



**Junos Space**

# **Network Application Platform User Guide**

*Release 1.0*

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## **Part 1**

# **Junos Space User Interface**

- Getting Started with Junos Space on page 3
- User Interface Overview on page 7



## Chapter 1

# Getting Started with Junos Space

- Logging In To the System on page 3
- Using the Getting Started Assistants on page 4
- Accessing Help on page 4
- Logging Out From the System on page 5

## Logging In To the System

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You connect to Junos Space 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 Junos Space, follow these steps:

1. In the address field of your browser window, type:

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

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

2. Press Enter or click Search. The system log in screen appears.



3. Type your username and password. The default username is **super**; the password is **juniper123**. See “Changing User Passwords” on page 107 for information about how to change your user password. For information about how to change your username, see the system administrator.
4. Click Log In. The Junos Space Application Chooser appears, see “Application Chooser Overview” on page 12.

- Related Topics**
- Logging Out From the System on page 5
  - Junos Space User Interface Overview on page 7
  - Platform Dashboard Overview on page 16

## Using the Getting Started Assistants

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The Getting Started assistants display steps and help on how to complete common tasks. Getting Started is a section in the sidebar that appears when you log in to the system if the **Show Getting Started on Startup** check box is selected. The Getting Started topics are context sensitive per application. Getting Started displays all the steps in a task. From a step in a task, you can jump that point in the user interface to actually complete it.

To use a Getting Started assistant, follow these steps:

1. In Application Chooser, select an application.
2. Click the Help icon. The sidebar appears.
3. In the sidebar, expand **Getting Started**.  
A main Getting Started topic link appears in the sidebar.
4. Select the main topic. For example in the Ethernet Activator application, click **Provision a Service**. A list of required steps appears in the sidebar. Each step contains a task link and a link to the help.
5. To perform a specific step, click that link. You jump to that point in the user interface. The assistant remains visible in the sidebar to aid navigation to subsequent tasks.
6. To access Help for a specific step, click the **Help** icon next to that step.

- Related Topics**
- Accessing Help on page 4

## Accessing Help

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Junos Space provides complete documentation in a Help system that is context-sensitive per workspace. The Help system provides information on each element in the system, including workspaces, dashboards, tasks, inventory pages, actions, and etc. The Help system also provides frequently asked questions (FAQs) and the entire system documentation. Help topics appear as links in the sidebar.

To access online help, follow these steps:

1. Click the workspace within which you want to work.
2. Click the **Help** icon. The sidebar appears, if it is not already displayed, with the Help section open listing specific topics for that workspace and tasks.

3. Click a topic link to view its contents. The Help topic appears in a separate window.
4. To hide the Help sidebar, click the button at the top right.

## Logging Out From the System

---

When you complete your administrative tasks in the Junos Space user interface, log out to prevent unauthorized users from intruding.

To log out from the system:

1. Click the **Log Out** icon in the banner. The Logout page appears.

To log in the system again, click the **Click here to log in again** link.

- Related Topics**
- Logging In To the System on page 3
  - Junos Space User Interface Overview on page 7
  - Changing User Passwords on page 107



## Chapter 2

# User Interface Overview

- Junos Space User Interface Overview on page 7
- Application Chooser Overview on page 12
- Platform Dashboard Overview on page 16
- Viewing Dashboard Statistics on page 17
- Workspace Statistics Pages Overview on page 21
- Inventory Pages Overview on page 23
- Viewing and Sorting Tabular Data on page 27

### Junos Space User Interface Overview

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The Junos Space application design allows multiple users concurrent access to its user interface. Each user accesses the system using a Web browser.

Each user has access to the same systemwide database, which ensures that each user sees current information. User access to tasks and objects is controlled by permissions assigned to the user. For example, a service provisioner will have full access to the tasks in the Service Provisioning workspace, but might not have access to Service Design tasks.

#### ***Parts of the System User Interface***

The sections that follow describe the major parts of the system user interface.

- Application Chooser on page 7
- Application Dashboard on page 8
- Workspace Statistics on page 9
- Inventory Page on page 10

#### ***Application Chooser***

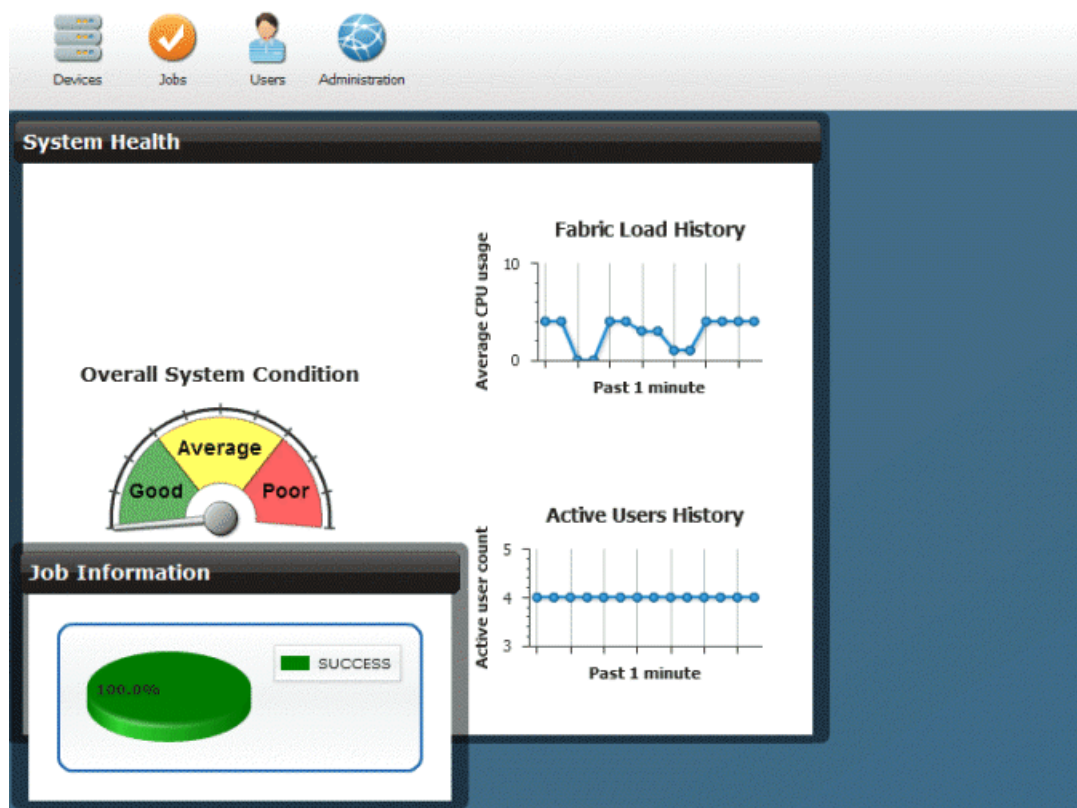
When you log in to the system, you see the Application Chooser that displays the available applications and shortcuts as shown in Figure 1 on page 8. For more information about the Application chooser, see “Application Chooser Overview” on page 12.

**Figure 1: Application Chooser User Interface**

### ***Application Dashboard***

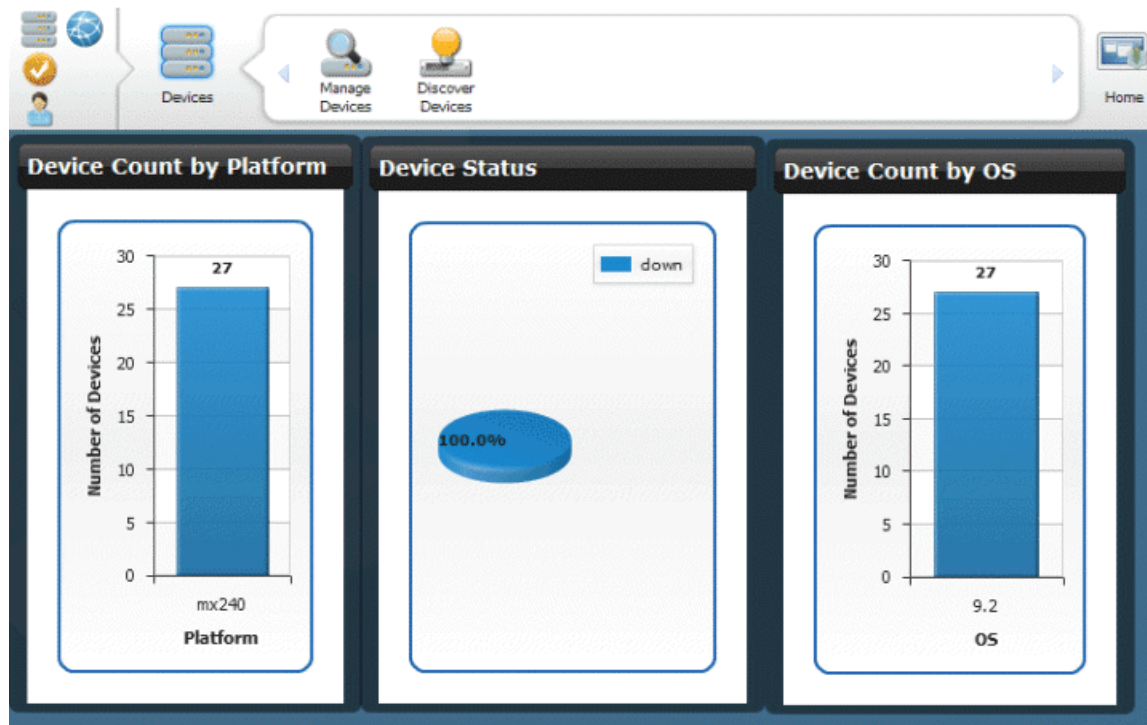
In Application Chooser, click an application icon to view its dashboard that displays graphical data about devices, jobs, users, administration, and etc. For example, the Platform dashboard is shown in Figure 2 on page 9. For more information about the application dashboard, see “Platform Dashboard Overview” on page 16.



**Figure 2: Platform Application Dashboard**

### Workspace Statistics

In the application dashboard, click a workspace icon in the task ribbon to view its statistics page. For example, the Device Management statistics page is shown in Figure 3 on page 10. The statistics view displays charts, graphics, and sub-tasks. For more information about the workspace statistics page, see “Workspace Statistics Pages Overview” on page 21.

**Figure 3: Platform Statistical Page**

### ***Inventory Page***

Click a sub-task in the workspace task ribbon to view its inventory page. For more information about inventory pages, see “Inventory Pages Overview” on page 23. Inventory pages display managed items in two views: thumbnail and tabular.

For more information about inventory thumbnail and tabular views, see “Inventory Pages Overview” on page 23.

- Inventory Thumbnail View on page 10
- Inventory Tabular View on page 11

### ***Inventory Thumbnail View***

Figure 4 on page 11 shows the Device Management Manage Devices inventory thumbnail view.

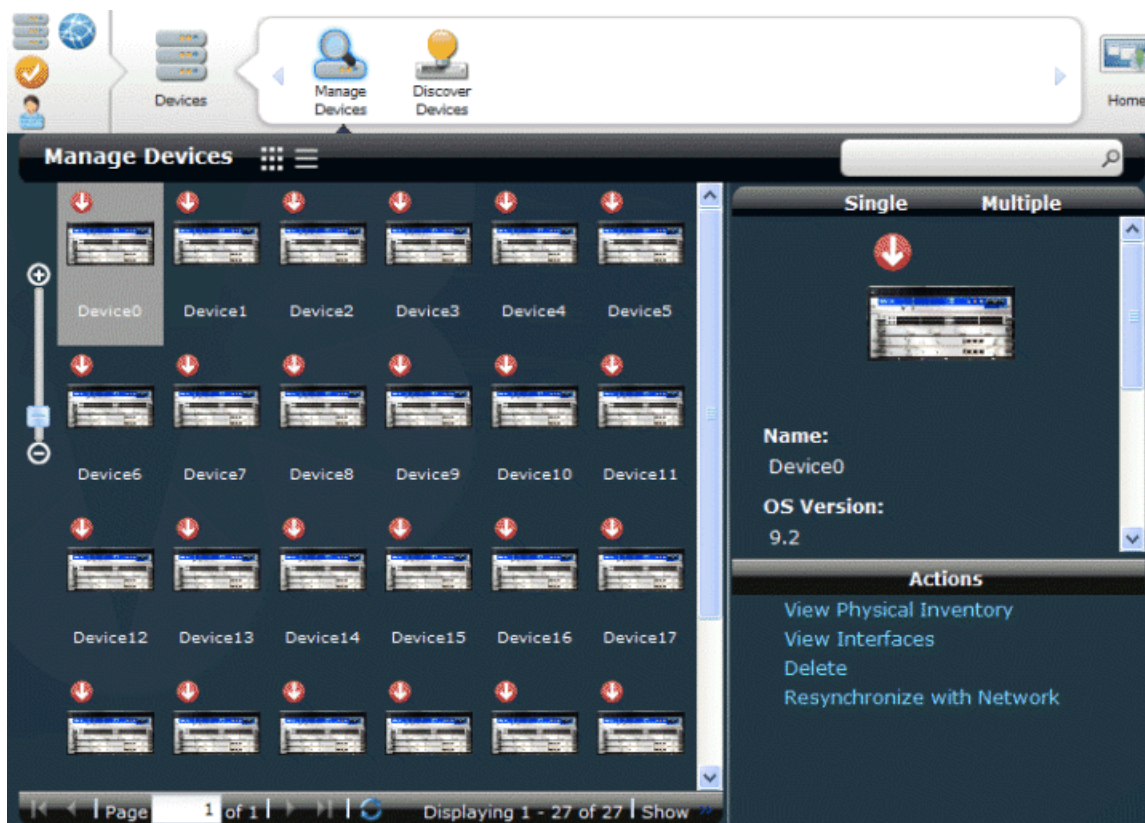
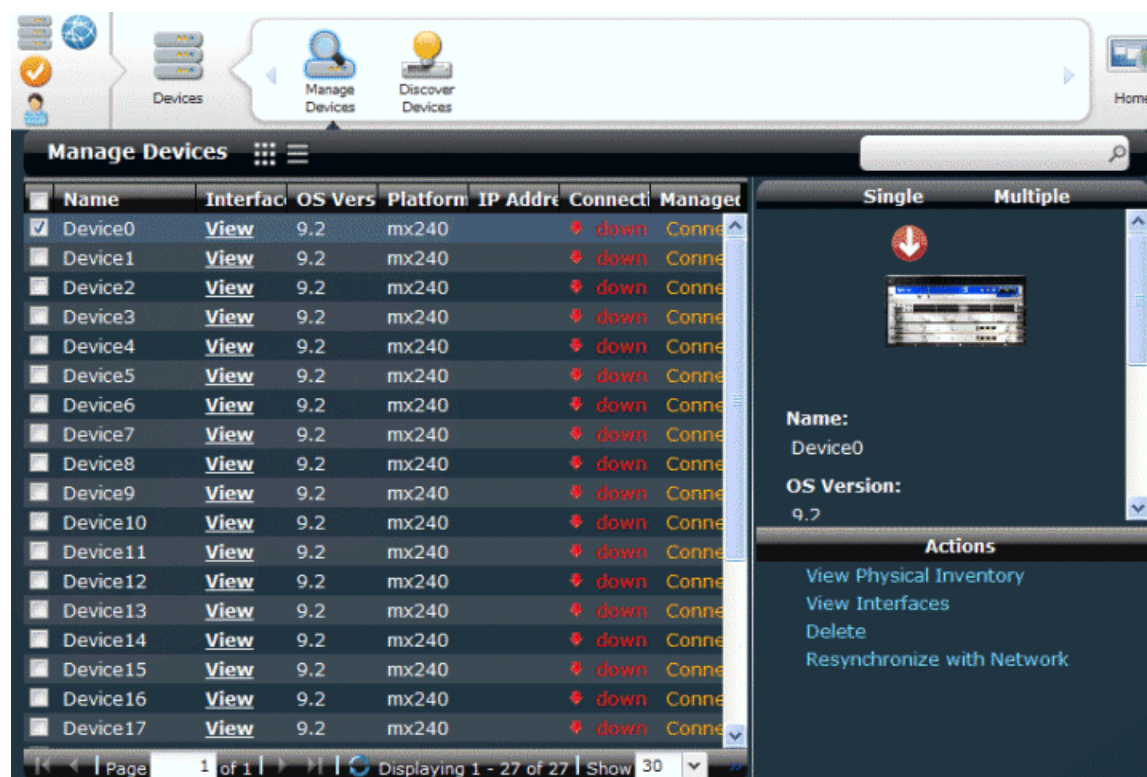
**Figure 4: Device Management Manage Devices Inventory Thumbnail View*****Inventory Tabular View***

Figure 5 on page 12 shows the Device Management Manage Devices Inventory Tabular View.

**Figure 5: Device Management Manage Devices Inventory Tabular View**

- Related Topics**
- Platform Dashboard Overview on page 16
  - Workspace Statistics Pages Overview on page 21
  - Inventory Pages Overview on page 23

## Application Chooser Overview

The Application Chooser provides a user interface within which you can view and manage installed applications in Junos Space. Application Chooser appears when you first log in to the system.

Application Chooser also contains shortcuts to frequently used workspaces. For example from Application Chooser, you can jump directly to the devices and users workspaces without having to click the Network Application Platform icon and the Devices or Users workspace icons in the navigation ribbon.

Applications are represented as icons that display in two views: thumbnail and carousel. In thumbnail view, application icons are arranged in a tiled format in the workspace. In carousel view, the icons rotate three-dimensionally in a circular manner.

New applications will be added in subsequent software releases.

Mouse over an application to view its title and description. Double-click an application icon to launch it and navigate to its dashboard.

Filter application icons by those newest first, alphabetically, and custom criteria using the **Sorted by** link.

Add or remove applications from Application Chooser using the + icon in the actions toolbar at the bottom right.

Figure 6 on page 13 shows the parts of Application Chooser.

**Figure 6: Parts of Application Chooser**



The following sections describe the parts of Application Chooser.

#### ***Parts of Application Chooser***

- Banner on page 14
- Login User Name on page 14
- Application Icons on page 14
- Shortcut Icons on page 14
- Workspace on page 14







- Sorted By Link on page 15
- Actions Toolbar on page 15

### **Banner**

The banner displays the Junos Space application logo, date and server time in the active time zone, and global actions such as Help, Application Switcher, User Preferences, and Log Out. The banner appears throughout the system. Table 1 on page 14 describes the global action icons at the right in the banner.

**Table 1: Banner Global Actions**

Banner Global Action Button	Description
	Displays the application Help
	Displays the User Preferences dialog box from you can change user preferences, such as the password.
	Displays the Application Switcher drop-down menu to switch between up to the last five applications used.
	Logs you out of the system.

### **Login User Name**

Displays the username of the person currently logged into the system.

### **Application Icons**

The applications appear as icons in the Application Chooser in thumbnail or carousel views. Mouse over an application to view its name. Double-click an application to navigate to it and open its workspace. Switch to a different application using the Application Switcher global action in the application banner.

### **Shortcut Icons**

The shortcuts appear as icons in the Application Chooser. Shortcuts allow you to jump directly to a workspace without user interface navigation. For example, use the Devices shortcut to jump directly to the Devices workspace.

### **Workspace**

The workspace displays the installed application icons. Shortcuts to the most common tasks also appear in the workspace. The Sorted by link displays the options for filtering applications, such as newest first or alphabetical. The bottom-right toolbar changes the application view from thumbnail to carousel and allows you to add or remove installed applications.

The Application Switcher displays the last five applications you use.



### **Sorted By Link**

Filters applications in the Application Chooser workspace by newest first, alphabetical, or custom.

### **Actions Toolbar**

(Bottom-Right) Use the toolbar at the bottom right of the workspace to change the application icons from thumbnail to carousel views. Table 2 on page 15 defines the toolbar buttons.

**Table 2: Application Chooser Toolbar Buttons**

Application Toolbar Button	Description
	Displays the application icons so that they rotate in a circular manner in the workspace.
	Displays the application icons tiled in the workspace.

### **Application Chooser Actions**

The Application Chooser provides the following user actions:

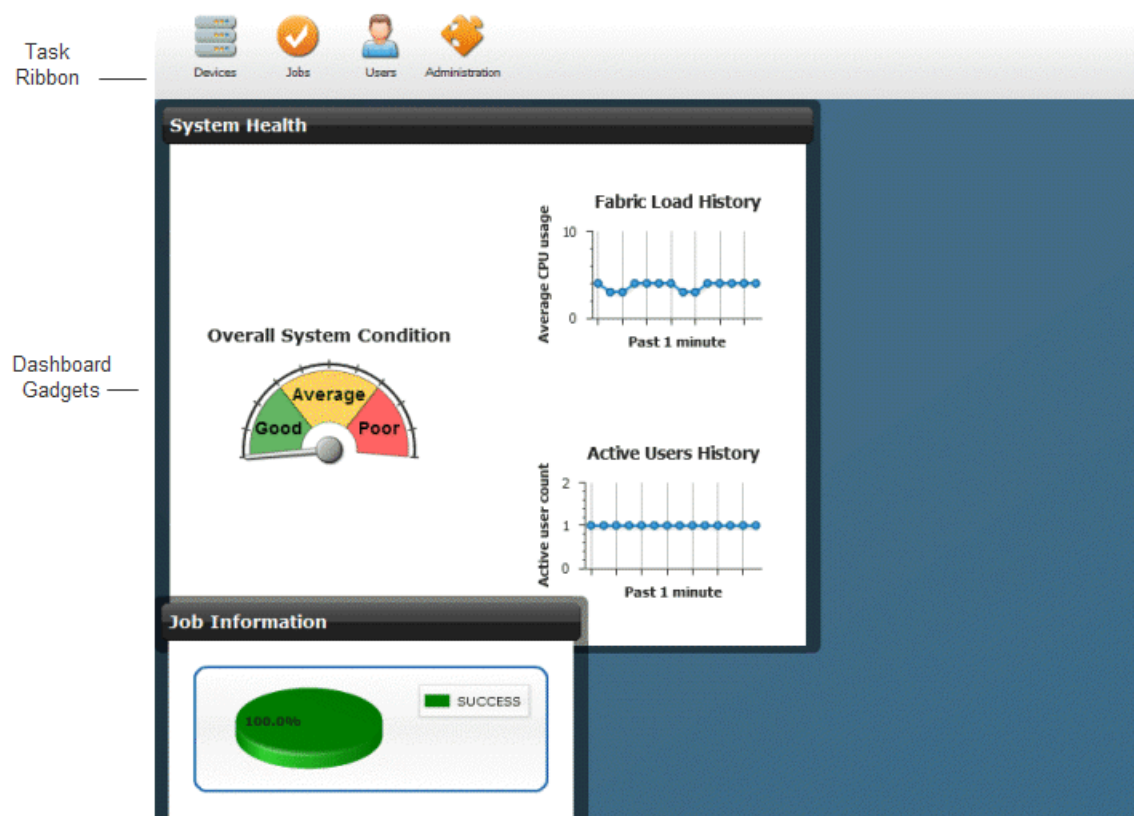
- **Change Application Chooser Views**—To change the Application Chooser view, click either Thumbnail or Carousel in the bottom-right actions toolbar.
- **Sort Applications**—To sort applications, click the Sort by link at the bottom of the Application Chooser page, then select a sort option in the pop-up menu. The filter options include newest application first, alphabetical, and custom user settings.
- **Open Applications**—To open an application, double-click its icon. You can also use the Application Switcher global action at the right in the banner to navigate to up to the last applications five you used.
- **Switch to Other Applications**—To switch to other applications from Application Chooser, select an application name in the Application Switcher drop-down menu. The Application Switcher is a global action to the right in the banner. The Application Switcher drop-down menu displays up to the last five applications you used. You must confirm whether you want to switch to that application.

**Related Topics** ■ [Modifying Application Settings on page 89](#)

## Platform Dashboard Overview

The Platform dashboard provides a single page snapshot of the current status of your network. The Platform dashboard appears when you click the Platform application icon from Application Chooser or switch to it from the Application Switcher. Figure 7 on page 16 shows an example of a typical system dashboard.

**Figure 7: Platform Dashboard**



The sections that follow describe the parts of the Platform Dashboard.




### Platform Workspaces

**Table 3: Workspace Icons**

Icon	Workspace Name	Task
	Devices	Manage devices, including adding, discovering, importing, and updating them.



**Table 3: Workspace Icons** (continued)

Icon	Workspace Name	Task
	Jobs	Monitor the progress of ongoing jobs.
	Users	Add, manage, and delete users.
	Administration	Add network nodes, backup your database, or troubleshoot.

**Platform Dashboard Gadgets**

The Platform dashboard contains items of system information known as *gadgets*. These gadgets include a series of graphs and charts. For information about the data shown in the gadgets, see “Understanding Overall System Condition and Fabric Load” on page 45.

Gadget information is updated automatically and immediately.

Click a gadget or gadget elements to drill down to more detailed information. Typically, clicking a gadget element takes you either to the statistics page of the associated workspace, or to an inventory page. Some gadgets let you filter information by selecting a specific segment or bar from a chart, or a specific line of a table. For example, if you select the red segment on the Status of Tasks run gadget, you navigate to the manage tasks inventory page that displays only failed tasks.

You can move gadgets on the dashboard or change the size of them. Changes in location or size of dashboard gadgets persist on returning to the dashboard, even after logging back into the system.

- Related Topics**
- Junos Space User Interface Overview on page 7
  - Viewing Dashboard Statistics on page 17
  - Understanding Overall System Condition and Fabric Load on page 45

**Viewing Dashboard Statistics**

The dashboard appears when you select an application from Application Chooser. It contains graphs and charts known as gadgets that provide high-level monitoring information for the system.

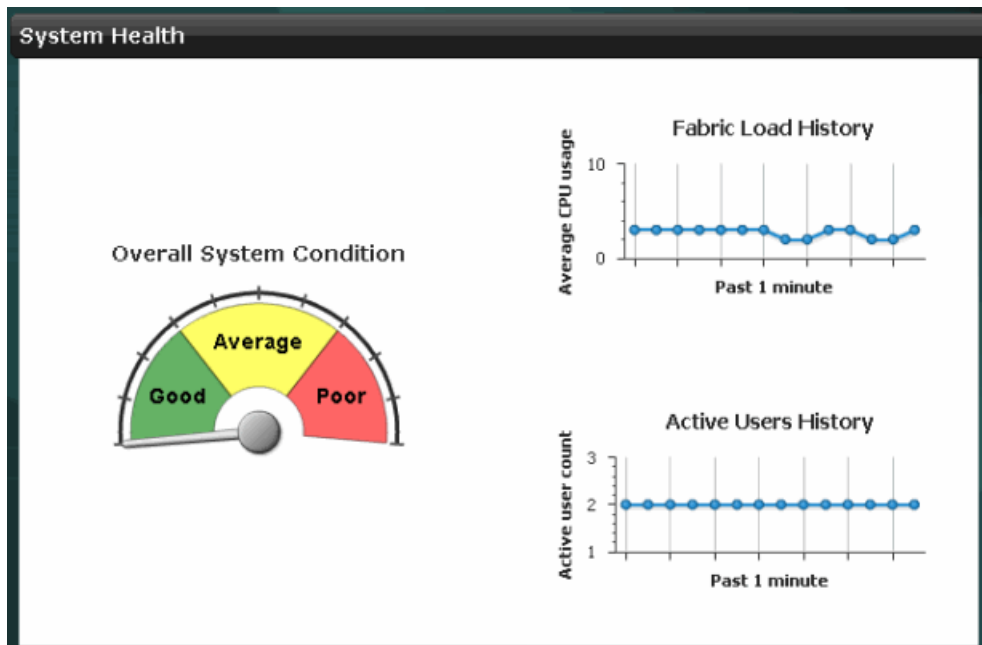
The following topics describe how to use and interpret dashboard gadgets:

- Viewing System Health Statistics on page 18
- Viewing the Job Information on page 20

## Viewing System Health Statistics

The Network Application Platform dashboard system Health gadget displays real-time information about the overall health of the Junos Space system. It includes an overall system condition gauge, and graphs that report the system load and number of users. Figure 8 on page 18 shows an example.

**Figure 8: Viewing System Health Statistics**



The Overall System Condition gauge represents a combination of the health of the database, the application, and load balancing software. If all these components are functional on all processors in the fabric, then the overall system condition is reported as good.

The Fabric Load History graph shows the trend of the average load of all CPUs in the fabric over the last minute. The Y axis shows the percentage of CPU use and scales dynamically so that useful information can be obtained at low loads. A new reading appears every five seconds.

To view the average CPU use at a specific data point, drag the mouse over the data point of interest. The fabric load is shown in parentheses in a tooltip.

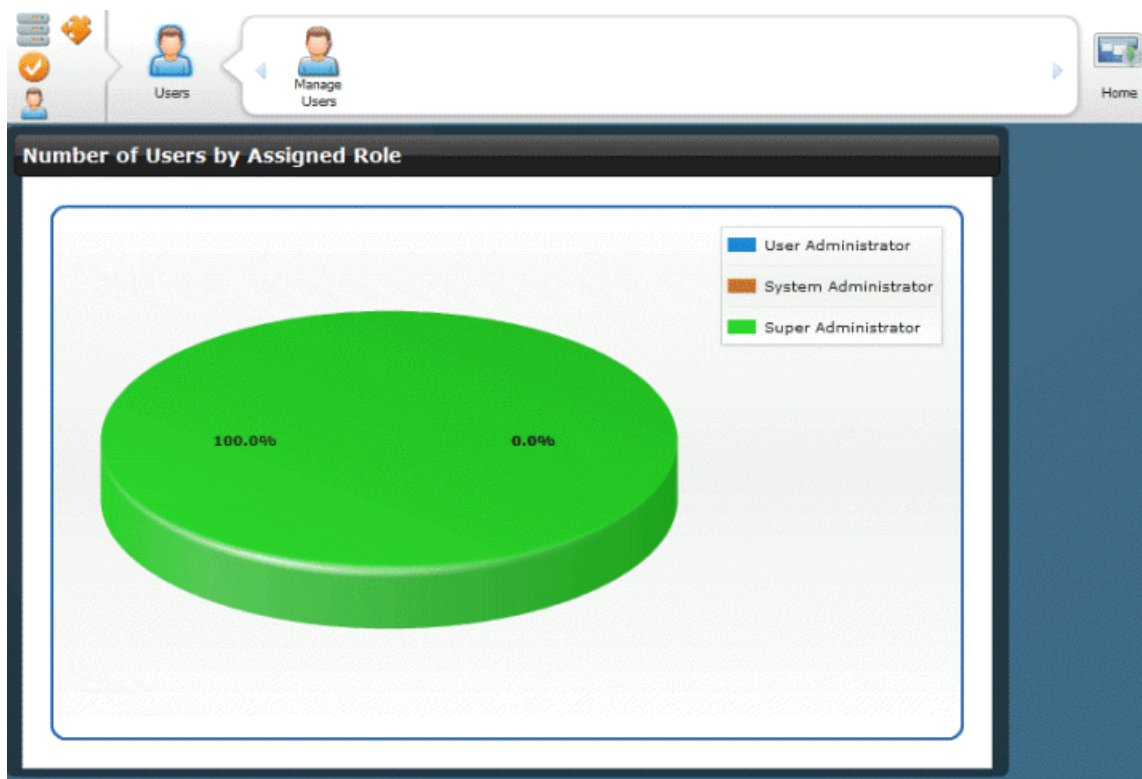
To obtain more details about the status of the fabric, click any data point in the graph. The Fabric Monitoring page appears and shows detailed status of each node in the fabric as shown in Figure 9 on page 19.

**Figure 9: Fabric Monitoring Details**

The Active Users History graph shows a history of the number of active users on the system for the previous minute.

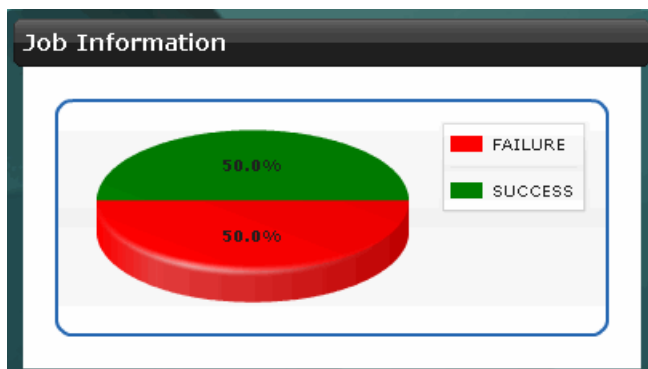
To view the number of active users at a specific data point, drag the mouse over the data point of interest. The fabric load is shown in parentheses in a tooltip.

To obtain more details about active users, click any data point in the graph. The Administration workspace statistics page appears as shown in Figure 10 on page 20.

**Figure 10: Number of Users Assigned Details**

### Viewing the Job Information

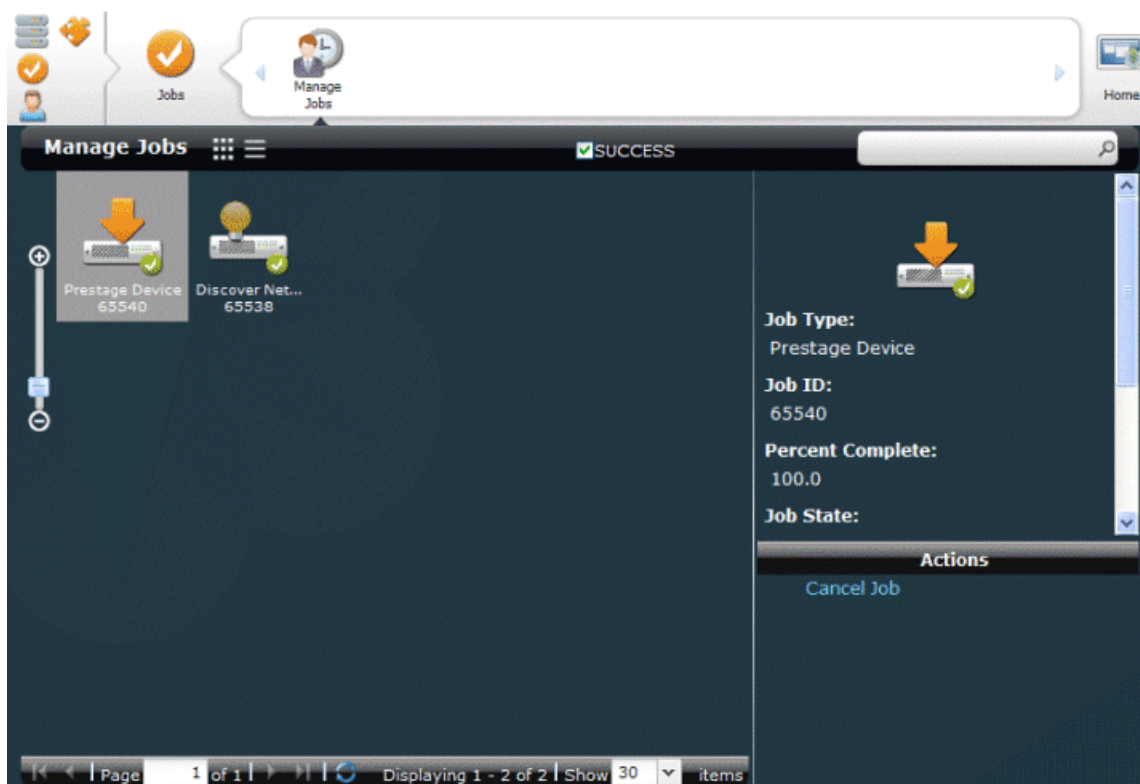
The Job Information gadget on the system dashboard provides real-time information about the proportion of tasks successfully completed, failed, or in some other state during in the logged-on user's current work session. Figure 11 on page 20 shows an example of the Job Information gadget.

**Figure 11: Viewing Job Information**

To view the number of jobs in a specific state rather than the percentage, drag the mouse over the segment in the chart. The number of jobs appears in parentheses in a tooltip.

To view details about the jobs represented in the chart, click on the segment of interest. For example, click on the red segment to view details about failed jobs. The Manage Jobs page appears as shown in Figure 12 on page 21.

**Figure 12: Manage Jobs Details**



## Workspace Statistics Pages Overview

When you select a workspace from the application dashboard task ribbon, Junos Space typically displays high-level statistics relevant to that workspace. The example shown in Figure 13 on page 22 shows a bar chart of service orders by customer and a pie chart showing the proportion of service requests in each potential service request state.

**Figure 13: Workspace Statistics Page**

The tasks for a workspace appears to the right in the task ribbon; the workspace icons collapse to the left in the task bar.

From the statistics page, you can drill down to more details. For example, when you select the Service Provisioning workspace, the system displays information about the managed services.

You can move charts and graphs on the screen or resize them. Changes in location or size of charts and graphs persist on returning to the statistics page, even after logging back into the system.

If a chart has more data points than can be viewed clearly at once, a scroll bar appears at the bottom of the chart for access to the remaining data.

Active links within the graphs and charts provide access to more details. For example, if you click on a bar or pie-chart segment, you navigate to the corresponding inventory page, and displays information filtered according to the bar or segment you selected. For example, if you select the blue bar in Figure 13 on page 22, a service order inventory page appears showing only service orders associated with the customer named Cust-1.

- Related Topics**
- Viewing Customers
  - Viewing Statistics for Scheduled Jobs on page 153



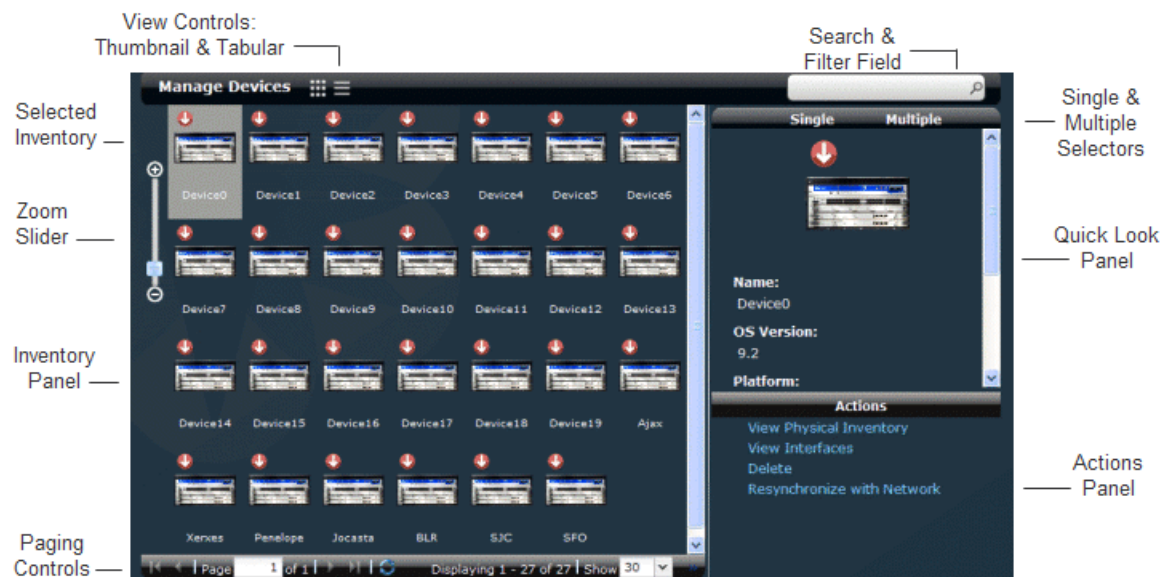
- Viewing User Statistics on page 109
- Inventory Pages Overview on page 23

## Inventory Pages Overview

An inventory page appears when you select an application, select a workspace, then select a task. It is often the starting point for performing tasks. Inventory pages provide information about all instances of a specific type of object. For example, to view the users inventory page to perform tasks on all users in the system, you select the Users workspace icon then select the Manage Users task. To view the devices inventory page to perform task on a devices in the network, you select the Devices workspace icon, then select the Manage Devices task.

Inventory pages have two views: thumbnail and tabular. Figure 14 on page 23 shows the thumbnail view of the Manage Devices inventory page for managing devices and identifies the major components that are common to all inventory pages.

**Figure 14: Manage Devices Inventory Page**



### Inventory Panel

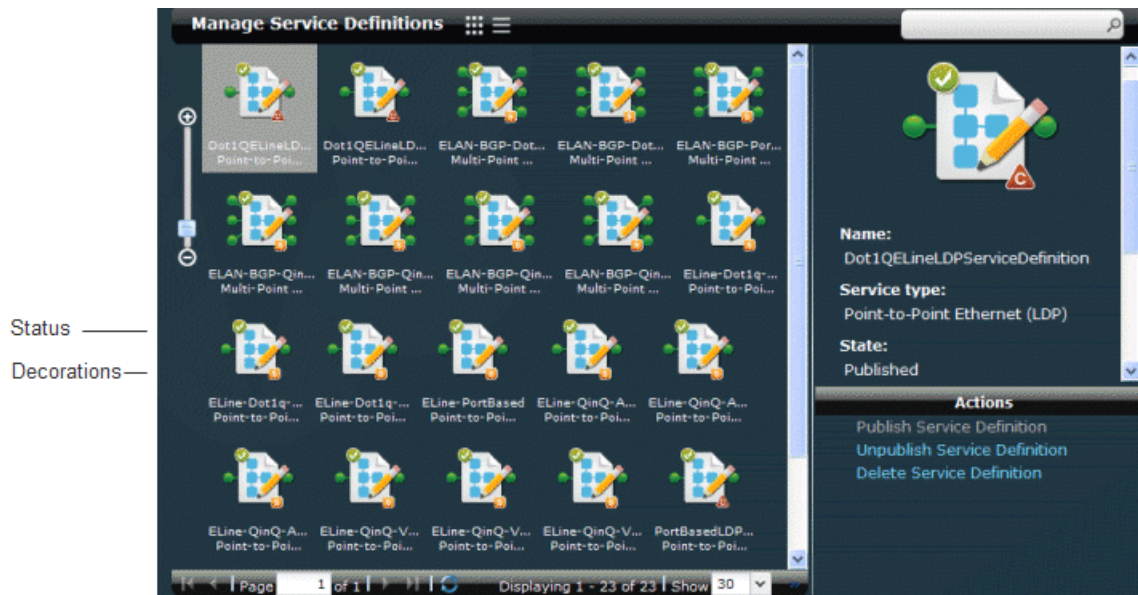
The inventory panels lists the objects in the inventory either as thumbnail icons or in a tabular form. You can switch between thumbnail and tabular views by selecting the thumbnail view selector or tabular view selector icon in the inventory page header.

### Thumbnail View

By default, an inventory page shows a thumbnail view of each object in the inventory panel. Selected items appear with a grey background. The thumbnail always has a

name associated with it, and might include additional decorations to provide more information about the object. For example, in the Manage Service Definitions inventory page, a decoration might indicate whether a specific service definition is standard or custom. Figure 15 on page 24 shows an example of the inventory page with icons with status and decoration indicators.

**Figure 15: Inventory Page—Thumbnail View**



For inventories that will not fit on one screen, navigation is through the standard table controls at the bottom of the screen.

The paging controls at the bottom of the inventory panel determines how many icons appear on one page. The zoom slider determines the size of the icon on the screen (see “Paging Controls” on page 26). If the screen is too small to show all thumbnail icons for a given page size at the icon size set by the zoom slider, then a scroll bar appears to the right of the inventory panel to allow you to access the icons off screen.

### Tabular View

The Tabular View selector displays inventory information in tabular form. Selected items are indicated by a check mark and highlighting. You can sort information in each of the table columns. For more information, see “Viewing and Sorting Tabular Data” on page 27.

Figure 16 on page 25 shows an example of the Manage Service Definitions inventory page in tabular view.



**Figure 16: Inventory Page—Tabular View**

Selected Inventory

Name	State	Service Type	Created By
Dot1QELDPServiceDefinition	Published	Point-to-Point Ethernet (LDP)	super
Dot1QELDPServiceDefinition-1-100M	Published	Point-to-Point Ethernet (LDP)	super
ELAN-BGP-Dot1q-Normalized-VLAN-None	Published	Multi-Point Ethernet	super
ELAN-BGP-Dot1q-SingleVLAN	Published	Multi-Point Ethernet	super
ELAN-BGP-PortBased-10-100M	Published	Multi-Point Ethernet	super
ELAN-BGP-QinQ-AllVLAN	Published	Multi-Point Ethernet	super
ELAN-BGP-QinQ-AllVLAN-Normalized-All	Published	Multi-Point Ethernet	super
ELAN-BGP-QinQ-AllVLAN-Normalized-None	Published	Multi-Point Ethernet	super
ELAN-BGP-QinQ-Range-Normalized-VLAN	Published	Multi-Point Ethernet	super
ELine-Dot1q-SingleVLAN	Published	Point-to-Point Ethernet (LDP)	super
ELine-Dot1q-SingleVLAN-CCC	Published	Point-to-Point Ethernet (LDP)	super
ELine-Dot1q-SingleVLAN-Ext-CCC	Published	Point-to-Point Ethernet (LDP)	super
ELine-PortBased	Published	Point-to-Point Ethernet (LDP)	super
ELine-QinQ-AllVLAN	Published	Point-to-Point Ethernet (LDP)	super
ELine-QinQ-AllVLAN-CCC	Published	Point-to-Point Ethernet (LDP)	super
ELine-QinQ-AllVLAN-Ext-CCC	Published	Point-to-Point Ethernet (LDP)	super
ELine-QinQ-VLANRange	Published	Point-to-Point Ethernet (LDP)	super
ELine-QinQ-VLANRange-CCC	Published	Point-to-Point Ethernet (LDP)	super
ELine-QinQ-VLANRange-Ext-CCC	Published	Point-to-Point Ethernet (LDP)	super
PortBasedLDPServiceDefinition	Published	Point-to-Point Ethernet (LDP)	super

Page 1 of 11 | Showing 1 - 23 of 23 items

**Quick Look Panel**

Name: Dot1QELDPServiceDefinition

Service type: Point-to-Point Ethernet (LDP)

State: Published

**Actions**

- Publish Service Definition
- Unpublish Service Definition
- Delete Service Definition

In the tabular view, the Show items drop-down list box determines how many rows appear on each page of the table. If the selected value is more than can fit on one screen, a scroll bar appears to the right to access the off screen rows.

### Quick Look Panel

Single click an object in the inventory panel once to see summary information about that object in the Quick Look panel. Double-click more complex objects to see more details.

### Actions Panel

Select an object in the inventory panel, then selecting the action link you want to perform in the Actions panel. For example, to delete a device from the inventory, select the device in the Manage Devices inventory panel, then click the Delete link in the Actions panel.

Actions in the Actions panel are dimmed if the object you selected does not support the selected action in its current state.

### Search and Filter

The Search and Filter field on the right of the task header bar enables you to find a specific object.

### Multiple Object Selection

The inventory page allows you to select multiple objects so that you can perform batch operations on them.

The Single and Multiple buttons at the top of the Quick Look panel switch between single and multiple selection modes. Once in multiple selection mode, selected objects

are added to the Selections list, which replaces the quick view panel as shown in Figure 17 on page 26.

The Single/Multiple panel option appears only on inventory pages that support batch operations. The service definition inventory, for example, has no bulk operations, so the Single/Multiple selection panel does not appear. Similarly, if only one item appears in a device inventory, the single/multiple section panel does not appear.

**Figure 17: Multiple Selection Mode of Devices in Manage Devices Inventory Panel**



You can deselect items before selecting a batch action. Deselected items remain in the Selections list, but no longer check marked.

When you have selected the objects you want, you can use any of the commands in the Actions panel to perform operations on those objects.






### **Paging Controls**

Paging controls at the bottom of the inventory panel allow you to navigate the inventory when the inventory is too large to fit on one page. Using these controls, you can go to a specific page, navigate to the next or previous page, navigate to the first or last page of the inventory, or refresh the inventory view.

To access a specific page, in the Page field, type the page number and press Enter.

Other table controls are described in Table 4 on page 27.

**Table 4: Table Paging and Refreshing Controls**

Table Control	Operation
	Advances to the next page of the table.
	Returns to the previous page of the table.
	Displays the last page of the table.
	Displays the first page of the table.
	Refreshes the table content.

- Related Topics**
- Junos Space User Interface Overview on page 7
  - Viewing and Sorting Tabular Data on page 27

## Viewing and Sorting Tabular Data

In large networks, some tables of data can grow to hundreds, thousands, possibly millions of entries. To help manage and interpret such potentially large volumes of information, Junos Space enables you to selectively view, sort and filter your tabulated data in the user interface as described in the following sections:

- Viewing Tabular Data on page 27
- Sorting Tabular Data on page 28
- Hiding Tabular Data on page 29

### Viewing Tabular Data

Figure 18 on page 27 shows an example of the Manage Users inventory in tabular view.

**Figure 18: Manage Users Tabular View**

Manage Users  

	User Name	First Name	Last Name	Email
<input checked="" type="checkbox"/>	bear	Major	Jones	major@mycompany.net
	buffalo	John	Davis	davis@mycompany.net
	moose	Susan	Brink	myaccount@company.net
	super	Open	Space	super@juniper.net






By default, up to 30 lines of data display per screen. Use the Show items field to customize this value. If the screen size is too small to accommodate the selected entries, use the scroll bar to the right to access the remaining lines in the page.

Adjust column widths to your taste. Adjusted column widths persist on returning to the same screen even after logging out and then logging back in again.

To access a specific page, in the Page field, type the page number and press Enter.

Other table controls are described in Table 5 on page 28.

**Table 5: Table Controls**

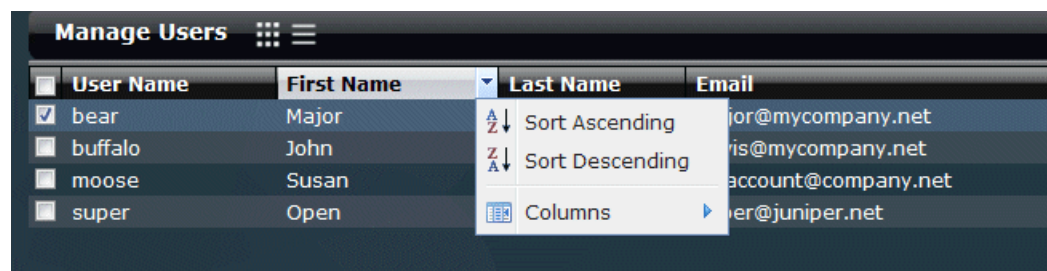
Table Control	Effect
	Advances to the next page of the table.
	Returns to the previous page of the table.
	Displays the last page of the table.
	Displays the first page of the table.
	Refreshes the table content.

## Sorting Tabular Data

You can sort data in some tables on a specific field. To do so, select the down arrow to the right of the column header and select either **Sort Ascending** or **Sort Descending** from the menu.

Figure 19 on page 28 shows an example.

**Figure 19: Sorting Tabular Data**



The table immediately reappears with the rows sorted on the data in the selected column.

Changes in the sort order persist on return to the same screen.

## Hiding Tabular Data

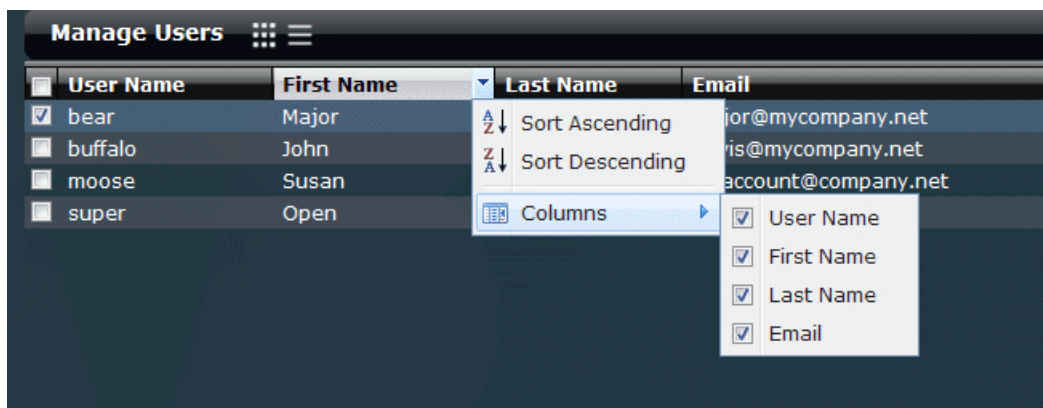
Some tables contain many columns of information which might not all be useful for a specific user or task. You can hide unwanted columns of information.

To hide unwanted columns of information, follow these steps:

1. Select the down arrow to the right of the header in any column.
2. In the drop-down menu, select **Columns**.

A submenu appears, as shown in the example in Figure 20 on page 29.

**Figure 20: Hiding Columns**



3. Clear the checkmarks for the columns you want to hide.

The deselected columns disappear immediately.

To make columns reappear, follow the same steps, and check the boxes of the columns you want to see.



**NOTE:** Columns that you hide or make visible will remain hidden or visible on returning to the same screen even after logging out and then logging back in again.



## **Part 2**

# **Managing the Junos Space Fabric**

- Fabric Overview on page 33
- Configuring Nodes on page 39
- Monitoring Nodes on page 41





## Chapter 3

# Fabric Overview

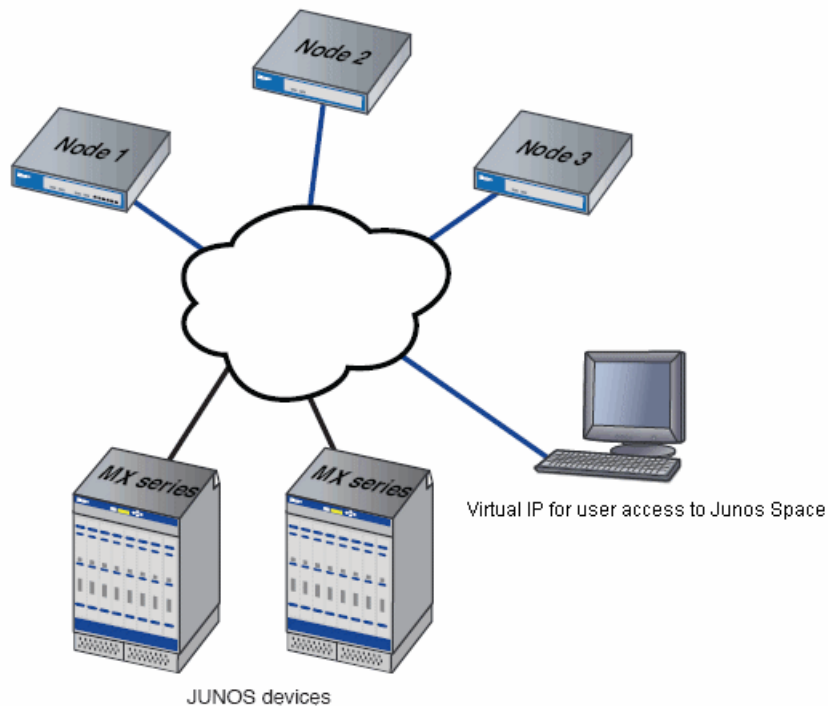
- Fabric Management Overview on page 33

### Fabric Management Overview

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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.



### 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:

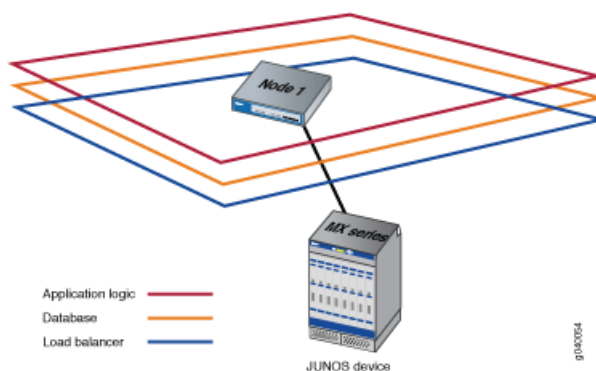
- **Load Balancer**— When a node that functions as the active load balancer server is down, all HTTP requests are automatically routed to the standby load balancer server that is running on a separate node.
- **Database**— When a node that functions as the active database server is down, all database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

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

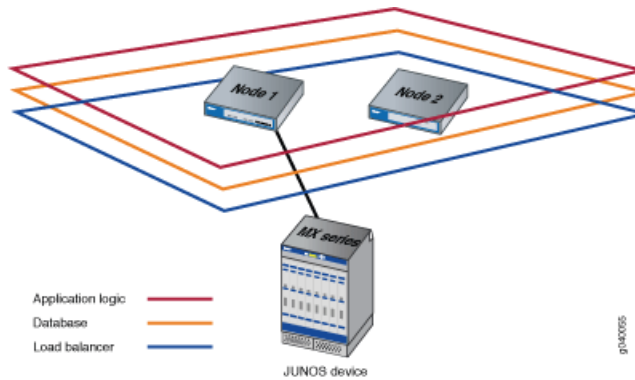
The following workflow describes how the node functions are enabled across the fabric as nodes are added:

- **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.

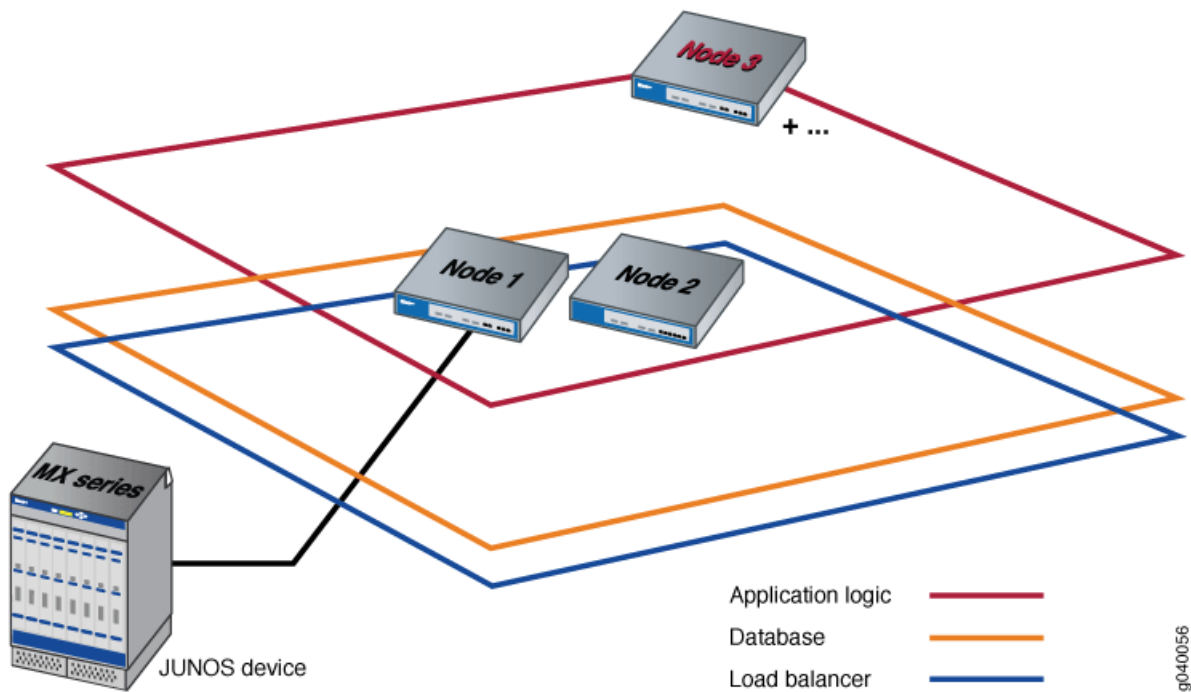


- **Add second node:** When a second node is added to the fabric, the first node functions as the active load balancer server and active database server, and the second node functions as the standby load balancer server and standby database server. The load balancer and application logic node functions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

- Related Topics**
- Managing Nodes in the Fabric on page 39
  - Viewing Nodes in the Fabric on page 41



## Chapter 4

# Configuring Nodes

- Managing Nodes in the Fabric on page 39

### Managing Nodes in the Fabric

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You can install one or more Junos Space appliances to create a scalable fabric. A Junos Space *appliance* can be either a JA1500 Junos Space Appliance or a Junos Space Virtual Appliance. Each Junos Space appliance that you install is represented as a single node in the fabric. As the number of devices on your network expands, you can add nodes to the fabric to manage the increased workload. By default, the Junos Space fabric contains a single node that provides complete Junos Space management functionality. When you install and configure the first appliance, Junos Space automatically adds the first node to the fabric and uses the logical node name that you assign to the appliance when you configure the appliance in the command line interface. For each additional appliance that you install and configure, you must add the node in Junos Space to represent the appliance in the fabric.

- Adding a Node on page 39

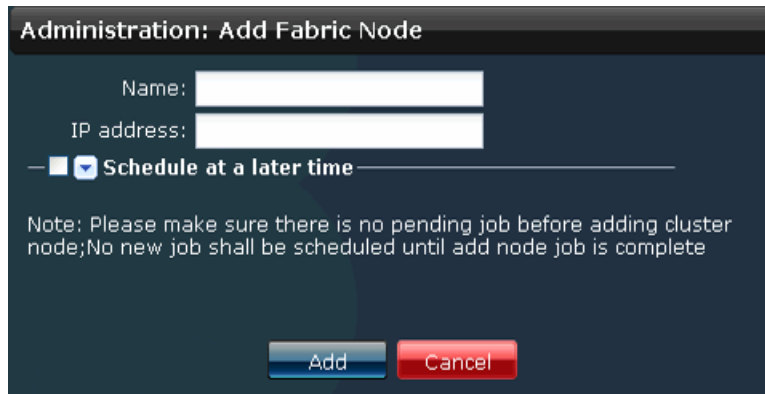
### Adding a Node

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 JA1500 Junos Space Appliance or Junos Space 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)

The third node (and all subsequent nodes) added to a fabric perform only the Application Logic function.

- Related Topics**
- Fabric Management Overview on page 33
  - Viewing Nodes in the Fabric on page 41
  - Understanding Overall System Condition and Fabric Load on page 45



## Chapter 5

# Monitoring Nodes

- Viewing Nodes in the Fabric on page 41
- Understanding Overall System Condition and Fabric Load on page 45

### Viewing Nodes in the Fabric

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You can view configuration and runtime information for each node in the Junos Space fabric. You can also monitor the status of the database, load balancer, and application logic functions running on each node, and identify nodes that are overloaded or down. You can view nodes in the fabric either graphically or in a table.

- Viewing Nodes as Graphics on page 41
- Viewing Nodes in a Table on page 43

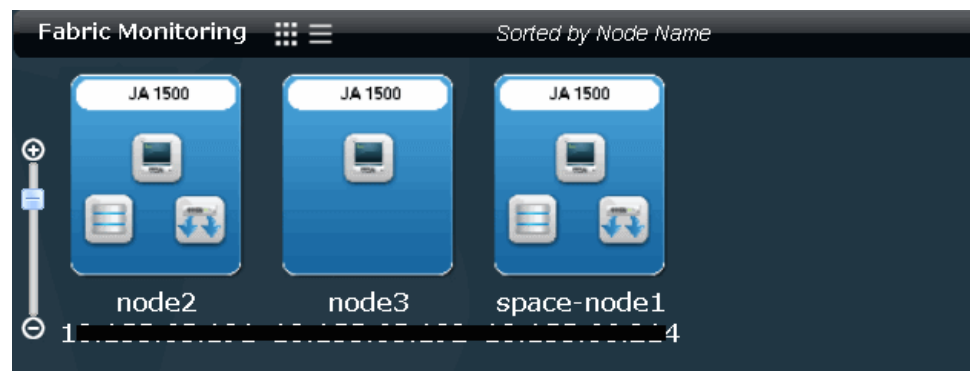
### Viewing Nodes as Graphics

You can view thumbnail, quick look, and detailed information about the nodes running on a fabric.

To view the nodes in a fabric:

1. From the task ribbon, select the **Administration** workspace icon.
2. From the task ribbon, select the **Manage Fabric** icon.

The Fabric Monitoring window displays the nodes in the fabric.



The Fabric Monitoring window is refreshed every 10 seconds, by default.

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



3. To view runtime and node function status for a node, click on the node.

Runtime and status information for the selected node is displayed in the Quick Look panel.

4. To view detailed runtime and status information for a node, double-click on the node.

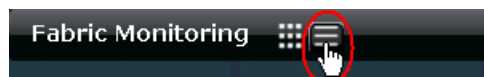
For example, the following illustration shows the node icon and detailed information for a JA1500 Junos Space Appliance.



## Viewing Nodes in a Table

To view configuration and runtime information in a table:

1. From the task ribbon, select the **Administration** workspace icon.
2. From the task ribbon, select the **Manage Fabric** icon.
3. Click the table icon in the filter bar, as shown in the following example.



Junos Space displays a table with information about each node in the fabric.

Node Name	Management IP	Status	% CPU	% RAM	% Disk	App Logic	Database	Load Balancer
Node1	10.10.10.1	UP	4	22	1	UP	UP	UP

Table 6 on page 43 describes the node information displayed in each field in the table and information available from the detailed view.

**Table 6: Fields for the Fabric Monitoring Inventory Panel**

Field	Description
Node Name	<p>The logical name assigned to the node.</p> <p><b>NOTE:</b> For the first node, Junos Space uses the node name that the user specifies during the initial configuration of the Junos Space appliance (physical or virtual). For each subsequent node, the user must specify a node name when adding the node to the fabric.</p>
Management IP	The IP address for the node.
Status	<p>Connection status for the node.</p> <ul style="list-style-type: none"> <li>■ UP—Node is connected to the fabric.</li> <li>■ DOWN—Node is disconnected from the fabric.</li> </ul>
% CPU	<p>The percentage of CPU resource utilized by the node.</p> <ul style="list-style-type: none"> <li>■ Unknown—The percentage of CPU utilized is unknown, for example, because the node is not connected.</li> </ul>
% RAM	<p>The percentage of memory resource utilized by the node.</p> <ul style="list-style-type: none"> <li>■ Unknown—The percentage of memory utilized is unknown, for example, because the node is not connected.</li> </ul>
% Disk	<p>The percentage of <code>/var</code> directory utilized by the node.</p> <ul style="list-style-type: none"> <li>■ Unknown—The percentage of <code>/var</code> directory utilized by the node is unknown, for example, because the node is not connected.</li> </ul>

**Table 6: Fields for the Fabric Monitoring Inventory Panel** (continued)

Field	Description
App Logic	<p>Application Logic function status for the node.</p> <ul style="list-style-type: none"> <li>■ UP— Application Logic function is running on node.</li> <li>■ DOWN—Application Logic function enabled on the node but is not running.</li> <li>■ Unknown—Status for the application logic function is unknown, for example, because the node is not connected.</li> <li>■ N/A— Application Logic function is not configured to run on the node.</li> </ul>
Database	<p>Database function status for the node.</p> <ul style="list-style-type: none"> <li>■ UP—Database function is running on node.</li> <li>■ DOWN—Database function that is enabled on the node but is not running.</li> <li>■ Unknown—Status for the Database function is unknown, for example, because the node is not connected.</li> <li>■ N/A—Database function is not configured to run on the node.</li> </ul> <p><b>NOTE:</b> By default, the Database function is enabled on no more than two nodes in the fabric.</p>
Hardware Model	<p>Model of Junos Space Appliance.</p> <p><b>NOTE:</b> Hardware model is displayed when you double-click a thumbnail or table row for a detailed view of the node.</p> <p><b>NOTE:</b> Hardware model only applies for a Junos Space physical appliance.</p>
Load Balancer	<p>Load Balancer function for the node.</p> <ul style="list-style-type: none"> <li>■ UP – Load Balancer function is running on the node.</li> <li>■ DOWN – Load Balancer function that is enabled on the node is not running.</li> <li>■ Unknown – Status for the Load Balancer function is unknown, for example, because the node might not be connected.</li> <li>■ N/A – Load Balancer function is not running because it is not configured to run on the node.</li> </ul> <p><b>NOTE:</b> By default, the Load Balancer function is enabled on no more than two nodes in the fabric.</p>
Serial Number	<p>Serial Number for the Junos Space appliance.</p> <p><b>NOTE:</b> Serial number is displayed when you double-click a thumbnail or table row for a detailed view of the node.</p>
Software Version	<p>Junos Space Release Version.</p> <p><b>NOTE:</b> Software version is displayed when you double-click a thumbnail or table row for a detailed view of the node.</p>

- Related Topics**
- Managing Nodes in the Fabric on page 39
  - Understanding Overall System Condition and Fabric Load on page 45

- Fabric Management Overview on page 33

## Understanding Overall System Condition and Fabric Load

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You can view the overall Junos Space system condition and fabric load from the platform application dashboard or from the Administration workspace landing page.

### System Condition

To calculate the overall system condition, Junos Space uses an algorithm based on cluster health and node-function health:

- Cluster health indicates the percentage of nodes in the fabric that are currently running.

For example, if only three nodes are reachable in a four-node fabric, cluster health is 75 %.

- Load-balancer health indicates the percentage of nodes (enabled for load balancing) that are running the load balancing process.

For example, if two nodes are enabled for load balancing and the load-balancing process is running on only one node, the load-balancing health is 50 %.

- Database health indicates the percentage of nodes (enabled for database requests) that are running the database process.

For example, if two nodes are enabled as database server and the database process is running on only one node, then database health is 50 %.

- Application-logic health indicates the percentage of nodes (enabled for application logic (DML and business logic)) that are running the application-logic process.

For example, if three nodes are enabled for application logic and the application-logic process is running on only two nodes, then application-logic health is 67 %.

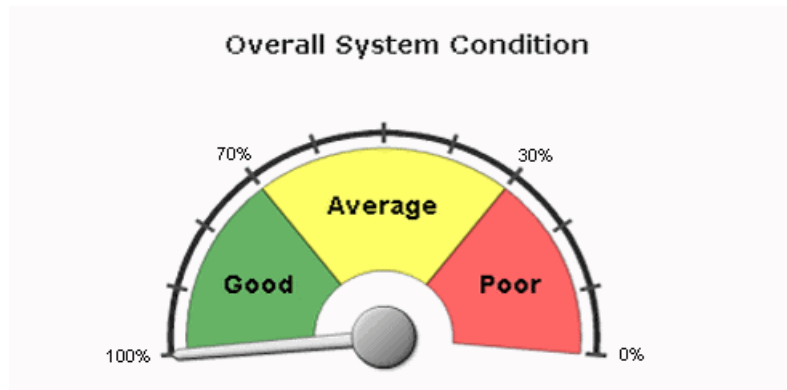
Junos Space retrieves data on the nodes and the node functions running, and then applies the following algorithm to determine the overall system condition:

$$\begin{aligned} \text{overall system condition} = & [ (\text{number of nodes running}) / (\text{number of nodes in fabric}) \\ & ] * [ (\text{number of nodes running load balancing process}) / (\text{number of nodes enabled} \\ & \text{for load balancing}) ] * [ (\text{number of nodes running database server process}) / \\ & (\text{number of nodes enabled as database server}) ] * [ (\text{number of nodes running} \\ & \text{application logic process}) / (\text{number of nodes enabled for application logic}) ] \end{aligned}$$

Using the preceding examples for cluster health and node-function health, the overall system condition is expressed as a percentage:

$$\text{overall system condition} = 75\% * 50\% * 50\% * 67\% = 12.5\%$$

The Overall System Condition window indicates Poor (0–30 %), Average (30–70 %), or Good (70–100 %), based on the value the algorithm returns.

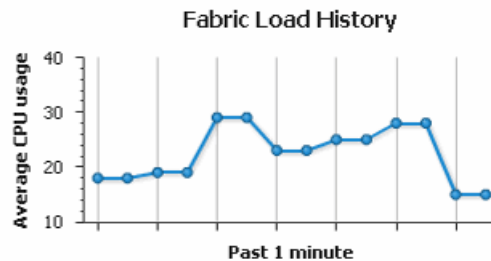


The overall system health indicates 0 % (Poor) when any one of the following conditions is detected:

- No nodes in the fabric are running.
- No nodes enabled for load balancing are running the load balancing process.
- No nodes enabled for database requests are running the database process.
- No nodes enabled for application logic are running the application logic process.

### **Fabric Load**

The Fabric Load chart displays the average CPU usage across all nodes that are running in the fabric.



Junos Space uses the following algorithm to determine the fabric load:

$$\text{fabric load} = [ \text{total CPU usage for all nodes running} ] / [ \text{number of nodes running} ]$$

For example, given a fabric with three nodes running and CPU usage of 80 %, 30 %, and 10 %, respectively, the fabric load is 40 %. The following example illustrates how the fabric load is calculated.

$$\begin{aligned} \text{fabric load} &= [ 80\% + 30\% + 10\% ] / 3 \\ \text{fabric load} &= 120\% / 3 \\ \text{fabric load} &= 40\% \end{aligned}$$

To view the average CPU use at a specific data point, drag the mouse over the data point of interest.

To obtain details about the status of the fabric, click any data point in the graph. The Fabric Monitoring window is displayed and shows detailed status for each node in the fabric. Status information includes CPU, disk, and memory usage and indicates up or down status for each node function enabled on the node.

- Related Topics**
- Fabric Management Overview on page 33
  - Junos Space User Interface Overview on page 7





## **Part 3**

# **Junos Space Administration**

- System Maintenance on page 51
- Application Management on page 87



Chapter 6

# System Maintenance

- System Administration on page 51
- Database Backup and Restore on page 56
- Software Upgrade on page 72
- Licensing on page 75
- Troubleshooting on page 79

## System Administration

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- Junos Space Administrators Overview on page 51
- Maintenance Mode Overview on page 52
- Understanding Overall System Condition and Fabric Load on page 54

### Junos Space Administrators Overview

Junos Space administrators can serve different functional roles. A CLI administrator installs and configures Junos Space appliances. A maintenance-mode administrator performs system-level tasks, such as troubleshooting and database restore operations. After appliances are installed and configured, users are created from the Junos Space user interface to access workspaces and manage applications, users, devices, services, customers, and so forth.

Table 7 on page 51 shows the Junos Space administrators and the tasks that can be performed.

**Table 7: Junos Space Administrators**

Junos Space Administrator Function	Description	Tasks
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**Table 7: Junos Space Administrators** *(continued)*

CLI administrator	<p>An administrator responsible for setting up and managing system settings for Junos Space appliances from the serial console.</p> <p>The CLI administrator name is “admin”.</p> <p>The CLI administrator password can be changed from the console system settings menu.</p>	<ul style="list-style-type: none"> <li>■ Install and configure basic settings for Junos Space appliances.</li> <li>■ Change network and system settings for appliances, for example: <ul style="list-style-type: none"> <li>■ Change CLI administrator password.</li> <li>■ Set routing</li> <li>■ Set DNS servers</li> <li>■ Change time options</li> <li>■ Expand VM drive size (Junos Space Virtual Appliances only)</li> <li>■ Retrieve log files for troubleshooting</li> </ul> </li> </ul>
Maintenance mode administrator	<p>An administrator responsible for performing system-level maintenance on Junos Space.</p> <p>The maintenance mode administrator name is “maintenance”.</p> <p>The maintenance mode password is configured from the serial console when you first configure a Junos Space appliance.</p>	<ul style="list-style-type: none"> <li>■ Restore Junos Space to previous state by using a database backup file.</li> <li>■ Shut down Junos Space nodes by entering maintenance mode.</li> <li>■ Retrieve log files for troubleshooting.</li> <li>■ Exit Maintenance mode and explicitly start up Junos Space system.</li> </ul>
Junos Space user interface users	<p>A Junos Space user that is assigned one or more predefined roles. Each role assigned to a user provides specific access and management privileges on the objects (applications, devices, users, jobs, services, customers) available from a workspace in the Junos Space user interface.</p>	<p>For complete information about the predefined roles that can be assigned to a Junos Space user, see “Predefined Administrator Roles” on page 95.</p>

- Related Topics**
- Maintenance Mode Overview on page 52
  - Role Based Access Control Overview on page 93
  - Understanding How to Configure Users to Manage Objects in Junos Space on page 94

## Maintenance Mode Overview

In Junos Space, maintenance mode is a special mode that an administrator can use to perform database restore or debugging tasks while all nodes in the fabric are shutdown and the Junos Space web proxy is running.

The Junos Space system goes into maintenance mode in the following cases:

- Junos Space goes down.

The system will go into maintenance mode when Junos Space is down on all nodes in the fabric. Users attempting to log in when the system is in maintenance mode are redirected to the maintenance mode log in screen. Users who logged in to Junos Space before the shutdown and attempt to perform an action in the user interface are also redirected to the maintenance mode log in screen.

## Maintenance Mode

Space is currently in maintenance mode.

[If you have the privileges to manage maintenance mode, click here to log in](#)

- An authorized Junos Space administrator initiates a **Restore database** action.  
When a user initiates a Restore database action, Junos Space prompts the user for user name and password to enter maintenance mode, as shown in Authentication Required window. After the user is authenticated, Junos Space initiates the restore database operation and the system remains in maintenance mode until the database is restored and the user exits maintenance mode.
- A Junos Space administrator connects to an appliance in maintenance mode using the URL `https://ip-address/maintenance`, where *ip-address* is the Web access IP address for the appliance.

When a user is authenticated to access Junos Space in maintenance mode, the Maintenance Mode Actions menu displays the tasks a user can perform in Maintenance Mode.

- [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 Space logs for troubleshooting
- [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

When a user exits maintenance mode, Junos Space is restarted. After several minutes, the system returns to normal operational mode, and Junos Space users can log in to the user interface.

### **Maintenance Mode Access and System Locking**

Only one maintenance mode administrator can access the maintenance mode landing page at a time. When an administrator logs in to maintenance mode, Junos Space locks the landing page. When a second administrator attempts to log in to

maintenance mode while the first administrator is logged in, Junos Space displays a message indicating that another administrator is currently logged in to the system and the Maintenance Mode landing page is locked. The maintenance mode lock is released when the first administrator logs out or the lock times out. If the logged-in administrator is inactive for a period of time, the maintenance mode lock is released after 5 minutes, and another administrator can log in.

### ***Maintenance Mode User Administration***

The user name for the maintenance mode administrator is “maintenance”.

The password for the maintenance mode administrator is set from the Junos Space system console during the initial installation/configuration of a Junos Space appliance or virtual appliance.

- Related Topics**
- Restoring a Database in the User Interface on page 63
  - Restoring a Database in Maintenance Mode on page 67
  - Backing Up the Database on page 58
  - Database Backup and Restore Overview on page 57

## ***Understanding Overall System Condition and Fabric Load***

You can view the overall Junos Space system condition and fabric load from the platform application dashboard or from the Administration workspace landing page.

### ***System Condition***

To calculate the overall system condition, Junos Space uses an algorithm based on cluster health and node-function health:

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For example, if only three nodes are reachable in a four-node fabric, cluster health is 75 %.
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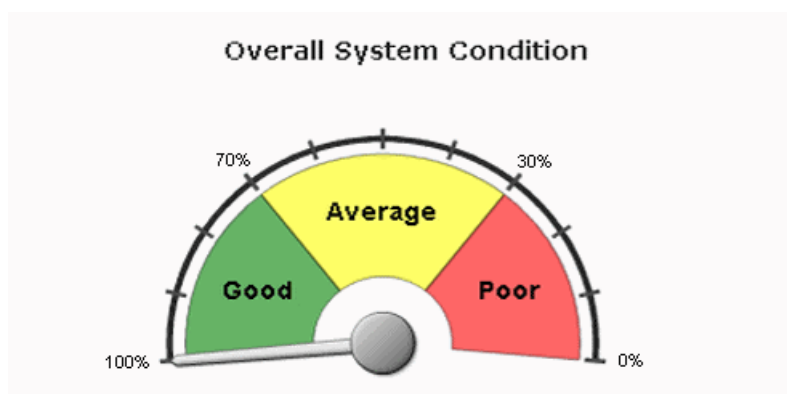
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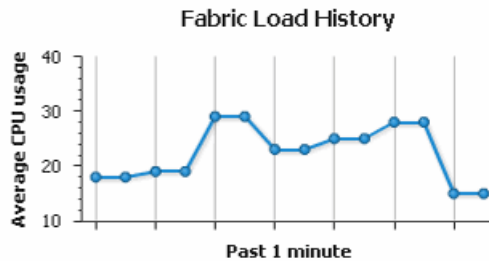


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Junos Space uses the following algorithm to determine the fabric load:

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For example, given a fabric with three nodes running and CPU usage of 80%, 30%, and 10%, respectively, the fabric load is 40%. The following example illustrates how the fabric load is calculated.

$$\begin{aligned} \text{fabric load} &= [ 80\% + 30\% + 10\% ] / 3 \\ \text{fabric load} &= 120\% / 3 \\ \text{fabric load} &= 40\% \end{aligned}$$

To view the average CPU use at a specific data point, drag the mouse over the data point of interest.

To obtain details about the status of the fabric, click any data point in the graph. The Fabric Monitoring window is displayed and shows detailed status for each node in the fabric. Status information includes CPU, disk, and memory usage and indicates up or down status for each node function enabled on the node.

- Related Topics**
- Fabric Management Overview on page 33
  - Junos Space User Interface Overview on page 7

## Database Backup and Restore

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- Database Backup and Restore Overview on page 57
- Backing Up the Database on page 58
- Restoring a Database in the User Interface on page 63
- Restoring a Database in Maintenance Mode on page 67
- Viewing Database Backup Files on page 69
- Deleting Database Backup Files on page 70



## **Database Backup and Restore Overview**

You can perform Junos Space database backup and restore operations from the Administration workspace. By default, Junos Space does not automatically backup the database. However, you can schedule a backup to run at anytime and perform either local or remote backups. All jobs that completed prior to the time the backup operation starts are captured in the database backup file.

To perform database backup or restore operations, a Junos Space user must be assigned the system administrator role.

You might need to restore the Junos Space database if any of the following conditions occur:

- Junos Space data is corrupted, and you need to replace it with uncorrupted data.
- The Junos Space software became corrupted, and you reinstalled the Junos Space software.
- You are upgrading to a new version of Junos Space and you need to populate the Junos Space database with your existing data.

### **Database Backup**

You can perform a local backup to copy data and log files to the Junos Space default directory or perform a remote backup to copy data and log files to remote network hosts or media. You cannot specify a location for a local backup.

When you perform a local backup, Junos Space backs up all data and log files to a default directory.

When you perform a remote backup, you must specify a remote host that is configured to run the Linux Secure Copy (SCP) command. You must also specify a valid user ID and password for the remote host. To ensure that you are using a valid directory, check the destination directory before you initiate a database backup to the remote system.

During a backup, Junos Space archives data files and the logical logs that record database transactions, such as the users, nodes, devices, services that were added or deleted in Junos Space.

### **Database Restore**

When you perform a restore operation, you retrieve data that was previously backed up to restore the Junos Space database to a previous state. You can restore a database from the Junos Space user interface, or directly from the Maintenance Mode Actions window, if Junos Space goes down and you cannot access the user interface. When a user initiates a restore database operation from the user interface, Junos Space prompts the user for the user name and password to enter maintenance mode. When the user is authenticated, Junos Space initiates the restore database operation and Junos Space remains in maintenance mode until the database is restored. When Junos Space is in maintenance mode, Junos Space is down on all nodes in the fabric.

and only the web proxy is running. During this time, all Junos Space users, except the maintenance mode administrator, are locked out of the Junos Space system. When the restore operation completes and the administrator exits maintenance mode, Junos Space is restarted on all nodes, and users can again access the system through the Junos Space user interface.

- Related Topics**
- Restoring a Database in the User Interface on page 63
  - Restoring a Database in Maintenance Mode on page 67
  - Backing Up the Database on page 58
  - Maintenance Mode Overview on page 52

## ***Backing Up the Database***

You can make a backup copy of the Junos Space database and, at a later time, use the backup file to restore the Junos Space database to a previous state. When you perform a backup, Junos Space backs up the entire database. The database backup file contains configuration data for managed nodes, managed devices, deployed services, scheduled jobs, Junos Space users, and so forth.

You can perform local and remote backup and restore operations. You perform a local backup to copy the backup file to the default directory `/var/lib/mysql/backup`. You perform a remote backup to copy the backup file to remote network hosts or media.

This topic includes the following tasks:

- Backing Up the Database to a Local Directory on page 58
- Backing Up the Database to a Remote Host on page 60

### **Backing Up the Database to a Local Directory**

To back up the Junos Space database to a local directory:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.  
The inventory panel displays thumbnails for all existing database backup files.
3. From the task ribbon, select the **Backup Database** icon.  
The Backup Database dialog box is displayed.

**System Management Workspace: Backup Database**

Mode:

User:

Password:

Re-enter Password:

Machine IP:

Directory:

Comment:

☐ ☒ **Schedule at a later time**

4. In the Mode field, select **local** to back up the Junos Space database to the default directory `/var/lib/mysql/backup`.
5. Optional: In the Comment field, add a comment to describe or otherwise identify the backup operation.
6. Schedule the Junos Space database backup operation:
  - Clear the **Schedule at a later time** check box (the default) to initiate the database backup when you complete Step 7.
  - Select the **Schedule at a later time** check box to specify a later start date and time for the database backup.



**NOTE:** The selected time in the scheduler corresponds to Junos Space server time but using the local time zone of the client computer.

7. Click **Backup**.

The database is backed up. The Order Information window is displayed.

**Order Information**

Please click on Job Id to view details:  
[32769](#)

8. Optional: To view job details for the database backup, click on the Job Id in the Order Information window.

Junos Space displays the View Job Details window.



9. Click OK.

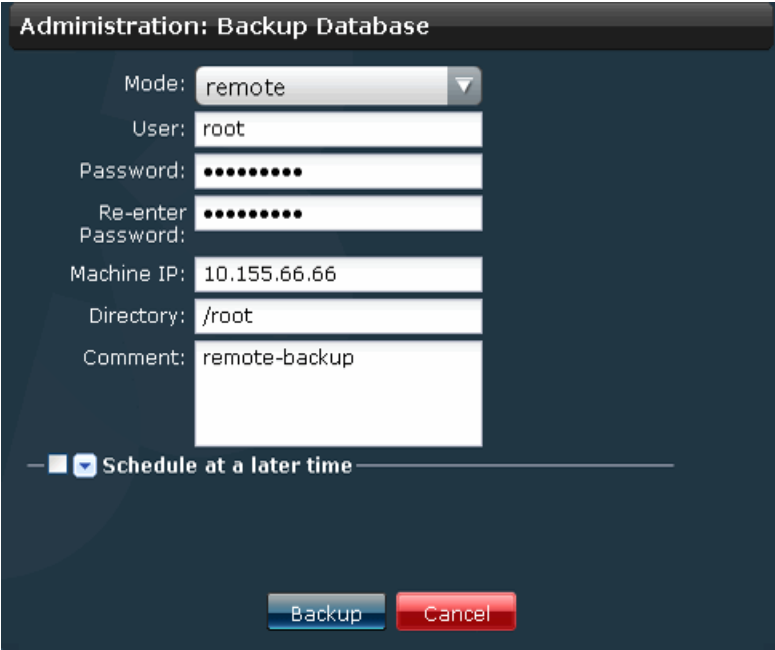
The Junos Space database backup is displayed in the Manage Databases inventory panel.

## Backing Up the Database to a Remote Host

To back up the Junos Space database to a remote host:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.
3. From the task ribbon, select the **Backup Database** icon.

The Backup Database dialog box is displayed.



The image shows a dialog box titled "Administration: Backup Database". It contains several input fields: "Mode" is a drop-down menu set to "remote"; "User" is a text field with "root"; "Password" and "Re-enter Password" are masked text fields with dots; "Machine IP" is a text field with "10.155.66.66"; "Directory" is a text field with "/root"; and "Comment" is a text field with "remote-backup". At the bottom left, there is a checkbox labeled "Schedule at a later time" which is currently unchecked. At the bottom right, there are two buttons: "Backup" (blue) and "Cancel" (red).

4. In the Mode field, select **remote** from the drop-down menu.
5. Enter a valid user name to access the remote host server.
6. Enter a valid password to access the remote host server.
7. Reenter the password you entered in the previous step.
8. Enter the IP address of the remote host server.
9. Enter a directory path on the remote host server for the database backup file.



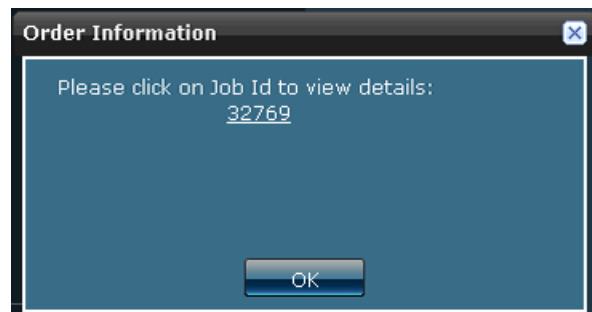
**NOTE:** The directory path must already exist on the remote host server.

10. Optional: Add a comment to describe or otherwise identify the backup operation.
11. Schedule the Junos Space database backup operation:
  - Clear the **Schedule at a later time** check box (the default) to initiate the database backup when you complete Step 12.
  - Select the **Schedule at a later time** check box to specify a later start date and time for the database backup.



**NOTE:** The selected time in the scheduler corresponds to Junos Space server time but using the local time zone of the client computer.

12. Click **Backup**.  
The Order Information window is displayed.



13. Optional: To view job details for the database backup, click on the Job Id in the Order Information window.

Junos Space displays the View Job Details window.



14. Click OK.

When the backup operation finishes, the Junos Space database backup file is displayed in the Manage Databases inventory panel.

- Related Topics**
- Restoring a Database in the User Interface on page 63
  - Restoring a Database in Maintenance Mode on page 67
  - Viewing Database Backup Files on page 69
  - Deleting Database Backup Files on page 70
  - Database Backup and Restore Overview on page 57

## Restoring a Database in the User Interface

You can restore any archived Junos Space database to restore your Junos Space system to a previous state. When you initiate a restore database operation, Junos Space is shutdown on all nodes in the fabric and the system goes into maintenance mode, during which time only one maintenance mode administrator can log in to the system at a time. Once the restore database operation is complete, Junos Space is restarted and users can access the Junos Space user interface.

To restore a database, you must have System Administrator privileges and be a Maintenance Mode administrator.



**NOTE:** Before you restore a database, wait until all jobs currently running have completed.

---

To view information about the available database backup files before you select a database to restore, see “Viewing Database Backup Files” on page 69.

Junos Space supports both local and remote backup and restore operations.

- Restoring a Local Database on page 63
- Restoring a Database from a Remote Host on page 65

### Restoring a Local Database

To restore the Junos Space database to a previous state:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.

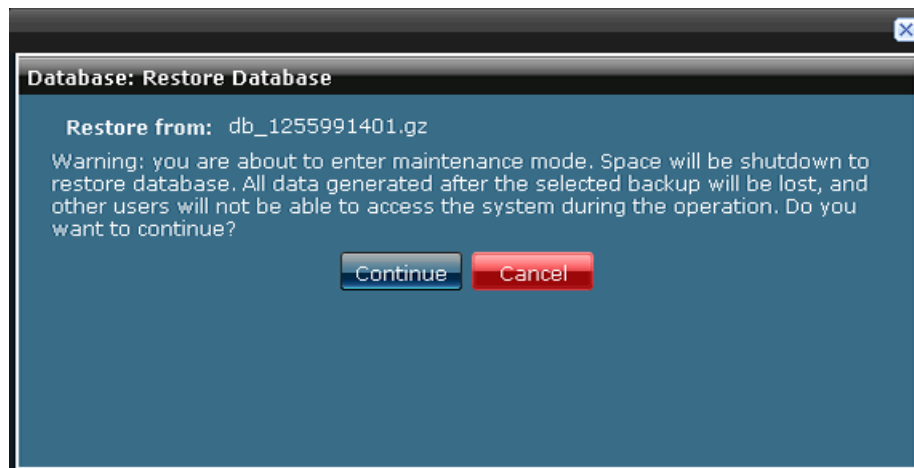
The Manage Databases inventory panel displays database backups as graphics (or in a table).

3. In the inventory panel, select the database backup file that you want to restore.

Junos Space displays summary information for the selected database backup in the Quick Look panel.

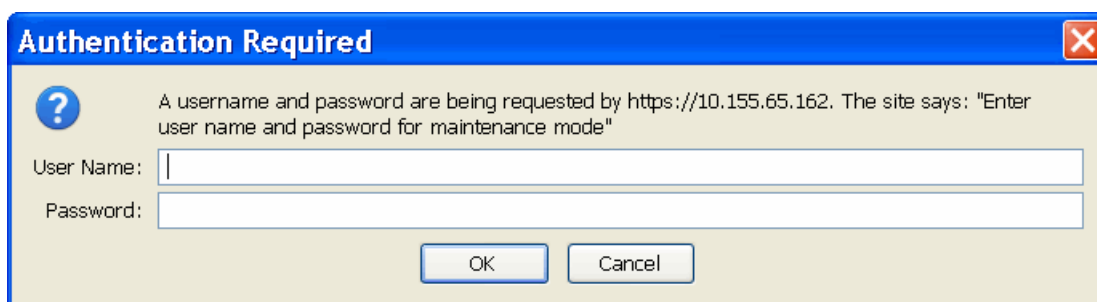
4. From the Actions panel, select the **Restore Database** option.

Junos Space displays the Restore Database confirmation window.



5. Click **Continue** in the Restore Database window.

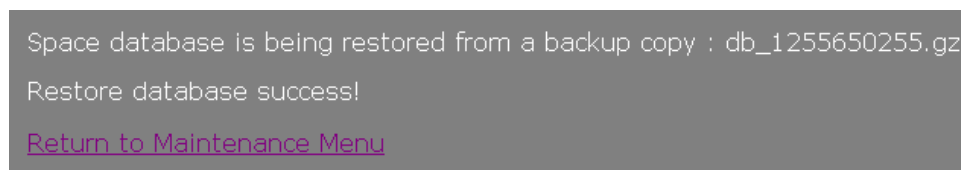
Junos Space prompts you enter a user name and password to enter maintenance mode.



6. Enter the maintenance mode user name and password.
7. Click **OK**.

Junos Space is shut down and other users will be unable to access the system during the restore database operation.

The Restore Database Status window displays the status for the restore database operation, as shown in the following example.



8. In the Restore Database Status window, click **Return to Maintenance Menu**.  
The Maintenance Mode Actions window is displayed.



- [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 Space logs for troubleshooting

- [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

9. In the Maintenance Mode Actions window, click **Log Out and Exit from Maintenance Mode** to exit maintenance mode, start up Junos Space, and return to normal operational mode.

The process of exiting maintenance mode and restarting Junos Space takes several minutes.

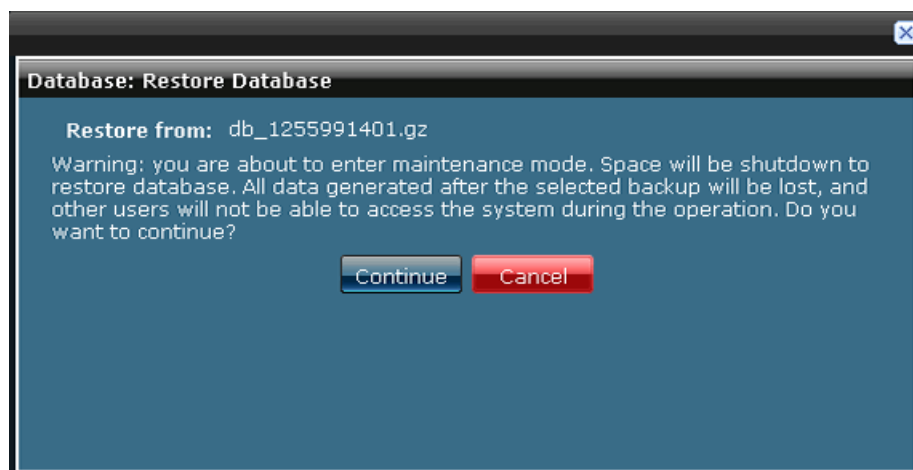
## Restoring a Database from a Remote Host

To restore the Junos Space database to a previous state:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.

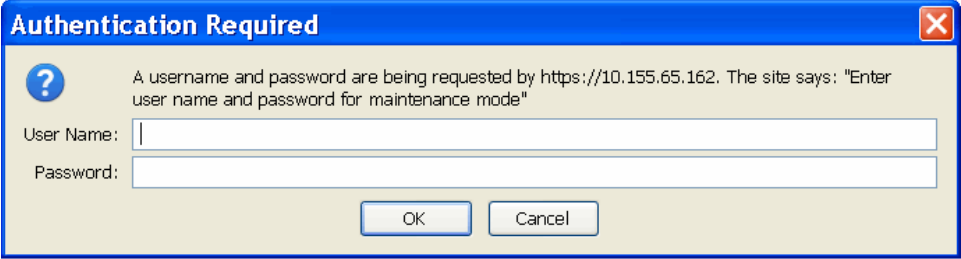
The Manage Databases inventory panel displays database backups as graphics or as a table.

3. In the inventory panel, select the database backup file that you want to restore.  
Junos Space displays summary information for the selected database backup in the Quick Look panel.
4. From the Actions panel, select the **Restore Database** option.  
Junos Space displays the Restore Database confirmation window.



5. Click **Continue** in the Restore Database window.

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



The dialog box has a blue title bar with the text "Authentication Required" and a close button (X). Below the title bar is a message icon (question mark) and a text area containing: "A username and password are being requested by https://10.155.65.162. The site says: 'Enter user name and password for maintenance mode'". Below this are two input fields: "User Name:" and "Password:". At the bottom are two buttons: "OK" and "Cancel".

6. Enter the maintenance mode user name and password.
7. Click OK.

Junos Space is shut down and other users will be unable to access the system during the restore database operation.

The Restore Database Status window displays the status for the restore database operation, as shown in the following example.

Space database is being restored from a backup copy : db\_1255650255.gz  
 Restore database success!  
[Return to Maintenance Menu](#)

8. In the Restore Database Status window, click **Return to Maintenance Menu**.  
 The Maintenance Mode Actions window is displayed.

- [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 Space logs for troubleshooting
- [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

9. In the Maintenance Mode Actions window, click **Log Out and Exit from Maintenance Mode** to exit maintenance mode, start up Junos Space, and return to normal operational mode.

The process of exiting maintenance mode and restarting Junos Space takes several minutes.

#### Related Topics

- Backing Up the Database on page 58
- Viewing Database Backup Files on page 69
- Deleting Database Backup Files on page 70

- Maintenance Mode Overview on page 52
- Restoring a Database in Maintenance Mode on page 67

## Restoring a Database in Maintenance Mode

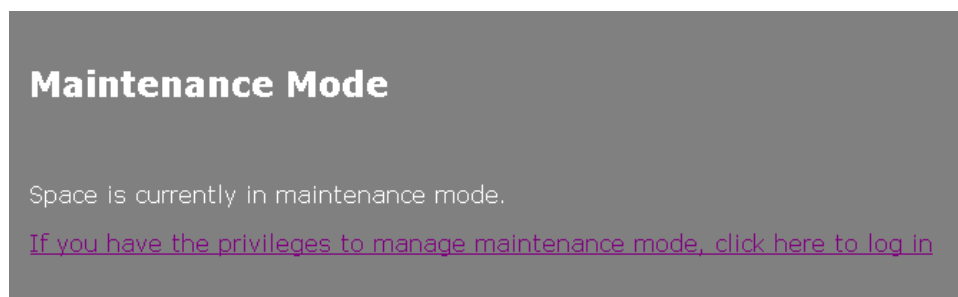
In Junos Space, maintenance mode is a special mode that an administrator can use to restore the database when Junos Space is down on all nodes in the fabric and the Web proxy is running.

To restore a database in maintenance mode:

1. Connect to a Junos Space appliance in maintenance mode using the following URL, where *ip-address* is the Web access IP address for the appliance:

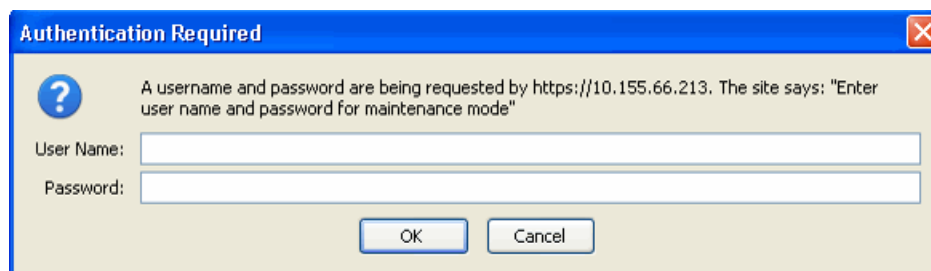
`https://ip-address/maintenance`

The Maintenance Mode window is displayed.



2. Click on the link to log in.

The Authentication Required dialog box is displayed.



3. Enter the user name and password for maintenance mode access.
4. Click OK.

The Maintenance Mode Actions window is displayed.

- [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 Space logs for troubleshooting

- [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

5. Click on the link **Restore Database from Backup** in the Maintenance Mode Actions window.

Junos Space displays the available database backup files, as shown in the following example.

Choose a backup database to restore

☒ db\_1255398948.gz (test1) created at Mon Oct 12 18:55:49 2009

[Return to Maintenance Menu](#)

6. From the available database backup files, select a database backup file to overwrite the current database.
7. Click **Submit**.

The database is restored from the backup copy you selected.

Space database is being restored from a backup copy : db\_1255650255.gz

Restore database success!

[Return to Maintenance Menu](#)

8. Click **Return to Maintenance Menu**.  
The Maintenance Mode Actions window is displayed.
9. Click **Log Out and Exit from Maintenance Mode**.  
Junos Space returns to normal operational mode.

#### Related Topics

- Maintenance Mode Overview on page 52
- Database Backup and Restore Overview on page 57
- Backing Up the Database on page 58
- Restoring a Database in the User Interface on page 63

## Viewing Database Backup Files

You can view information about Junos Space database backups, including the date and time of the backup, the backup file name and location, and the IP address of the Junos Space appliance that was backed up. You can view Junos Space database backup information graphically or in tables. By default, Junos Space displays graphical thumbnail representations of database backups.

- Viewing Database Backups Graphically on page 69
- Viewing Database Backups in a Table on page 70

### Viewing Database Backups Graphically

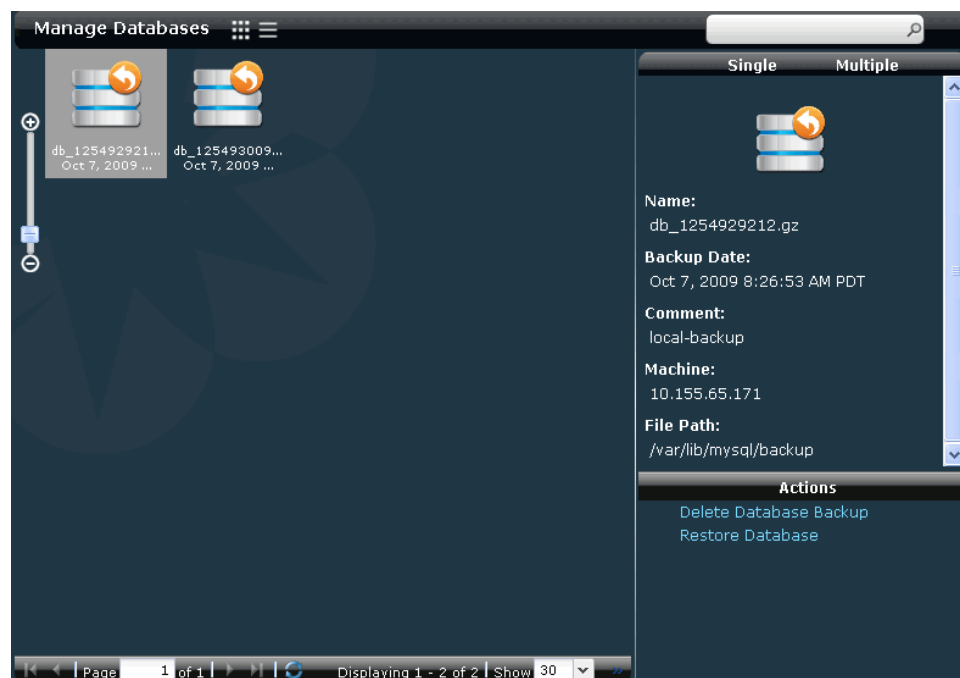
To view Junos Space database backups graphically:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.

The Manage Databases inventory panel displays thumbnails of database backups by file name and date.

3. To view summary information for a database backup, click on the thumbnail.

Junos Space displays summary information about the database backup in the Quick Look panel, as shown in the following illustration.



## Viewing Database Backups in a Table

To view Junos Space database backups in a table:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.
3. Click the table view in the filter bar, as shown in the following illustration.



The Manage Databases inventory panel displays database backups as a table, as shown in the following example.

 A screenshot of the 'Manage Databases' inventory panel. It displays a table with five columns: Name, Backup Date, Comment, Machine, and File Path. There are two rows of data. The first row has a checked checkbox in the Name column. The second row has an unchecked checkbox. Below the table is a pagination bar showing 'Page 1 of 1' and 'Displaying 1 - 2 of 2' items.
 

Name	Backup Date	Comment	Machine	File Path
<input checked="" type="checkbox"/> db_1255896920.gz	Oct 18, 2009 1:15:22 PM PDT	NA	10.157.59.137	/var/lib/mysql/backup
<input type="checkbox"/> db_1255896984.gz	Oct 18, 2009 1:16:25 PM PDT	Test Backup	10.157.59.137	/var/lib/mysql/backup

Table 8 on page 70 describes the fields displayed in the inventory window.

**Table 8: Fields in the Manage Databases Table**

Field	Description
Name	The name of the database backup file. Junos Space automatically assigns a name to the backup file.
Backup Date	Date and time of the database backup.
Comment	Information a Junos Space user optionally provides in the Comments field of the Backup Database dialog box when scheduling database backup.
Machine	IP address of the appliance on which the database backup was performed.
File Path	File path for the database backup.

## Deleting Database Backup Files

You can delete archived database backup files that are no longer useful for restore operations.



**NOTE:** When you delete a database backup file from the Manage Databases inventory panel, the backup file is permanently deleted from Junos Space and cannot be retrieved or restored.

To delete a Junos Space database backup file:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Databases** icon.

The Manage Databases inventory panel displays thumbnail representations of database backups by file name and date.

3. Optional: To view summary information for a database backup file before deleting the file, click on the database backup thumbnail from the inventory panel.

Junos Space displays summary information about the database backup file in the Quick Look panel, as shown in the following illustration.



4. From the Manage Databases inventory panel (thumbnails or table view), select one or more database backup files that you want to delete.

To delete more than one database at a time, click on the **Multiple** button above the Quick Look panel, then select the thumbnails of the databases you want to delete.

5. From the Actions panel, select **Delete Database Backup**.

Junos Space deletes the selected Junos Space database backup files. The deleted backup files are no longer displayed in the inventory panel and are deleted from the `/var/lib/mysql/backup` directory.

- Related Topics**
- Backing Up the Database on page 58
  - Restoring a Database in the User Interface on page 63
  - Restoring a Database in Maintenance Mode on page 67
  - Viewing Database Backup Files on page 69

## Software Upgrade

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- Upgrading Software on page 72
- Viewing Uploaded Software on page 73

### Upgrading Software

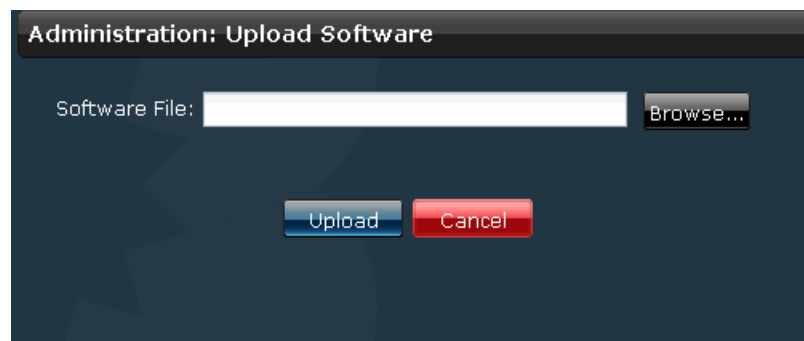
You can upload software to upgrade Junos Space.

Before you upgrade your software to the latest version, Juniper 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 want to install.
7. In the Actions panel, click **Install Software** to upgrade the Junos Space software.
8. In the Maintenance Mode dialog box, enter the maintenance mode user name and password.
9. Click **OK**.

The Software Installation status window is displayed.

**Related Topics** ■ Viewing Uploaded Software on page 73

## Viewing Uploaded Software

You can view information about the software that you installed from the Junos Space user interface.

- Viewing Uploaded Software as Graphics on page 73
- Viewing Uploaded Software in Tables on page 74

### Viewing Uploaded Software as Graphics

To view software that has been uploaded into Junos Space:

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

The inventory panel displays thumbnails for uploaded software, as shown in the following example.



Each thumbnail represents a single software \*.tgz file.

3. To view information about a specific software file, click on the thumbnail.

The Quick Look panel displays information about the software, as shown in the preceding illustration.

## Viewing Uploaded Software in Tables

To view software upload information in a table:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Software** icon.
3. To display information about the uploaded software in a table, click the table icon from the filter bar, as shown in the illustration.



Junos Space displays a table view of uploaded software, as shown in the following example.

Name	Build Date	Node	File Path
<input checked="" type="checkbox"/> 1.0R1.140831.tgz	2009-08-08 07:00:01	10.157.59.122	/var/cache/jboss/jmp/payloads/1.0R1.140831

Table 9 on page 75 describes the fields in the Manage Software table.

**Table 9: Fields in the Manage Software Table**

Field	Description
Name	Name of the software file.
Build Date	Date and time of the software build.
Node	IP address of the appliance where the software file was uploaded.
File Path	The directory location of the software file.

4. To show or hide columns in the table view:
  - a. Mouse over any column header, and click the down arrow button. The Manage Software table pull-down menu is displayed.
  - b. Select **Columns** from the pull-down menu.
  - c. Select the check box for columns not currently displayed that you want to view. Clear the check box for columns that you want to hide.

**Related Topics** ■ Upgrading Software on page 72

## Licensing

- Uploading Licenses on page 75
- Viewing Licenses on page 77

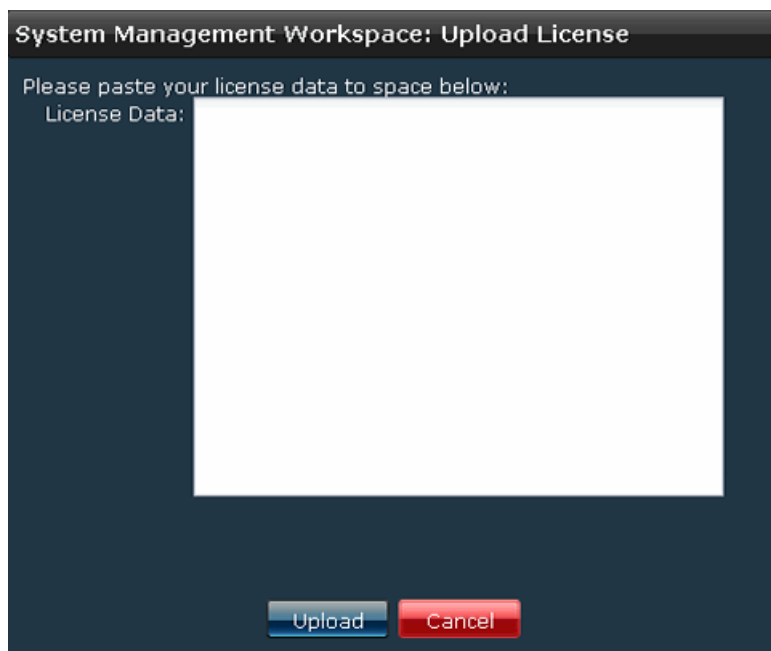
### Uploading Licenses

You must upload licenses for Junos Space software to access functionality for Junos Space and other Value Added Resource (VAR) applications.

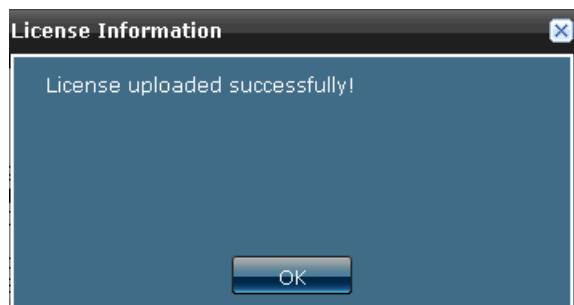
To upload a license, you must have System Administrator privileges.

To upload a license:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Licenses** icon.  
The inventory panel displays thumbnails for all existing licenses.
3. From the task ribbon, select the **Upload License** icon.  
The Upload License window is displayed.



4. Cut and paste your license in the Upload License window.  
You must provide all license information, including license data and signature.
5. In the Upload License window, click **Upload**.  
The License Information window displays status for the license upload operation.



6. In the License Information window, click **OK**.  
You can view all uploaded licenses from the Manage Licenses inventory panel.

- Related Topics** ■ Viewing Licenses on page 77

## Viewing Licenses

You can view licenses in Junos Space as graphics or as tables. By default, Junos Space displays thumbnail representations of licenses. Licenses might include Junos Space licenses as well as licenses for VAR applications that run on Junos Space.

- Viewing Licenses as Graphics on page 77
- Viewing Licenses in Tables on page 78

### Viewing Licenses as Graphics

To view licenses that have been uploaded in Junos Space:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Licenses** icon.

The inventory panel displays thumbnails for uploaded licenses, as shown in the following example.



Each thumbnail represents a single license.

3. To view information for a license, click on the thumbnail.

The Quick Look panel displays license information, as shown in the preceding illustration.

## Viewing Licenses in Tables

To view license information in a table:

1. From the task ribbon, select the **Administration** workspace.
2. From the task ribbon, select the **Manage Licenses** icon.
3. To display jobs in a table, click the table icon from the filter bar, as shown in the illustration.



Junos Space displays a table view of uploaded licenses, as shown in the following example.

Name	Creation Date	Expiration Date	Serial	Node	File Path
<input checked="" type="checkbox"/> Space-license.txt	2009-10-15T19:21	None	SPC-VA-BSE05	10.157.59.122	/var/cache/jboss/jmp/licenses

Table 10 on page 78 describes the fields in the Manage Licenses table.

**Table 10: Fields in the Manage Licenses Table**

Field	Description
Name	Name of the license file
Creation Date	Date and Time that the license is generated.
Expiration Date	Specifies the number of days the license is valid, starting from the Creation date.
File Path	The directory location of the license file.
Node	The IP address of the node that is displaying the license information.
Serial Number	<p>The serial number of the appliance/node.</p> <p>Each JA1500 Junos Space Appliance and Junos Space Virtual Appliance is represented as a unique node in the Junos Space fabric, and each appliance has a unique serial number.</p>

4. To show or hide columns in the table view:
  - a. Mouse over any column header, and click the down arrow button. The Licenses table pull-down menu is displayed.
  - b. Select **Columns** from the pull-down menu.

- c. Select the check box for columns not currently displayed that you want to view. Clear the check box for columns that you want to hide.

**Related Topics** ■ [Uploading Licenses on page 75](#)

## Troubleshooting

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- [System Status Log File Overview on page 79](#)
- [Customizing Node System Status Log Checking on page 81](#)
- [Customizing Node Log Files To Download on page 81](#)
- [Downloading the Troubleshooting Log File from the UI on page 82](#)
- [Downloading the Troubleshooting Log File In Maintenance Mode on page 83](#)
- [Downloading Troubleshooting System Log Files Using the CLI on page 84](#)

### System Status Log File Overview

The system writes a system log file for each fabric node to provide troubleshooting and monitoring information. See “System Status Log File” on page 79.

The system administrator can customize the information that is collected in the system log file. See “Customizing Node System Status Log Checking” on page 81.

The system administrator can download the latest log files for each fabric node when logged into an appliance. See “Downloading System Log Files For an Appliance” on page 80.

In each operating mode, the system administrator can customize the default log files that are download from an appliance. See “Customizing Node Log Files To Download” on page 81.

#### System Status Log File

Approximately once a minute, the system checks and writes a status log file **SystemStatusLog** for each fabric node by default. Each log file consists of system status, such as the disk, CPU, and memory usage information, as shown. Junos Space writes each system status log file to `/var/log/SystemStatusLog`.

```
2009-08-10 11:51:48,673 DEBUG [net.juniper.jmp.cmp.nma.NMResponse]
(Thread-110:)
Node IP: 1.1.1.1Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/mapper/VolGroup00-LogVol00
79162184 15234764 59841252 21% /
Cpu(s): 8.7%us, 1.1%sy, 0.0%ni, 90.0%id, 0.1%wa, 0.0%hi, 0.0%si, 0.0%st
```

Mem: 3866536k total, 2624680k used, 1241856k free, 35368k buffers  
 Swap: 2031608k total, 941312k used, 1090296k free, 439704k cached

### **Customizing Status Log File Content**

The system administrator can customize the information that is written in a fabric node system status log file. For more information, see “Customizing Node System Status Log Checking” on page 81.

### **Downloading System Log Files For an Appliance**

The system administrator can download the latest log files for each fabric node when logged into an appliance. The system status log file and all other third party log files are collected and compressed in a troubleshooting file.

Table 11 on page 80 lists the files included in the troubleshoot file.

**Table 11: Log Files included in the troubleshoot File**

<b>Description</b>	<b>Location</b>
System status log file	/var/logSystemStatusLog
Jboss log files	/var/log/jboss/*
Service Provisioning data files	/var/tmp/jboss/debug/*
MYSQL error log	/var/log/mysqld.log
Log files for Apache, NMA, Webproxy	/var/log/httpd/*
Watchdog log file	/var/log/watchdog/*
Linux system messages	/var/log/messages/*

The system administrator can download log files in each operation mode as follow:

- Server Mode (See “Downloading the Troubleshooting Log File from the UI” on page 82.)
- Maintenance Mode (See “Downloading the Troubleshooting Log File In Maintenance Mode” on page 83.)
- CLI mode (See “Downloading Troubleshooting System Log Files Using the CLI” on page 84.)

### **Customizing Log Files To Download**

The system administrator can also customize the log files to be downloaded for specific fabric nodes. For more information, see “Customizing Node Log Files To Download” on page 81.



**Related Topics** Maintenance Mode Overview on page 52

## Customizing Node System Status Log Checking

The system administrator can customize the system checking for a fabric node so that the necessary information is written to `/var/log/SystemStatusLog`. The administrator must modify the fabric node Perl script in `/usr/nma/bin/writeLogCronJob`.

To customize system status checking for an appliance, modify the `writeSystemStatusLogFile` sub-function in `writeLogCronJob` as shown:

```
sub writeSystemStatusLogFile{
    my $err = 0;
    my $logfile = $_[0];
    $err = system("date >> $logfile");
    $err = system("df /var >> $logfile");
    $err = system("top -n 1 -b | grep Cpu >> $logfile");
    $err = system("top -n 1 -b | grep Mem: >> $logfile");
    $err = system("top -n 1 -b | grep Swap: >> $logfile");

    ***<Add additional system command here that you want to print out in the
    SystemStatusLog file>***

    if ($err == 0 ) {          print "write log to $logfile successfully\n";
    } else {                   print "cannot write log to $logfile\n";
    }
    return $err;
}
```

## Customizing Node Log Files To Download

The system administrator can customize the log files that are downloaded for each fabric node by modifying the Perl script in `/var/www/cgi-bin/getLogFiles`.

To customize the log files that are downloaded for each fabric node, modify the `getLogFiles` Perl script zip command as shown:

```
...
system("zip -r $logFileName /var/log/jboss/* /var/tmp/jboss/debug/
/var/log/mysqld.log /var/log/httpd/* /var/log/watchdog /var/log/messages
/var/log/SystemStatusLog > /dev/null");
...
```

**Related Topics**

## Downloading the Troubleshooting Log File from the UI

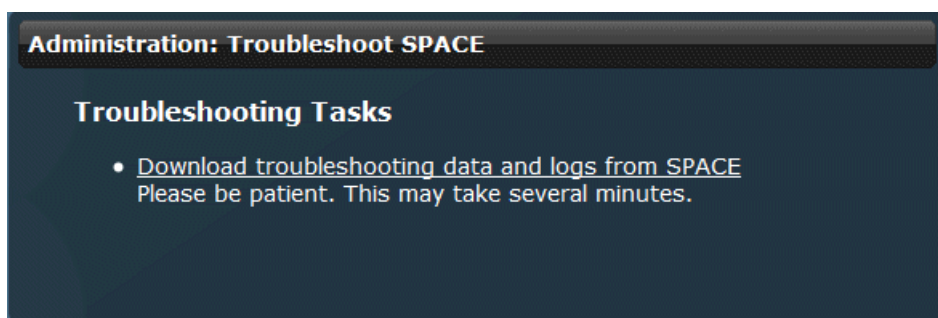
From the Administration workspace, the system administrator can download a troubleshooting file `troubleshoot.zip` that contains useful information for managing and monitoring the nodes in the system.

To retrieve troubleshooting data and log files, follow these steps:

1. From the task ribbon, select the Administration workspace icon.
2. From the task ribbon, select the **Troubleshoot SPACE** task.

The Troubleshoot SPACE page is displayed, as shown in Figure 21 on page 82.

**Figure 21: Troubleshoot SPACE Page**



3. Click on the hypertext link **Download troubleshooting data and logs from SPACE** to access the `troubleshoot.zip` file in your browser.
  - If you are using Mozilla Firefox: In the Opening `troubleshoot.zip` dialog box, select **Save file** and click **OK** to save the zip file to your computer using the Firefox Downloads window.
  - If you are using Internet Explorer: From the File Download screen, select **Save** and select a directory on your computer where you want to save the `troubleshoot.zip` file.
4. When you contact the Juniper Technical Assistance Center, describe the problem you encountered and provide the JTAC representative with the `troubleshoot.zip` file.

Table 12 on page 82 lists the files included in the `troubleshoot.zip` file.

**Table 12: Data and Log Files in `troubleshoot.zip` File**

Description	Location
Jboss log files	<code>/var/log/jboss/*</code>
Service Provisioning data files	<code>/var/tmp/jboss/debug/*</code>
MYSQL error log	<code>/var/log/mysqld.log</code>
Log files for Apache, NMA, Webproxy	<code>/var/log/httpd/*</code>

**Table 12: Data and Log Files in troubleshoot.zip File** (continued)

Watchdog log file	/var/log/watchdog/*
Linux system messages	/var/log/messages/*
CPU/RAM/Disk statistics (during past 24 hours)	Not applicable

- Related Topics**
- Downloading Troubleshooting System Log Files Using the CLI on page 84
  - System Status Log File Overview on page 79

## Downloading the Troubleshooting Log File In Maintenance Mode

Maintenance Mode is a special mode that an administrator can use to perform system recovery or debugging tasks while all nodes in the fabric are shutdown and the web proxy is running.

To download the troubleshooting log file in maintenance mode, follow these steps:

1. Connect to an appliance in maintenance mode using the following URL.

<https://<ipaddress>/maintenance>

Where *ipaddress* is the address of the Juniper Networks appliance. The maintenance mode page appears.

### Maintenance Mode

Space is currently in maintenance mode.

[If you have the privileges to manage maintenance mode, click here to log in](#)

2. Click the **click here to log in** link. The login dialog box appears.
3. Log in to maintenance mode using the authorized login name and password.
4. Click OK. The Maintenance Mode Actions menu appears.
5. Click **Download Troubleshooting Data and Logs**. The file download dialog box appears.
6. Click **Save** to download the **troubleshoot.zip** file to the connected computer.
7. Click **Log Out and Exit from Maintenance Mode**.

## Related Topics

### Downloading Troubleshooting System Log Files Using the CLI

If Junos Space is operating, the administrator can log into an appliance console and download system status logs for each fabric node using the CLI Network Settings Utility > SecureCoPy (SCP) command. If the system is not operating, the Administrator can download system status logs using the CLI USB command.

The Network Settings Utility, for both commands, collects all system log files in the `/var/log` subdirectory and creates a `*.TAR` file to download. For more information on the log files that are written, see “System Status Log File Overview” on page 79.

This procedure includes the following tasks:

- Downloading a System Log File Using a USB Device on page 84
- Downloading System Log File Using SCP on page 85

### Downloading a System Log File Using a USB Device

Using the Networks Settings Utility Retrieve Logs > USB command, the administrator can download system status logs to a connected USB device if the network is down.

1. Using a console utility, such as SSH or Telnet, connect to the appliance. The Junos Space Settings Menu appears.

Junos Space 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 [1-7,QR]:

2. Type option 5> Retrieve Logs. The Retrieve Logs submenu appears.

Choice [1-7,QR]: 5

```
1> Save to USB
2> Send via SCP
```

```
M> Return to Main Menu
R> Redraw Menu
```

Choice [1-2,MR]:

3. Select 1> Save to USB. The USB device must be connected to an appliance.

4. Indicate whether you want to continue. Enter **y** for yes; **n** to abort.
5. The Save to USB process downloads the log files from all cluster members and combines them into a **.tar** file. Once the file is created, the process copies the file onto a USB device. You see the following:

Copying 20090827-1511-logs.tar to USB drive

## Downloading System Log File Using SCP

Using the Networks Settings Utility Retrieve Logs > SCP command, the administrator can download system status logs to a specific location.

To download system status logs using SCP, follow these steps:

1. Using a console utility, such as SSH or Telnet, connect to an appliance. The Junos Space Settings Menu appears.

Junos Space 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 [1-7,QR]:

2. Type option **5> Retrieve Logs**. The Retrieve Logs submenu appears.

Choice [1-7,QR]: 5

```
1> Save to USB
2> Send via SCP
```

```
M> Return to Main Menu
R> Redraw Menu
```

Choice [1-2,MR]:

3. Select **2> Send via SCP**. The process retrieves the log files on all cluster members and combines them into a **.TAR** file.
4. Indicate whether you want to continue. Enter **y** for yes; **n** to abort.
5. Specify the SCP server IP address to which to transfer the file.
6. Enter the remote SCP user. For example, **root**
7. Enter the remote SCP file location. For example, **/root/tmplogs**. You see the following:

```
Remote scp IP: 123.123.123.123
Remote scp user: root
Remote scp path: /root/tmplogs
Is this correct? [y/n]
The authenticity of host '123.123.123.123 (123.123.123.123)' can't be
established.
RSA key fingerprint is 01:70:4c:47:9e:1e:84:fc:69:3c:65:99:6d:e6:88:87.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '123.123.123.123' (RSA) to the list of known
hosts.
Warning-Please dont use this system
/etc/selinux/strict/contexts/files/file_contexts: Multiple same specifications
for /usr/local/lost\+found/*.
/etc/selinux/strict/contexts/files/file_contexts: Multiple same specifications
for /usr/local/.journal.
/etc/selinux/strict/contexts/files/file_contexts: Multiple same specifications
for /usr/local/lost\+found.
123.123.123.123 password:
20090827-1517-logs.tar

100% 18MB 17.6MB/s 00:01
```

8. Indicate whether the SCP server information is correct. Enter y for yes; n if incorrect.
9. Indicate whether you want to continue. Enter y for yes; n for no.

## Chapter 7

# Application Management

- Application Management Workspace Overview on page 87
- Modifying Application Settings on page 89

### Application Management Workspace Overview

---

Use the Administration Manage Applications task to administer the settings of Junos Space applications. Each application has specific settings. You must have administrator privileges to manage applications.

To navigate to the Manage Applications page from the Space Platform, click Administration > Manage Applications. The Manage Application page appears as shown in Figure 22 on page 88.

**Figure 22: Manage Applications Page**

In the Manage Applications inventory panel, you display applications in both thumbnail and tabular views.

The Quick Look panel displays the application name and description.

The Actions panel displays the actions you can perform on selected applications. For example, you can modify specific application settings per application.

For more information about modifying application settings, see “Modifying Application Settings” on page 89.

### Related Topics



## Modifying Application Settings

The administrator can modify the settings of Junos Space installed applications. Each application has specific configurable settings.



**NOTE:** The Ethernet Analyzer application settings are not available for this release.

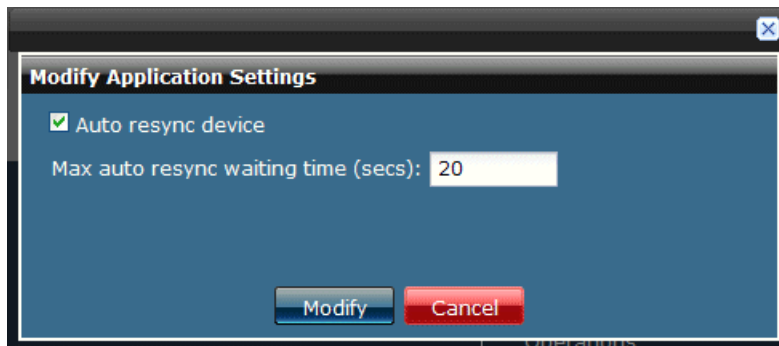
The Modify Application Settings action allows the administrator to optimize the operation of each application.

To modify application settings, follow these steps:

1. Navigate to the Platform application.
2. Click the Administration workspace icon.
3. Click the Manage Application task icon. The Manage Application inventory page appears.



4. Select the application for which you want to modify settings.
5. In the Actions panel, click the Modify Application Settings link. The Modify Application Settings dialog box appears.



- Auto resync device check box—Ensures that configuration changes on a connected Juniper Networks device is synchronized or imported to the application database.
- Max auto resync waiting time (secs)—Specifies the time within which device configuration changes are synchronized to the database. 20 seconds is the default. You can specify any number of seconds. There is no specific range.

**Related Topics** ■ [Application Management Workspace Overview on page 87](#)

## **Part 4**

# **Managing Users**

- Role-Based Access Control on page 93
- Authenticating Users on page 99
- Monitoring Users on page 109



## Chapter 8

# Role-Based Access Control

- Role Based Access Control Overview on page 93
- Understanding How to Configure Users to Manage Objects in Junos Space on page 94
- Predefined Administrator Roles on page 95

### Role Based Access Control Overview

---

Junos Space supports authentication and authorization. A Junos Space super administrator or user administrator creates users and assigns roles (permissions) that allow users to access and manage the users, nodes, devices, services, and customers in Junos Space.

To access and manage Junos Space, a user must be assigned one or more roles, which are validated during authorization. The roles that an administrator assigns to a user controls the workspace or workspaces the user can access and the tasks that can be performed on the objects that are managed within a workspace. A user with no role assignments cannot access any Junos Space workspace and is unable to perform tasks.

#### **Authentication**

Through authentication, Junos Space validates users based on password and other security services. Junos Space supports local user authentication only. Each user password is saved in the Junos Space database and is used to validate a user during login.

#### **RBAC Enforcement**

With RBAC enforcement, a Junos Space super administrator or user administrator controls the workspaces a user can access, the system resources users can view and manage, and the tasks available to a user within a workspace. RBAC is enforced in the Junos Space user interface navigation hierarchy by workspace, task group, and task. A user can only access those portions of the navigation hierarchy that are explicitly granted through access privileges. The following sections describe RBAC enforcement behavior at each level of the user interface navigation hierarchy.

### **Enforcement by Workspace**

The Junos Space user interface provides a task-oriented environment in which a collection of related user tasks are organized by workspace. For example, the **Users** workspace defines the group of tasks related to managing users and roles. Tasks include creating, modifying, and deleting users, and assigning roles. Enforcement by *workspace* ensures that a user can view only those workspaces that contain the tasks that the user has permissions to execute. For example, a user that is assigned the Device Manager role, which grants access privileges to all tasks in the **Devices** workspace, can access only the **Devices** workspace. No other workspaces are visible to this user unless other roles are assigned to this user.

### **RBAC Enforcement Not Supported for Getting Started Panel**

RBAC enforcement is not enabled for the contents of the Getting Started panel. Consequently, a user who does not have certain access privileges can still view the steps displayed in the Getting Started panel. For example, a user without privileges to manage devices will still see the Discover Devices step. However, when the user clicks on the step, Junos Space displays an error to indicate that the user might not have permission to access the workspace or tasks to which the step is linked.

- Related Topics**
- Understanding How to Configure Users to Manage Objects in Junos Space on page 94
  - Predefined Administrator Roles on page 95
  - Creating Users on page 99
  - Viewing User Statistics on page 109
  - Viewing Users on page 110

## **Understanding How to Configure Users to Manage Objects in Junos Space**

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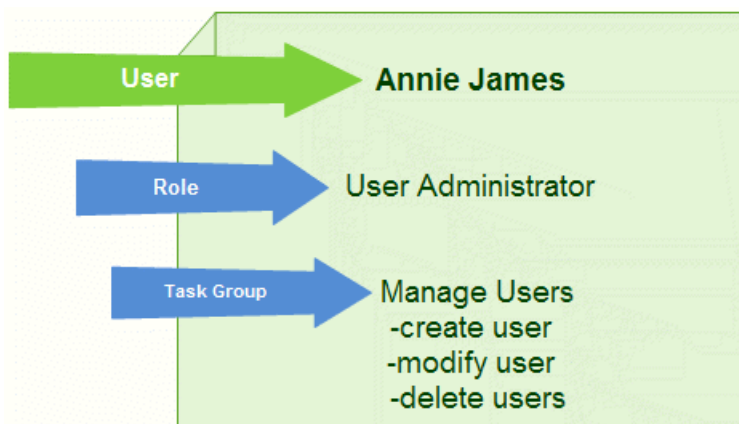
Junos Space is shipped with a super administrator that has full access to the Junos Space system. When you first log on to Junos Space with the default super administrator, you can perform all tasks and access all Junos Space system resources. The super administrator can create new users and assign roles to those users to specify which workspaces and system resources users can access and manage, and which tasks users can perform within each workspace.

After you first setup Junos Space, you can disable the super administrator, if necessary. However, before disabling the default super administrator, you should first create another user with super administrator privileges.

To access and manage Junos Space system resources, a user must be assigned at least one role. A *role* defines the tasks (create, modify, delete) that can be performed on the objects (devices, users, roles, services, customers) that Junos Space manages. For complete information on the predefined roles, see “Predefined Administrator Roles” on page 95.

Users receive permission to perform tasks only through the roles that they are assigned. In most cases, a single role assignment enables a user to view and perform tasks on the objects within a workspace. For example, a user assigned the Device Manager role can discover devices, resynchronize devices, view the physical inventory and interfaces for devices, and delete managed devices. A user that is assigned the user administrator role can create, modify, and delete other users in Junos Space, and assign and remove roles.

Typically a role contains one or more task groups. A *task group* provides a mechanism for grouping a set of related tasks that can be performed on a specific object. The following illustration shows the task group and associated tasks that are available to a user that is assigned the User Administrator role.



**NOTE:** You can assign multiple roles to a single user, and multiple users can be assigned the same role.

- Related Topics**
- Role Based Access Control Overview on page 93
  - Creating Users on page 99
  - Viewing Users on page 110
  - Viewing User Statistics on page 109

## Predefined Administrator Roles

Junos Space provides predefined roles that you can assign to users to define administrative responsibilities and specify the management tasks that a user can perform within one or more workspaces.

To assign roles to other users in Junos Space, a user must be a Super Administrator or User Administrator.

Each predefined role defines a set of tasks for a single workspace, except the super administrator role, which defines all tasks for all workspaces. By default, Junos Space

provides Read privileges on all objects associated with the task groups defined in a predefined role.

Table 13 on page 96 shows the Junos Space predefined roles.

**Table 13: Junos Space Predefined Roles**

<b>Predefined Role</b>	<b>Task Group and Tasks</b>	<b>Workspace</b>
Device Manager	<ul style="list-style-type: none"> <li>■ Discover Devices <ul style="list-style-type: none"> <li>■ Discover Targets</li> <li>■ Specify Probes</li> <li>■ Specify Credentials</li> </ul> </li> <li>■ Manage Devices <ul style="list-style-type: none"> <li>■ Delete Devices</li> <li>■ View Physical Inventory</li> <li>■ View Interfaces</li> <li>■ Resynchronize with Network</li> </ul> </li> </ul>	Devices
Job Manager	Manage Jobs	Jobs
Service Activator	<ul style="list-style-type: none"> <li>■ Manage Customers <ul style="list-style-type: none"> <li>■ Create Customer</li> <li>■ Modify Customer</li> <li>■ Delete Customers</li> </ul> </li> <li>■ Manage Service Orders <ul style="list-style-type: none"> <li>■ Create P2P Service Order</li> <li>■ Deploy Service Order</li> <li>■ Delete Service Order</li> <li>■ Create VPLS Service Order</li> </ul> </li> <li>■ Manage Services <ul style="list-style-type: none"> <li>■ Modify Service</li> <li>■ Decommission Service</li> <li>■ View Configuration Audit Results</li> <li>■ Perform Configuration Audit</li> <li>■ View Functional Audit Results</li> <li>■ Perform Functional Audit</li> </ul> </li> </ul>	Service Provisioning
Service Designer	<ul style="list-style-type: none"> <li>■ Manage Service Definitions <ul style="list-style-type: none"> <li>■ Create Service Definition</li> <li>■ Create Service Provider</li> <li>■ Publish Service Definition</li> <li>■ Unpublish Service Definition</li> </ul> </li> </ul>	Service Design



**Table 13: Junos Space Predefined Roles** *(continued)*

Service Manager	<ul style="list-style-type: none"> <li>■ Manage Service Providers <ul style="list-style-type: none"> <li>■ Modify Service Provider</li> <li>■ Delete Service Provider</li> </ul> </li> <li>■ Manage Device Roles <ul style="list-style-type: none"> <li>■ View Engine Rules</li> <li>■ Launch Role Discovery</li> <li>■ Unassign NPE Role</li> <li>■ Manage Device UNIs</li> <li>■ Delete UNI</li> <li>■ Add Device UNIs</li> <li>■ Assign UNI</li> <li>■ Role Discovery Results</li> <li>■ Modify Loopback Address</li> <li>■ Manage Device UNIs</li> <li>■ Exclude from UNI Role</li> <li>■ Exclude from NPE Role</li> <li>■ Assign NPE Role</li> </ul> </li> </ul>	Prestage Devices
Super Administrator	All Junos Space task groups and tasks	Administration  Devices  Jobs  Prestage Devices  Service Design  Service Provisioning  Users
System Administrator	<ul style="list-style-type: none"> <li>■ Manage Fabric <ul style="list-style-type: none"> <li>■ Add Fabric Node</li> </ul> </li> <li>■ Manage Databases <ul style="list-style-type: none"> <li>■ Backup Database</li> <li>■ Delete Database Backup</li> <li>■ Restore Database</li> </ul> </li> <li>■ Manage Software <ul style="list-style-type: none"> <li>■ Delete Software</li> <li>■ Install Software</li> </ul> </li> <li>■ Troubleshoot Junos Space</li> <li>■ Manage Applications <ul style="list-style-type: none"> <li>■ Modify Application Settings</li> </ul> </li> <li>■ Manage Licenses <ul style="list-style-type: none"> <li>■ Upload License</li> </ul> </li> </ul>	Administration

**Table 13: Junos Space Predefined Roles** *(continued)*

User Administrator	■ Manage Users	Users
	■ Create User	
	■ Modify User	
	■ Delete Users	

- Related Topics**
- Role Based Access Control Overview on page 93
  - Understanding How to Configure Users to Manage Objects in Junos Space on page 94
  - Creating Users on page 99
  - Viewing Users on page 110
  - Viewing User Statistics on page 109

## Chapter 9

# Authenticating Users

- Creating Users on page 99
- Modifying a User on page 103
- Deleting Users on page 105
- Changing User Passwords on page 107

## Creating Users

---

You can create users and assign roles to allow users access to Junos Space workspaces. Each user account must include a login ID, password, first name, and last name. For each user, you can assign roles that define the tasks and objects (devices, users, services, and so forth) that the user can access and manage. You can assign multiple roles to a single user and assign the same role to multiple users.



**NOTE:** A user can access all the objects within the workspace that the assigned role controls.

---

- Creating a User Without Assigning A Role on page 99
- Creating a User with Roles on page 101

## Creating a User Without Assigning A Role

You can create a user without assigning any roles, and then at a later date, use the **Modify User** option to assign roles to the user.

To create a new user account without assigning a role:

1. From the task ribbon, select the **Users** workspace.
2. From the task ribbon, select the **Manage Users** icon
3. From the task ribbon, select the **Create User** icon. The Create User dialog box is displayed.

4. In the Login ID field, enter a login ID for the new Junos Space user account.  
The login ID cannot exceed 32 characters. Allowable characters include dash (-), underscore (\_), apostrophe ('), letters, and numbers.
5. In the Password field, enter a password for the user account.  
The password must include at least two numbers or symbols and must be from 6 to 31 characters.



**NOTE:** All passwords in Junos Space are case-sensitive.

6. In the Confirm Password field, reenter the password you entered in Step 5.
7. In the First Name field, enter the user's first name.
8. In the Last Name field, enter the user's last name.
9. In the Email field, enter the user's email address.
10. In the Image File field, upload the user's photo ID:
  - a. Use the **Browse** button to locate the user's photo ID file.  
You can upload JPG, PNG, and TIF file types.
  - b. Click the **Upload** button.

Junos Space saves the photo ID file for the user account.

11. Click **Create** to create the user account without any assigned roles.

The user account is created in Junos Space.

## Creating a User with Roles

To create a new user with one or more roles:

1. From the task ribbon, select the **Users** workspace.
2. From the task ribbon, select the **Manage Users** icon.
3. From the task ribbon, select **Create User**. The Create User dialog box is displayed.

Login ID:

Password:

Confirm Password:

First Name:

Last Name:

Email:

Image File:  **Browse...**

**Upload**

☐ Use Same Roles Assigned to ▼

**Available Roles**

- User Administrator
- Job Manager
- System Administrator
- Super Administrator
- Device Manager
- Service Designer
- Service Manager
- Service Activator

→

←

**Selected Roles**

**Create** **Cancel**

4. In the Login ID field, enter a login ID for the new Junos Space user.  
The login ID cannot exceed 32 characters. Allowable characters include dash (-), underscore (\_), apostrophe ('), letters, and numbers.
5. In the Password field, enter a password for the user account.  
The password must include a minimum of two numbers or symbols and must be from 6 to 31 characters.



---

**NOTE:** All passwords in Junos Space are case-sensitive.

---

6. In the Confirm Password field, reenter the password you entered in the previous step.
7. In the First Name field, enter the user's first name.
8. In the Last Name field, enter the user's last name.
9. In the Email field, enter the user's email address.
10. In the Image File field, upload the user's photo ID:
  - a. Use the **Browse** button to locate the user's photo ID file.  
You can upload JPG, PNG, and TIF file types.
  - b. Click the **Upload** button.  
Junos Space saves the photo ID file with the user account.
11. Assign one or more roles to the new user by using either of the following options:
  - Select one or more roles from the Available Roles column and click the right arrow to move the roles to the Selected Roles column. You can also move a role to the Selected Roles column by double-clicking on the role.
  - Select the check box **Use Same Roles Assigned to**. From the drop-down menu, select the name of the user whose role assignment you want to assign to the new user.  
  
You can enter one or more characters in the **Use Same Roles Assigned to** field to retrieve a filtered list of users with role assignments that you might want to use.
12. Click **Create** to create the user account with the assigned roles.  
The new user account is created in Junos Space.

- Related Topics**
- Understanding How to Configure Users to Manage Objects in Junos Space on page 94
  - Predefined Administrator Roles on page 95
  - Changing User Passwords on page 107
  - Modifying a User on page 103
  - Deleting Users on page 105
  - Viewing Users on page 110
  - Viewing User Statistics on page 109

## Modifying a User

---

A Super Administrator or User Administrator can modify any user account in Junos Space. You can add or remove roles and modify any user settings except the Login ID.

Each user account can have multiple roles and a role can be associated with multiple users.

To modify an existing user account:

1. From the task ribbon, select the **Users** workspace.
2. From the task ribbon, select the **Manage Users** icon.
3. From the inventory panel, select the user account that you want to modify.

User account information is displayed in the **Quick Look** panel.



**NOTE:** You can modify only one user account at a time.

---

4. From the Actions panel, select **Modify User**. The Modify User window is displayed.

Login ID: Wesley  
 Password: .....  
 Confirm Password: .....  
 First Name: Josephine  
 Last Name: Wesley  
 Email:   
 Image File:  **Browse...**  
**Upload**  
☐ Use Same Roles Assigned to ▼  

**Available Roles**  
 User Administrator  
 System Administrator  
 Super Administrator  
 Device Manager  
 Service Designer  
 Service Manager  
 Service Activator  
 anonymous\_1255730568574

→  
←

**Selected Roles**  
 Job Manager

**Modify** **Cancel**

5. You can change the password, first name, last name, email address, photo ID, and the selected roles.
  - To change the password, you must include at least two numbers or symbols in the new password and the password must be from 6 to 31 characters. All passwords in Junos Space are case-sensitive.
  - To change the user name, enter a new name in the First Name and/or Last Name fields.
  - To change the email account, enter a new email address in the Email field.
  - To modify the image file:
    - a. Use the **Browse** button to locate the new user photo ID file.  
You can upload JPG, PNG, and TIF file types.
    - b. Click the **Upload** button.  
Junos Space updates the photo ID file for the user account.
  - To add or remove role assignments:



- To add role assignments, select one or more roles from the Available Roles column and click the right arrow to move the roles to the Selected Roles column.
  - To remove role assignments, select one or more roles from the Selected Roles and click the left arrow to move the roles to the Available Roles column.
6. Click **Modify** to save your changes to the user account.  
Junos Space updates the user account with the changes you specified.

- Related Topics**
- Understanding How to Configure Users to Manage Objects in Junos Space on page 94
  - Role Based Access Control Overview on page 93
  - Creating Users on page 99
  - Deleting Users on page 105
  - Viewing Users on page 110
  - Viewing User Statistics on page 109

## Deleting Users

---

When a Junos Space user leaves your organization or no longer needs access to the network objects that Junos Space manages, you can delete the existing user account.

To delete one or more users:

1. From the task ribbon, select the **Users** workspace.
2. From the task ribbon, select the **Manage Users** icon.

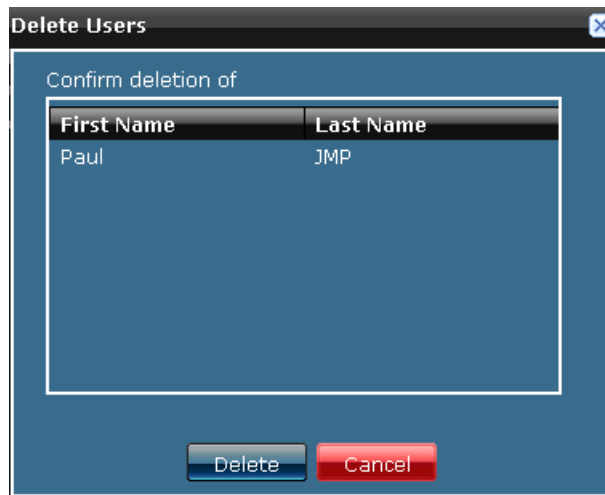
The inventory panel displays all Junos Space users.

3. Optional: To view detailed user account information before deleting a user:
  - a. Double-click on the thumbnail (or table row) in the inventory panel. The following illustration shows the User Detail Summary window.



- b. Click **OK** to close the User Detail Summary window.
4. In the inventory panel, select one or more users to delete. In the Action panel, click **Delete Users**.

The Delete Users confirmation window is displayed.



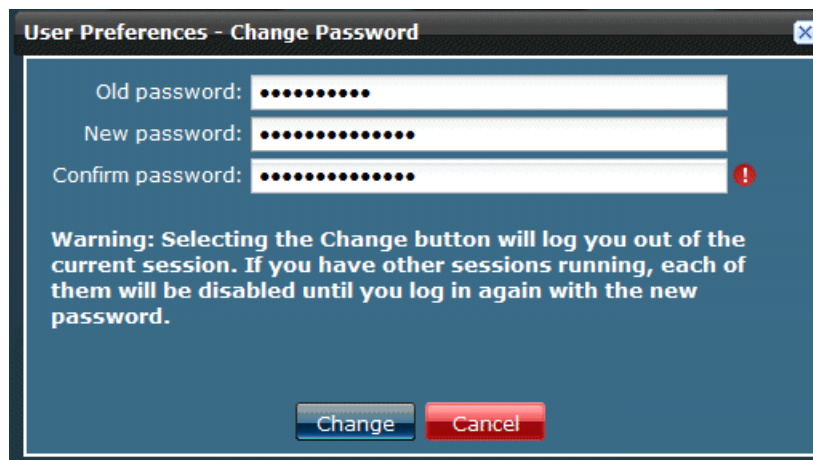
5. Verify the list of users that you want to delete, and click **Delete** to delete all selected user accounts.

- Related Topics**
- Understanding How to Configure Users to Manage Objects in Junos Space on page 94
  - Role Based Access Control Overview on page 93
  - Creating Users on page 99
  - Modifying a User on page 103
  - Viewing Users on page 110
  - Viewing User Statistics on page 109

## Changing User Passwords

Any logged in user can change their account password using the User Preferences icon in the Junos Space banner. You do not have to have any user roles configured to change your password.

To change your user password, follow these steps:



The image shows a dialog box titled "User Preferences - Change Password". It contains three input fields: "Old password:", "New password:", and "Confirm password:". Each field is filled with dots representing masked text. To the right of the "Confirm password:" field is a red exclamation mark icon. Below the input fields is a warning message: "Warning: Selecting the Change button will log you out of the current session. If you have other sessions running, each of them will be disabled until you log in again with the new password." At the bottom of the dialog are two buttons: "Change" (blue) and "Cancel" (red).

1. Click the User Preferences icon in the Junos Space banner. The User Preferences – Change Password dialog box appears.
2. Type your old password.
3. Type your new password. The password must be 6 to 31 characters long, including 2 numbers or symbols.
4. Retype your password again to confirm it.
5. Click Change. You are logged out of the system. You have to log in again using your new password. Any open sessions are disabled until you log in again.

## **Related Topics**

## Chapter 10

# Monitoring Users

- Viewing User Statistics on page 109
- Viewing Users on page 110

### Viewing User Statistics

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You can view the percentage and the number of Junos Space users that have been assigned to a role.

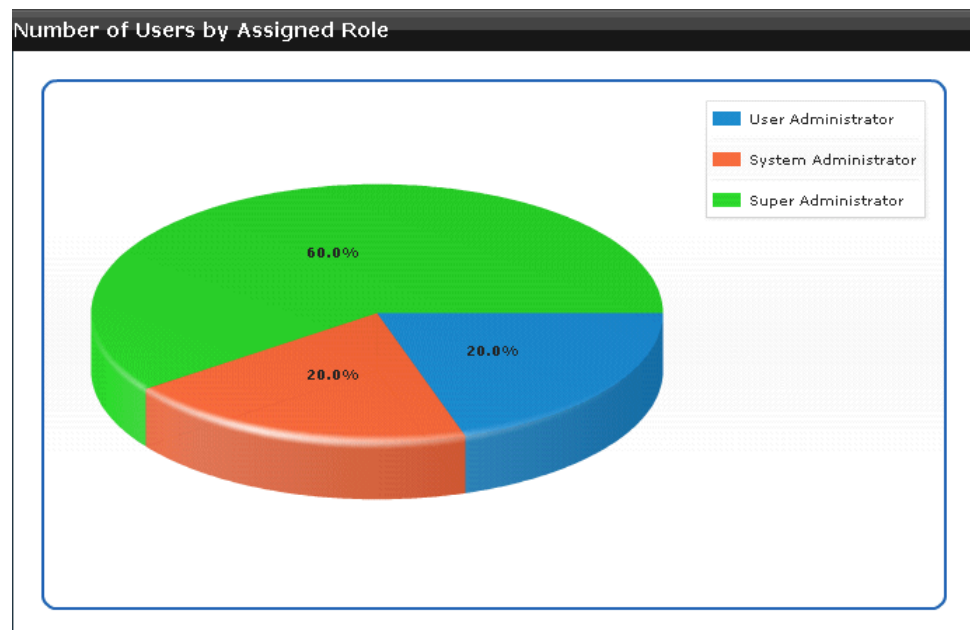
- Viewing the Number of Users Assigned by Role on page 109

### Viewing the Number of Users Assigned by Role

To view the percentage of total users that have been assigned to a predefined role:

1. From the task ribbon, select the **Users** workspace.

Junos Space displays a pie chart showing the users by assigned role.



The pie chart displays the percentage of all users assigned to each role that has one or more assigned users.

2. To view the number of users assigned to a specific role, mouse over the role in the chart.
3. To display an inventory view of users assigned to a specific role, click on the segment of the chart that represents the role.

- Related Topics**
- Role Based Access Control Overview on page 93
  - Viewing Users on page 110
  - Creating Users on page 99
  - Deleting Users on page 105

## Viewing Users

You can view user information as graphics or as a table. By default, Junos Space displays thumbnail representations of users.

- Viewing Users as Graphics on page 110
- Viewing Users in a Table on page 111

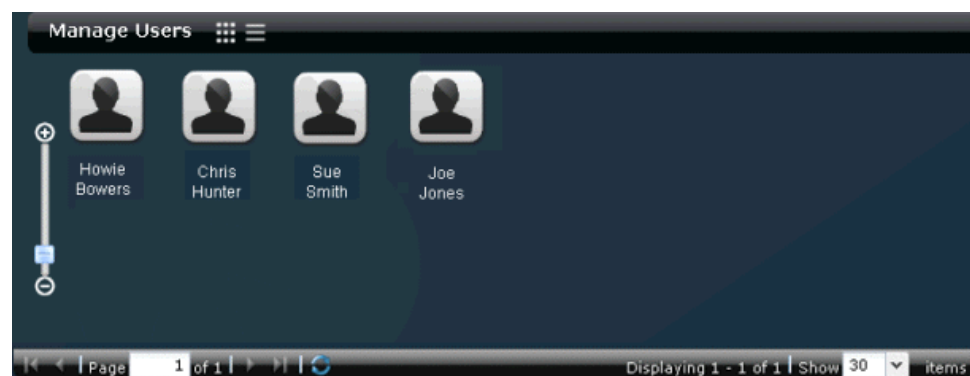
### Viewing Users as Graphics

You can view thumbnail, quick look, and detailed information about Junos Space users.

To display a graphical view of users:

1. From the task ribbon, select the **Users** workspace.
2. From the task ribbon, select the **Manage Users** icon.

The task ribbon displays all available tasks for the Manage User task group. The inventory panel displays thumbnails of users in alphabetical order by first name, as shown in the following example.



3. You can use the following options to view user information:
  - To restrict the display of users, enter a search criterion of one or more characters in the Search bar and press Enter.

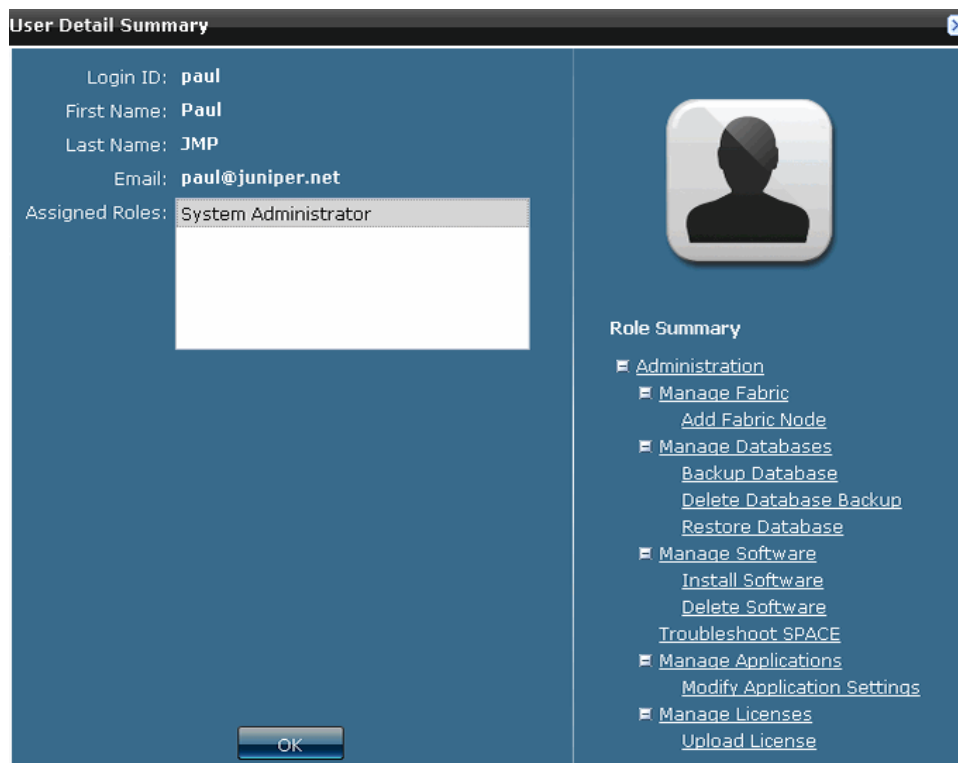
All users that match the search criterion are shown in the main display area.

- To view summary information for a user, click on the thumbnail.

The Quick Look panel displays summary information, including the Login ID, first and last name, and email address.

- To view detailed information for a user, double-click on the thumbnail.

The User Detail Summary window displays the user's account information and assigned roles, as shown in the following example.



## Viewing Users in a Table

You can view the inventory of Junos Space users as a table.

To display a table of users:

1. From the task ribbon, select the **Users** workspace.
2. From the task ribbon, select the **Manage Users** icon.
3. Click the table icon in the filter bar, as shown in the following example.



The user inventory panel displays a table view of users.

User Name	First Name	Last Name	Email
aaron	Aaron	Dix	@juniper.net
abhishek	Abhishek	Kumar	@juniper.net
adam	Adam	Malik	@juniper.net
barbara	Barbara	Sprajc	@juniper.net
barnaby	Barnaby	Freeman	@juniper.net

Page 1 of 1 | Displaying 1 - 49 of 49 | Show 60 Items

After you select the table view once, the table view is displayed each time you select the **Manage Users** task category.

4. You can use the following options to view user information:

- To view summary information for a user, click on the table row.

The **Quick Look** panel displays summary information, including the Login ID, first and last name, and email address.

- To view detailed information for a user, double click on the table row.

The **User Detail Summary** screen displays information about the user's account and assigned roles.

**Related Topics**

- Understanding How to Configure Users to Manage Objects in Junos Space on page 94
- Creating Users on page 99
- Deleting Users on page 105
- Modifying a User on page 103
- Viewing User Statistics on page 109



## **Part 5**

# **Managing Devices**

- Overview of Device Management on page 115
- Discovery on page 117
- Inventory on page 133
- Monitoring Devices on page 139



## Chapter 11

# Overview of Device Management

- Device Management Overview on page 115

### Device Management Overview

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You can use Junos Space to simplify management of the devices running Junos software on your network.

From the Devices workspace, you use device discovery to discover devices and synchronize device configurations with the Junos Space database. You can use device discovery to discover one or many devices at a time. After Junos Space discovers your network devices, you can perform the following tasks to monitor and configure devices from Junos Space:

- View statistics about the managed devices in your network, including the number of devices by platform and the number of Junos family devices by release.
- View connection status and configuration status for managed devices.
- View operational and administrator status of the physical interfaces on which devices are running.
- View hardware inventory for a selected device, such as information about power supplies, chassis cards, fans, FPCs, and available PIC slots.
- Resynchronize a managed device to resynchronize the device configuration in the Junos Space database with the physical device.
- Deploy service orders to activate a service on your network devices.

#### **Supported Devices**

Junos Space supports the following routing platforms running Junos Software:

- J Series Routers
- M Series Routers
- MX Series Routers
- T Series Routers

- Related Topics**
- Device Discovery Overview on page 117
  - Device Inventory Management Overview on page 133
  - Discovering Devices on page 120
  - Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118
  - Viewing Managed Devices on page 139

## Chapter 12

# Discovery

- Discovery Overview on page 117
- Managing Devices on page 120

### Discovery Overview

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- Device Discovery Overview on page 117
- Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118

### Device Discovery Overview

You use device discovery to add devices to Junos Space. *Discovery* is the process of finding a device and then synchronizing the device's inventory and configuration with the Junos Space database. To use device discovery, Junos Space must be able to connect to the device.

To discover network devices, Junos Space uses the SSH and SNMP protocols. Device authentication is handled through administrator login SSH v2 credentials and SNMP v1/v2c or v3 settings, which are part of the device discovery configuration. You can specify a single IP address, a DNS hostname, an IP range, or an IP subnet to discover devices on a network. During discovery, Junos Space connects to the physical device and retrieves running configuration and status information of the device. To connect with and configure devices, Junos Space uses Juniper Network's Device Management Interface (DMI), which is an extension to the NETCONF network management protocol.

When discovery succeeds, Junos Space creates an object in the Junos Space database to represent the physical device and maintains a connection between the object and the physical device so their information is linked.

When configuration changes are made in Junos Space, for example, when you deploy service orders to activate a service on your network devices, the configuration is pushed to the physical device.

When configuration changes are made on the physical device, (out-of-band CLI commits and change-request updates), Junos Space automatically resynchronizes with the device, so that the device inventory information in the Junos Space database matches the current device inventory and configuration information.

The following device inventory and configuration data is captured and stored in relational tables in the Junos Space database:

- Devices: hostname, IP address, credentials
- Physical Inventory: chassis, FPM board, PEM, Routing Engine, CB, FPCs, CPU, PICs, Xcvrs, fan trays

Junos Space displays the model number, part number, serial number, and description for each inventory component, when applicable.

- Logical Inventory: sub-interfaces, encapsulation (link-level), type, speed, MTU, VLAN ID
- Loopback interface

Other device configuration data is stored in the Junos Space database as Binary Large Objects, and is only available to NBI users.

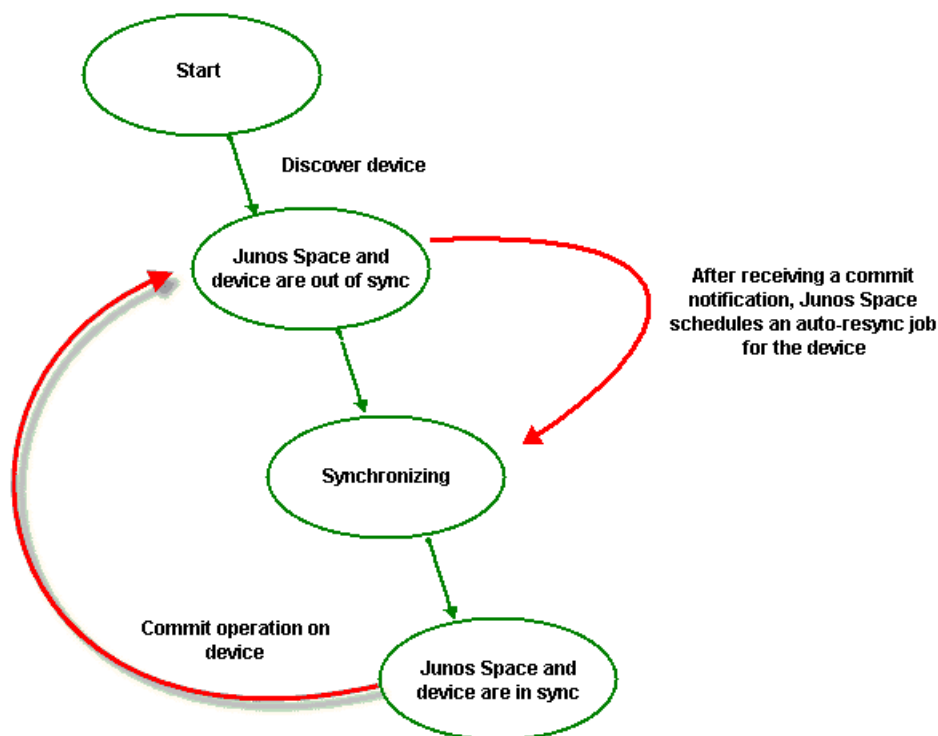
- Related Topics**
- Discovering Devices on page 120
  - Viewing Managed Devices on page 139
  - Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118
  - Resynchronizing Managed Devices on page 128
  - Device Management Overview on page 115
  - Device Inventory Management Overview on page 133

## ***Understanding How Junos Space Automatically Resynchronizes Managed Devices***

When configuration changes are made on a physical device that Junos Space manages, Junos Space automatically resynchronizes with the device, so that the device inventory information in the Junos Space database matches the current configuration information on the device.

After Junos Space discovers and imports a device, Junos Space enables the auto-resync feature on the physical device by initiating a commit operation.

After auto-resynchronization is enabled, any configuration changes made on the physical device, including out-of-band CLI commits and change-request updates, automatically trigger resynchronization on the device. The following diagram shows how a commit operation on the device triggers resynchronization.



When a commit operation is performed on a managed device, Junos Space schedules a re-sync job to run 20 seconds after the commit notification is received. However, by default, if Junos Space receives another commit notification from the device within 25 seconds of the previous commit notification, no additional re-sync jobs are scheduled, but Junos Space will resynchronize both commit operations in one job. This damping feature of automatic resynchronization provides a window of time during which multiple commit operations can be executed on the device, but only one or a few re-sync jobs are required to resynchronize the Junos Space database after multiple configuration changes are executed on the device.

When Junos Space receives the device commit notification, the device status is “Out of Sync”. When the re-sync job begins on the device, the Managed Status for the device displays “Synchronizing” and then “In Sync” after the re-sync job has completed, unless a pending device commit operation causes the device to display “Out of Sync” while it was synchronizing.

When a resync job is scheduled to run but another resync job on the same device is in progress, Junos Space delays the scheduled resync job. The time delay is determined by the damper interval that you can set from the application workspace. By default, the time delay is 20 seconds. The scheduled job is delayed as long as the other resync job to the same device is in progress. When the currently running job finishes the scheduled resync job starts.

You can disable the auto-resync feature in the **Application** workspace. When auto-resync is turned off, the server continues to receive notifications and will go into the out of sync state; however the auto-resync will not run on the device. To

resynchronize a device when the auto-resync feature is disabled, you can use the resync feature to manually resync the device.

For information about setting the damper interval to change the resync time delay and information about disabling the auto-resync feature, see “Modifying Application Settings” on page 89.

- Related Topics**
- Resynchronizing Managed Devices on page 128
  - Device Discovery Overview on page 117
  - Device Inventory Management Overview on page 133
  - Viewing Managed Devices on page 139

## Managing Devices

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- Discovering Devices on page 120
- Resynchronizing Managed Devices on page 128
- Deleting Devices on page 130

### *Discovering Devices*

You use device discovery to automatically discover and synchronize Junos devices in Junos Space. Device discovery is a three step process in which you specify target devices, a probe method (Ping and/or SNMP), and credentials to connect to each device.

To add a device using device discovery, the following conditions must be met:

- SSH v2 is enabled on the device. To enable SSH v2 on a device, issue the following CLI command:  
  
    **set system services ssh protocol-version v2**
- NETCONF protocol over SSH is enabled on the device. To enable the NETCONF protocol over SSH on a device, issue the following CLI command:  
  
    **set system services netconf ssh**
- The device is configured with a static management IP address that is reachable from the Junos Space server.



- A user with full administrative privileges is created on the device for the Junos Space administrator.
- If you plan to use SNMP to probe devices as part of device discovery, SNMP should be enabled on the device with appropriate read-only V1/V2C/V3 credentials.

To discover and synchronize devices, complete the following tasks:

1. Specifying Device Targets on page 121
2. Specifying Probes on page 122
3. Specifying Credentials on page 125

## Specifying Device Targets

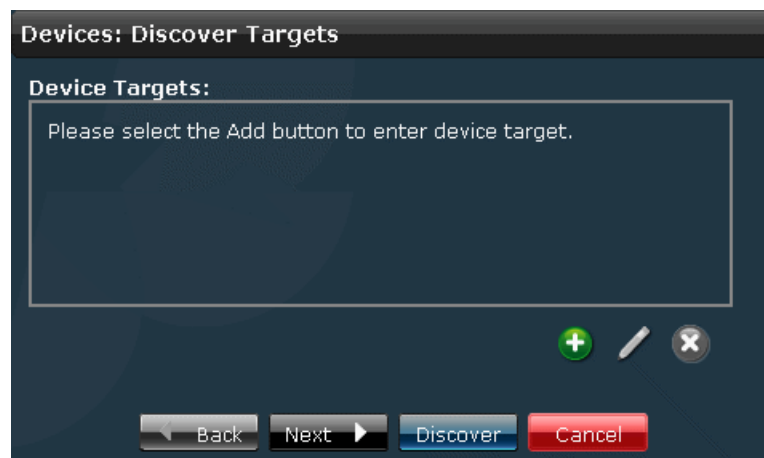
To specify the device targets that you want Junos Space to discover:

1. From the task ribbon, select the **Devices** workspace.
2. From the task ribbon, click the **Discover Devices** icon.

Junos Space displays discovery status for discovery targets that are already processed.

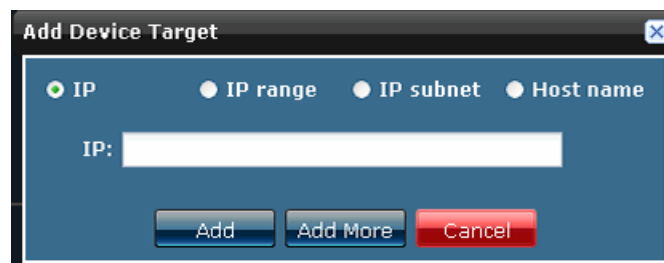
3. From the task ribbon, click the **Discover Targets** icon.

Junos Space displays the Discover Targets window.



4. Click the Add icon.

The Add Device Target dialog box is displayed.



Choose one of the following options to specify device targets:

- Select the **IP** radio button and enter the IP address of the device.
- Select the **IP Range** radio button and enter a range of IP addresses for the devices.



**NOTE:** The maximum number of IP addresses for an IP range target is 1024.

---

- Select the **IP Subnet** radio button and enter an IP subnet for the devices.
  - Select the **Host Name** radio button and enter the host name of the device.
5. Click **Add** to save the target devices that you specified, or click **Add More** to add additional device targets. When you have added all device targets that you want Junos Space to discover, click **Add**.

The Discover Targets window displays the addresses of the configured device targets.

6. Click **Discover** from the Discover Targets window.

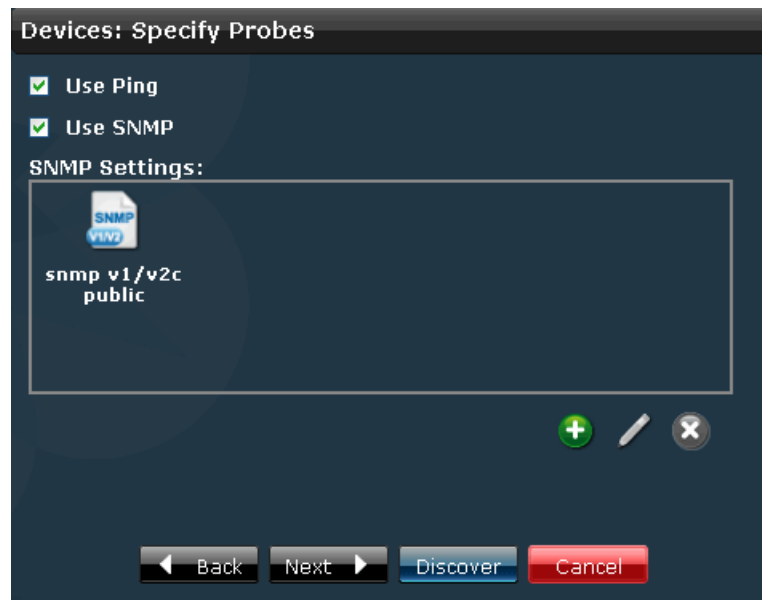
In the next task, you specify a probe method to connect to and discover the device targets.

## Specifying Probes

To configure the method Junos Space will use to discover the device targets:

1. From the task ribbon, select the **Devices** workspace, and then click the **Discover Devices** icon.
2. From the task ribbon, click the **Specify Probes** icon.

The Specify Probes window is displayed.



3. Select a probe method (or SSH) to discover target devices:
  - If SNMP is configured for the device, select **Use SNMP** (the default), and clear the check box **Use Ping**.  
Junos Space will use the SNMP GET command to discover target devices.
  - If SNMP is not configured for the device, select the check box **Use Ping** (the default), and clear the check box **Use SNMP**.  
Junos Space will use Juniper Network's Device Management Interface (DMI) to directly connect to and discover devices. DMI is an extension to the NETCONF network management protocol.
  - To use the SSH protocol to discover every device IP in the range or subnet, clear the check boxes **Use Ping** and **Use SNMP**. Clearing the check boxes will disable both the SNMP and Ping probe methods. When you use SSH to discover devices, Junos Space does not perform a check to verify that the device is a Juniper device during the discovery operation.



**NOTE:** If you will use SSH to discover devices, you can bypass the SNMP settings (Steps 4–6) and go directly to Step 7 in the Specifying Probes procedure.

4. Click the Add icon (+).  
The Add SNMP Settings dialog box is displayed.

The dialog box titled "Add SNMP Settings" has a close button in the top right. It contains two radio buttons: "SNMP V1/V2C" (selected) and "SNMP V3". Below the radio buttons is a text field labeled "Community:". At the bottom are three buttons: "Add", "Add More", and "Cancel".

5. For SNMPv1 or SNMPv2:
  - a. Select **SNMP V1/V2C** (the default).
  - b. In the community field, specify the community string, which can be “public”, “private”, or a predefined string.
  - c. Click **Add** to save the SNMP settings, or click **Add More** to specify another community string. When you have finished adding community strings, click **Add**.

The Specify Probes window displays the configured SNMP settings.

6. For SNMPv3:

- a. Select **SNMP V3**.

The SNMP V3 dialog box is displayed.

The dialog box titled "Add SNMP Settings" has a close button in the top right. It contains two radio buttons: "SNMP V1/V2C" and "SNMP V3" (selected). Below the radio buttons are five fields: "Username:" (text field), "Privacy type:" (dropdown menu with "Please select ..." text), "Privacy password:" (text field), "Authentication type:" (dropdown menu with "Please select ..." text), and "Authentication password:" (text field). At the bottom are three buttons: "Add", "Add More", and "Cancel".

- b. Enter the username.
    - c. Select the privacy type (AES 128, DES, or none)
    - d. Enter the privacy password (if AES 128 or DES). If you specify 'none' for the privacy type, the privacy function is disabled.
    - e. Select the authentication type (MD5, SHA, or none).

- f. Enter the authentication password (if MD5 or SHA). If you specify 'none' for the authentication type, the authentication function is disabled.
- g. Click **Add** to save the SNMP V3 settings, or click **Add More** to specify additional SNMP settings. When you have finished adding SNMP settings, click **Add**.

The Specify Probes window displays the configured SNMP settings.

7. Click **Discover** in the Specify Probes window.

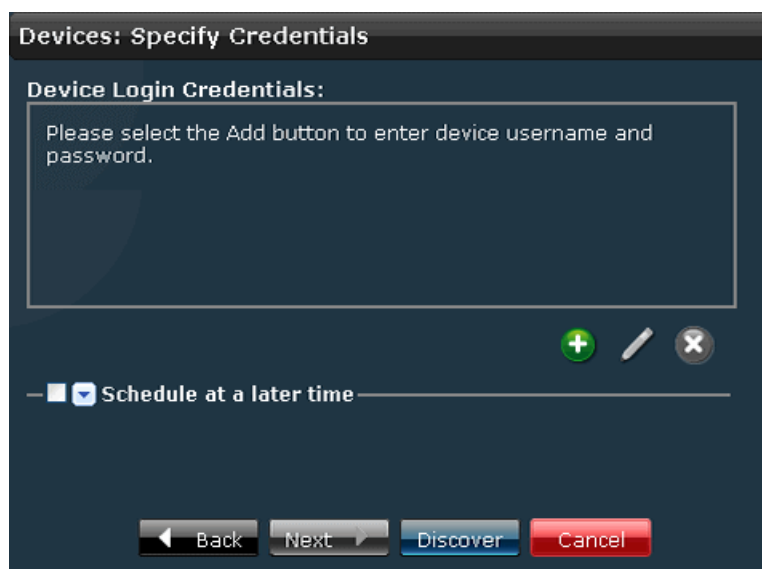
In the next task, you specify credentials to establish the SSH connection for the target devices.

## Specifying Credentials

Specify an administrator name and password to establish the SSH connection for each target device that you configured:

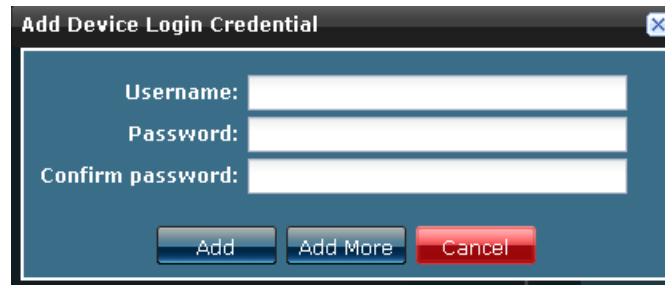
1. From the task ribbon, select the **Devices** workspace, and then click the **Discover Devices** icon.
2. From the task ribbon, select the **Specify Credentials** icon.

The Specify Credentials window is displayed.



3. Click the Add icon.

The Add Device Login Credential dialog box is displayed.



The image shows a dialog box titled "Add Device Login Credential". It has a blue header bar with a close button (X) in the top right corner. The main area is white and contains three input fields: "Username:", "Password:", and "Confirm password:". Below these fields are three buttons: "Add" (blue), "Add More" (blue), and "Cancel" (red).

4. Specify the administrator user name and password, and confirm the password. The name and password must match the name and password configured on the device
5. To save the user name and password that you specified, click **Add** or click **Add More** to add another user name and password. When you have finished adding login credentials, click **Add**.

The Credential window displays the administrator user names that you configured.

6. Schedule the device discovery operation:
  - Clear the **Schedule at a later time** check box (the default) to initiate the discovery operation when you complete Step 7 in this procedure.
  - Select the **Schedule at a later time** check box to specify a later start date and time for the discovery 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.

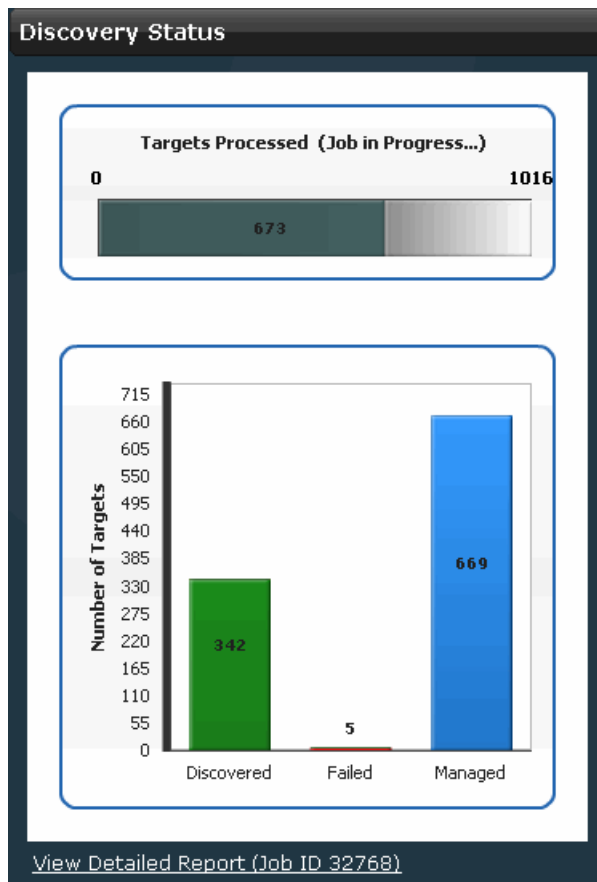
- 
7. In the Specify Credentials window, click **Discover** to discover and synchronize the device targets in Junos Space.



**NOTE:** When the Targets, Probes, and Credentials are configured, Junos Space displays a check mark next to the Discover Targets, Specify Probes, and Specify Credentials icons in the task ribbon to show that the device discovery configuration is complete.

---

The Discovery Status window, shown in the following illustration, displays the progress of discovery in real-time. Click on any bar in the chart to view information about devices currently managed, discovered, or for which discovery failed.



8. For information about device discovery results you can view the Detailed Reports and view job status from the **Jobs** workspace:

- To view device discovery details, click **View Detailed Report** in the Discovery Status window.



The Detailed Report displays the IP address, host name, discovered devices, and discovery status. If the discovery operation fails, the Description field indicates the cause of failure.

To sort on a column in the Detailed Report, mouse over any column header and click the down arrow, as shown in the following example.

Devices			
IP Address	Hostname	Status	Description
4.4.1.1	J6350-CE2	Device Managed	<div> <div>Sort Ascending</div> <div>Sort Descending</div> <div>Columns</div> </div>
4.4.1.2	J6350-CE2	Device Managed	
4.4.1.3	J6350-CE2	Device Managed	
4.4.1.4	J6350-CE2	Device Managed	
4.4.1.5	J6350-CE2	Device Managed	

- To view device discovery from the Jobs workspace:
  - a. From the task ribbon, select the **Jobs** workspace.
  - b. From the task ribbon, select the **Manage Jobs** icon.

- c. From the Job Manager inventory panel, select a “Discover Network Elements” job that you want to view. The following example shows summary information for a Discover Network Elements job.

Manage Jobs 					
Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	 SUCCESS	Discover Network Elements	32768	Number of scanned IP: 1016 Number of Device Managed: 1000 Number of Discovery succeeded: 1016 Number of Already Managed: 0 Number of Skipped: 0 Number of Juniper Device but Add device failed: 16	Oct 14, 2009 5:45:01 AM PDT

- Related Topics**
- Viewing Managed Devices on page 139
  - Viewing Scheduled Jobs on page 155
  - Resynchronizing Managed Devices on page 128
  - Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118
  - Viewing Hardware Inventory for Devices on page 134
  - Viewing Physical Interfaces for Devices on page 135

## Resynchronizing Managed Devices

You can resynchronize a managed device at any time. For example, when a managed device is updated by a device administrator from the device's native GUI or CLI, you can resynchronize the device configuration in the Junos Space database with the physical device.

To resynchronize a device:

1. From the task ribbon, select the **Devices** workspace icon.
2. From the task ribbon, select the **Manage Devices** icon.

The Manage Devices inventory panel displays the list of managed devices by name and IP address.

3. Select one or more devices to resynchronize:
  - To select a single device, from the Manage Devices inventory panel, click on the thumbnail image for the device.
  - To select multiple devices, select **Multiple** from the top of the Quick Look panel, then select the thumbnail images for the devices that you want to resynchronize from the Manage Devices inventory panel. The selected devices are displayed in the Quick Look panel, as shown in the following example.





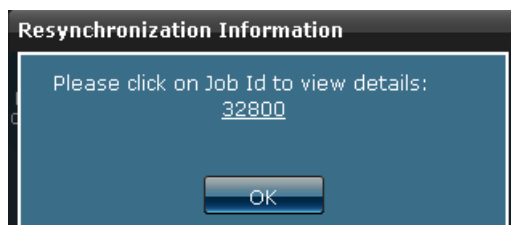
4. From the Actions panel, click **Resynchronize with Network** to reimport the devices in Junos Space.

Junos Space displays the Resynchronize Devices window.



5. Click **Confirm**.

Junos Space starts resynchronizing the device and displays the Resynchronization Information window, as shown in the example.



6. Click on the Job ID to view details about the device resynchronization, or click **OK** to close the window.

When a resync job is scheduled to run but another resync job on the same device is in progress, Junos Space delays the scheduled resync job. The time delay is determined by the damper interval that you can set from the application workspace. By default the time delay is 20 seconds. The scheduled job is delayed as long as the other resync job to the same device is in progress. When the job that is currently running finishes, the scheduled resync job starts.

For information about setting the damper interval to change the time delay for resync, see “Modifying Application Settings” on page 89.

- Related Topics**
- Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118
  - Device Inventory Management Overview on page 133
  - Discovering Devices on page 120
  - Viewing Managed Devices on page 139
  - Viewing Hardware Inventory for Devices on page 134
  - Viewing Physical Interfaces for Devices on page 135

## Deleting Devices

You can delete devices from Junos Space. Deleting a device removes all device configuration and device inventory information from the Junos Space database.

To delete a device from Junos Space:

1. From the task ribbon, select the **Devices** workspace.
2. From the task ribbon, click the **Manage Devices** icon.

The Manage Devices inventory panel displays thumbnails of the devices managed in Junos Space.



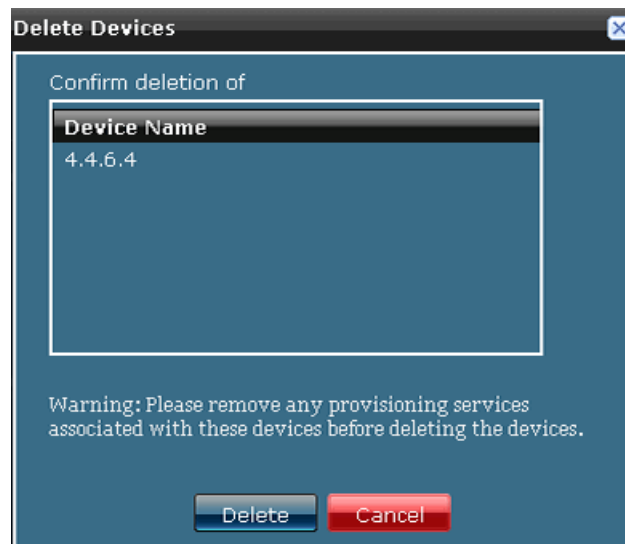
3. Optional: To view summary information for a device before deleting, select on the device. The Quick Look panel displays the summary information for the selected device, as shown in the example.



Junos Space displays basic device information, including name, OS version, platform, IP address, and connection status.

4. From the Manage Devices inventory panel, select one or more devices to delete.  
To delete more than one device at a time, click on **Multiple** at the top of the Quick Look panel, then select the thumbnails of the devices that you want to delete.
5. If provisioning services are associated with a device that you want to delete, you must remove the provisioning services before deleting the device. For information about deleting service orders, see [Deleting a Service Order](#).
6. Select **Delete** from the Actions panel.

Junos Space displays the Delete Devices confirmation window.



7. Select **Delete** to delete the selected devices.

Junos Space deletes all device configuration and inventory information for the selected devices from the Junos Space database.

- Related Topics**
- Viewing Managed Devices on page 139
  - Viewing Hardware Inventory for Devices on page 134
  - Viewing Physical Interfaces for Devices on page 135
  - Discovering Devices on page 120

## Chapter 13

# Inventory

- Overview of Device Inventory on page 133
- Viewing Device Inventory on page 134

### Overview of Device Inventory

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- Device Inventory Management Overview on page 133

#### ***Device Inventory Management Overview***

You use the device inventory to view information about the hardware and software components of each device that Junos Space manages. You can also view the operational and administrator status for the physical interfaces on which devices are run.

The device inventory in the Junos Space database is generated when the device is first discovered and synchronized in Junos Space. After a device is synchronized, the device inventory in the Junos Space database matches the inventory on the device itself.

If either the physical (hardware) or logical (config) inventory on the device is changed, then the inventory on the device is no longer synchronized with the Junos Space database. However, Junos Space automatically triggers a re-sync job when a configuration change request commit or out-of-band CLI commit occurs on a managed device.

You can also manually resynchronize the Junos Space database with the physical device by using the **Resynchronize with Network** command from the Devices workspace in the Junos Space user interface.

- Related Topics**
- Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118
  - Resynchronizing Managed Devices on page 128
  - Viewing Hardware Inventory for Devices on page 134
  - Device Management Overview on page 115
  - Device Discovery Overview on page 117

## Viewing Device Inventory

- Viewing Hardware Inventory for Devices on page 134
- Viewing Physical Interfaces for Devices on page 135

### Viewing Hardware Inventory for Devices

Hardware inventory information shows the slots that are available for a device and provides information about power supplies, chassis cards, fans, part numbers, and so forth. Junos Space displays hardware inventory by device name, based on data that Junos Space retrieves from the device during discovery and resync operations, and from data stored in the hardware catalog. For J Series, MX Series, M Series, and T Series devices, the Junos Space hardware catalog provides descriptions for field replaceable units (FRUs), part numbers, model numbers, and the pluggable locations from which empty slots are determined.

Sorting is disabled for the hardware inventory view to preserve the natural slot order of the devices.

To view hardware inventory for devices that Junos Space manages:

1. From the task ribbon, select the **Devices** workspace.
2. From the task ribbon, select **Manage Devices** icon.

The Manage Devices inventory panel displays the devices managed in Junos Space.

3. Double-click on a device, or select a device and click **View Physical Inventory** in the Actions panel.

The device inventory panel displays the chassis components and FRUs and inventory detail for the selected device, as shown in the following example.

Return to Inventory View				
Item	Model Number	Part Number	Serial Number	Description
IND - M10i			B2496	
Chassis	CHAS-MP-M10i-S	710-008920	B2496	M10i Chassis with Installed Midplane Spare (With Craft Interface)
Power Supply 0	PWR-M10i-M7i-AC-S	740-008537 (Rev 08)	UK52856	M10i,M7i AC Power Supply Spare (Note: AC power cords are sold
Power Supply 1	PWR-M10i-M7i-AC-S	740-008537 (Rev 08)	UK52872	M10i,M7i AC Power Supply Spare (Note: AC power cords are sold
Power Supply 2 (Empty)				
Power Supply 3 (Empty)				
HCM 0	HCM-M10i-S	710-010580 (REV 06)	DT1101	Chassis Manager for M10i
HCM 1	HCM-M10i-S	710-010580 (REV 06)	DT1188	Chassis Manager for M10i
Routing Engine 0	RE-400-768-S	740-021833 (REV 01)	9005121830	RE-400 for M10i, M7i with 768 MB Mem spare
Routing Engine 1 (Empty)				
CEEB 0	FEB-M10i-M7i-S	750-010465 (REV 12)	D56593	M10i,M7i Forwarding Engine Spare with 128MB DRAM
CEEB 1 (Empty)				
FPC 0				E-FPC
PIC 0	PE-4GE-TYPE1-SFP-IC	750-012838 (REV 12)	DT2893	4-Port Type1 Gigabit Ethernet IQ2 PIC (Uses SFP Optics Modules
Xcvr 0 (qe-0/0/0)	SFP-T	740-013111 (REV 02)	8435809	SFP-T
Xcvr 1 (qe-0/0/1)	SFP-T	740-013111 (REV 02)	8435781	SFP-T
Xcvr 2 (qe-0/0/2)	SFP-T	740-013111 (REV 02)	8435776	SFP-T
Xcvr 3 (qe-0/0/3)	SFP-T	740-013111 (REV 02)	8446676	SFP-T
PIC 1	PE-4GE-TYPE1-SFP-IC	750-012838 (REV 12)	DT2924	4-Port Type1 Gigabit Ethernet IQ2 PIC (Uses SFP Optics Modules
Xcvr 0 (qe-0/1/0)	SFP-T	740-013111 (REV 02)	8435673	SFP-T
Xcvr 1 (qe-0/1/1)	SFP-T	740-013111 (REV 02)	8435848	SFP-T
Xcvr 2 (qe-0/1/2)	SFP-T	740-013111 (REV 02)	8435780	SFP-T
Xcvr 3 (qe-0/1/3)	SFP-T	740-013111 (REV 02)	8446709	SFP-T
PIC 2	PE-4GE-TYPE1-SFP-IC	750-012838 (REV 12)	DT2901	4-Port Type1 Gigabit Ethernet IQ2 PIC (Uses SFP Optics Modules
Xcvr 0 (qe-0/2/0)	SFP-T	740-013111 (REV 01)	7351657	SFP-T
Xcvr 1 (qe-0/2/1)	SFP-T	740-013111 (REV 01)	7351598	SFP-T
Xcvr 2 (qe-0/2/2)	SFP-T	740-013111 (REV 01)	7365191	SFP-T

Table 14 on page 135 describes the information displayed in the device inventory panel.

**Table 14: Device Inventory Fields**

Field	Description
Item	Chassis component. Depending on the device type, can include the midplane, backplane, power supplies, fan trays, Routing Engine, front panel module board, PDM, CIP, PEM, SCG, CB, FPCs, and PICs.
Model Number	Model number for the chassis component.
Part Number	Part number and revision level of the component (FRU).  “BUILTIN” indicates the component is not a FRU.
Serial Number	Serial number of the component (FRU).  “BUILTIN” indicates the component is not a FRU.
Description	Description of the component or FRU.

- To return to the device inventory view, click **Return to Inventory View** at the top of the inventory panel.

- Related Topics**
- Viewing Managed Devices on page 139
  - Viewing Physical Interfaces for Devices on page 135
  - Resynchronizing Managed Devices on page 128
  - Understanding How Junos Space Automatically Resynchronizes Managed Devices on page 118

## Viewing Physical Interfaces for Devices

Junos Space displays physical interfaces by device name, based on the device information Junos Space has in its database. You can view the operational status and admin status of physical interfaces for one or more devices to troubleshoot problems.

Sorting is disabled for the physical interfaces view to preserve the natural slot order of the devices.

If the interface status changes on the managed device, the data is not updated in Junos Space until the device is resynchronized with the Junos Space database.

To view the physical interfaces for devices:

- From the task ribbon, select the **Devices** workspace.
- From the task ribbon, select the **Manage Devices** icon.

3. Select the device for which you want to view the physical interfaces.

Junos Space displays summary information for the selected device in the Quick Look panel.



4. In the Actions panel, click View Interfaces.

Junos Space displays the status of the physical interfaces for a device.

Return to Inventory View								
Device Name	Interface Name	Ip Address	Operational Status	Admin Status	Encapsulation	Link Type	Speed (Mbps)	MTU
Maine-PE1	lo0	127.0.0.1	up	up			0	0
Maine-PE1	dsc		up	up			0	0
Maine-PE1	fxp0	10.155.69.4	up	up	Ethernet	full-duplex	100	1514
Maine-PE1	fxp1		up	up	Ethernet	full-duplex	100	1514
Maine-PE1	gre		up	up	GRE		1000	0

Table 15 on page 136 describes the information displayed for the physical Interfaces.

**Table 15: Physical Interfaces Columns**

Field	Description
Admin Status	Admin status of the interface: up or down.
Device Name	Device configuration name.
Encapsulation	Encapsulation used on the physical interface.



**Table 15: Physical Interfaces Columns** (*continued*)

Interface Name	Standard information about the interface, in the format <i>type-lfpc/pic/port</i> where <i>type</i> is the media type that identifies the network device; for example, ge-0/0/6.
IP Address	IP address for the interface.
Link Type	Physical interface link type: full duplex or half duplex.
MTU	Maximum transmission unit size on the physical interface.
Operational Status	Operational status of the interface: up or down.
Speed (Mbps)	Speed at which the interface is running.

5. To return to the device inventory, click **Return to Inventory View** at the top of the inventory panel.

- Related Topics**
- Viewing Managed Devices on page 139
  - Viewing Hardware Inventory for Devices on page 134



## Chapter 14

# Monitoring Devices

- Viewing Managed Devices on page 139
- Viewing Device Statistics on page 143

### Viewing Managed Devices

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You can view operating system, platform, IP-address, and connection status information for all the managed devices in your network. Device information can be viewed graphically or in a table. By default, Junos Space displays thumbnail representations of devices.

- Viewing Devices as Graphics on page 139
- Viewing Devices in a Table on page 141

### Viewing Devices as Graphics

You can view thumbnails, summary information, and detailed information about the devices managed by Junos Space.

To view the managed devices:




1. From the task ribbon, select the **Devices** workspace.
2. From the task ribbon, select the **Manage Devices** icon.

The inventory panel displays thumbnails of managed devices by name and IP address.



Above each thumbnail, an icon indicates whether the device is connected (up) or down. Table 16 on page 140 describes the connection status icons.

**Table 16: Device Connection Status Icon**

Icon	Description
	Connection is up—The device is connected to Junos Space and is running properly. <b>NOTE:</b> Before you can update a device from Junos Space (deploy service orders), the device connection must be up.
	Out Of Sync—The device is connected to Junos Space but the device configuration in the Junos Space database is Out Of Sync with the physical device.
	Connection is down—Device is not currently connected to Junos Space or an event has occurred, either manually by an administrator or automatically by the flow of a type of traffic, that has stopped the device from running.

3. You can use the following options to view information about devices:
  - To restrict the display of devices, enter a search criterion of one or more characters in the Search bar and press Enter.  
All devices that match the search criterion are shown in the main display area.
  - To view summary information for a device, click on the thumbnail.  
Junos Space displays device information in the Quick Look panel and the tasks that you can perform on the selected device in the Actions panel.

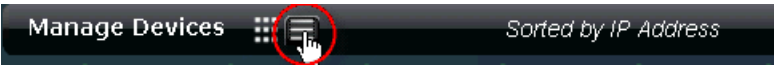


- To view hardware inventory information for a device, double-click on the thumbnail, or select the device, and click **View Physical Inventory** from the Actions panel.

**Viewing Devices in a Table**

To view configuration and run-time information for devices in a table:

1. From the task ribbon, select the **Devices** workspace.
2. Click the table icon in the filter bar, as shown in the following example.



Junos Space displays a table of devices in the inventory panel.

Manage Devices		Sorted by Interfaces				
Interfaces	OS Version	Platform	IP Address	Connection Status	Managed Status	
<a href="#">View</a>	9.3	MX960	4.4.6.10	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.2	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.13	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.9	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.30	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.8	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.12	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.20	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.1	up	In Sync	
<a href="#">View</a>	9.3	MX960	4.4.6.24	up	In Sync	

Table 17 on page 142 describes the fields displayed in the inventory window.

**Table 17: Fields in the Manage Devices Table**

Field	Description
Connection Status	<p>Connection status of the device in Junos Space.</p> <ul style="list-style-type: none"> <li>■ up—Device is connected to Junos Space. When connection status is up, the Managed status is Out of Sync, Synchronizing, In Sync, or Sync Failed.</li> <li>■ down—Device is not connected to Junos Space. When Connection status is down, the Managed status can be None or Connecting.</li> </ul>
Device Family (not displayed by default)	Device family of the selected device.
Interfaces	Link to the view of physical interfaces for the device.
IP Address	IP address of the device.
Managed Status	<p>Current status of the managed device in Junos Space:</p> <ul style="list-style-type: none"> <li>■ Connecting— Junos Space has sent connection RPC and is waiting for first connection from device.</li> <li>■ In Sync—Sync operation has completed successfully, and Junos Space and the device are synchronized.</li> <li>■ None—Device is discovered, but Junos Space has not yet sent connection RPC.</li> <li>■ Out of Sync—Device has connected to Junos Space, but the sync operation has not been initiated, or an out-of-band configuration change on the device was detected and auto-resync is disabled or has not yet started.</li> <li>■ Synchronizing—Sync operation has started because of device discovery, a manual re-sync operation, or an automatic re-sync operation.</li> <li>■ Sync Failed—Sync operation failed.</li> </ul>
Name (not displayed by default)	The device configuration name for the device.
OS Version	Operating system firmware version running on the device.
Platform	Model number of the device.
Serial Number (not displayed by default)	Serial number of the device chassis.

3. To display columns not shown in the default table view or to hide columns:
  - a. Mouse over any column header and click the down arrow. The Device List pull-down menu is displayed.
  - b. Select **Columns** from the pull-down menu, as shown in the following example.

Interfaces	OS Version	Platform	IP Address	Connection Status
<a href="#">View</a>	9.61	OLIVE	0.94.22.204	up
<a href="#">View</a>	9.61	OLIVE	0.94.22.58	up
<a href="#">View</a>	9.61	OLIVE	0.94.22.78	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up
<a href="#">View</a>	9.61	OLIVE	1	up

- c. Select the check box for columns that you want to view. Clear the check box for columns that you want to hide.

- Related Topics**
- Viewing Device Statistics on page 143
  - Viewing Hardware Inventory for Devices on page 134
  - Viewing Physical Interfaces for Devices on page 135
  - Discovering Devices on page 120

## Viewing Device Statistics

You can view the number of devices by platform, the number of Junos family devices by release, and the connection status for devices in your managed network.

This topic includes the following tasks:

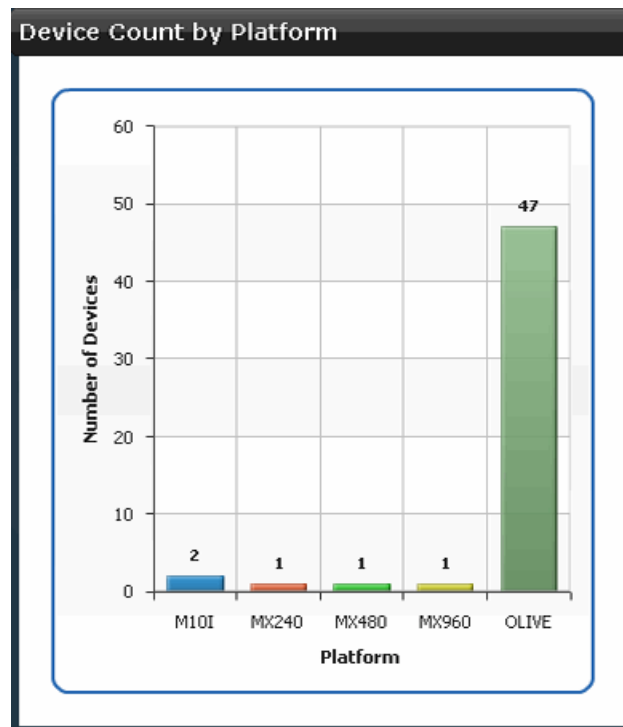
- Viewing the Number of Devices by Platform on page 143
- Viewing Connection Status for Devices on page 144
- Viewing Devices by Junos Release on page 145

### Viewing the Number of Devices by Platform

To view the number of devices by device platform:

1. From the task ribbon, select the **Devices** workspace.

Junos Space retrieves and displays the number of devices by platform, as shown in the following example.



2. Each vertical bar in the chart displays the number of managed devices for a platform.
3. To display an inventory of devices for a specific platform, double-click on the vertical bar.

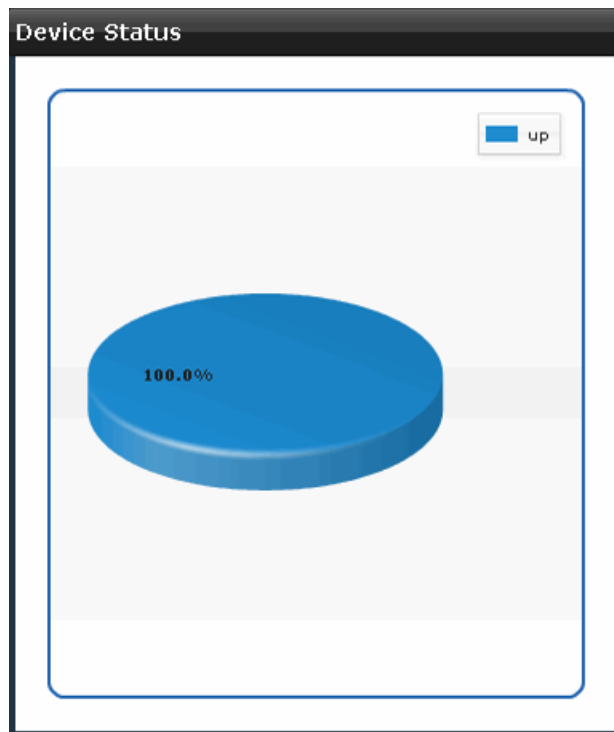
## Viewing Connection Status for Devices

To view the percentage and number of devices that are connected and down:

1. From the task ribbon, select the **Devices** workspace icon.

Junos Space retrieves and displays device connection status, as shown in the following example.





The pie chart displays the connection status for all managed devices. The up or down status is expressed as a percentage of the total number of devices.

2. To view the number of devices that are connected or down, mouse over a segment in the chart.

Junos Space displays the number of devices that are connected or down.

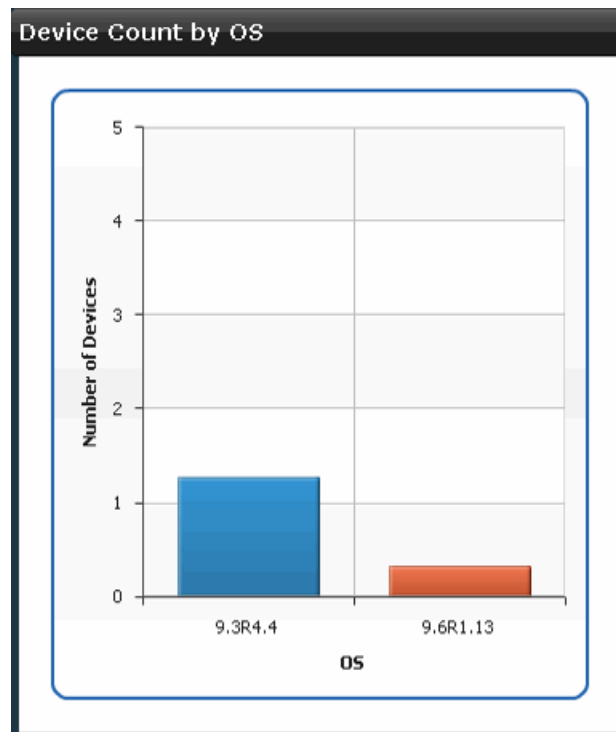
3. To display the inventory view of devices that are up or down, as represented in segments of the pie chart, double-click on a segment.

### **Viewing Devices by Junos Release**

To view the number of devices by Junos release:

1. From the task ribbon, select the **Devices** workspace icon.

Junos Space retrieves and displays the number of devices by Junos release, as shown in the following example.



2. To display an inventory of devices for a specific Junos release, double-click on a vertical bar.

- Related Topics**
- Viewing Managed Devices on page 139
  - Viewing Hardware Inventory for Devices on page 134
  - Discovering Devices on page 120

## **Part 6**

# **Managing Jobs**

- Job Management Overview on page 149
- Managing Jobs on page 151
- Monitoring Jobs on page 153



## Chapter 15

# Job Management Overview

- Job Management Overview on page 149

### Job Management Overview

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In Junos Space, a job is a user-initiated action that is performed on a Junos Space object, such as a device, service, or customer. All scheduled jobs can be monitored.

Typical jobs in Junos Space include device discovery, deploying services, prestaging devices, and performing functional and configuration audits. Jobs can be scheduled to occur immediately or in the future. For all jobs scheduled in Junos Space, you can view job status from the **Jobs** workspace. Junos Space maintains a history of job status for all scheduled jobs. When a job is scheduled from a workspace, Junos Space assigns a job ID that serves to identify the job (along with the job type) in the Manage Jobs inventory panel.

You can perform the following tasks from the **Jobs** workspace:

- View status of all scheduled, running, canceled, and completed jobs
- Retrieve details about the execution of a specific job
- View statistics about average execution times for jobs, types of jobs that are run, and success rate
- Cancel a scheduled job or in-progress job (when the job has stalled and is preventing other jobs from starting)

Junos Space supports the following job types:

- Configuration Audit
- Decommission Service
- Deploy Service
- Discover Network Elements
- Functional Audit
- Prestage Device
- Resync Network Element
- Role Assignment

- Related Topics**
- Viewing Scheduled Jobs on page 155
  - Viewing Statistics for Scheduled Jobs on page 153
  - Canceling a Job on page 151

## Chapter 16

# Managing Jobs

- Canceling a Job on page 151

### Canceling a Job

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In some cases, you might need to cancel a job. For example, you can cancel jobs that are scheduled but that you don't want to run, or jobs in-progress that are hanging or incapable of completing and therefore preventing other jobs from starting.



**NOTE:** If Junos Space determines that the job operation is non-interruptible, the job runs to completion; otherwise the job is cancelled.

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**NOTE:** Junos Space performs no cleanup on cancelled jobs.

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To cancel a job that is in progress:

1. From the task ribbon, select the **Jobs** workspace.
2. From the task ribbon, select the **Manage Jobs** icon.

The inventory panel displays thumbnails of scheduled jobs in order by scheduled start time.

3. Select the scheduled or in-progress job that you want to cancel.
4. In the actions panel, select **Cancel Job**.

When the Cancel Job operation completes, the inventory view displays the Job State CANCELLED.

- Related Topics**
- Viewing Statistics for Scheduled Jobs on page 153
  - Job Management Overview on page 149





## Chapter 17

# Monitoring Jobs

- Viewing Statistics for Scheduled Jobs on page 153
- Viewing Scheduled Jobs on page 155

### Viewing Statistics for Scheduled Jobs

You can view average execution times for scheduled jobs and information about the state and types of jobs that are run.

This topic includes the following tasks:

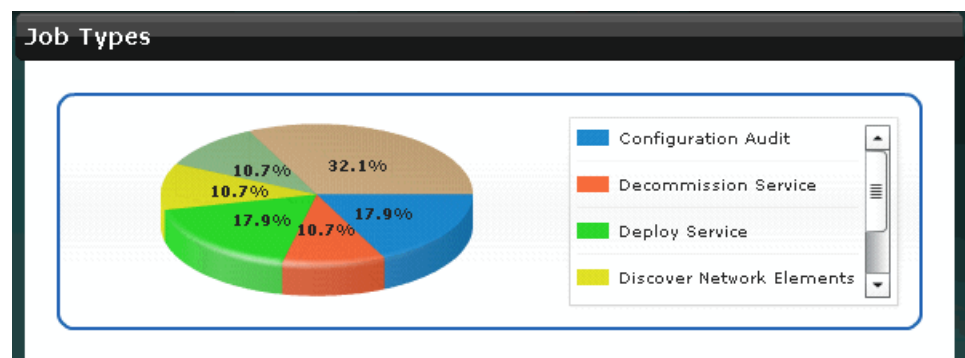
- Viewing the Types of Jobs That Are Run on page 153
- Viewing Average Execution Times for Jobs on page 154
- Viewing the State of Jobs That Have Run on page 154

### Viewing the Types of Jobs That Are Run

To view the types of scheduled jobs that are run:

1. From the task ribbon, select the **Jobs** workspace.

Junos Space displays the job types for all jobs that have run, as shown in the following illustration.



Each segment of the pie chart displays a job type and the percentage of time a job type was run.

2. To view the number of jobs of a specific type that were run, mouse over the segment of the pie chart that represents the job type.

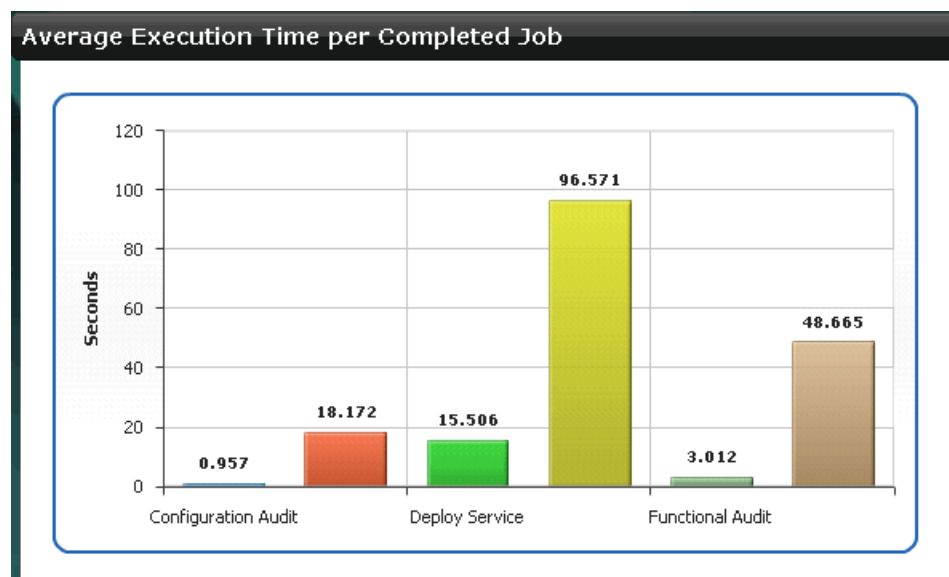
3. To view the inventory of jobs by job type, double-click on the segment of the pie chart that represents the job type.

### Viewing Average Execution Times for Jobs

To view the average execution times for scheduled jobs:

1. From the task ribbon, select the **Jobs** workspace.

Junos Space displays the average execution time per completed job, as shown in the following illustration



Each vertical bar represents a type of job, such as discovering devices, deploying services, prestaging devices, and so forth. The average execution time for each job type (represented in seconds on the y axis) is displayed above the vertical bar for the job type.

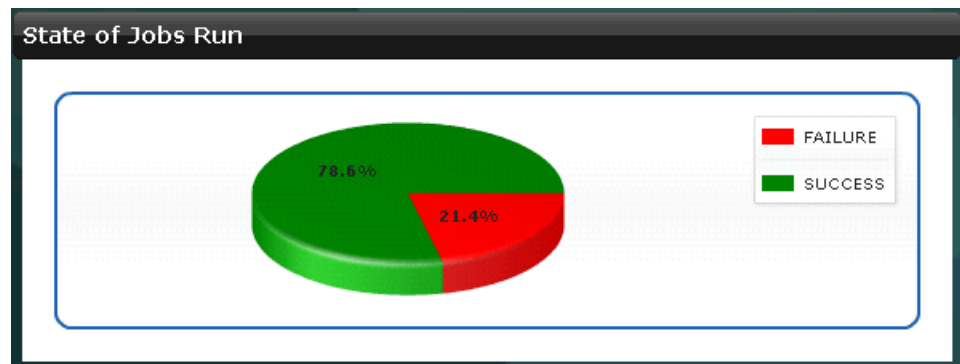
2. To see an inventory of the completed jobs for a specific job type, double-click on a vertical bar.

### Viewing the State of Jobs That Have Run

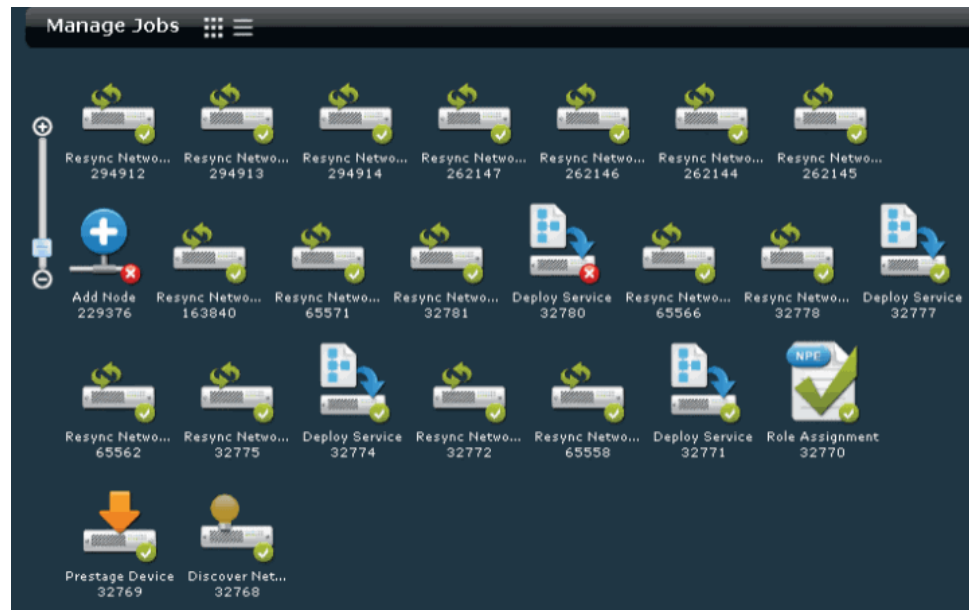
To view the state of scheduled jobs that have run:

1. From the task ribbon, select the **Jobs** workspace.

Junos Space displays the state of jobs that have run, as shown in the following illustration.



2. To view the number of jobs that succeeded or failed, mouse over a segment of the pie chart.
3. To display an inventory of jobs by job success or failure, double-click on the segment of the pie chart. For example, the following illustration shows thumbnails of all jobs that were successfully run.



- Related Topics**
- Viewing Scheduled Jobs on page 155
  - Job Management Overview on page 149

## Viewing Scheduled Jobs

You can view scheduled jobs in Junos Space as graphics or as tables. By default, Junos Space displays thumbnail representations of jobs.

- Viewing Jobs as Graphics on page 156
- Viewing Jobs in a Table on page 158

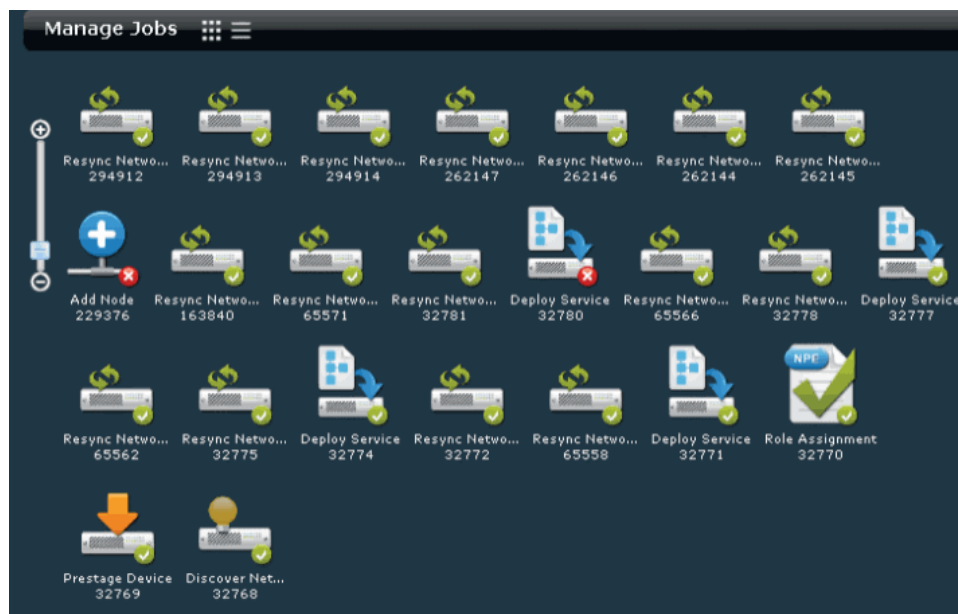
## Viewing Jobs as Graphics

You can view thumbnail, quick look, and detailed information about scheduled jobs.

To view scheduled jobs:




1. From the task ribbon, select the **Jobs** workspace.
2. From the task ribbon, select the **Manage Jobs** icon.

The inventory panel displays thumbnails of scheduled jobs in order by scheduled start time, as shown in the following illustration.





Each thumbnail represents a scheduled job and the job type. An icon indicating job success or failure is displayed in the lower right corner of the thumbnail. Table 18 on page 156 shows the icons.

**Table 18: Job Success or Failure Icons**

Icon	Description
	The job completed successfully.
	The job failed.
	The job was canceled by a user.

**Table 18: Job Success or Failure Icons** *(continued)*

	The job is scheduled.
	The job is in progress.

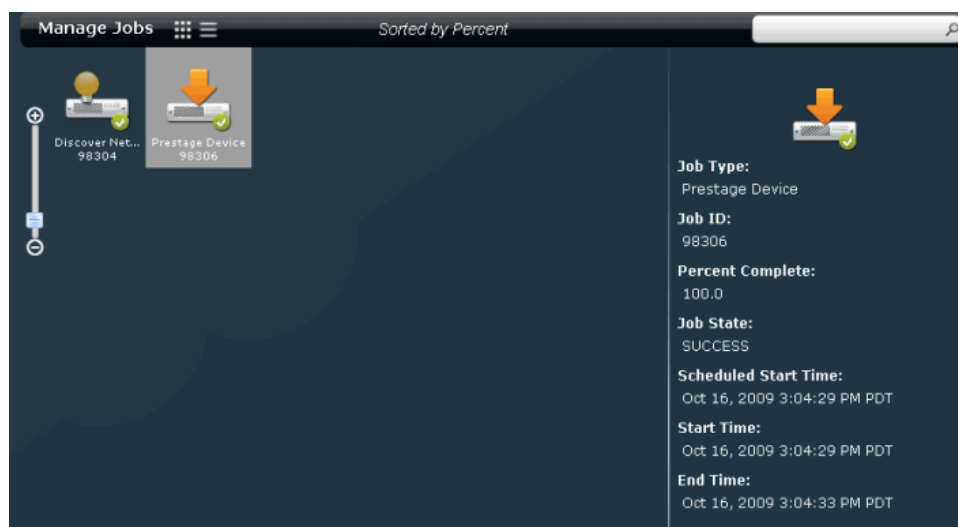
3. To view additional information about tasks, use the following options:

- To restrict the display of jobs, enter a search criterion of one or more numbers in the Search bar and press Enter.

All jobs that match the search criterion are shown in the main display area.

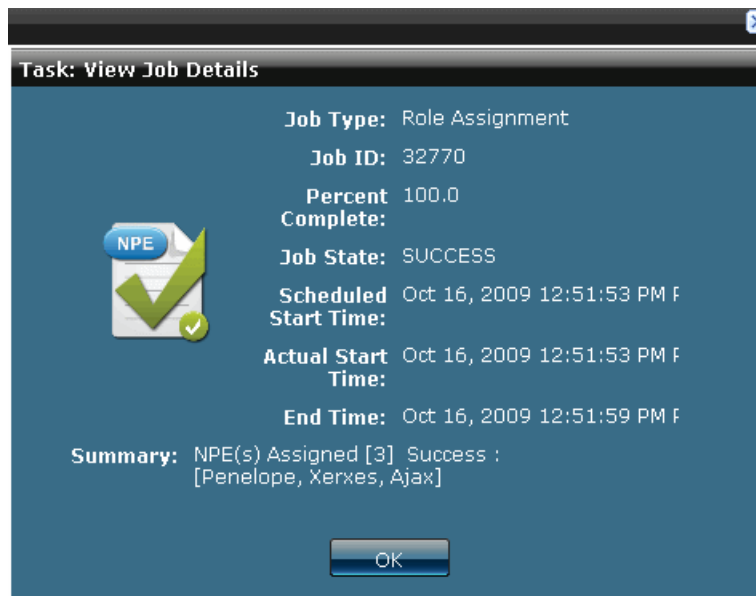
- To view summary information for a job, click on the thumbnail.

The Quick Look panel displays job summary information, as shown in the following example.



- To view detailed information about a scheduled job, double-click on the thumbnail. Detailed job information is displayed in either a form-based or table-based format depending on the job type.

For example, detailed information for a Role Assignment job is displayed in a form-based view.



Detailed information for a Discover Network Elements job is displayed in a table-based view.

IP Address	Hostname	Status	Description
10.155.64.1		Skipped	SNMP settings for Device and JMP do not match
10.155.64.2	Penelope	Device Managed	
10.155.64.3		Skipped	Device is not reachable
10.155.64.4		Skipped	Device is not reachable
10.155.64.5	Ajax	Device Managed	

Page 1 of 2 | Displaying 1 - 25 of 40

## Viewing Jobs in a Table

To view job information in a table:

1. From the task ribbon, select the **Jobs** workspace.
2. To display jobs in a table, click the table icon from the filter bar, as shown in the illustration.



Junos Space displays a table view of jobs that have run, as shown in the example.

Manage Jobs  					
Sorted by Percent					
Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	✓ SUCCESS	Discover Network Elements	98304	Number of scanned IP: 1 Number of Skipped: 0 Number of Discovery succeeded: 1 Number of Already Managed: 0 Number of Device Managed: 0 Number of Juniper Device but Add device failed: 0	Oct 16, 2009 3:00:02 PM PDT
100.0	✓ SUCCESS	Prestage Device	98306	Discover Roles: NPE(s) Discovered [13] P(s) Discovered [0] Undiscovered [0]	Oct 16, 2009 3:04:29 PM PDT

The fields displayed in the Jobs table are described in Table 19 on page 159.

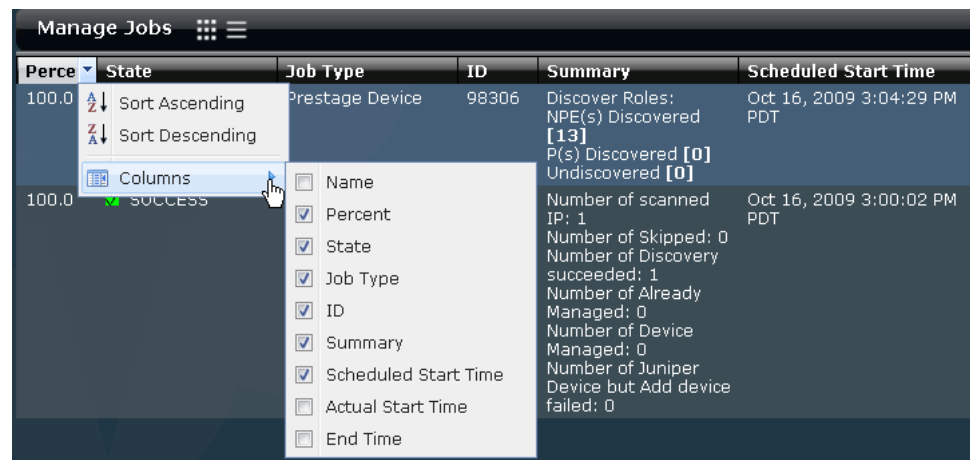
**Table 19: Fields in the Jobs Table**

Field	Description
Actual Start Time (not displayed in default view)	Time when Junos Space begins execution of the job. In most cases, actual start time should be the same as the scheduled start time.
End Time (not displayed in default view)	Time that the job completed or was terminated, if job execution failed.
ID	ID of the job.
Job Type	The following job types are supported: <ul style="list-style-type: none"> <li>■ Configuration Audit</li> <li>■ Decommission Service</li> <li>■ Deploy Service</li> <li>■ Discover Network Elements</li> <li>■ Functional Audit</li> <li>■ Prestage Device</li> <li>■ Resync Network Element</li> </ul>
Name (not displayed in default view)	For most jobs, the name is the Job Type with the timestamp (in milliseconds) appended. However, for service-related jobs (Deploy Service, Decommission, Configuration Audit, and Functional Audit) jobs, the job name is supplied by the user as part of the workflow.
Percent	Percentage of job that has completed.
Scheduled Start Time	The scheduled start time for the job (specified by a Junos Space user).
State	State of job execution: <ul style="list-style-type: none"> <li>■ SUCCESS—Job completed successfully</li> <li>■ FAILURE—Job failed and was terminated.</li> <li>■ IN PROGRESS—Job is in progress..</li> <li>■ CANCELED—Job was canceled by a user.</li> </ul>

**Table 19: Fields in the Jobs Table** (continued)

Summary	The operations executed for the job.
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3. To display columns not shown in the default table view or to hide columns:
  - a. Mouse over any column header, and click the down arrow button. The Job table pull-down menu is displayed.
  - b. Select **Columns** from the pull-down menu, as shown in the following illustration.



- c. Select the check box for columns not currently displayed that you want to view. Clear the check box for columns that you want to hide.

- Related Topics**
- Viewing Statistics for Scheduled Jobs on page 153
  - Job Management Overview on page 149
  - Canceling a Job on page 151