Release Notes: Junos® OS Release 13.2X52 for the QFX Series

Release 13.2X52-D15
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Revision 1

Contents

Introduction

Junos OS runs on the following Juniper Networks® hardware: ACX Series, EX Series, J Series, M Series, MX Series, PTX Series, QFabric, QFX Series, SRX Series, and T Series.

These release notes accompany Junos OS Release 13.2X52 for the QFX Series. They describe new and changed features, limitations, and known and resolved problems in the hardware and software.

New and Changed Features

There are no new features in 13.2X52-D15 for the QFX Series. Several known issues have been fixed in this release. See "Resolved Issues" on page 12 for more information.

This section describes the new features and enhancements to existing features in Junos OS Release 13.2X52-D10 for the QFX Series. To view the entire set of software information in PDF format, see the Complete Software Guide for Junos OS for the QFX Series.

Hardware

Extended Node device support (QFX5100-48S switches)—Enables you to include a QFX5100-48S switch as a Node device in a QFabric system. To add the device, first install the QFabric "5" family software package (jinstall-qfabric-5-*release*.tgz) on the switch, and attach two management ports to the QFabric system control plane. For copper-based control plane systems, use the RJ-45 fixed management port and one SFP management port on the QFX5100 Node device with a copper module. For fiber-based control plane systems, use two SFP management ports on the QFX5100 Node device with fiber modules.

NOTE:

- Redundant server Node groups in a QFabric system still require Node devices to be of the same type. As a result, you can have two QFX5100-48S Node devices in a redundant server Node group, but you cannot mix device types (such as a QFX3500 and a QFX5100) in the same group.
- If you include a QFX5100-48S Node device in a network Node group that contains multiple Node device models, the configuration commits but the network Node group does not work properly in the current release.
- When you load a QFabric software package on a QFX5100-48S Node device, the default device mode is Node device rather than standalone (unlike other Node device models). In addition, no other device modes are supported at this time. If you issue the request chassis device-mode operational mode command on a QFX5100-48S Node device, you cannot change the device mode.

[See QFX5100 Switch Hardware Overview.]

Interfaces and Chassis

- **QSFP+ port type configuration (QFX5100 Switches)**—Allows you to change default FTE (uplink interfaces) to XLE (access interfaces) and default XLE interfaces to FTE interfaces. Fixed FTE however, cannot be changed. Ports Q0 and Q1 are fixed FTE ports. Ports Q2, Q3, Q4, and Q5 can be configured as either XLE or FTE interfaces.

  NOTE: **FTE interfaces must be contiguous. There can be no gaps between the FTE interfaces.**

  To change a block of FTE interface to a block of XLE interfaces, issue the set interface-type port-range port-range-low port-range-high command at the [edit chassis fpc 0 pic 0] hierarchy. [See Configuring the QSFP+ Port Type on QFX5100 Switches.]

Junos OS Software

- **New software for the QFabric system control plane network (EX4200 switches)**—The supported control plane software for EX4200 switches in a QFabric system running Junos OS 13.2X52 is now Junos OS Release 12.3R6.6.

Layer 2 Features

- **Exclusion of tagged membership for the native VLAN ID (QFabric Systems)**—On a QFabric system, you can prevent packets with the native VLAN ID from being tagged by using the **except** configuration statement. Use this statement to specify that any egressing packet for the native VLAN of the configured interface will be untagged on egress.

This example shows how to configure a QFabric system to prevent tagging for native VLAN ID packets on egress:

```
set interfaces tor1:xe-0/0/0 unit 0 family ethernet-switching port-mode trunk
set interfaces tor1:xe-0/0/0 unit 0 family ethernet-switching vlan members all
set interfaces tor1:xe-0/0/0 unit 0 family ethernet-switching vlan except v1
set interfaces tor1:xe-0/0/0 unit 0 family ethernet-switching native-vlan-id v1
set vlans v1 vlan-id 1
set vlans v2 vlan-id 2
set vlans v3 vlan-id 3
```

This configuration defines VLAN **v1** as the native VLAN on interface **tor1:xe-0/0/0** and prevents egress traffic for that VLAN from being tagged. Without the **except v1** statement, packets would egress as tagged with VLAN ID 1.

- **Increasing vmembers to 131,008 (QFabric Systems)**—Supports up to 131,008 VLAN members on a single network Node group, server Node group, or redundant server Node group. VLAN members are used to indicate a unique (VLAN, port) combination. The number of vmembers is calculated by multiplying the maximum number of VLANs by 32. For example, to calculate how many interfaces are required to support 4,000 VLANs, divide the maximum number of vmembers (128,000, in this example) by the number of configured VLANs (4,000). In this case, 32 interfaces are required. On network Node groups and server Node groups, you can configure link aggregation groups (LAGs) across multiple interfaces. Each LAG and VLAN combination is considered a vmember.
- **Unified forwarding table (QFX5100 Nodes on QFabric Systems)**—Enables you to control the allocation of forwarding table memory available to store the following:
  - MAC addresses
  - Layer 3 host entries
  - Longest prefix match table entries

  [See Understanding the Unified Forwarding Table.]

Layer 3 Features

- **Bidirectional Forwarding Detection (BFD) (QFabric Systems)**—Enables you to use BFD to enable a QFabric System to quickly detect forwarding path failures and allow routing protocols to rapidly converge in response. [See Understanding Bidirectional Forwarding Detection (BFD).]

Network Management and Monitoring

- **QFabric SNMP trap categories (QFabric Systems)**—Enables you to define types of traps that are sent to the targets of the named trap group. [See Configuring Trap Groups.]

Routing Protocols

- **Intermediate System-to-Intermediate System (IS-IS) (QFabric Systems)**—Enables you to use the IS-IS interior gateway routing protocol. IS-IS is also supported for use with virtual routing instances. [See IS-IS Overview.]

Storage

- **Fibre Channel over Ethernet (FCoE) link aggregation group (LAG) (QFabric Systems)**—Enables you to transport FCoE traffic and regular Ethernet traffic across the same link aggregation bundle. Fibre Channel (FC) storage area network (SAN) switches require a point-to-point connection. Communication between an FCoE device and QFabric system Node device must use the same physical LAG link to maintain that (virtual) point-to-point connection. Standard LAGs can place traffic on any LAG link and therefore do not work for FCoE traffic, because a response from the FC SAN might return on a different link than the FCoE device used to send the request to the FC SAN. FCoE LAGs always use the same LAG link to send and receive traffic between a given FCoE device and a Node device. FCoE LAGs provide this special treatment for FCoE traffic, while at the same time handling regular Ethernet traffic normally, so Ethernet traffic enjoys the usual LAG benefits of load balancing and link redundancy. FCoE LAGs do not provide load balancing or link redundancy for FCoE traffic, but they do ensure that FCoE traffic uses the same link to communicate with the FC SAN through the QFabric system Node device LAG. [See Understanding FCoE LAGs.]
- **Originator exchange identifier (OxID) field (QFabric Systems)**—One of several fields used in the hash function computation for FCoE traffic load balancing over multiple outgoing links in an Ethernet link aggregation group (LAG) on ports that face an FCoE forwarder (FCF). When FCoE traffic has multiple paths to an FCF (crosses a LAG that faces an FCF), packets can take different links between the source and destination endpoints. The switch creates a hash value from some of the packet header fields, and uses the hash value to assign each packet to one of the LAG links. By default, the QFabric system includes the OxID field in the hash value computation. OxID hash control enables you to remove the OxID field from the hash value computation. [See Understanding OxID Hash Control for FCoE Traffic Load Balancing on QFabric Systems.]

Related Documentation

- Known Behavior on page 7
- Known Issues on page 10

Known Behavior

This section lists the limitations in Junos OS Releases 13.2X52 for the QFX Series.

Multicast Protocols

- On a QFabric system, IGMP group-specific queries are forwarded as follows:
  - When a group-specific query for an unknown multicast group ingresses into the QFabric system, it is forwarded to all the multicast router interfaces on the receiving device and also to the uplink (fte) interfaces. When the other Nodes in the QFabric system receive the query, they flood the query to all the access interfaces that have VLAN members.
  - When a group-specific query for a known multicast group ingresses into the QFabric system, it is forwarded to any local multicast receivers for the group and other Nodes that also have members of the group. When the other Nodes in the QFabric system receive the query from the ingress Node, they flood the query to all the access interfaces that have VLAN members.
- On a QFabric system, the Packet Forwarding Engine might not process group membership when IGMP reports are sent at a high rate. As a workaround, set the report send rate to 1000 reports per second or fewer. PR980927

Network Management and Monitoring

- If a QFX5100 switch drops traffic because of an ingress firewall filter, the switch does not generate an sFlow technology monitoring flow sample packet that contains this dropped traffic.
- sFlow monitoring ingress samples are not captured for a port on a QFabric system network Node group if the ingress traffic on that port is being copied to the CPU at the same time. This can happen during an Internet Control Message Protocol (ICMP) redirect operation.

Platform and Infrastructure

- On a QFX5100 switch, when you issue the **request system halt command**, you must press the power button to reboot. PR950910
- On a QFX5100 switch, when the system mode is in default-mode, the latency for 10-Gigabit Ethernet ports in cut-through mode is the same as it is for store and forward mode. This issue does not apply to 40-Gigabit Ethernet ports. PR958957

QFabric Systems

- On a QFabric system, if you configure forwarding options that are supported only on a QFX5100 Node device (such as unified forwarding table settings), these options might be committed on the adjacent unsupported platforms (such as QFX3500 and QFX3600 Node devices). However, these options do not take effect on the unsupported platforms. PR960562
- On a QFabric system, issues with distributing the periodic packet management daemon (PPMD) for a routed VLAN interface (RVI) that spans Node devices might prevent BFD from becoming active on the RVI. You can work around this problem by disabling distributed PPMD over RVIs by entering **set no-delegate-processing-rvi** at the **edit routing-options ppm** hierarchy level. PR984513
- On a QFabric system, if you reboot the master Routing Engine of the network Node group while the system is trying to converge, this action might cause multicast traffic loss. As such, we recommend you ensure that the QFabric system converges before you reboot the master Routing Engine. Use the **show fabric statistics** and **show bgp neighbor fabric** commands to verify that the system has converged. PR985060

Security

- On a QFabric system, if a port is blocked because of the MAC limiting (mac-limit) configuration, a routing engine switchover causes the port to be unblocked and then blocked again. The port can remain unblocked for up to 20 seconds before it is blocked again. PR980811

Storage and Fibre Channel

- During the period of transition time during which a switch changes from unknown unicast MAC learning to known unicast MAC learning, a small number of packets flow to the FCoE output queue (queue 3) in addition to the packets flowing to the best-effort queue (queue 0). Packets should only flow to the best-effort queue. PR797687
- The maximum number of logins for each FCoE node (ENode) is a range of 32 to 2500. (Each ENode can log in to a particular fabric up to the maximum number of configured times. The maximum number of logins is per fabric, so an ENode can log in to more than one fabric and have its configured maximum number of logins on each fabric.)
- The maximum number of FCoE sessions for the switch, which equals the total number of fabric login (FLOGI) sessions plus the total number of fabric discovery (FDISC) sessions, is 2500.
- The maximum number of FIP snooping sessions is 2500.
- When you configure FIP snooping filters, if the filters consume more space than is available in the ternary content-addressable memory (TCAM), the configuration commit operation succeeds even though the filters are not actually implemented in the configuration. Because the commit operation checks syntax but does not check available resources, it appears as if the FIP snooping filters are configured, but they are not. The only indication of this issue is that the switch generates a system log

message that the TCAM is full. You must check the system log to find out if a TCAM full message has been logged if you suspect that the filters have not been implemented.

- You cannot use a fixed classifier to map FCoE traffic to an Ethernet interface. The FCoE application type, length, and value (TLV) carries the FCoE priority-based flow control (PFC) information when you use an explicit IEEE 802.1p classifier to map FCoE traffic to an Ethernet interface. You cannot use a fixed classifier to map FCoE traffic to an Ethernet interface because untagged traffic is classified in the FCoE forwarding class, but FCoE traffic must have a priority tag (FCoE traffic cannot be untagged).

  For example, the following behavior aggregate classifier configuration is supported:

  [edit class-of-service]
  user@switch# **set congestion notification profile fcoe-cnp input ieee-802.1 code-point 011 pfc**
  user@switch# **set interfaces xe-0/0/24 unit 0 classifiers ieee-802.1 fcoe**

  For example, the following fixed classifier configuration is not supported:

  [edit class-of-service]
  user@switch# **set interfaces xe-0/0/24 unit 0 forwarding-class fcoe**

- On a QFX Series device, a DCBX interoperability issue between 10-Gigabit Ethernet interfaces on QFX Series devices and 10-Gigabit Ethernet interfaces on another vendor's devices can prevent the two interfaces from performing DCBX negotiation successfully in the following scenario:

  1. On a QFX Series 10-Gigabit Ethernet interface, LLDP is running, but DCBX is disabled.
  2. On another vendor's device 10-Gigabit Ethernet interface, both LLDP and DCBX are running, but the interface is administratively down.
  3. When you bring another vendor's 10-Gigabit Ethernet interface up by issuing the **no shutdown** command, the device sends DCBX 1.01 (CEE) TLVs, but receives no acknowledge (ACK) message from the QFX Series device, because DCBX is not enabled on the QFX Series device. After a few tries, another vendor's device sends DCBX 1.00 (CIN) TLVs, and again receive no ACK messages from the QFX Series device.
  4. Enable DCBX on the QFX Series 10-Gigabit Ethernet interface. The interface sends DCBX 1.01 (CEE) TLVs, but the other vendor's device ignores them and replies with DCBX 1.00 (CIN) TLVs. The other vendor's device does not attempt to send or acknowledge DCBX 1.01 TLVs, only DCBX 1.00 TLVs.

  In this case, the QFX Series device ignores the DCBX 1.00 (CIN) TLVs because the QFX Series does not support DCBX 1.00 (the QFX Series supports DCBX 1.01 and IEEE DCBX). The result is that the DCBX capabilities negotiation between the two interfaces fails. PR803631

Related Documentation

- New and Changed Features on page 3
- Known Issues on page 10
- Resolved Issues on page 12

- Migration, Upgrade, and Downgrade Instructions on page 13
- *Product Compatibility*

Known Issues

The following issues are outstanding in Junos OS Release 13.2X52-D15. The identifier following the description is the tracking number in our bug database.

For the latest, most complete information about outstanding and resolved issues with the Junos OS software, see the Juniper Networks online software defect search application at http://www.juniper.net/prsearch .

- High Availability (HA) and Resiliency
- Interfaces and Chassis
- Multicast Protocols
- QFabric Systems
- Security
- Storage and Fibre Channel

High Availability (HA) and Resiliency

- On a QFabric system, if you disable and re-enable an interface on a server Node group that is a member of a routed VLAN interface and is also a member of a Virtual Router Redundancy Protocol (VRRP) group, the VRRP state transitions to idle state. In this situation, the VRRP functionality is not affected because the VRRP state in the network Node group is still in the backup role. To work around this problem, increase the priority of the affected interface so that it asserts itself as the master. PR985051
- On a QFabric system, TLV IDs responsible for synchronizing Spanning Tree Protocol (STP) ports between active and backup Ethernet switching daemons (eswds) are not consistent between release Junos OS Release 12.2 and later releases. During a nonstop software upgrade (NSSU), when the active eswd is still running Junos OS Release 12.2 and the backup eswd is running the later release, the synch STP port messages from active eswd to backup eswd are dropped on the backup eswd because of the TLV ID inconsistency between the two images. Because there is no sync STP port information on the new active eswd after the backup becomes active, the STP ports will be deleted and then added again, which makes the ports go through blocked state and drop traffic. PR985830

Interfaces and Chassis

- On a QFabric system, when a link aggregation group (LAG) is configured, two copies of each multi-domain authentication packet are sent on each member interface of the LAG. PR930876
- On a QFX5100 Node device in a QFabric system, failover between member interfaces of a link aggregation group can take as long as 300 milliseconds. This can occur even if all the member interfaces are on the same Node device. PR994207

Multicast Protocols

- On a QFabric system, multicast IPv6 **ping** might not work. Because of this, well-known multicast IPv6 address **ping** (ff02::1, see RFC4291) does not work. PR974396

QFabric Systems

- On a QFabric system with QFX5100 Node devices, if you poll the **jnxFabricDeviceTable**, the system provides incorrect information for the device description, device installed, and device content last change objects. PR985120
- On a QFabric system, if you power off the master device in a redundant server Node group, the sessions on the backup device might be terminated. PR986979
- On a QFabric system, when a QFX5100 Node device hosts the source fabric maintenance end point (FMEP) interface, multicast fabric **ping** does not work if you disable the source interface. PR990366
- On a QFabric system, if you commit a configuration that deletes a routing instance and immediately execute a graceful Routing Engine switchover, the switchover is successful. However, you might not be able to perform a second graceful Routing Engine switchover. To prevent this problem, make these changes at different times so that one completes before you perform the other. PR1010154

Security

- On a QFX5100 Node device in a QFabric system, MAC-move limiting does not work properly. Do not use the **set mac-move-limit** statement at the **[edit ethernet-switching-options secure-access-port]** hierarchy level. PR980610

Storage and Fibre Channel

- On a QFabric system, when the FCoE source VN_Port and the FCoE target VN_Port are both connected to the QFabric system, a small percentage of FCoE traffic drops if a redundant server Node group (RSNG) that connects to the FCoE source or target VN_Port undergoes a master switchover. For Fibre Channel (FC) traffic, the source and destination are identified by the source identification (SID) and the destination identification (DID), respectively. An FCoE packet from the source VN_Port traverses the QFabric system to reach the connected FCoE-FC gateway. When the FCoE packet reaches the FCoE-FC gateway, the FCoE packet is decapsulated (the Ethernet encapsulation is removed) and the resulting FC packet is forwarded from the gateway to the FC switch. Then the FC switch uses the DID to determine where to send the packet, which is back to the QFabric system because the target is also connected to the QFabric system. The FC switch sends the packet back to the FCoE-FC gateway, which encapsulates the packet in Ethernet as an FCoE packet, and forwards the packet to the QFabric system to reach the destination VN_Port. During this time, if an RSNG that is connected to one of the FCoE devices switches mastership, packets are dropped. PR995476

Related Documentation

- New and Changed Features on page 3
- Known Behavior on page 7
- Resolved Issues on page 12
- Migration, Upgrade, and Downgrade Instructions on page 13
- *Product Compatibility*

Resolved Issues

This section lists the issues fixed in the Junos OS Release 13.2X52 for the QFX Series.

For the most complete and latest information about known Junos OS defects, use the Juniper Networks online Junos Problem Report Search application.

- Issues Resolved in Junos OS Release 13.2X52-D15 on page 12

Issues Resolved in Junos OS Release 13.2X52-D15

This section lists the issues fixed since Junos OS Release 13.2X52-D10 for the QFX Series. The identifier following the description is the tracking number in our bug database.

Multicast Protocols

- On a QFabric system with IGMP snooping configured, the IGMP membership might be formed by sending IGMP join requests with the destination MAC address as a unicast or broadcast MAC address instead of a multicast group MAC address. PR971796
- If you restart the routing daemon (rpd) on a QFabric system running PIM, the (S, G) entries might not inherit the (*, G) downstream interfaces. You can resolve this issue by entering the commands **clear pim join** or **clear igmp membership**. PR999858

QFabric Systems

- On a QFabric system, if you include a QFX5100 Node device in a network Node group that contains other Node device models (QFX3500 or QFX3600), or add other Node device models to a network Node group that originally contained only QFX5100 Node devices, the configuration commits but the network Node group does not work properly. PR981887
- On a QFabric system, if you place QFX5100 Node devices in a redundant server Node group and upgrade the software, the chassis process (**chassism**) might dump a core file and stop operating at the **fpm_display_periodic** step. PR992031

Related Documentation

- Known Behavior on page 7
- Known Issues on page 10
- Migration, Upgrade, and Downgrade Instructions on page 13
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Migration, Upgrade, and Downgrade Instructions

This section contains the procedure to upgrade Junos OS, and the upgrade and downgrade policies for Junos OS. Upgrading or downgrading Junos OS can take several hours, depending on the size and configuration of the network.

- Upgrading Software on QFabric Systems on page 13

Upgrading Software on QFabric Systems

The QFabric system software package contains software for all of the different devices in the QFabric system infrastructure, Director group, Interconnect devices, Node devices, and other QFabric system components.

NOTE: Before you upgrade from Junos OS Release 11.3 to Junos OS Release 12.2, you must replace your existing upgrade script on both Director devices with one that you download from the PSN when you download the software. For more information, see "Downloading and Retrieving Software Files for the QFabric System Using a Browser" on page 14.

You can upgrade the software on the QFabric system using one of the following methods:

Peforming a Standard Upgrade on the QFabric System

Use the **request system software add component all reboot** CLI command to install the software for the Director group, fabric control Routing Engines, fabric manager Routing Engine, Interconnect devices, and the network and server Node groups.

Additionally, you can back up your current QFabric system configuration file and installation-specific parameters using the **request system software configuration-backup** command. Although you can save this file locally, we recommend that you save it to an external location, like an FTP site or USB device.

Perform the following tasks:

Backing Up the Current Configuration Files on the QFabric System

To back up your current configuration files:

`user@switch>` **request system software configuration-backup** ***path***

Back up the configuration files to a local directory, remote server, or removable drive (for example, an external USB flash drive).

For example:

`user@switch>` **request system software configuration-backup /media/USB/**

Downloading and Retrieving Software Files for the QFabric System Using a Browser

NOTE: To access the download site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website https://www.juniper.net/registration/Register.jsp .

To download the software package:

1. In a browser, go to http://www.juniper.net/support/downloads/junos.html .

   The Junos Platforms Download Software page appears.

2. In the QFX Series section of the Junos Platforms Download Software page, select the QFX Series platform for which you want to download the software.

3. Select **13.2** in the Release pull-down list to the right of the Software tab on the Download Software page.
4. In the Install Package section of the Software tab, select the QFabric System Install Package for the Junos OS 13.2 release.

   An Alert box appears.
5. For more information about the alert, click the link to view the PSN document.

   To download the software, click **Continue to Download** in the Alert box.
6. Log in to the Juniper Networks authentication system using the username (generally your e-mail address) and password supplied by Juniper Networks representatives.
7. Read the End User License Agreement, select the **I agree** option button, and then click **Proceed**.
8. Save the **jinstall-qfabric-13.2X52-D15.2.rpm** file on your computer, FTP site.
9. To retrieve the software you just downloaded, issue the **request system software download** ***/path/package-name*** command. The software package is copied from where you downloaded it and is placed locally on the QFabric system.

   For example, if the software is located on an FTP site:

   ```
   user@switch> request system software download
   ftp://server/files/jinstall-qfabric-13.2X52-D15.2.rpm
   ```

Installing the Software Package on the Entire QFabric System

To install the software on all of the QFabric system components:

1. Issue the **request system software add** ***package-name*** **component all reboot** command.

   For example:

   ```
   user@switch> request system software add jinstall-qfabric-13.2X52-D15.2.rpm component
   all reboot
   ```

   NOTE: If you receive an error message after issuing the **request system software add** ***package-name*** **component all reboot** command that says that the configuration file cannot be loaded as is, you need to enter configuration mode, make any necessary changes to the configuration file, and then commit the changes.
2. After the reboot has finished, verify that the new version of software has been properly installed by issuing the **show version component all** command.

Reinstalling and Booting the QFabric System from a USB Device

You can boot and reinstall software on your Director group. This is especially useful in the event of disaster recovery.

The first section of this procedure describes how to boot and reinstall the software when you do *not* have access to the default partition. The second section of this procedure describes how to boot and reinstall the software when you do have access to the default partition. Before you begin this procedure, make sure you have the software installed on a USB device.

NOTE: **After you perform a software installation from a USB drive, some system devices might become disconnected and the upgrade might not complete for these devices. As a workaround, turn off the disconnected devices and power them back on to activate the new software.**

- To boot and reinstall software on a Director group when you do *not* have access to the default partition:

  1. Connect to one of the Director devices in the Director group by using the management console connection.
  2. Insert the USB device in the USB port in the Director device.

     The following menu appears once you are connected to the Director group:
     Juniper Networks QFabric Director Install/Recovery Media
     - To boot from the USB device, wait 10 seconds or press the <ENTER> key.
     - To reinstall the QFabric software on this Director device, type: install <ENTER>.
     - To perform a network installation on this Director device, type: network <ENTER>.
  3. Reinstall the software on the Director group by typing **install**, and then press **Enter**.

     The Director group copies the software from the USB device, occasionally displaying status messages. Copying the software can take up to 10 minutes.
  4. Remove the USB device when prompted and then press Enter.

     The Director group then reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the Director group displays the login prompt.
  5. Create a new configuration file as you did when the Director group was shipped from the factory, or restore the previously saved configuration file to the Director group.

- To boot and reinstall software on a Director group when you have access to the default partition:

  1. Log in to the default partition.
  2. Copy the software from the external USB device to the internal storage of the Director group by issuing the **request system software download** command, and specify the path and the package name on the external USB device. For example:

     user@switch> request system software download
     /media/usbdisk/jinstall-qfabric-13.2X52-D15.2.rpm

3. Install the software by issuing the **request system software add** *package-name* **component director-group reboot** command, and specify the name of the software package:

   user@switch> request system software add jinstall-qfabric-13.2X52-D15.2.rpm component director-group reboot

   The Director group installs the software, occasionally displaying status messages. Copying the software can take up to 10 minutes.

4. Remove the external USB device when prompted, and then press **Enter**.

   The Director group then reboots from the internal flash storage on which the software was just installed. When the reboot is complete, the Director group displays the login prompt.

5. Create a new configuration as you did when the Director group was shipped from the factory, or restore the previously saved configuration file to the Director group.

Performing a Nonstop Software Upgrade on the QFabric System

Nonstop software upgrade enables you to upgrade a QFabric system with minimal packet loss and maximum uptime. This feature introduces several high availability improvements to the QFabric system software upgrade process, including:

- Upgrading members of a Director group or Node group one at a time so that one device in the group is always operational
- Switching mastership of Routing Engine processes to the backup Director device before upgrading the master Director device
- Rebooting Interconnect devices and fabric control Routing Engines one at a time, so that one Interconnect device or one fabric control Routing Engine is always operational
- Switching mastership of a Node group to the backup Node device before upgrading the master Node device
- Specifying an upgrade group if you want all Node devices in a Node group to be upgraded in parallel (which shortens the time of the upgrade)
- Rebooting devices automatically as part of the nonstop upgrade process

When performing a nonstop upgrade, start with the Director group upgrade, then issue the fabric upgrade, and end with the Node group upgrades.

NOTE: Because there is no redundancy for Node groups containing a single Node device, traffic loss occurs when the device reboots during the upgrade. For Node groups defined with two Node devices, both Node devices must be online in order for the upgrade to succeed.

NOTE: Before you install the software, we recommend that you back up your current configuration files by issuing the **request system software configuration-backup** command.

NOTE: Before you can perform a nonstop software upgrade in your QFabric system, you must first upgrade your system to Junos OS Release 12.2 by using a conventional upgrade method such as issuing the **request system software add component all** command.

Perform the following tasks:

- Backing Up the Current Configuration Files on page 18
- Downloading Software Files Using a Browser on page 18
- Retrieving Software Files for Download on page 20
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Backing Up the Current Configuration Files

To back up your current configuration files:

`user@qfabric>` **request system software configuration-backup** ***path***

Back up the configuration files to a local directory, remote server, or removable drive (for example, an external USB flash drive).

For example:

`user@qfabric>` **request system software configuration-backup /media/USB/**

Downloading Software Files Using a Browser

NOTE: To access the download site, you must have a service contract with Juniper Networks and an access account. If you need help obtaining an account, complete the registration form at the Juniper Networks website https://www.juniper.net/registration/Register.jsp .

To download the software package:

1. In a browser, go to http://www.juniper.net/support/downloads/junos.html .

   The Junos Platforms Download Software page appears.

2. In the **QFX Series** section, select the QFabric system for which you want to download software.

   The Software Download page for the selected QFabric system appears.

3. Select **12.2** in the Release pull-down window to the right of the Software tab on the Download Software page.

4. In the Install Package section of the Software tab, select the QFabric System Install Package for the Junos OS 13.2 release.

   An Alert box appears.

5. For more information about the alert, click the link to view the PSN document.

   To download the software, click **Continue to Download** in the Alert box.

6. Log in to the Juniper Networks authentication system using the username (generally your e-mail address) and password supplied by Juniper Networks representatives.

7. Read the End User License Agreement, select the **I agree** option button, and then click **Proceed**.

8. Save the **jinstall-qfabric-13.2X52-D15..2.rpm** file on your computer.

Retrieving Software Files for Download

Retrieve the software from the location in which you downloaded it. To do this, issue the **request system software download** command. The software package is copied from where you downloaded it and is placed locally on the QFabric system.

- To retrieve the software:

  `user@qfabric>` **request system software download** */path/package-name*

  For example:

  `user@qfabric>` **request system software download ftp://server/files/jinstall-qfabric-13.2X52-D15.2.rpm**

Performing a Nonstop Software Upgrade for Director Devices in a Director Group

NOTE: If you reboot any server Node groups or Interconnect devices after you perform a nonstop upgrade on the Director group, these devices are upgraded to the same version of software that is running on the Director group.

To upgrade the software on the Director devices in a Director group:

- Issue the **request system software nonstop-upgrade director-group** *package-name* command.

  For example:

  `user@qfabric>` **request system software nonstop-upgrade director-group jinstall-qfabric-13.2X52-D15.2.rpm**

Performing a Nonstop Software Upgrade for Interconnect Devices and Other Fabric-Related Components

Before you perform a nonstop upgrade on the Interconnect devices and other fabric-related components, verify that both Director devices in the Director group are online. Both Director devices must be online before you attempt to perform a nonstop upgrade. To do this, issue the **show fabric administration inventory director-group status** command.

To install the software on the Interconnect device and other components in the fabric:

- Issue the **request system software nonstop-upgrade fabric** *package-name* command.

  For example:

  `user@qfabric>` **request system software nonstop-upgrade fabric jinstall-qfabric-13.2X52-D15.2.rpm**

(Optional) Creating Upgrade Groups for Node Groups

Upgrade groups enable two or more Node devices in a Node group, or an entire Node group, to be rebooted at the same time. If you do not create an upgrade group, the Node devices are upgraded one at a time . Before performing a nonstop upgrade on a Node

group, create an upgrade group and include the devices you want to reboot at the same time.

NOTE: If you add Node devices that have links to the same link aggregation group (LAG), there might be traffic loss.

- Create the upgrade group by issuing the **set chassis node-group** *node-group-name* **nssu upgrade-group** *upgrade-group-name* **node-devices** *name* command at the **[edit chassis]** hierarchy.

  For example:

  ```
  user@qfabric# set chassis node-group nodegroup1 nssu upgrade-group upgrade1 node-devices [node1 node2]
  ```

Performing a Nonstop Software Upgrade on a Node Group

When you perform a nonstop software upgrade on a network Node group, the Node devices in the network Node group are upgraded in a serial fashion except when upgrade groups are configured. If you perform a nonstop upgrade on a redundant server Node group, both Node devices must be online for a successful upgrade. If one of the Node devices is no longer available, remove it from the configuration before you perform the nonstop software upgrade. If you perform a nonstop upgrade on a Node group with only one Node device, traffic loss occurs while the Node device is rebooting.

NOTE: You can upgrade multiple Node groups with this command: **request system software nonstop-upgrade node-group** *node-group-name package-name*. However, if more than one Node group is specified, there may be traffic loss depending on the topology of the network.

To install software on a Node group:

- Issue the **request system software nonstop-upgrade node-group** *node-group-name package-name* command.

  To perform a nonstop upgrade on one Node group:

  ```
  user@qfabric> request system software nonstop-upgrade node-group nodegroup1 jinstall-qfabric-13.2X52-D15.2.rpm
  ```

  To perform a nonstop upgrade on more than one Node group:

  ```
  user@qfabric> request system software nonstop-upgrade node-group [nodegroup1 nodegroup2 nodegroup3] jinstall-qfabric-13.2X52-D15.2.rpm
  ```

Related Documentation

- New and Changed Features on page 3
- Known Behavior on page 7
- Resolved Issues on page 12
- *Product Compatibility*

Product Compatibility

- Hardware Compatibility on page 22

Hardware Compatibility

To obtain information about the components that are supported on the devices, and special compatibility guidelines with the release, see the Hardware Guide for the product.

To determine the features supported on QFX Series switches in this release, use the Juniper Networks Feature Explorer, a Web-based application that helps you to explore and compare Junos OS feature information to find the right software release and hardware platform for your network. Find Feature Explorer at: http://pathfinder.juniper.net/feature-explorer/

Related Documentation

- New and Changed Features on page 3
- Known Behavior on page 7
- Known Issues on page 10
- Resolved Issues on page 12
- Migration, Upgrade, and Downgrade Instructions on page 13

Third-Party Components

This product includes third-party components. To obtain a complete list of third-party components, see Copyright and Trademark Information.

For a list of open source attributes for this Junos OS release, see Open Source: Source Files and Attributions.

Finding More Information

For the latest, most complete information about known and resolved issues with Junos OS, 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 OS 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/.

Documentation Feedback

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

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

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at http://www.juniper.net/customers/support/downloads/710059.pdf .
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

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

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/

- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

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

Opening a Case with JTAC

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

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

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

If you are reporting a hardware or software problem, issue the following command from the CLI before contacting support:

```
user@host> request support information | save filename
```

To provide a core file to Juniper Networks for analysis, compress the file with the **gzip** utility, rename the file to include your company name, and copy it to **ftp.juniper.net/pub/incoming**. Then send the filename, along with software version information (the output of the **show version** command) and the configuration, to **support@juniper.net**. For documentation issues, fill out the bug report form located at https://www.juniper.net/cgi-bin/docbugreport/.

Revision History

8 September 2014—Revision 1, Junos OS for the QFX Series, Release 13.2X52-D15