

Release Notes

Published
2024-12-17

release-note-21.3R1

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Introduction

Junos Space is a comprehensive network management solution that simplifies and automates management of Juniper Networks switching, routing, and security devices.

Junos Space Management Applications optimize network management by extending the breadth of the Junos Space solution for various domains in service provider and enterprise environments.

These release notes accompany Junos Space Network Management Platform Release 21.3R1.



NOTE: The terms Junos Space Network Management Platform and Junos Space Platform are used interchangeably in this document.

New and Changed Features

Junos Space® Network Management Platform Release 21.3R1 includes the following enhancement:

- Infrastructure improvement— We've upgraded JBoss 6 EAP to WildFly 22.0.

Installation Instructions

Junos Space Network Management Platform Release 21.3R1 can be installed on a Junos Space Appliance or a Junos Space Virtual Appliance.



CAUTION: During the Junos Space Network Management Platform installation process, do not modify the filename of the software image that you download from the Juniper Networks support site. If you modify the filename, the installation fails.

- For installation instructions for a JA2500 Junos Space Appliance, see the [Installation and Configuration](#) section of the [JA2500 Junos Space Appliance Hardware Guide](#).
- For installation instructions for a Junos Space Virtual Appliance, see the [Junos Space Virtual Appliance Deployment Overview](#) section of the [Junos Space Virtual Appliance Installation and Configuration Guide](#).



NOTE: Starting from Junos Space Network Management Platform release 21.1R1, ethernet interface order is changed for JA2500.

See [Junos Space Ethernet Interfaces Overview](#) for more details.

See ["Supported Hardware" on page 8](#) for more information about the hardware supported.

Upgrade Instructions

IN THIS SECTION

- [Supported Upgrade Path | 2](#)
- [Upgrade Notes | 4](#)
- [Instructions for Validating the Junos Space Network Management Platform OVA Image | 5](#)

This section provides information about upgrading the Junos Space Network Management Platform installations running versions earlier than Release 21.3R1.

- ["Supported Upgrade Path" on page 2](#)
- ["Upgrade Notes" on page 4](#)
- ["Instructions for Validating the Junos Space Network Management Platform OVA Image" on page 5](#)

Supported Upgrade Path

[Table 1 on page 3](#) provides information about the supported upgrade path across Junos Space Network Management Platform releases.

Table 1: Supported Upgrade Path

Upgrade from Junos Space Release	Upgrade to Junos Space Release									
Junos Space Release	18.4	19.1	19.2	19.3	19.4	20.1	20.3	21.1	21.2	21.3
18.2	Yes									
18.3	Yes	Yes								
18.4		Yes	Yes							
19.1			Yes	Yes						
19.2				Yes	Yes					
19.3					Yes	Yes	Yes			
19.4						Yes	Yes			
20.1							Yes			
20.3								Yes		
21.1									Yes	Yes
21.2										Yes

Related Information

- [Upgrading Junos Space Network Management Platform Overview](#)
- [Juniper Networks Devices Supported by Junos Space Network Management Platform](#)
- [Upgrading Junos Space Network Management Platform](#)



NOTE: Before you upgrade Junos Space Platform to Release 21.3, ensure that the time on all Junos Space nodes is synchronized. For information about synchronizing time on Junos Space nodes, see [Synchronizing Time Across Junos Space Nodes](#).

You can upgrade to Junos Space Network Management Platform 21.3R1 from the following earlier release:

- Junos Space Network Management Platform Release 21.1R1 and 21.2R1



CAUTION: During the Junos Space Network Management Platform upgrade process, do not modify the filename of the software image that you download from the Juniper Networks support site. If you modify the filename, the upgrade fails.

Upgrade Notes

- Before the upgrade, ensure that the latest backups are available in a location other than the Junos Space server. For more information about backups, see [Backing Up the Junos Space Network Management Platform Database](#).
- To upgrade to Junos Space Network Management Platform Release 21.3, follow the procedure mentioned in [Upgrading Junos Space Network Management Platform](#).
- During the upgrade process, do not manually reboot the nodes if the Junos Space user interface does not come up for an extended period of time. Contact the Juniper Networks Support team for help in resolving this issue.
- After you upgrade Junos Space Platform to Release 21.3R1, all previously installed applications are disabled until the applications are upgraded to a version compatible with Junos Space Platform 21.3R1. You must upgrade the applications to releases that are compatible with Junos Space Platform Release 21.3R1, by using the Junos Space Platform UI. For information about application versions compatible with Junos Space Platform 21.3R1, see ["Application Compatibility" on page 8](#).



NOTE: Starting from Junos Space Network Management Platform release 21.1R1, ethernet interface order is changed for JA2500.
See [Junos Space Ethernet Interfaces Overview](#) for more details.

Instructions for Validating the Junos Space Network Management Platform OVA Image

From Junos Space Network Management Platform Release 14.1R1 onward, the Junos Space Platform open virtual appliance (OVA) image is securely signed.

**NOTE:**

- Validating the OVA image is optional; you can install or upgrade Junos Space Network Management Platform without validating the OVA image.
- Before you validate the OVA image, ensure that the PC on which you are performing the validation has the following utilities available: tar, openssl, and ovftool (VMWare Open Virtualization Format (OVF) Tool). You can download VMWare OVF Tool from the following location: <https://my.vmware.com/web/vmware/downloads/details?productId=353&downloadGroup=OVFTOOL351>.

To validate the Junos Space Network Management Platform OVA image:

1. Download the Junos Space Platform OVA image and the Juniper Networks Root CA certificate chain file (JuniperRootRSACA.pem) from the Junos Space Network Management Platform - Download Software page at <https://www.juniper.net/support/downloads/space.html>.



NOTE: You need to download the Juniper Networks Root CA certificate chain file only once; you can use the same file to validate OVA images for future releases of Junos Space Network Management Platform.

2. (Optional) If you downloaded the OVA image and the Root CA certificate chain file to a PC running Windows, copy the two files to a temporary directory on a PC running Linux or Unix. You can also copy the OVA image and the Root CA certificate chain file to a temporary directory (/var/tmp or /tmp) on a Junos Space node.



NOTE: Ensure that the OVA image file and the Juniper Networks Root CA certificate chain file are not modified during the validation procedure. You can do this by providing write access to these files only to the user performing the validation procedure. This is especially important if you use a generally accessible temporary directory, such as /tmp or /var/tmp, because such directories can be accessed by several users.

3. Navigate to the directory containing the OVA image.

4. Unpack the OVA image by executing the following command:

```
tar xf ova-filename
```

where *ova-filename* is the filename of the downloaded OVA image.

5. Verify that the unpacked OVA image contains a certificate chain file (*junos-space-certchain.pem*) and a signature file (**.cert extension**).
6. Validate the signature in the unpacked OVF file (extension **.ovf**) by executing the following command:
ovftool ovf-filename, where *ovf-filename* is the filename of the unpacked OVF file.
7. Validate the signing certificate with the Juniper Networks Root CA certificate chain file by executing the following command:

```
openssl verify -CAfile JuniperRootRSACA.pem -untrusted Certificate-Chain-File Signature-file
```

where **JuniperRootRSACA.pem** is the Juniper Networks Root CA certificate chain file, *Certificate-Chain-File* is the filename of the unpacked certificate chain file (extension *.pem*), and *Signature-file* is the filename of the unpacked signature file (extension *.cert*).

If the validation is successful, a message indicating that the validation is successful is displayed.

A sample of the validation procedure is as follows:

```
-bash-4.1$ ls
JuniperRootRSACA.pem space-16.1R1.3.ova
-bash-4.1$ mkdir tmp
-bash-4.1$ cd tmp
-bash-4.1$ tar xf ../space-16.1R1.3.ova
-bash-4.1$ ls
junos-space-certchain.pem space-16.1R1.3.cert
space-16.1R1.3-disk1.vmdk.gz space-16.1R1.3.mf
space-16.1R1.3.ovf
-bash-4.1$ ovftool space-16.1R1.3.ovf
OVF version: 1.0
VirtualApp: false
Name: viso-space-16.1R1.3

Download Size: 1.76 GB

Deployment Sizes:
  Flat disks: 250.00 GB
  Sparse disks: 4.68 GB

Networks:
```



```

Name:          VM Network
Description: The VM Network network

Virtual Machines:
Name:          viso-space-16.1R1.3
Operating System:  rhel5_64guest
Virtual Hardware:
  Families:      vmx-04
  Number of CPUs:  4
  Cores per socket: 1
  Memory:         8.00 GB

Disks:
  Index:          0
  Instance ID:    7
  Capacity:       250.00 GB
  Disk Types:     SCSI-lsillogic

NICs:
  Adapter Type:   E1000
  Connection:     VM Network

  Adapter Type:   E1000
  Connection:     VM Network

  Adapter Type:   E1000
  Connection:     VM Network

  Adapter Type:   E1000
  Connection:     VM Network

-bash-4.1$ openssl verify -CAfile JuniperRootRSACA.pem -untrusted junos-space-certchain.pem
space-16.1R1.3.cert
space-16.1R1.3.cert: OK
-bash-4.1$

```

8. (Optional) If the validation is not successful, perform the following tasks:
 - a. Determine whether the contents of the OVA image are modified. If the contents are modified, download the OVA image from the Junos Space Network Management Platform - Download Software page.

- b. Determine whether the Juniper Networks Root CA certificate chain file is corrupted or modified. If it is corrupted or modified, download the Root CA certificate chain file from the Junos Space Network Management Platform - Download Software page.
- c. Retry the preceding validation steps by using one or both of the new files.

Application Compatibility



WARNING: Before you upgrade to Junos Space Network Management Platform Release 21.3R1, ensure that compatible versions of Junos Space applications are available for upgrade by referring to the Junos Space Application Compatibility [Junos Space Application Compatibility](#) knowledge base article. If you upgrade to Junos Space Platform Release 21.3R1 and the compatible version of a Junos Space application is not available, the current version of the Junos Space application is deactivated and cannot be used until Juniper Networks releases a compatible version of the Junos Space application.

This release of Junos Space Network Management Platform supports Worldwide (ww) Junos OS Adapter adapter and the following applications.

- Security Director 21.3R1

Supported Hardware

Junos Space Network Management Platform Release 21.3R1 can be installed on the following hardware:

- JA2500 Junos Space Appliance
- VMware ESXi server 6.7 and 7.0



NOTE: Adobe Flash is no longer supported and VMware ESXi server 6.0 and 6.5 are removed.

- Kernel-based virtual machine (KVM) (Release 1.5.3-141.el7_4.4 or later)

For detailed information about hardware requirements, see the *Hardware Documentation* section of the [Junos Space and Applications](#) page.



NOTE: For information about whether a Junos Space application can be installed on a particular Junos Space Appliance (JA2500) or Junos Space Virtual Appliance, see the release notes of the specific Junos Space application release.



NOTE: For detailed information about hardware requirements, see [Junos Space Virtual Appliance Deployment Overview](#).

Supported Devices

For a list of supported devices up to and including Junos Space Platform Release 21.3R1, see [Juniper Networks Devices Supported by Junos Space Network Management Platform](#).

Table 2: Supported Line Cards

Device	Line Cards
MX10008	JNP10K-LC480
MX10016	JNP10K-LC480



NOTE: When Junos Space Platform discovers EX Series switches running Layer 2 next generation software, the device family for these devices is displayed (on the Device Management page) as junos and not as junos-ex. This behavior is currently observed on EX4300 and EX9200 switches running Layer 2 next-generation software.



NOTE: Previous versions of Junos OS releases are also supported. If you are using previous versions of Junos OS releases, you can continue to use the same versions. For a complete list of Junos OS compatibility and support information, see [Junos OS Releases Supported in Junos Space Network Management Platform](#).

Changes in Default Behavior

- From Release 17.2R1 onward, Junos Space Platform does not sort configurations while comparing templates. In releases earlier than 17.2R1, Junos Space Platform sorts configurations while comparing templates, and this causes Junos Space Platform to trigger incorrect deviation reports because of a change in the order of configuration statements caused by the sorting.
- From Release 17.2R1 onward, Junos Space Platform does not support the click action in the Top 10 Active Users in 24 Hours chart. In releases earlier than 17.2R1, you can click within the chart to view details of the selected item on the corresponding page.
- From Junos Space Platform Release 17.1R1 onward, the VLAN field in reports supports both integer and string values. In releases earlier than 17.1R1, the VLAN field in reports supports only integer values, whereas the VLAN field for logical interfaces accepts both integer and string values. This mismatch causes issues in displaying VLAN information for logical interfaces in reports.

From Release 17.1R1 onward, the VLAN option in the Add Filter Criteria section of the Create Report Definition page and the filter support for the VLAN column on the View Logical Interface page are removed.

- From Junos Space Platform Release 16.1R2 onward, the upgrade-related logs at `/var/jmp_upgrade` are added to the troubleshooting logs.
- From Release 17.1R1 onward, Junos Space Platform boot menu accepts text inputs, such as reinstall, when you install the Junos Space Platform software from USB drives. In versions earlier than Release 17.1R1, the boot menu supports only numerical values. From Release 17.1R1 onward, when you do a reinstall, the software restarts and a local reboot occurs by default. Previously, you had to connect to the console and manually trigger a reboot.
- From Junos Space Platform Release 16.1R2 onward, validation messages are provided for tasks where CSV files are used for device selection, and all devices that are listed in the CSV file are not selected when the task is performed. Validation messages are provided when devices are selected using CSV files from the following pages and dialog boxes:
 - Deploy Device Image dialog box
 - Deploy Satellite Device Image dialog box
 - Stage Image on Device page
 - Stage Image on Satellite Device page
 - Remove Image from Staged Device dialog box
 - Undeploy JAM Package from Device dialog box

- Verifying checksum of image on device(s) dialog box
- Stage Scripts on Device(s) page
- Disable Scripts on Device(s) page
- Execute Script on Device(s) page
- Remove Scripts from Device(s) dialog box
- Verify Checksum of Scripts on Device(s) dialog box

From Release 17.1R1 onward, validation messages are provided for the following pages and dialog boxes, too:

- Run Operation page
- Stage Script Bundle on Devices dialog box
- Enable Script Bundle on Devices page
- Disable Script Bundle on Devices page
- Execute Script Bundle on Devices dialog box
- Starting in Junos Space Network Management Platform Release 21.3R1, unicast Junos Space cluster is the default mode for Junos Space Network Management Platform.
- Starting in Junos Space Network Management Platform Release 21.3R1, the AppLogic node restarts, when the Add Node jobs for JBoss and database nodes are successful. This is not applicable for Fault Monitoring and Performance Monitoring (FMPM) node.
- While upgrading from Junos Space Network Management Platform Release 21.1R1 (with Junos Space Network Management Platform Release 21.1R1 supported applications) or Junos Space Network Management Platform Release 21.2R1 (with Junos Space Network Management Platform Release 21.1R1 supported applications) to Junos Space Network Management Platform Release 21.3R1, the deployment status is displayed only for the Junos Space Network Management Platform and not for the applications.
- Starting in Junos Space Network Management Platform Release 21.3R1, the scripts with existing Network Configuration protocol (NETCONF) Remote Procedure Calls (RPC) commands needs to be replaced with CLI commands with display xml option.
- Starting in Junos Space Network Management Platform Release 21.3R1, the AppLogic service restarts after the application upgrade or installation job is successful.

- Starting in Junos Space Network Management Platform Release 21.3R1, before initiating any operation like configuration change, configlet or template push to the device, make sure that the nodes are not in **Deploying** / **Parsing Schema** state.

Known Behavior



CAUTION: To avoid a BEAST TLS 1.0 attack, whenever you log in to Junos Space through a browser tab or window, make sure that the tab or window was not previously used to access a non-HTTPS website. The best practice is to close your browser and relaunch it before logging in to Junos Space.

- To complete the image deployment and upgrade process for EX Series switches, you must reboot the device using the device CLI or perform a separate reboot job using the Junos Space Network Management UI.
- Starting from Junos Space Network Management Platform Release 18.1R1 onwards, to view and edit firewall policies, users must have permissions or roles corresponding to all the attributes present under the Firewall Policies and Shared Objects predefined roles. Go to Network Management Platform>Role Based Access Control>Roles to view and assign the relevant roles.
- Tag names can be alphanumeric strings. The tag name can also contain underscores, hyphens, and spaces. However, a tag name must not:
 - Exceed 255 characters
 - Start with a space
 - Contain special characters such as commas, double quotation marks, or parentheses.



NOTE: “Untagged” is a reserved term and, therefore, you cannot create a tag with this name.

- The right-click menu is not available on the Import Licenses (Administration > Licenses > Import License) page. You can use either the browser menu options or the keyboard shortcuts to copy and paste onto the page.
- Device-initiated connections to Junos Space can have different IP addresses from those listed in Junos Space. For example, if you use a loopback address to discover a device, you can source the SSH session of the device from its interface address (Junos OS default behavior is to select the default address) instead. This can lead to firewall conflicts.

- When a remote user with the FMPM Manager role uses the API to access Junos Space Platform, the user details are not updated in the `/opt/opennms/etc/users.xml` file.
- You might observe the following limitations on the Topology page:
 - The tooltip on the node displays the status as Active/Managed even when the node is down.
 - For an SRX Series cluster, topology links are displayed only for the primary member of the cluster and not for the secondary member.
- When unified in-service software upgrade (ISSU) is performed from the Manage Operations workflow, the Routing Engines are not rebooted. The Routing Engines must be manually rebooted for the image to be loaded.
- For LSYS (logical, nonroot) devices, when there are pending out-of-band changes on the root device, the Resolve out-of-band changes menu option is disabled for those child LSYS devices, even though Device Managed Status displays Device Changed. This is by design.
- RMA is not supported on devices running Junos OS, and devices that are not running Junos OS.
- Script Manager supports only Junos OS Release 10.x and later.
- A stage device script or image supports only devices running Junos OS Release 10.x and later.
- For unified ISSU support for both device-initiated and Junos Space-initiated dual Routing Engine connections, we strongly recommend that you configure the virtual IP (VIP) on the dual Routing Engine device. Dual Routing Engine devices without VIP configuration are not fully supported on Junos Space.
- In a single node or multiple nodes, changes to the user (for example, password, roles, and disable or enable user) take effect only at the next login.
- Looking Glass functionality is not supported on logical systems.
- For devices running Junos OS Release 12.1 or later, the following parameters do not display any data in the Network Monitoring workspace because the corresponding MIB objects have been deprecated:
 - `jnxJsSPUMonitoringFlowSessIPv4`
 - `jnxJsSPUMonitoringFlowSessIPv6`
 - `jnxJsSPUMonitoringCPSessIPv4`
 - `jnxJsSPUMonitoringCPSessIPv6`
 - `jnxJsNodeSessCreationPerSecIPv4`
 - `jnxJsNodeSessCreationPerSecIPv6`

- jnxJsNodeCurrentTotalSessIPv4
- jnxJsNodeCurrentTotalSessIPv6
- For SNMPv3 traps, if more than one trap setting is configured in the `/opt/opennms/etc/trapd-configuration.xml` file, then the *security-name* attribute for the *snmpv3-user* element must be unique for each configuration entry. If a unique *security-name* attribute is not provided, then SNMP traps are not received by Network Monitoring.

The following is a sample snippet of the `/opt/opennms/etc/trapd-configuration.xml` file with two configuration entries:

```
<?xml version="1.0"?>
<trapd-configuration snmp-trap-port="162" new-suspect-on-trap="false">
  <snmpv3-user security-name="Space-SNMP-1" auth-passphrase="abcD123!" auth-protocol="MD5"/>
  <snmpv3-user security-name="Space-SNMP-2" auth-passphrase="abcD123!" auth-protocol="MD5"
    privacy-passphrase="zyxW321!" privacy-protocol="DES"/>
</trapd-configuration>
```

- On the Network Monitoring > Node List > Node page, the *ifIndex* parameter is not displayed for IPv6 interfaces if the version of Junos OS running on the device is Release 13.1 or earlier. This is because IPv6 MIBs are supported only on Junos OS Release 13.2 and later.
- When you modify the IP address of a Fault Monitoring and Performance Monitoring (FMPM) node using the Junos Space CLI, the FMPM node is displayed on the Fabric page but cannot be monitored by Junos Space Platform because of a mismatch in the certificate.

Workaround: After modifying the IP address of the FMPM node using the Junos Space CLI, generate a new certificate on the Junos Space VIP node and copy the certificate to the FMPM node by executing the following scripts on the Junos Space VIP node:

1. `curl -k https://127.0.0.1:8002/cgi-bin/createCertSignReq.pl? ip='fmpm-node-ip' \&user='admin' \&password='password'`
2. `curl -k https://127.0.0.1:8002/cgi-bin/authenticateCertification.pl? ip='fmpm-node-ip' \&user='admin' \&password='password' \&mvCertToDestn='Y'`

where *fmpm-node-ip* is the IP address of the FMPM node and *password* is the administrator's password.

- When you execute a script and click the View Results link on the Script Management Job Status page, the details of the script execution results are displayed up to a maximum of 16,777,215 characters; the rest of the results are truncated.

This might affect users who execute the *show configuration* command on devices with large configurations or if the output of a Junos OS operational command (executed on a device) is large.

- When you configure a Junos Space fabric with dedicated database nodes, the Junos Space Platform database is moved from the Junos Space nodes to the database nodes. You cannot move the database back to the Junos Space nodes.
- For a purging policy triggered by a cron job:
 - If the Junos Space fabric is configured with MySQL on one or two dedicated database nodes, the database backup files and log files (mainly in the **/var/log/** directory with the filenames **.log.**, *messages.**, or *SystemStatusLog.**) are not purged from the dedicated database nodes.
 - If the Junos Space fabric is configured with one or two FMPM nodes, the log files (mainly in the **/var/log/** directory with the filenames **.log.**, *messages.**, or *SystemStatusLog.**) are not purged from the FMPM nodes.
- If Network Monitoring receives two traps within the same second—that is, one for a trigger alarm and another for a clear alarm—then the triggered alarm is not cleared because the clear alarm is not processed by Network Monitoring.

- If you use Internet Explorer versions 8.0 or 9.0 to access the Junos Space Platform GUI, you cannot import multiple scripts or CLI Configlets at the same time.

Workaround: Use Internet Explorer Version 10.0 or later, or use a different supported browser (Mozilla Firefox or Google Chrome) to import multiple scripts or CLI Configlets at the same time.

- If you access the Junos Space Platform UI in two tabs of the same browser with two different domains selected and access the same page in both tabs, the information displayed on the page is based on the latest domain selected. To view pages that are accessible only in the Global domain, ensure that you are in the Global domain in the most recent tab in which you are accessing the UI.
- If you select the Add SNMP configuration to device check box on the Administration > Applications > Modify Network Management Platform Settings page and discover a device whose trap target is updated, clicking Resync Node from the Network Monitoring workspace does not reset the trap target for the device.
- If you clear the Add SNMP configuration to device check box on the Administration > Applications > Modify Network Management Platform Settings page, the trap target is not set for the device during device discovery and resynchronizing node operations.
- If you want to perform a global search by using partial keywords, append "*" to the search keywords.
- To perform a partial keyword search on tags on the Tags page (Administration > Tags) or the Apply Tags dialog box (right-click a device on the Device Management page and select Tag It), append * to the search keyword.
- Internet Explorer slows down because some scripts can take an excessive amount of time to run. The browser prompts you to decide whether to continue running the slow script. see <http://support.microsoft.com/kb/175500> for instructions on how to fix this issue.

- When you switch from Space as system of record mode to Network as system of record mode, devices with the Managed Status Device Changed or Space & Device Changed are automatically synchronized after 900 seconds. To reduce this time period, modify the Polling time period secs setting for Network Management Platform (Administration > Applications > Modify Application Settings) to a lower value such as 150 seconds.
- In Space as System of Record (SSoR) mode on Junos Space, when a new authentication key is generated, devices discovered and managed using RSA keys whose management status is Device Changed move to the Key Conflict Authentication status. To resolve the conflict on the devices and bring them back to a key-based state, upload the RSA keys manually (Devices > Upload Keys to Devices).
- The EnterpriseDefault (uei.opennms.org/generic/trap/EnterpriseDefault) event appears on the Events page in the Network Monitoring workspace only if there is no associated event definition for a received event. To create the required event definition, compile the MIB corresponding to the object ID (OID). You can find the OID by reviewing the details of the EnterpriseDefault event.

For more information about compiling SNMP MIBs, see [Compiling SNMP MIBs](#).

- When a physical hard drive is removed from a Junos Space hardware appliance (JA2500) or a logical hard drive is degraded, the corresponding SNMP traps (jnxSpaceHardDiskPhysicalDriveRemoved and jnxSpaceHardDiskLogicalDeviceDegraded respectively) are generated and displayed as events in the Network Monitoring workspace. Later, when the physical hard drive is reinserted, the corresponding events (jnxSpaceHardDiskPhysicalDriveAdded and jnxSpaceHardDiskLogicalDeviceRebuilding) are generated and displayed in the Network Monitoring workspace; however, the alarms previously raised for the removal of the physical hard drive are not cleared automatically. You can clear these alarms manually, if required. The alarms for the reinsertion of the physical hard drive are automatically cleared after a few minutes because they are of the Normal type.
- If the administrator password for a Fault Monitoring and Performance Monitoring (FMPM) node is modified using the Junos Space CLI, the disaster recovery with the FMPM node fails and new users added in Junos Space (after the password is modified) are not synchronized to the FMPM node. This is because the modified administrator password is not automatically updated in the Junos Space MySQL database.

To ensure that the synchronization to the FMPM node takes place, you must run the **`/var/www/cgi-bin/changeSpecialNodepassword.pl`** script so that the modified FMPM node password is updated in the Junos Space MySQL database. The syntax for the script is as follows: **`/var/www/cgi-bin/changeSpecialNodePassword.pl fmpm-node-ip fmpm-node-password`**, where *fmpm-node-ip* is the IP address of the FMPM node, and *fmpm-node-password* is the modified password for the FMPM node.

- If you clear the Add SNMP configuration to device check box (on the Modify Network Management Platform Settings page under Administration > Applications > Network Management Platform > Modify Application Settings) and discover devices, and subsequently select the Add SNMP

configuration to device check box and resynchronize nodes (Network Monitoring > Node List > Resync Nodes), the SNMPv2 trap target is updated on the devices.

- If you discover devices with the SNMP probing enabled, the correct version of the SNMP trap target is updated on the devices for the following cases:
 - When you modify the virtual IP (VIP) address or the device management interface IP address
 - When a separate interface for device management is configured and there is a failover of the VIP node
 - When you add or delete a Fault Monitoring and Performance Monitoring (FMPM) node
 - When you discover devices when the Network Monitoring service is stopped and subsequently start the Network Monitoring service and resynchronize nodes (Network Monitoring > Node List > Resync Nodes)

In all other cases, the default SNMP trap target (SNMPv2) is updated on the devices. If needed, you can use the predefined SNMPv3 Configlets (CLI Configlets > CLI Configlets) to update the trap settings on the device.

- In Junos Space Platform Release 16.1R1, Network Monitoring supports only a single set of SNMPv3 trap parameters.
- In Junos Space Platform Release 16.1R1, you cannot modify the trap settings for the SNMPv3 manager on the Network Monitoring GUI. You can modify the trap settings manually in the **/opt/opennms/etc/trapd-configuration.xml** file. After modifying the trap settings manually, restart the Network Monitoring service.
- With default SNMPv3 trap settings, the discovery of devices running worldwide Junos OS (wwJunos OS devices) fails as the default SNMPv3 trap settings cannot be updated to wwJunos OS devices because wwJunos OS devices do not support privacy settings.
- The setting to manage objects from all assigned domains can be enabled globally for all users by selecting the Enable users to manage objects from all allowed domains in aggregated view check box in the Domains section of the Modify Application Settings page (Administration > Applications > Network Management Platform > Modify Application Settings). Alternatively, you can enable the setting to manage objects from all assigned domains at the user level by selecting the Manage objects from all assigned domains check box on the Object Visibility tab of the Change User Settings dialog box, which appears when you click the User Settings (gear) icon on the Junos Space banner.
- The Juniper Networks Device Management Interface (DMI) schema repository (<https://xml.juniper.net/>) does not currently support IPv6. If you are running Junos Space on an IPv6 network, you can do one of the following:
 - Configure Junos Space to use both IPv4 and IPv6 addresses and download the DMI schema by using the Junos Space Platform Web GUI.

- Download the DMI schema by using an IPv4 client and update or install the DMI schema by using the Junos Space Web GUI.
- If you are planning on expanding the disk space for nodes in a Junos Space fabric (cluster) comprising of virtual appliances, you must first expand the disk space on the VIP node and ensure that the VIP node has come up (the status of the JBoss and MySQL services must be “Up”) before initiating the disk expansion on the other nodes in the fabric. If you fail to do this, it might cause fabric instability and you might be unable to access to the Junos Space GUI.
- In a Junos Space fabric with two or more nodes configured with both IPv4 and IPv6 addresses (dual stack), the communications between all nodes in the fabric must be enabled for both IPv4 and IPv6 addresses.
- The Network Monitoring Topology feature is not supported on Internet Explorer.
- If the network connectivity at the active disaster recovery site is down and the active site cannot connect to sufficient arbiter devices after resuming network connectivity, both sites become standby disaster recovery sites. Execute the **jmp-dr manualFailover -a** command at the VIP node of the active disaster recovery site to convert the original site to the active site and start the disaster recovery process.
- When you are discovering devices running the worldwide Junos OS (ww Junos OS devices), ensure that you wait at least 10 minutes after the Add Adapter job for the device worldwide Junos adapter has completed successfully before triggering the device discovery.
- A new pattern (requested 'commit synchronize' operation) is added to the syslog pattern in Junos Space Release 16.1R2. During the syslog registration after a device is discovered or connects back to Junos Space following a Junos Space upgrade from Release 16.1R1 to 16.1R2, the (requested 'commit synchronize' operation) pattern is added to the syslog patterns on the device. When you issue the commit synchronize command, Junos Space automatically resynchronizes only those devices that have the (requested 'commit synchronize' operation) pattern added to the syslog patterns.
- If you are using Internet Explorer to access the Junos Space Network Platform UI and need to copy the job ID value from the Job ID field of the Job Management page, you must click outside the job ID text to start the selection.
- After you upgrade Junos Space Platform from Release 16.1R1 to 17.1R1, the Last Reboot Reason field on the Administration > Fabric > View Node Detail > Reboot Detail page shows the value as Reboot from Shell/Other instead of Space reboot after Software Upgrade.
- If the device IP could not be verified, the Add Unmanaged Devices action fails.

Known Issues

This section lists the known issues in Junos Space Network Management Platform Release 21.3R1.

For the most complete and latest information about known defects, use the Juniper Networks online [Junos Problem Report Search](#) application.

- Although the external interfaces are present in the device in 2-node setup, they appear as blank in Junos Space network Management Platform GUI. [PR1637560](#)

Resolved Issues

For the most complete and latest information about known defects, use the Juniper Networks online [Junos Problem Report Search](#) application.



NOTE: Log4j vulnerabilities are addressed in Junos Space Network Management Platform Release 21.3R1.

- Deletion of Junos Space® Connectivity Services Director templates on the service order results in removal of configurations. [PR1587378](#)
- Few of the SRX series devices fails to resolve the Out-of-Band (OOB) changes resulting in errors. [PR1595940](#)
- After successfully carrying out the out-of-band changes, Junos Space Network Management Platform doesn't show any confirmation of the changes. [PR1598265](#)
- When you run the `cleanUpJobs.sh` script to clean up the jobs and reduce the CPU process, the CPU process reduces but the scheduled jobs remove. [PR1600114](#)
- Junos Space Network Management Platform is unable to perform OOB changes for the devices. [PR1604790](#)
- Junos Space Fabric database (DB) backup files do not include OpenNMS DB even when you 've checked the Network monitoring option. [PR1606272](#)
- Although the devices in the Junos Space Network Management Platform shows the OOB changes, but fails to display the user details. [PR1606752](#)
- **SD_Device_Config** takes 25GB of disk space on the Junos Space servers resulting is less disk space. [PR1608896](#)

- Import of large configurations gets stuck during the upload in Junos Space Network Management Platform. [PR1609622](#)
- When you try to deploy a new template in Junos Space Network Management Platform, it fails with an error. [PR1612825](#)
- Issue with deployment and disengagement of new templates in Junos Space Network Management Platform. [PR1612848](#)
- Database backup fails with Failed to backup configuration files. Machine IP: 172.22.111.213. error message when you 've configured eth1 interface for administration. [PR1613697](#)
- When you try to delete the remote DB backups, the GUI gets hanged and runs out of time. [PR1613782](#)
- After upgrading to CentOS 7, the log rotation fails to work in Junos Space Network Management Platform. [PR1613823](#)
- Both physical and logical interface inventory reports shows missing or incorrect data. [PR1615279](#)
- Junos Space Network Management Platform image staging incorrectly includes SRX1500 device to the list of targets for `junos-srxsme-19.2R1-S7.tgz`. [PR1616158](#)
- Hibernate stdout logger fills the application server log. [PR1619589](#)
- While using REST APIs, you can observe class cast exception. [PR1607487](#)

Hot Patch Releases

IN THIS SECTION

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- [New and Enhanced Features in the Hot Patch | 22](#)
- [Known Behavior | 23](#)
- [Known Issues | 23](#)
- [Resolved Issues | 24](#)

This section describes the installation procedure and resolved issues in Junos Space Network Management Platform Release 21.3R1 hot patches.

During hot patch installation, the script performs the following operations:

- Blocks the device communication.
- Stops JBoss, JBoss-dc, and watchdog services.
- Backs up existing configuration files and Enterprise Application Archive (EAR) files.
- Updates the Red Hat Package Manager (RPM) files.
- Restarts the watchdog process, which restarts JBoss and JBoss-dc services.
- Unblocks device communication after restarting the watchdog process for device load balancing.

Installation Instructions

Perform the following steps in the CLI of the JBoss-VIP node only:

1. Download the Junos Space Platform 21.3R1 Patch vX from the [download site](#).

Here, X is the hot patch version. For example, v1, v2, and so on.

2. Copy the Space-21.3R1-Hotpatch-vX.tgz file to the /home/admin location of the VIP node.

3. Verify the checksum of the hot patch for data integrity:

```
md5sum Space-21.3R1-Hotpatch-vX.tgz.
```

4. Extract the Space-21.3R1-Hotpatch-vX.tgz file:

```
tar -zxvf Space-21.3R1-hotpatch-vX.tgz
```

5. Change the directory to Space-21.3R1-Hotpatch-vX.

```
cd Space-21.3R1-Hotpatch-vX
```

6. . Execute the patchme.sh script from the Space-21.3R1-Hotpatch-vX folder:

```
sh patchme.sh
```

The script detects whether the deployment is a standalone deployment or a cluster deployment and installs the patch accordingly.

A marker file, `/etc/.Space-21.3R1-Hotpatch-vX`, is created with the list of Red-hat Package Manager (RPM) details in the hot patch.



NOTE:

- We recommend that you install the latest available hot-patch version, which is the cumulative patch.
- Set the SSH option “ServerAliveInterval” to a minimum value of 300, when connecting to the Applogic VIP via SSH to apply the hotpatch.

Sample command: `ssh admin@x.x.x.x -o ServerAliveInterval=300`.

- When you configure the Disaster Recovery (DR), make sure that you reset the DR configuration on both the active and the standby sites.

Once the DR reset is complete, you must remove the `user.properties` file from the `/var/cache/jmp-geo/config` path for all the JBoss, database, and Fault Monitoring and Performance Monitoring (FMPM) nodes, if any.

New and Enhanced Features in the Hot Patch

Junos Space® Network Management Platform Release 21.3R1 hotpatch includes the following enhancements:

- **Support for Junos Space Platform UI user to override an active CLI session**— Starting in Junos Space Network Management Platform Release 21.3R1 hot patch v3, we've provided an option for Junos Space Platform UI users to override an active CLI session while configuring a device in edit mode. When you configure a device through UI, and a CLI session is also active on the same device, the system shows an error. When you retry the update job on failed devices caused due to device lock failures, you can log the user out who locked the configuration database, from the device CLI. Navigate to **Jobs > Job Management** to select the failed job and right click to select **Retry on Failed Devices**. On the **Retry Job for Deploy Consolidated Config** page, enable **Evict CLI/J-Web edit mode users** option.

The option to evict a CLI user is provided in the following modules in the UI, you can navigate to the respective paths to access the option:

- **Modify configuration for a device**— Navigate to **Devices > Device Management > Device configuration > Modify configuration**.

- Assigning or deploying a device template— Navigate to **Device Template > Template > Assign/Deploy Template**.
- Undeploying a device template— Navigate to **Device Template > Template > Undeploy Template**.
- Applying configlets— Navigate to **CLI configlets > Configlets**.
- Restoring a configuration file— Navigate to **Configuration Files > Config Files Management > Restore Config Files(s)**.

Known Behavior

- When you modify the administrator password using CLI on both active and standby sites, update to the DR configuration on the standby site fails with an error.

Workaround: To change the administrator password and update the DR configuration on both the sites, perform the following steps:

1. Enter **passwd admin** command to change the password for all the nodes in the active site cluster.
2. Update the DR configuration on the active site using the following command: **jmp-dr toolkit config update --user-core**
3. Repeat "[Step 2](#)" on [page 23](#) to update the DR configuration on the standby site.

Known Issues

This section lists the known issues in Junos Space Network Management Platform Release 21.3R1 hot patch.

- During the Disaster Recovery (DR) initialization process, when you try to retrieve information for all the arbiter devices, it fails with an error. [PR1702232](#)
- Validation check option is missing when arbiter devices are not selected in **Configure Disaster Recovery Wizard** page. [PR1654835](#)
- Validation issue with device selection disables the **NEXT** button. [PR1628290](#)
- Junos Space Network Management Platform sends multiple access requests to the server, resulting in accounts being locked. [PR1668786](#)

Resolved Issues

Table 3 on page 24 lists the resolved issues in Junos Space Network Management Platform Release 21.3R1 hot patch.

Table 3: Resolved Issues

PR	Description	Hot Patch Version
PR1734109	When you modify the device configuration in both Security Director and Junos Space Network Management Platform, the schema does not show the entire configuration on the device.	v8
PR1655144	When the user tries to stage the MX10 devices in Junos Space Network Management Platform, the MX10 devices fail to appear in the staging window.	v8
PR1664169	Junos Space Network Management Platform modifies or deletes SNMPv3 configurations from devices.	v8
PR1678701	Database backup synchronization stops, when you configure eth1 for administration in the cluster.	v8
PR1679812	Unable to update the SNMP configuration for fabric node.	v8
PR1686226	The purging policy provided in Junos Space Network Management Platform, fails to remove the database backup files even when the purge job is complete.	v8

Table 3: Resolved Issues *(Continued)*

PR	Description	Hot Patch Version
PR1688998	After the database backup and synchronization, the files are available on both the database nodes. But only a single node appears under Machine column in the GUI.	v8
PR1693261	Junos Space Network Management Platform shows images as staged even when they are not.	v8
PR1699306	Detailed job result for CLI configlets shows in progress even after completion.	v8
PR1716241	When you remove an image from the Staged Devices dialog box in Junos Space Network Management Platform, it fails with an error.	v8
PR1719781	After stopping the DR and rebooting the standby site, when you execute the <code>jmp-dr health</code> command to check the DR health, it fails with an error.	v8
PR1723041	User is unable to receive Junos Space Fabric Monitoring alerts in all the configured emails, but only in one email.	v8
PR1735409	After initialization of the DR through the GUI, the DR health check fails for MySQL replication.	v8

Table 3: Resolved Issues *(Continued)*

PR	Description	Hot Patch Version
PR1736086	After HA failover and automatic failover, if you execute the <code>jmp-dr health</code> command for a DR set up with 2 Jboss nodes and 2 FMPM nodes, Junos Space Network Management Platform shows 1236 error for MySQL replication.	v8
PR1736832	After a HA failover, Junos Space Network Management Platform shows 1256 error and 1050 error for MySQL replication in the standby site.	v8
PR1736886	When you set up the DR in Junos Space Network Management Platform, the <code>httpd</code> service flaps in the active site.	v8
PR1736933	When you check for postgresql (PgSQL) replication on Junos Space Network Management Platform with 2 Jboss nodes and 2 FMPM nodes setup, it fails on both active and standby sites.	v8
PR1738821	Resync Nodes job in OpenNMS page does not update the device progress in Junos Space Network Management Platform.	v8
PR1739511	After an automatic failover in a DR setup with 2 Jboss nodes and 2 FMPM nodes, PgSQL replication fails on primary FMPM node on active site.	v8
PR1741465	Replication script skips the identified tables for the DR errors 1032 and 1062.	v8

Table 3: Resolved Issues *(Continued)*

PR	Description	Hot Patch Version
PR1738590	Junos Space Network Management Platform fails to choose the best match for schema, which is an expected behaviour.	v8
PR1740558	Junos Space Network Management Platform patch scripts show incorrect data.	v8
PR1731540	Users sees Fail in load selections data error while changing domains in the Device Management page and Job Management page.	v8
PR1732590	The configuration does not match the device in Junos Space Network Management Platform, even after resynchronization with the network.	v8
PR1740818	Resynchronization with the network fails with <code>java.nio.channels.ClosedChannelException</code> error.	v8
PR1679769	User is facing frequent logging issues after installing Junos Space Network Management Platform Hotpatch Release 21.3R1 V3.	v7
PR1670298	When you execute the jmp-dr health command for Disaster Recovery (DR), Junos Space Network Management Platform shows 1045 error for MySQL replication.	v7

Table 3: Resolved Issues *(Continued)*

PR	Description	Hot Patch Version
PR1677974	When you execute the jmp-dr health command for DR, Junos Space Network Management Platform shows 1236 error for MySQL replication.	v7
PR1685941	User is automatically logged out from Junos Space Network Management Platform despite activity.	v7
PR1689277	DR setup fails to start due to MySQL replication issue.	v7
PR1710169	When you start the DR configuration, standby site displays an error.	v7
PR1711201	Synchronization between Junos Space Network Management Platform and SRX340 Service Firewall fails with a routing-instance error.	v7
PR1714872	Junos Space Network Management Platform CLI displays the password expiry notification too early.	v7
PR1673696	The performance graphs for the MX series devices are missing from the FPC cards after upgrading to Junos Space Network Management Platform 21.3R1.	v6
PR1684165	Junos Space Network Management Platform does not close the SSH sessions properly.	v6
PR1693209	User is unable to power off the MX series devices via Junos Space Network Management Platform.	v6

Table 3: Resolved Issues *(Continued)*

PR	Description	Hot Patch Version
PR1699230	<p>Few of the Logical System (LSYS) devices display the status as DOWN while the root device displays the status as UP.</p> <p>Workaround: Perform RMA for the device to trigger the Junos Space Network Management Platform to reconnect. Most of the devices get connected and display the status as UP but at least one device needs to be performed RMA for the second time. After performing the RMA, some devices does not display in-sync in a timely manner until you run a resync with the network.</p>	v6
PR1700218	REST API fails with errors.	v6

Table 3: Resolved Issues *(Continued)*

PR	Description	Hot Patch Version
PR1701653	<p>JUNOS Enhanced Services (JUNOS-ES) device logs contain a matching term "GRES" that matches with the terms "INGRESS" and "EGRESS".</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Junos Space Network Management Platform 21.3R1 Hot Patch V6 updates the match pattern to receive messages matching with "_GRES" besides "GRES" for JUNOS-ES devices. This update drops the unwanted messages received from the devices. • Devices discovered from Junos Space Network Management Platform after the above mentioned fix will have the changes as the pattern gets pushed to the devices during device discovery. • Perform the following steps to modify the system log configuration of devices that are discovered before upgrading to Junos Space Network Management Platform 21.3R1 Hot Patch V6: <ol style="list-style-type: none"> 1. Login to Junos Space Network Management Platform UI and select Device Templates > Templates. 2. Right click on COMMIT_SYNC_CONFIG_JUN 	v6

Table 3: Resolved Issues (*Continued*)

PR	Description	Hot Patch Version
	<p>OS_ES and select Modify Quick template.</p> <p>3. Select Preview to verify the occurrence of _GRES at the end of the template.</p> <p>4. Click Save and Assign/Deploy. The screen displays all the JUNOS-ES devices.</p> <p>5. Select the devices where you want to update the pattern and click Next.</p> <p>6. Click Validate on Device to validate the templates for the devices.</p> <p>7. Click Deploy now to complete the update immediately or click Deploy later to schedule it later.</p> <p>8. Click Finish and wait for the update to complete.</p>	
PR1685214	Purging of MySQL bin files does not happen correctly.	v5
PR1656477	User sessions do not time out as per the pre-configured timeout in Junos Space Network Management Platform.	v4
PR1657647	Purge jobs do not work as expected in Junos Space Management Platform.	v4
PR1658248	Configlet jobs get stuck resulting a delay in all other jobs in Junos Space Network Management Platform.	v4

Table 3: Resolved Issues (Continued)

PR	Description	Hot Patch Version
PR1664301	Disaster recovery manual failover causes MySQL errors.	v4
PR1664964	Junos Space Network Management Platformm /tmp directory floods with 100K zero byte isFIPSMoDEnabled.xxxxxxxxxx files.	v4
PR1652639	Insufficient space in /var/log in Junos Space Network Management Platform Server.	v4
PR1677100	User is unable to deploy config template due to internal server error.	v4
PR1665842	User is automatically logged out from Security Director despite activity.	v4
PR1646459	Network Time Protocol (NTP) activation fails after user reboots Junos Space Network Management Platform node.	v3
PR1654497	Resynchronization with Junos Space Network Management Platform fails.	v2
PR1648704	The user sessions in Junos Space Network Management Platform fail to end correctlywhich results in multiple sessions for a single user.	v2
PR1648129	Issue with the two factor authentication in Junos Space Network Management Platform.	v2
PR1641759	Inactive timeout API fails in Junos Space Network Management Platform.	v2

Table 3: Resolved Issues (*Continued*)

PR	Description	Hot Patch Version
PR1637162	The execution of the device inventory clean up script <code>cleanUpDeviceInvStaleEntries.sh</code> fails.	v2
PR1654586	User sessions remain active even after idle timeout.	v2
PR1638525	Image upload fails with Software validation failure, check certificate keys error message in Network Director.	v1

Documentation Updates

This section lists the errata and changes in Junos Space Network Management Platform Release 21.3R1 documentation:

- From Junos Space Platform Release 16.1, the *Frequently Asked Questions* are migrated to [FAQ: Junos Space Network Management Platform](#) on the [Juniper Networks TechWiki](#) and are not available on the [TechLibrary](#).

The *Complete Software Guide* no longer contains the *Frequently Asked Questions*.

Finding More Information

For the latest, most complete information about known and resolved issues with Junos Space Network Management Platform and Junos Space Management Applications, see the Juniper Networks Problem Report Search application at: <http://prsearch.juniper.net/>.

Juniper Networks Feature Explorer is a Web-based application that helps you to explore and compare Junos Space Network Management Platform and Junos Space Management Applications feature information to find the correct software release and hardware platform for your network. Find Feature Explorer at: <http://pathfinder.juniper.net/feature-explorer/>.

Juniper Networks Content Explorer is a Web-based application that helps you explore Juniper Networks technical documentation by product, task, and software release, and download documentation in PDF format. Find Content Explorer at: <http://www.juniper.net/techpubs/content-applications/content-explorer/>.

Requesting Technical Support

IN THIS SECTION

- Self-Help Online Tools and Resources | 34
- Creating a Service Request with JTAC | 35

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: [Juniper Support Portal](#)

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 [Juniper Support Portal](#)
- 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/>.

Revision History

29 June, 2023—Revision 9-Junos Space Network Management Platform 21.3R1 Hot Patch V8.

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