



Junos Space

JA1500 Appliance Installation Guide

Release 1.0

Juniper Networks, Inc.

1194 North Mathilda Avenue
Sunnyvale, California 94089
USA

408-745-2000

www.juniper.net

Published: 2009-12-01

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Junos Space JA1500 Appliance Installation Guide
Release 1.0

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Writing: Donice G. Mitchell
Editing: Stella Hackell
Illustration: Faith Bradford

Revision History
November 30, 2009—R1 Junos Space 1.0

The information in this document is current as of the date listed in the revision history.

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Part 1

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Chapter 1

Junos Space JA1500 Appliance Overview

- Junos Space JA1500 Appliance Overview on page 3
- Understanding How Nodes Are Connected in a Fabric on page 4
- NTP Time Source For Each JA1500 Appliance on page 4
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Junos Space JA1500 Appliance Overview

The Juniper Networks Junos Space JA1500 appliance simplifies network administration through a single, integrated management interface that provides a platform for service provisioning and control of device parameters (see Figure 1 on page 3).



The hardware management system is easy to deploy and provides full high availability (HA) and scalability support. Enterprise customers with limited resources can benefit from the appliance by eliminating dedicated resources for maintaining a network and security management solution. Service providers can use the Juniper Network service provisioning software to simplify the management of their enterprise customers' VPNs and provide services.

The appliance makes it easy to manage networks of multiple families of Juniper Networks devices. The following Juniper routers are supported:

- Customer Premise Equipment (CPE)-based routers—J Series routers
- Service provider edge routers—MX Series and M series routers
- Service provider core routers—T Series routers

User access to the appliance is through a thin Web 2.0 UI client, which allows up to 50 administrators to log into Junos Space concurrently. Additionally, Junos Space allows concurrent access for up to 50 clients through its API. Through one Junos Space appliance, UI clients and API clients can manage networks with up to 15,000

devices, with up to a maximum of 14,400 branch or CPE devices, 500 PE devices, and 100 core (P) devices.

You can combine Junos Space appliances in clusters for high availability or increased throughput.

You can create a fabric of Junos Space appliances, Junos Space virtual appliances, or a hybrid fabric of both appliances and virtual appliances.

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.

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 needs to 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, and then to the second node, because both nodes are in same subnet. However, if the second (standby) node is configured in a different subnet than the first (active) node, and the first node goes down, the second node becomes the active node, but because the Web IP now points to the different subnet of the second node, all packets originally destined for first node won't be received by the second node.

NTP Time Source For Each JA1500 Appliance

To ensure consistent behavior among all nodes in a multi-node 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 is not of the highest precision. 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 set up.
 - For each additional appliance, add the same NTP server that you specified for the first appliance.
-



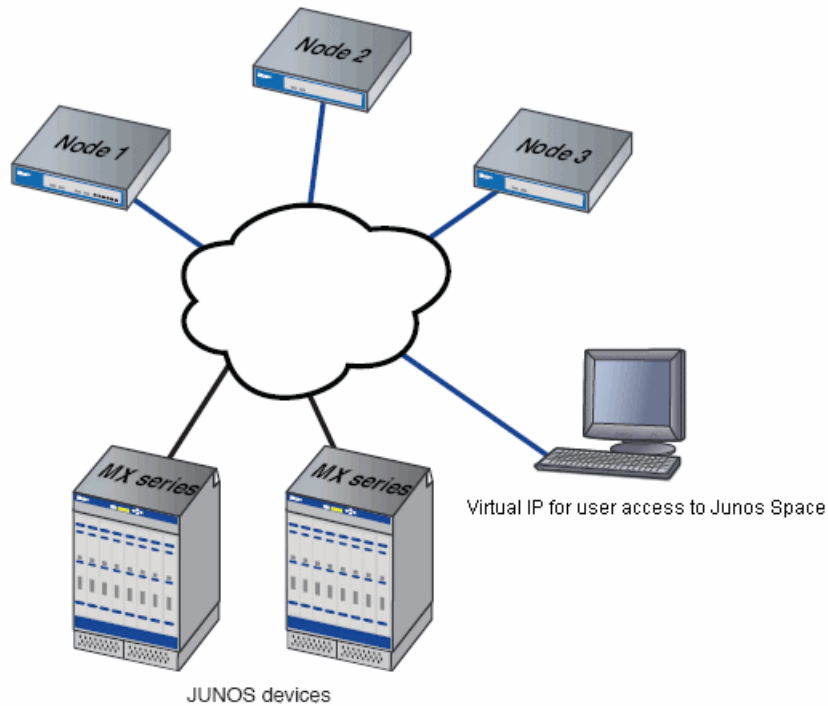
NOTE: You must add the NTP server before you add the appliance/node to the fabric from the user interface.

- Do not under any circumstances change the time zone for any node.

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, as shown in the illustration.



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, with the following node functions 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 back-end business logic (Junos Space service requests) and 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:

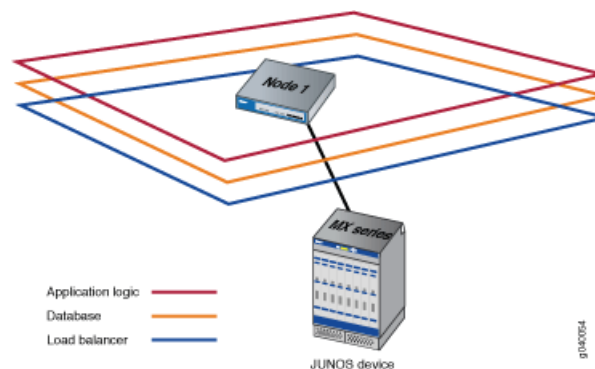
- **Load Balancer**— When a node that functions as the active load balancer server is down, all HTTP requests are automatically routed to the standby load balancer server that is running on a separate node.
- **Database**— When a node that functions as the active database server is down, all database requests (create, read, update, and delete) are routed to the node that functions as the standby database server.
- **Application Logic (DML and business 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:

$$\text{Threshold Limit} = \left[\frac{\text{(number of devices in database)}}{\text{(number of nodes running)}} \right] + 2$$

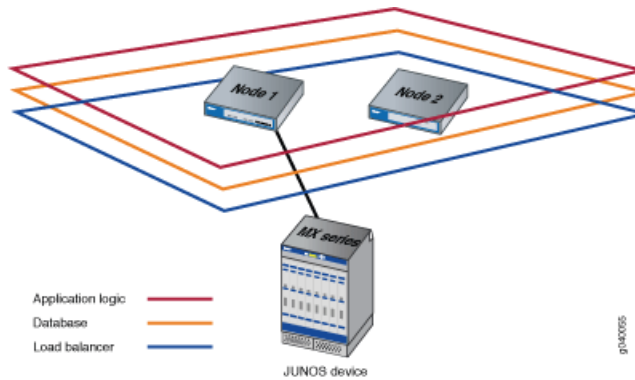
The following workflow describes how the node functions are enabled across the fabric as nodes are added:

- **First node up:** The load balancer, database, and application logic functions are enabled on the node. Each node function provides both scalability and high availability. The following illustration shows all functions enabled on fabric comprising one node.

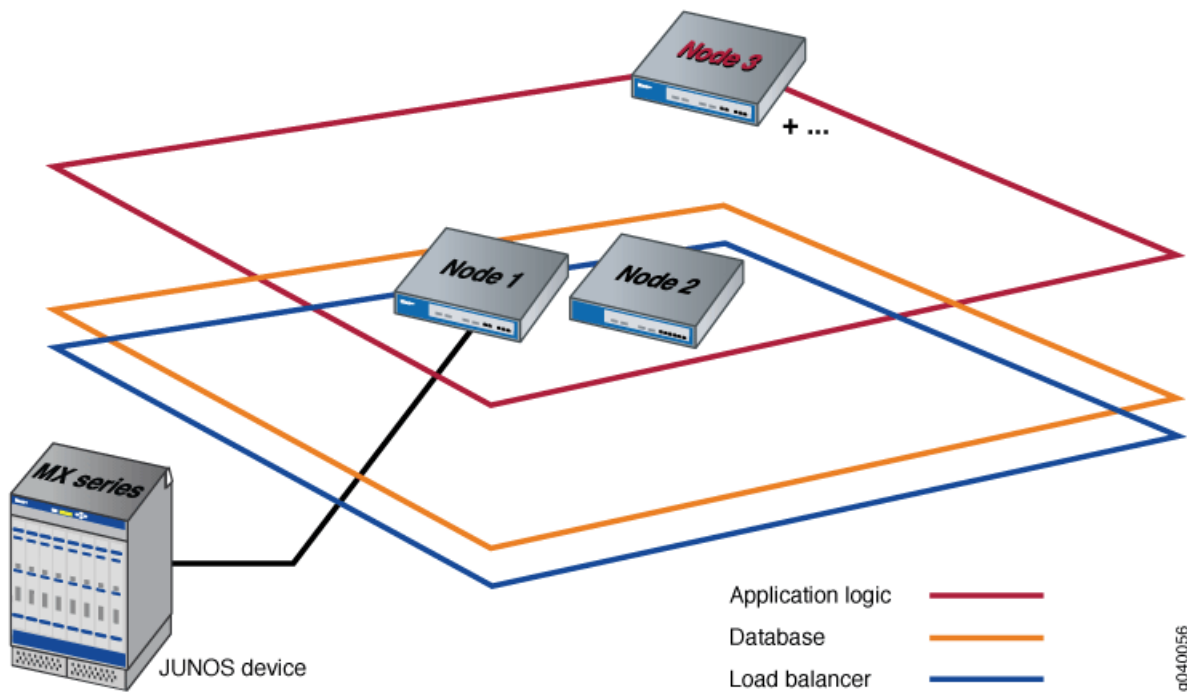


- **Add second node:** When a second node is added to the fabric, the first node functions as the active load balancer server and active database server, and the second node functions as the standby load balancer server and standby database server. The load balancer and application logic node functions provide scalability and high availability. The database node function on the second node provides

high availability only. The following illustration shows the functions enabled on a fabric comprising two nodes.



- Add third node: 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 route device-related operations to the node to which the device is connected. The application logic functionality provides both scalability and high availability. The following illustration shows the functions enabled on a fabric comprising 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 active server.

Chapter 2

Understanding the Junos Space JA1500 Appliance

- Parts of the Junos Space JA1500 Appliance on page 11

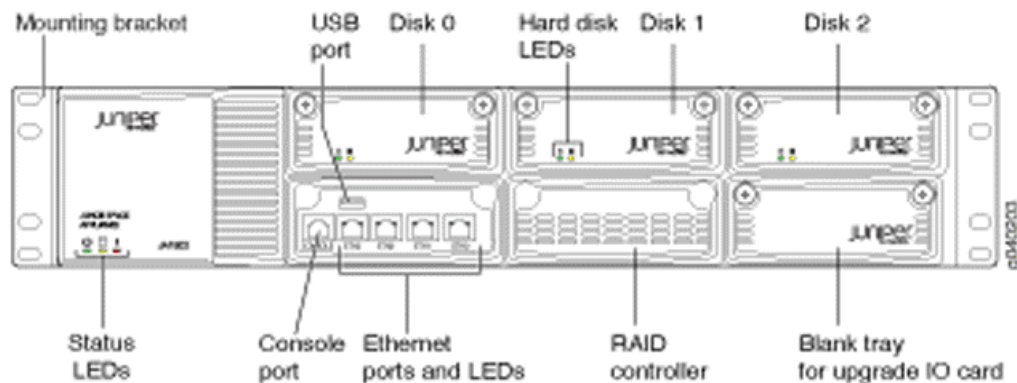
Parts of the Junos Space JA1500 Appliance

The Junos Space JA1500 Appliance front panel, rear panel, and LEDs are described in the sections that follow.

Parts of the JA1500 Appliance Front Panel

Figure 2 on page 11 shows the parts of the JA1500 Appliance.

Figure 2: Parts of the JA1500 Appliance Front Panel



- Mounting Brackets on page 12
- Chassis on page 12
- Hard Disks on page 12
- Ports on page 12
- RAID Controller on page 13
- Status LEDs on page 13

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 1 TB hard disks in hot-swappable RAID 5 array
- One RAID controller²
- 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 (Empty tray at bottom right)
- One 250-watt cold-swappable power supply with an AC power receptacle; one optional dual-redundant, hot-swappable power supply option
- One AC power switch
- Two cooling fans

Hard Disks

The JA1500 Appliance includes three hard disk drives in RAID5 array. The Serial Attached SCSI (SAS), hot-swappable drives are externally accessible in field replaceable trays providing component high availability. If one drive fails and the system recovers by hot swapping the failed drive which is rebuilt. A fourth empty hard disk tray is available for upgrade. The disks are labeled from left to right **Disk 0** , **Disk 1**, **Disk 2**. Front panel LEDs indicate drive activity and failure. You can order a spare hard disk on hand for hot-swapping a failed hard disk.

Ports

The JA1500 Appliance includes the following ports:

- Four RJ-45 10/100/1000 Mbps network ports using an Intel 82573EB 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, located at the bottom right most slot, that can be removed and replaced with an upgrade I/O card.

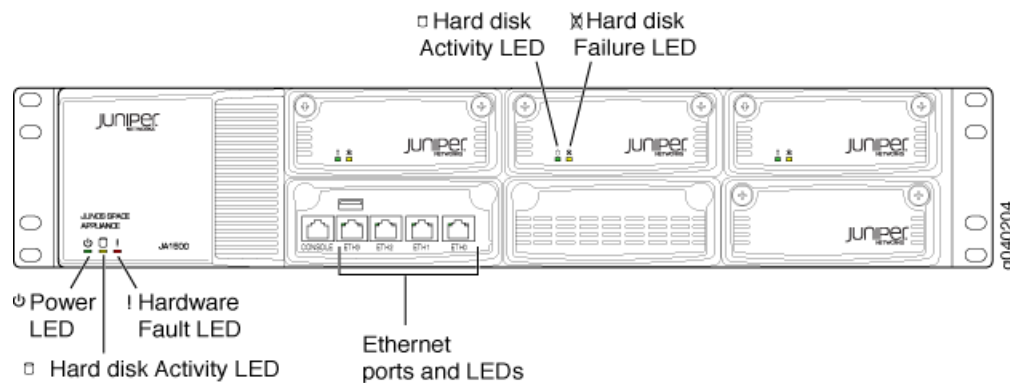
RAID Controller

The JA1500 Appliance Redundant Array of Inexpensive Disks (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 13.

Figure 3: JA1500 Appliance LEDs



The JA1500 chassis LEDs are described in Table 1 on page 13.

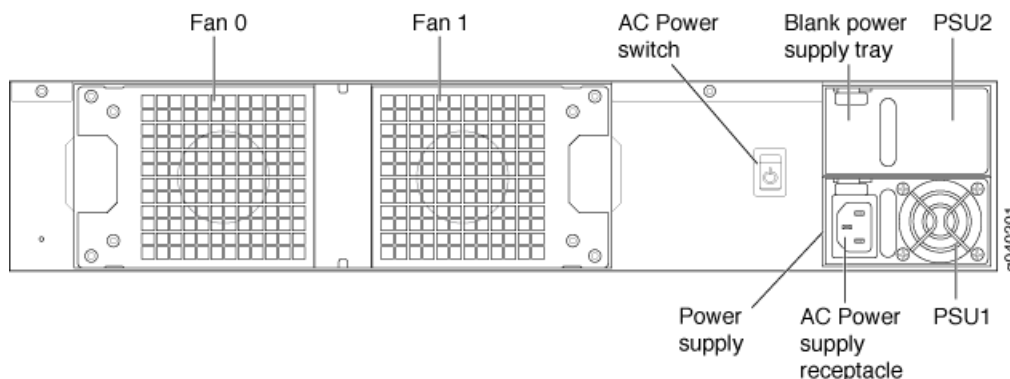
Table 1: JA1500 Appliance Front Panel LEDs

LEDs	Description
Chassis Status LEDs	<ul style="list-style-type: none"> ■ Power (green)—Indicates that the appliance is powered on ■ Hard disk (yellow)—Indicates the hard disk is in use (writing or reading data) ■ Hardware (red)—Indicates that a fan, power supply, or temperature alarm has occurred
Networking Port LEDs	<ul style="list-style-type: none"> ■ Left Ethernet Port LED (green)—Indicates link and activity <ul style="list-style-type: none"> ■ On—indicates the link ■ Blinking—indicates activity ■ Right Ethernet Port LED—Indicates the link speed: <ul style="list-style-type: none"> ■ Off—10 Mbps ■ Green—100 Mbps ■ Yellow—1000 Mbps or 1 Gbps
Hard drive tray LEDs	<ul style="list-style-type: none"> ■ LED 1 on left (green)—When lit, Indicates disk activity ■ LED 2 on right (red)—When lit, indicates disk failure

Parts of the JA 1500 Rear Panel

Figure 4 on page 14 shows the parts of the JA1500

Figure 4: Parts of the JA1500 Rear Panel



- Cooling System on page 14
- AC Power Switch on page 14
- Power Supply on page 14

Cooling System

The JA1500 Appliance includes two rear-accessible, hot-swappable fans to cool the other components. The fans are numbered from left to right: Fan 0, Fan 1.

AC Power Switch

The AC power switch is rear accessible 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) auto ranging power supply for all countries. The power supply is high efficiency—80 PLUS certified. The power supply includes a 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.

Part 2

Planning for the Junos Space JA1500 Appliance

- JA1500 Appliance Rack Requirements on page 17
- JA1500 Appliance Safety Requirements on page 21

Chapter 3

JA1500 Appliance Rack Requirements

- Rack Requirements and Specifications for a Junos Space JA1500 Appliance on page 17
- Environmental Requirements for the Junos Space JA1500 Appliance on page 18
- Power Requirements for a Junos Space JA1500 Appliance on page 19

Rack Requirements and Specifications for a Junos Space JA1500 Appliance

The Junos Space JA1500 appliance has a 2U rackmountable 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. Table 2 on page 17 lists the rack requirements.

Table 2: 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	<ul style="list-style-type: none">■ Ensure that the rack complies with one of these standards:<ul style="list-style-type: none">■ 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 2: JA1500 Appliance Rack Requirements *(continued)*

Rack Requirement	Guidelines
Rack connection to building structure	<ul style="list-style-type: none"> 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.

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 3 on page 18 provides the required environmental conditions for normal appliance operation.

Table 3: Environmental Requirements for Appliance Operation

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

Table 4: 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)

Power Requirements for a Junos Space JA1500 Appliance

A JA1500 Appliance can be powered by an AC electrical supply. Table 5 on page 19 shows the electrical power requirements for a JA1500 Appliance with AC power supplies.

Table 5: 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
Maximum output power	250 W (One AC power supply) 2x 250W (Two AC power supplies)

Chapter 4

JA1500 Appliance Safety Requirements

- General Safety Guidelines and Warnings for the Junos Space JA1500 Appliance on page 21
- Fire Safety Requirements for the Junos Space JA1500 Appliance on page 22

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.

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.

Part 3

Installing the Junos Space JA1500 Appliance

- Installing the Junos Space JA1500 Appliance on page 27
- Configuring the JA1500 Appliance Software on page 31
- Changing Junos Space JA1500 Appliance Settings on page 37
- Managing Nodes on page 41

Chapter 5

Installing the Junos Space JA1500 Appliance

- Unpacking the Junos Space JA1500 Appliance on page 27
- Attaching Mounting Brackets to a Junos Space JA1500 Appliance on page 28
- Installing the Junos Space JA1500 Appliance in a Rack and Connecting the Cables on page 29

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 following items, listed in Table 6 on page 27 are included in the JA1500 appliance box:

Table 6: Items in the JA1500 Appliance Shipping Container

Component	Quantity
Junos Space JA1500 Appliance chassis (See “Parts of the Junos Space JA1500 Appliance” on page 11)	1
Power cable	
Mounting kits	2
RJ45 to DB9F cable with adapter, 7 ft. Console cable	1
7-foot blue CAT5E cable	2
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 JA1500 Appliance 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 6 on page 27 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.

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, midmount brackets, rear mount 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.

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 27.
- 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 28.

To install the physical appliance in a rack:

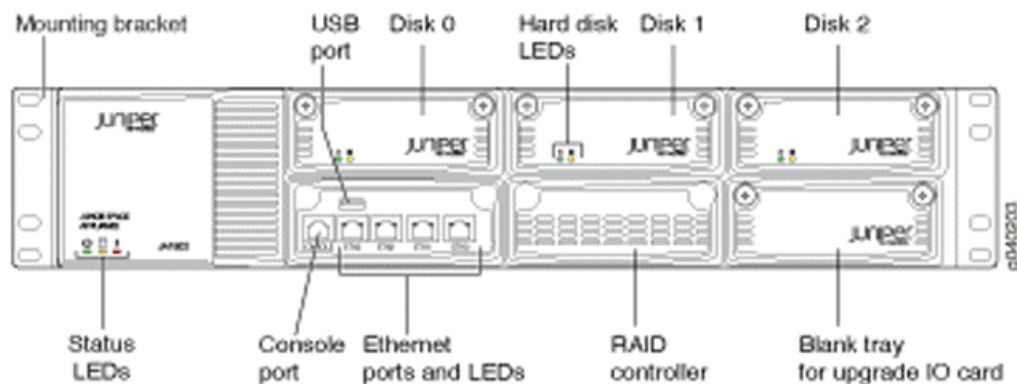
You need a Phillips (+) screwdriver, number 2

1. Attach the chassis to 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.

- Align the holes in the mounting bracket with the holes in the rack rails.
 - Insert the screws in each of the holes and tighten them with the Phillips screwdriver.
2. Plug the Ethernet cable into the network port marked ETH0 on the front panel.



3. 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.

Chapter 6

Configuring the JA1500 Appliance Software

- Booting and Configuring the Junos Space JA1500 Appliance on page 31
- Configuring Basic Settings for a Junos Space JA1500 Appliance on page 32

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 or laptop 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 separate wall sockets.

When the appliance is powered on, the serial console displays diagnostic information before booting. When complete, the serial console displays the login prompt.

5. At the boot prompt, enter **erase-reinstall-serial** and press Enter.

The Junos Space software is installed from the USB drive onto the appliance hard-disk drive, and the JA1500 Appliance automatically reboots.

6. During reboot, when you see the power down message, remove the USB drive from the JA1500 Appliance USB port.

When the appliance has rebooted, the login prompt on the serial console appears.

7. At the login prompt, type your user name and press Enter. The default user name is **super**.
8. At the login prompt, type your password and press Enter. The default password is **juniper123**. Junos Space prompts you to change your default password.
9. Change your default password when prompted. Enter the default password first followed by your new password. All passwords are case sensitive. You see **passwd: all authentication tokens updated successfully**.

This procedure allows you to configure the basic settings for your Junos Space JA1500 Appliance from the serial console.

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. Enter a new IP address for interface **ETH0** and press Enter.



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

2. Enter a new subnet mask for interface **ETH0** and press Enter.
3. Enter the default gateway as a dotted decimal IP address and press Enter.
4. Enter the nameserver address in dotted decimal notation for interface **ETH0** and press Enter.
5. 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?”

- Enter the password that will be used for authentication when an administrator adds the node to a cluster from the Junos Space user interface.

6. Enter the IP address for the Web GUI and press Enter.
7. Enter the display name for the node and press Enter.
8. 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.

9. 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]:

10. 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> (Debug) run shell
```

```
Q> Quit
R> Redraw menu
```

Choice [1-6,QR]:

11. Type 6 to run the shell. You see the following:

```
Password:
[root@junos-space-02561220080000008 ~]# ls
anaconda-ks.cfg  install.log  install.log.syslog
[root@junos-space-02561220080000008 ~]# 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-02561220080000008 ~]# 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> (Debug) run shell
```

```
Q> Quit
R> Redraw menu
```

Choice [1-6,QR]:

12. 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, Logging In To the System.

Chapter 7

Changing Junos Space JA1500 Appliance Settings

- Changing Network and System Settings for a Junos Space Appliance on page 37

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 is displayed. 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:

- Changing the Password on page 37
- Setting Routing Options on page 38
- Adding DNS Servers on page 38
- Setting the System Time on page 38
- Retrieve Logs on page 39
- (Debug) Run Shell on page 39

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 Options

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:
 - 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.



NOTE: Juniper strongly recommends that you do not change the time zone for any node.

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 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.

Retrieve 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. Once 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. Once the file is created, you can transfer the file to a remote SCP server.

(Debug) Run Shell

To run shell commands to debug Junos Space:

1. From the Junos Space Appliance Settings menu, enter **6** and follow the prompts.

Chapter 8

Managing Nodes

- Managing Nodes in the Fabric on page 41

Managing Nodes 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 with 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.

- Adding a Node on page 41

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

The Add Fabric Node screen is displayed.

Administration: Add Fabric Node

Name:

IP address:

☒ **Schedule at a later time**

Note: Please make sure there is no pending job before adding cluster node; No new job shall be scheduled until add node job is complete

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 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 is displayed 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 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 4

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