

Security Director

Security Director Installation and Upgrade Guide

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Security Director Security Director Installation and Upgrade Guide
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About the Documentation

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Use this guide to install and upgrade Security Director application, set up Log Collector, add Log Collector to Security Director, and upgrade Log Collector.

Documentation and Release Notes

To obtain the most current version of all Juniper Networks[®] technical documentation, see the product documentation page on the Juniper Networks website at <https://www.juniper.net/documentation/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <https://www.juniper.net/books>.

Documentation Conventions

[Table 1 on page vi](#) 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.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page vi 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: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>

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

Convention	Description	Examples
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric <i>metric</i> >;
(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 (<i>string1</i> <i>string2</i> <i>string3</i>)
# (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 [<i>community-ids</i>]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	

GUI Conventions

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

Convention	Description	Examples
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. 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 so that we can improve our documentation. You can use either of the following methods:

- Online feedback system—Click TechLibrary Feedback, on the lower right of any page on the [Juniper Networks TechLibrary](#) site, and do one of the following:



- Click the thumbs-up icon if the information on the page was helpful to you.
- Click the thumbs-down icon if the information on the page was not helpful to you or if you have suggestions for improvement, and use the pop-up form to provide feedback.
- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software 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 Juniper Care or Partner Support Services 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 <https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <https://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: <https://www.juniper.net/customers/support/>
- Search for known bugs: <https://prsearch.juniper.net/>
- Find product documentation: <https://www.juniper.net/documentation/>
- Find solutions and answer questions using our Knowledge Base: <https://kb.juniper.net/>
- Download the latest versions of software and review release notes: <https://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <https://www.juniper.net/company/communities/>
- Create a service request online: <https://myjuniper.juniper.net>

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

Creating a Service Request with JTAC

You can create a service request with JTAC on the Web or by telephone.

- Visit <https://myjuniper.juniper.net>.
- 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 <https://support.juniper.net/support/requesting-support/>.

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Security Director Installation Overview

Security Director is a Junos Space management application designed to enable quick, consistent, and accurate creation, maintenance, and application of network security policies. It is a powerful and easy-to-use solution that lets you secure your network by creating and publishing firewall policies, IPsec VPNs, NAT policies, IPS policies, and application firewalls.

Before you install Security Director, you must configure the Junos Space Appliance as a Junos Space node.

You can install Security Director in one of the following appliances:

- Juniper Networks JA2500 Junos Space Hardware Appliance—The JA2500 appliance consists of preconfigured Junos Space Network Management Platform software. It is a dedicated hardware device that provides the computing power and specific requirements to run Security Director and the Security Director API as applications.

The JA2500 appliance has a 2-U, rack-mountable chassis with dimensions of 17.81 in. x 17.31 in. x 3.5 in. (45.2 cm x 44 cm x 8.89 cm). The appliance has six 1-TB hard drives arranged in a RAID 10 configuration.

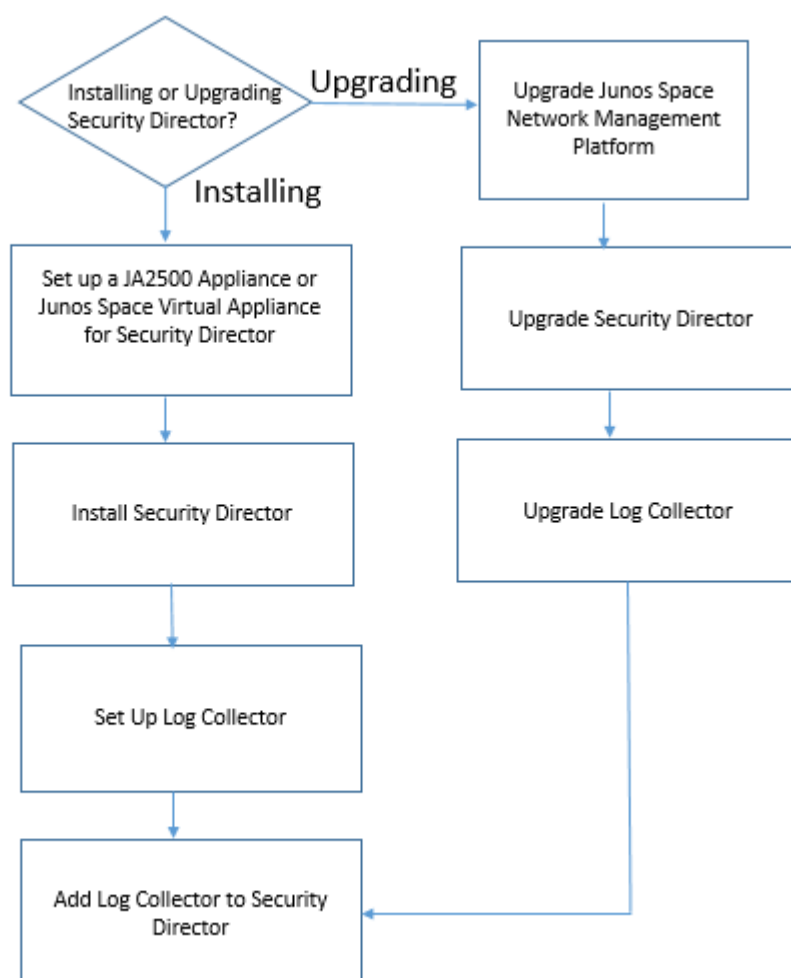
For details about the JA2500 appliance and instructions for installation, see the [Juniper Networks JA2500 Junos Space Appliance Hardware Guide](#).

- Junos Space Virtual Appliance—The Junos Space virtual appliance consists of preconfigured Junos Space Network Management Platform software with a built-in operating system and application stack that is easy to deploy, manage, and maintain. A Junos Space virtual appliance includes the same software and provides all the functionality available in a JA2500 appliance. You must deploy the virtual appliance on a VMware ESX server, VMware ESXi server, or a KVM server which provides a CPU, hard disk, RAM, and a network controller, but requires installation of an operating system and applications to become fully functional.

For information about installing Junos Space virtual appliances on a VMware ESX server, VMware ESXi server, or KVM server, see the [Junos Space Virtual Appliance Installation and Configuration Guide](#).

[Figure 1 on page 12](#) shows the Security Director installation and upgrade flow.

Figure 1: Security Director Installation and Upgrade Flow



Intended Audience

This document is intended for network operators and administrators who install, configure, and manage the network security infrastructure.

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[Setting Up a Junos Space Virtual Appliance for Security Director | 13](#)

Setting Up a JA2500 Appliance for Security Director

The Juniper Networks JA2500 Junos Space appliance is a dedicated hardware device that provides the computing power and specific requirements to run Security Director and the Security Director API as applications. For detailed steps on installing a JA2500 appliance, see [Juniper Networks JA2500 Junos Space Appliance Hardware Guide](#).

You must set up the JA2500 appliance to run as a Junos Space node. To configure a JA2500 appliance as a Junos Space node, you must configure basic network and system settings to make the appliance accessible on the network. For complete configuration steps, see [Configuring a Junos Space Appliance as a Junos Space Node](#).

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Setting Up a Junos Space Virtual Appliance for Security Director

The Junos Space virtual appliance consists of preconfigured Junos Space Network Management Platform software with a built-in operating system and application stack that is easy to deploy, manage, and maintain. For more information on installing Junos Space virtual appliance, see [Junos Space Virtual Appliance Installation and Configuration Guide](#).

You must set up the Junos Space virtual appliance to run as a Junos Space node. After you deploy a Junos Space virtual appliance, you must enter basic network and machine information to make your Junos Space virtual appliance accessible on the network. For complete configuration steps, see [Configuring a Junos Space Virtual Appliance as a Junos Space Node](#).

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Upgrading Junos Space Network Management Platform

Junos Space Security Director Release can be installed or upgraded only on the supported Junos Space Network Management Platform Release. For example, Security Director Release 19.1R2 is supported only on Junos Space Network Management Platform Release 19.1R1. If your appliance is running the supported version of Junos Space, you can skip this procedure and begin installation of Security Director. For information on supported version of Junos Space Network Management Platform for Security Director, see [“Upgrading Security Director” on page 16](#).

If your appliance is running a Junos Space Network Management Platform release that is earlier than the supported release, you need to upgrade Junos Space Network Management Platform before upgrading Security Director.

To upgrade your Junos Space Network Management Platform:

1. Determine the installed Junos Space Network Management Platform version:
 - a. Log in to Junos Space. The default username is super and password is juniper123. The Dashboard is displayed.

Change the default credentials, when prompted.
 - b. Click the + icon next to Administration to expand the Administration menu.
 - c. Click **Applications** to list all of the applications installed.
 - d. Note the version of the Junos Space Network Management Platform or the Network Application Platform. (Some earlier versions of the Network Management Platform were named Network Application Platform.) If the currently installed release is a supported one, you can skip the upgrade procedure; if not, you must upgrade the Junos Space Network Management Platform to the supported release.
2. Upgrade Junos Space Network Management Platform using the procedure at [Upgrading to Junos Space Network Management Platform Release 19.1R1](#).

NOTE: You can upgrade the existing Junos Space Platform running on your appliance to the immediate next release. You can also choose to skip a release and upgrade to the next release. For example, you can upgrade to Junos Space Network Management Platform 19.1R1 from Junos Space Network Management Platform 18.4R1 or 18.3R1.

NOTE: For more information about application compatibility, see the Knowledge Base article KB27572 at [Junos Space Application Compatibility](#).

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[Setting Up a Junos Space Virtual Appliance for Security Director](#) | 13

Installing Security Director

In Junos Space Security Director, a single image installs Security Director, Log Director, and the Security Director Logging and Reporting modules. You must deploy the Log Collector and then add it to the Security Director to view the log data in the Dashboard, Events and Logs, Reports, and Alerts pages.

NOTE: Both JSA as Log Collector and Security Director Log Collector cannot be added together.

NOTE: Upgrade to the supported release of Junos Space Network Management Platform Release. See [“Upgrading Junos Space Network Management Platform”](#) on page 14.

To install the Junos Space Security Director:

1. Download the Junos Space Security Director Release image from the [download site](#).
2. Install the Security Director application using the procedure at [Adding a Junos Space Application](#).

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[Upgrading Security Director](#) | 16

[Setting Up Security Director Log Collector](#) | 38

Upgrading Security Director

You can upgrade from a previous Security Director release to the latest Security Director release.

Before You Begin

- If you are upgrading from a previous version of Security Director, clear your browser cache before accessing the Security Director user interface.
- Back up Junos Space Security Director Release that you want to upgrade. You must take the backup before upgrading Junos Space Network Management Platform. Backing up the Junos Space Network Management Platform database before the upgrade helps you to recover the data if the upgrade fails. See [Backing Up the Junos Space Network Management Platform Database](#).
- You must upgrade to the supported Junos Space Network Management Platform Release, before you upgrade the Security Director, Log Director, and Security Director Logging and Reporting modules. See [“Upgrading Junos Space Network Management Platform” on page 14](#).
- The Junos Space Network Management Platform should be active and functioning.

NOTE: Required Platform Version column in [Table 3 on page 17](#) indicates the supported Junos Space Network Management Platform version. Before upgrading Security Director, ensure that the system is running the supported Junos Space Network Management Platform version. See [“Upgrading Junos Space Network Management Platform” on page 14](#).

Table 3: Upgrade Path

Upgrading to Release	Required Platform Version	Upgrade Path	Description
Security Director 19.1R2	19.1R1	<ul style="list-style-type: none">• 19.1R1 > 19.1R2• 18.4R1 > 19.1R2• 18.3R1 > 19.1R2	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none">• Junos Space Network Management Platform Release 19.1R1 and Security Director Release 19.1R1• Junos Space Network Management Platform Release 18.4R1 and Security Director Release 18.4R1• Junos Space Network Management Platform Release 18.3R1 and Security Director Release 18.3R1
Security Director 19.1R1	19.1R1	<ul style="list-style-type: none">• 18.4R1 > 19.1R1• 18.3R1 > 19.1R1	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none">• Junos Space Network Management Platform Release 18.4R1 and Security Director Release 18.4R1• Junos Space Network Management Platform Release 18.3R1 and Security Director Release 18.3R1
		<p>You can now perform direct upgrade to 19.1R1 from older versions of Junos Space Security Director Release 18.2R1, 18.1R1, and 17.2R2.</p> <ul style="list-style-type: none">• 18.2R1 > 19.1R1• 18.1R1 > 19.1R1• 17.2R2 > 19.1R1 <p>NOTE: You can perform direct upgrade only for Junos Space Security Director. However, you must follow all the supported upgrade paths for Junos Space Network Management Platform to upgrade to 19.1R1.</p>	
Security Director 18.4R1	18.4R1	<ul style="list-style-type: none">• 18.3R1 > 18.4R1• 18.2R1 > 18.4R1	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none">• Junos Space Network Management Platform Release 18.3R1 and Security Director Release 18.3R1• Junos Space Network Management Platform Release 18.2R1 and Security Director Release 18.2R1

Table 3: Upgrade Path (continued)

Upgrading to Release	Required Platform Version	Upgrade Path	Description
Security Director 18.3R1	18.3R1	<ul style="list-style-type: none"> • 18.2R1 > 18.3R1 • 18.1R2 > 18.3R1 • 18.1R1 > 18.3R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 18.2R1 and Security Director Release 18.2R1 • Junos Space Network Management Platform Release 18.1R1 and Security Director Release 18.1R2 • Junos Space Network Management Platform Release 18.1R1 and Security Director Release 18.1R1
Security Director 18.2R1	18.2R1	<ul style="list-style-type: none"> • 18.1R2 > 18.2R1 • 18.1R1 > 18.2R1 • 17.2R1 > 18.2R1 • 17.2R2 > 18.2R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 18.1R1 and Security Director Release 18.1R2 • Junos Space Network Management Platform Release 18.1R1 and Security Director Release 18.1R1 • Junos Space Network Management Platform Release 17.2R1 and Security Director Release 17.2R1 • Junos Space Network Management Platform Release 17.2R1 and Security Director Release 17.2R2
Security Director 18.1R2	18.1R1	<ul style="list-style-type: none"> • 18.1R1 > 18.1R2 • 17.2R2 > 18.1R2 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 18.1R1 and Security Director Release 18.1R1 • Junos Space Network Management Platform Release 17.2R1 and Security Director Release 17.2R2
Security Director 18.1R1	18.1R1	<ul style="list-style-type: none"> • 17.1R2 > 18.1R1 • 17.2R2 > 18.1R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 17.1R1 and Security Director Release 17.1R2 • Junos Space Network Management Platform Release 17.2R1 and Security Director Release 17.2R2
Security Director 17.2R2	17.2R1	<ul style="list-style-type: none"> • 17.2R1 > 17.2R2 • 17.1R2 > 17.2R2 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 17.2R1 and Security Director Release 17.2R1 • Junos Space Network Management Platform Release 17.1R1 and Security Director Release 17.1R2

Table 3: Upgrade Path (continued)

Upgrading to Release	Required Platform Version	Upgrade Path	Description
Security Director 17.2R1	17.2R1	<ul style="list-style-type: none"> • 17.1R1 > 17.2R1 • 17.1R2 > 17.2R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 17.1R1 and Security Director Release 17.1R1 • Junos Space Network Management Platform Release 17.1R1 and Security Director Release 17.1R2
Security Director 17.1R2	17.1R1	<ul style="list-style-type: none"> • 17.1R1 > 17.1R2 • 16.2R1 > 17.1R2 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 17.1R1 and Security Director Release 17.1R1 • Junos Space Network Management Platform Release 16.1R2 and Security Director Release 16.2R1
Security Director 17.1R1	17.1R1	<ul style="list-style-type: none"> • 16.2R1 > 17.1R1 • 16.1R1 > 17.1R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 16.1R2 and Security Director Release 16.2R1 • Junos Space Network Management Platform Release 16.1R1 and Security Director Release 16.1R1
Security Director 16.2R1	16.1R2	<ul style="list-style-type: none"> • 16.1R1 > 16.2R1 • 15.2R2 > 16.2R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 16.1R1 and Security Director Release 16.1R1 • Junos Space Network Management Platform Release 15.2R2 and Security Director Release 15.2R2
Security Director 16.1R1	16.1R1	<ul style="list-style-type: none"> • 15.2R2 > 16.1R1 • 15.2R1 > 16.1R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform Release 15.2R2 and Security Director Release 15.2R2 • Junos Space Network Management Platform Release 15.2R1 and Security Director Release 15.2R1

Table 3: Upgrade Path (*continued*)

Upgrading to Release	Required Platform Version	Upgrade Path	Description
Security Director 15.2R2	15.2R2	<ul style="list-style-type: none"> 15.2R1 > 15.2R2 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> Junos Space Network Management Platform Release 15.2R1 and Security Director Release 15.2R1 <p>NOTE:</p> <ul style="list-style-type: none"> Security Director 15.2R2 does not support the Integrated Log Collector VM. Data migration from an earlier version of Log Collector to a later version is not supported.
Security Director 15.2R1	15.2R1	<ul style="list-style-type: none"> 15.1R1 > 15.2R1 15.1R2 > 15.2R1 	<p>You can upgrade from the following releases:</p> <ul style="list-style-type: none"> Junos Space Network Management Platform Release 15.1R1 and Security Director Release 15.1R1 Junos Space Network Management Platform Release 15.1R2 and Security Director Release 15.1R2

To upgrade from a previous version of Junos Space Security Director:

1. Download the Junos Space Security Director Release image to which you want to upgrade from the [download site](#).
2. Upgrade the Junos Space Security Director application using the procedure at [Upgrading a Junos Space Application](#).

NOTE:

- If you try to upload Junos Space Security Director image of a lower version, an error message **Can only upgrade to newer version** appears. Click **OK** and upload compatible version of Junos Space Security Director.
- If you try to upload incompatible version of Junos Space Security Director image, an error message **Current platform version does not support this software version** appears. Click **OK** and upload compatible version of Junos Space Security Director.

NOTE: Starting in Junos Space Security Director Release 16.2R1, all IPS report definitions are consolidated into a single report definition called IPS Report. After upgrading Security Director to 16.2R1, IPS reports for already scheduled IPS report definitions will not be generated because the individual IPS report definitions do not exist. You must use the consolidated IPS report.

Release History Table

Release	Description
16.2	Starting in Junos Space Security Director Release 16.2R1, all IPS report definitions are consolidated into a single report definition called IPS Report.

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Junos Space Store Overview

The Junos Space store displays the latest compatible versions of the Junos Space applications, which can be installed or upgraded on the current version of Junos Space Network Management Platform. Starting in Junos Space Security Director Release 18.2R1, you can install or upgrade Junos space Security Director application from the Junos Space store on the Network Management Platform.

You must configure the Juniper Networks Software download credentials to connect to Junos Space store. The Junos Space store lists the latest available applications.

The Junos Space Network Management Platform accesses the metadata repository hosted by Juniper Networks to discover the available applications and published versions. When the user initiates an install or upgrade for Security Director application or its components, the package path is identified from the metadata file and package is downloaded. This reduces the manual effort of downloading the application package from the download site and then uploading it to the Junos Space Network Management Platform server, thereby enhancing the installation and upgrade process.

You can view whether a Security Director application version is supported on the current Junos Space Network Management Platform version, even before initiating install or upgrade. Junos Space store allows the component configuration while installing Security Director. It limits the component configuration when user tries to upgrade Security Director. Therefore, refer the existing method of upgrading Log Collector and Policy Enforcer components after upgrading the Security Director application.

NOTE: The earlier method of installing and Upgrading Security Director application documented in [“Installing Security Director” on page 15](#) and [“Upgrading Security Director” on page 16](#) are still applicable. You can choose to install using the existing method or through the Junos Space store.

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Installing and Upgrading Security Director from the Junos Space Store

The Junos Space store displays a list of applications, which can be installed on the Junos Space Network Management Platform. This topic describes the Security Director installation and upgrade procedure using the Junos Space store.

Before You Begin

- Configure Junos Space Store in Junos Space Network Management Platform. For details on configuring and modifying the Junos Space settings, see [Configuring and Managing Junos Space Store](#).
- You must deploy the Log Collector and Policy Enforcer nodes before installing Security Director.
- Ensure the HDD size (>500GB) of the Junos Space Platform before configuring Log Collector. OpenNMS should be in the disabled state.

For configuring Log Collector component in Junos Space store:

- For distributed deployment of Security Director Log Collector, deploy Log Collector VM on a VMWare ESX server, KVM server, or a JA2500 appliance. To know more about distributed deployment, see [“Setting Up Security Director Log Collector” on page 38.](#)
- For integrated deployment of Log Collector, install the Integrated Log Collector on a JA2500 Appliance or Junos Space virtual appliance. To know more about the integrated deployment of Log Collector, see, [“Setting Up Security Director Log Collector” on page 38.](#)
- Deploy and configure JSA for using JSA as Log Collector. See, [“JSA Log Collector Overview” on page 55.](#)

For configuring Policy Enforcer component in Junos Space Store:

- Deploy and configure Policy Enforcer. See, *Installing Policy Enforcer* in [Administration Guide](#).

To install and upgrade Security Director from the Junos Space Store:

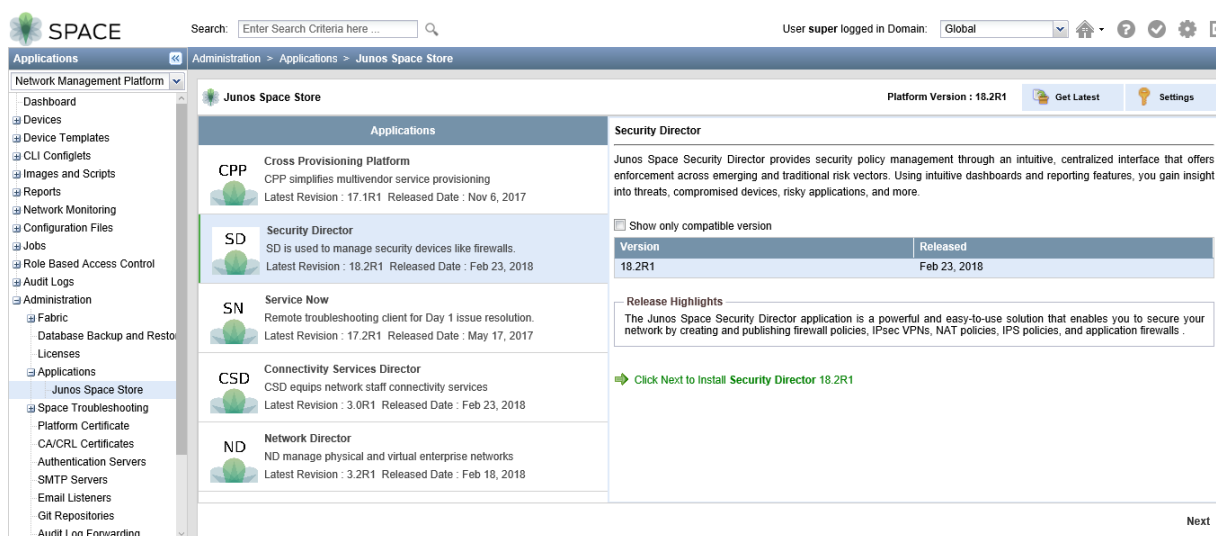
1. Log in to Junos Space Network Management Platform.
2. Select **Administration > Applications > Junos Space Store**.

The Junos Space Store page appears.

NOTE: Click **Get Latest** to refresh the list of applications in Junos Space store.

The Junos Space store with all the applications are displayed as shown in [Figure 2 on page 23.](#)

Figure 2: Junos Space Store



3. Select **Security Director**.

The details of the application such as the compatible versions, version release date, and release highlights are displayed.

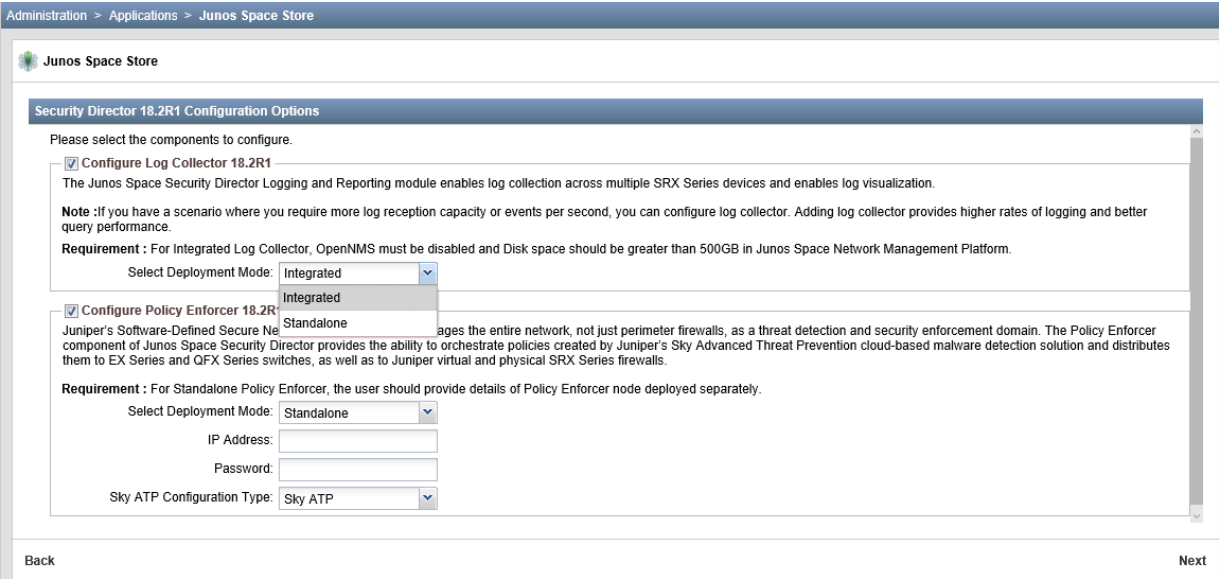
NOTE: Click **Show only compatible version** option to display only the Security Director versions supported on the current platform version.

- 4. Select a version to be installed or upgraded and click **Next**

NOTE: If the selected version is not compatible with the Junos Space Network Management Platform version, a warning message is displayed.

The Security Director configuration options are displayed as shown in [Figure 3 on page 24](#).

Figure 3: Security Director Components



- 5. Select the components, which you want to configure and complete the configuration according to the guidelines given in [Table 4 on page 26](#).

NOTE: User can configure Log Collector and Policy Enforcer if already deployed and available. The previous method of adding the Log Collector and Policy Enforcer from Security Director is also applicable.

NOTE: Junos Space store allows the component configuration while installing Security Director. Upgrade of components like Log Collector and Policy Enforcer is not handled by Junos Space Store. Therefore, refer the existing method of upgrading Log Collector and Policy Enforcer components after upgrading the Security Director application.

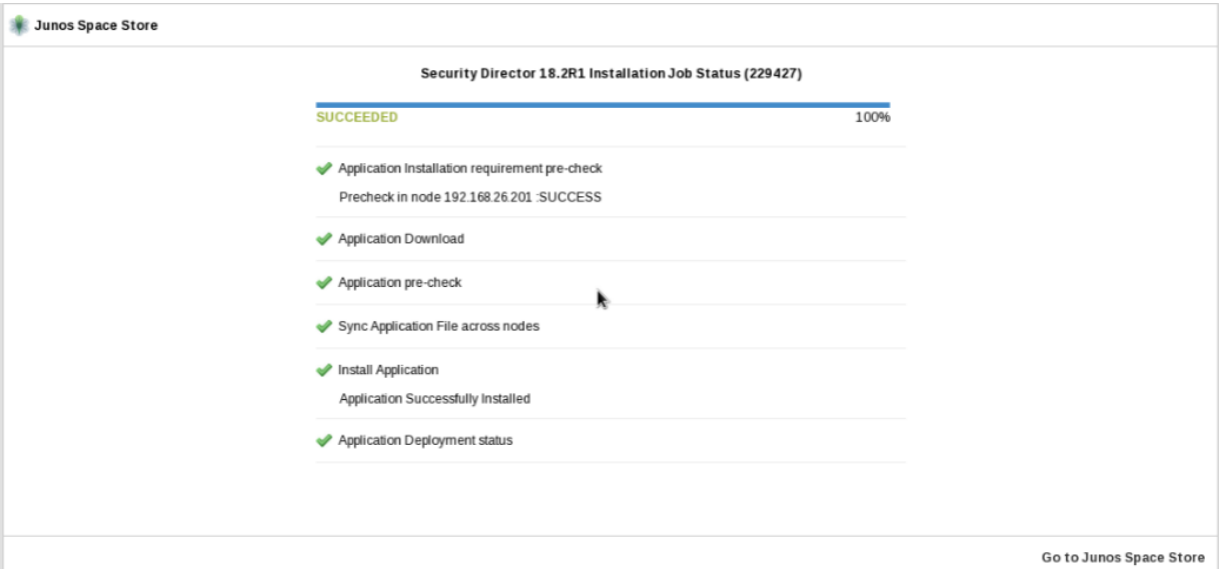
6. Click **Next**.

The Security Director terms and conditions and the license agreement is displayed. Review the license agreement.

7. Click **Accept and Install**.

The job status is displayed as shown in [Figure 4 on page 25](#).

Figure 4: Job Status



8. Click **Go to Junos Space Store**.

The installed or upgraded version of Security Director is displayed in the Junos Space store as shown in [Figure 5 on page 26](#).

Figure 5: Verifying the Installed or Upgraded Version

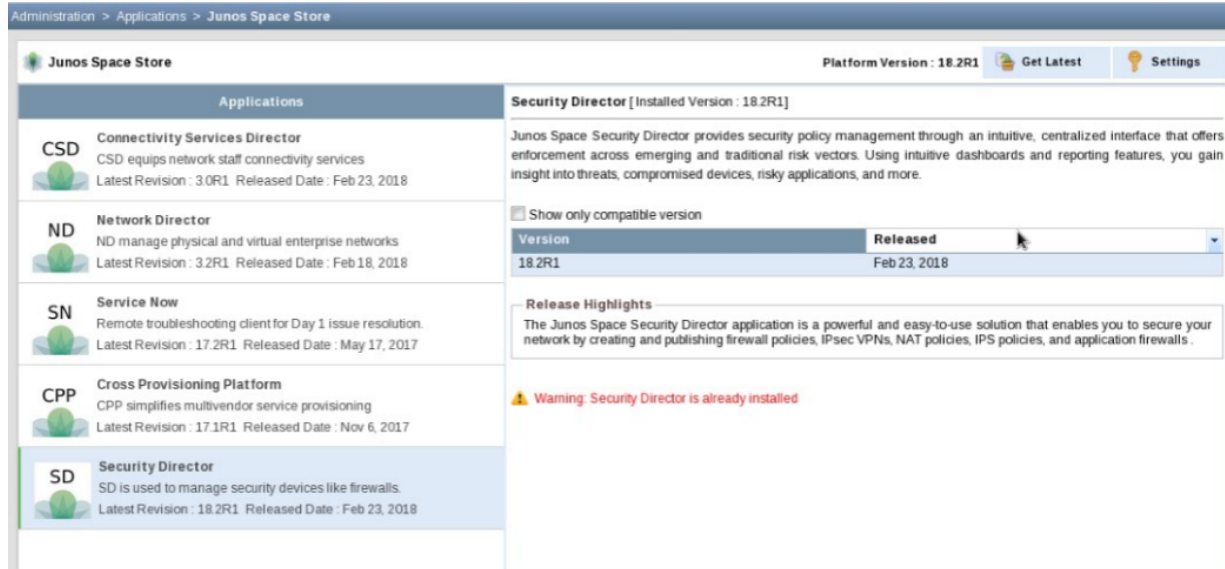


Table 4: Security Director Components Description

Fields	Description
Log Collector	
Deployment Mode	<p>Select one of the following:</p> <ul style="list-style-type: none"> Integrated—The integrated Log Collector is installed on Junos Space node (JA2500 appliance or virtual appliance). <p>Integrated Log Collector on a JA2500 appliance or Junos Space virtual appliance supports only 500 eps.</p> <p>NOTE: For Integrated Log Collector, OpenNMS must be disabled. On the Junos Space Network Management Platform, the disk space must be greater than 500GB.</p> <ul style="list-style-type: none"> Standalone—Standalone log collector VM is deployed separately on a VMWare ESX Server, KVM Server, or JA2500 appliance. <p>NOTE: The fields Node Type, Node Name, IP Address, and Username and Password are applicable only if the deployment mode is Standalone.</p>
Node Type	<p>Select one of the following:</p> <ul style="list-style-type: none"> Security Director Log Collector Juniper Secure Analytics <p>NOTE: You can add only Log Receiver node in Security Director and cannot add Log Storage node.</p>

Table 4: Security Director Components Description (*continued*)

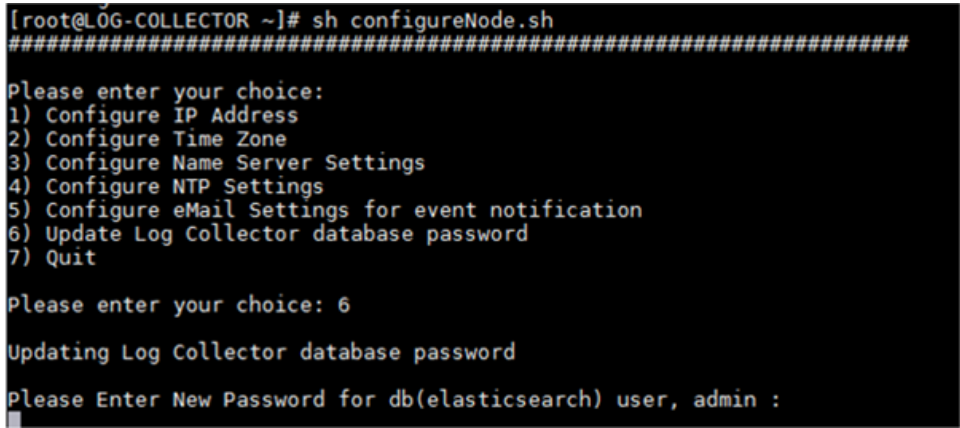
Fields	Description
Node Name	Enter the Node name.
IP Address	Enter the IPv4 or IPv6 address.
Username and Password	<p>For Security Director Log Collector, provide the default credentials; username is admin and password is juniper123. Change the default password using the Log Collector CLI configureNode.sh command as shown in Figure 6 on page 27.</p> <p>Figure 6: Change Password</p>  <pre>[root@LOG-COLLECTOR ~]# sh configureNode.sh ##### Please enter your choice: 1) Configure IP Address 2) Configure Time Zone 3) Configure Name Server Settings 4) Configure NTP Settings 5) Configure eMail Settings for event notification 6) Update Log Collector database password 7) Quit Please enter your choice: 6 Updating Log Collector database password Please Enter New Password for db(elasticsearch) user, admin : </pre> <p>For JSA, provide the admin credentials that is used to login to the JSA console.</p>
Policy Enforcer	
Deployment Mode	<p>Select Standalone.</p> <p>NOTE: For Policy Enforcer, only Standalone option is available.</p>
IP Address	Specify the IP address of the Policy Enforcer virtual machine.
Password	Enter the password to login to the virtual machine with the root credentials.

Table 4: Security Director Components Description (*continued*)

Fields	Description
Sky ATP Configuration Type	<p>Select one of the following configuration types:</p> <ul style="list-style-type: none"> • Sky ATP—Includes all threat prevention types, but does not include the benefits of Secure Fabric, Policy Enforcement Groups, and Threat Prevention policies provided by Policy Enforcer. All enforcement is done through SRX Series Device policies. • Cloud Feeds Only—The prevention types available are command and control server, infections hosts, and Geo IP feeds. Policy Enforcer Secure Fabric, Policy Enforcement Groups, and Threat Prevention policies are also available. All enforcement is done through SRX Series Device policies. • Sky ATP with SDSN—A full version of the product. All Policy Enforcer features and threat prevention types are available. • None—There are no feeds available from Sky ATP, but the benefits of Secure Fabric, Policy Enforcement Groups, and Threat Prevention policies provided by Policy Enforcer are available. Infected hosts is the only prevention type available.
Network End Point	Polling timers affect how often the system polls to discover endpoints. The timer polls infected endpoints moving within the sites that are a part of Secure fabric. You can set this range from 2 minutes to 60 minutes. The default is 5 minutes.
PollSite End Point	Polling timers affect how often the system polls to discover endpoints. The timer polls all endpoints added to the secure fabric. You can set this range between 1 to 48 hours. The default is 24 hours.

RELATED DOCUMENTATION

2

CHAPTER

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Security Director Log Collector Overview

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The Junos Space Security Director Logging and Reporting module enables log collection across multiple SRX Series devices and enables log visualization.

In Junos Space Security Director 15.2R1, you can set up Log Collectors in a VM environment. From Junos Space Security Director 15.2R2, you can set up Log Collectors in a VM and JA2500 environment. For easy scaling, begin with a single Log Collector and incrementally add dedicated Log Collectors, as your needs expand. You must configure a Log Indexer if you are using more than one Log Collector. In case of VM environment, a single OVA image is used to deploy a Log Collector and Log Indexer. The image presents a configuration script after you log in. During setup, you can configure the node as either a Log Collector or a Log Indexer. At deployment, the user must select appropriate memory and CPU configuration values, as appropriate for the role of the VM.

Table 5: Log Collector Setup Environment

Release	Option
15.2R1	VM
15.2R2 and later releases	VM, JA2500

From Security Director Release 16.1R1, you can set up Log Collector on a VM or a JA2500 appliance. You can configure Log Collector as an All-in-One node or integrated node for small-scale deployments. For larger deployments, begin with a single Log Receiver node and Log Storage node, and incrementally add Log Storage nodes as your needs expand. You can have a maximum of one Log Receiver node and three Log Storage nodes.

You need to set up the Log Collector VM and deploy the Log Collector as an All-in-One node, Log Storage Node, or Log Receiver Node.

The naming conventions for different node types in various releases are described in [Table 6 on page 31](#).

Table 6: Supported Log Collector Node Types

Node Type in Release 15.2R1	Node Type in Release 15.2R2	Node Type in Release 16.1R1 and later releases
All-in-One node	All-in-One node	All-in-One node
Log Collector node, Log Receiver node	NA	Log Receiver node
Log Data node, Log Indexer node	NA	Log Storage node
Primary-node, Cluster Manager node	NA	NA
Client-node, Log Query node	NA	NA
NA	NA	Integrated node

NOTE: You can configure eth0 or eth1 for receiving logs from devices in different Log Collector deployment modes.

NOTE: In Security Director Release 15.2R2, you can deploy Log Collector as an all-in-one node only, with eps rate of 3k.

NOTE: Starting in Junos Space Security Director 16.2R1, you can use JSA as a Log Collector node. See [“JSA Log Collector Overview” on page 55](#) and [“Adding Log Collector to Security Director” on page 56](#).

NOTE: High Availability is not supported on Security Director Log Collector. However, JSA as Log Collector supports High Availability.

NOTE: Security Director Logging and Reporting is not supported on JA1500 appliance.

Log Director

Log Director is an application on Junos Space Network Management Platform that gets installed as part of Security Director installation. It is used for system log data collection for SRX and vSRX Series devices running Junos OS. Log Director consists of two components:

- Junos Space application
- VM or JA2500 deployment of Log Collector node(s)

Log Collector Deployment Modes

[Table 7 on page 32](#) and [Table 8 on page 33](#) describe different modes in which Log Collector can be deployed.

Table 7: Log Collector Deployment Modes for Security Director Release 15.2R1

Node Type	Description
All-in-One Node (Combined deployment)	Both Receiver and Indexer nodes run on the same VM. It supports eps of up to 2,000 with spinning disks and 4,000 with SSD drives. It is suitable for demos and small-scale deployments.
Log Receiver Node (Distributed deployment)	This node receives system logs from SRX Series devices. SRX Series devices must be configured with the Log Receiver node IP to send system logs. Upon configuration, this node parses and forwards logs to Log Indexer node. You must provide the IP address of the Log Indexer node while configuring this node.

Table 7: Log Collector Deployment Modes for Security Director Release 15.2R1 (*continued*)

Node Type	Description
Log Indexer Node (Distributed deployment)	<p>This node analyzes, indexes, and stores the system logs. It receives the system logs from Log Receiver node and serves all the queries from Security Director. The Log Indexer node roles are split into the following three major roles when the scale of deployment is more than 10K eps:</p> <ul style="list-style-type: none"> • Log Storage node – Dedicated node for storing the indexed system logs. • Primary node – Dedicated cluster manager node that monitors and maintains the integrity of Log Indexer cluster. • Query node – Dedicated query node that receives system logs from Log Receiver node(s) and distributes them across the available log storage nodes. Also, this node also acts as the single query point for the Security Director application and responds to all the system log queries.

NOTE: In Security Director Release 15.2R2, you can deploy Log Collector as an all-in-one node only, with eps rate of 3k. Distributed Log Collector deployment is not supported.

Table 8: Log Collector Deployment Modes for Security Director Release 16.1 and Later

Node Type	Description
All-in-One Node (Combined deployment)	Both the Log Receiver and Log Storage nodes run on the same VM or JA2500 appliance. It supports up to 3,000 eps with spinning disks and 4,000 eps with SSD drives. All-in-One node is suitable for demos and small-scale deployments.
Log Receiver Node (Distributed deployment)	The Log Receiver node receives system logs from SRX Series devices and vSRX Series devices and forwards them to a Log Storage node. You can configure up to three Log Storage nodes. You must configure the IP address of the Log Receiver Node on SRX and vSRX Series devices and the IP address of the Log Storage nodes on the Log Receiver node.
Log Storage Node (Distributed deployment)	This node analyzes, indexes, and stores the system logs. It receives the system logs from Log Receiver node.
Integrated	It is similar to an All-in-One node. It is installed on a Junos Space node (JA2500 appliance or virtual appliance) and it works as both the Log Receiver node and Log Storage node.

Log Collector Storage Requirements

The total storage required for retaining X number of days at a given events per second (eps) rate is:

$$\text{eps} * 0.155 * X = \text{Total storage (in GB)}$$

For example, the storage requirement for 7 days at 500 eps is $500 * 0.155 * 7 = 542$ GB, with a +20% margin. The storage space is allocated and equally distributed to the Log Storage nodes.

NOTE: The logs get rolled over under the following scenarios:

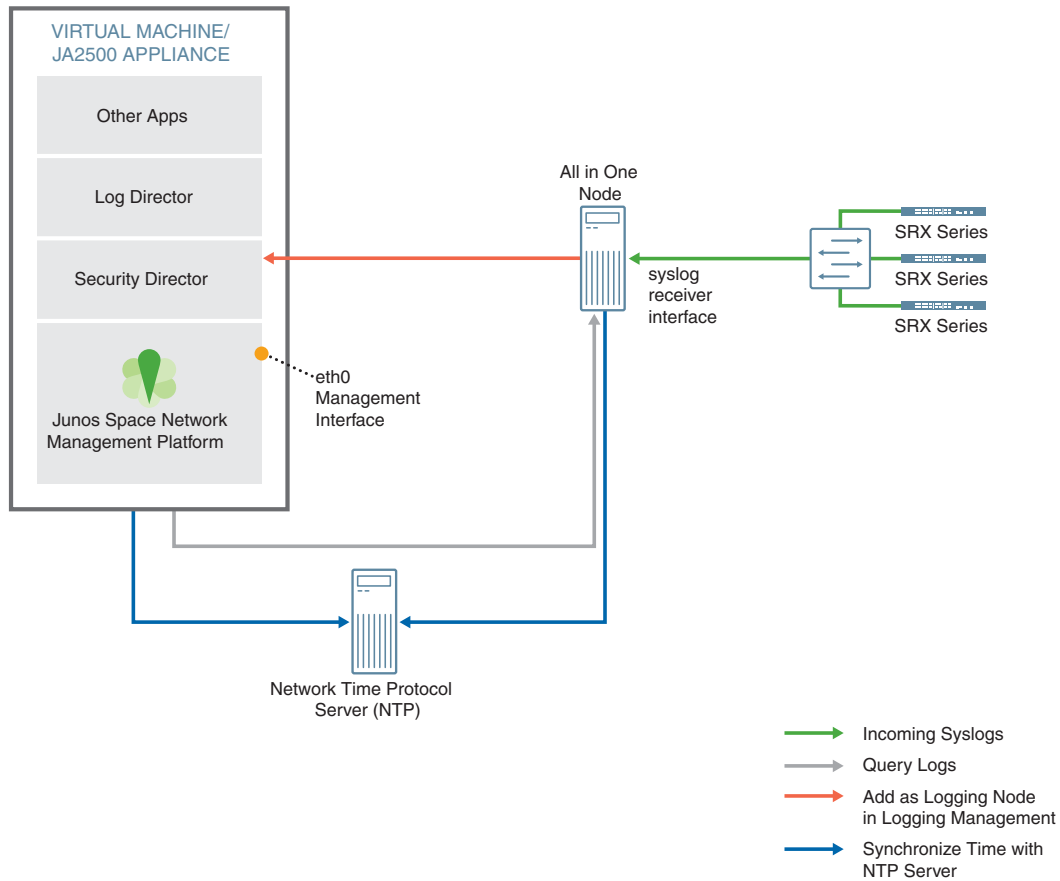
- Time-based rollover—Logs that are older than 45 days are automatically rolled over, even if the disk space is available.
- Disk size-based rollover—Older logs get rolled over when the disk size reaches 400 GB.

Deploying Log Collector as an All-in-One Node

An All-in-One node acts both as the Log Receiver and Log Storage node. For a VM environment, a single OVA image is used to deploy the All-in-One, Log Receiver, and Log Storage nodes. The image presents a configuration script after you log in and you must select All-in-One to configure the node. For JA2500 deployments, a single ISO image is used to install the All-in-One, Log Receiver, and Log Storage nodes. During setup, you can configure the node as an All-in-One node.

[Figure 7 on page 35](#) shows an example of an All-in-One node deployment.

Figure 7: All-in-One Node Deployment



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Deploying Multiple Log Collectors

If you have a scenario where you require more log reception capacity or events per second, you can add multiple logging nodes. Multiple logging nodes provide higher rates of logging and better query performance. You can add a maximum of one Log Receiver node and three Log Storage nodes.

For a VM environment, a single OVA image is used to deploy a Log Receiver node and a Log Storage node. The image presents a configuration script after you log in. During setup, you can configure the node as either a Log Receiver or Log Storage node. At deployment, the user must select the memory and CPU configuration values, as appropriate for the VM or JA2500 appliance.

For JA2500 deployments, a single ISO image is used to install the Log Receiver and Log Storage nodes. During setup, you can configure the node as either a Log Receiver or a Log Storage node.

[Figure 8 on page 36](#) shows the deployment example using multiple nodes for up to 10K eps.

Figure 8: Using Multiple Nodes for Up to 10K eps

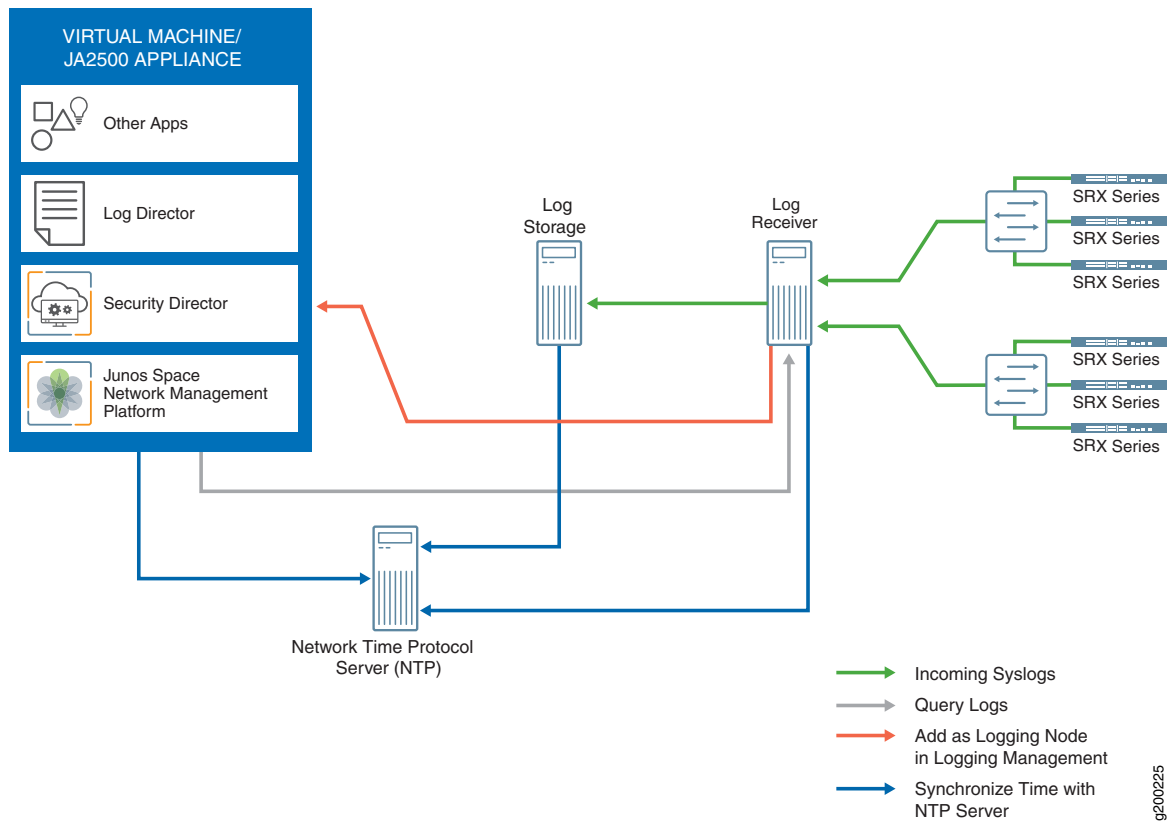
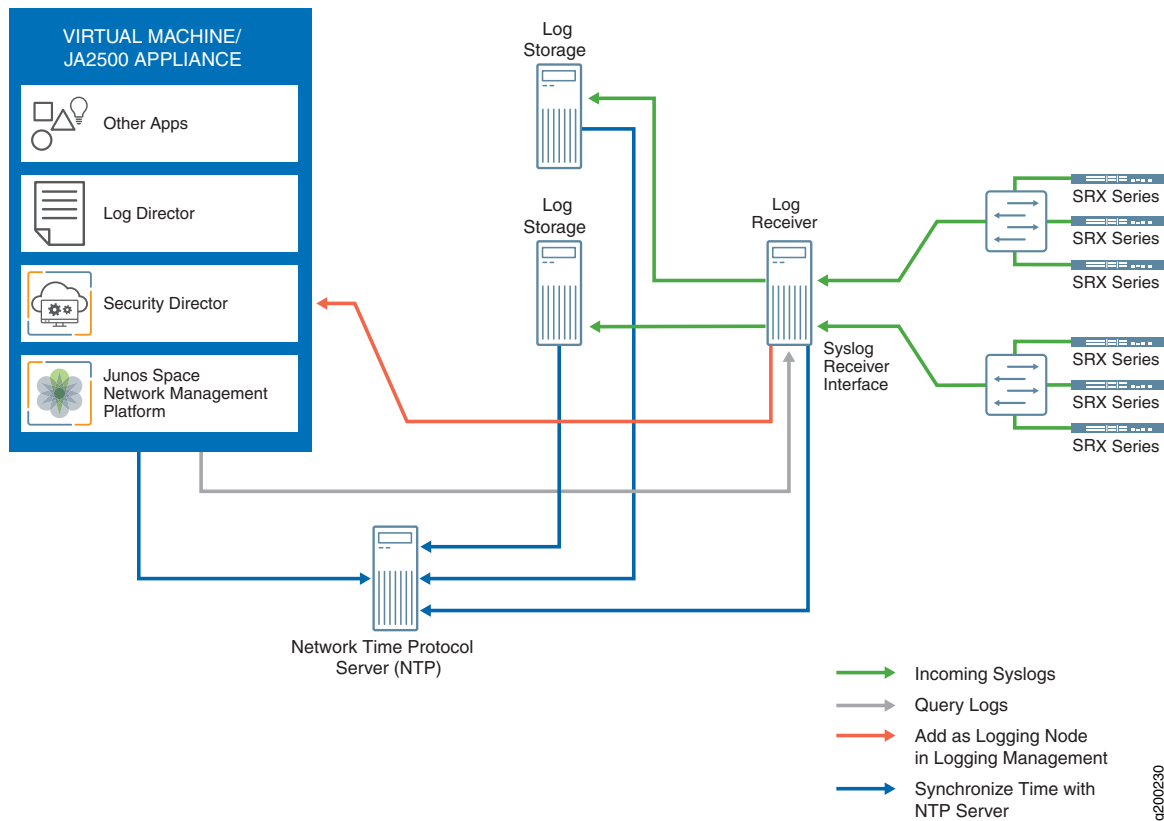


Figure 9 on page 37 shows the deployment example using multiple nodes for greater than 10K eps.

Figure 9: Using Multiple Nodes for Greater Than 10K eps

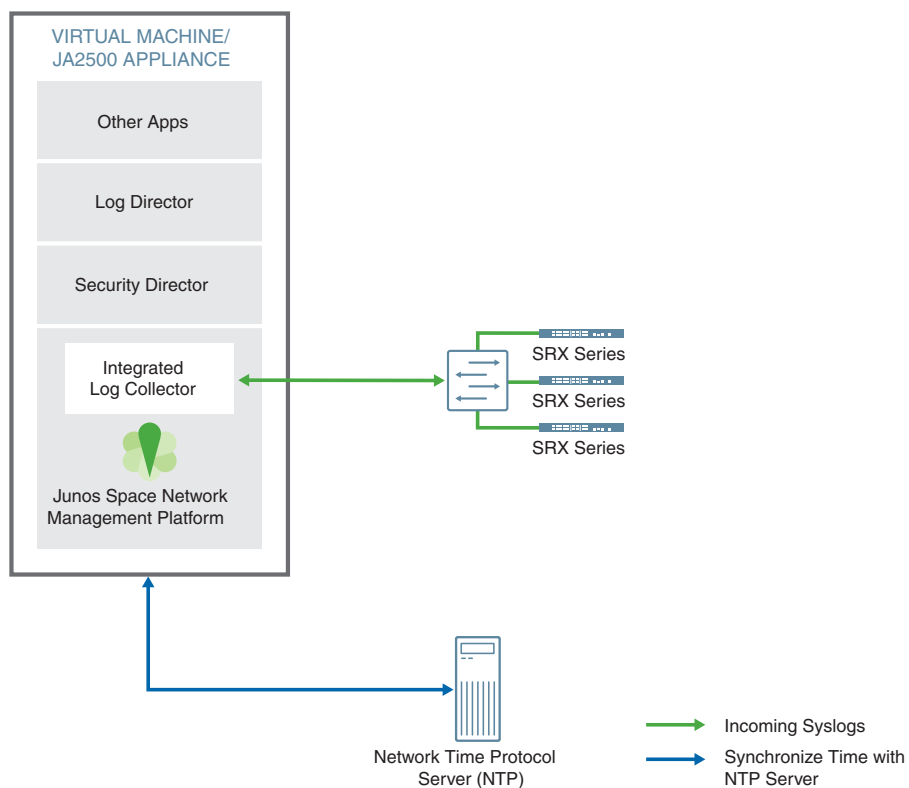


Deploying Log Collector as an Integrated Node

It is installed on a Space node (JA2500 appliance or virtual appliance) and it works as both the Log Receiver node and Log Storage node. You must use the Integrated Log Collector installer for Space application package to install integrated Log Collector on JA2500 appliance or virtual appliance.

NOTE: Integrated Log Collector is not a feasible solution in Junos Space high-availability (HA) mode. We recommended you to use All-in-one virtual machine or JSA as a Log Collector for Junos Space HA mode.

Figure 10: Integrated Node Deployment



RELATED DOCUMENTATION

[Upgrading Junos Space Network Management Platform | 14](#)

[Installing Security Director | 15](#)

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Setting Up Security Director Log Collector

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- [Deploying Log Collector VM on a VMWare ESX Server | 42](#)

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A single Security Director image installs Security Director, Log Director, and Security Director Logging and Reporting applications.

The prerequisites for setting up Log Collector are as follows:

- Make sure that the JA2500 appliance or VM is running supported release of Junos Space Network Management Platform and Junos Space Security Director.
- The Junos Space Network Management Platform must be active and functioning.
- The following ports are required for Log Collector to function and these ports must be open between the Junos Space server and the Log Collector:
 - Port 8004 (TCP)—Used for communication between the Junos Space server and the Log Collector node agent.
 - Port 8003 (TCP)—Used for log data queries.
 - Port 9200 (TCP)—Used in Log Storage nodes.
 - Port 9300 (TCP)—Used for communicating across elasticsearch cluster.
 - Port 4567 (TCP)—Used for communication between the Log Receiver node and Log Storage node.
 - Port 514 (TCP)—Used for receiving system logs.
 - Port 514 (UDP)—Used for receiving system logs.
 - Port 22 (TCP)—Used for SSH connectivity.
- The following ports are not required for Log Collector to function, but they are used by other peripheral services:
 - Port 5671 (TCP)
 - Port 32803 (TCP)
 - Port 32769 (UDP)

See the following topics for information about deploying Log Collector.

Specifications for Deploying a Log Collector Virtual Machine on a VMware ESX Server

You can use the tables below to decide if you require a single Log Collector or multiple Log Collectors.

The following tables describe the VM configuration on a VMware ESX server with Solid State Drives (SSD) and the VM configuration on a VMware ESX server with non Solid State Drives for different Security Director Releases. They list the required specifications for deploying a Log Collector VM on a VMware ESX server for various sustained events per second (eps) rates. The eps rates shown in the tables were achieved in a testing environment. Your results might differ, depending on your configuration and network environment.

Table 9: VMware ESX Server with Solid State Drives (SSD) for Security Director Release 15.2R1 and 15.2R2

Setup	Log Receiver Node			Log Indexer Node			Log Query Node		Cluster Manager Node		Total Nodes
	Number of Nodes	CPU	Memory	Number of Nodes	CPU	Memory	CPU	Memory	CPU	Memory	
4K eps	1	4	16 GB	-	-	-	-	-	-	-	1
7K eps	1	4	16 GB	1	4	32 GB	-	-	-	-	2
10K eps	2	8	32 GB	1	8	32 GB	-	-	-	16 GB	2
20K eps	2	16	32 GB	3	16	32 GB	8	16 GB	4	16 GB	6

Table 10: VMware ESX Server with Non Solid State Drives (SSD) for Security Director Release 15.2R1 and 15.2R2

Setup	Log Receiver Node			Log Indexer Node			Log Query Node		Cluster Manager Node		Total Nodes
	Number of Nodes	CPU	Memory	Number of Nodes	CPU	Memory	CPU	Memory	CPU	Memory	
2K eps	1	4	16 GB	-	-	-	-	-	-	-	1

Table 10: VMware ESX Server with Non Solid State Drives (SSD) for Security Director Release 15.2R1 and 15.2R2 (continued)

Setup	Log Receiver Node			Log Indexer Node			Log Query Node		Cluster Manager Node		Total Nodes
	Number of Nodes	CPU	Memory	Number of Nodes	CPU	Memory	CPU	Memory	CPU	Memory	
5K eps	1	8	16GB	1	4	32 GB	-	-	-	-	2
10K eps	2	8	32 GB	1	8	32 GB	-	-	-	16 GB	3
20K eps	2	16	32 GB	4	16	32 GB	8	16 GB	4	16 GB	8

Table 11: VMware ESX Server with Solid State Drives (SSD) for Security Director Release 16.1 and Later

Setup	Log Receiver Node			Log Storage Node			Total Nodes
	Number of Nodes	CPU	Memory	Number of Nodes	CPU	Memory	
4K eps	1	4	16 GB	-	-	-	1
10K eps	1	8	32 GB	1	8	64 GB	2
20K eps	1	8	32 GB	2	8	64 GB	3

Table 12: VMware ESX Server with Non-Solid State Drives for Security Director Release 16.1 and Later

Setup	Log Receiver Node			Log Storage Node			Total Nodes
	Number of Nodes	CPU	Memory	Number of Nodes	CPU	Memory	
3K eps	1	4	16 GB	-	-	-	1
10K eps	1	8	32 GB	2	8	64 GB	3
20K eps	1	8	32 GB	3	8	64 GB	4

NOTE: VMs with 64 GB memory provide better stability for log storage.

Deploying Log Collector VM on a VMWare ESX Server

NOTE: Install VMware vSphere or vCenter client on your local system.

To deploy Log Collector VM on a VMware ESX server:

1. Download the latest Log Collector open virtual appliance (OVA) image from the [download site](#).
2. Using VMware vSphere or vCenter client, deploy the Log Collector OVA image onto the VMware ESX server.
3. Edit the CPU and memory as per the system requirement for the required events per second (eps).

NOTE: For Security Director Release 15.2R1 and 15.2R2, see [Table 9 on page 40](#) and [Table 10 on page 40](#). For Security Director Release 16.1R1 and later see [Table 11 on page 41](#) and [Table 12 on page 41](#).

4. Power on the Log Collector VM.
5. Use the default credentials to log in to Log Collector. The username is **root** and password is **juniper123**.
6. Change the default password of the VM.
7. Select one of the following node types:
 - Enter **1** to deploy Log Collector as an All-in-One node.
 - Enter **2** to deploy Log Collector as a Log Receiver node.
 - Enter **3** to deploy Log Collector as a Log Storage node.
8. Configure your network settings.

After setting up the Log Collector, add the Log Collector node to Security Director. See “[Adding Log Collector to Security Director](#)” on page 56.

NOTE: Using VMware vSphere Client version 5.5 and earlier, you cannot edit the settings of virtual machines of version 10 or later. See [VMware Knowledge Base](#).

Deploying Log Collector VM on a KVM Server

Starting in Security Director Release 15.2R2, you can deploy Log Collector VM on a kernel-based virtual machine (KVM) server installed on CentOS Release 6.5.

Before You Begin

- The KVM server and supported packages must be installed on a machine running CentOS Release 6.5 with the required kernels and packages. See <http://wiki.centos.org/HowTos/KVM>.
- Install the Virtual Machine Manager (VMM) client on your local system.
- Configure the bridge interface according to your environment. You must have at least two static IP addresses that are unused.

NOTE: We recommend you to install the Log Collector virtual machine on a KVM server using VMM.

To deploy Log Collector VM on a KVM server:

1. Download the Log Collector KVM image from the [download site](#) on the KVM host and extract the tgz file, which contains the **system.qcow2** and **data.qcow2** files.
2. Launch the VMM client by typing **virt-manager** from your terminal or from the Applications menu, click **System Tools** and select Virtual Machine Manager.

The Virtual Machine Manager window appears.

3. Select **File > New Virtual Machine** to install a new virtual machine.

The new VM dialog box appears.

4. In the new VM dialog box:
 - a. Select **Import existing disk image** and click **Next**.
 - b. Click **Browse** and then select the **system.qcow2** file.
 - c. Select **Linux** as the operating system and the version as **Red Hat Enterprise Linux 6.6 or later**.
 - d. Click **Forward**.
 - e. Set the CPU settings as **4** , and then select or enter the minimum memory (RAM) value as **16384** MB.
5. Click **Forward**.
6. Edit the **Name** field, select or set up the network for each bridge or interface configured, and select the **Customize Configuration Before Install** option.
7. Click **Finish**.
8. Select the Storage option from the left navigation on the Add New Virtual Hardware window, and then click **Add Hardware**.
9. On the Storage window:
 - a. Click **Select managed or other existing storage** and choose the **data.qcow2** file.
 - b. Select the storage format as **qcow2** under Advanced Options.
 - c. Click **Finish**.
10. Select one of the following node types:
 - Enter 1 to deploy Log Collector as an All-in-One node.
 - Enter 2 to deploy Log Collector as a Log Receiver node.
 - Enter 3 to deploy Log Collector as a Log Storage node.
11. Click **Begin Installation** to start the Log Collector VM.
12. After the installation, you can configure the IP address, name server, and time zone.

After setting up the Log Collector, add the Log Collector node to Security Director. See [“Adding Log Collector to Security Director” on page 56](#).

Deploying Log Collector on a JA2500 Appliance

Starting in Security Director Release 15.2R2, you can deploy Log Collector on a JA2500 appliance. To install the Log Collector on the JA2500 appliance using a USB flash drive, you must create a bootable USB flash drive, install the Log Collector node using the USB flash drive, and add the Log Collector node to Security Director.

NOTE: Before creating a bootable USB flash drive, download and install [Rufus software](#) on your system.

To create a bootable USB flash drive:

1. Plug the USB flash drive into the USB port of a laptop or PC.
2. Download the Log Collector ISO image from the [download site](#) to your laptop or PC.

If you are using a computer with Microsoft Windows as the operating system, follow these steps to create a bootable USB flash drive:

1. Open Rufus software installed on your computer.
The Rufus window opens.
2. Select the USB storage device from the Device list.
3. Select the ISO image downloaded in Step 2 in the Format options section. Click the open or browse icon next to the Create a bootable disk using option to select the ISO image.
4. Click **Start**.
A progress bar indicates the status of the bootable USB flash drive creation. A success message is displayed once the process completes successfully.
5. Click **Exit** to exit the window.
6. Eject the USB flash drive and unplug it from the computer.

To install Log Collector using a USB flash drive:

1. Power down the JA2500 appliance.
2. Plug the USB flash drive into the USB port of the JA2500 appliance.
3. Perform the following steps to access the JA2500 appliance boot menu:
 - a. Power on the JA2500 appliance.
 - b. While the JA2500 appliance powers on, press the key mapped to send the DEL character in the terminal emulation utility.

NOTE: Typically, the Backspace key is mapped to send the DEL character.

- c. The boot menu appears after a few minutes.
4. Ensure that the USB boot is at the top of the appliance boot-priority order.

If USB KEY: CBM USB 2.0 - (USB 2.0) is not at the top of the list, perform the following steps:

 - a. Use the Down Arrow key to select USB KEY:CBM USB 2.0- (USB 2.0), and use the + key to move the entry to the top of the list.
 - b. Press the F4 key to save your changes and exit the BIOS setup.
5. After Verifying the BIOS setting, power off the JA2500 appliance.
6. Power on the appliance again. The boot menu displays the following options:
 - a. Install Log Collector on Juniper JA2500 Hardware.
 - b. Boot from local drive.
7. Select **Install Log Collector on Juniper JA2500 Hardware**.
8. Power off the appliance once the installation is completed.
9. Restart the appliance and select **Boot from local drive**.
10. Use the default credentials to log in to the JA2500 appliance; username is **root** and password is **juniper123**.

11. Change the default password.

12. After logging in, select the desired Log Collector node type.

- Enter 1 to deploy Log Collector as an All-in-One node.
- Enter 2 to deploy Log Collector as a Log Receiver node.
- Enter 3 to deploy Log Collector as a Log Storage node.

13. Configure the IP address and gateway.

14. Configure settings for the DNS name server and the NTP server.

After setting up the Log Collector, add the Log Collector node to Security Director. See [“Adding Log Collector to Security Director” on page 56](#).

Installing Integrated Log Collector on a JA2500 Appliance or Junos Space Virtual Appliance

Starting in Security Director Release 16.1R1, you can install an integrated Log Collector on a JA2500 appliance or Junos Space virtual appliance. The integrated Log Collector is installed on Junos Space node (JA2500 appliance or virtual appliance) and it works as both the Log Receiver node and Log Storage node.

NOTE: Integrated Log Collector on a JA2500 appliance or Junos Space virtual appliance supports only 500 eps.

Before You Begin

- Integrated Log Collector uses the 9200, 514, and 4567 ports.
- Junos Space Network Management Platform must be configured with Ethernet Interface eth0 and management IP addresses.
- OpenNMS must be disabled on Junos Space Network Management Platform.
- Ethernet Interface eth0 on the Junos Space Network Management Platform must be connected to the network to receive logs.
- /var should have a minimum of 500-GB disk space for the integrated Log Collector installation to complete.

[Table 13 on page 48](#) shows the specifications for installing the integrated Log Collector on a JA2500 appliance.

Table 13: Specifications for Installing an Integrated Log Collector on a JA2500 appliance

Component	Specification
Memory	8 GB Log Collector uses 8 GB of the available 32-GB system RAM.
Disk space	500 GB This is used from the existing JA2500 appliance disk space.
CPU	Single core

NOTE: These specifications are used internally by the integrated Log Collector on JA2500 appliance.

[Table 14 on page 48](#) shows the specifications for installing the integrated Log Collector on Junos Space virtual appliance.

Table 14: Specifications for Installing an Integrated Log Collector on a Junos Space Virtual Appliance

Component	Specification
Memory	8 GB If integrated Log Collector is running on the Junos Space virtual appliance, we recommend that you add 8 GB of RAM to maintain the Junos Space performance. It uses 8 GB of system RAM from the total system RAM.
Disk space	500 GB Minimum 500 GB free space is required. You can add any amount of disk space.
CPU	2 CPUs of 3.20 GHz

NOTE: These specifications are used internally by the integrated Log Collector running on the Junos Space virtual appliance.

To install an integrated Log Collector on a JA2500 appliance or virtual appliance:

1. Download the integrated Log Collector script from the [download site](#).
2. Copy the integrated Log Collector script to a JA2500 appliance or virtual appliance.
3. Connect to the CLI of JA2500 appliance or virtual appliance with admin privileges.
4. Navigate to the location where you have copied the integrated Log Collector script.
5. Change the file permission using the following command:

```
chmod +x Integrated-Log-Collector-xx.xxx.xxx.sh
```

For example, **chmod +x Integrated-Log-Collector-19.1R2.xxx.sh**

6. Install the integrated Log Collector script using the following command:

```
./Integrated-Log-Collector-xx.xxx.xxx.sh
```

For example, **./Integrated-Log-Collector-19.1R2.xxx.sh**

- The installation stops if the following error message is displayed while installing the integrated Log Collector on the virtual appliance. You must expand the virtual appliance disk size to proceed with the installation.

ERROR: Insufficient HDD size, Please upgrade the VM HDD size to minimum 500 GB to install Log Collector

To expand the hard disk size for the Junos Space virtual appliance:

- a. Add a 500 GB capacity hard disk on the Junos Space virtual appliance through VMware vSphere client.
- b. Connect to the console of the Junos Space virtual appliance through SSH.
- c. Select **Expand VM Drive Size**.
- d. Enter the admin password and expand /var with 500 GB.
- e. Once /var is expanded, you are prompted for any further HDD expansion. Select **No** to reboot the system.

NOTE: Junos Space Network Management Platform must be active and functioning. You must be able to log in to the Junos Space Network Management Platform and Security Director user interfaces before attempting to run the integrated Log Collector setup script again.

- f. After the disk size is expanded and Junos Space Network Management Platform and Security Director user interfaces are accessible, run the following command:

`./Integrated-Log-Collector-xx.xxx.xxx.sh`

For example, **`./Integrated-Log-Collector-19.1R2.xxx.sh`**

- The installation stops if the following error message is displayed while installing the integrated Log Collector on a JA2500 appliance or virtual appliance. You must disable OpenNMS by following the steps mentioned in the error message to proceed with the installation.

ERROR: Opennms is running...

Please try to disable opennms as described below or in document and retry Log Collector installation...

STEPS: Login to Network Management Platform --> Administration --> Applications

Right Click on Network Management Platform --> Manage Services -> Select Network Monitoring and click Stop

Service Status should turn to Disabled

After OpenNMS is disabled, run the following command:

`./Integrated-Log-Collector-xx.xxx.xxx.sh`

For example, **`./Integrated-Log-Collector-19.1R2.xxx.sh`**

When the integrated Log Collector is installed on the JA2500 appliance or virtual appliance, the following message is displayed:

Shutting down system logger: [OK]

Starting jingest ... jingest started.

```
{"log-collector-node": {"id":376,"ip-address":"x.x.x.x","priority":0,"node-type":
"INTEGRATED","cpu-usage":0,"memory-usage":0, "fabric-id":0,"display-name":
"Integrated","timestamp":0}}
```

After the installation is complete, a logging node is automatically added in **Administration > Logging Management > Logging Nodes**.

Configuring Log Collector Using Scripts

You can use the following command to configure Log Collector using script described in [Table 15 on page 51](#).

```
"jnpr-" <TAB>
[root@NWAPPLIANCE25397 ~]# jnpr- jnpr-configure-node jnpr-configure-ntp
jnpr-configure-timezone jnpr-network-script healthcheckOSLC
```

Table 15: Description of the Log Collector Script

Script	Description
jnpr-configure-node	Master script for the node configuration and network settings.
jnpr-configure-ntp	Script for NTP configuration.
jnpr-configure-timezone	Script for time zone configuration.
jnpr-network-script	Script for interface configuration.
healthcheckOSLC	Script for checking the issues with logging infrastructure.

NOTE: You can only configure the IP address of all Log Collector nodes by using the configuration script. If an IP address is configured manually, the Log Collector node cannot be added to Security Director.

[Figure 11 on page 52](#) shows the configuration options.

Figure 11: Configuration Options

```
Please enter your choice:
1) Configure IP Address
2) Configure Time Zone
3) Configure Name Server Settings
4) Configure NTP Settings
5) Configure eMail Settings for event notification
6) Update Log Collector database password
7) Quit

Please enter your choice: 1

Setup Network

1) Configure IP Address for eth0
2) Configure IP Address for eth1

Please enter your choice: _
```

Expanding the Size of the VM Disk for Log Collector

You can increase the disk size of your virtual machine (VM) when the log files created by your application become too large.

NOTE: The default shipping configuration of your VM includes 500 GB of disk space.

Before You Begin

- Ensure that the VM is powered off.
- Ensure that the VM has no snapshots.

To expand the disk size using VMware VSphere or VCenter:

1. Deploy the Log Collector VM on a VMware ESX server.
2. Using VSphere client (either the desktop client or the Web), right-click the VM settings.
3. Click **Edit Settings**.

4. Set the Hard disk 2 option to 600. The default disk configuration is 12 GB for hard disk 1 and 500 GB for hard disk 2.
5. Click **Save**.
6. Power on the VM.

To verify and apply the configuration:

1. Log in as a root user from the Log Collector VM.
2. Check the current file system state by entering the **df -h** command.

Filesystem	Size	Used	Available	Use%	Mounted On
/dev/mapper/data1_vg-elasticsearch	500G	267M	500G	1%	/var/lib/elasticsearch

3. Run the `/opt/jnpr/bin/resizeFS.sh` script.

You see the following sample output:

```
[root@LOG-COLLECTOR ~]# /opt/jnpr/bin/resizeFS.sh
```

```
Physical volume "/dev/sdb" changed 1 physical volume(s) resized / 0 physical
volume(s) not resized

Extending logical volume elasticsearch to 600.00 GB

Logical volume elasticsearch successfully resized
meta-data=/dev/mapper/data1_vg-elasticsearch isize=256 agcount=4, agsize=32767744
blks = sectsz=512 attr=2, projid32bit=0 data = bsize=4096 blocks=131070976,
imaxpct=25 = sunit=0 swidth=0 blks naming =version 2 bsize=4096 ascii-ci=0 log
=internal bsize=4096 blocks=63999, version=2 = sectsz=512 sunit=0 blks,
lazy-count=1 realtime =none extsz=4096 blocks=0, rtextents=0 data blocks changed
from 131070976 to 157285376
```

4. Enter the **df -h** command again. Verify the expanded disk space, which should now be 600 GB.

`/dev/mapper/data1_vg-elasticsearch`

Filesystem	Size	Used	Available	Use%	Mounted On
/dev/mapper/data1_vg-elasticsearch	600G	267M	600G	1%	/var/lib/elasticsearch

NOTE: You must restart the VM after editing the disk size and then execute the `resizeFS.sh` script.

For more information on troubleshooting any issue while setting up Log Collector, see the following:

- To learn more about enabling vMotion and fault tolerance logging, see [Enabling vMotion and Fault tolerance logging](#).
- To learn more about VMWare chassis cluster and fault tolerance, see [vSphere Availability](#).
- To learn more about configuring vMotion, see [Creating a VMkernel port and enabling vMotion on an ESXi/ESX host](#) and [Set Up a Cluster for vMotion](#).

Release History Table

Release	Description
16.1	Starting in Security Director Release 16.1R1, you can install an integrated Log Collector on a JA2500 appliance or Junos Space virtual appliance.
15.2R2	Starting in Security Director Release 15.2R2, you can deploy Log Collector VM on a kernel-based virtual machine (KVM) server installed on CentOS Release 6.5.

RELATED DOCUMENTATION

Upgrading Junos Space Network Management Platform	 14
Installing Security Director	 15
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Security Director Log Collector Overview	 30

JSA Log Collector Overview

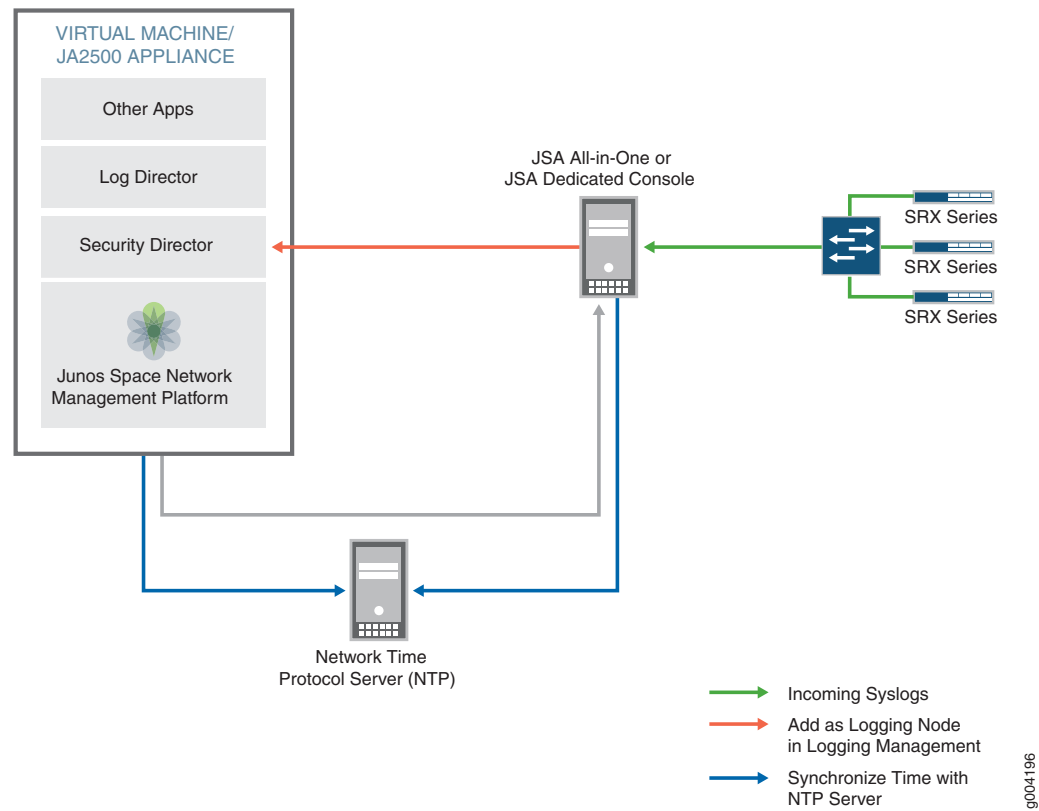
Starting in Security Director Release 16.2 R1, you can use Juniper Secure Analytics (JSA) as a Log Collector to view log data in Security Director. From the JSA console, Security Director queries logs from SRX Series devices. Security Director can use either JSA3800, JSA5800, JSA7500, or virtual JSA for log collection. You must add JSA as a logging node in Security Director to view log data in the Dashboard, Events and Logs, Reports, and Alerts pages.

NOTE: The JSA version supported by Security Director to be added as log collector node is JSA Release 2014.8.R4 or later.

After JSA is deployed, you can configure network devices to send system logs to JSA. It collects the logs in a standalone or clustered setup. For more details on deploying and configuring JSA, see [Juniper Secure Analytics](#) documentation.

[Figure 12 on page 56](#) shows the deployment example using the JSA All-in-One or JSA Dedicated Console.

Figure 12: Using JSA All-in-One or JSA Dedicated Console



To add JSA as a logging node in Security Director, see [“Adding Log Collector to Security Director”](#) on page 56.

Release History Table

Release	Description
16.2	Starting in Security Director Release 16.2 R1, you can use Juniper Secure Analytics (JSA) as a Log Collector to view log data in Security Director.

Adding Log Collector to Security Director

You must deploy either Security Director Log Collector or Juniper Secure Analytics (JSA) as a log collector and then add it to Security Director to view the log data in the Dashboard, Events and Logs, Reports, and Alerts pages.

Before You Begin

- Deploy Security Director Log Collector or JSA as a Log Collector.
- Configure system log and security logging for the devices managed by Junos Space Security Director from **Devices > Security Devices > Modify Configuration**.
- While adding SRX firewall as a log source in JSA or QRadar, set the log source type to Juniper Junos Platform and not Juniper SRX Series Services Gateway.
- You must have the recent version of Juniper Junos Device Support Module (DSM) installed on JSA or QRadar.

To add Log Collector to Security Director:

1. From the Security Director user interface, select **Administration > Logging Management > Logging Nodes**, and click the plus sign (+).

The Add Logging Node page appears.

2. Choose the Log Collector type as **Security Director Log Collector** or **Juniper Secure Analytics**.
3. Click **Next**.
4. Complete the configuration for Add Collector/JSA Node.

NOTE: From Junos Space Security Director Release 17.2, for distributed Log Collector deployment, you must add only Log Receiver node.



CAUTION: For Security Director Log Collector, provide the default credentials: Username is admin and Password is juniper123. You must change the default password using the Log Collector CLI `configureNode.sh` command as shown in [Figure 13 on page 58](#).

Figure 13: Change Password

```
[root@LOG-COLLECTOR ~]# sh configureNode.sh
#####

Please enter your choice:
1) Configure IP Address
2) Configure Time Zone
3) Configure Name Server Settings
4) Configure NTP Settings
5) Configure eMail Settings for event notification
6) Update Log Collector database password
7) Quit

Please enter your choice: 6

Updating Log Collector database password

Please Enter New Password for db(elasticsearch) user, admin :
█
```

For JSA, provide the admin credentials that is used to log in to the JSA console.

5. Click **Next**.

The certificate details are displayed.

6. Click **Finish**.

7. Review the summary of configuration changes from the summary page and click **Edit** to modify the details, if required.

8. Click **OK** to add the node.

A new logging node with your configuration is added. To verify that the node is configured correctly, click **Logging Management** to check the status of the node.

To remove an existing Security Director Log Collector and add JSA as a Log Collector:

1. Select **Administration > Logging Management > Logging Nodes**.
2. Select the existing Security Director Log Collector and click the delete icon to delete Security Director Log Collector node.
3. Click the + icon to add JSA as a Log Collector.
4. Configure the SRX Series devices to stop sending logs to Security Director Log Collector, and ensure that logs are sent to the JSA node.

RELATED DOCUMENTATION

[Security Director Log Collector Overview | 30](#)

[Setting Up Security Director Log Collector | 38](#)

[JSA Log Collector Overview | 55](#)

Upgrading Security Director Log Collector

IN THIS SECTION

- [Upgrading Log Collector from 15.2R1 to 15.2R2 | 60](#)
- [Upgrading Log Collector VM or JA2500 Appliance from 15.2R2 or Later Releases | 61](#)
- [Upgrading Log Collector VM or JA2500 Appliance from 18.3R1, 18.4R1, or 19.1R1 to 19.1R2 | 64](#)
- [Upgrading Integrated Log Collector | 65](#)
- [Upgrading Integrated Log Collector from 18.3R1, 18.4R1, or 19.1R1 to 19.1R2 | 66](#)

You can upgrade the Log Collector VM or the JA2500 appliance and integrated Log Collector to a later release.

Before You Begin

- You must delete all the Log Collector nodes from **Security Director > Administration > Logging Management > Logging Nodes**.
- Upgrade to a supported version of Junos Space Network Management Platform Release and then upgrade the Security Director application.

See the following topics for information about upgrading Log Collector.

Table 16 on page 60 shows the topology difference for the Log Collector Release 15.2R2, 16.1R1, and later.

Table 16: Topology Difference

Node Type	Release 15.2R2	Release 16.1R1 and later
All-in-One Node	Yes	Yes
Log Receiver Node	Yes	Yes
Log Storage Node	Yes (Log indexer node, Log data node)	Yes
Query node, Client node	Yes (20K eps)	No
Primary node, Cluster Manager node	Yes (20K eps)	No
Integrated	No	Yes

Upgrading Log Collector from 15.2R1 to 15.2R2

NOTE: The supported upgrade path is Log Collector 15.2R1 > Log Collector 15.2R2.

To upgrade from Log Collector 15.2R1 to Log Collector 15.2R2:

1. Download the Log Collector upgrade image for VM from the [download site](#).
2. Copy the rpm file **nwscripts-1-2.noarch.12.rpm** to each Log Receiver node, Log Indexer, or Log Receiver and Indexer node.

3. Upgrade each Log Receiver node, Log Indexer node, or Log Receiver and Indexer node using the **rpm -Uvh nwscripsts-1-2.noarch.12.rpm** command.

NOTE: Upgrading Log Collector from 15.1 to Log Collector 15.2R1 is not supported.

Upgrading Log Collector VM or JA2500 Appliance from 15.2R2 or Later Releases

NOTE: Create a back up of Log Collector.

Table 17: Log Collector Upgrade Path

Upgrading to Release	Upgrade Path
Log Collector 19.1R2	<ul style="list-style-type: none"> • Log Collector 19.1R1 > Log Collector 19.1R2 • Log Collector 18.4R1 > Log Collector 19.1R2 • Log Collector 18.3R1 > Log Collector 19.1R2
Log Collector 19.1R1	<ul style="list-style-type: none"> • Log Collector 18.4R1 > Log Collector 19.1R1 • Log Collector 18.3R1 > Log Collector 19.1R1 <p>You can now perform direct upgrade to 19.1R1 from older versions of Log Collector Release 18.2R1, 18.1R1, and 17.2R2.</p> <ul style="list-style-type: none"> • 18.2R1 > 19.1R1 • 18.1R1 > 19.1R1 • 17.2R2 > 19.1R1 <p>NOTE: You can perform direct upgrade only for Junos Space Security Director and Log Collector. However, you must follow all the supported upgrade paths for Junos Space Network Management Platform to upgrade to 19.1R1.</p>
Log Collector 18.4R1	<ul style="list-style-type: none"> • Log Collector 18.3R1 > Log Collector 18.4R1 • Log Collector 18.2R1 > Log Collector 18.4R1

Table 17: Log Collector Upgrade Path (*continued*)

Upgrading to Release	Upgrade Path
Log Collector 18.3R1	<ul style="list-style-type: none"> • Log Collector 18.2R1 > Log Collector 18.3R1 • Log Collector 18.1R2 > Log Collector 18.3R1 • Log Collector 18.1R1 > Log Collector 18.3R1
Log Collector 18.2R1	<ul style="list-style-type: none"> • Log Collector 18.1R2 > Log Collector 18.2R1 • Log Collector 18.1R1 > Log Collector 18.2R1 • Log Collector 17.2R1 > Log Collector 18.2R1 • Log Collector 17.2R2 > Log Collector 18.2R1
Log Collector 18.1R2	<ul style="list-style-type: none"> • Log Collector 18.1R1 > Log Collector 18.1R2 • Log Collector 17.2R2 > Log Collector 18.1R2
Log Collector 18.1R1	<ul style="list-style-type: none"> • Log Collector 17.1R2 > Log Collector 18.1R1 • Log Collector 17.2R2 > Log Collector 18.1R1
Log Collector 17.2R2	<ul style="list-style-type: none"> • Log Collector 17.2R1 > Log Collector 17.2R2 • Log Collector 17.1R2 > Log Collector 17.2R2
Log Collector 17.2R1	<ul style="list-style-type: none"> • Log Collector 17.1R2 > Log Collector 17.2R1
Log Collector 17.1R1	<ul style="list-style-type: none"> • Log Collector 15.2R2 > Log Collector 16.1R1/16.2R2 > Log Collector 17.1R1
Log Collector 16.2R1	<ul style="list-style-type: none"> • Log Collector 15.2R2 > Log Collector 16.1R1 > Log Collector 16.2R1 • Log Collector 15.2R2 > Log Collector 16.2R1
Log Collector 16.1R1	<ul style="list-style-type: none"> • Log Collector 15.2R2 > Log Collector 16.1R1

To upgrade Log Collector VM or JA2500 Appliance:

1. If you had changed the log database password for the logging nodes in Log Collector Release 15.2R2, perform the following steps. Otherwise, continue with Step 2.

NOTE: This step is applicable from Release 15.2R2 to 16.1R1.

- a. Use the **ssh** command to log in to the node.
- b. Open the **elasticsearch.yml** file located at **/etc/elasticsearch/** in a text editor.

- c. In the **elasticsearch.yml** file, search for `http.basic.password` and replace the changed password with `58dd311734e74638f99c93265713b03c391561c6ce626f8a745d1c7ece7675fa`
 - d. Save the changes.
2. Download the Log Collector upgrade script from the [download site](#).
 3. Copy the upgrade script to the /root directory of all the nodes that you want to upgrade.
 4. Change the file permission using the following command:
chmod +x Log-Collector-Upgrade-xx.xxx.xxx.sh
 For example, **chmod +x Log-Collector-Upgrade-19.1R2.xxx.sh**
 5. Run the upgrade script using the **./Log-Collector-Upgrade-xx.xxx.xxx.sh** command.
 For example, **./Log-Collector-Upgrade-19.1R2.XXX.sh**
 The status of the upgrade is shown on the console.

NOTE:

- From release 16.2R1, the **Logstash** process no longer runs on the Log Receiver node. Instead, the **jingest** process will run.
- You must ensure that the **jingest** and **elasticsearch** processes are running.

6. Add the logging nodes back to Security Director from **Security Director > Administration > Logging Management > Logging Nodes**.

See [“Adding Log Collector to Security Director” on page 56](#).

NOTE: For upgrading from 15.2R2 to 16.1R1:

- Multiple-node deployment is a combination of Log Receiver and Log Storage nodes. You can add a maximum of one Log Receiver node and three Log Storage nodes.
- Only one Log Receiver node is supported for all levels of deployment. If you have multiple Log Receivers in the Release 15.2R2 setup, upgrade only one Log Receiver to Release 16.2R1 and delete the other Log Receivers.
- Log Query node and Primary node are not supported. So you can delete them.
- You must run the upgrade script on each node to upgrade it to the corresponding release.

Upgrading Log Collector VM or JA2500 Appliance from 18.3R1, 18.4R1, or 19.1R1 to 19.1R2

To upgrade Log Collector All-In-One node:

1. Download the Log Collector upgrade script **Log-Collector-Upgrade-19.1R2.X.sh** from the [download site](#).
2. Copy the Log Collector upgrade script to the Log Collector All-In-One node.
3. Connect to the CLI Log Collector All-In-One node.
4. Navigate to the location where you have copied Log Collector upgrade script.
5. Run Log Collector upgrade script.

```
sh Log-Collector-Upgrade-19.1R2.X.sh
```

6. Select from the below options and continue.
 - 1) Upgrade WITHOUT Recovering current log data
[This will PERMANENTLY DELETE THE CURRENT LOG DATA]
 - 2) Upgrade and Recover the current log data
 - 3) Exit

Is this running on SSD? [Y/N]

Wait for the upgrade to complete.

To upgrade distributed Log Collector:

Before You Begin

- For upgrade process, you should be able to ping both Log Receiver and Log Storage nodes.
- Download the Log Collector upgrade script **Log-Collector-Upgrade-19.1R2.X.sh** from the [download site](#).
- Copy the Log Collector upgrade script to Log Receiver and Log Storage nodes of the distributed deployment.

To upgrade on Log Receiver node:

1. Connect to the Log-Receiver Node CLI.
2. Navigate to the location where you have Log Collector upgrade script.
3. Run Log Collector upgrade script:
sh Log-Collector-Upgrade-19.1R2.X.sh
4. Select from the below options and continue.

Please choose how you want to upgrade Log Collector:

- 1) Upgrade WITHOUT Recovering current log data.
 [This will PERMANENTLY DELETE THE CURRENT LOG DATA]
- 2) Upgrade and Recover the current log data
- 3) Exit

To upgrade on Log Storage node:

1. Run Log Collector upgrade script:
sh Log-Collector-Upgrade-19.1R2.X.sh
2. Enter the Log Receiver Node IP.
3. Select from the below options and continue
 Please choose how you want to upgrade Log Collector:
 - 1) Upgrade WITHOUT Recovering current log data.
 [This will PERMANENTLY DELETE THE CURRENT LOG DATA]
 - 2) Upgrade and Recover the current log data
 - 3) Exit

Upgrading Integrated Log Collector

To upgrade an integrated Log Collector to a latest release:

NOTE: Integrated Log Collector is supported from 16.1R1 Release onwards.

1. Download the integrated Log Collector script from the [download site](#).
2. Copy the integrated Log Collector script to a JA2500 appliance or virtual appliance.
3. Connect to the CLI of a JA2500 appliance or virtual appliance with admin privileges.
4. Navigate to the location where you have copied the integrated Log Collector script.

5. Change the file permission using the following command:

chmod +x Integrated-Log-Collector-xx.xxx.xxx.sh

For example, **chmod +x Integrated-Log-Collector-19.1R2.xxx.sh**

6. Run the integrated Log Collector script using the following command:

./Integrated-Log-Collector-xx.xxx.xxx.sh

For example, **./Integrated-Log-Collector-19.1R2.xxx.sh**

NOTE:

- The integrated Log Collector does not support high availability (HA) even if it is installed in a Junos Space HA cluster. The integrated Log Collector must be installed only on one of the Junos Space cluster nodes.
- 500 eps is supported for the integrated Log Collector.

Upgrading Integrated Log Collector from 18.3R1, 18.4R1, or 19.1R1 to 19.1R2

1. Copy **Integrated-Log-Collector-19.1R2.x.sh** to the space node.
2. Run the script: **sh Integrated-Log-Collector-19.1R2.x.sh**
3. Select from following options and continue:

Please choose how you want to upgrade Log Collector:

1) Upgrade WITHOUT Recovering current log data.

[This will PERMANENTLY DELETE THE CURRENT LOG DATA]

2) Upgrade and Recover the current log data.

3) Exit

NOTE: After upgrading the log collector, add the log collector node. See [“Adding Log Collector to Security Director” on page 56](#).

For Security Director log collector, provide the default credentials admin/juniper123. Change the default password.

For JSA, provide the admin credentials that is used to log in to the JSA console.

RELATED DOCUMENTATION

[Upgrading Junos Space Network Management Platform | 14](#)

[Upgrading Security Director | 16](#)