



**Junos Space**

# **Virtual Appliance Installation Guide**

*Release 1.1*

**Juniper Networks, Inc.**

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*Junos Space Virtual Appliance Installation Guide*

Release 1.1

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# Table of Contents

	<b>About The Documentation</b>	<b>xi</b>
	Junos Space Documentation and Release Notes .....	xi
	Documentation Conventions .....	xi
	Documentation Feedback .....	xii
	Requesting Technical Support .....	xii
	Self-Help Online Tools and Resources .....	xii
	Opening a Case with JTAC .....	xiii
<b>Part 1</b>	<b>Overview</b>	
<b>Chapter 1</b>	<b>Installation Overview</b>	<b>3</b>
	Junos Space Virtual Appliance Overview .....	3
	Understanding How Nodes Are Connected in a Fabric .....	3
	Virtual Appliance Deployment .....	4
	Recommendations for Deploying Virtual Appliances on the VMware ESX Server .....	4
	Configuring an NTP Time Source For Each Appliance .....	5
	Fabric Management Overview .....	5
	Single Node Functionality .....	6
	Multinode Functionality .....	7
	Node Function Availability .....	9
<b>Part 2</b>	<b>Installation and Configuration</b>	
<b>Chapter 2</b>	<b>Deploying a Virtual Appliance</b>	<b>13</b>
	Deploying a Junos Space Virtual Appliance .....	13
	Installing the VMware ESX Server .....	14
	Extracting Files from the Junos Space Virtual Appliance Package .....	14
	Converting a Virtual Appliance to a Virtual Machine by Using the VMware Converter .....	15
	Increasing RAM and Virtual Processors (CPU) for a Junos Space Virtual Appliance .....	19
	Adding Disk Resources for a Junos Space Virtual Appliance .....	23

<b>Chapter 3</b>	<b>Configuring a Virtual Appliance</b>	<b>29</b>
	Configuring Basic Settings for a Junos Space Virtual Appliance .....	29
	Configuring an Appliance that is the First Node in a Cluster or that Will Not Be Added to an Existing Cluster .....	29
	Configuring an Appliance to Add to an Existing Cluster .....	33
	Changing Network and System Settings for a Junos Space Virtual Appliance .....	36
	Changing the Password .....	37
	Setting Routing Options .....	37
	Adding DNS Servers .....	37
	Setting the System Time .....	37
	Retrieve Logs .....	38
	Expand VM Drive Size .....	38
	(Debug) Run Shell .....	39
<b>Part 3</b>	<b>Upgrades</b>	
<b>Chapter 4</b>	<b>Upgrading Junos Space Software</b>	<b>43</b>
	Junos Space Software Upgrade Overview .....	43
	Upgrading Junos Space Software .....	43
	Upgrading from Junos Space Release 1.0 to Release 1.1 .....	44
	Upgrading from Junos Space Release 1.1 .....	46
<b>Part 4</b>	<b>Accessing the Junos Space User Interface</b>	
<b>Chapter 5</b>	<b>Logging In</b>	<b>53</b>
	Logging In to the Junos Space User Interface as Super Administrator .....	53
<b>Chapter 6</b>	<b>Adding a Node</b>	<b>55</b>
	Adding a Node to an Existing Fabric .....	55



**Part 5**                      **License Key Management**

---

**Chapter 7**                      **Junos Space License Key Files** **59**

---

Generating and Uploading the Junos Space License Key File .....	59
Generating the License Key File .....	59
Uploading the License Key File Contents .....	59

**Part 6**                      **Index**

---

Index .....	65
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# About The Documentation

- Junos Space Documentation and Release Notes on page xi
- Documentation Conventions on page xi
- Documentation Feedback on page xii
- Requesting Technical Support on page xii

## Junos Space Documentation and Release Notes

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

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## Documentation Conventions

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**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.

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- Document or topic name
- URL or page number
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- 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/>

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- 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**

- Installation Overview on page 3





## Chapter 1

# Installation Overview

- Junos Space Virtual Appliance Overview on page 3
- Fabric Management Overview on page 5

### Junos Space Virtual Appliance Overview

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The Junos Space Virtual Appliance consists of preconfigured Junos Space software with a built-in operating system and application stack that is easy to deploy, manage, and maintain.

A Junos Space Virtual Appliance includes the same software and all the functionality available in a Junos Space physical appliance. However, you must deploy the virtual aAppliance on the VMware ESX Server, which provides a CPU, hard disk, RAM, and a network controller, but requires installation of an operating system and applications to become fully functional.

Just as you can install additional physical appliances to create a fabric to provide scalability and availability, you can deploy multiple virtual appliances to create a fabric that provides the same scalability and high availability as a fabric of physical appliances.

You can create a fabric of JA1500 Junos Space appliances, Junos Space virtual appliances, or a hybrid fabric of both physical 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 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 the 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.

## ***Virtual Appliance Deployment***

The Junos Space Virtual Appliance is stored in the Open Virtualization Format (OVF) 1.0 and is packaged as an \*.ovf file, which is a tar file that contains all the files of the Junos Space Virtual Appliance. OVF is not a bootable format, and you must deploy each Junos Space Virtual Appliance to a hosted ESX server before you can run the Junos Space Virtual Appliance.

For release 1.0 and later, to deploy a Junos Space Virtual Appliance on a VMware ESX server, version 3.5. or higher, you use the VMware vCenter Converter, version 4.0.1 to convert the Junos Space Virtual Appliance to a virtual machine. After the Junos Space Virtual Appliance is converted to a virtual machine, you use the VMware Infrastructure Client that is connected to the VMware ESX Server to deploy the Junos Space Virtual Appliance on the ESX Server.

## ***Recommendations for Deploying Virtual Appliances on the VMware ESX Server***

The CPU, RAM, and disk space provided by the VMware ESX server must meet or exceed the documented CPU, RAM, and disk space requirements for deploying a Junos Space Virtual Appliance. In addition, Juniper recommends that, for a multi-node fabric, you deploy the first and second virtual appliance on separate VMware ESX servers to ensure failover support.

The distributed Junos Space Virtual Appliance files are created with 5 GB of disk space, and you add an additional 40GB of disk resources when you first deploy the virtual appliance to a VMware ESX server. In many cases, the 45 GB of disk space will be sufficient; however, if the percent of Junos Space disk resources utilized reaches 80 % capacity, Juniper recommends that you add another 40 GB of disk space to your virtual appliance. You can monitor the percent of disk space utilized in the Fabric Monitor inventory panel in the Junos Space user interface.

## Configuring an NTP Time Source For Each 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 Virtual Appliance (and JA1500 Junos Space 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 the time is mapped to the local time zone of your client computer.

To ensure time remains synchronized across all nodes in the fabric, Juniper strongly recommends that you use the following guidelines:

- Add an NTP server to the first appliance (physical or virtual) during initial set up.
- For each additional appliance, add the same NTP server that you specified for the first appliance.



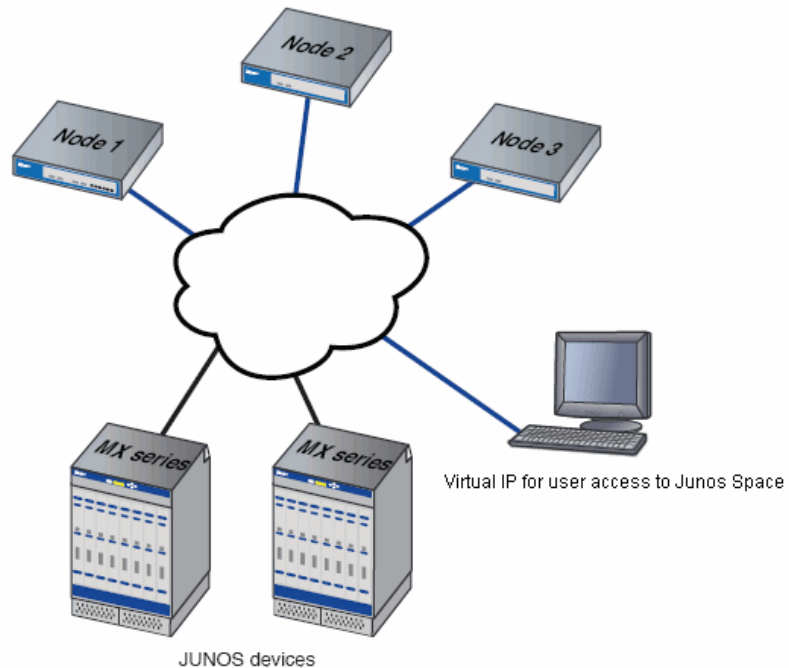
**NOTE:** You must add the NTP server before you add the appliance/node to the fabric from the user interface.

- Do not under any circumstances change the time zone for any Junos Space appliance.

## 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 JA1500 Junos Space 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.



**NOTE:** All appliances (nodes) in a fabric must be from same Junos Space release. For example, a fabric comprises Junos Space Release 1.0 appliances or Junos Space Release 1.1 appliances, but not both.

## 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:

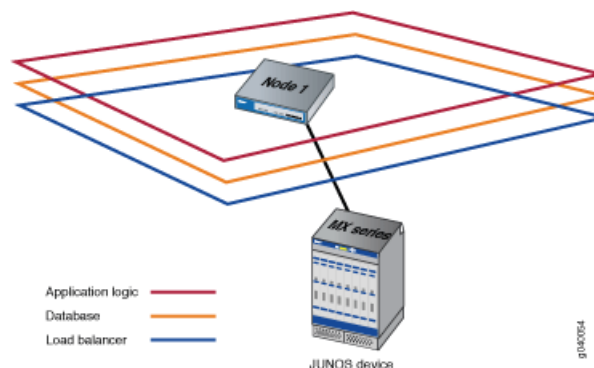
- **Load Balancer**— When a node that functions as the active load balancer server is down, all HTTP requests are automatically routed to the standby load balancer server that is running on a separate node.
- **Database**— When a node that functions as the active database server is down, all database 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:

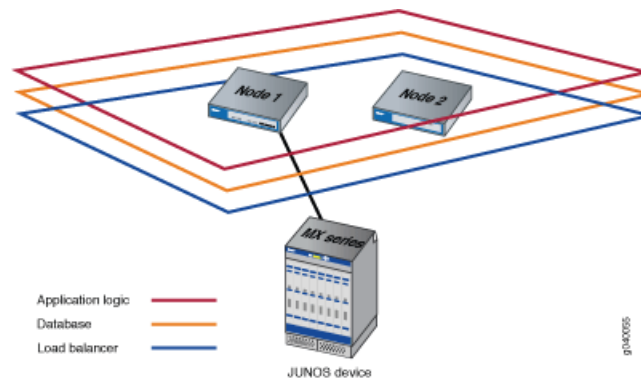
$$\text{Threshold Limit} = \left\lceil \frac{\text{(number of devices in database)}}{\text{(number of nodes running)}} \right\rceil + 2$$

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

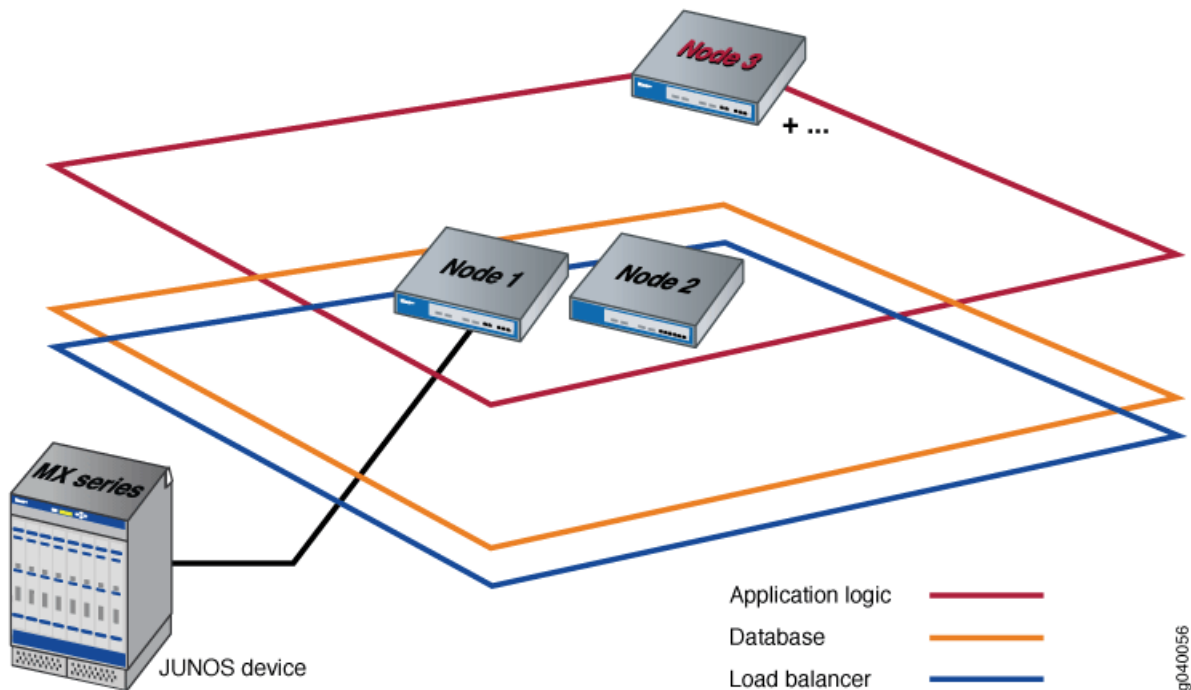
- **First node up:** The load balancer, database, and application logic functions are enabled on the node. Each node function provides both scalability and high availability. The following illustration shows all functions enabled on fabric comprising one node.



- 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.





## **Part 2**

# **Installation and Configuration**

- Deploying a Virtual Appliance on page 13
- Configuring a Virtual Appliance on page 29



## Chapter 2

# Deploying a Virtual Appliance

- Deploying a Junos Space Virtual Appliance on page 13

## Deploying a Junos Space Virtual Appliance

---

You use the VMware vCenter Converter to deploy one or more Junos Space virtual appliances on a VMware ESX server.

The Junos Space Virtual Appliance requires a VMware ESX server, version 3.5 or later, that can support a virtual machine with the following configuration:

- 64-bit quad processor with at least 2.66 GHz
- 8 GB memory



**NOTE:** The ESX host server must be configured to support the creation/operation of a virtual machine allocated with 8 GB memory. If the ESX server does not support the 8 GB memory requirement for creating and running a virtual machine, you will not be able to successfully deploy the Junos Space Virtual Appliance. The Junos Space OVF file is initially configured with 4 GB memory; however, during the configuration of the Virtual Appliance you must increase memory to 8 GB.

---

- One RJ-45 10/100/1000 Network Interface Connector
- 45 GB hard disk (5 GB initial disk resources + 40 GB disk resources to be added)

This topic includes the following tasks:

This topic includes the following tasks:

1. Installing the VMware ESX Server on page 14
2. Extracting Files from the Junos Space Virtual Appliance Package on page 14
3. Converting a Virtual Appliance to a Virtual Machine by Using the VMware Converter on page 15
4. Increasing RAM and Virtual Processors (CPU) for a Junos Space Virtual Appliance on page 19
5. Adding Disk Resources for a Junos Space Virtual Appliance on page 23

## Installing the VMware ESX Server

To download the installation package for the VMware ESX server, go to <http://www.vmware.com/download/vi/>.

To view installation instructions for the VMware ESX server, go to [http://www.vmware.com/support/pubs/vi\\_pubs.html](http://www.vmware.com/support/pubs/vi_pubs.html).



**NOTE:** You install the VMware Infrastructure client when you install the VMware ESX server.

## Extracting Files from the Junos Space Virtual Appliance Package

The Junos Space Virtual Appliance is created in the Open Virtualization Format (OVF) 1.0. The Junos Space package, named \*.tar.gz, contains the OVF file and corresponding disk files.

To extract files from the Junos Space Virtual Appliance package:

1. Create a directory for the extracted Junos Space package files; for example, from a Linux computer, use the following command:

```
mkdir Space
```

2. Use an extraction utility to extract all compressed files from the space-1.1R1.x.tar.gz package into the directory you created, for example:

```
tar xvf space-1.1R1.x.tar.gz /Space
```

A new directory named space-1.1R1.x is created.

3. Verify that the Junos Space package files have been extracted to the new directory, for example:

```
cd Space/space-1.1R1.x  
ls
```

The space-1.1R1.x directory includes the files described in Table 2 on page 14.

**Table 2: Files in the space-1.1R1.x Directory**

File Name	Description
space-1.1R1.x.mf	The manifest file.
space-1.1R1.x.ovf	The virtual appliance source file that is required to convert the virtual appliance to a virtual machine.

**Table 2: Files in the space-1.1R1.x Directory (continued)**

space-1.1R1.x-disk1.vmdk	The virtual disk file— a virtual partition with data and installed operating system (Microsoft Windows, Linux, Mac OS X, and so forth) that VMware uses to run as a virtual machine under the host operating system.
--------------------------	--

**Converting a Virtual Appliance to a Virtual Machine by Using the VMware Converter**

To deploy a Junos Space Virtual Appliance to an ESX server, you use the VMware vCenter Converter Standalone application, version 4.01. You convert the Junos Space Virtual Appliance (source) to a VMware Infrastructure virtual machine (destination) to deploy the Junos Space Virtual Appliance on a VMware ESX Server.

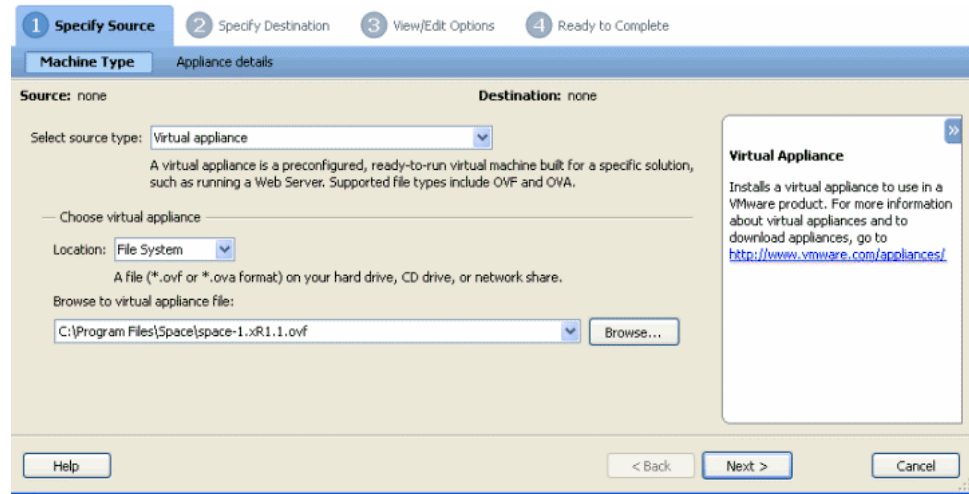


**NOTE:** Refer to the VMware vCenter Converter Standalone User’s Guide at [http://www.vmware.com/pdf/converter\\_standalone\\_guide401.pdf](http://www.vmware.com/pdf/converter_standalone_guide401.pdf) for complete information on converting your Junos Space Virtual Appliance. For instructions on installing the VMware Converter Standalone, see Chapter 3, “Installing and Uninstalling VMware vCenter Converter Standalone” in the User’s Guide. For complete information about converting a Junos Space Virtual Appliance to a VMware Infrastructure virtual machine, see Chapter 4, “Converting Machines” in the User’s Guide.

The following procedure describes the basic steps required to convert a Junos Space Virtual Appliance to a virtual machine.

To convert a Junos Space Virtual Appliance to a virtual machine:

1. Start the VMware vCenter Converter Standalone application.  
The Conversion wizard is displayed.
2. Click **Convert Machine** from the application menu.  
The Specify Source page is displayed.
3. Select **Virtual appliance** from the **Select source type** drop-down menu.
4. From the **Location** drop-down menu, select the location of the source **space-1.1R1.x.ovf** file.
  - If the file is on your hard drive or a network location, select **File System**.
  - If the file is on a Web server, select **URL** and enter the URL in the **Enter the web location** field.
5. Browse to the **space-1.1R1.x.ovf** file.  
The following illustration shows the Specify Source/Machine Type page.



6. Click **Next**.

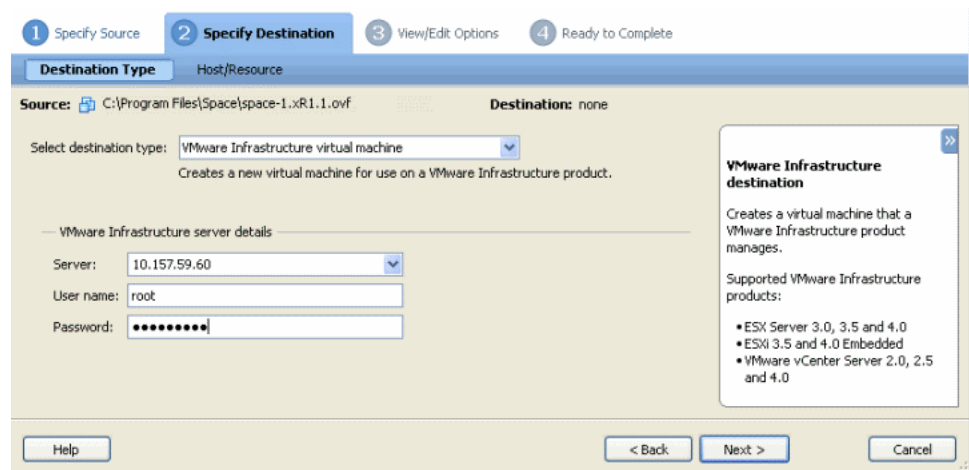
The Appliance details page displays the download size.

7. Click **Next**.

The Specify Destination/Destination Type page is displayed.

8. Select **VMware Infrastructure virtual machine** in the Select destination type drop-down menu.
9. Select the VMware server from the Server drop-down menu, or enter the IP address or host name for the server.
10. Enter the User name and Password for the VMware server.

The following illustration shows the Specify Destination/Destination Type page.



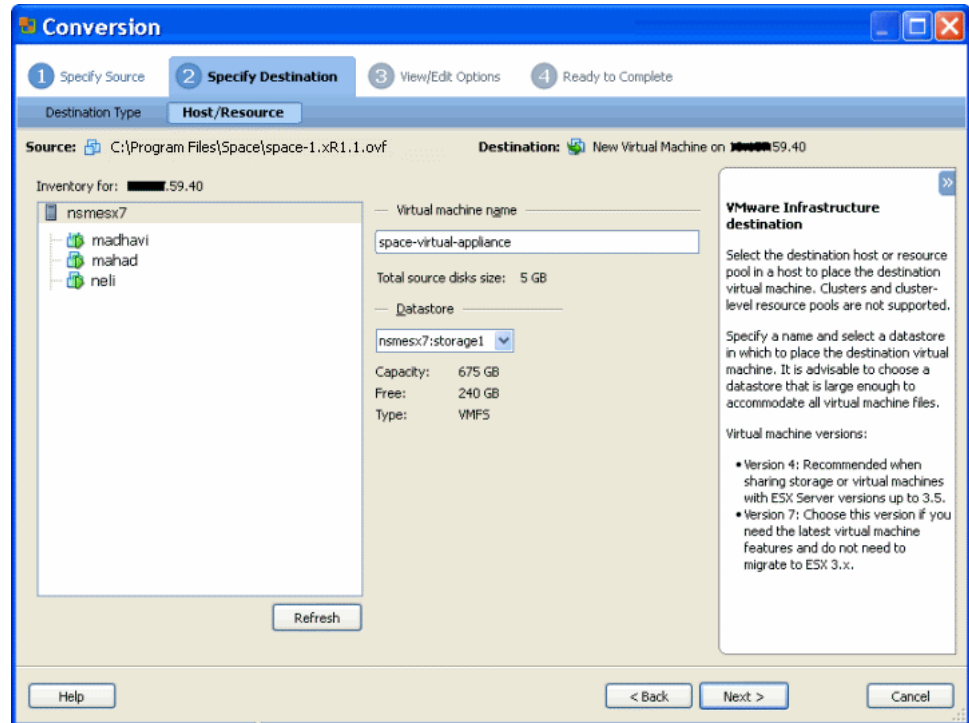
11. Click **Next**.

The Host/Resource page is displayed.

12. Enter a name for the virtual machine.
13. Select a datastore from the drop-down menu.

The datastore capacity appears under the drop-down menu. Choose a datastore that can accommodate all files of the source virtual machine. The source size is displayed above the selected datastore.

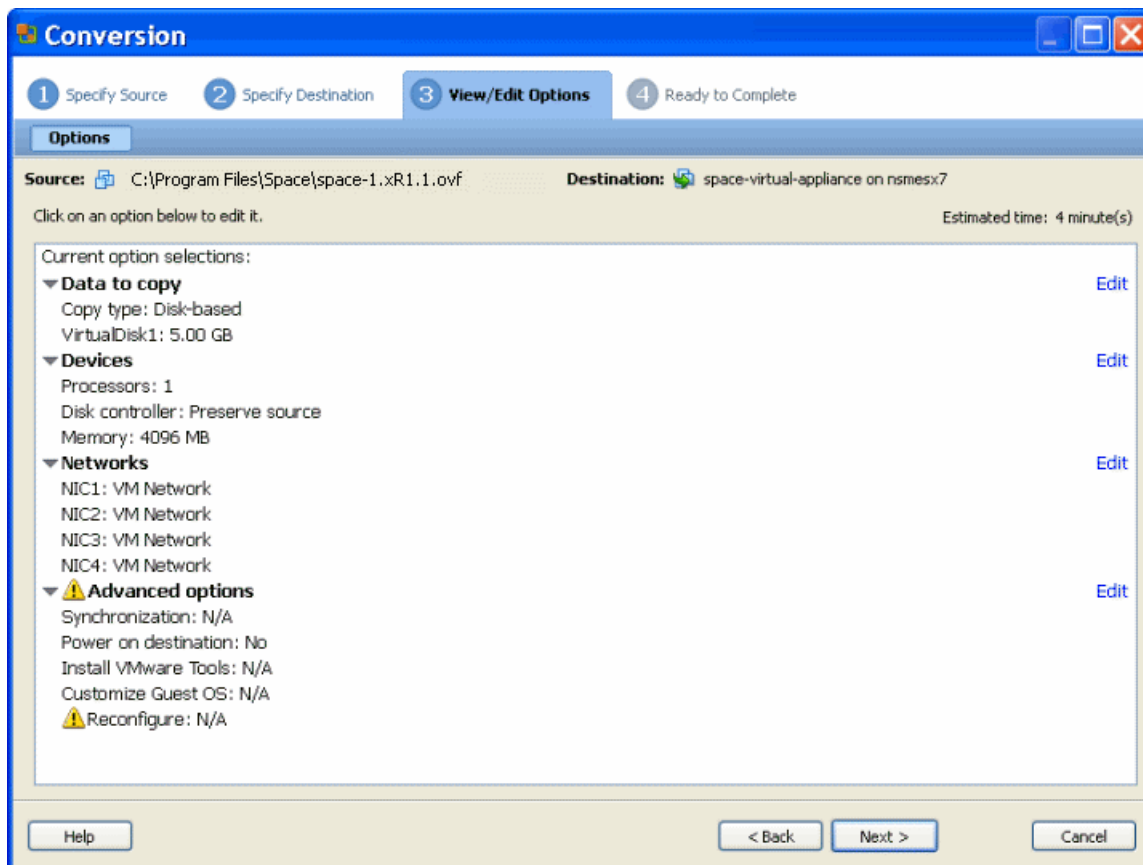
The following illustration shows the Specify Destination/Host/ Resource page.



14. Click **Next** to create a virtual machine to run on an ESX server host that vCenter Server or a standalone ESX host manages.

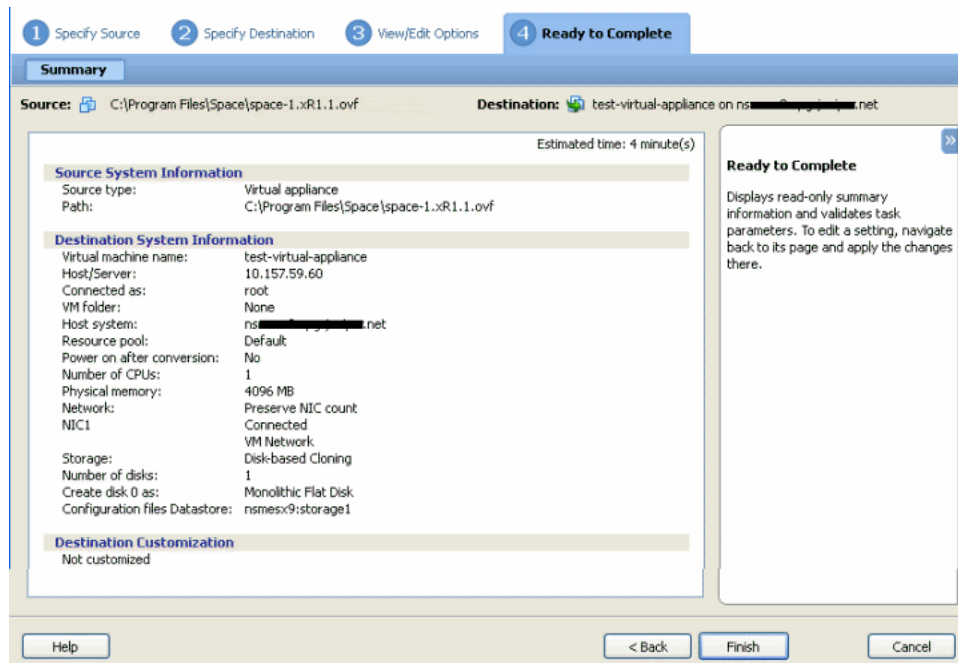
The View/Edit Options page is displayed.

15. Optional: You can make more precise settings to the virtual machine conversion task from the View/Edit Options page. The following illustration shows the configuration options that are available from the View/Edit Options page.



16. Click Next.

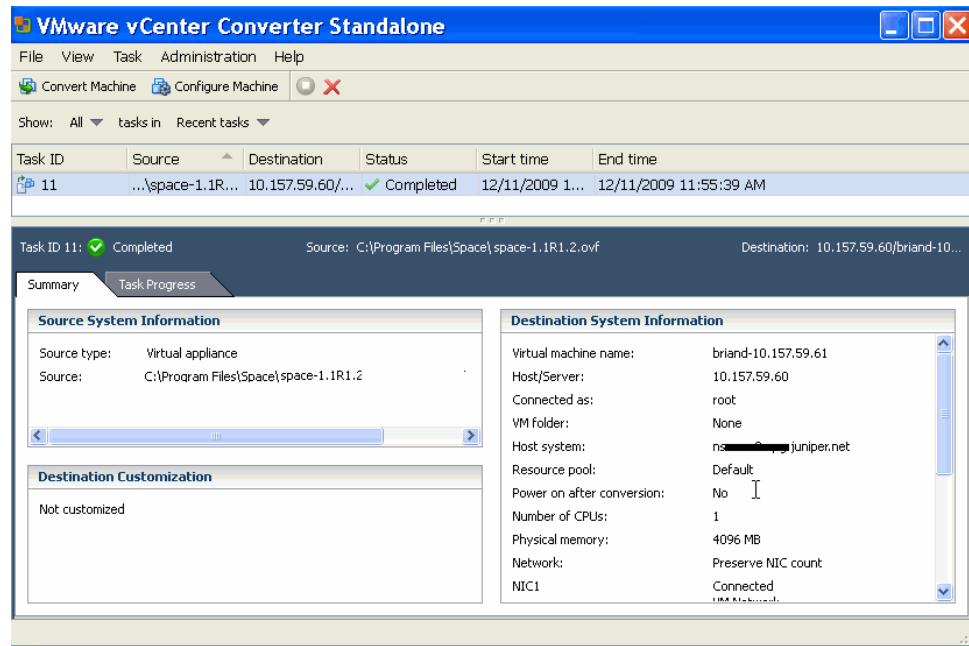
The Ready to Complete page is displayed, as shown in the following example.





17. Verify that the virtual machine conversion configuration shown in the Ready to Complete page is complete and accurate. Then click **Finish** to convert the Junos Space Virtual Appliance to a virtual machine.

When the virtual machine conversion finishes, the VMware Converter Standalone displays the status. In the following illustration, the Status column displays “Completed”, which indicates the conversion was successful.

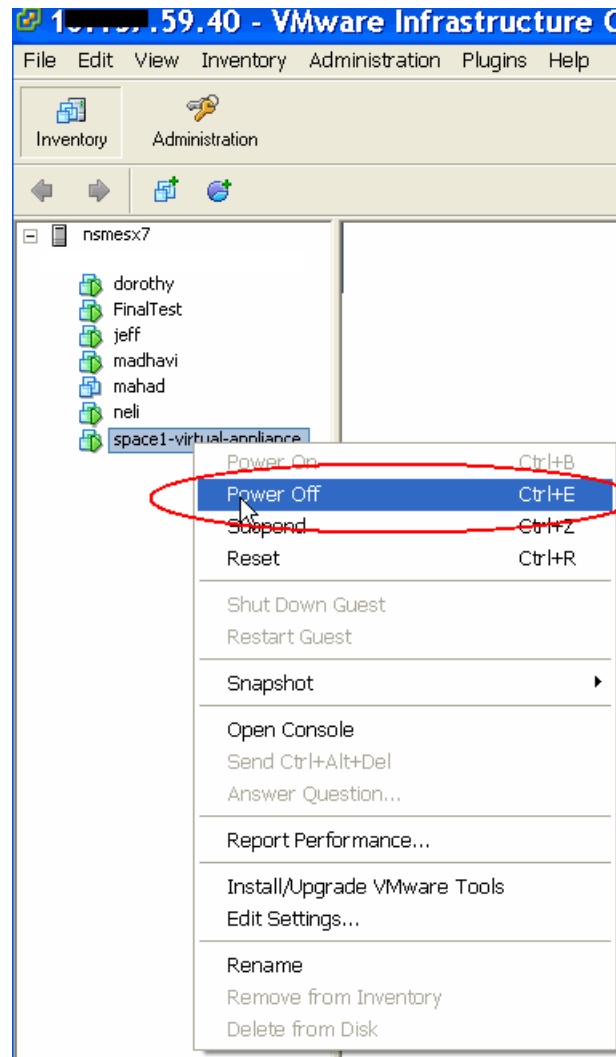


### ***Increasing RAM and Virtual Processors (CPU) for a Junos Space Virtual Appliance***

The distributed Junos Space Virtual Appliance files are created with 4 GB of RAM and one virtual processor (CPU). To support Junos Space functionality, after deploying the Junos Space Virtual Appliance to the VMware ESX server, you must increase RAM and add virtual processors for the Junos Space Virtual Appliance.

To increase RAM and add virtual processors for the Junos Space Virtual Appliance:

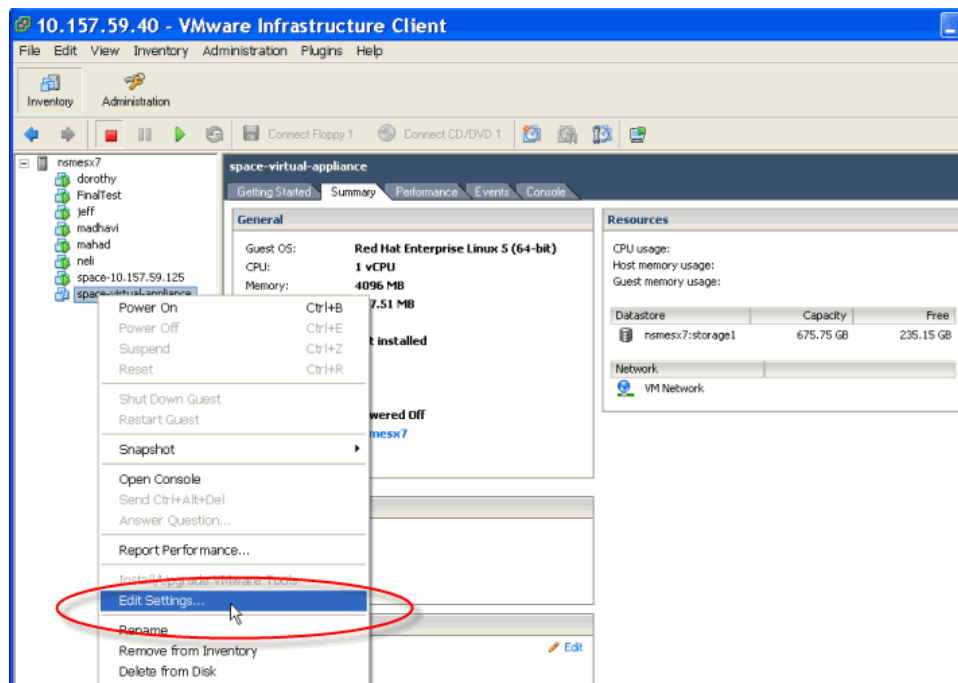
1. Launch the VMware Infrastructure client that is connected to the ESX Server where the Junos Space Virtual Appliance is deployed.
2. Select the Junos Space Virtual Appliance from the inventory view.
3. If the Junos Space Virtual Appliance is powered on, you must power off the appliance to configure RAM and increase the number of virtual processors (CPUs). To power off the Virtual Appliance, right-click on the Junos Space Virtual Appliance icon, and select **Power Off**, as shown in the following illustration.



4. Select the **Summary** tab to view the Junos Space virtual machine settings for CPU and memory.

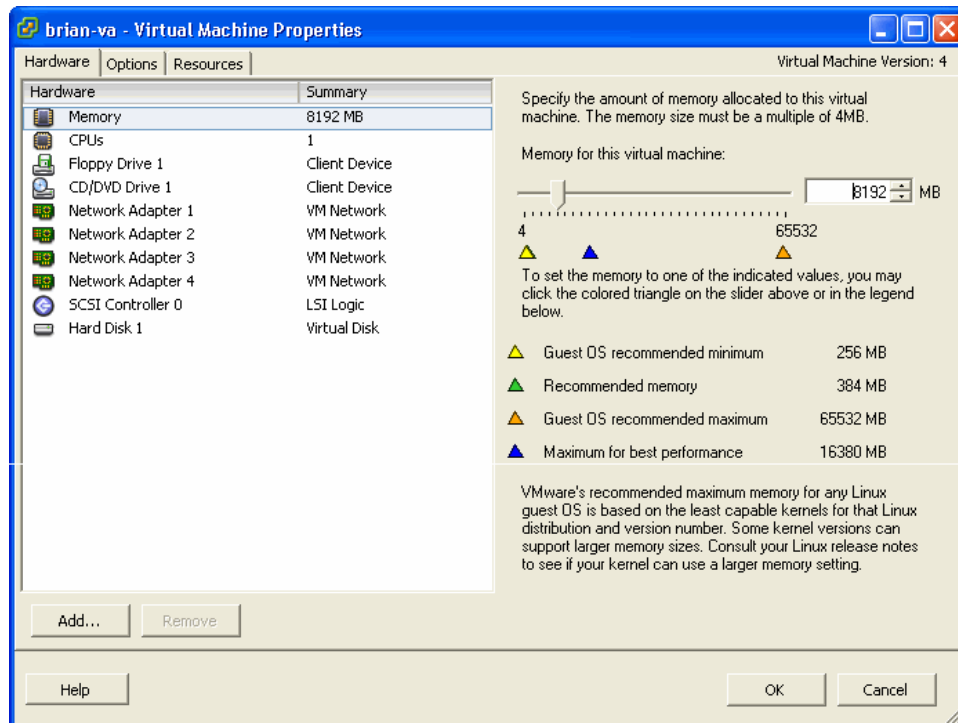
The default CPU setting is 1. The default memory setting is 4096 MB.

5. Right-click on the Junos Space Virtual Appliance icon, and select **Edit Settings** from the drop down menu, as shown in the following illustration.

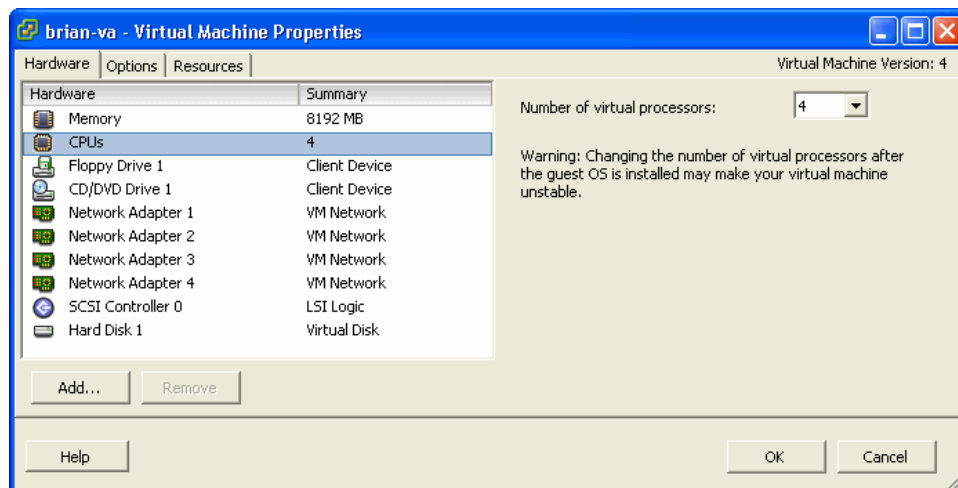


The Virtual Machine Properties dialog box is displayed.

6. Select the **Hardware** tab.
7. Select **Memory**.
8. Drag the slider to increase memory to 8192 MB, as shown in the following illustration.



9. Click OK.
10. Right-click on the Junos Space Virtual Appliance icon, and select **Edit Settings** from the drop down menu.
11. From the **Hardware** tab, and select **CPU**.
12. Set the value for **Number of virtual processors** field to **4**, as shown in the following illustration.



13. Click OK.

The number of virtual processors (CPU) for your Junos Space Virtual Appliance is increased to 4.

## Adding Disk Resources for a Junos Space Virtual Appliance

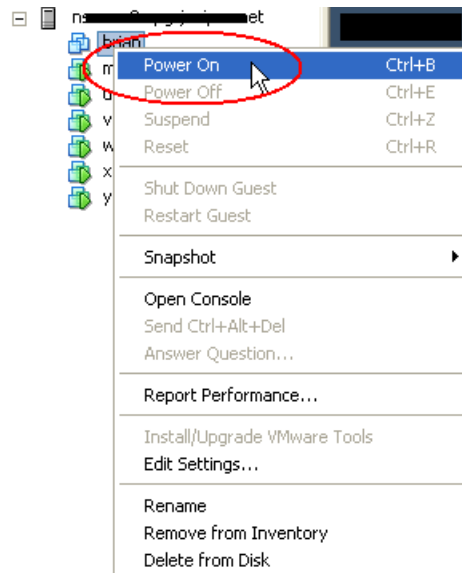
The distributed Junos Space Virtual Appliance files are created with 5 GB of disk space. To support Junos Space functionality, after deploying the Junos Space Virtual Appliance to the VMware ESX server, you must add disk resources for the Junos Space Virtual Appliance.



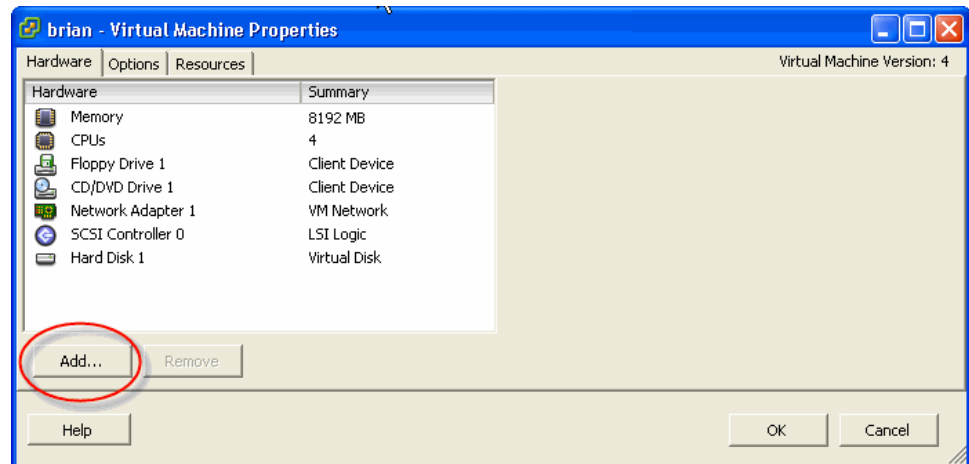
**NOTE:** You must *add* a disk resource to increase disk space for a Junos Space Virtual Appliance. You cannot resize the existing disk by assigning a new size.

To add disk resources for the Junos Space Virtual Appliance:

1. In the VMware Infrastructure client, right-click on the Junos Space Virtual Appliance icon, and select **Power On**, as shown in the illustration. The Junos Space Virtual Appliance must be powered on to add disk resources.

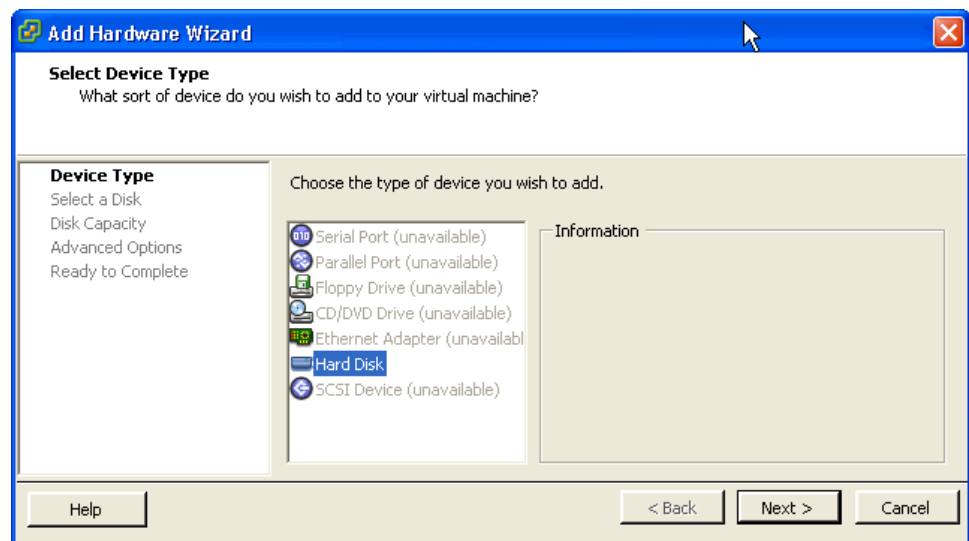


2. In the VMware Infrastructure client, right-click on the Junos Space Virtual Appliance icon, and select **Edit Settings** from the drop down menu.  
The Virtual Machine Properties window is displayed.
3. Select the Hardware tab, and click **Add**, as shown in the following illustration.



The Select Device Type window is displayed.

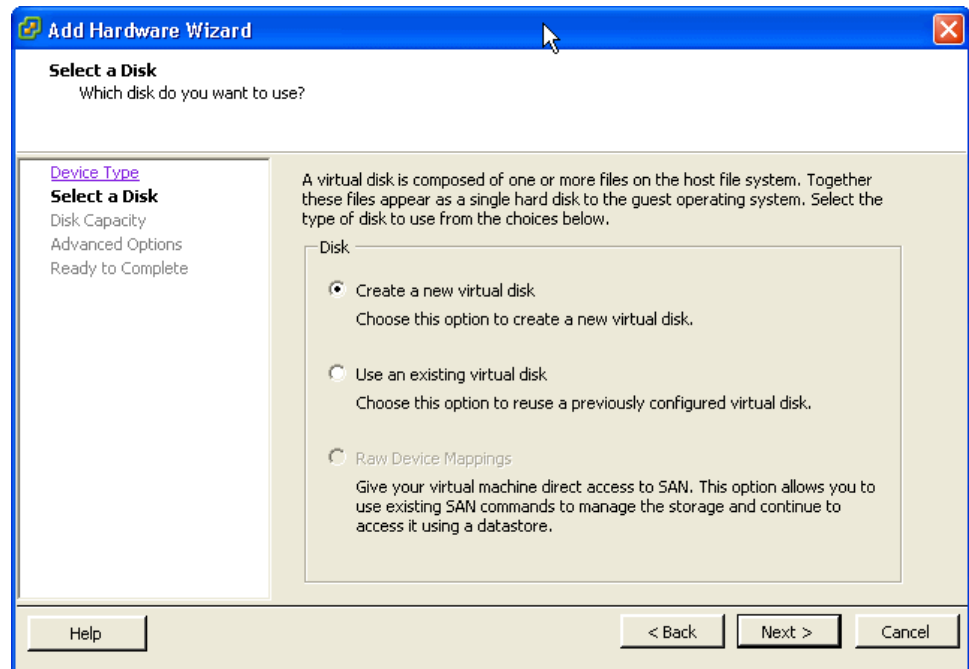
4. Select **Hard Disk**, as shown in the following illustration.



5. Click **Next**.

The Select a Disk window is displayed.

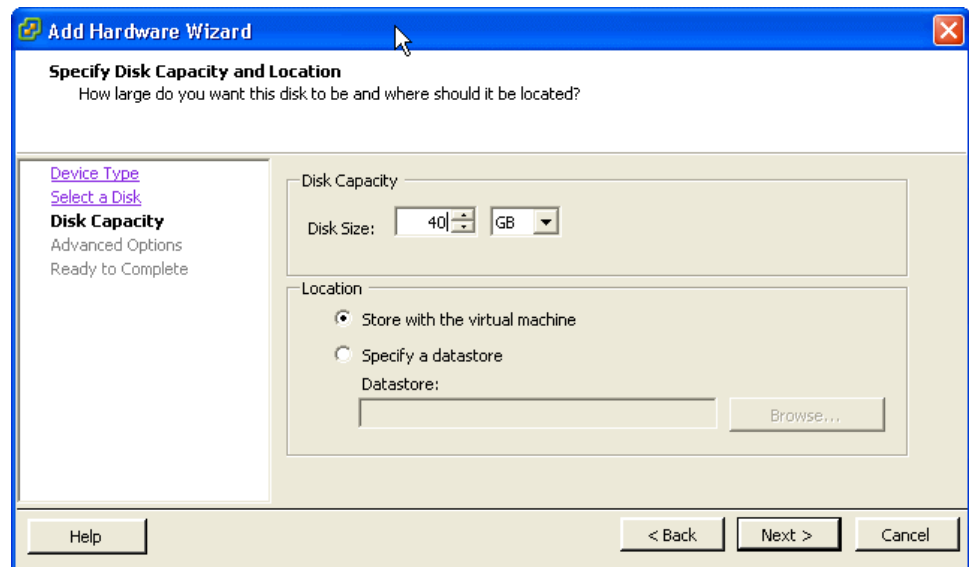
6. Select **Create a new Virtual disk**, as shown in the following illustration.



7. Click Next.

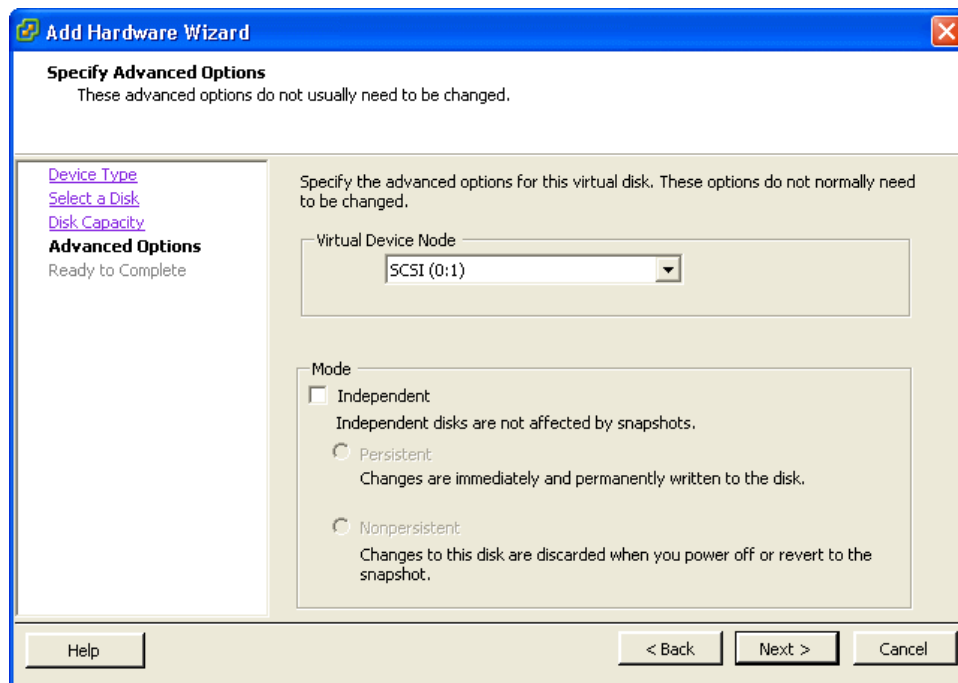
The Specify Disk Capacity and Location window is displayed.

8. Set the Disk Size field to **40 GB**, as shown in the following illustration. The Location option should remain at the default setting “Store with the virtual machine.”



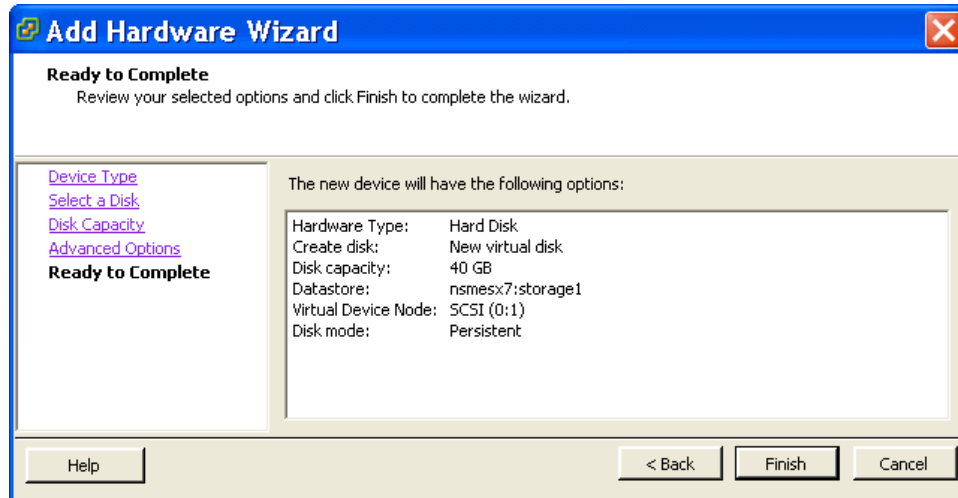
9. Click Next.

The Specify Advanced Options window is displayed.



10. Leave the default settings unchanged, and click **Next**.

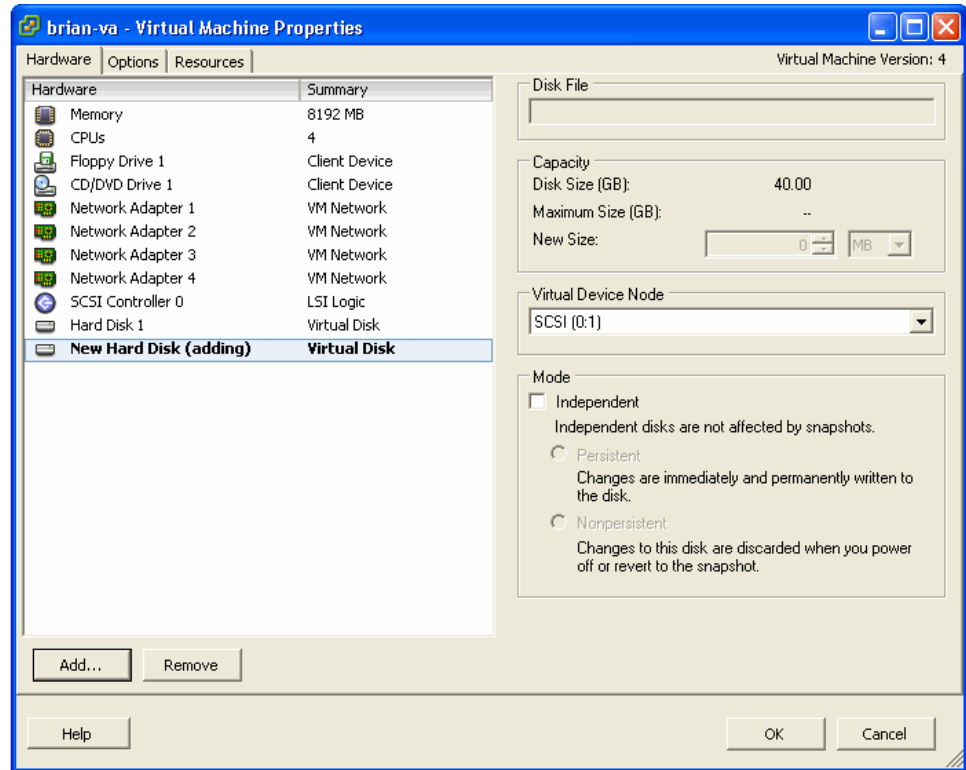
The Ready to Complete window is displayed.



11. Review your selected options, and click **Finish**.

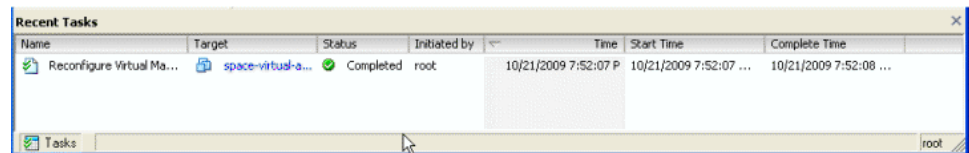
The Virtual Machine Properties window displays the new virtual disk is displayed in the Hardware list.





12. Click OK to create the new virtual disk.

A status bar shows progress at the bottom of the window, as shown in the following illustration.



**NOTE:** After the new virtual disk is created, the Junos Space node must be scanned to detect the additional disk space that you added. To start the scan for additional disk space, you select the “Expand VM Drive Size” option in the Junos Space Settings Menu, immediately after you configure basic settings for your Junos Space Virtual Appliance.

The next step is to configure basic settings for your deployed Junos Space Virtual Appliance. To configure basic settings for the appliance, you access the console in the VMware Infrastructure Client.

To deploy another Junos Space Virtual Appliance, you complete the all the preceding steps (and configure basic settings) for each Junos Space Virtual Appliance that you want to create.



## Chapter 3

# Configuring a Virtual Appliance

- Configuring Basic Settings for a Junos Space Virtual Appliance on page 29
- Changing Network and System Settings for a Junos Space Virtual Appliance on page 36

### Configuring Basic Settings for a Junos Space Virtual Appliance

---

After you deploy a Junos Space Virtual Appliance to a VMware ESX server, you must enter basic network and machine information to make your Junos Space Virtual Appliance accessible to the network. You must also increase the virtual appliance drive space.

To configure a deployed Junos Space Virtual Appliance, the VMware Infrastructure client must be connected to the VMware ESX server on which the virtual appliance is running.

This topic includes the following tasks:

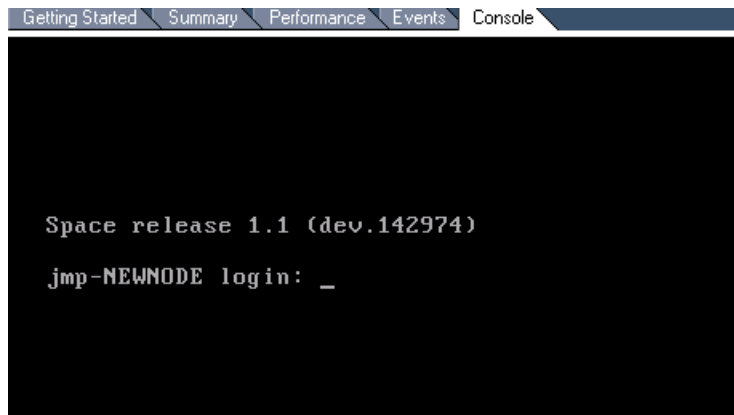
- Configuring an Appliance that is the First Node in a Cluster or that Will Not Be Added to an Existing Cluster on page 29
- Configuring an Appliance to Add to an Existing Cluster on page 33

### ***Configuring an Appliance that is the First Node in a Cluster or that Will Not Be Added to an Existing Cluster***

To configure the settings of a Junos Space appliance that is the first node in a cluster or that will not be added to an existing cluster:

1. Power on the Junos Space Virtual Appliance:
  - a. From the VMware Infrastructure Client, right-click on the Junos Space Virtual Appliance and select **Power On** from the drop-down menu.
  - b. Select the Console tab.

The VMware Infrastructure Client console screen displays the Junos Space login prompt, as shown in the following illustration.



```

Getting Started Summary Performance Events Console

Space release 1.1 (dev.142974)

jmp-NEWNODE login: _

```

2. At the Junos Space login prompt, enter **admin** as your default login name and press Enter.
3. Enter **abc123** as your default password and press Enter.  
Junos Space prompts you to change your default password.
4. Enter the default password again.
5. Enter a new password.  
Passwords should include both alpha and numeric characters and be at least 6 characters in length. All passwords are case-sensitive.
6. Reenter your new password.
7. Enter a new IP address for interface **eth0**.



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

8. Enter a new subnet mask for interface **eth0**.
9. Enter the default gateway as a dotted decimal IP address.
10. Enter the nameserver address in dotted decimal notation for interface **eth0**.
11. Enter Device Management IP interface information:  
  
If you want to configure a separate interface for device management:
  - Enter **y** when prompted to configure a separate interface for device management.
  - Enter a new IP address for interface **eth3**.
  - Enter a new subnet mask for interface **eth3**.
 If you do not want to configure a separate interface for device management, enter **n** when prompted.
12. Enter **n** when prompted “Will this Junos Space system be added to an existing cluster?”

13. Enter the IP address for Web access.



**NOTE:** 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.

14. Add an NTP server to synchronize the node with an external NTP source. For example, you can specify `ntp.juniper.net` as the external NTP server.
15. Enter the display name for this node.

This is the logical node name that Junos Space displays for the first node in a Junos Space cluster.

16. Enter a password for the cluster maintenance mode administrator.



**NOTE:** This is the password that a maintenance mode administrator must specify to access maintenance mode and shutdown all Junos Space nodes in the fabric. When in maintenance mode, an administrator can troubleshoot the Junos Space system or perform database restore operations.

17. Reenter the password for cluster maintenance mode.

The Settings Summary is displayed, as shown in the following example.

```

Getting Started Summary Performance Events Console

Settings Summary:

1> IP Change: eth0 is 10.1.1.59.221 / 255.255.224.0
2> Default Gateway = 10.1.1.32.1 on eth0
3> DNS add: 10.1.1.191.252
4> Create as first node or standalone
5> Web IP address is 10.1.1.59.222
6> NTP add: ntp.juniper.net
7> Node display name is "space1"
8> Password for Junos Space maintenance mode is set.

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

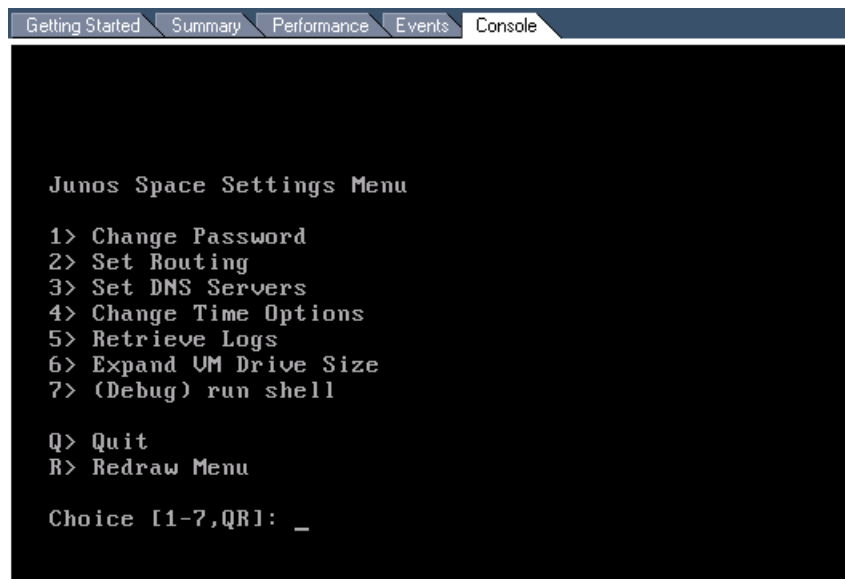
Choice [ACQR]: _

```

18. Confirm that the information in the Settings Summary is correct:
  - If all summary information is correct, enter **A** to apply the settings.
  - If any summary information is not correct, enter **C** to change the settings.

When you enter **C**, you will be prompted to reenter all the basic configuration information that you have configured up to this point.

When you enter A to apply the settings, the Junos Space Settings Menu is displayed, as shown in the following illustration.



```

Getting Started Summary Performance Events Console

Junos Space Settings Menu

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

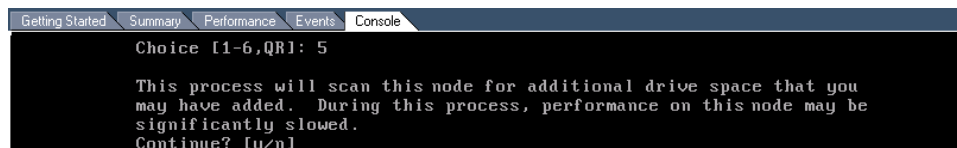
Q> Quit
R> Redraw Menu

Choice [1-7,QR]: _

```

19. Enter 6 to Expand VM drive size.

Junos Space displays the prompt to expand VM (virtual appliance) drive size, as shown in the following illustration.



```

Getting Started Summary Performance Events Console

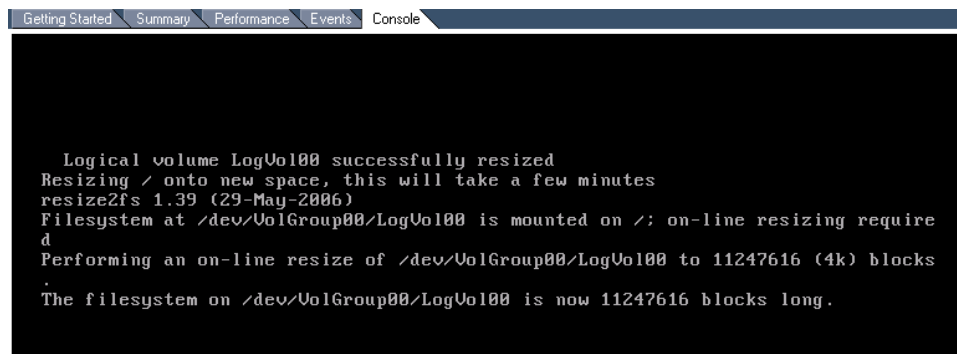
Choice [1-6,QR]: 5

This process will scan this node for additional drive space that you
may have added. During this process, performance on this node may be
significantly slowed.
Continue? [y/n] _

```

20. Enter **y** to start a scan for the 40 GB of additional drive space that you added when you deployed the virtual appliance.
21. Enter the admin password when prompted.

Junos Space starts a scan for the 40 GB of additional drive space that you added when you deployed the virtual appliance. When the scan completes, Junos Space displays the results to verify that the file system size was increased to include the new logical volume. The following example shows the results of a scan for additional drive space.



```

Getting Started Summary Performance Events Console

Logical volume LogVol00 successfully resized
Resizing / onto new space, this will take a few minutes
resize2fs 1.39 (29-May-2006)
Filesystem at /dev/VolGroup00/LogVol00 is mounted on /: on-line resizing required
Performing an on-line resize of /dev/VolGroup00/LogVol00 to 11247616 (4k) blocks
The filesystem on /dev/VolGroup00/LogVol00 is now 11247616 blocks long.

```

The Junos Space Settings Menu is displayed.

22. Enter **Q** to exit the Junos Space Settings Menu.

The configuration of the Junos Space Virtual Appliance is now complete.



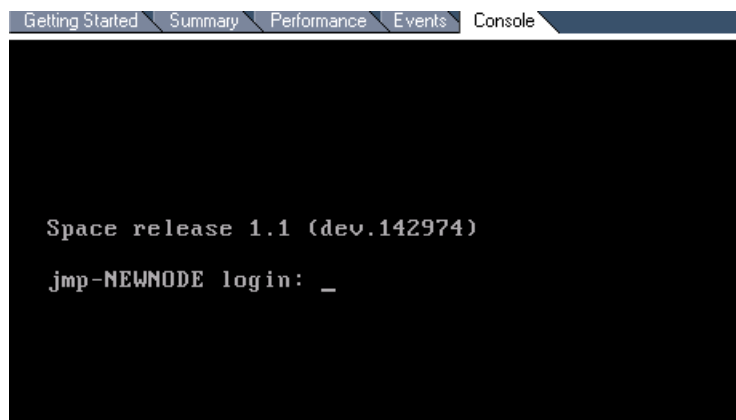
**NOTE:** To log in to Junos Space from a Web browser, enter “super” as the default user name and “juniper123” as the password.

## Configuring an Appliance to Add to an Existing Cluster

To configure the basic settings of a Junos Space appliance that will be added to an existing cluster:

1. Power on the Junos Space virtual appliance:
  - a. From the VMware Infrastructure Client, right-click on the Junos Space Virtual Appliance and select **Power On** from the drop-down menu.
  - b. Select the Console tab and then click inside the console display screen.

The VMware Infrastructure Client console screen displays the Junos Space login prompt, as shown in the following illustration.



2. At the Junos Space login prompt, enter **admin** as your default login name and press Enter.
3. Enter **abc123** as your default password and press Enter.  
Junos Space prompts you to change your default password.
4. Enter the default password again.
5. Enter a new password.  
All passwords are case-sensitive.
6. Reenter your new password.
7. Enter a new IP address for interface **eth0**.



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

8. Enter a new subnet mask for interface **eth0**.
9. Enter the default gateway as a dotted decimal IP address.
10. Enter the nameserver address in dotted decimal notation for interface **eth0**.
11. Enter Device Management IP interface information:

If you want to configure a separate interface for device management:

- Enter **y** when prompted to configure a separate interface for device management.
- Enter a new IP address for interface **eth3**.
- Enter a new subnet mask for interface **eth3**.

If you do not want to configure a separate interface for device management, enter **n** when prompted.

12. Enter **y** when prompted “Will this Junos Space system be added to an existing cluster?”

The Settings Summary is displayed, as shown in the following example.

```

Getting Started Summary Performance Events Console
Settings Summary:
1> IP Change: eth0 is 10.157.59.221 / 255.255.224.0
2> Default Gateway = 10.157.32.1 on eth0
3> DNS add: 10.155.191.252
4> Note to be added to existing cluster

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

Choice [ACQR]: _
  
```

13. Confirm that the information in the Settings Summary is correct:
  - If all summary information is correct, enter **A** to apply the settings.
  - If any summary information is not correct, enter **C** to change the settings.

When you enter **C**, you will be prompted to reenter all the basic configuration information that you have configured up to this point.

When you enter **A** to apply the settings, the Junos Space Settings Menu is displayed, as shown in the following illustration.



```

Getting Started Summary Performance Events Console
Junos Space Settings Menu

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

Q> Quit
R> Redraw Menu

Choice [1-7,QR]: _

```

14. Enter 6 to Expand VM drive size.

Junos Space displays the prompt to expand VM (virtual appliance) drive size, as shown in the following illustration.

```

Getting Started Summary Performance Events Console
Choice [1-6,QR]: 5

This process will scan this node for additional drive space that you
may have added. During this process, performance on this node may be
significantly slowed.
Continue? [y/n] _

```

15. Enter **y** to start a scan for the 40 GB of additional drive space that you added when you deployed the virtual appliance.
16. Enter the admin password when prompted.

Junos Space start a scan for the 40 GB of additional drive space that you added when you deployed the virtual appliance. When the scan completes, Junos Space displays the results to verify that the file system size was increased to include the new logical volume. The following example shows the results of a scan for additional drive space.

```

Getting Started Summary Performance Events Console

Logical volume LogVol100 successfully resized
Resizing / onto new space, this will take a few minutes
resize2fs 1.39 (29-May-2006)
Filesystem at /dev/VolGroup00/LogVol100 is mounted on /; on-line resizing required
Performing an on-line resize of /dev/VolGroup00/LogVol100 to 11247616 (4k) blocks
The filesystem on /dev/VolGroup00/LogVol100 is now 11247616 blocks long.

```

When the scan for additional drive space completes, the Junos Space Settings Menu is displayed.

17. Specify an external NTP source for the virtual appliance.
  - a. Enter 4 to Change Time Options.
  - b. Enter 2 to add an NTP server.
  - c. Specify an NTP server, using the same external NTP source that you configured for the first node in the cluster.



**NOTE:** Juniper strongly recommends that you configure an external NTP source for each node in the cluster, and that each node in the cluster (fabric) is configured with the same NTP server that is configured on the first node.

---



**NOTE:** Juniper also strongly recommends that you do not, under any circumstances, change the time zone for any node.

---

- d. Enter A to apply the settings and add the NTP server.

18. Enter Q to exit the Junos Space Settings Menu.

The basic configuration of the Junos Space Virtual Appliance is now complete.

For each appliance that you add to an existing fabric, you must add the node in the Junos Space user interface, as described in *Managing Nodes in the Fabric*.



**NOTE:** To log in to Junos Space from a Web browser, enter “super” as the default user name and “juniper123” as the password.

---

## Changing Network and System Settings for a Junos Space Virtual Appliance

---

You can change some of the basic configuration options that you configured when you first installed and set up your Junos Space Virtual Appliance. You can also change system time defaults and retrieve system log files your virtual 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 37
- Adding DNS Servers on page 37
- Setting the System Time on page 37
- Retrieve Logs on page 38

- Expand VM Drive Size on page 38
- (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 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 should be configured with the same external NTP source that you configured for the first appliance.




---

**NOTE:** Juniper strongly recommends that you do not change the time zone.

---

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.

## 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.

## Expand VM Drive Size

To increase disk space on a Junos Space Virtual Appliance, you must first add a disk resource in the VMWare Infrastructure Client to create a new virtual disk. Then you initiate a scan for the additional drive space that you added from the VMWare Infrastructure Client to increase the file system size.



**NOTE:** The Junos Space Virtual Appliance must be powered on to increase disk space.

---

To expand the Virtual Machine drive size:

1. Enter **6** to expand the VM drive size.
2. Enter **y** to initiate a scan for the additional drive space you added when you deployed the virtual appliance.

When the scan completes, Junos Space displays the results to verify that file system size was increased to include the new logical volume.

### ***(Debug) Run Shell***

To run shell commands to debug Junos Space:

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



## **Part 3**

# **Upgrades**

- Upgrading Junos Space Software on page 43





## Chapter 4

# Upgrading Junos Space Software

- Junos Space Software Upgrade Overview on page 43
- Upgrading Junos Space Software on page 43

### Junos Space Software Upgrade Overview

---

To upgrade Junos Space software for Junos Space physical and virtual appliances, you upload the Junos Space image file to your existing fabric and perform the software upgrade in 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 appliance, complete the following tasks.

- Back up all your Junos Space data files before you begin the upgrade process.
- 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 release.



**NOTE:** To perform the upgrade from Junos Space Release 1.0 to Release 1.1, you must log in as the default super administrator.

---

- Validate that the software is successfully installed by logging in to the user interface.  
  
To view the release 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.

### Upgrading Junos Space Software

---

To upgrade Junos Space software for Junos Space physical and virtual appliances, you upload the Junos Space image file to your existing fabric and perform the software

upgrade in the Junos Space user interface. When you perform an upgrade, all appliances (nodes) in the fabric are upgraded with the new software.

- Upgrading from Junos Space Release 1.0 to Release 1.1 on page 44
- Upgrading from Junos Space Release 1.1 on page 46

### **Upgrading from Junos Space Release 1.0 to Release 1.1**

You can upload and install the Release 1.1 software image file to upgrade Junos Space Release 1.0 to Release 1.1.

Juniper Networks recommends that you back up the Junos Space database before you begin the upgrade process.

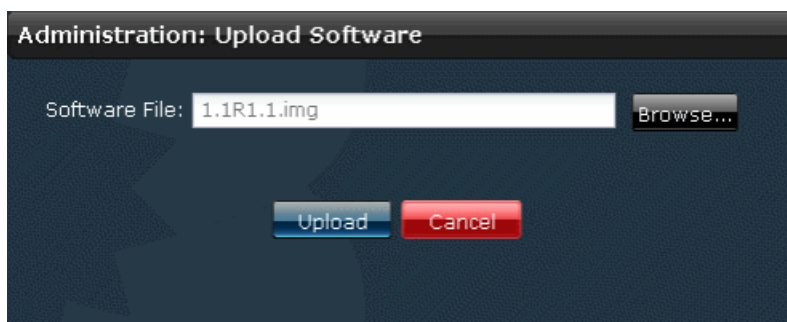
You must log in as the default super administrator to upgrade from Junos Space, Release 1.0.

To add or upgrade software:

1. From the task ribbon, select the **Administration** workspace icon.
2. From the task ribbon, select the **Manage Software** icon.
3. From the task ribbon, select the **Upload Software** task.

The Upload Software window is displayed.

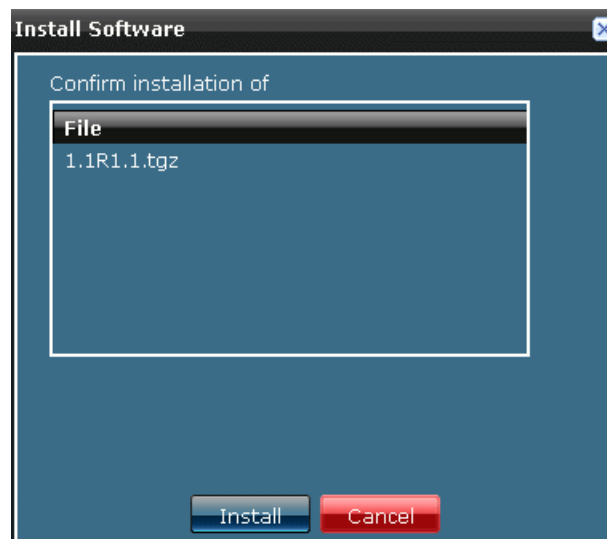
4. Use the Browse button to locate the Junos Space, Release 1.1 image file **1.1R1.1.img** from your computer, as shown in the following illustration.



5. Click **Upload** to upload the software image.
6. From the task ribbon, select the **Manage Software** icon to display the Manage Software inventory panel.
7. Select the Release 1.1 software image that you uploaded, as shown in the following illustration.

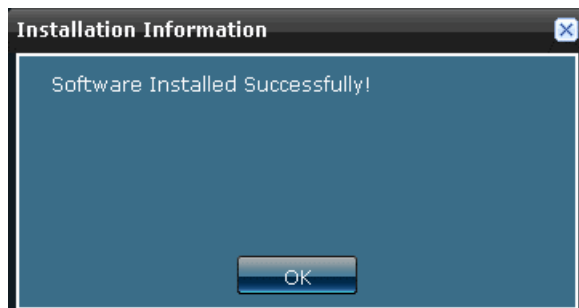


8. In the Actions panel, click **Install Software** to upgrade to Junos Space Release 1.1. The Install Software confirmation window is displayed.



9. Click **Install**.

The Installation Information window displays status, as shown in the following illustration.



10. Click OK.
11. If the software upgrade status window does not display, click the refresh button in your browser.  
  
Junos Space displays the following status window during the software upgrade process.

### Space is installing software ...

Space is currently in progress of software installation. Once it is done, the log in page will be presented. Please wait ...



**NOTE:** The software upgrade takes some time to complete.

12. When the installation is complete, the Junos Space login prompt is displayed. You can now log in to begin using Junos Space Release 1.1.

## Upgrading from Junos Space Release 1.1

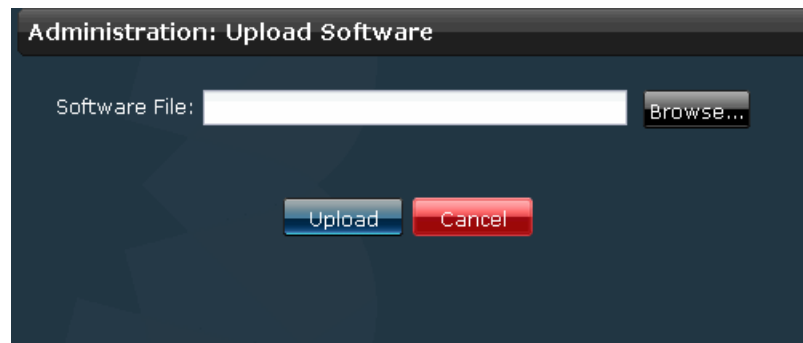
When Junos Space, Release 1.2 is available, you can upgrade your Junos Space software from the Junos Space user interface by uploading and installing the Release 1.2 software image file.

Juniper Networks recommends that you back up the Junos Space database before you begin the upgrade process.

To add or upgrade software:

1. From the task ribbon, select the **Administration** workspace icon.
2. From the task ribbon, select the **Manage Software** icon.
3. From the task ribbon, select the **Upload Software** task.

The Upload Software window is displayed.

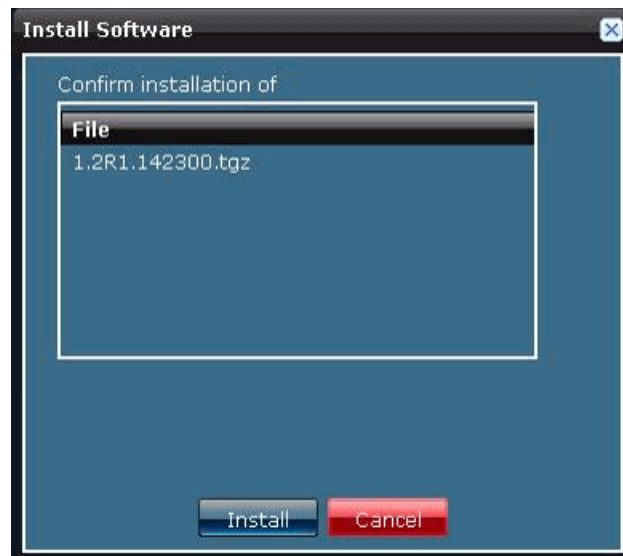


4. Use the Browse button to locate the software image you want to upload to Junos Space from your computer.
5. Click Upload to upload the software image.

The software image is displayed in the Manage Software inventory panel, as shown in the following illustration.

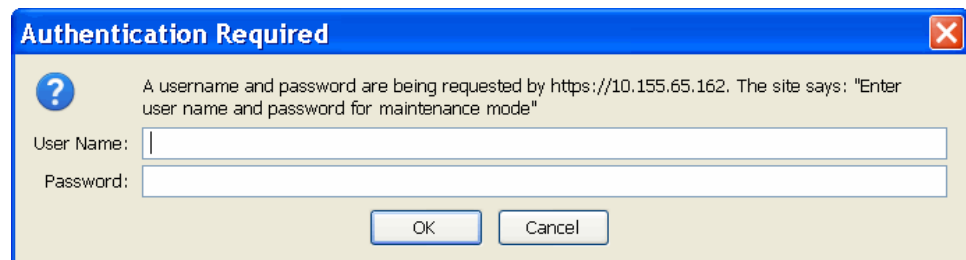


6. In the Manage Software inventory panel, select the software image that you uploaded.
  7. In the Actions panel, click **Install Software** to upgrade the Junos Space software.
- The Install Software confirmation window is displayed.



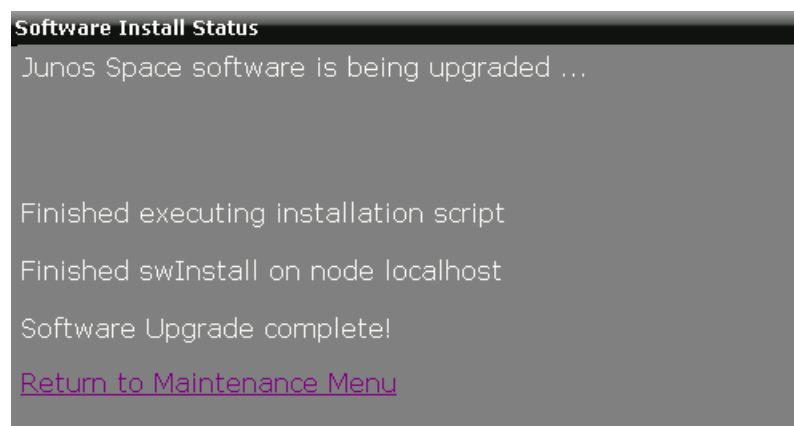
8. Click **Install**.

Junos Space prompts you enter a user name and password to enter maintenance mode.



9. Enter the maintenance mode user name and password.
10. Click **OK**.

Junos Space displays a status window during the software upgrade process, as shown in the following illustration.



11. When the software upgrade completes, click **Return to Maintenance Menu**.

The Maintenance Mode Actions window is displayed, as shown in the following illustration.

**Maintenance Mode Actions**

- [Restore Database from Backup](#)  
This action leads user to select a database backup file and overwrite the current database
- [Download Troubleshooting Data and Logs](#)  
This action allows user to download Junos Space logs for troubleshooting
- [Install Junos Space Software](#)  
This action leads user to install new software
- [Log Out and Remain in Maintenance Mode](#)  
This action logs out the current user so that another administrator can login and manage in maintenance mode
- [Log Out and Exit from Maintenance Mode](#)  
This action returns Space to normal operational mode

12. Click **Log Out and Exit from Maintenance Mode**.

Junos Space displays the following window.

**Space is installing software ...**

Space is currently in progress of software installation. Once it is done, the log in page will be presented. Please wait ...



**NOTE:** The software upgrade takes some time to complete.

When the installation is complete, the Junos Space login prompt is displayed. You can now log in to begin using Junos Space with the latest software.





## **Part 4**

# **Accessing the Junos Space User Interface**

- Logging In on page 53
- Adding a Node on page 55



## Chapter 5

# Logging In

- Logging In to the Junos Space User Interface as Super Administrator on page 53

### Logging In to the Junos Space User Interface as Super Administrator

---

You connect to a Junos Space appliance from your Web browser. Internet Explorer version 7 and Mozilla Firefox version 3.0 or later Web browsers are supported.



**NOTE:** Before you can log into the system, your browser must have the Flash 10 plug-in installed.

---


To access and log in to an appliance, follow these steps:

1. In the address field of your browser window, type the URL of your appliance, for example:

`https://<1.1.1.1>/mainui/`

Where `<1.1.1.1>` is the Web (virtual) IP address for access to Junos Space.

2. Press Enter. The Junos Space log in screen is displayed.

A screenshot of the Junos Space login interface. It features a dark blue background. On the left, the labels 'Username:' and 'Password:' are in white. To the right of each label is a white text input field. Below the password field is a blue button with the text 'Log In' in white.

3. Type your username and password. The default username is **super**; the password is **juniper123**. See Changing User Passwords for information about how to change your user password.

You can now use the Junos Space user interface to add users, add nodes to the fabric, discover devices, provision services, and so forth.



## Chapter 6

# Adding a Node

- Adding a Node to an Existing Fabric on page 55

### Adding a Node to an Existing Fabric

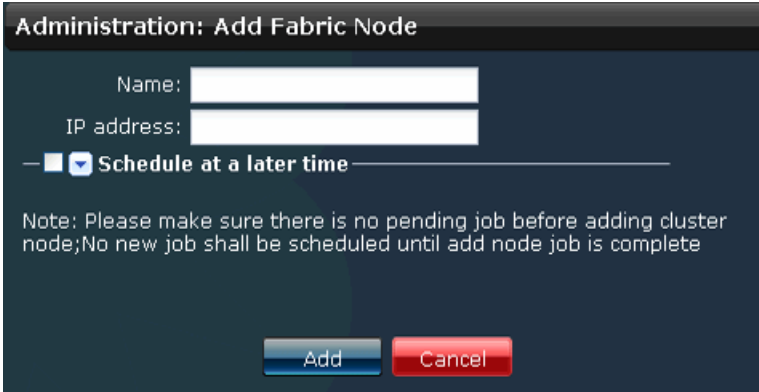
---

Junos Space automatically adds the first appliance (node) to the fabric and uses the logical node name that you assign to the JA1500 Junos Space Appliance or Junos Space Virtual Appliance when you configure the node in a fabric. For each additional JA1500 Junos Space Appliance or Junos Space Virtual Appliance that you install, you must add the node in Junos Space to represent the appliance in the fabric.

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.



The screenshot shows a dark-themed dialog box titled "Administration: Add Fabric Node". It has two input fields: "Name:" and "IP address:". Below these is a checkbox labeled "Schedule at a later time" which is currently checked. A note below the checkbox reads: "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". At the bottom are two buttons: "Add" (blue) and "Cancel" (red).

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 Virtual Appliance.



**NOTE:** This is the IP address for interface `eth0` that you specified during the basic configuration of the 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.

After you add the node to the fabric from the user interface, the configuration of the Junos Space Virtual Appliance is complete.

## **Part 5**

# **License Key Management**

- Junos Space License Key Files on page 59





## Chapter 7

# Junos Space License Key Files

- Generating and Uploading the Junos Space License Key File on page 59

### Generating and Uploading the Junos Space License Key File

---

To add a Junos Space license you must perform the following steps:

1. Generate the license key file—Juniper Networks uses a license management system (LMS) to manage the deployment of the Junos Space product—appliances, connection points, connections, and applications. When you order Junos Space, Juniper Networks LMS sends an e-mail with an authorization code or serial number and instructions on how to obtain a license key.
  2. Upload the license key— In the Junos Space user interface, a system administrator must upload a license key file to license the Junos Space product and activate the configuration ordered.
1. Generating the License Key File on page 59
  2. Uploading the License Key File Contents on page 59

### Generating the License Key File

If you order Junos Space, Juniper Networks sends an e-mail with an authorization code that includes a resource guide describing how to obtain a license key.

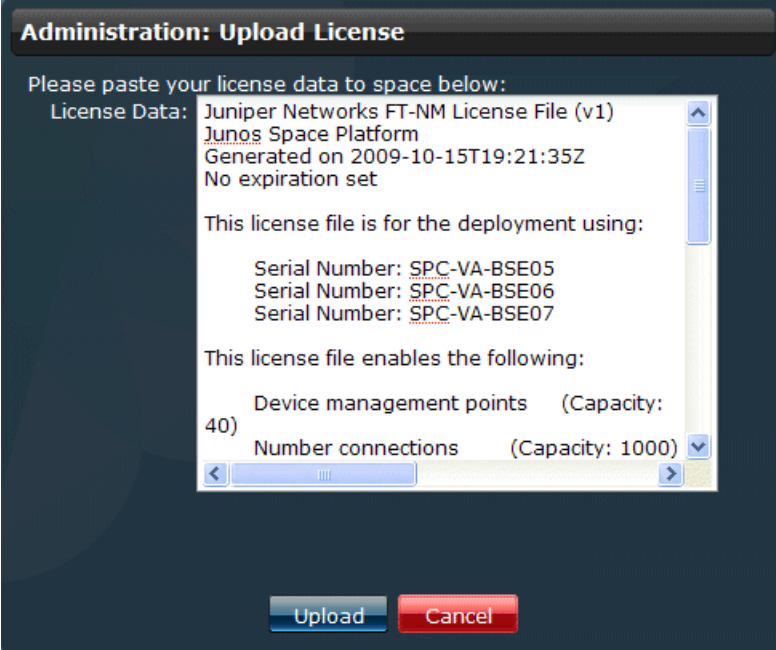
If you order a Junos Space virtual appliance, you also receive an e-mail with a serial number and instructions on how to go to the Juniper Networks license management system to apply that serial number.

### Uploading the License Key File Contents

To upload the license key file, follow these steps:

1. Open the Juniper Networks Authorization Codes e-mail you received and follow the directions.
2. Open the license key text file attached to the e-mail and copy all the contents.
3. In Junos Space Application Chooser, click the Network Application Platform application icon.
4. In the task ribbon, click the **Administration** workspace icon. The Administration dashboard appears.

5. In the task ribbon, click the **Manage Licenses** task icon. The Manage Licenses inventory page appears.
6. In the task ribbon, click the **Upload License** icon. The Upload License page appears.
7. Paste the contents of the license key text file in the License Data text field using the Web browser Edit > Paste command.



**Administration: Upload License**

Please paste your license data to space below:

License Data: Juniper Networks FT-NM License File (v1)  
Junos Space Platform  
Generated on 2009-10-15T19:21:35Z  
No expiration set

This license file is for the deployment using:

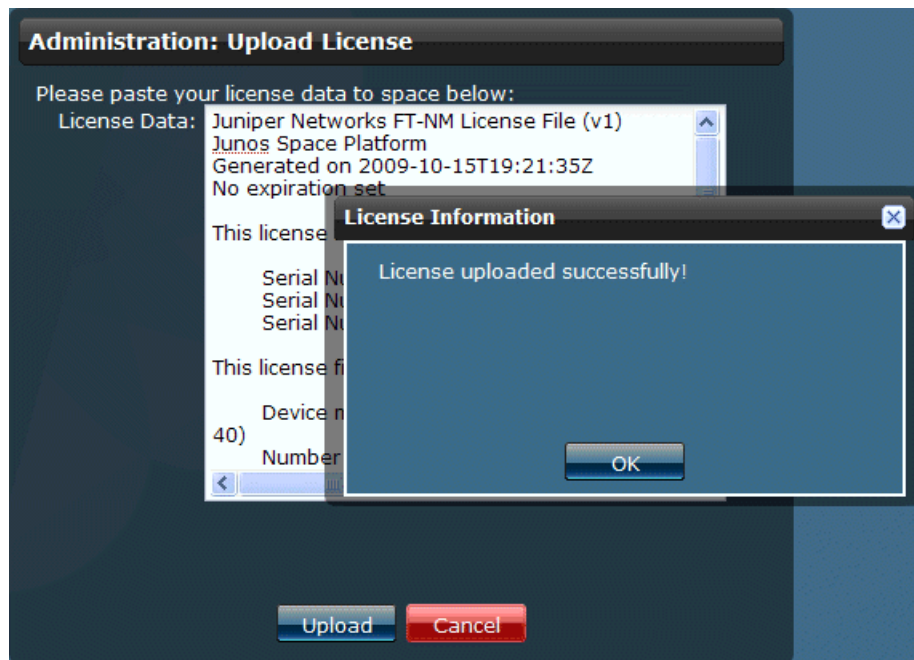
Serial Number: SPC-VA-BSE05  
Serial Number: SPC-VA-BSE06  
Serial Number: SPC-VA-BSE07

This license file enables the following:

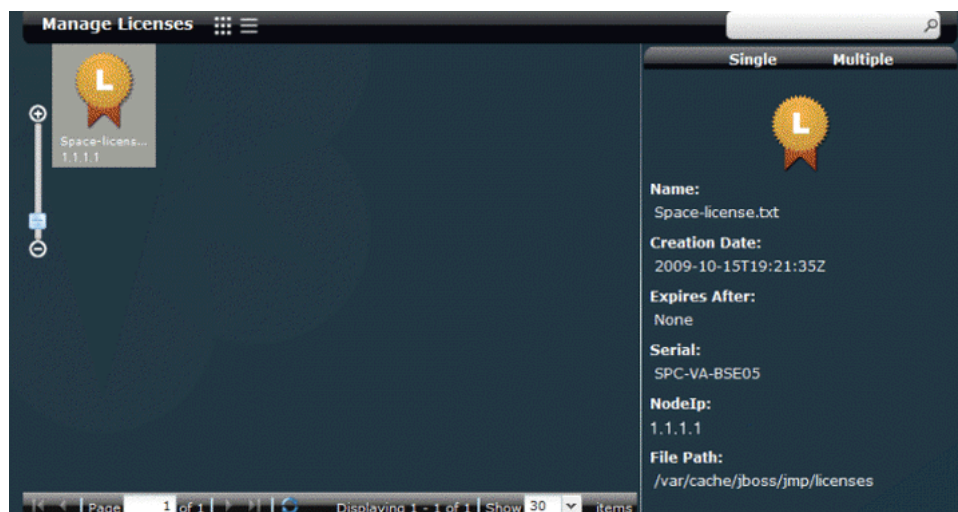
Device management points (Capacity: 40)  
Number connections (Capacity: 1000)

**Upload** **Cancel**

8. Click **Upload**. The license key data is uploaded in Junos Space database. The license upload success message is displayed.



9. Click OK. The license appears on the Manage Licenses inventory page.





## **Part 6**

# **Index**

- Index on page 65



# Index

## C

customer support.....xii  
    contacting JTAC.....xii

## D

documentation  
    comments on.....xii

## F

fabric  
    adding a node.....55

## I

installation  
    adding disk space for a virtual appliance.....23  
    configuring a virtual appliance.....29  
    converting a virtual appliance to a virtual  
        machine.....15  
    extracting Junos Space package files.....14  
    increasing RAM and CPU for a virtual  
        appliance.....19  
    upgrading Junos Space software.....43  
    VMware ESX host server.....14

## L

license key  
    generating.....59  
    uploading.....59

## M

manuals  
    comments on.....xii

## N

network settings  
    changing.....37  
node  
    adding to fabric.....55

## S

support, technical *See* technical support  
system settings  
    changing.....37

## T

technical support  
    contacting JTAC.....xii

## U

user interface  
    logging in.....53

