

Chapter 12

Installation Overview

Your router comes with JUNOS software installed on it. When you power on the router, all software starts automatically. You simply need to configure the software and the router will be ready to participate in the network.

The software is installed on the router's flash drive (a nonrotating drive) and hard disk (a rotating disk). A copy of the software also is provided on removable media, either an LS-120 floppy disk or a PC card, which can be inserted into the router's drive or card slot. Normally, when you power on the router, it runs the copy of the software that is installed on the flash drive.

You might want to upgrade the router software as new features are added or software problems are fixed. You normally obtain new software by downloading the images onto your router or onto another system on your local network. Then you install the software upgrade on the router's flash and hard disks. You can also copy the software onto the removable media.

If the software on the flash drive, hard disk, or removable media becomes damaged, you can reinstall the software onto those devices.

This chapter discusses the following concepts and terminology related to installing and upgrading the JUNOS software:

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JUNOS Software Distribution

This section discusses the following topics:

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Package Names on page 302

Software Release Names

A JUNOS software release has a name in the following format:

`JUNOS-m.nZx`

m.n is two integers that represent the software release number; *m* denotes the major release number.

Z is a capital letter that indicates the type of software release. In most cases, it is an *R*, to indicate that this is released software. If you are involved in testing prereleased software, this letter might be an *A* (for alpha-level software), *B* (for beta-level software), or *I* (a capital letter *I*; for internal, test, or experimental versions of software).

x represents the version of the major software release.

The following is an example of a software release name:

`JUNOS-7.0R1`

Package Names

A *package* is a collection of files that make up a software component.



NOTE: All JUNOS software is delivered in signed packages that contain digital signatures, Secure Hash Algorithm (SHA-1), and Message Digest 5 (MD5) checksums. Which checksum is used depends on the software version:

Digital signatures are used when you upgrade or downgrade between JUNOS Release 7.0 and a later version.

The SHA-1 checksum is used when you upgrade or downgrade between JUNOS Release 6.4 and a later version.

The MD5 checksum is used when you upgrade or downgrade from JUNOS Release 6.3 or earlier to a later version.

You can upgrade the packages individually.

A software package has a name in the following format:

`package-name-release.tgz or package-name-release-signed.tgz`

package-name is the name of the package. Examples are *route* (the routing package) and *kernel* (the operating system package).

Each JUNOS software release consists of a set of software packages whose names contain the package name and the software release version, and includes the following components:

- Kernel and network tools package, which contains the operating system

- Base package, which contains additions to the operating system

- Routing package, which contains the software that runs on the Routing Engine

- Encryption package, which contains security software (domestic version)

- Packet Forwarding Engine software package

- Documentation package, which contains the documentation for the software

release is the software release number; for example, 7.0 R1 or 7.0 R1.5.

The following are examples of package names:

```
jroute-7.0R1-signed.tgz
jkernel-7.0R1-signed.tgz
jpfe-7.0R1-signed.tgz
```

The JUNOS software contains two additional packages: `jinstall` and `jbundle`. These packages contain the complete JUNOS software.

`jinstall`—A package used to upgrade from JUNOS Release 5.x to 6.x or when the software becomes damaged. If you upgrade from 5.x to 6.0 using `jinstall`, use `jbundle` for subsequent upgrades or downgrades. The `jinstall` package completely reinstalls the software. It rebuilds the JUNOS file system only, but retains configuration, log files, and similar information from the previous version. For more information about how to use `jinstall` when the software becomes damaged, see “Reinstalling Software Using `jinstall`” on page 323.

`jbundle`—A package used to downgrade from release 6.2. `jbundle` is also used to upgrade or downgrade between minor versions of the JUNOS software. `jbundle` modifies the smallest set of files needed to change to the new software version. For more information about how to upgrade from Release 5.x to 6.0 or downgrade from Release 6.0 to 5.x, see “Upgrading to Release 7.x from Release 5.x” on page 327.



NOTE: You cannot use the `jbundle` package to upgrade from JUNOS 5.x to JUNOS 6.0.

Two sets of JUNOS software packages are provided: one for customers in the United States and Canada and another for other customers. The worldwide version does not include any capabilities that provide encryption of data leaving the router. Otherwise, the two packages are identical.

Storage Media

The router has three forms of storage media:

Flash drive, which is a nonrotating drive. When a new router is shipped from the factory, the JUNOS software is preinstalled on the flash drive.

Hard disk, which is a rotating drive. When a new router is shipped from the factory, the JUNOS software is preinstalled on the hard disk. This drive also is used to store system log files and diagnostic dump files.

Removable media, either a PC card or an LS-120 floppy disk. The removable media that ships with each router contains a copy of the JUNOS software.

Table 10 specifies the router's device names. The device names are displayed when the router boots.

Table 10: Device Names

Device	Routing Engine 400	Routing Engine 600	Routing Engine 1600
Flash drive	ad0	ad0	ad0
Hard disk	ad1	ad1	ad1
Removable media	ad3	ad3	ad3 and ad4

Boot Devices

There are three devices from which the router boots: the flash drive, the hard disk, or a removable medium. Typically, the router boots from the flash drive. The disk from which the router boots is called the *primary boot device*, and the other disk is the *alternate boot device*. The primary boot device is generally the flash drive, and the alternate boot device is generally the hard disk.



NOTE: If the router boots from an alternate boot device, a yellow alarm lights the LED on the router's craft interface. Some routers have text and LED displays.

For information about chassis conditions that trigger alarms, see "Chassis Conditions That Trigger Alarms" on page 701.

Boot Sequence

Normally, the router boots from the flash drive. If it fails, the router attempts to boot from the hard disk, which is the alternate boot device.

If a removable medium is installed when the router boots, the router attempts to boot the image on it. If the booting fails, the router tries the flash drive and then the hard disk.

When the router boots from the storage media (flash drive, hard disk, or removable media) it expands its search in the /config directory of the routing platform for the following files in the following order: juniper.conf (the main configuration file), rescue.conf (the rescue configuration file), and juniper.conf.1 (the first rollback configuration file). When the search finds the first configuration file that can be loaded properly, the file loads and the search ends. If none of the files can be loaded properly, the routing platform does not function properly.



NOTE: To reinstall the JUNOS software, you boot the router from the removable media. Do not insert the removable media during normal operations. The router does not operate normally when it is booted from the removable media.

If the router boots from an alternate boot device, the JUNOS software displays a message indicating this when you log in to the router. For example, this message shows that the software booted from the hard disk (/dev/ad2s1a):

```
login: username
Password: password
Last login: date on terminal

--- JUNOS 7.0 R1 built date
---
--- NOTICE: System is running on alternate media device (/dev/ad2s1a).
```

The default boot order for the M7i Internet router is different from other Juniper Networks routers, because the default configuration of the Routing Engine on the M7i router does not include an internal compact flash disk.

If the Routing Engine does not have an internal compact flash disk, two copies of the JUNOS software are preinstalled on the router: one on a PC card that can be inserted into the slot in the Routing Engine faceplate, and one on a rotating hard disk in the Routing Engine. When the router boots, it first attempts to access the software image on the PC card. If a PC card is not inserted into the Routing Engine or the attempt otherwise fails, the router tries the hard disk.

If the Routing Engine has an internal compact flash disk, three copies of the JUNOS software are preinstalled on the router. When the router boots, it first attempts to access the image on the PC card. If a PC card is not inserted into the Routing Engine or the attempt otherwise fails, the router next tries the flash disk, and finally the hard disk.

