JUNIPER NETWORKS

# Junos® Space

## Network Director Frequently Asked Questions

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*Junos® Space Network Director Frequently Asked Questions*
1.5


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

YEAR 2000 NOTICE

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

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# Table of Contents

# List of Tables

# About the Documentation



## Documentation and Release Notes

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## Documentation Conventions

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

### Table 1: Notice Icons

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

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

### Table 2: Text and Syntax Conventions

| Convention | Description | Examples |
|---|---|---|
| **Bold text like this** | Represents text that you type. | To enter configuration mode, type the **configure** command:<br><br>user@host> **configure** |
| `Fixed-width text like this` | Represents output that appears on the terminal screen. | `user@host>` **show chassis alarms**<br><br>`No alarms currently active` |
| *Italic text like this* | • Introduces or emphasizes important new terms.<br>• Identifies guide names.<br>• Identifies RFC and Internet draft titles. | • A policy *term* is a named structure that defines match conditions and actions.<br>• *Junos OS CLI User Guide*<br>• RFC 1997, *BGP Communities Attribute* |
| *Italic text like this* | Represents variables (options for which you substitute a value) in commands or configuration statements. | Configure the machine's domain name:<br><br>[edit]<br>root@# **set system domain-name** *domain-name* |
| **Text like this** | Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components. | • To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level.<br>• The console port is labeled **CONSOLE**. |
| < > (angle brackets) | Encloses optional keywords or variables. | **stub <default-metric** *metric***>;** |

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

| Convention | Description | Examples |
|---|---|---|
| \| (pipe symbol) | Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity. | **broadcast \| multicast**<br><br>**(*string1* \| *string2* \| *string3*)** |
| # (pound sign) | Indicates a comment specified on the same line as the configuration statement to which it applies. | **rsvp { # Required for dynamic MPLS only** |
| [ ] (square brackets) | Encloses a variable for which you can substitute one or more values. | **community name members [ *community-ids* ]** |
| Indention and braces ( { } ) | Identifies a level in the configuration hierarchy. | [edit]<br>routing-options {<br>  static {<br>  route default {<br>  nexthop *address*;<br>  retain;<br>  }<br>  }<br>} |
| ; (semicolon) | Identifies a leaf statement at a configuration hierarchy level. | |
| GUI Conventions | | |
| **Bold text like this** | Represents graphical user interface (GUI) items you click or select. | • In the Logical Interfaces box, select **All Interfaces**.<br>• To cancel the configuration, click **Cancel**. |
| > (bold right angle bracket) | Separates levels in a hierarchy of menu selections. | In the configuration editor hierarchy, select **Protocols>Ospf**. |

## Documentation Feedback

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

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

## Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract,

or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

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

## Self-Help Online Tools and Resources

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

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://www.juniper.net/alerts/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

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

## Opening a Case with JTAC

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

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

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

PART 1

# FAQ

CHAPTER 1

# User Interface



## What Are the Client Requirements?

You access Network Director through a Web browser. The client requirements are as follows:

- The supported Web browsers are:
  - Mozilla Firefox versions 14.0 and later
  - Internet Explorer versions 9.0 and 10.0
  - Chrome version 17 and later
- No browser plug-ins are required.
- A minimum screen resolution of 1280x1024 is required for the user interface to display properly.
- Because Network Director is accessible through a browser, there are no operating system requirements.

**Related Documentation**

- *Logging In to Network Director*
- *Understanding the Network Director User Interface*

## What URL should I Use?

You can access Network Director directly by using the following URL:

https://<*n.n.n.n*>/networkdirector

where *n.n.n.n* is the IP address of the Junos Space Web interface. You can bookmark the login page for future use.

You can also access Network Director indirectly by logging in to the Junos Space Web interface and then switching to Network Director by selecting Network Director from the Junos Space task tree.

**Related Documentation**

- What Are the Default Username and Password? on page 4
- *Logging In to Network Director*

## What Are the Default Username and Password?

The default username and password are the same as the Junos Space default username and password:

- Username: super
- Password: juniper123

The user with the username *super* is assigned the system administrator role and has complete access to all Network Director features.

For information about setting up additional users, see *Understanding Network Director User Administration*.

**Related Documentation**

- What URL should I Use? on page 4
- How Do I Change My Password? on page 5
- *Understanding Network Director User Administration*

## How Do I Change My Password?

You can change your password by using the the User Password icon available on the Junos Space banner.

To change your password:

1. Click the Junos Space icon in the Network Director banner.

   The Network Application Platform dashboard appears.

2. Click the User Password icon (the icon that resembles a gear) in the Junos Space banner.

3. Enter your old and new passwords as prompted.

For more information about changing your password, see Changing User Passwords in the Junos Space documentation.

**Related Documentation**

- What Are the Default Username and Password? on page 4

## What Are the DMI Schema Requirements for Working on Network Director?

Each device type is described by a unique data model (DM) that contains all the configuration data for it. The DMI schema lists all the possible fields and attributes for a type of device. The newer schemas describe the new features available with recent device releases. It is important that you load all your device schemas into Junos Space Network Management Platform; otherwise only a default schema will be applied when you try to edit a device configuration.

In most installations, Junos Space automatically matches DMI schemas with device families. But there might be certain situations where your network uses a device for which Junos Space does not have the latest or a supported schema available. In such instances, you must obtain and upload the required schema and set it as the default DMI schema for each device family. Setting the default DMI schema for each device family enables Junos Space to apply the appropriate schema to each device family.

Table 3 on page 6 lists the latest DMI schemas that you must obtain and upload in Junos Space before you start working on Network Director or Network Director API Release 1.5:

### Table 3: DMI Schemas

| Device | Name of the DMI Schema | Product | Device Family |
|---|---|---|---|
| EX4300<br>EX9200 | JUNOS 13.2X50-D10.2 | Network Director<br>Network Director API | junos |
| MX Series (applies to Network Director API only) | JUNOS 12.3R4.6 | Network Director API | junos |
| QFabric devices | JUNOS 13.1X50-D15 | Network Director<br>Network Director API | junos-qf |
| QFX3500<br>QFX3600 | JUNOS 12.3X50-D30.2 | Network Director<br>Network Director API | junos-qfx |
| SRX Series (applies to Network Director API only) | JUNOS 12.1R7.9 | Network Director API | junos-es |

For detailed steps for acquiring and uploading the schema files, see the *Junos Space Documentation*.

**Related Documentation**

- Managing DMI Schemas Overview

CHAPTER 2

# Device Discovery, Configuration, Management

## What Juniper Networks Devices Does Network Director Support?

Network Director supports the following Juniper Networks devices:

- EX Series Ethernet Switches

NOTE: EX4500 and EX4550 devices and the corresponding profiles that were discovered and managed by Network Director Release 1.0 or Release 1.1, will be listed under DataCenter devices after you upgrade to Network Director Release 1.5.

- EX Series Switches with ELS
- QFX Series devices
- QFabrics
- WLC Series Wireless LAN Controllers
- WLA Series Wireless LAN Access Points

In addition, you can also discover and monitor vCenter virtual devices in your network by using Network Director. For a complete list of the supported devices and their required operating system versions, see the Network Director release notes at Network Director documentation page.

**Related Documentation**

- What Is the Minimum Configuration Required for Discovering and Managing Devices? on page 9

## What Is the Minimum Configuration Required for Discovering and Managing Devices?

For Network Director to be able to discover and manage devices, the following minimum configuration is required:

- A static management IP address must exist on the device that is reachable from the Junos Space platform. This IP address can be in-band or out-of-band.
- SSH v2 must be enabled on the device.
- If you plan to use SNMP for device discovery, you must enable SNMP on the device and create the appropriate V1/V2/V3 credentials.
- The following protocol ports must be open between the Junos Space Network Management Platform server and the devices:
  - Port 22 for SSH connections. If you have changed the SSH port to a port other than port 22 on your Network Management Platform, you must change the SSH ports on your managed devices to the port that the Network Management Platform is using.
  - Port 443 for virtualization support. Use port 443 for outbound traffic to vCenter servers.
  - Port 10162 for SNMP traps. Network Director receives traps from managed devices on this port. (After you install Network Director, use Network Director to configure SNMP on your devices to send traps to Network Director on this port.)
  - Port 8889 for the management of wireless LAN controllers.
  - Port 21 (TCP) and port 69 (UDP) for uploading the software image and configuration file to the FTP server.

  You can verify that the ports are open to the devices by logging in to the Network Management Platform CLI and executing the **nmap** command. For example, to verify that port 8889 is open to a controller, enter:

  ```
  root@space# nmap <controller-ip-address> -p 8889
  ```

**Related Documentation**

- What Juniper Networks Devices Does Network Director Support? on page 8
- *Discovering Devices in a Physical Network*
- *Discovering Devices in a Virtual Network*

## Can I Discover Network Director Managed Devices by Using Junos Space?

You can use Junos Space device discovery, available under the Network Application Platform, to discover devices supported by Network Director and to bring them under Network Director management. The only exception to this are the virtual devices in your network. You can discover virtual devices and bring them under Network Director management only by using the virtual network discovery task of Network Director.

For devices that you want to discover by using Junos Space, ensure that SNMP is enabled on that device and that you choose SNMP as the discovery method. Network Director device discovery does not have this restriction.

When you use Junos Space device discovery to discover devices, Network Director imports the device configurations of the discovered devices into its Build mode profiles and configuration just as it does when you use Network Director to discover devices. In addition, when Network Director is installed, it imports the configurations of any supported devices that were previously discovered by Junos Space.

Any devices discovered by Network Director are also brought under Junos Space management. If you uninstall Network Director, the devices you discovered by using Network Director remain in the Junos Space device database. This does not apply for virtual devices. These devices will have to be rediscovered from Network Director after you reinstall Network Director.

**Related Documentation**

- *Discovering Devices in a Physical Network*
- *Discovering Devices in a Virtual Network*

## What Are the Tasks That I should Perform to be Able to Manage Supported Devices from Network Director?

Following is the sequence of tasks that you need to perform to be able to manage switches, WLCs, and QFabric systems in your network by using Network Director:

- Discover devices by using the Discover Devices task in Build mode with Location, Logical, Physical, or Custom Views selected. Network Director automatically creates appropriate profiles based on the configuration of the discovered devices.
- Optionally, create additional profiles depending on your network configuration and requirements.
- Assign profiles to switches, WLCs, and QFabric systems.
- Deploy the configuration changes to devices by using the Deploy Configuration Changes task in Deploy mode.
- Use Monitor mode to analyze the status and performance of devices.
- Use Fault mode to know about the health of your network and changing conditions of your equipment.
- Use Report mode to create standardized reports from the monitoring and fault data collected by Network Director.

Following is the sequence of tasks that you need to perform to be able to manage virtual devices in your network using Network Director:

- Discover Virtual Infrastructure (VMware vCenter) by using the Discover Virtual Devices task in the Build mode with Virtual View selected.
- Manage Network Adapter associations between the host network adapter and the corresponding physical network adapter on the physical switch by using the Manage Network Adapter Associations task.
- Set the orchestration mode of each vCenter server from the Manage Virtual Networks page.
- Use Monitor mode to analyze the status and performance of virtual devices and to view the vMotion history.

**Related Documentation**

- *Discovering Devices in a Physical Network*
- *Understanding Profiles*
- *Deploying Configuration to Devices*
- *Discovering Devices in a Virtual Network*
- *Managing Network Adapter Associations*
- *Managing Virtual Networks*
- *Understanding Monitor Mode in Network Director*

- *Understanding Fault Mode in Network Director*
- *Understanding Report Mode in Network Director*

## What Are Out-of-Band Changes and How Does Network Director Handle Them?

Out-of-band configuration changes are changes you make to a device configuration through any method other than deploying the configuration change from Deploy mode in Network Director.

Out-of-band changes include configuration changes made by:

- Using the device CLI.
- Using the device Web-based management interface (J-Web interface or Web View).
- Using the Junos Space Network Management Platform configuration editor.
- Using RingMaster.
- Using any other Junos Space application.
- Restoring or replacing device configuration files.

The above configuration changes are out-of-band even if you use Network Director to access the device management interface or to restore configuration files.

When you make out-of-band changes, Network Director detects that the configuration has changed on the device. It sets the device configuration state to *Out of Sync* because the device configuration no longer matches the Build mode configuration for the device. You cannot deploy configuration on devices that are in the Out of Sync state.

To return the device configuration state to In Sync, use the Resynchronize Device Configuration task in Deploy mode. This task resynchronizes the device's configuration stored in Network Director to match the device configuration. It disassociates all profiles from the device and then reimports the device configuration. Reimporting the device configuration, reestablishes the original profile associations if they were unaffected by the out-of-band configuration changes and creates new profiles and associations as needed.

How Network Director performs resynchronization depends on the system of record (SOR) mode set for the Junos Space Network Management Platform. There are two possible modes:

- Network as system of record (NSOR). This is the default mode.
- Junos Space as system of record (SSOR).

You set the mode in Junos Space under Administration > Applications > Network Management Platform > Modify Application Settings.

In NSOR mode, the network device is considered the system of record for device configuration, which means that the configuration maintained by the device takes precedence over the configuration maintained by Junos Space and Network Director.

Thus, when you perform a resynchronization, the Junos Space configuration record and the Network Director Build mode configuration are updated to match the device configuration.

When Junos Space is in SSOR mode, Junos Space is considered the system of record for device configuration. In this mode, when an out-of-band configuration change occurs on a device, you can choose whether to accept the change or to overwrite the change with the configuration maintained by Junos Space.

**Related Documentation**

- *Understanding Resynchronization of Device Configuration*
- *Understanding Build Mode in Network Director*
- Understanding Systems of Record in Junos Space

## Can I Make Changes to My Managed Devices by Using the Configuration Editor in Junos Space?

You can use the Junos Space configuration editor to make configuration changes to all the data center and campus switches that are managed by Network Director. However, you cannot use it to make configuration changes to WLC Series wireless LAN controllers.

Note that any changes you make to EX Series switches by using the configuration editor are out-of-band changes. The Build mode configuration is not updated to reflect these changes. For more information about how Network Director handles out-of-band changes, see "What Are Out-of-Band Changes and How Does Network Director Handle Them?" on page 12.

**Related Documentation**

- Editing Device Configuration Overview

## What should I Do If I Do Not See Any Data in the Monitoring and Fault Modes?

If you face such a scenario, you must restart the jboss service that runs in Junos Space. Do the following to stop and start the jboss service:

1. Log in to the Junos Space system console.
2. When the console displays the Junos Space Appliance Settings menu, enter the number corresponding to the run shell option at the prompt.
3. Type the password and press Enter.
4. At the shell prompt, type the following commands sequentially and press enter after each command:

```
[root@space]#service jmp-watchdog stop
[root@space]#service jboss stop
[root@space]#service jboss start
[root@space]#service jmp-watchdog start
```

Junos Space restarts. This might take a few minutes. After Junos Space restarts, you can log in to Network Director and continue working in Monitoring and Fault modes.

## What should I Do If I Do Not See Device Connectivity in the Topology View?

To be able to see the device connectivity in the topology view, ensure that:

- You have enabled SNMP on the managed device.
- You select the SNMP option while discovering the devices.
- Any one of the layer 2 protocols—Link Layer Discovery Protocol (LLDP), Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP)—is enabled on the managed device.
- You use the Refresh Topology task to refresh the devices that are already discovered and managed by Network Director.

**Related Documentation**

- *Setting Up and Managing the Topology View*

CHAPTER 3

# Virtual Device Management



## After A vMotion, Why Are the Changes Not Visible in Network Director?

After each successful vMotion, Network Director initiates an *orchestration* in your virtual network. Network Director tracks the status of orchestration by using an orchestration job. After the orchestration job is completed successfully, you must manually resynchronize the physical switch's configuration with Network Director. If the system of record (SOR) mode set for the Junos Space Network Management Platform is:

- Network as system of record (NSOR), then performing a resynchronization ensures that Junos Space automatically resynchronizes its configuration record to match the device configuration and sets the device configuration state to In Sync when the resynchronization completes.
- Junos Space as system of record (SSOR), then you must perform a resynchronization and accept the out-of-band changes. Both the Junos Space configuration record and the Network Director Build mode configuration are resynchronized to reflect the out-of-band configuration changes.

**Related Documentation**

- *Resynchronizing Device Configuration*

CHAPTER 4

# Alarms



## How Do I Ensure That I Receive Alarms in Network Director?

If you enable alarms, Network Director notifies you of unexpected, significant events happening in your network by displaying alarms that represent these events. To enable alarms:

- Ensure that port 10162 is open between the Junos Space appliance and the managed device. Network Director uses this port to receive SNMP notifications, or traps, from the devices.
- Use the Set SNMP Trap Configuration task in Deploy mode to configure your devices to send traps to Network Director.
- Ensure that the alarms relevant to you are enabled in the Fault tab under Preferences.

**Related Documentation**

- What Is the Minimum Configuration Required for Discovering and Managing Devices? on page 9
- *Enabling SNMP Categories and Setting Trap Destinations*
- *Setting Up User and System Preferences*

CHAPTER 5

# Administration



## How Do I Back Up Network Director Data?

You can back up the data that Network Director holds—such as configuration data, monitoring data, and generated reports. You do so by using the Junos Space Network Application Platform database backup and restore facility. This facility backs up all the data kept by Junos Space and installed applications and can be configured to perform backups on a recurring schedule.

If you restore the database from a backup, all data generated after you performed the backup is lost.

To back up Network Director data:

1. Click the **Space Platform** icon in the Network Director banner.

   The Network Application Platform dashboard appears.
2. Select **Administration** > **Databases** from the tasks list in the Network Application Platform workspace.
3. Click the **Backup Database** icon.

**Related Documentation**

- Database Backup and Restore Overview

CHAPTER 6

# Adapters



## What Is the MSS OS Adapter?

To manage devices, Network Director uses Juniper Network's Device Management Interface (DMI), which is an extension to the NETCONF network configuration protocol. Because Mobility System Software (MSS) running on WLC Series wireless LAN controllers does not support DMI, an MSS OS adapter is used to translate communications between Network Director and WLC Series controllers.

The MSS OS adapter is automatically installed when you install Network Director. To verify that it is installed:

1. Click the **Space Platform** icon in the Network Director banner.

   The Network Application Platform dashboard appears.
2. Select **Devices** > **Device Adapter** from the tasks list.
3. Confirm that **MSSOSADAPTER** appears in the list of device adapters.

**Related Documentation**

- What Juniper Networks Devices Does Network Director Support? on page 8