is subject to premature failure and unreliable operation. The equipment is considered to be irreparably damaged.

NOTE: **To keep warranties effective, do not use a dry chemical fire extinguisher to control a fire at or near a Juniper Networks appliance. If a dry chemical fire extinguisher is used, the unit is no longer eligible for coverage under a service agreement.**

We recommend that you dispose of any irreparably damaged equipment in an environmentally responsible manner.

Related Documentation

- General Safety Guidelines and Warnings for the Junos Space JA1500 Appliance on page 23
- Environmental Requirements for the Junos Space JA1500 Appliance on page 18

PART 4

Installation

CHAPTER 4

Installing the Junos Space JA1500 Appliance

Unpacking the Junos Space JA1500 Appliance

The Junos Space JA1500 appliance is shipped in a cardboard shipping container and is secured with foam packing material. The container also includes an accessory box. The items, listed in Table 9 on page 29 are included in the JA1500 appliance box:

Table 9: Items in the JA1500 Appliance Shipping Container

Component	Quantity
Junos Space JA1500 appliance chassis (See "Parts of the Junos Space JA1500 Appliance" on page 4)	1
Power cable	1
Mounting kits	2
RJ–45 to DB–9F cable with adapter, 7 ft. Console cable	1
7-foot, blue, Category 5e cable	2
Null modem serial cable	1
USB restore media Flash drive	1
Security Products Safety Guide	1

CAUTION: The JA1500 appliance is maximally protected inside the shipping container. Do not unpack it until you are ready to begin installation.

WARNING: The dimensions of a JA1500 appliance are 17.72in x 17.26in x 3.5in (450mm x 438.4mm x 88mm) and it weighs over 27 lbs. (approximately 12.2 Kg). Use correct lifting technique when moving the appliance.

To unpack the appliance, follow these steps:

1. Move the shipping container to a staging area as close to the installation site as possible, but where you have enough room to remove the system components.
2. Position the container so that the arrows are pointing up.
3. Open the top flaps on the shipping container.
4. Remove the accessory box and verify the contents against the parts inventory on the label attached to the container.
5. Pull out the packing material holding the appliance in place.
6. Read the "General Safety Guidelines and Warnings" document with particular attention to "Chassis Lifting Guidelines."
7. Remove the appliance from the shipping container.
8. Verify the appliance chassis components received against the packing list. Table 9 on page 29 provides an inventory of parts provided with a appliance.
9. Save the shipping container and packing materials in case you need to move or ship the appliance later.

Related Documentation

- Attaching Mounting Brackets to a Junos Space JA1500 Appliance on page 30
- Installing the Junos Space JA1500 Appliance in a Rack and Connecting the Cables on page 31
- Connecting a Console to a Junos Space JA1500 Appliance on page 33
- Booting and Configuring the Junos Space JA1500 Appliance on page 33

Attaching Mounting Brackets to a Junos Space JA1500 Appliance

To install your physical appliance in a rack, you must attach mounting brackets to the appliance.

Your JA1500 appliance is shipped with front ears, midpoint brackets, rear mounting rails, and mounting screws.

The outer edges of the mounting brackets extend the width of the chassis to 19 in. (48.2 cm). The spacing of rails and adjacent racks must also allow for the clearances around the appliance and rack.

The chassis and brackets are designed to allow front, middle, or rear mounting in a 19–inch rack.

You need a Phillips (+) screwdriver, number 2 to mount the brackets.

To attach the mounting bracket to a physical appliance, follow these steps:

1. Place the physical appliance on a flat, stable surface.
2. Align the mounting brackets along the front, rear, or center of a side panel of the physical appliance chassis, depending on how you want to mount the appliance in a rack. For example, if you want to center-mount the appliance, align the mounting brackets along the center of the side panel.
3. Align the bottom hole in the mounting bracket with a hole on the side panel on the appliance chassis.
4. Insert one mounting screw (provided in the accessory box shipped with the appliance) into each of the two aligned holes. Using the Phillips screwdriver, tighten the screw to the chassis. Ensure that the other holes in the mounting bracket are aligned with the other holes in the side panel.
5. Insert screws into the other holes in the mounting bracket aligned with the holes in the side panel and tighten the screws to the chassis using the Phillips screwdriver.

Related Documentation

- Unpacking the Junos Space JA1500 Appliance on page 29
- Installing the Junos Space JA1500 Appliance in a Rack and Connecting the Cables on page 31

Installing the Junos Space JA1500 Appliance in a Rack and Connecting the Cables

Before installing the physical appliance in a rack:

- Unpack the appliance, as described in "Unpacking the Junos Space JA1500 Appliance" on page 29.
- Remove the JA1500 appliance from the shipping container and place it on a flat surface.
- Attach the mounting brackets to the chassis, as described in "Attaching Mounting Brackets to a Junos Space JA1500 Appliance" on page 30.

To install the physical appliance in a rack:

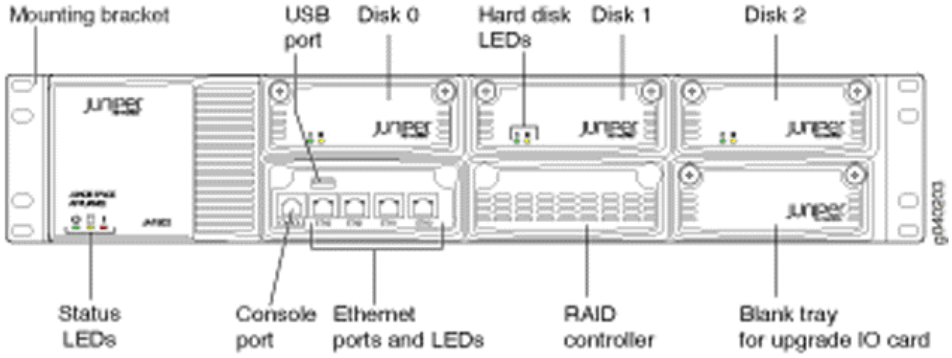
You need a Phillips (+) screwdriver, number 2

1. Position the chassis in the rack. We recommend that two people perform this step: One person holds the chassis in place while the other inserts the screws.

   WARNING: **Use the recommended lifting technique when moving the physical appliance.**

2. Align the holes in the mounting bracket with the holes in the rack rails.
3. Insert the screws in each of the holes and tighten them with the Phillips screwdriver.
4. Plug the Ethernet cable into the network port marked **ETH0** on the front panel. See Figure 9 on page 32.

Figure 9: JA1500 Appliance Front Panel



5. Plug the null modem serial cable into the **CONSOLE** port.

   This cable was shipped with your appliance. If you do not have this cable, use any other null modem serial cable.

The basic hardware installation is now complete. The next step is to connect the physical appliance to a console.

Related Documentation

- Connecting a Console to a Junos Space JA1500 Appliance on page 33
- Attaching Mounting Brackets to a Junos Space JA1500 Appliance on page 30
- Connecting a Console to a Junos Space JA1500 Appliance on page 33
- Booting and Configuring the Junos Space JA1500 Appliance on page 33
- Booting and Configuring the Junos Space JA1500 Appliance from a USB Drive on page 34

Connecting a Console to a Junos Space JA1500 Appliance

To connect to a physical appliance for the first time, you must attach your appliance to a console terminal running an emulation utility such as HyperTerminal.

To connect to console, follow these steps:

1. Configure a console terminal or terminal emulation utility to use the following serial connection parameters:
   - 9600 bits per second
   - 8-bit no parity (8N1)
   - 1 stop bit
   - No flow control
2. Connect the terminal or laptop to the null modem serial or cable plugged into the JA1500 appliance console port.

The procedure allows you to install the Junos Space application and operating system on the JA1500 appliance.

Related Documentation

- Booting and Configuring the Junos Space JA1500 Appliance on page 33
- Installing the Junos Space JA1500 Appliance in a Rack and Connecting the Cables on page 31
- Upgrading the Junos Space Software on page 58

Booting and Configuring the Junos Space JA1500 Appliance

Follow these steps to start up the Junos Space JA1500 Appliance and install the Junos Space application and operating system.

The JA1500 Appliance must be installed in a rack, turned on, and connected to a console terminal running an emulation utility such as HyperTerminal.

To start a JA1500 appliance and install the Junos Space software, follow these steps:

1. Configure a console terminal or terminal emulation utility to use the following serial connection parameters:
   - 9600 bits per second
   - 8-bit no parity (8N1) 8
   - 1 stop bit
   - No flow control
2. Connect the terminal to the **CONSOLE** port using the console cable.

3. Plug the power cord into the AC receptacle on the rear panel. If the appliance has two power supplies, plug a power cord into each AC receptacle.
4. Plug the other end of the power cord into a wall socket. If the appliance has two power supplies, plug each power cord into a separate wall sockets.

   The appliance is shipped with a version of the Junos Space software. When the appliance is powered on, the serial console displays diagnostic information before booting. When booting is complete, the serial console displays the login prompt. You are now ready to configure basic settings on the appliance. See "Configuring Basic Settings for a Junos Space JA1500 Appliance" on page 41

Related Documentation

- Configuring Basic Settings for a Junos Space JA1500 Appliance on page 41
- Connecting a Console to a Junos Space JA1500 Appliance on page 33
- Upgrading the Junos Space Software on page 58
- Booting and Configuring the Junos Space JA1500 Appliance from a USB Drive on page 34

Booting and Configuring the Junos Space JA1500 Appliance from a USB Drive

This procedure shows you how to reset a Junos Space appliance to its factory settings by using a standard USB 2.0 drive.

This process has three main steps:

1. Copying an ISO image onto the key
2. Ensuring that the appliance's basic input/output system (BIOS) boots from the key instead of the disk
3. Running the reinstallation procedure

To reset an appliance to the factory settings from a USB drive:

1. Plug the USB drive into the USB port of a device, such as a laptop or PC, that is connected to the Internet.

   NOTE: **For images up to Release 11.2, you can use a USB drive with 2 GB of free space. However, for Releases 11.4 and later, you must use a USB drive with at least 4 GB of free space.**

2. Using a Web browser, navigate to the Juniper Networks Junos Space software download site (http://www.juniper.net/support/products/space/), and click **Image for hardware Appliance** to download the Junos Space USB bootable image.

   The name of the downloaded image will be space-< version >.< spinnumber >.img. For example, space-11.1R1.1.img

3. Convert and copy the ISO image to the USB drive.

You can copy the ISO image to the USB drive in two ways:

- **Using Win32 Disk Imager software (for Windows users)**

  To create a bootable USB drive using the Win32 Disk Imager software, follow these steps:

  a. Open the Win32. Disk Imager software to copy the Junos Space ISO image file to your USB drive. The Win32 Disk Imager dialog box appears.

     (You can download the Win32 Disk Imager software for free from https://launchpad.net/win32-image-writer .)

  b. Click the browse icon and select the image file that you want to copy to the USB drive.

  c. Verify that the device drive letter matches the chosen USB drive, and click **Write**.

     After creating the USB drive, you need to set up the device (laptop or PC) and Junos Space appliance to accept the USB drive as the reinstall media. For this, the BIOS menu of the appliance needs to be modified. You can modify the BIOS menu by creating a serial connection between the device (laptop or PC) and the Junos Space appliance. To gain access to the BIOS menu, you must use a terminal application (such as Putty, Hyperterm, or SecureCRT) to send a DEL character to the Junos Space appliance as soon as it powers on.

     The terminal application maps every keyboard key to a code that it sends through the serial cable. Typically, pressing the Delete key on a PC keyboard does not send a DEL character.

     To ensure that the terminal application maps a key to the DEL character, go to the settings dialog box of the application and select the **Backspace Key sends DEL** option. After you make this modification, you must ensure that the connection is opened with the typical serial parameters of **9600**, **8**, **none**, **1**, and **none**.

- **Using the dd program in Linux**

  You can also use Linux distributions to create a bootable USB drive. You do not need a PC for this procedure.

  To create a bootable USB drive using Linux distributions:

  a. While you can use any of the available conversion tools, we recommend using the dd program in Linux to convert the ISO image.

     In a CLI window, enter the following command at the CLI prompt to convert and copy the ISO image:

     dd if= space-*< version >.< spinnumber >*.img of=/dev/sdb

     where
     space-< version >.< spinnumber >.img is the name of the downloaded image.
     /dev/sdb is the name of the device drive into which your USB drive is plugged..

  b. Press the Enter key to copy the ISO image to the USB drive.

4. After you copy the ISO image to the USB drive, remove the USB drive from the device and plug it into the USB port of the Junos Space JA1500 appliance.
5. Power on the appliance. The boot menu appears.
6. After about one minute, the BIOS menu appears.

   NOTE: If the hard disk LEDs begin to flash at this point for more than a few seconds, the appliance is booting from disk instead of the USB drive and is not loading the BIOS menu.

7. Ensure that the USB boot is at the top of the appliance boot priority order.

   By default, the boot order in the BIOS of the appliance prevents it from booting from a USB drive. However, you can access the menu and change the boot order by sending the DEL character three times as soon as you power on the appliance.

   Press the DEL key three times as soon as the appliance powers on. The BIOS setup appears and displays the appliance boot priority order:

   ```
   Boot priority order:
   1:  USB KEY: CBM USB 2.0-(USB 2.0)
   2:  PCI SCSI: ASR-5405 PCI-E RAID
   3:  PCI BEV: IBA GE Slot 0B00 v1240
   4:  USB CDROM
   5:  ALL USB KEY
   6:  All USB CDROM
   7:  CF Card:
   8:  SATA Port 1:
   ```

   If **USB KEY:CBM USB 2.0- (USB 2.0)** is not at the top of the list, use the down arrow to select it and the <+> key to move it to the top of the list. Press the F10 key to save your changes and exit the BIOS setup.

8. After you have confirmed the BIOS setting, power off the appliance.
9. Power on the appliance again. The boot prompt displays the following menu:

   ```
   To enter rescue mode, type rescue-serial < ENTER >
   or rescue-kvm < ENTER >

   To boot from local type:
   local < ENTER >

   To reinstall type:
   reinstall < ENTER >
   boot:
   ```

   Type **reinstall** and press the Enter key at the boot prompt to install the ISO image from the USB drive.

   If no input is provided, the appliance boots from the local disk by default.

   After completing the installation, the appliance powers down. The reinstallation process should take 30 to 60 minutes

WARNING: This procedure overwrites your hard disk drive with a new factory default Junos Space installation. No trace of the previous installation or configuration shall remain. If you do not want to erase your system, power off the device immediately.

10. The next time you power on the appliance, it boots with the Junos Space version you have selected, and eventually prompts you for the default username (**super**) and password (**juniper123**).

NOTE: Do not remove the USB drive until the reinstallation procedure is complete and the appliance is powered off.

Follow the instructions at Configuring Basic Settings for a Junos Space JA1500 Appliance to configure basic Junos Space settings the next time you power on the appliance.

Related Documentation

- Configuring Basic Settings for a Junos Space JA1500 Appliance on page 41
- Booting and Configuring the Junos Space JA1500 Appliance on page 33

PART 5

Configuration

CHAPTER 5

Configuring the Junos Space JA1500 Appliance

Configuring Basic Settings for a Junos Space JA1500 Appliance

You must configure basic network and machine information to make your appliance accessible to the network.

To configure the startup settings of the JA1500 Appliance, follow these steps:

1. At the serial console login prompt, type the default user name and press Enter. The default user name for console access is **admin**.
2. At the login prompt, type the default password and press Enter. The default password for console access is **abc123**. Junos Space prompts you to change your default password.
3. Enter the default password, then enter your new password. All passwords are case sensitive. You see **passwd: all authentication tokens updated successfully.**
4. Enter a new IP address for interface **ETH0** and press Enter. See also "Understanding How Junos Space Uses Ethernet Interfaces eth0 and eth3" on page 44.

   NOTE: **The first and second appliance or virtual appliance that you configure in a cluster (fabric) must be in the same subnet.**

5. Enter a new subnet mask for interface **ETHO** and press Enter.
6. Enter the default gateway as a dotted decimal IP address and press Enter.
7. Enter the nameserver address in dotted decimal notation for interface **ETH0** and press Enter.

8. Specify whether the Junos Space system will be added to an existing cluster.
   - If the appliance will be not be added to an existing node cluster or is the first node in the cluster:
     - Enter **n** when prompted “Will this Junos Space system be added to an existing cluster?”
     - Enter the IP address for Web access.

       The IP address for Web access must be in the same subnet as the IP address for interface **ETH0** but must be a different IP address.
     - Enter the display name for this node.

       This is the logical node name that Junos Space displays for the first node in a cluster.
   - If the JA1500 Appliance will be added to an existing node cluster, enter **y** when prompted “Will this Junos Space system be added to an existing cluster?”
9. Enter the IP address for the Web GUI and press Enter.
10. Enter the display name for the node and press Enter.
11. Enter the password for the cluster maintenance mode.

    This is the password a maintenance mode administrator must specify to access maintenance mode and shutdown all nodes.
12. Reenter the password to confirm it. You see the settings summary:

```
1> IP Change: eth0 is 1.1.1.1 / 1.1.1.1
2> Default Gateway = 1.1.1.1 on eth0
3> DNS add: 1.1.1.1
4> Create as first node or standalone
5> Web IP address is 1.1.1.1
6> Node display name is "space1"
7> Password for Junos Space maintenance mode is set.

A> Apply settings
C> Change settings
Q> Quit and set up later
R> Redraw menu

Choice [ACQR]:
```

13. If the settings are correct, type **A** to apply the setting by typing option and press Enter. You see the following:

```
Applying Changes...
Re-loading database
5280 semi-random bytes loaded
Generating RSA private key, 1024 bit long modulus
.....++++++
.....++++++
e is 65537 (0x10001)
grep: /etc/ha.d/haresources: No such file or directory
Stopping High-Availability services:
```

```
[  OK  ]
logd is already stopped
heartbeat is stopped. No process
Starting High-Availability services:
2009/11/04_11:34:50 INFO:  Resource is stopped
[  OK  ]
Done!
Adding password for user maintenance
httpd is stopped
Starting httpd: httpd: Could not reliably determine the server's fully qualified domain
 name, using 10.155.65.191 for ServerName
[  OK  ]
Starting MySQL.. SUCCESS!

Welcome to the Junos Space Network Settings Utility.

Initializing, please wait


Junos Space Appliance Settings Menu

1> Change Password
2> Set Routing
3> Set DNS Servers
4> Change Time Options
5> Retrieve Logs
6> Security
7> (Debug) run shell

Q> Quit
R> Redraw Menu

Choice [1-7,QR]:
```

14. Type 7 to run the shell. You see the following:

```
Password:
[root@junos-space-0256122008000008 ~]# ls
anaconda-ks.cfg  install.log  install.log.syslog
[root@junos-space-0256122008000008 ~]# df -h
Filesystem          Size  Used Avail Use% Mounted on
/dev/sda1           3.8G  1.3G  2.4G  34% /
/dev/mapper/jmpvgnocf-lvvar
                    1.8T  316M  1.7T   1% /var
tmpfs               4.0G     0  4.0G   0% /dev/shm
[root@junos-space-0256122008000008 ~]# jmp_setup

Welcome to the Junos Space Network Settings Utility.

Initializing, please wait


Junos Space Appliance Settings Menu

1> Change Password
2> Set Routing
```

```
3> Set DNS Servers
4> Change Time Options
5> Retrieve Logs
6> Security
7> (Debug) run shell

Q> Quit
R> Redraw menu

Choice [1-7,QR]:
```

15. Type Q to quit.

    The configuration of the JA1500 Appliance is now complete.

NOTE: To log in to the Junos Space user interface from a Web browser, See the *Junos Space Network Application User Guide*.

Related Documentation

- Understanding How Junos Space Uses Ethernet Interfaces eth0 and eth3 on page 44

Understanding How Junos Space Uses Ethernet Interfaces eth0 and eth3

Junos Space is designed to perform best using only eth0 if the managed devices are routable, using in-bound management. Use eth3 for a device management subnet if the managed devices are non-routable or on an out-of-band management subnet.

Table 10 on page 44 describes how Junos Space interfaces intentionally function:

Table 10: How Junos Space IP Addresses Function

/Interface	Function
eth0	SSH and device management if eth3 is not configured (node IP)
eth0:0	GUI interface with an instance of JBOSS running (GUI)
eth1	Not supported
eth2	Not supported
eth3	Device management when managed devices are on a subnet and not reachable by way of eth0.

Junos Space uses eth0 and eth3 interfaces as follows:

- Secure Shell Daemon (sshd) is listening on all IP addresses.
- The web interface is only on the VIP, the same subnet as eth0.
- Device management, outbound (discover) and inbound (post-discovery), including syslog and DMI, should be eth3, or eth0 if eth3 is not configured.

Related Documentation

- Configuring Basic Settings for a Junos Space JA1500 Appliance on page 41
- Changing Network and System Settings for a Junos Space Appliance on page 45

Changing Network and System Settings for a Junos Space Appliance

You can change some of the basic settings that you configured when you first installed and set up your Junos Space appliance. You can also change system time defaults and retrieve system log files for your appliance.

Each time you log in from the Junos Space system console, the Junos Space Appliance Settings menu appears. Follow the system prompts from the menu to set or modify any menu options. Password changes take effect immediately. Any configuration changes you make do not take effect until you apply the changes.

You can perform the following tasks from the Junos Space Appliance Settings menu:

```
Junos Space Appliance Settings Menu

1> Change Password
2> Set Routing
3> Set DNS Servers
4> Change Time Options
5> Retrieve Logs
6> Security
7> (Debug) run shell

Q> Quit
R> Redraw Menu

Choice [1-7,QR]:
```

- Changing the Password on page 45
- Setting Routing Option on page 46
- Adding DNS Servers on page 46
- Setting the System Time on page 46
- Retrieving Logs on page 47
- Configuring Security on page 48
- Running the Shell on page 49

Changing the Password

To change your password:

1. From the Junos Space Appliance Settings menu, enter **1** at the prompt.
2. Enter **y** when prompted to change the password for an admin user.
3. Type the new password and press Enter.
4. Retype the new password and press Enter.

Your password is updated and the setup program returns you to the main menu.

Setting Routing Option

The Set Routing option changes only the default gateway. You cannot add a new static route using Set Routing. When you have only a management ETH0 interface configured, the Set Routing option allows you to change the default gateway for the Management interface. However, if you have both ETH0 and ETH3 interfaces configured, the Set Routing option provides two options: one to change the default gateway for the management interface ETH0; the other to change the gateway for the device management interface ETH3. See also "Understanding How Junos Space Uses Ethernet Interfaces eth0 and eth3" on page 44.

To modify options for the default gateway or static routing:

1. From the Junos Space Appliance Settings menu, enter **2** at the prompt.
2. Enter one of the following options:

NOTE: **Enter only option 1 if you have configured only ETH0. Enter both option 1 and/or 2 if you have configured both ETH0 and ETH3 interfaces.**

- Enter **1** to change default gateway options.

  Follow the prompts to change the IP address of the default gateway and return to the main menu.

- Enter **2** to change the static routing options.

  Follow the prompts to add a new static route and return to the main menu.

Adding DNS Servers

You can add up to three DNS servers. Enter each one using dotted decimal notation (for example, 10.157.191.252. Each addition returns you to the main menu.

To add a DNS server:

1. From the Junos Space Appliance Settings menu, enter **3** at the prompt.
2. Enter **1** to add a nameserver.
3. Enter the new nameserver in dotted decimal notation.

Repeat Step 1 through Step 3 to add another DNS server.

Setting the System Time

When you configure each Junos Space appliance or virtual appliance with an NTP server, you ensure that, if the first node (which is used to synchronize time for all nodes in the fabric) goes down, all other nodes in the fabric remain synchronized. To ensure this behavior, all nodes in a fabric must use the same external NTP source that you configure for the first appliance.

NOTE: When an NTP server is enabled on the first node in the cluster, all other nodes are synchronized with the NTP server time. However to ensure time synchronization across all nodes in a fabric in the event of failover, all nodes in a fabric should be configured using the same NTP server.

To change time options for an appliance:

1. From the Junos Space Appliance Settings menu, enter **4** at the prompt.
2. Enter **2** to set NTP servers.

   NTP servers automatically set the system clock based on external time sources.
3. Enter one of the following values at the prompt:

   - **1** to enable or disable NTP.
   - **2** to add an NTP server.

   The remaining numbered options let you remove an NTP server from the list.
4. Follow the prompts to enable, set, or delete the NTP servers and return to the main menu.

Retrieving Logs

To retrieve system log files, you can use SecureCopy (SCP) if the network is functional, or a USB device if the network is down.

NOTE: To save the system log file to a USB device, the device must be connected to the Junos Space appliance.

To retrieve system logs:

1. From the Junos Space Appliance Settings menu, enter **5** at the prompt.
2. Choose a method for retrieving log files from the Retrieve Logs submenu:

   a. To save the log files to USB , enter **1** and follow the prompts.

      Junos Space retrieves the log files on all cluster members and combines them into a tar file. After the file is created, you can copy the file onto a USB device.

   b. To save the log files using SCP enter **2** and follow the prompts.

      Junos Space retrieves the log files on all cluster members and combine them into a tar file. After the file is created, you can transfer the file to a remote SCP server.

Configuring Security

The Security CLI menu command allows you to enable and disable the firewall and SSH connection to an appliance. Enabling or disabling the firewall and SSH take place immediately.

You can enable the firewall to examine all traffic routed between the network and the appliance to prevent intrusion. The Enable Firewall option is enabled on the appliance by default. The Enable Firewall option toggles to Disable Firewall when the option is enabled.

NOTE: **The only recommended time to disable the firewall is when using Service Now e-mail or SNMP notifications, or when using Service Now through a proxy.**

Additionally, you can enable an SSH connection to the appliance. SSH is enabled by default. If SSH is disabled, you can still connect to an appliance through the serial console.

To enable a firewall:

NOTE: **The firewall is enabled on the appliance by default.**

1. From the Junos Space Appliance Settings menu, enter **6**. The submenu appears.
2. If the firewall option is disabled, enter option **1** Enable Firewall.
3. Type the password. You see the following at the prompt:

   ```
   Starting jmp-firewall: [  OK  ]
   ```

To disable a firewall:

1. From the Junos Space Appliance Settings menu, enter **6**. The submenu appears.
2. If the firewall is enabled, enter option **1** Disable Firewall.
3. Type the password. You see the following at the prompt:

   ```
   Flushing firewall rules: [  OK  ]
   Setting chains to policy ACCEPT: filter [  OK  ]
   Unloading iptables modules: [  OK  ]
   Stopping jmp-firewall:
   ```

To enable SSH:

NOTE: **SSH is enabled on the appliance by default.**

1. From the Junos Space Appliance Settings menu, enter **6**. The submenu appears.
2. If SSH is disabled, enter option **2** Disable SSH.

3. Type the password. You see the following at the prompt:

   Starting sshd: [OK]

   This action starts the SSH daemon process.

To disable SSH:

1. From the Junos Space Appliance Settings menu, enter **6**.The submenu appears.
2. If SSH is enabled, enter option **2** Enable SSH.
3. Type the password. You see the following at the prompt:

   Stopping sshd: [OK]

   This action stops the SSH daemon process.

Running the Shell

To run shell commands to debug Junos Space:

1. From the Junos Space Appliance Settings menu, enter **7** and follow the prompts.

Related Documentation

- Configuring Basic Settings for a Junos Space JA1500 Appliance on page 41

Viewing Nodes in the Fabric

The Fabric Monitoring inventory page allows the administrator to view configuration and runtime information for each node in the Junos Space fabric. You can also monitor the status of the database, load balancer, and application logic functions running on each node, and identify nodes that are overloaded or down. The Fabric Monitoring inventory page refreshes every 10 seconds, by default.

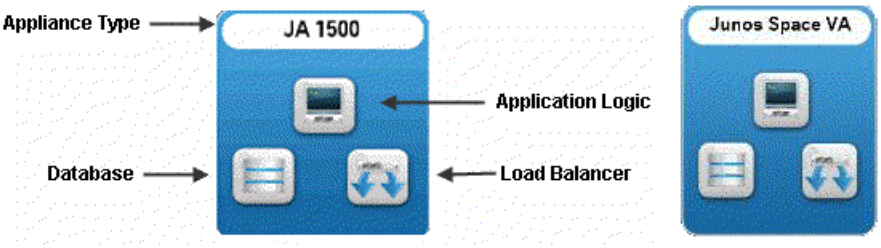
- Changing Views on page 49
- Viewing Fabric Node Details on page 50

Changing Views

You can display fabric monitoring in two views: thumbnail and tabular. By default, fabric monitoring objects appear in thumbnail view.

In thumbnail view, fabric monitoring appears as icons listed in descending order alphabetically by node name. Each fabric has a node name.

Each node in the fabric is represented by a thumbnail, which indicates whether the node is a JA1500 Junos Space Appliance (JA1500) or a Junos Space Virtual Appliance (Junos Space VA), and the node functions (database, load balancer, or application logic) that run (whether up or down) on the appliance. For example, icons for the JA1500 Junos Space appliance and virtual appliance are shown.



In tabular view, fabric nodes appear in a table sorted by node name. Each fabric is a row in the Fabric Monitoring table.

To change views:

1. Navigate to Platform > Administrator > Manage Fabric. The Manage Fabric page appears.
2. Click a view indicator at the right of the Manage Fabric page title bar.

Viewing Fabric Node Details

To view detailed runtime and status information for a node:

- Double-click a node in either thumbnail or tabular views.The View Node Details page appears.
- In Fabric Monitoring thumbnail view, move the zoom slider to the far right.

Table 11 on page 50 describes the node information displayed in each column in the table and from the detailed view.

Table 11: Fields for the Fabric Monitoring Inventory Panel

Field	Description
Node Name	The logical name assigned to the node. NOTE: For the first node, Junos Space uses the node name that the user specifies during the initial configuration of the Junos Space appliance (physical or virtual). For each subsequent node, the user must specify a node name when adding the node to the fabric.
Management IP	The IP address for the node.
Status	Connection status for the node. • UP—Node is connected to the fabric. • DOWN—Node is disconnected from the fabric.
% CPU	The percentage of CPU resource utilized by the node. • Unknown—The percentage of CPU utilized is unknown, for example, because the node is not connected.

Table 11: Fields for the Fabric Monitoring Inventory Panel *(continued)*

Field	Description
% RAM	The percentage of memory resource utilized by the node. • Unknown—The percentage of memory utilized is unknown, for example, because the node is not connected.
% Disk	The percentage of the **/var** directory utilized by the node. • Unknown—The percentage of the **/var** directory utilized by the node is unknown, for example, because the node is not connected.
App Logic	Application Logic function status for the node. • UP— Application Logic function is running on node. • DOWN—Application Logic function enabled on the node but is not running. • Unknown—Status for the application logic function is unknown, for example, because the node is not connected. • N/A— Application Logic function is not configured to run on the node.
Database	Database function status for the node. • UP—Database function is running on node. • DOWN—Database function that is enabled on the node but is not running. • Unknown—Status for the Database function is unknown, for example, because the node is not connected. • N/A—Database function is not configured to run on the node. NOTE: By default, the Database function is enabled on no more than two nodes in the fabric.
Hardware Model	Model of Junos Space Appliance. NOTE: Hardware model appears when you double-click a thumbnail or table row for a detailed view of the node. NOTE: Hardware model only applies for a Junos Space physical appliance.
Load Balancer	Load Balancer function for the node. • UP – Load Balancer function is running on the node. • DOWN – Load Balancer function that is enabled on the node is not running. • Unknown – Status for the Load Balancer function is unknown, for example, because the node might not be connected. • N/A – Load Balancer function is not running because it is not configured to run on the node. NOTE: By default, the Load Balancer function is enabled on no more than two nodes in the fabric.
Serial Number	Serial Number for the Junos Space appliance. NOTE: Serial number appears when you double-click a thumbnail or table row for a detailed view of the node.

Table 11: Fields for the Fabric Monitoring Inventory Panel *(continued)*

Field	Description
Software Version	Junos Space Release Version. NOTE: Software version appears when you double-click a thumbnail or table row for a detailed view of the node.

For more information about manipulating data on the Fabric Monitoring inventory page, see the *Junos Space Network Application Platform User Guide*.

Related Documentation

- Fabric Management Overview on page 9
- Understanding How Nodes Are Connected in a Fabric on page 8
- Adding a Node in the Fabric on page 52
-

Adding a Node in the Fabric

You can deploy one or more Junos Space appliances or virtual appliances to create a scalable fabric. As the number of devices on your network expands, you can add nodes to the fabric to manage the increased workload. Each Junos Space appliance and virtual appliance that runs the complete Junos Space software is represented as a single node in the fabric. By default, the Junos Space fabric contains a single node that provides complete Junos Space management functionality. Junos Space automatically adds the first node to the fabric and uses the logical node name that you assign to the appliance or virtual appliance when you configure the first appliance (node) in a cluster (fabric). For each additional appliance or virtual appliance you deploy, you must add the node in Junos Space to represent the appliance or virtual appliance in the fabric.

Before you add a node to the fabric, you must ensure the following:

- The new node must be configured to be added to an existing cluster. See Configuring an Appliance to Add to an Existing Cluster for more details.
- The ETH0 IP address on the first and second nodes and the virtual IP (VIP) address for the fabric must be in the same subnet.
- You must be able to route multicast packets through all nodes in the fabric.
- You must configure the same Network Time Protocol (NTP) servers on all nodes in the fabric.
- You must ensure that all nodes are running the same software release version.
- If the new node is a virtual appliance, you must ensure that the first and second nodes are hosted on two separate VMware ESX servers to ensure failover support.

NOTE: Where the Junos Space Virtual Appliance documentation references "ESX server", you can use either the ESX server, version 3.5 or later, or the ESXi server, version 4.0 or later.

- Adding a Node on page 53

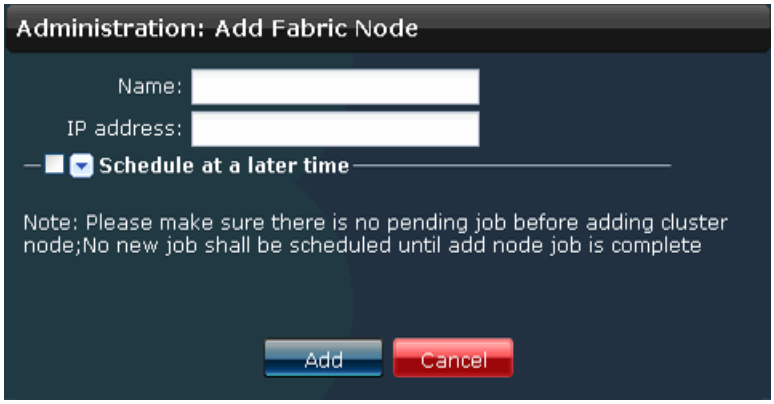
Adding a Node

You can add one or more nodes to the existing Junos Space fabric, but you can add only one node at a time.

To add a node to the Junos Space fabric:

1. From the taskbar, select the **Administration** workspace.
2. From the taskbar, select the **Manage Fabric** icon.
3. From the taskbar, select the **Add Fabric Node** task.

   The Add Fabric Node screen appears.



4. In the Name field, enter a name for the node.
5. In the IP address field, enter the IP address of the Junos Space appliance or virtual appliance.
6. Schedule the Add Fabric Node operation:
   - Clear the **Schedule at a later time** check box (the default) to initiate the add node operation when you complete step 7 of this procedure.
   - Select the **Schedule at a later time** check box to specify a later start date and time for the add node operation.

   NOTE: The selected time in the scheduler corresponds to Junos Space server time but is mapped to the local time zone of the client computer.
7. Click **Add** to add the node to the fabric.

The node is added to the fabric and appears in the Junos Space user interface and database. When you add a node, the node functions are automatically assigned by Junos Space. By default, the first and second nodes added to a fabric perform all the following functions:

- Database— for processing database requests (create, read, update, and delete operations)
- Load Balancer— for processing HTTP requests from remote browsers and NBI clients
- Application Logic— for processing back-end business logic (Junos Space service requests) and data manipulation language (DML) workload (device connectivity, device events, and logging)

By default, the third node, and all subsequent nodes, added to a fabric perform only the Application Logic function.

PART 6

Upgrading

CHAPTER 6

Upgrading the Junos Space JA1500 Appliance Software

Junos Space Software Upgrade Overview

To upgrade Junos Space software for Juniper Networks physical and virtual appliances, you upload the Junos Space image file to your existing fabric and perform the software upgrade from the Junos Space user interface. When you perform an upgrade, all appliances (nodes) in the fabric are upgraded with the new software.

To ensure a successful upgrade of your Junos Space appliances, complete the following tasks.

- Back up all your Junos Space data before you begin the upgrade process.
- When upgrading a Junos Space virtual appliance, perform a snapshot to save a copy of the current Junos Space software configuration of the appliance.
- Ensure that the current Junos Space virtual appliance meets the memory requirement of the software to which you want to upgrade.
- Download the Junos Space software image from the Juniper Networks software download Web site.
- Complete the steps to upgrade your current Junos Space software to the latest software version. See "Upgrading the Junos Space Software" on page 58.

NOTE: **To perform the Junos Space upgrade , you must log in as the default super administrator or system administrator.**

- Validate that the software is successfully installed by logging in to Junos Space, selecting the Help icon to the right in the banner, then clicking About in the side panel.

To view the version of the installed Junos Space software, select the Help icon in the user interface banner, and click on the **About** panel.

- Upload the License Key that was sent to you when you purchased the Junos Space software upgrade.

Related Documentation

- Upgrading the Junos Space Software on page 58
- Upgrading the Network Application Platform on page 59

Upgrading the Junos Space Software

Junos Space administrator can upgrade software for the JA1500 Junos Space appliance by downloading the Junos Space Upgrade image file from the Juniper Networks software download site onto the local client file system. Once downloaded, upload the Junos Space software to Junos Space using Platform > Administration > Manage Applications Upgrade Platform action. Thereafter, Junos Space upgrades the selected software. When you perform an upgrade, all appliances (nodes) in the fabric are upgraded with the new software.

CAUTION: **The Junos Space Upgrade supports only two consecutive releases.**

CAUTION: **You cannot upgrade directly from Junos Space release 1.0, 1.1, 1.2, 1.3, or 1.4 to release 11.3. Instead, you must upgrade indirectly to Junos Space release 11.1 or 11.2 before upgrading to release 11.3.**

- Junos Space 11.3 Release Highlights on page 58
- Before You Begin on page 59
- Upgrading Junos Space Release 11.1 or 11.2 to Release 11.3 on page 59

Junos Space 11.3 Release Highlights

The Junos Space Upgrade Release 11.3 includes:

Junos Space Release 11.3 Contents

- Network Application Platform Release 11.3 (The platform provides the operating environment for Junos Space, therefore upgrade using the Platform > Administration > Manage Application Upgrade Platform action.)
- Service Now Release 11.3
- Service Insight Release 11.3

Available Hot-Pluggable Applications

The following applications are hot-pluggable in Junos Space. Hot-pluggable applications mean that adding removing, and upgrading occurs while Junos Space is still running, and

without service interruption. A hot-pluggable application is packaged separately and has an separate image file for installing and upgrading.

- Ethernet Design
- Network Activate
- QoS Design
- Security Design Release
- Virtual Control Release

Before You Begin

Before you upgrade the Junos Space Software, ensure that you are aware of the following:

- Upgrading to Junos Space release 11.3 clears existing user preferences set using the User Preference global action icon at the right in the title bar of Application Chooser.
- We recommend that you:
  - Back up the Junos Space database before you begin the upgrade process. See also "Junos Space Software Upgrade Overview" on page 57.
  - Clear the Web browser cache before logging in to the upgraded Junos Space software.
- You must log in as the default super administrator or system administrator to upgrade Junos Space.

Upgrading Junos Space Release 11.1 or 11.2 to Release 11.3

The Platform provides the running environment for all Junos Space applications, so upgrading it causes operation interruption.

NOTE: **When upgrading Junos Space from release 11.1 or 11.2 to release 11.3, the Network Application Platform and Service Now application are upgraded only. Junos Space release 11.1 or 11.2 applications are disabled. You must upgrade release 11.1 or 11.2 disabled applications to release 11.3. Do not add disabled Junos Space Release 11.1 or 11.2 applications using Platform > Administration > Manage Applications > Add Application.**

To upgrade Junos Space from release 11.1 or 11.2 to release 11.3, see "Upgrading the Network Application Platform" on page 59.

Upgrading the Network Application Platform

The Network Application Platform (Platform) provides the running environment for all Junos Space applications, so upgrading causes operation interruption. The Upgrade Network Application Platform action allows the administrator to upgrade the Network Application Platform independently from one version to another without installing other Junos Space applications.

NOTE: During an upgrade of Junos Space release 11.1 or 11.2 to release 11.3 on a multi-node fabric, the install status is shown in the installation process.

To upgrade the Junos Space Platform:

1. Ensure that the Junos Space Upgrade image to which you want to upgrade is downloaded to the local client file system using https://www.juniper.net/support/products/space/#sw.
2. Select **Platform** > **Administration** > **Manage Applications**.

   The Manage Applications inventory page appears.
3. Right-click the **Network Application Platform** application to select it.
4. Select **Upgrade Platform** in the pop-up menu.

   You can also select the platform and select **Upgrade Platform** from the **Actions** drawer. The **Upgrade Application** page appears displaying all previously uploaded versions of the Platform.
5. Do one of the following:
   - If the platform to which you want to upgrade is listed in the Upgrade Application dialog box, select the file, and click **Upgrade**.

     The application upgrade process begins. (Go to the next step.)
   - If the application to which you want to upgrade is not listed in the Upgrade Application dialog box, click **Upload**.

     The **Software File** page appears.

   Upload the new application by performing one of the following:

   a. Click **Upload via HTTP**.

      The **Software File** dialog box appears.

      i. Type the name of the application file or click **Browse** to navigate to where the new Junos Space application file is located on the local file system.

      ii. Click **Upload**

   b. Click **Upload via SCP**.

      The **Upload Software via SCP** dialog box appears. You must add the following Secure Copy remote machine credentials.

      i. Add your username.

      ii. Add your password.

      iii. Conform by adding your password again.

      iv. Add the host IP address.

v. Add the local path name of the Junos Software application file.

vi. Click **Upload**.

The new application is uploaded from the local file system into Junos Space and displayed by application name, filename, version, release level, and required Junos Space Platform version

When the process is completed the Upgrade Platform Job Information dialog box appears.

a. In the **Upgrade Application Job Information** dialog box, if you click the Job ID link, you see the Upgrade Application job on the **Platform** > **Job Management** > **Manage Jobs** inventory page.

i. Ensure that the job is successful.

ii. Select **Administration** > **Manage Applications** to continue with the add application process.

The **Manage Applications** inventory page appears.

b. Right-click the **Network Application Platform** application and select **Upgrade Platform**.

c. Click **OK**.

The **Upgrade Platform** dialog box appears. You see the application file that was uploaded.

d. Select the application file to which you want to upgrade, and click **Upgrade**. The application upgrade process begins.

6. You enter **Maintenance** mode. Junos Space prompts you to enter a user name and password to enter maintenance mode. The user name is **maintenance**; the password is one that the administrator created during the initial installation process.
7. Enter the maintenance mode user name and password in the text field.
8. Click **OK**.

Junos Space displays a status window during the platform upgrade process.

9. When the platform upgrade completes, click the **Return to Maintenance Menu** link.

The Maintenance Mode Actions window appears.

10. Click the **Log Out and Exit from Maintenance Mode** link.

The installation progress window appears.

NOTE: The platform upgrade process takes approximately between 2 and 30 minutes to complete depending on the size of the Junos Space database.

When the installation is complete, the Junos Space login prompt appears.

NOTE: If a blank page appears instead of the login prompt, click Refresh. The login prompt is then displayed.

NOTE: Juniper Networks recommends that you clear the Web browser cache before logging in to the upgraded software.

NOTE: Juniper recommends that you perform a functional audit on all deployed services after upgrading.

You can now log in to begin using the upgraded Junos Space software.

Related Documentation

- Upgrading the Junos Space Software on page 58

PART 7

Troubleshooting

CHAPTER 7

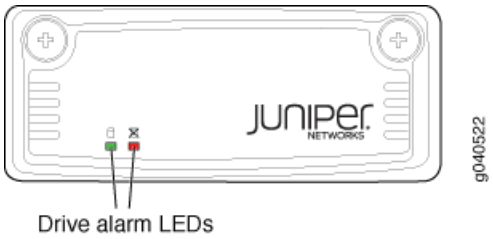
Troubleshooting the Junos Space JA1500 Appliance Hardware

Removing and Installing a Hard Disk

Problem The JA1500 appliance ships with three hard disk drives in RAID 5 array. The hot-swappable and hot-insertable drives are externally accessible in field-replaceable trays. You can remove and replace a hard disk without powering off the appliance or disrupting functions

If one drive fails, the appliance recovers by automatically rebuilding the failed drive. During failure, the LED 2 on the right on the front of the hard disk tray turns solid red and an alarm sounds . See Figure 10 on page 65.

Figure 10: JA1500 Appliance Hard Disk Alarm LEDs



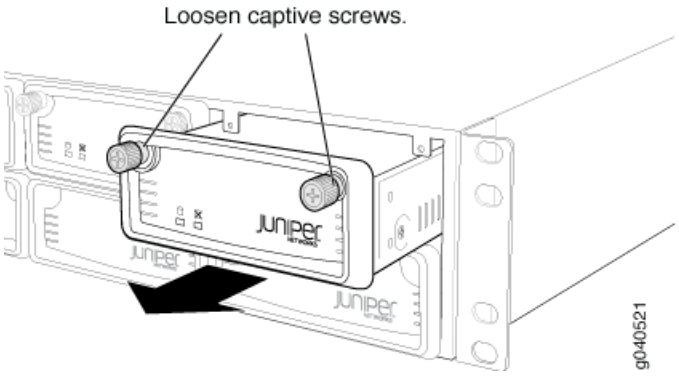
CAUTION: RAID system performance is impacted during the hard disk recovery process. The rebuild process can take between one hour and a day depending on the system load.

Solution Before you begin removing a hard drive from a JA1500 appliance, ensure that you have taken the necessary precautions to prevent ESD damage.

To remove a failed hard disk and install a new one:

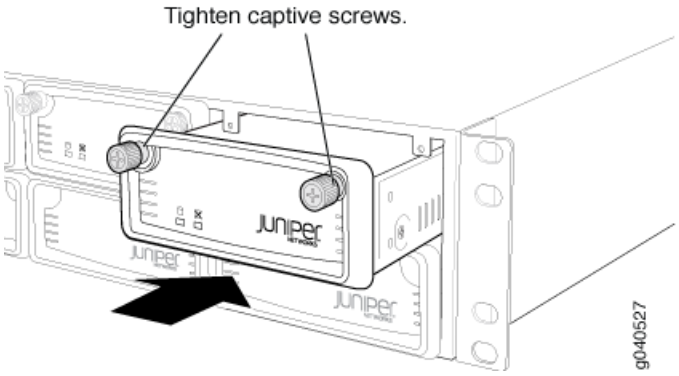
1. Place an antistatic bag on a flat surface.
2. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the JA1500 appliance
3. Loosen the hard disk captive screws. See Figure 11 on page 66.

Figure 11: JA1500 Appliance Hard Disk Removal



4. Slide the hard disk tray out of the appliance.
5. Put the failed hard disk in the antistatic bag for return material authorization (RMA).
6. Remove the new hard disk from the antistatic bag.
7. Insert the new hard disk into the JA1500 appliance and secure the two captive screws. See Figure 12 on page 66.

Figure 12: JA1500 Appliance Hard Disk Installation



The alarm silences and LED 2 starts blinking indicating the new hard drive is recovering RAID volume. LED 2 stops blinking when the drive rebuilding is complete and normal operation is established.

Related Documentation

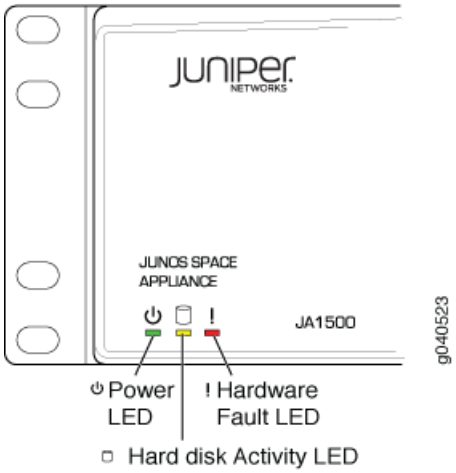
- Removing and Installing a Fan on page 67
- Removing and Installing a Power Supply on page 68

Removing and Installing a Fan

Problem The JA1500 appliance ships with two field-replaceable fans that are hot-removable and hot-insertable. You can remove and replace a fan without powering off the appliance or disrupting functions.

When a fan fails, the full cooling load switches to the remaining fan and the red Failure LED blinks on the JA1500 front panel and an alarm sounds. See Figure 13 on page 67.

Figure 13: JA1500 Appliance Front Panel Status LEDs



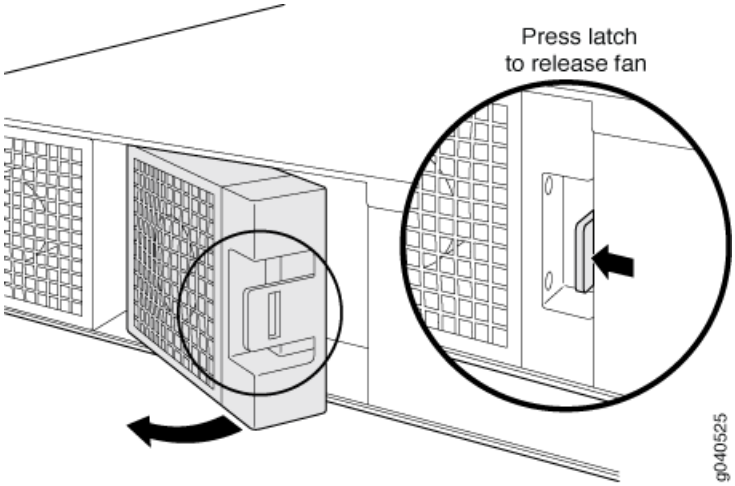
CAUTION: The JA1500 appliance should not run on one fan for an extended period of time. Failed fans should be replaced as soon as possible.

Solution Before you begin removing a fan tray from a JA1500 appliance, ensure that you have taken the necessary precautions to prevent ESD damage.

To remove a failed fan and install a new one:

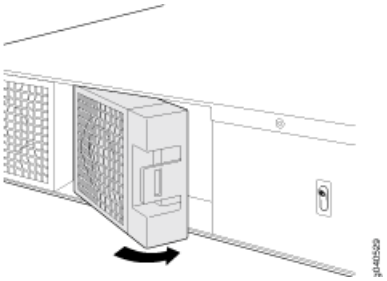
1. Place the antistatic bag or the antistatic mat on a flat, stable surface.
2. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
3. Press the latch to release the fan. See Figure 14 on page 68.

Figure 14: JA1500 Appliance Fan Removal



4. Pull the fan out of the chassis.
5. Place the fan in the antistatic bag or on the antistatic mat placed on a flat, stable surface.
6. Remove the new fan from the antistatic bag.
7. Insert the new fan until the latch locks. See Figure 15 on page 68.

Figure 15: JA1500 Appliance Fan Installation



When you replace the failed fan, the cooling load is distributed back evenly across both fans, the failure LED goes out, and an the alarm silences.

Related Documentation

- Removing and Installing a Hard Disk on page 65
- Removing and Installing a Power Supply on page 68

Removing and Installing a Power Supply

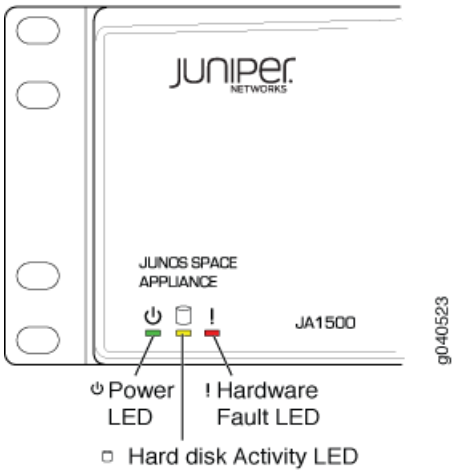
Problem The JA1500 appliance ships with one AC power supply that is cold-swappable. You must remove a failed power supply and insert a new one while the main power is off.

The JA1500 appliance is upgradable to a redundant hot-swappable dual power supply. If the JA1500 appliance includes two power supplies, plug each power cord into a separate power circuit to ensure that the device continues to receive power if one of the power

circuits fails. If a power supply fails, you can remove it while the other functioning power supply carries the full power load.

When a power supply fails, the red Failure status LED lights on the front panel of the JA1500 appliance. See Figure 16 on page 69.

Figure 16: JA1500 Appliance Front Panel Status LEDs

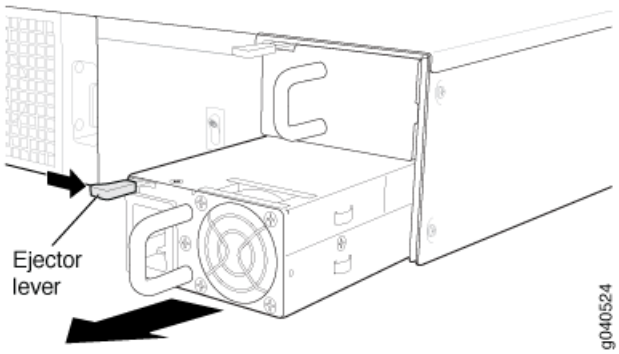


Solution Before you begin removing a power supply from a JA1500 appliance, ensure that you have taken the necessary precautions to prevent ESD damage.

To remove a failed power supply and install a new one:

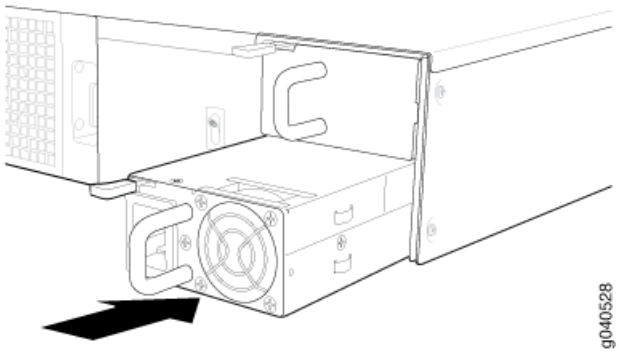
1. Place the antistatic bag or the antistatic mat on a flat, stable surface.
2. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
3. Remove the power source cable from the power supply faceplate. Pull out the female end of the power cord connected to the power supply faceplate.
4. Push on the locking ejector lever to the right until it is in its furthest position. See Figure 17 on page 69.

Figure 17: JA1500 Power Supply Removal



5. Grasp the power supply handle and pull firmly to slide it halfway out of the appliance.
6. Place one hand under the power supply to support it and slide it completely out of the appliance.
7. Place the power supply in the antistatic bag or on the antistatic mat placed on a flat, stable surface.
8. Remove the new power supply from the antistatic bag.
9. Insert the new power supply until the ejector lever locks. See Figure 18 on page 70.

Figure 18: JA1500 Appliance Power Supply Installation



The red failure alarm on the JA1500 front panel goes out when the new power supply is powered on and the alarm silences.

Related Documentation

- Removing and Installing a Hard Disk on page 65
- Removing and Installing a Fan on page 67

PART 8

Index

Index