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 drive (a rotating disk). A copy of the software also is provided on removable media, either an LS-120 floppy disk or a PCMCIA 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 drives. You can also copy the software onto the removable media.

If the software on the flash, 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:

JUNOS Software Distribution

Each JUNOS software release consists of the following components:

- Base package, which contains additions to the operating system
- Kernel and network tools package, which contains the operating system
- Routing package, which contains the software that runs on the Routing Engine
- Packet Forwarding Engine software package
- Documentation package, which contains the documentation for the software

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

The five software packages are provided as a single unit, called a *bundle*, which you can use to upgrade all the packages at once. You can also upgrade the packages individually.

When upgrading to a new major release, you must upgrade using the bundle; do not upgrade packages individually.

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.

JUNOS Software Naming Conventions

Software Release Name

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

JUNOS-*m.nZnumber*

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).

number is an integer that represents the version of the major software release.

The following is an example of a software release name:

JUNOS-4.0R1

Package Names

A software package has a name in the following format:

package-name-release.tgz

package-name is the name of the package. Examples are jroute (the routing package) and jkernel (the operating system package).

release is the software release number; for example, 3.4R2 or 3.4R2.1.

The following are examples of package names:

jroute-4.0R1.tgz
jkernel-4.0R1.tgz
jpfe-4.0R1.tgz

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

Removable media, either a LS-120 floppy drive (which reads a 120-MB LS-120 floppy disk) or a PCMCIA card slot. The removable media that ships with each router contains a copy of the JUNOS software.

The storage media have the following device names, which are displayed when the router boots:

Flash drive—wd0

Hard drive—wd2

Removable media—wfd0

Boot Devices

The router typically boots from either the flash disk or the hard disk. (Although it is possible to boot the router from the removable media, typically this is not done.) These disks are referred to as the *boot de vices*. The disk from which the router boots is called the *primary boot de vice*, and the other disk is the *alternate boot de vice*. The primary boot device is generally the flash disk, and the alternate boot device is generally the hard disk.

Boot Sequence

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

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

If the router boots from an alternate medium, the JUNOS software displays a message indicating this when you log into the router. For example, this message shows that the software booted from the hard disk (device wd2):

```
login: username
Password: password
Last login: Thu Oct 29 09:52:29 from my-router

--- JUNOS 3.2R1 built 1999-03-12 19:45:03 UTC
---
--- NOTICE: System is running on alternate media device (/dev/wd2s1a).
```

When the router successfully boots from the flash disk, hard drive, or removable media, it will, by default, boot from the same medium again.