



Junos Continuity Software



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Junos Continuity Software
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YEAR 2000 NOTICE

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

END USER LICENSE AGREEMENT

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About the Documentation

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Documentation and Release Notes

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

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

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

Supported Platforms

For the features described in this document, the following platforms are supported:

- MX2020
- MX2010
- MX960
- MX480
- MX240

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming

configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xsl;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.


```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the *CLI User Guide*.

Documentation Conventions

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

Table 1: Notice Icons







Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

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

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric metric>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (string1 string2 string3)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Encloses a variable for which you can substitute one or more values.	community name members [community-ids]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	

GUI Conventions

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

Convention	Description	Examples
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at <http://www.juniper.net/techpubs/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <http://www.juniper.net/techpubs/feedback/>.
- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

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

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

Self-Help Online Tools and Resources

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

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

Opening a Case with JTAC

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

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

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

PART 1

Junos Continuity Software

- [Overview on page 3](#)
- [Using Junos Continuity Software to Upgrade Line Cards on page 7](#)

CHAPTER 1

Overview

- [Junos Continuity Software Overview on page 3](#)
- [Junos Continuity Software Package Naming Conventions on page 4](#)
- [Hardware Supported by Junos Continuity Software on page 5](#)

Junos Continuity Software Overview

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

Junos Continuity is a software package that enables you to deploy new hardware in the network without the need to upgrade Juniper Networks Junos operating system (Junos OS). Junos Continuity software works like a pluggable software module that enables you to deploy new hardware by providing the drivers and support files required to bring the hardware online. Each version of the Junos Continuity software package supports a specific type of hardware, such as Modular Port Concentrators (MPCs), power supply modules, and so on. You can download and install the Junos Continuity software package that supports the hardware component that you want to deploy.

You can install Junos Continuity software to add support for new hardware on elected releases of Junos OS. An elected release is a maintenance release of Junos OS, which supports Junos Continuity software. You need to download the Junos Continuity software package that is specific to the elected release.

Junos Continuity software standalone package is supported only on the MX240, MX480, MX960, MX2010, and MX2020 3D Universal Edge Routers.

On the basis of the version of Junos OS installed on the router, you can follow one of the following methods to install Junos Continuity software:

- **Install the Standalone Junos Continuity Plug-in**—You install the Standalone Junos Continuity Plug-in if the version of Junos OS that is installed on the router supports Junos Continuity software. For example, if the router is running Junos OS Release 14.1R4, you can directly install Standalone Junos Continuity Plug-in and then bring the line cards online.
- **Install the Junos Continuity Plug-in Integrated with Junos OS**—You use the integrated package if the version of Junos OS that is installed on the router does not support Junos Continuity software. For example, if you want to install Junos Continuity software on Junos OS Release 13.3, you can use the integrated package that contains both Junos OS

Release 14.1R4 and the Junos Continuity Plug-in. This is a one-step process to upgrade Junos OS to Junos OS Release 14.1R4 and also to install Junos Continuity software.

[Table 3 on page 4](#) lists the Junos OS releases that support Junos Continuity software.

Table 3: Junos OS Support for Junos Continuity Software

Junos OS Release	Supports Junos Continuity?	Solution
Junos OS Release 14.1R4	Yes	<p>Install the Standalone Junos Continuity Plug-in and then make the line cards operational.</p> <p>Restart of the router is not required in this case.</p>
Releases older than 14.1R4 (For example, Junos OS Release 13.3)	No	<p>Install the Junos Continuity Plug-in Integrated with Junos OS package. This package contains the Junos Continuity Plug-in and the Junos OS release that supports it.</p> <p>This method requires you to restart the router for the changes to take effect because installing the integrated package also results in upgrading Junos OS.</p>

Related Documentation

- [Junos Continuity Software FAQ on page 37](#)
- [Junos Continuity Software Package Naming Conventions on page 4](#)
- [Line Card Upgrade Using Junos Continuity Software Overview on page 7](#)

Junos Continuity Software Package Naming Conventions

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

This topic describes the naming conventions that are followed for the Junos Continuity software standalone package and for the package bundled with Junos OS.

The Junos Continuity software standalone package has the following naming convention:

jam-package-name-release-Cx.y-signed.tgz

Where:

- ***jam-package-name*** is the name of the Junos Continuity software package. The package name also indicates the hardware models and the version of Junos OS that the package supports. For example, in the name ***jam-mpc-2e-3e-ng64***, ***mpc-2e-3e*** indicates that the package supports the line cards MPC2E and MPC3E, and ***ng64*** indicates that the package is for 64-bit Junos OS.
- ***release*** is the Junos OS release that the Junos Continuity software package supports.

- **Cx.y** is the Junos Continuity software package version, where **C** represents Junos Continuity and **x.y** stands for the software release number—for example, 1.3.

For example, **jam-mpc-2e-3e-ng64-14.1R4.10-C1.3-signed.tgz**.

The Junos Continuity software package bundled with Junos OS has the following naming convention:

package-name-release-jam-Nx.y-domestic-signed.tgz

Where:

- **package-name** is the name of the bundled package. For 64-bit Junos OS, the package name is **package-name64**.
- **release** is the Junos OS release that is used in the bundled package.
- **jam** indicates the presence of Junos Continuity software.
- **Nx.y** is the integrated Junos Continuity software package version, where **N** represents the Junos Continuity software package bundled with Junos OS and **x.y** stands for the software release number—for example, 1.2.

For example, **jinstall64-14.1R4.10-jam-N1.2-domestic-signed.tgz**.

Related Documentation

- [Junos Continuity Software FAQ on page 37](#)
- [Junos Continuity Software Overview on page 3](#)

Hardware Supported by Junos Continuity Software

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

Junos Continuity software enables the routers to support new hardware without upgrading Junos OS. Support for new hardware depends on the Junos Continuity package that is installed on the router.

[Table 4 on page 5](#) lists the Junos Continuity software package name, the corresponding Junos OS release, and the list of hardware that Junos Continuity software supports.

Table 4: Junos Continuity Package Version, Supported Junos OS Release, and the Supported Hardware

Junos Continuity Package Name	Junos OS Release	Supported Hardware	Description
jam-mpc-2e-3e-ng64	Junos OS Release 14.1R4	<ul style="list-style-type: none"> • MPC3E-3D-NG-Q • MPC3E-3D-NG • MPC2E-3D-NG-Q • MPC2E-3D-NG 	Junos Continuity software package for 64-bit Junos OS.

Table 4: Junos Continuity Package Version, Supported Junos OS Release, and the Supported Hardware *(continued)*

Junos Continuity Package Name	Junos OS Release	Supported Hardware	Description
jam-mpc-2e-3e-ng	Junos OS Release 14.1R4	<ul style="list-style-type: none">• MPC3E-3D-NG-Q• MPC3E-3D-NG• MPC2E-3D-NG-Q• MPC2E-3D-NG	Junos Continuity software package for 32-bit Junos OS.

Related Documentation

- [Junos Continuity Software Overview on page 3](#)
- [Junos Continuity Software FAQ on page 37](#)
- [MPC3E NG Q on page 11](#)
- [MPC3E NG on page 13](#)
- [MPC2E NG Q on page 15](#)
- [MPC2E NG on page 17](#)

CHAPTER 2

Using Junos Continuity Software to Upgrade Line Cards

- [Line Card Upgrade Using Junos Continuity Software Overview on page 7](#)

Line Card Upgrade Using Junos Continuity Software Overview

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

You can deploy new line cards on a router by installing Junos Continuity software, a software package that enables a router to support new hardware without the need to upgrade Junos OS. In the current scenario, after you upgrade line cards, you must restart the router to bring the newly installed line cards online. Whereas, when you install Junos Continuity software, you do not need to restart the router after you upgrade the line cards. You can bring the new line card online by using the **request chassis fpc slot-number online** command.

Because Junos OS upgrade is not required, this method of upgrading line hardware helps faster deployment of the new line cards and eliminates the time required for software release requalification. To support new hardware, you only need to install the Junos Continuity software package that is specific to the new hardware that you want to install.



NOTE: If graceful Routing Engine switchover (GRES) is enabled, you must install the Junos Continuity software package on both the primary and the backup Routing Engines to ensure that the line cards remain operational after a Routing Engine switchover.

Related Documentation

- [Junos Continuity Software Overview on page 3](#)
- [Installing Junos Continuity Software Package on page 27](#)
- [Junos Continuity Software FAQ on page 37](#)
- [Junos Continuity Software Package Naming Conventions on page 4](#)
- [Uninstalling Junos Continuity Software Package on page 32](#)

PART 2

Hardware Supported by Junos Continuity Software

- [Line Cards Supported by Junos Continuity Software on page 11](#)

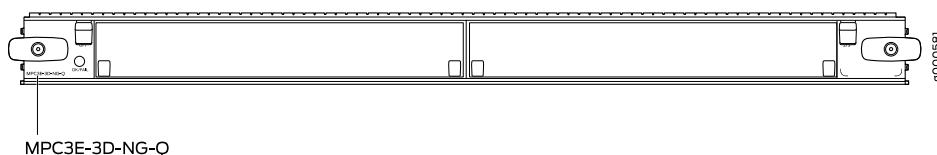
CHAPTER 3

Line Cards Supported by Junos Continuity Software

- MPC3E NG Q on page 11
- MPC3E NG on page 13
- MPC2E NG Q on page 15
- MPC2E NG on page 17
- MIC/MPC Compatibility on page 19

MPC3E NG Q

Supported Platforms MX2010, MX2020, MX240, MX480, MX960



Software release

- Junos OS Release 14.1R4 and Junos Continuity
- For more information see [Junos Continuity Software Overview](#).

For information about which MICs are supported on this MPC, see “MIC/MPC Compatibility” on page 19.

Description

- 130 Gbps capacity with hierarchical quality of service (HQoS)
- Requires high-capacity fan trays and high-capacity filter trays
- Weight: 15.96 lb (7.26 kg)
- Model number: MPC3E-3D-NG-Q
- Name in the CLI: **MPC3E NG HQoS**

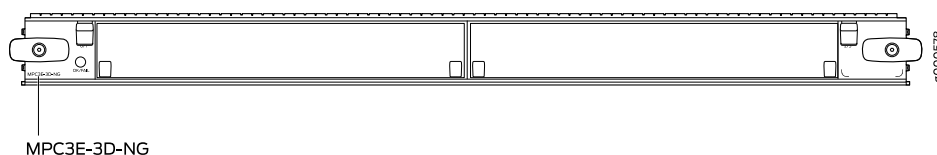
NOTE: To power on an MPC on MX240, MX480, and MX960 routers, you must configure the **network-services enhanced-ip** or **network-services enhanced-ethernet** statement. With this configuration, the router functions in **Enhanced-IP/Enhanced-Ethernet network services** mode and powers on MPCs and MS-DPCs only. The MPC does not come online if this statement is not configured. On MX2010, and MX2020 routers, **network-services enhanced-ip** is configured by default.

Hardware features	<ul style="list-style-type: none">• Line-rate throughput of up to 130 Gbps• Supports up to 512,000 queues per slot• Supports WAN-PHY mode at 9.95 Gbps and LAN-PHY mode at 10.31 Gbps• Two slots for MICs• Junos Trio chipsets for increased scaling for bandwidth, subscribers, and services
Software features	<ul style="list-style-type: none">• Chained composite next hops• Layer 3 VPN localization• Detection of Layer 2 loops• Entropy label support in mixed mode• SNMP and CLI support for Routing Engine memory monitoring• BFD support for inline MLPPP/MLFR• Mixed-mode LAG support on core interfaces• Next-generation MVPN• See <i>Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E</i> for information about the protocols and applications that this MPC supports.
Power requirement	<p>Maximum with highest-power MICs at 55° C: 12.15 A @ 48 V (583 W)</p> <p>At different temperatures:</p> <ul style="list-style-type: none">• 55° C: 473 W• 40° C: 422 W• 25° C: 393 W
LEDs	<p>OK/FAIL LED, one bicolor:</p> <ul style="list-style-type: none">• Steady green—MPC is functioning normally.• Blinking green—MPC is transitioning online or offline.• Red—MPC has failed.

- Related Documentation**
- *MX Series MPC Overview*
 - *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*

MPC3E NG

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)



Software release	<ul style="list-style-type: none"> • Junos OS Release 14.1R4 and Junos Continuity <p>For more information see Junos Continuity Software Overview.</p> <p>For information about which MICs are supported on this MPC, see “MIC/MPC Compatibility” on page 19.</p>
Description	<ul style="list-style-type: none"> • 130 Gbps capacity without hierarchical quality of service (HQoS) • Requires high-capacity fan trays and high-capacity filter trays • Weight: 15.96 lb (7.26 kg) • Model number: MPC3E-3D-NG • Name in the CLI: MPC3E NG PQ & Flex Q <p>NOTE: To power on an MPC on MX240, MX480, and MX960 routers, you must configure the network-services enhanced-ip or network-services enhanced-ethernet statement. With this configuration, the router functions in Enhanced-IP/Enhanced-Ethernet network services mode and powers on MPCs and MS-DPCs only. The MPC does not come online if this statement is not configured. On MX2010, and MX2020 routers, network-services enhanced-ip is configured by default.</p>
Hardware features	<ul style="list-style-type: none"> • Line-rate throughput of up to 130 Gbps • Supports WAN-PHY mode at 9.95 Gbps and LAN-PHY mode at 10.31 Gbps • Two slots for MICs • Junos Trio chipsets for increased scaling for bandwidth, subscribers, and services <p>NOTE: The non-HQOS MPC3E NG and MPC2E NG MPCs support MIC-3D-8CHOC3-4CHOC12 and MIC-3D-4CHOC3-2CHOC12 only with a limited queuing license.</p>
Software features	<ul style="list-style-type: none"> • Chained composite next hops • Layer 3 VPN localization • Detection of Layer 2 loops • Entropy label support in mixed mode • SNMP and CLI support for Routing Engine memory monitoring • BFD support for inline MLPPP/MLFR • Mixed-mode LAG support on core interfaces • Next-generation MVPN • See <i>Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E</i> for information about the protocols and applications that this MPC supports.

Power requirement Maximum with highest-power MICs at 55° C: 11.13 A @ 48 V (534 W)

At different temperatures:

- 55° C: 424 W
- 40° C: 375 W
- 25° C: 351 W

LEDs

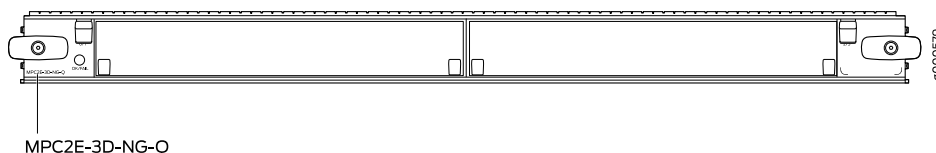
OK/FAIL LED, one bicolor:

- Steady green—MPC is functioning normally.
- Blinking green—MPC is transitioning online or offline.
- Red—MPC has failed.

- Related Documentation**
- *MX Series MPC Overview*
 - *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*

MPC2E NG Q

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)



Software release	<ul style="list-style-type: none"> • Junos OS Release 14.1R4 and Junos Continuity <p>For more information see Junos Continuity Software Overview.</p> <p>For information about which MICs are supported on this MPC, see “MIC/MPC Compatibility” on page 19.</p>
Description	<ul style="list-style-type: none"> • 80 Gbps capacity with hierarchical quality of service (HQoS) • Requires high-capacity fan trays and high capacity filter trays • Weight: 15.96 lb (7.26 kg) • Model number: MPC2E-3D-NG-Q • Name in the CLI: MPC2E NG HQoS <p>NOTE: To power on an MPC on MX240, MX480, and MX960 routers, you must configure the network-services enhanced-ip or network-services enhanced-ethernet statement. With this configuration, the router functions in Enhanced-IP/Enhanced-Ethernet network services mode and powers on MPCs and MS-DPCs only. The MPC does not come online if this statement is not configured. On MX2010, and MX2020 routers, network-services enhanced-ip is configured by default.</p>
Hardware features	<ul style="list-style-type: none"> • Line-rate throughput of up to 80 Gbps • Supports WAN-PHY mode at 9.95 Gbps and LAN-PHY mode at 10.31 Gbps • Two slots for MICs • Junos Trio chipsets for increased scaling for bandwidth, subscribers, and services. <p>NOTE: MPC2E-3D-NG-Q does not support MIC3-3D-10XGE-SFPP, MIC3-3D-1X100GE-CFP, MIC3-3D-1X100GE-CXP, and MIC3-3D-2X40GE-QSFPP.</p>
Software features	<ul style="list-style-type: none"> • Chained composite next hops • Layer 3 VPN localization • Detection of Layer 2 loops • Entropy label support in mixed mode • SNMP and CLI support for Routing Engine memory monitoring • BFD support for inline MLPPP/MLFR • Mixed-mode LAG support on core interfaces • Next-generation MVPN • See <i>Protocols and Applications Supported by MX240, MX480, MX960, MX2010, and MX2020 MPC2E</i> for information about the protocols and applications that this MPC supports.

Power requirement Maximum with highest-power MICs at 55° C: 11.02 A @ 48 V (529 W)

At different temperatures:

- 55° C: 419 W
- 40° C: 350 W
- 25° C: 328 W

LEDs

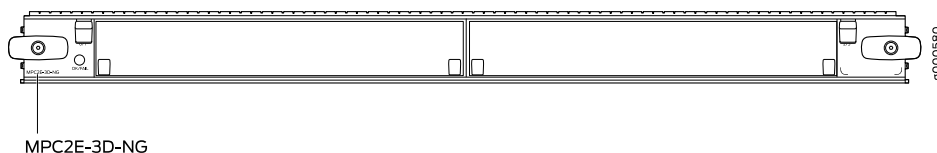
OK/FAIL LED, one bicolor:

- Steady green—MPC is functioning normally.
- Blinking green—MPC is transitioning online or offline.
- Red—MPC has failed.

- Related Documentation**
- *MX Series MPC Overview*
 - *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers*

MPC2E NG

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)



Software release	<ul style="list-style-type: none"> • Junos OS Release 14.1R4 and Junos Continuity <p>For more information see Junos Continuity Software Overview.</p> <p>For information about which MICs are supported on this MPC, see “MIC/MPC Compatibility” on page 19.</p>
Description	<ul style="list-style-type: none"> • 80 Gbps capacity without hierarchical quality of service (HQoS) • Requires high-capacity fan trays and high-capacity filter trays • Weight: 15.96 lb (7.26 kg) • Model numbers: MPC2E-3D-NG • Name in the CLI: MPC2E NG PQ & Flex Q <p>NOTE: To power on an MPC on MX240, MX480, and MX960 routers, you must configure the network-services enhanced-ip or network-services enhanced-ethernet statement. With this configuration, the router functions in Enhanced-IP/Enhanced-Ethernet network services mode and powers on MPCs and MS-DPCs only. The MPC does not come online if this statement is not configured. On MX2010, and MX2020 routers, network-services enhanced-ip is configured by default.</p>
Hardware features	<ul style="list-style-type: none"> • Line-rate throughput of up to 80 Gbps • Supports WAN-PHY mode at 9.95 Gbps and LAN-PHY mode at 10.31 Gbps • Two slots for MICs • Junos Trio chipsets for increased scaling for bandwidth, subscribers, and services. <p>NOTE: MPC2E-3D-NG does not support MIC3-3D-10XGE-SFPP, MIC3-3D-1X100GE-CFP, MIC3-3D-1X100GE-CXP, and MIC3-3D-2X40GE-QSFPP.</p> <p>NOTE: The non-HQOS MPC3E NG and MPC2E NG MPCs support MIC-3D-8CHOC3-4CHOC12 and MIC-3D-4CHOC3-2CHOC12 only with a limited queuing license.</p>

Software features	<ul style="list-style-type: none">• Chained composite next hops• Layer 3 VPN localization• Detection of Layer 2 loops• Entropy label support in mixed mode• SNMP and CLI support for Routing Engine memory monitoring• BFD support for inline MLPPP/MLFR• Mixed-mode LAG support on core interfaces• Next-generation MVPN• Fine-grained queuing• Faster upgrade of non-ISSU supported FRUs during an ISSU upgrade• See <i>Protocols and Applications Supported by MX240, MX480, MX960, MX2010, and MX2020 MPC2E</i> for information about the protocols and applications that this MPC supports.
Power requirement	<p>Maximum with highest-power MICs at 55° C: 9.88 A @ 48 V (474 W)</p> <p>At different temperatures:</p> <ul style="list-style-type: none">• 55° C: 364 W• 40° C: 307 W• 25° C: 290 W
LEDs	<p>OK/FAIL LED, one bicolor:</p> <ul style="list-style-type: none">• Steady green—MPC is functioning normally.• Blinking green—MPC is transitioning online or offline.• Red—MPC has failed.

- Related Documentation**
- [MX Series MPC Overview](#)
 - [MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 Routers](#)

MIC/MPC Compatibility

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

Table 5 on page 19, Table 6 on page 20, Table 7 on page 22, and Table 8 on page 24 provide a compatibility matrix for the current MICs supported by MPC1, MPC2, MPC3, and MPC6 on MX240, MX480, MX960, MX2010, and MX2020 routers. The table lists the first Junos OS release in which the MPC supports the MIC. For example, Junos OS Release 10.2 is the first release in which the MX-MPC1-3D supports the Gigabit Ethernet MIC with SFP. A dash indicates that the MIC is not supported.

Table 5: MIC/MPC1 Compatibility

MIC Name	MPC1	MPC1E	MPC1 Q	MPC1E Q
MIC-3D-8OC3-2OC12-ATM (ATM MIC with SFP)	—	—	12.1	12.1R4
MIC-3D-20GE-SFP (Gigabit Ethernet MIC with SFP)	10.2	11.2R4	10.2	11.2R4
MIC-3D-20GE-SFP-E (Gigabit Ethernet MIC with SFP (E))	13.2R2	13.2R2	13.2R2	13.2R2
MIC-3D-2XGE-XFP (10-Gigabit Ethernet MICs with XFP)	10.2	11.2R4	10.2	11.2R4
MIC-3D-4XGE-XFP (10-Gigabit Ethernet MICs with XFP)	—	—	—	—
MIC-3D-40GE-TX (Tri-Rate MIC)	10.2	11.2R4	10.2	11.2R4
MIC-3D-4OC3OC12-1OC48, MIC-3D-8OC3OC12-4OC48 (SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP)	11.2	11.2R4	11.2	11.2R4
MIC-3D-4COC3-1COC12-CE (Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP)	—	—	12.2	12.2

Table 5: MIC/MPC1 Compatibility (*continued*)

MIC Name	MPC1	MPC1E	MPC1 Q	MPC1E Q
MIC-4COC3-1COC12-CE-H (Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP (H))	—	—	13.2R2	13.2R2
MIC-3D-1OC192-XFP (SONET/SDH OC192/STM64 MIC with XFP)	12.2	12.2	12.2	12.2
MIC-3D-4CHOC3-2CHOC12, MIC-3D-8CHOC3-4CHOC12 (Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP)	—	—	11.4	11.4
MIC-3D-16CHE1-T1-CE (Channelized E1/T1 Circuit Emulation MIC)	13.2	13.2	12.3	12.3
MIC-3D-16CHE1-T1-CE-H (Channelized E1/T1 Circuit Emulation MIC (H))	13.2R2	13.2R2	13.2R2	13.2R2
MIC-3D-8DS3-E3, MIC-3D-8CHDS3-E3-B (DS3/E3 MIC)	11.4	11.4	11.4	11.4
MS-MIC-16G (Multiservices MIC)	13.2	13.2	13.2	13.2

Table 6: MIC/MPC2 Compatibility

MIC Name	MPC2	MPC2E	MPC2E NG	MPC2 Q	MPC2E Q	MPC2 EQ	MPC2E EQ	MPC2E P	MPC2E NG Q
MIC-3D-8OC3-2OC12-ATM (ATM MIC with SFP)	—	—	—	12.1	12.1R4	12.1	12.1R4	—	—
MIC-3D-20GE-SFP (Gigabit Ethernet MIC with SFP)	10.1	11.2R4	14.1R4 and Junos Continuity 15.1	10.1	11.2R4	10.1	11.2R4	12.2	14.1R4 and Junos Continuity 15.1
MIC-3D-20GE-SFP-E (Gigabit Ethernet MIC with SFP (E))	13.2R2	13.2R2	14.1R4 and Junos Continuity 15.1	13.2R2	13.2R2	13.2R2	13.2R2	13.2R2	14.1R4 and Junos Continuity 15.1

Table 6: MIC/MPC2 Compatibility (*continued*)

MIC Name	MPC2	MPC2E	MPC2E NG	MPC2 Q	MPC2E Q	MPC2 EQ	MPC2E EQ	MPC2E P	MPC2E NG Q
MIC-3D-2XGE-XFP <i>(10-Gigabit Ethernet MIC with XFP)</i>	10.2	11.2R4	14.1R4 and Junos Continuity 15.1	10.2	11.2R4	10.2	11.2R4	12.2	14.1R4 and Junos Continuity 15.1
MIC-3D-4XGE-XFP <i>(10-Gigabit Ethernet MICs with XFP)</i>	10.1	11.2R4	14.1R4 and Junos Continuity 15.1	10.1	11.2R4	10.1	11.2R4	12.2	14.1R4 and Junos Continuity 15.1
MIC-3D-40GE-TX <i>(Tri-Rate MIC)</i>	10.2	11.2R4	14.1R4 and Junos Continuity 15.1	10.2	11.2R4	10.2	11.2R4	12.2	14.1R4 and Junos Continuity 15.1
MIC-3D-4OC3OC12-1OC48, MIC-3D-8OC3OC12-4OC48 <i>(SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP)</i>	11.4	11.4	14.1R4 and Junos Continuity 15.1	11.4	11.4	11.4	11.4	12.2	14.1R4 and Junos Continuity 15.1
MIC-3D-4COC3-1COC12-CE <i>(Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP)</i>	—	—	—	12.2	12.2	12.2	12.2	12.2	14.1R4 and Junos Continuity 15.1
MIC-4COC3-1COC12-CE-H <i>(Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP (H))</i>	—	—	—	13.2R2	13.2R2	13.2R2	13.2R2	13.2R2	—
MIC-3D-1OC192-XFP <i>(SONET/SDH OC192/STM64 MIC with XFP)</i>	12.2	12.2	14.1R4 and Junos Continuity 15.1	12.2	12.2	12.2	12.2	12.2	14.1R4 and Junos Continuity 15.1
MIC-3D-4CHOC3-2CHOC12, MIC-3D-8CHOC3-4CHOC12 <i>(Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP)</i>	—	—	— With a license, limited additional queuing is supported.	11.4	11.4	11.4	11.4	—	15.1 14.1R4 and Junos Continuity

Table 6: MIC/MPC2 Compatibility (*continued*)

MIC Name	MPC2	MPC2E	MPC2E NG	MPC2 Q	MPC2E Q	MPC2 EQ	MPC2E EQ	MPC2E P	MPC2E NG Q
MIC-3D-16CHE1-T1-CE (<i>Channelized E1/T1 Circuit Emulation MIC</i>)	13.2	13.2	14.1R4 and Junos Continuity 15.1	12.3	12.3	12.3	12.3	—	14.1R4 and Junos Continuity 15.1
MIC-3D-16CHE1-T1-CE-H (<i>Channelized E1/T1 Circuit Emulation MIC (H)</i>)	13.2R2	13.2R2	14.1R4 and Junos Continuity 15.1	13.2R2	13.2R2	13.2R2	13.2R2	—	14.1R4 and Junos Continuity 15.1
MIC-3D-8DS3-E3, MIC-3D-8CHDS3-E3-B (<i>DS3/E3 MIC</i>)	11.4	11.4	14.1R4 and Junos Continuity 15.1	11.4	11.4	11.4	11.4	12.2	14.1R4 and Junos Continuity 15.1
MS-MIC-16G (<i>Multiservices MIC</i>)	13.2	13.2	14.1R4 and Junos Continuity 15.1	13.2	13.2	13.2	13.2	13.2	14.1R4 and Junos Continuity 15.1
NOTE: Only one MS-MIC-16G can be installed into any MPC.									

Table 7: MIC/MPC3 Compatibility

MIC Name	MPC3E	MPC3E NG	MPC3E NG Q
MIC-3D-20GE-SFP (<i>Gigabit Ethernet MIC with SFP</i>)	12.1	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC-3D-20GE-SFP-E (<i>Gigabit Ethernet MIC with SFP (E)</i>)	13.2R2	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC3-3D-1X100GE-CFP (<i>100-Gigabit Ethernet MIC with CFP</i>)	12.1	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC-3D-2XGE-XFP (<i>10-Gigabit Ethernet MICs with XFP</i>)	12.2	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1

Table 7: MIC/MPC3 Compatibility (*continued*)

MIC Name	MPC3E	MPC3E NG	MPC3E NG Q
MIC-3D-4XGE-XFP (10-Gigabit Ethernet MICs with XFP)	—	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC3-3D-10XGE-SFP+	12.3	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC3-3D-2X40GE-QSFP+	12.2	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC3-3D-1X100GE-CXP (100-Gigabit Ethernet MIC with CXP)	12.2	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC-3D-4OC3OC12-1OC48 MIC-3D-8OC3OC12-4OC48 (SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP)	13.3	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC-3D-1OC192-XFP (SONET/SDH OC192/STM64 MIC with XFP)	13.3	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MIC-3D-8DS3-E3, MIC-3D-8CHDS3-E3-B (DS3/E3 MIC)	13.3	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
MS-MIC-16G (Multiservices MIC)	13.2R2	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
<p>NOTE: On MPC3E, the installation of the Multiservices MIC (MS-MIC-16G) with MIC3-3D-2X40GE-QSFP+, MIC3-3D-10XGE-SFP+, or MIC3-3D-1X100GE-CFP does not meet the NEBS criteria.</p> <p>NOTE: Only one MS-MIC-16G can be installed into any MPC.</p>			

Table 7: MIC/MPC3 Compatibility (*continued*)

MIC Name	MPC3E	MPC3E NG	MPC3E NG Q
<i>Tri-Rate MIC</i>	—	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
<i>SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP</i>	12.1	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
<i>Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP</i>	12.1	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1
<i>DS3/E3 MIC</i>	12.1	14.1R4 and Junos Continuity 15.1	14.1R4 and Junos Continuity 15.1

Table 8: MIC/MPC6 Compatibility

MIC Name	MPC6E
MIC6-10G <i>10-Gigabit Ethernet MIC with SFP+</i>	13.3R2
MIC6-10G-OTN <i>10-Gigabit Ethernet DWDM OTN MIC</i>	13.3R3
MIC6-100G-CXP <i>100-Gigabit Ethernet MIC with CXP</i>	13.3R2
MIC6-100G-CFP2 <i>100-Gigabit Ethernet MIC with CFP2</i>	13.3R3

Related Documentation • [MICs Supported by MX Series Routers](#)

PART 3

Installation

- [Installing Junos Continuity Software on page 27](#)

CHAPTER 4

Installing Junos Continuity Software

- Installing Junos Continuity Software Package to Support New Hardware on page 27
- Uninstalling Junos Continuity Software Package on page 32

Installing Junos Continuity Software Package to Support New Hardware

Supported Platforms MX2010, MX2020, MX240, MX480, MX960

You install the Junos Continuity software package to enable a router to support new hardware without the need to upgrade Junos OS. You can install the Junos Continuity software package as a standalone package or as a package bundled with Junos OS.

If graceful Routing Engine switchover (GRES) is enabled, you must install the Junos Continuity software package on both the primary and the backup Routing Engines to ensure that the hardware components remain operational after a Routing Engine switchover.



NOTE: Before you proceed with the installation, verify that the version of Junos OS that is installed on the router supports Junos Continuity software.

You can consider one of the following methods to install Junos Continuity software:

- Install the Standalone Junos Continuity Plug-in—Restart of the router is not required. You install the Standalone Junos Continuity Plug-in if the version of Junos OS that is installed on the router supports Junos Continuity software. For example, if the router is running Junos OS Release 14.1R4, you can directly the install Standalone Junos Continuity Plug-in and then bring the line cards online.

After you install Junos Continuity software, you can bring the new line card online by using the **request chassis fpc slot-number online** command.

This topic guides you through the installation of the Standalone Junos Continuity Plug-in on 64-bit Junos OS.

- Install the Junos Continuity Plug-in Integrated with Junos OS—Requires you to restart the router for the changes to take effect. You use the integrated package if the version of Junos OS that is installed on the router does not support Junos Continuity software. For example, if you want to install Junos Continuity software on Junos OS Release 13.3, you can use the integrated package that contains both Junos OS Release 14.1R4 and

the Junos Continuity Plug-in. This is a one-step process to upgrade Junos OS to Junos OS Release 14.1R4 and also to install Junos Continuity software.

See *Installation and Upgrade Guide* for more information about upgrading Junos OS.

Before you begin installing Junos Continuity software:

1. Download the Junos Continuity software package from <http://www.juniper.net/support/>. For information about downloading software packages, see *Downloading Software*.
2. Install the new line cards by following the procedure given in the router's hardware guide.
3. (Optional) Run the **run show chassis fpc** command to verify the status of the new line cards.

For example, the following sample output displays information about all the line cards installed on the router:

```
[edit]
user@router# run show chassis fpc
```

Slot	State	Temp (C)	CPU Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Online	34	9	0	2048	11	14
1	Empty						
2	Online	31	31	10	1024	14	26
3	Offline	---Unsupported FPC---					
4	Online	32	8	0	2048	10	14
5	Offline	---Unsupported FPC---					
6	Offline	---Unsupported FPC---					
7	Online	33	7	0	2048	12	13
8	Offline	---Unsupported FPC---					
9	Online	35	14	0	3584	5	13

The newly installed line cards are displayed as **Unsupported FPC** because the router cannot recognize them.

Installing the Junos Continuity Software Package

This section provides the steps to install the Junos Continuity software package.

To install the Junos Continuity software package:

1. Run the **request system software add** *path/package-name* command to start installation of the Junos Continuity software package on the master Routing Engine. For example, to install the **jam-mpc-2e-3e-ng-14.1R4.10-C1.4** package:

```
{master}
user@router> request system software add
/var/tmp/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz
NOTICE: Validating configuration against
jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
Checking compatibility with configuration
Initializing...
Using jbase-14.1R4.10
Verified manifest signed by PackageProductionEc_2015
Using /var/tmp/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz
Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4.tgz signed by PackageProductionEc_2015
Using jam-mpc-2e-3e-ng-14.1R4.10-C1.4.tgz
Checking jam-mpc-2e-3e-ng requirements on /
Available space: 2783474 require: 20884
Verified manifest signed by PackageProductionEc_2015
Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4 signed by PackageProductionEc_2015
Using jruntime-14.1R4.10
```

```
Verified manifest signed by PackageProductionEc_2015
Using jkernel-14.1R4.10
Verified manifest signed by PackageProductionEc_2015
Using jroute-14.1R4.10
Verified manifest signed by PackageProductionEc_2015
Using jcrypto-14.1R4.10
Verified manifest signed by PackageProductionEc_2015
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
mgd: commit complete
Validation succeeded
Installing package '/var/tmp/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz' ...
Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4.tgz signed by PackageProductionEc_2015
Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4.tgz signed by PackageProductionRSA_2015
Adding jam-mpc-2e-3e-ng...
Available space: 2783472 require: 20884
Mounted jam-mpc-2e-3e-ng package on /dev/md12...
Verified manifest signed by PackageProductionEc_2015
Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4 signed by PackageProductionEc_2015
dcd loaded successfully
cosd loaded successfully
dfwd loaded successfully
l2ald loaded successfully
chassisd loaded successfully
WARNING: GRES is enabled on this RE. In order to ensure that the JAM supported
hardware remains operational across GRES switchover, please install JAM package
on the other RE also
jam-mpc-2e-3e-ng-14.1R4.10-C1.4 has been installed successfully
Saving package file in /var/sw/pkg/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz
...
Saving state for rollback ...

{master}
user@router>
```

2. Run the **show version** command to verify the installation.

```
{master}
user@router> show version
Hostname:
Model: mx240
Junos: 14.1R4.10
JUNOS Base OS boot [14.1R4.10]
JUNOS Base OS Software Suite [14.1R4.10]
...
JUNOS py-base-i386 [14.1R4.10]
JUNOS Kernel Software Suite [14.1R4.10]
JUNOS Crypto Software Suite [14.1R4.10]
JUNOS Routing Software Suite [14.1R4.10]
JUNOS 64-bit JAM Plugin Software Suite [14.1R4.10-C1.4]

{master}

user@router>
```

After Junos Continuity software package is installed successfully, the output of the **show version** command displays **JUNOS JAM Plugin Software Suite** among the list of packages that are installed on the router.

3. (Optional) Run the **request system software add path/package-name** command to install Junos Continuity software package on the backup Routing Engine. For example, to install the **jam-mpc-2e-3e-ng-14.1R4.10-C1.4** package:

```
{backup}
user@router> request system software add
/var/tmp/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz
NOTICE: Validating configuration against
jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
Checking compatibility with configuration
Initializing...
Using jbase-14.1R4.10
Verified manifest signed by PackageProductionEc_2015
Using /var/tmp/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz
Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4.tgz signed by PackageProductionEc_2015
Using jam-mpc-2e-3e-ng-14.1R4.10-C1.4.tgz
Checking jam-mpc-2e-3e-ng requirements on /
...

Verified jam-mpc-2e-3e-ng-14.1R4.10-C1.4 signed by PackageProductionEc_2015
chassisd loaded successfully
WARNING: GRES is enabled on this RE. In order to ensure that the JAM supported
hardware remains operational across GRES switchover, please install JAM package
on the other RE also
jam-mpc-2e-3e-ng-14.1R4.10-C1.4 has been installed successfully
Saving package file in /var/sw/pkg/jam-mpc-2e-3e-ng-14.1R4.10-C1.4-signed.tgz
...
Saving state for rollback ...

{backup}
user@router>
```

4. (Optional) Run the **show chassis fpc pic-status** command to display the status of the new line card.

For example, the following sample output shows the status of the new line card installed in slot 1.

```
{master}
user@router> show chassis fpc pic-status
Slot 1   Present      MPC3E NG HQoS

{master}
user@router>
```



NOTE: The status **Present** indicates that the router can recognize the new line cards. To make the new line cards operational, you must bring them online.

5. Run the **request chassis fpc slot slot-number online** command to bring the newly installed line card online.

For example, the following sample output shows that the line card is being brought online.

```
{master}
```

```
user@router> request chassis fpc slot 1 online
Online initiated, use "show chassis fpc" to verify
```

```
{master}
user@router>
```

6. (Optional) Run the **show chassis fpc pic-status** command to display the status of the newly installed line card.

For example, the following sample output shows the status of the line card in slot 1 and the installed PICs.

```
{master}
user@router> show chassis fpc pic-status
Slot 1  Online      MPC3E NG HQoS
  PIC 0  Online      1X100GE CFP
  PIC 2  Online      1X100GE CFP

{master}
user@router>
```

The newly installed line card and PICs are online and operational.

Related Documentation

- [Junos Continuity Software Overview on page 3](#)
- [Uninstalling Junos Continuity Software Package on page 32](#)
- [Verifying Installation of Junos Continuity Software on page 41](#)

Uninstalling Junos Continuity Software Package

Supported Platforms [MX2010](#), [MX2020](#), [MX240](#), [MX480](#), [MX960](#)

You can uninstall the Junos Continuity software package by using the **request system software delete software-package** command. Before you uninstall Junos Continuity software package, you must take the line cards that Junos Continuity software supports offline.

This topic guides you through the uninstallation of the Junos Continuity software standalone package. The steps for uninstalling the Junos Continuity software package bundled with Junos OS are similar to those for downgrading Junos OS to an earlier release. See *Installation and Upgrade Guide* for more information about downgrading Junos OS.



NOTE: If GRES is enabled, you must uninstall the Junos Continuity software package from both the primary and the backup Routing Engines.

To uninstall the Junos Continuity software package:

1. (Optional) Run the **show version** command to verify that the Junos Continuity software package is installed on the router. For example, on an MX240 router that has Junos Continuity software installed:

```
{master}
user@router> show version
Hostname:
Model: mx240
Junos: 14.1R4.10
JUNOS Base OS boot [14.1R4.10]
JUNOS Base OS Software Suite [14.1R4.10]
...

JUNOS py-base-i386 [14.1R4.10]
JUNOS Kernel Software Suite [14.1R4.10]
JUNOS Crypto Software Suite [14.1R4.10]
JUNOS Routing Software Suite [14.1R4.10]
JUNOS 64-bit JAM Plugin Software Suite [14.1R4.10-C1.4]

{master}

user@router>
```

The **show version** command output indicates that the Junos Continuity software package (**JUNOS JAM Plugin Software Suite**) is installed on the router.

2. Take the line card that Junos Continuity software supports offline by using the **request chassis fpc slot slot-number offline** command. For example, the following sample output shows that the line card is being taken offline.

```
{master}
user@router> request chassis fpc slot 1 offline
Offline initiated, use "show chassis fpc" to verify

{master}
user@router>
```

3. (Optional) Verify that the line card is taken offline by using the **show chassis fpc** command. For example, the following sample output shows the status of line card after it is taken offline.

```
{master}
user@router> show chassis fpc
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)
			Total Interrupt	DRAM (MB) Heap Buffer
0	Empty			
1	Offline		---Offlined by cli command---	
2	Empty			

```
{master}
user@router>
```

4. Run the **request system software delete software-package** command to uninstall Junos Continuity software package. For example, to uninstall the **jam-mpc-2e-3e-ng-14.1R4.10-C1.4** package:

```
{master}
```

```
user@router> request system software delete jam-mpc-2e-3e-ng
Removing package 'jam-mpc-2e-3e-ng' ...
chassisd Unloaded successfully
l2ald Unloaded successfully
dfwd Unloaded successfully
cosd Unloaded successfully
dcd Unloaded successfully
WARNING: Please Uninstall the JAM package on the other RE also in order to
avoid unexpected behaviour
jam-mpc-2e-3e-ng-14.1R4.10-C1.4 has been uninstalled successfully
Unmounted /packages/mnt/jam-mpc-2e-3e-ng-14.1R4.10-C1.4 ...
Saving state for rollback ...

{master}
user@router>
```

The output of the command shows that the software is uninstalled.

5. Run the **show version** command to verify that the Junos Continuity software package is uninstalled successfully.

```
{master}
user@router> show version
Hostname: bugatti
Model: mx240
Junos: 14.1R4.10
JUNOS Base OS boot [14.1R4.10]
JUNOS Base OS Software Suite [14.1R4.10]
...

JUNOS Services IPSec [14.1R4.10]
JUNOS py-base-i386 [14.1R4.10]
JUNOS Kernel Software Suite [14.1R4.10]
JUNOS Crypto Software Suite [14.1R4.10]
JUNOS Routing Software Suite [14.1R4.10]

{master}
user@router>
```



NOTE: The **show version** command output indicates that the Junos Continuity software package (JUNOS JAM Plugin Software Suite) is not present on the router. If GRES is enabled, repeat Step 4 and Step 5 on the backup Routing Engine to uninstall Junos Continuity software package.

**Related
Documentation**

- [Junos Continuity Software Overview on page 3](#)
- [Installing Application Packages](#)
- [Installing Junos Continuity Software Package to Support New Hardware on page 27](#)

PART 4

FAQ & Troubleshooting

- [FAQ on page 37](#)
- [Troubleshooting on page 41](#)

CHAPTER 5

FAQ

- [Junos Continuity Software FAQ on page 37](#)

Junos Continuity Software FAQ

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

This section presents frequently asked questions and answers related to Junos Continuity software.

Q. What is Junos Continuity software?

Junos Continuity is a software package that enables a router to support new hardware without the need to upgrade Junos OS. See [“Junos Continuity Software Overview” on page 3](#) for details.

Q. Do I need to restart the router after installing Junos Continuity software?

No.

Q. Which are the FRUs supported by Junos Continuity software?

See [“Hardware Supported by Junos Continuity Software” on page 5](#).

Q. How do I install Junos Continuity software?

You can install Junos Continuity software by using the **request system software add *package-name*** command. See [“Installing Junos Continuity Software Package” on page 27](#) for information.

Q. What are the prerequisites for installing Junos Continuity software?

The version of Junos OS that is installed on the router must support the Junos Continuity software package.

You get the following message if the version of Junos OS that is installed on the router does not support Junos Continuity software:

WARNING: This base version of JUNOS will not properly
WARNING: support this package. Please install base OS
WARNING: JUNOS 14.1 or newer first. You can do this via
WARNING: a jinstall package or install-media.

Q. Should I install separate Junos Continuity software packages for each FRU?

No. Junos Continuity software package might support one or more FRUs. For each type of FRU, you need to install the package only once. For example, the Junos Continuity software package for Junos OS Release 14.1R4 supports the following MPCs:

- MPC2E-3D-NG
- MPC2E-3D-NG-Q
- MPC3E-3D-NG
- MPC3E-3D-NG-Q

Q. Can I install Junos Continuity software on my 32-bit system?

Yes. Junos Continuity software is supported on both 32-bit and 64-bit Junos OS. You can choose Junos Continuity software on the basis of whether 32-bit Junos OS or 64-bit Junos OS is installed on the router.

Q. How do I verify the FRUs supported by the Junos Continuity software package?

You can use the **show system software details** command after you install the Junos Continuity software package on the router.

For example, in the following sample output, the **Hardware Supported** field shows the line cards that the Junos Continuity software package supports.

```
user@router> show system software detail
Information for jam-mpc-2e-3e-ng:

Comment:
JUNOS JAM Plugin Software Suite [14.1R4.10-C1.4]

Depends on:
Description:
JUNOS JAM Plugin Software Release
Copyright (c) 1996-2015, Juniper Networks, Inc.
All rights reserved.

Software version:    14.1R4.10-C1.4
Hardware Supported : MPC2E NG PQ & Flex Q, MPC2E NG HQoS,
                    MPC3E NG PQ & Flex Q, MPC3E NG HQoS
```

Information for jbase:

```
Comment:
JUNOS Base OS Software Suite [14.1R4.10]

Depends on:
Description:
JUNOS Software Update Release
Copyright (c) 1996-2015, Juniper Networks, Inc.
All rights reserved.
```

Software version: 14.1R4.10

This package contains base OS components.

Q. I have installed Junos Continuity software. Will the FRU come online automatically?

No. The FRU does not come online automatically. You must bring the FRU online by using the `request chassis fpc slot slot-number online` command.

Q. Is service affected when I am installing or uninstalling Junos Continuity software?

No. Services remain unaffected when you install or uninstall Junos Continuity software.

Q. Should I uninstall the existing version of Junos Continuity software before upgrading to a later version?

No. The installed version of Junos Continuity software gets overwritten whenever you install a later version.

Q. Do FRUs supported through Junos Continuity software support GRES and NSR?

Yes. If GRES is enabled, you must install Junos Continuity software package on both primary and the backup Routing Engines to ensure that the line cards remain operational after a Routing Engine switchover.

Q. Do FRUs supported through Junos Continuity software support ISSU?

No. Installing new FRUs through Junos Continuity software minimizes the frequency of Junos OS upgrade.

Related Documentation

- [Junos Continuity Software Overview on page 3](#)

CHAPTER 6

Troubleshooting

- [Verifying Installation of Junos Continuity Software on page 41](#)

Verifying Installation of Junos Continuity Software

Supported Platforms [MX2010, MX2020, MX240, MX480, MX960](#)

- [Verifying That Junos Continuity Software Is Installed on page 41](#)
- [Verifying the Status of Newly Installed Hardware Before Junos Continuity Software Is Installed on page 42](#)
- [Verifying the Status of Newly Installed Hardware After Installing Junos Continuity Software on page 43](#)
- [Verifying the Status of Newly Installed Hardware After Installing Junos Continuity Software and Bringing the Hardware Online on page 43](#)
- [Verifying the PIC Status After Installing Junos Continuity Software and Bringing the New Hardware Online on page 44](#)
- [Displaying Installed Hardware After Uninstalling Junos Continuity Software on page 45](#)

Verifying That Junos Continuity Software Is Installed

Purpose Verify that Junos Continuity software is installed on the router.

Action From the CLI, enter the **show version** command.

For example, you see the following output when you run the **show version** command on an MX240 3D Universal Edge Router that has Junos Continuity software installed:

```
[edit]
user@router# show version
Hostname:
Model: mx240
Junos: 14.1R4.10
JUNOS Base OS boot [14.1R4.10]
JUNOS Base OS Software Suite [14.1R4.10]
JUNOS Packet Forwarding Engine Support (M/T/EX Common) [14.1R4.10]
JUNOS Packet Forwarding Engine Support (MX Common) [14.1R4.10]
JUNOS platform Software Suite [14.1R4.10]
JUNOS Runtime Software Suite [14.1R4.10]
JUNOS Online Documentation [14.1R4.10]
JUNOS Services AACL Container package [14.1R4.10]
JUNOS Services Application Level Gateways [14.1R4.10]
```

```

JUNOS AppId Services [14.1R4.10]
JUNOS Border Gateway Function package [14.1R4.10]
JUNOS Services Captive Portal and Content Delivery Container package [14.1R4.10]
JUNOS Services HTTP Content Management package [14.1R4.10]
JUNOS IDP Services [14.1R4.10]
JUNOS Services Jflow Container package [14.1R4.10]
JUNOS Services LL-PDF Container package [14.1R4.10]
JUNOS Services MobileNext Software package [14.1R4.10]
JUNOS Services Mobile Subscriber Service Container package [14.1R4.10]
JUNOS Services NAT [14.1R4.10]
JUNOS Services PTSP Container package [14.1R4.10]
JUNOS Services RPM [14.1R4.10]
JUNOS Services Stateful Firewall [14.1R4.10]
JUNOS Voice Services Container package [14.1R4.10]
JUNOS Services Crypto [14.1R4.10]
JUNOS Services SSL [14.1R4.10]
JUNOS Services IPSec [14.1R4.10]
JUNOS py-base-i386 [14.1R4.10]
JUNOS Kernel Software Suite [14.1R4.10]
JUNOS Crypto Software Suite [14.1R4.10]
JUNOS Routing Software Suite [14.1R4.10]
JUNOS JAM Plugin Software Suite [14.1R4.10-C1.4]

```

```

[edit]
user@router#

```

Meaning Junos Continuity software (JUNOS JAM Plugin Software Suite) is installed on the router.

Verifying the Status of Newly Installed Hardware Before Junos Continuity Software Is Installed

Purpose Verify the status of the newly installed hardware.

Action From the CLI, enter the **show chassis fpc** command.

The output displays information about all the line cards installed on the router:

```

[edit]
user@router# run show chassis fpc

```

Slot	State	Temp (C)	CPU Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Online	34	9	0	2048	11	14
1	Empty						
2	Online	31	31	10	1024	14	26
3	Offline	---Unsupported FPC---					
4	Online	32	8	0	2048	10	14
5	Offline	---Unsupported FPC---					
6	Offline	---Unsupported FPC---					
7	Online	33	7	0	2048	12	13
8	Offline	---Unsupported FPC---					
9	Online	35	14	0	3584	5	13

Meaning The new hardware is shown as **Unsupported FPC** because Junos Continuity software is not installed. The router can identify the new hardware only after you install Junos Continuity software.

Verifying the Status of Newly Installed Hardware After Installing Junos Continuity Software

Purpose Verify the status of the new hardware after you install Junos Continuity software.

Action From the CLI, enter the **show chassis fpc pic-status** command.

```
[edit]
user@router# run show chassis fpc pic-status
Slot 0  Online      MPC4E 3D 32XGE
  PIC 0  Online      8X10GE SFPP
  PIC 1  Online      8X10GE SFPP
  PIC 2  Online      8X10GE SFPP
  PIC 3  Online      8X10GE SFPP
Slot 2  Online      MS-MPC
  PIC 0  Online      MS-MPC-PIC
  PIC 1  Online      MS-MPC-PIC
  PIC 2  Online      MS-MPC-PIC
  PIC 3  Online      MS-MPC-PIC
Slot 3  Offline     MPC3E NG HQoS
Slot 4  Online      MPC4E 3D 2CGE+8XGE
  PIC 0  Online      4x10GE SFPP
  PIC 1  Online      1X100GE CFP
  PIC 2  Online      4x10GE SFPP
  PIC 3  Online      1X100GE CFP
Slot 5  Offline     MPC3E NG PQ & Flex Q
Slot 6  Offline     MPC3E NG HQoS
Slot 7  Online      MPC 3D 16x 10GE
  PIC 0  Online      4x 10GE(LAN) SFP+
  PIC 1  Online      4x 10GE(LAN) SFP+
  PIC 2  Online      4x 10GE(LAN) SFP+
  PIC 3  Online      4x 10GE(LAN) SFP+
Slot 8  Offline     MPC3E NG HQoS
Slot 9  Online      MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online      12X10GE SFPP
  PIC 1  Online      12X10GE SFPP
  PIC 2  Offline     3X40GE QSFPP
  PIC 3  Offline     3X40GE QSFPP

[edit]
user@router#
```

Meaning **Offline**—Indicates that the router can recognize the newly installed hardware. The hardware must be brought online to be operational.

Verifying the Status of Newly Installed Hardware After Installing Junos Continuity Software and Bringing the Hardware Online

Purpose Verify that the newly installed hardware is online.

Action From the CLI, enter the **show chassis fpc** command.

```
[edit]
user@router# run show chassis fpc
```

Slot	State	Temp (C)	CPU Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Online	33	8	0	2048	11	14
1	Empty						
2	Online	30	34	16	1024	14	26

3	Online	30	14	0	3584	5	13
4	Online	31	8	0	2048	10	14
5	Online	31	7	0	3584	5	13
6	Online	30	11	0	3584	5	13
7	Online	31	7	0	2048	12	13
8	Online	30	12	0	3584	5	13
9	Online	33	15	0	3584	5	13

```
[edit]
user@router#
```

Meaning **Online**—Indicates that the newly installed hardware is online.

Verifying the PIC Status After Installing Junos Continuity Software and Bringing the New Hardware Online

Purpose Verify the status of the PICs after bringing the new hardware online.

Action From the CLI, enter the **show chassis fpc pic-status** command.

```
[edit]
user@router# run show chassis fpc pic-status
Slot 0  Online      MPC4E 3D 32XGE
  PIC 0  Online      8X10GE SFPP
  PIC 1  Online      8X10GE SFPP
  PIC 2  Online      8X10GE SFPP
  PIC 3  Online      8X10GE SFPP
Slot 2  Online      MS-MPC
  PIC 0  Online      MS-MPC-PIC
  PIC 1  Online      MS-MPC-PIC
  PIC 2  Online      MS-MPC-PIC
  PIC 3  Online      MS-MPC-PIC
Slot 3  Online      MPC3E NG HQoS
  PIC 0  Online      1X100GE CFP
  PIC 2  Online      1X100GE CFP
Slot 4  Online      MPC4E 3D 2CGE+8XGE
  PIC 0  Online      4x10GE SFPP
  PIC 1  Online      1X100GE CFP
  PIC 2  Online      4x10GE SFPP
  PIC 3  Online      1X100GE CFP
Slot 5  Online      MPC3E NG PQ & Flex Q
  PIC 0  Online      1X100GE CFP
  PIC 2  Online      1X100GE CFP
Slot 6  Online      MPC3E NG HQoS
  PIC 0  Online      10X10GE SFPP
  PIC 2  Online      MIC-3D-8CHOC3-4CHOC12
Slot 7  Online      MPC 3D 16x 10GE
  PIC 0  Online      4x 10GE(LAN) SFP+
  PIC 1  Online      4x 10GE(LAN) SFP+
  PIC 2  Online      4x 10GE(LAN) SFP+
  PIC 3  Online      4x 10GE(LAN) SFP+
Slot 8  Online      MPC3E NG HQoS
  PIC 0  Online      1x 10GE XFP
  PIC 1  Online      1x 10GE XFP
  PIC 2  Online      2x 10GE XFP
  PIC 3  Online      2x 10GE XFP
Slot 9  Online      MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Online      12X10GE SFPP
  PIC 1  Online      12X10GE SFPP
```



```
PIC 2 Offline      3X40GE QSFP
PIC 3 Offline      3X40GE QSFP
```

```
[edit]
user@router#
```

Meaning The command output shows that the PICs are online.

Displaying Installed Hardware After Uninstalling Junos Continuity Software

To display details of hardware installed on the router:

Run the **show chassis hardware** command to list all the hardware components that are installed on the router.

```
[edit]
user@router# show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number  Description
Chassis
Midplane          REV 01   750-047865   ACRA1467       Enhanced MX240 Backplane
FPM Board         REV 04   760-021392   ABCB4816       Front Panel Display
PEM 0             Rev 09   740-029970   QCS1215U07W    PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0  REV 05   740-031118   9009074155     RE-S-1800x4
Routing Engine 1  REV 08   740-031116   9009128938     RE-S-1800x4
CB 0              REV 16   750-031391   CAAX4302       Enhanced MX SCB
CB 1              REV 16   750-031391   CAAX4424       Enhanced MX SCB
FPC 1             REV 13   750-054901   CACX3460       MPC3E NG HQoS
CPU
Fan Tray 0        REV 01   710-030216   ZK3141         Enhanced Fan Tray

user@router#
```


PART 5

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