

Novell Linux Point of Service

9

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INSTALLATION GUIDE

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About This Guide

Welcome to Novell® Linux Point of Service 9. This guide contains instructions on how to install and deploy the components in your Novell Linux Point of Service system.

This guide contains the following chapters:

- ♦ Chapter 1, “Overview,” on page 11
- ♦ Chapter 2, “Installing Novell Linux Point of Service Software,” on page 21
- ♦ Chapter 3, “Migrating from SLRS 8 to Novell Linux Point of Service 9,” on page 57
- ♦ Chapter 4, “Setting Up the Administration Server,” on page 59
- ♦ Chapter 5, “Setting Up a Dedicated Image Building Server,” on page 67
- ♦ Chapter 6, “Setting Up a Branch Server,” on page 71
- ♦ Chapter 7, “Setting Up High Availability Branch Servers,” on page 81
- ♦ Chapter 8, “Setting Up an Admin/Branch Server Combo,” on page 99
- ♦ Chapter 9, “Setting Up a POSBranch Terminal,” on page 107
- ♦ Chapter 10, “Automatic Branch Server Installation,” on page 115
- ♦ Chapter 11, “Deploying Point of Service Terminals,” on page 125
- ♦ Chapter 12, “Testing Your Novell Linux Point of Service Environment,” on page 143
- ♦ Appendix A, “Installation RPM Lists,” on page 147
- ♦ Appendix B, “Changing the Server Language,” on page 151
- ♦ Appendix C, “Documentation Updates,” on page 155

Audience

This documentation targets Linux* system administrators. It assumes a proficient knowledge of the Linux operating system and administration procedures.

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Documentation Updates

For the latest version of this documentation, see the *Novell Documentation Web site* (<http://www.novell.com/documentation/nlpos9/>).

Additional Documentation

For information on managing Novell Linux Point of Service 9, see the *Novell Linux Point of Service 9 Administration Guide*.

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Overview

1

Novell® Linux Point of Service 9 is a secure and reliable Linux platform optimized for enterprise retail organizations. Built on the solid foundation of SUSE® Linux Enterprise Server 9 and Novell Linux Desktop 9, it is the only enterprise-class Linux operating system tailored specifically for retail point of sale terminals, kiosk and self-service systems, and reverse-vending systems.

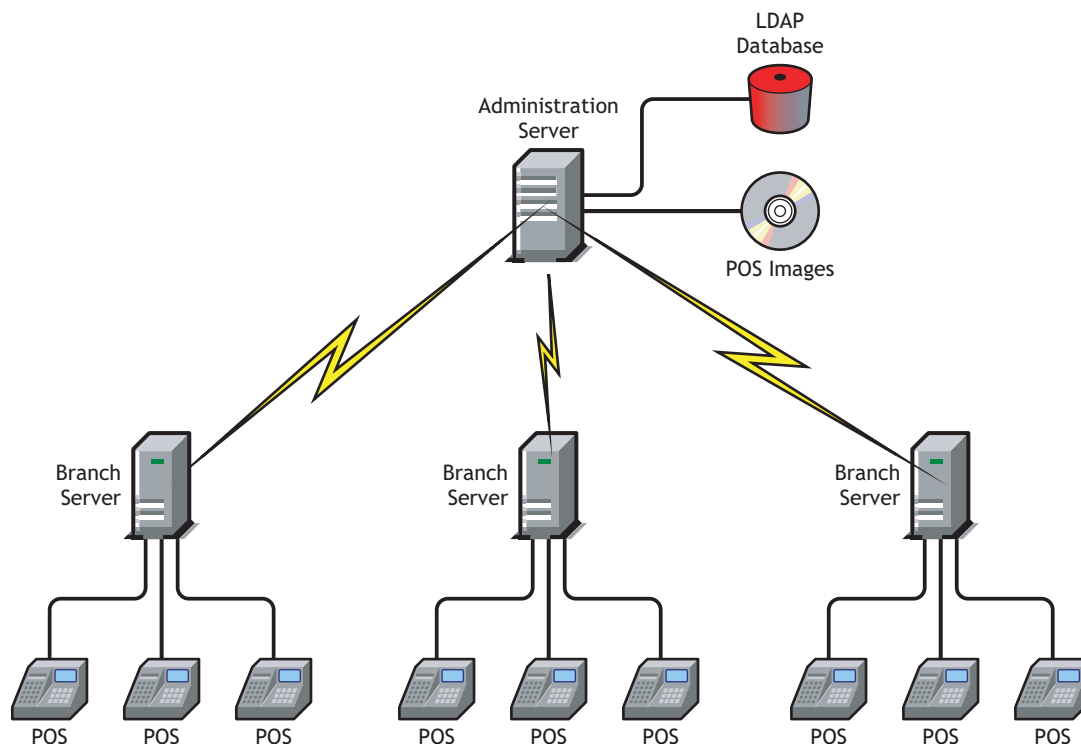
This section provides an architectural overview of the Novell Linux Point of Service product, along with an overview of images, the deployment process, and a summary of new features in Novell Linux Point of Service 9.

- ♦ [Section 1.1, “Architectural Overview,” on page 11](#)
- ♦ [Section 1.2, “Images Overview,” on page 12](#)
- ♦ [Section 1.3, “Deployment Overview,” on page 15](#)
- ♦ [Section 1.4, “What’s New,” on page 18](#)

1.1 Architectural Overview

The Novell Linux Point of Service architecture consists of one centralized Administration Server, one or more Branch Servers, and Point of Service terminals, which can be standard PCs running retail check-out applications or specialized point-of-sale machines such as cash registers and customer kiosks (see [Figure 1-1](#)).

Figure 1-1 Novell Linux Point of Service system architecture



All system information (system structure, the configuration and deployment method for each Branch Server and Point of Service terminal, image information, and so forth) is stored in an LDAP database on the Administration Server. The Administration Server is also the master repository for the images required to boot and configure Point of Service terminals and it provides the utilities required to build those images.

NOTE: By default, the utilities required to build Point of Service images are installed as part of the Administration Server installation. If you have a large system and want to offload the image building function from the Administration Server, you can create a dedicated image building server.

During the system initialization, each Branch Server downloads the system information and images required for its local Point of Service terminals from the Administration Server. The Point of Service terminals, in turn, download their respective images from the Branch Server when they boot.

WARNING: Because Branch Servers contain sensitive information, they should be secured. You should close unused ports and allow only the root user to have access to the server console.

Novell Linux Point of Service is broadly scalable so that a small shop with five Point of Service terminals can be managed just as well as a large chain with a thousand branches. For organizations with several Branch Servers, the link between the branch and administrative servers is maintained over WAN links. During execution of administrative tasks, such as installation of new Point of Service terminals in a branch, steps must be taken to ensure that the WAN link to the Administration Server is available.

The Novell Linux Point of Service architecture is highly centralized; however, administrative tasks can be delegated to subunits for role-based administration. Moreover, although the LDAP directory is not replicated on the Branch Server, the Branch Server provides all the services necessary for the operation and management of the Point of Service terminals. Consequently, the Branch Server and Point of Service terminals can function independently of the Administration Server in the event of server failure or a downed connection.

1.2 Images Overview

Novell Linux Point of Service is designed to automate the roll-out of Point of Service terminals as much as possible. To assist this automation, the product makes extensive use of image building technology. For each type of terminal, whether it is a non-graphical system or a full desktop environment, you can create customized images to be downloaded automatically from the Branch Server when the terminal boots.

1.2.1 Types of Images

To help get you started, Novell Linux Point of Service comes with a set of pre-built image files that you can customize to set up your own system. Every Point of Service terminal requires two images: a boot image and a client image.

Two customizable boot image templates provide the minimum your Point of Service terminals need to initially start up either from a bootable CD or from the network via standard Preboot Execution Environment (PXE) remote boot technology:

- ◆ CDBoot includes all the files and directories required to boot diskless and preinstalled diskful systems from CD.

Novell Linux Point of Service includes a binary version of the CDBoot image. This image must be combined with a client image and a `config.image` configuration file to create a CD that can be used to boot the Point of Service terminal.

- ◆ DiskNetBoot includes all the files and directories (including partitioning and boot loader installation) required to boot diskful and diskless terminals from the network.

Novell Linux Point of Service includes binary versions of the first and second stage boot images used to PXE boot Point of Service terminals. The first stage image is a bootstrap image called `initrd` because it initializes a RAM disk in the terminal's memory and performs the PXE boot. The second stage image is called `linux` because it loads the Linux kernel into the RAM disk so that the terminal can become network-capable, contact the Branch Server, and begin downloading the appropriate client image via the Trivial File Transfer Protocol (TFTP).

Four customizable client image templates are specially designed for the most common types of retail Point of Service terminals:

- ◆ The Minimal image contains only the runtime environment for native-code applications (C and C++) and the ncurses library for non-graphical user interface support. The Minimal image supports only console-based applications. Its maximum size is 35 MB compressed, and 64 MB of RAM is required to boot the image.
- ◆ The Java image includes the features of the Minimal operating system image and adds essential graphical interface capabilities as well as the ability to run Java programs. The Java image supports console-based C/C++ applications, Java programs in a Java2 runtime environment, and X11 applications. Its maximum size is 100 MB compressed, and 128 MB of RAM is required to boot the image.
- ◆ The Browser image includes the features of the Java operating system image and essential graphical interface capabilities, and adds the Mozilla* Web browser. The Browser image supports console-based C/C++ applications, Java programs in a Java2 runtime environment, X11 applications, and basic browser-based applications. Its maximum size is 150 MB compressed, and although it is intended to be loaded on diskful systems with 256 MB of RAM, you can load it on a diskless system that has adequate memory (at least 1 GB of RAM is recommended).
- ◆ The Desktop image is for high-functionality clients with full graphical user interface capabilities for a traditional desktop experience. It includes the Mozilla Web browser with plug-ins, and a full graphical desktop environment (GNOME 2.6 or KDE 3.2). The Desktop image supports console-based C/C++ applications, Java programs in a Java2 runtime environment, X11 applications, browser-based applications, and GNOME*-based or KDE*-based programs. It is intended to be loaded on diskful systems, but you can load it on a diskless system that has adequate memory (at least 1 GB of RAM is recommended).

In general, most Point of Service client images are created using the Novell Linux Desktop (NLD) 9 distribution. NLD is a general-purpose desktop platform that can be tailored for use in information kiosks, call-center terminals, or single-use PC workstations. However, because NLD shares a system core with SUSE Linux Enterprise Server (SLES) 9, you can build images using either NLD or SLES as the base. The only Point of Service images that require the SLES distribution are POSBranch images.

You can extend Point of Service client images to include add-on features such as:

- ◆ Advanced Linux Sound Architecture (ALSA) library for audio support
- ◆ EvTouch touchscreen driver
- ◆ GNOME or KDE desktop environments

- ◆ IBM* Java technology support
- ◆ Firefox and other Web browsers
- ◆ Samba 3 Client for SMB/CIFS connectivity to Microsoft* Windows* servers
- ◆ VNC 4 Remote Control Client to allow other computers to remotely control the terminal

Client images that you create are initially stored on the Administration Server. Before you deploy your Point of Service terminals, you run a script to transmit the client images via the RSYNC service to specific directories on the Branch Server where, in turn, they can be downloaded to Point of Service terminals at boot time.

When a Point of Service terminal is started for the first time, it performs a PXE boot (or boots from CD) and then registers with the Branch Server to obtain the information it needs to download its client image. The TFTP service on the Branch Server automatically delivers the matching client image to the Point of Service terminal.

To make this work as designed, you must create reference objects in the LDAP directory for the types of Point of Service terminals you intend to deploy in your system. Taking the time to correctly create and configure these objects when you install the Branch Servers saves you from separately managing the startup of each Point of Service terminal.

1.2.2 About ImageBuilder

ImageBuilder is a Perl-based tool that provides a command line interface for creating images. It is installed when you select the NLPOS Image Server software selection during the Administration Server installation.

When you build a client image, ImageBuilder compiles all the information required to run a Point of Service terminal—the Linux operating system, drivers, configuration settings, application files, and so forth—into a single image file. This file can then be electronically distributed to Point of Service terminals over the network, or you can generate an ISO version of the image file that can be burned to a CD for manual distribution.

ImageBuilder comes in two versions: standard (`scr`) and XML-based (`xscr`).

scr

`scr` builds images using an Image Description Tree and an `AdminServer.conf` file. The Image Description Tree is a specific file system directory structure that defines the version information, component list, scripts, configuration files, and other components required to build client images.

The `AdminServer.conf` file defines the paths to the distribution directories where you have copied the Novell Linux Point of Service source CDs.

NOTE: `scr` generates client images with the Novell Linux Desktop distribution only.

xscr

`xscr` builds images using an Image Description Tree and two XML documents: an Image Specification Document (`ImageSpecification.xml`) and a Distribution Source Document (`Distribution.xml`). These documents contain XML elements that define the version information, component list, configuration files, and other components required to build client images.

The Image Description Tree contains one parent Image Specification Document at its root. This allows you to define global settings that affect the implementation of image subcomponents.

Image Specification Document templates for the CDBoot, DiskNetboot, Minimal, Java, Browser, Desktop, and POSBranch images specify the RPMs and drivers required to build their respective images and are included as child documents in their parent Image Specification Document at the root of the Image Description Tree. Child Image Specification Document templates for the client image add-on options such as GNOME, KDE, Samba 3 Client, and VNC 4 Remote Control Client are also included.

The Distribution Source Document (`Distribution.xml`) defines the paths to the distribution directories where you have copied the Novell Linux Point of Service source CDs.

NOTE: `xscr` can generate client images with either NLD or SLES distributions.

The XML-based Image Specification Document and Distribution Source Document provide significant advantages in image design and manageability:

- ◆ You can manage image subcomponents as discrete elements. Drivers, RPMs, and even features can be separately managed within the Image Specification Document. This allows you to easily add features, RPMs, and drivers to an image.
- ◆ You can define global settings in the parent Image Specification Document to customize the implementation of image subcomponents. For example, in the parent document, you can choose to include or exclude specific drivers or RPMs.

This granular level of control is made possible by the structure of the Novell Linux Point of Service XML schema, which organizes the template components in discrete elements so they can be individually managed.

1.3 Deployment Overview

Novell Linux Point of Service requires the following components for a functional system:

- ◆ Administration Server
- ◆ Image Building Server
- ◆ Branch Servers
- ◆ Point of Service Terminals

The way in which these components are deployed depends on your system requirements. For example, systems that maintain hundreds of client images might require a dedicated image building server, whereas smaller systems can have the image building utilities installed on the Administration Server. Similarly, some customers might install the Administration and Branch Servers on a single box, while others deploy the Branch Server on a Point of Service terminal.

The flexibility of the architecture provides broad scalability so that in large environments components can be distributed to improve system performance, while in smaller environments components can be consolidated to maximize the use of system resources.

1.3.1 Design Guidelines for Large Environments

Every retail environment is different in terms of network speed, server hardware, Point of Service terminal hardware, size of images, frequency of updates, etc. This section presents some design guidelines for large environments, based on scalability and reliability improvements made in Novell Linux Point of Service 9 SSP3. These recommendations do not apply to previous releases of Novell Linux Point of Service 9.

The recommended maximum number of Point of Service terminals being serviced by a single Branch Server is 100. You can adjust this number up or down depending on how frequently the Point of Service terminals are reimaged and whether you can control when the terminals come online.

NOTE: For every 100 terminals coming online at the same time, it can take up to 10 minutes for the terminals to download larger desktop images. If the terminals are simply booting from an existing image, it can take 2-3 minutes per 100 terminals.

1.3.2 Installation Summary

The following summary outlines the general steps required to deploy a Novell Linux Point of Service system. It also identifies the configuration options for each system component and notes where you can go to find detailed instructions.

- 1 If you are migrating from SUSE Linux Retail Solution 8 (SLRS 8) to Novell Linux Point of Service 9, back up the LDAP directory and any SLRS 8 image files you want to continue to deploy to Point of Service terminals.

For detailed instructions, see [Chapter 3, “Migrating from SLRS 8 to Novell Linux Point of Service 9,” on page 57.](#)

- 2 Install the Administration Server using one of the following configurations:

- ◆ Install an Administration Server that includes the ImageBuilder utilities (scr and xsr) and all the files and directories required to create Point of Service images.

For detailed instructions, see [Chapter 4, “Setting Up the Administration Server,” on page 59.](#)

- ◆ Install an Administration Server and a dedicated Image Building Server.

For detailed instructions, see [Chapter 5, “Setting Up a Dedicated Image Building Server,” on page 67.](#)

- ◆ Install an Admin/Branch Server combination.

For detailed instructions, see [Chapter 8, “Setting Up an Admin/Branch Server Combo,” on page 99.](#)

- 3 Create the LDAP directory on your Administration Server using one of the following methods:

- ◆ If you are migrating from SLRS 8 to Novell Linux Point of Service 9, import the SLRS 8 LDAP directory from the backup copy you made in Step 1.

For detailed instructions, see [Chapter 3, “Migrating from SLRS 8 to Novell Linux Point of Service 9,” on page 57.](#)

- ◆ If this is a new installation, create the Novell Linux Point of Service 9 LDAP directory.

For detailed instructions, see [Section 4.3, “Initializing the LDAP Directory,” on page 61.](#)

- 4 Create the Point of Service images required to deploy your Point of Service terminals.
 - 4a Copy the image source files to your Image Building Server.

For detailed instructions, see “[Copying the Novell Linux Point of Service CDs](#)” in the *Novell Linux Point of Service 9 Administration Guide*.
 - 4b Define the location of the image source files.

For detailed instructions, see “[Generating AdminServer.conf or Distribution.xml](#)” in the *Novell Linux Point of Service 9 Administration Guide*.
 - 4c Build the Point of Service image files.

For detailed instructions, see “[Building Images with scr](#)” or “[Building Images with xscr](#)” in the *Novell Linux Point of Service 9 Administration Guide*.
 - 4d Copy the image files you have created to the appropriate directories on the Administration Server so they will be ready for the Branch Servers to download.

IMPORTANT: Client images must be located in `/opt/SLES/POS/rsync/image/` and boot images must be located in `/opt/SLES/POS/rsync/boot/` on the Administration Server before the RSYNC service can transmit the images to the Branch Server.

- 5 Create the required LDAP objects for each Branch Server and its Point of Service terminals in the LDAP tree.

For detailed instructions, see “[Creating Branch Server Objects in LDAP](#)” on page 72.
- 6 Install the Branch Servers using one of the following configurations:

NOTE: If you install an Admin/Branch Server combination, this step is already completed. For instructions on how to configure the Admin/Branch Server combination, see [Chapter 8](#), “[Setting Up an Admin/Branch Server Combo](#),” on page 99.

- ♦ Install a standard Branch Server.

For detailed instructions, see [Chapter 6](#), “[Setting Up a Branch Server](#),” on page 71.
 - ♦ Install a high availability Branch Server cluster of two nodes in an active/passive setup.

For detailed instructions, see [Chapter 7](#), “[Setting Up High Availability Branch Servers](#),” on page 81.
 - ♦ For stores where the Branch Server is only running the Point of Service infrastructure (that is, the Branch Server is running no additional applications), the Branch Server can be installed as a control terminal running on Point of Service hardware.

For more information, see [Chapter 9](#), “[Setting Up a POSBranch Terminal](#),” on page 107.
 - ♦ If the Branch Server is in a remote location where no onsite system expertise is available, you can create an Automatic Branch Server Installation image. The resulting ISO file can then be burned to a CD and used to install the Branch Server at the remote location.

For detailed instructions, see [Chapter 10](#), “[Automatic Branch Server Installation](#),” on page 115.
- 7 After a Branch Server is installed, you must complete the following steps to initialize the Branch Server before attempting to boot its Point of Service terminals:
 - 7a Run the `posInitBranchserver.sh` script to initialize and configure the Branch Server.

For detailed instructions, see “[Configuring the Branch Server](#)” on page 78.

- 7b** Run `possyncimages.pl` to download the Point of Service images from the Administration Server to the `/tftpboot/` directories on the Branch Server.
For detailed instructions, see [“Downloading Images from the Administration Server” on page 79](#).
- 7c** Start the core script (`posleases2ldap`) as a daemon process on the Branch Server. This script controls all other scripts.
For more information, see [“Starting the Core Script” on page 79](#).
- 8** Deploy the Point of Service terminals, following the general instructions in [Chapter 11, “Deploying Point of Service Terminals,” on page 125](#).
Depending on your network configuration and terminal hardware, you must prepare the Point of Service terminals to boot using one of the following procedures:
- ◆ If the Point of Service terminals have access to the network, the terminals can PXE boot and download their image files from the Branch Server. This method is typically used for diskless workstations.
For more information on this process, see [“Network PXE Boot” on page 138](#).
 - ◆ If the Point of Service terminals do not have access to the network, create a CDBoot image and deploy the image at the terminal. This method can be used for either diskless or diskful workstations that have a CD drive.
For information on creating a CDBoot image, see [“Building a CDBoot Image” in the *Novell Linux Point of Service 9 Administration Guide*](#).
For information on the CDBoot process, see [“CDBoot” on page 140](#).
 - ◆ If a Point of Service terminal cannot boot from the network or from a CD, it attempts to boot from the hard drive.
For more information, see [“Booting the Point of Service Terminal” on page 136](#).
- 9** Test your Novell Linux Point of Service installation to ensure that it is functioning correctly.
For detailed instructions, see [Chapter 12, “Testing Your Novell Linux Point of Service Environment,” on page 143](#).

1.4 What's New

The following features are new in the initial release of Novell Linux Point of Service 9:

- ◆ **New operating system base:** The original release of Novell Linux Point of Service 9 is built on SUSE Linux Enterprise Server 9 SP1 and Novell Linux Desktop 9 SP1. Subsequent releases of Novell Linux Point of Service 9 may require newer OS support packs.
- ◆ **Improved installation:** The installation of Administration Servers and Branch Servers has been simplified and improved. For information on installing Novell Linux Point of Service 9, see [Chapter 2, “Installing Novell Linux Point of Service Software,” on page 21](#).
- ◆ **Backward compatibility for OS image deployment:** Novell Linux Point of Service 9 Branch Servers can deliver SUSE Linux Retail Solution (SLRS) 8 client images. For more information on this configuration, see [Chapter 3, “Migrating from SLRS 8 to Novell Linux Point of Service 9,” on page 57](#).
- ◆ **Combined Branch Server/Point of Service terminal for small store environments:** For smaller stores where the Branch Server is only running the Point of Service infrastructure (that is, the Branch Server is running no additional applications), the Branch Server can be deployed

as a control terminal running on Point of Service hardware. For more information, see [Chapter 9, “Setting Up a POSBranch Terminal,” on page 107](#).

- ♦ **Easier image creation through an XML interface:** The Novell Linux Point of Service XML schema organizes the image components in discrete elements so they can be individually managed. This provides greater flexibility and ease of use when building custom images. For more information, see “[Building Images with the xscr ImageBuilder Tool](#)” in the *Novell Linux Point of Service 9 Administration Guide*.
- ♦ **Client image add-on features:** Novell Linux Point of Service includes several add-on features such as the Mozilla* and Firefox* browsers, the Samba 3 client, and the VNC 4 Remote Control Client that can be added to client images generated with xscr. For more information, see “[Adding Features to Client Images](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

See the [Readme files \(http://www.novell.com/documentation/nlpos9\)](http://www.novell.com/documentation/nlpos9) for information about new features and enhancements in subsequent Support Pack releases of Novell Linux Point of Service 9.

Installing Novell Linux Point of Service Software

2

This section reviews the system requirements and processes for installing Novell® Linux Point of Service software.

- ♦ [Section 2.1, “Preparing Your Servers,” on page 21](#)
- ♦ [Section 2.2, “Meeting the System Requirements,” on page 21](#)
- ♦ [Section 2.4, “Planning Your Installation,” on page 22](#)
- ♦ [Section 2.5, “YaST Installation Screens,” on page 22](#)

2.1 Preparing Your Servers

Before installing the Novell Linux Point of Service software, you must prepare the server as follows:

- ♦ The Novell Linux Point of Service installation program wipes the hard drive. Therefore, you must back up anything you want to save before installing the Novell Linux Point of Service software.
- ♦ If you are migrating from SUSE® Linux Retail Solution (SLRS) 8 to Novell Linux Point of Service 9, refer to [Chapter 3, “Migrating from SLRS 8 to Novell Linux Point of Service 9,” on page 57](#) for the migration procedure.

2.2 Meeting the System Requirements

[Table 2-1](#) lists the Novell Linux Point of Service system requirements for Administration Servers and Branch Servers.

Table 2-1 System requirements for Administration Servers and Branch Servers.

	Administration Server Only	Administration Server with Image Building Components	Branch Server
Supported Processor Platforms	x86	x86	x86
Disk Space	Minimum: 4 GB	Minimum: 4 GB	Minimum: 4 GB
	Recommended: 15 GB	Recommended: 25 GB	Recommended: 10 GB
RAM	Minimum: 256 MB	Minimum: 512 MB	Minimum: 256 MB
	Recommended: 512 MB - 3 GB; at least 256 MB per CPU	Recommended: 512 MB - 3 GB; at least 512 MB per CPU	Recommended: 512 MB - 3 GB; at least 256 MB per CPU

2.3 Obtaining the Software

To obtain the software you need to install Novell Linux Point of Service 9, go to the [Novell Downloads Web site \(http://www.novell.com/download\)](http://www.novell.com/download) and select the Novell Linux Point of Service product. Click *Search* and then select *Novell Linux Point of Service 9* from the results list. Click *Proceed to Download* and log in to your Novell Account to access the downloadable CD images.

After downloading the `.iso` files, verify the MD5 checksums to ensure that the images downloaded fully and without any errors. Burn the `.iso` files to CDs using the CD burning software of your choice. Label the CDs using the names of the `.iso` files.

2.4 Planning Your Installation

Before you install Novell Linux Point of Service, you must decide which system configuration to use. This choice determines how many servers you need and what software packages you install on each one.

For the Administration Server, you have three configuration options:

- ◆ Administration Server with Image Building Tools
- ◆ Administration Server with separate Image Building Server
- ◆ Admin/Branch Server combination

For the Branch Server, you have four configuration options:

- ◆ Branch Server
- ◆ High Availability Branch Server
- ◆ Branch Server running on a Point of Sale terminal
- ◆ Branch Server as part of the Admin/Branch Server combination

IMPORTANT: The Admin/Branch Server combination is supported only for single site, self-contained installations. No additional Branch Servers can connect to the Admin/Branch Server. You can, however, configure an Admin/Branch Server combination in a two-node heartbeat cluster with one server acting as the primary server and the other as the secondary server.

The installation process for each type of server is essentially the same. You use the SuSE Linux YaST utility for all installations; the main difference is the software you select to install on the server.

For instructions on how to select software packages during the installation, see “[Software Selection Screen](#)” on page 34.

2.5 YaST Installation Screens

This section provides an overview of the YaST installation utility that you will use to install the Novell Linux Point of Service software on your servers.

This section is intended as a reference only. The specific step-by-step procedures for installing each type of server are found in the following sections:

- ♦ Chapter 4, “Setting Up the Administration Server,” on page 59
- ♦ Chapter 5, “Setting Up a Dedicated Image Building Server,” on page 67
- ♦ Chapter 6, “Setting Up a Branch Server,” on page 71
- ♦ Chapter 7, “Setting Up High Availability Branch Servers,” on page 81
- ♦ Chapter 8, “Setting Up an Admin/Branch Server Combo,” on page 99

IMPORTANT: The procedure for installing updates of Novell Linux Point of Service 9 might require additional steps that are not documented in this manual. For the latest information, refer to the Readme file and installation instructions that are included with the software for new releases of Novell Linux Point of Service 9.

For additional information about the SUSE Linux Enterprise Server 9 installation process, refer to the *SUSE LINUX Enterprise Server Administration and Installation Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

The following sections show the screens you will encounter as you go through the installation, along with an explanation of the various options you can select.

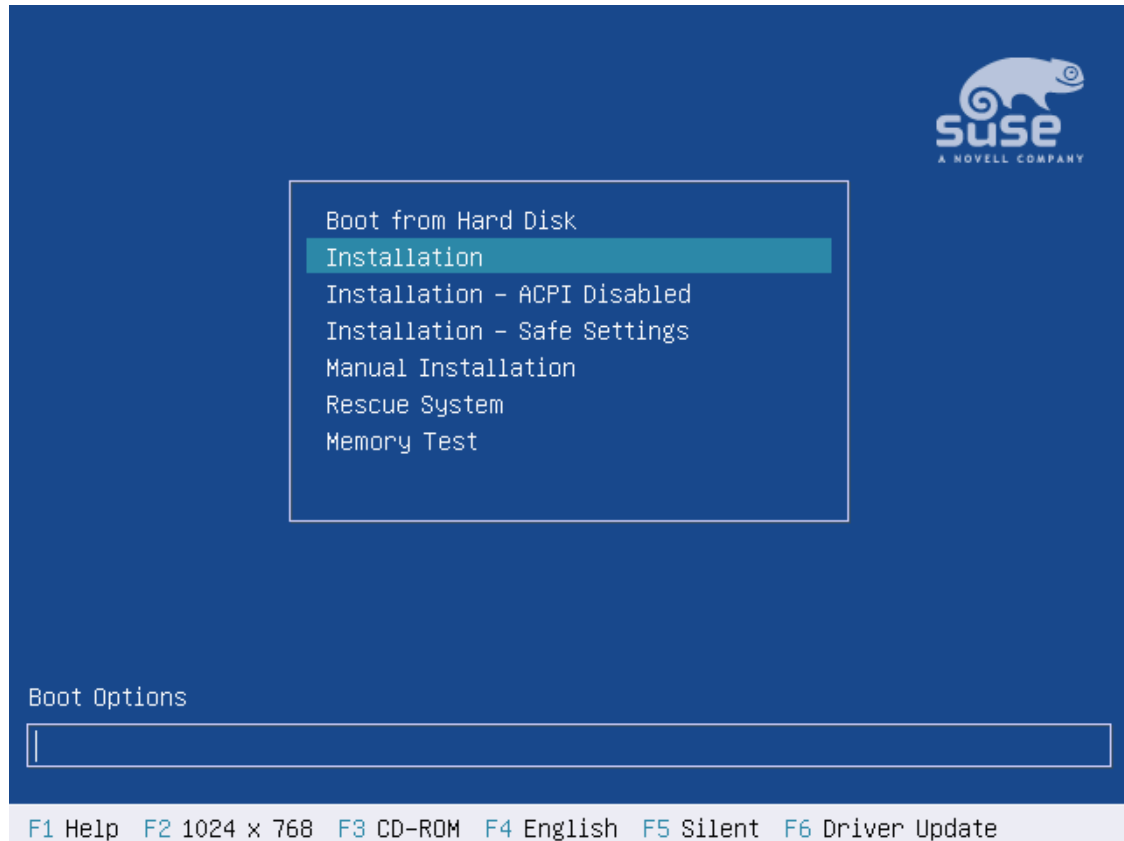
2.5.1 Starting the YaST Utility

To start the YaST installation program for Novell Linux Point of Service, you insert *Novell Linux Point of Service 9 CD 1* into the drive and then reboot the computer.

SuSE Boot Screen

Figure 2-1 shows the SuSE Linux boot screen. In most cases, you select the *Installation* option to proceed in normal installation mode with all standard hardware functions enabled.

Figure 2-1 SuSE Linux boot screen



Following is a brief explanation of the other options in the boot screen:

- ◆ *Boot from Hard Disk* boots the system on the hard disk (the system normally booted when the machine is started).
- ◆ *Installation - ACPI Disabled* installs without the Advanced Configuration and Power Interface (ACPI). If the normal installation fails, your system hardware might not support ACPI, in which case you can use this option to install without ACPI support.
- ◆ *Installation - Safe Settings* boots the system with Direct Memory Access (DMA) mode and any interfering power management functions disabled. DMA is used for CD drives. Experts can also use the command line to enter or change kernel parameters.
- ◆ *Manual Installation* allows you to manually load drivers during the installation. By default, drivers are loaded automatically during the installation. If this appears to cause problems, you can use this option to load drivers manually. (This does not work if you use a USB keyboard on your machine.)
- ◆ *Rescue System* starts a minimal Linux system without a graphical user interface that allows experts to access disk partitions to troubleshoot and repair an installed system. Less-experienced users can use the system repair tool supplied with YaST.

- ◆ *Memory Test* tests your system RAM using repeated read and write cycles. This process is repeated in an endless loop because memory corruption often shows up very sporadically and many read and write cycles might be necessary to detect it. If you suspect that your RAM might be defective, start this test and let it run for several hours. If no errors are detected after a long time period, you can assume that the memory is intact. Terminate the test by rebooting.

You can use these function keys to further manipulate the installation:

- ◆ Press F1 to access help for the currently active screen element of the boot screen.
- ◆ Press F2 to select the installation's graphical display mode. You can also select text mode, which is useful if graphical mode causes problems with the installation.
- ◆ Press F3 to designate the installation media. Normally, the installation is run from the inserted installation disk. However, in some cases, you might want to select another source, such as FTP or NFS.
- ◆ Press F4 to define the display language for the installation.
- ◆ Press F5 to define the mode for displaying Linux kernel diagnostic messages. By default, Linux kernel diagnostic messages are not displayed during system start-up. You only see a progress bar. To display these messages, select *Native*. For a maximum of information, select *Verbose*.
- ◆ Press F6 to tell the system you have an optional disk with a driver update for SuSE Linux. You will be asked to insert the update disk at the appropriate point in the installation process.

After you select the Installation option, the utility loads a minimal Linux system to run the installation. If you enable Native or Verbose diagnostic mode, a number of messages and copyright notices appear. At the end of the loading process, the YaST installation program starts.

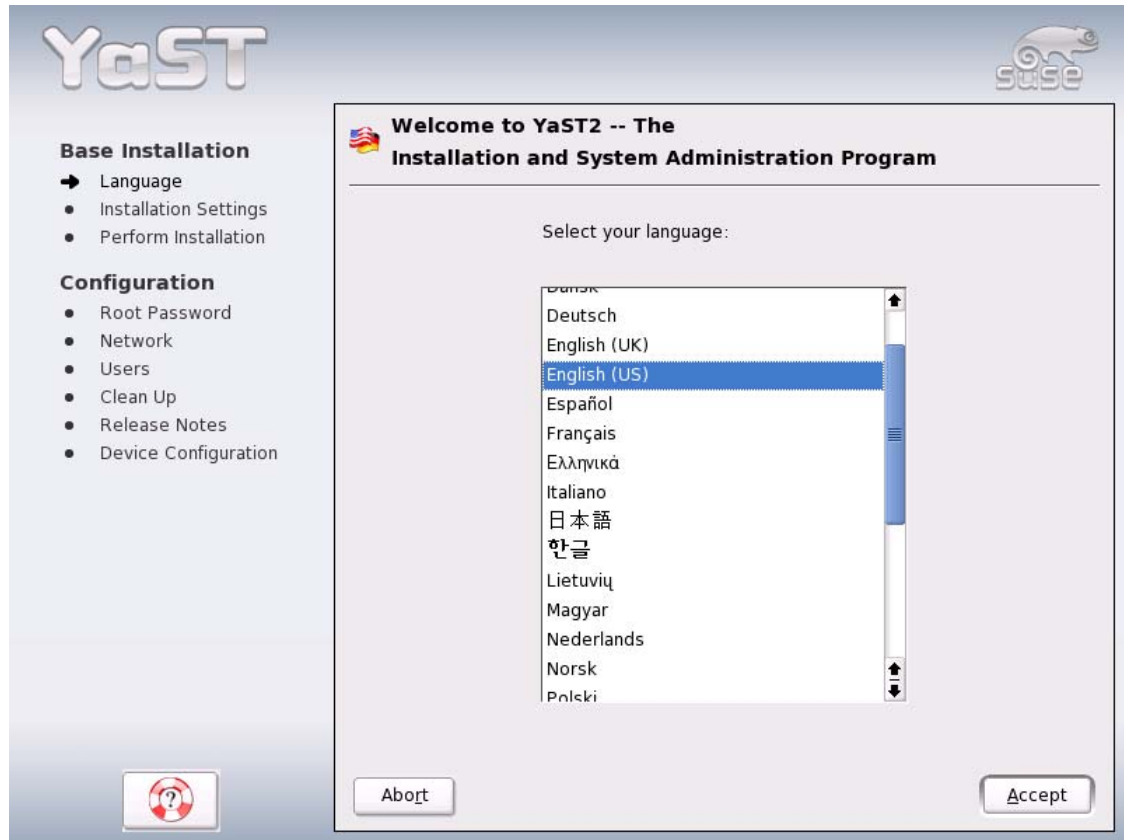
Software License Agreement

YaST displays the Novell Software License Agreement for you to read and agree to.

Language Selection

Figure 2-2 shows the language selection screen. Your selection here determines the operating system language and the default keyboard layout. YaST also uses this language setting to guess a time zone for the system clock.

Figure 2-2 Language selection screen

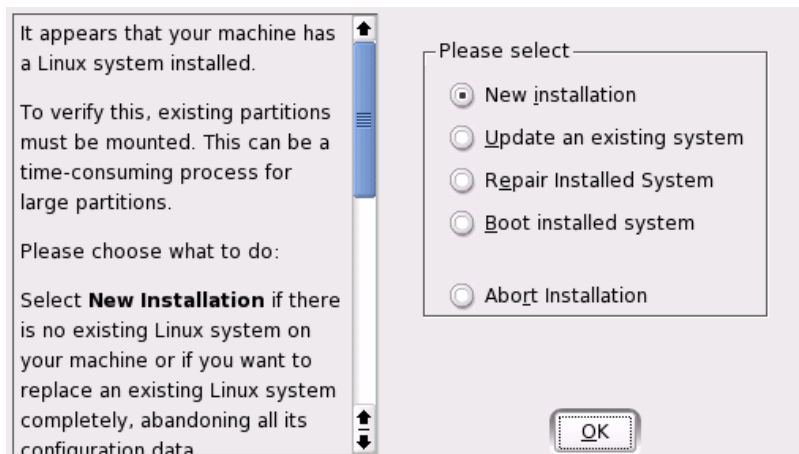


Currently, Novell Linux Point of Service is available only in English. The language selection affects only the SLES operating system and keyboard layout; it does not affect the Novell Linux Point of Service scripts or utilities.

Installation Mode

Figure 2-3 shows the installation mode screen, which allows you to specify what type of installation procedure you want to perform. This screen appears only if data exists on the server's hard disk.

Figure 2-3 Installation mode screen



IMPORTANT: To install Novell Linux Point of Service, you must select *New Installation*. This option install SUSE Linux and Novell Linux Point of Service on a new system.

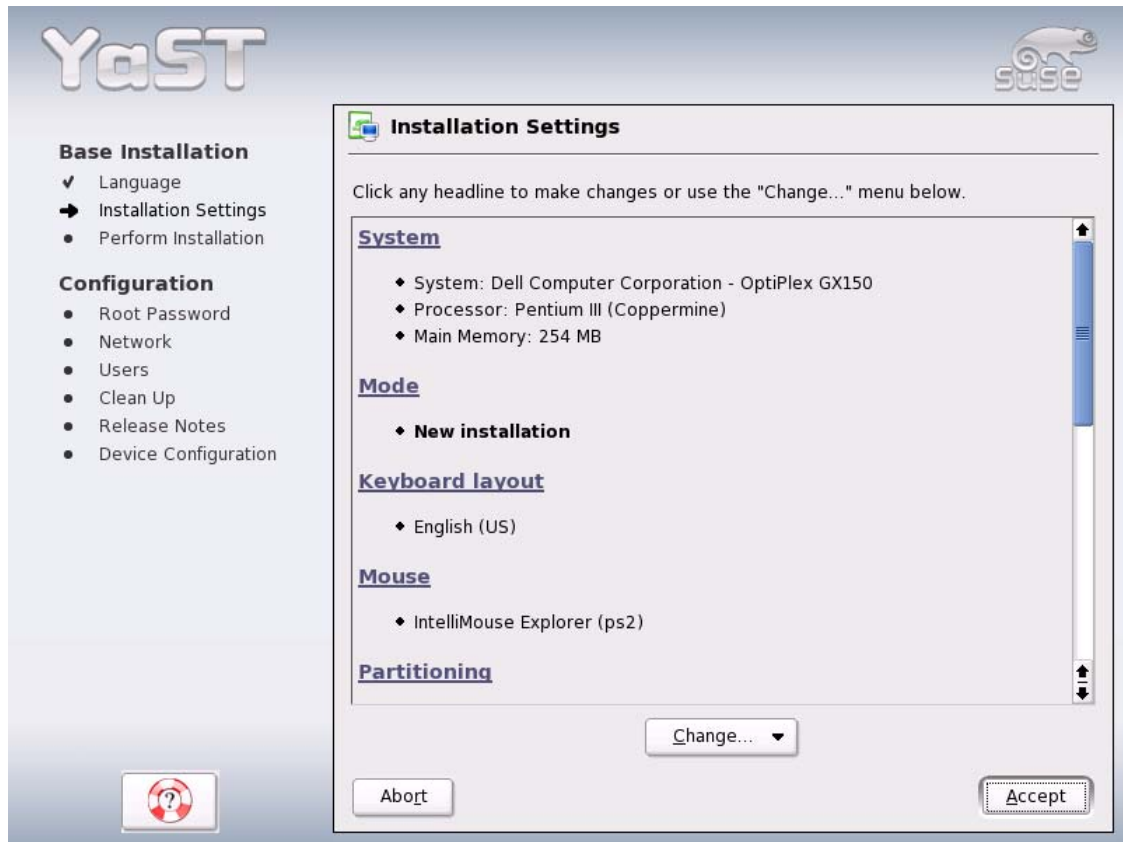
Following is a brief explanation of the other options in the Installation Mode screen:

- ◆ *Update an Existing System* updates the currently installed SUSE Linux system with the system on CD. This option is relevant only if SUSE Linux is already installed on the system.
- ◆ *Repair Installed System* attempts to repair the currently installed Linux system with the system on CD. This option is an alternative to the advanced Rescue System option in the boot screen. You can select this option if the installed SUSE Linux system fails to boot. This option is relevant only if SUSE Linux is already installed on the system.
- ◆ *Boot Installed System* boots the currently installed Linux system. This option is relevant only if SUSE Linux is already installed on the system.
- ◆ *Abort Installation* terminates the installation program.

2.5.2 The Installation Settings Screen

The Installation Settings screen shown in [Figure 2-4](#) provides information about the recognized hardware and proposes a number of installation and partitioning options. Click an option headline or click *Change* to configure the associated system parameters.

Figure 2-4 Installation Settings screen



Following is a brief explanation of the options in the Installation Settings screen, with references to sections that provide additional information:

- ◆ The *System* option shows the detected computer type, processor, and main memory. Click this option to perform any of the following tasks:
 - ◆ View additional information about the detected hardware components.
 - ◆ Save the detected hardware list to file or floppy disk.
 - ◆ Add a Peripheral Component Interconnect (PCI) ID to a device driver.

For more information, see [“Detected Hardware Screen” on page 30](#).

- ◆ The *Mode* option is identical to the screen explained in [“Installation Mode” on page 27](#).
- ◆ The *Keyboard Layout* option shows the default keyboard layout that YaST selected based on the language you selected in the Language screen. Click this option to change the default keyboard layout.

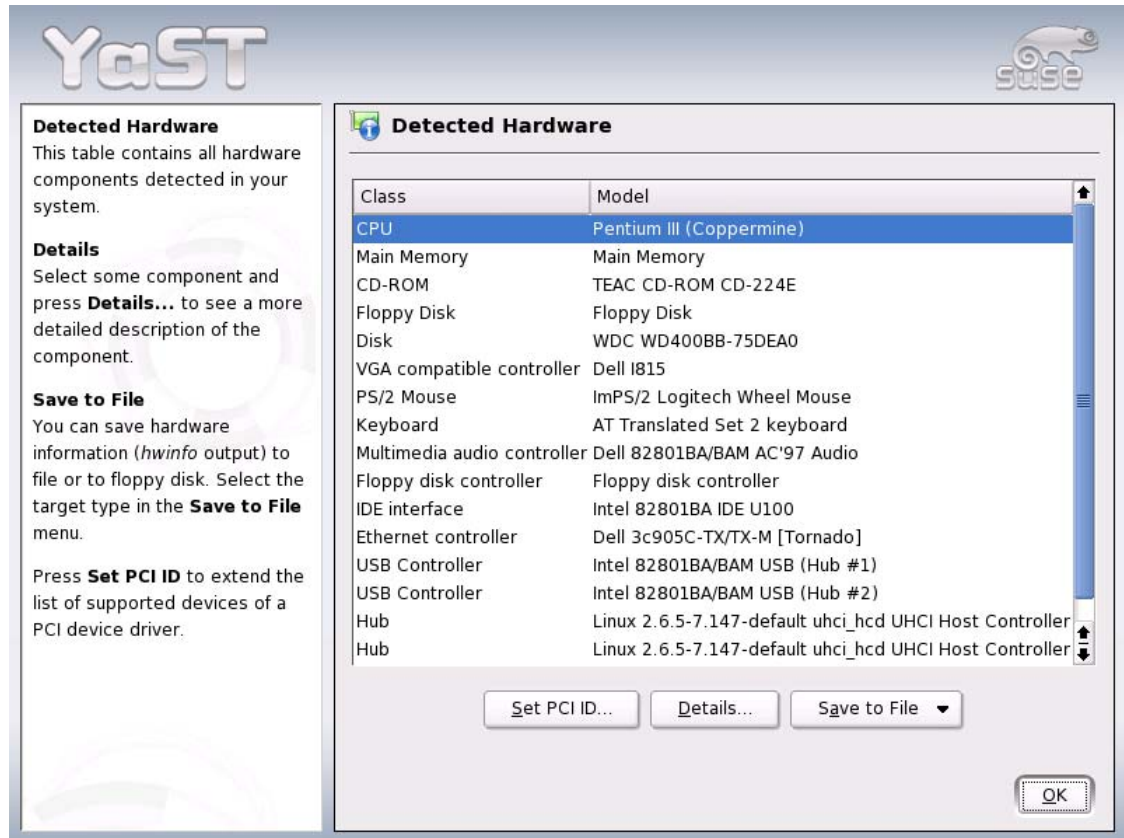
For more information, see [“Keyboard Configuration Screen” on page 31](#).

- ◆ The *Mouse* option shows the default mouse that YaST selected based on the system's detected hardware. Click this option to change the default mouse type.
For more information, see [“Mouse Configuration Screen” on page 32](#).
- ◆ The *Partitioning* option provides a suggested partitioning scheme for the system's hard disks. Click this option to modify the suggested partition formats or to create a custom partition setup.
For more information on how to partition the system for Novell Linux Point of Service, see [“Partitioning Screen” on page 32](#).
- ◆ The *Software* option lists the software packages to be installed on the current system. Click this option to select additional software packages you want to install.
For more information, see [“Software Selection Screen” on page 34](#).
- ◆ The *Booting* option displays the Boot Loader Setup. Click this option to change the boot loader setup.
For more information, see [“Boot Loader Setup Screen” on page 37](#).
- ◆ The *Time Zone* option shows the default time zone that YaST selected based on the language you selected in [“Language Selection” on page 26](#). Click this option to set the system clock and time zone configuration.
For more information, see [“Clock and Time Zone Configuration Screen” on page 38](#).
- ◆ The *Language* option lets you to select the operating system language, similar to the [“Language Selection” on page 26](#). Click this option to change the system language, set the Locale Settings for the user root, and choose UTF-8 encoding.
For more information, see [“Language Selection Screen” on page 38](#).
- ◆ The *Default Runlevel* option displays the current runlevel. Click this option to set a different default runlevel (level 2 or 3).
For more information, see [“Default Runlevel Screen” on page 40](#).

Detected Hardware Screen

Clicking the *System* option in the *Installation Settings* screen opens the Detected Hardware screen shown in [Figure 2-5](#), which provides a detailed listing of your system's detected hardware.

Figure 2-5 Detected Hardware screen



You have the following options in this screen:

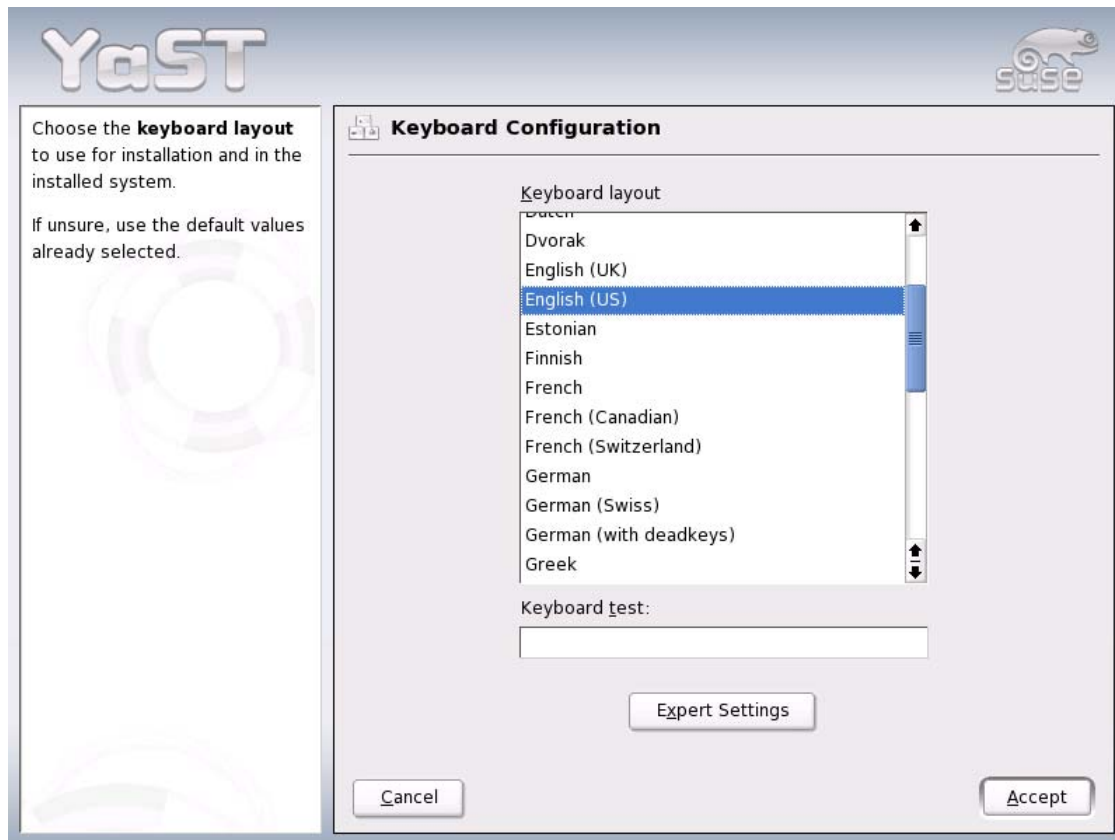
- ◆ Click *PCI ID* to add a Peripheral Component Interconnect (PCI) ID to a device driver.
- ◆ Click *Details* to view additional information about any hardware component.
- ◆ Click *Save to File* to save the hardware list to a file or floppy disk.

NOTE: The floppy drive must be mounted before you can save the file to floppy disk.

Keyboard Configuration Screen

The Keyboard Configuration screen shown in [Figure 2-6](#) allows you to select which keyboard layout (language) you want to use. By default, the layout corresponds to the language selected during installation (see [“Language Selection”](#) on page 26).

Figure 2-6 Keyboard Configuration screen



When you select a keyboard layout, you can type Y, Z, and special characters in the Keyboard Test field to verify the keyboard selection is correct.

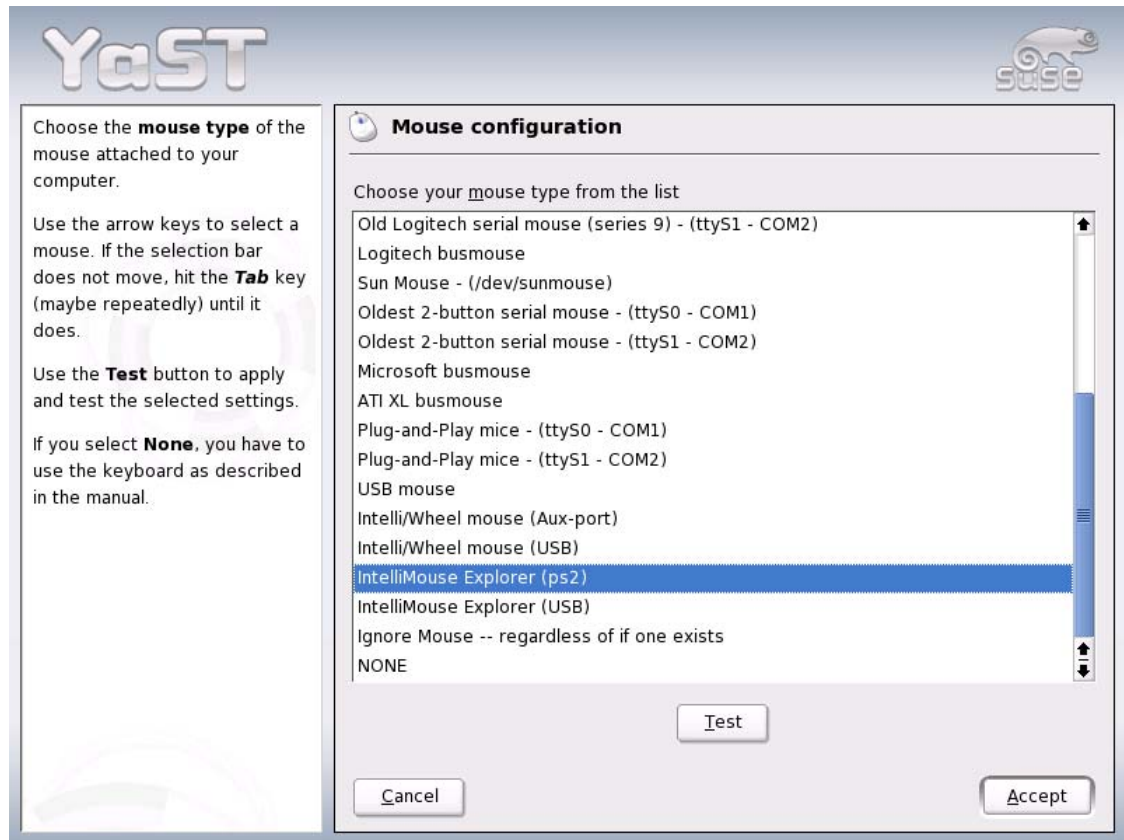
Click *Expert Settings* to define the following:

- ◆ Repeat Rate
- ◆ Delay before Repetition Starts
- ◆ Start-up States for Num Lock, Caps Lock, and Scroll Lock
- ◆ Devices on which the values for Num Lock, Caps Lock, and Scroll Lock should be set
- ◆ Disable Caps Lock

Mouse Configuration Screen

Figure 2-7 shows the Mouse Configuration screen which allows you to select a mouse type.

Figure 2-7 Mouse Configuration screen



If YaST failed to detect your mouse:

- 1 In the Installation Settings screen, press Tab until Mouse is selected.
- 2 Press the Spacebar to open the mouse type list.
- 3 Use Up-arrow and Down-arrow to select a mouse type.
- 4 After selecting a mouse type, press *Alt+T* to test whether the device works correctly.
If the mouse does not behave as expected, use the keyboard to select another type and test again.
- 5 When the correct mouse is selected, click *Accept* to apply the setting and return to the Installation Settings screen.

Partitioning Screen

The Partitioning screen provides suggested partition formats. In most cases, YaST proposes a reasonable partitioning scheme that can be accepted without change. However, you can also modify the suggested partition formats or create a custom partition setup.

When you click *Partitioning*, you can choose one of the following actions:

- ◆ Accept proposal as-is
- ◆ Base partition setup on this proposal
- ◆ Create custom partition setup (this option is recommended only for experienced administrators)

NOTE: YaST cannot select pre-existing partitions for deletion.

For Novell Linux Point of Service servers, all partitions should be formatted with a journaling file system (ext3) with the exception of the swap partition, where swap should be selected. [Table 2-2](#) provides a base guideline of the size requirements for the Novell Linux Point of Service directories.

Table 2-2 *Size guidelines for Novell Linux Point of Service directories*

Server	Partition	Directory	Size
Administration Server			
		/	512 MB+
		/usr	2.5 GB+
		/var	2 GB+ *
		/tmp	1 GB+
		/var/log	2 GB+ *
		/opt/SLES/POS	2 GB+ *
		/opt/SLES/POS/rsync	5 GB+ *
	swap		2x size of RAM, > 0.5 GB
Dedicated Image Building Server			
		/opt/SLES/dist	5 GB+ * (depends on if you put the image source files in this directory)
		/opt/SLES/POS/image/	5 GB+ * (varies depending on the size of your images)
Branch Server			
		/ftpboot/	5 GB+ (varies depending on the size of your images)
High Availability Branch Server			
	drbd		5 GB+ (accommodates all your images plus several configuration files, so the size will vary depending on the size of your images)

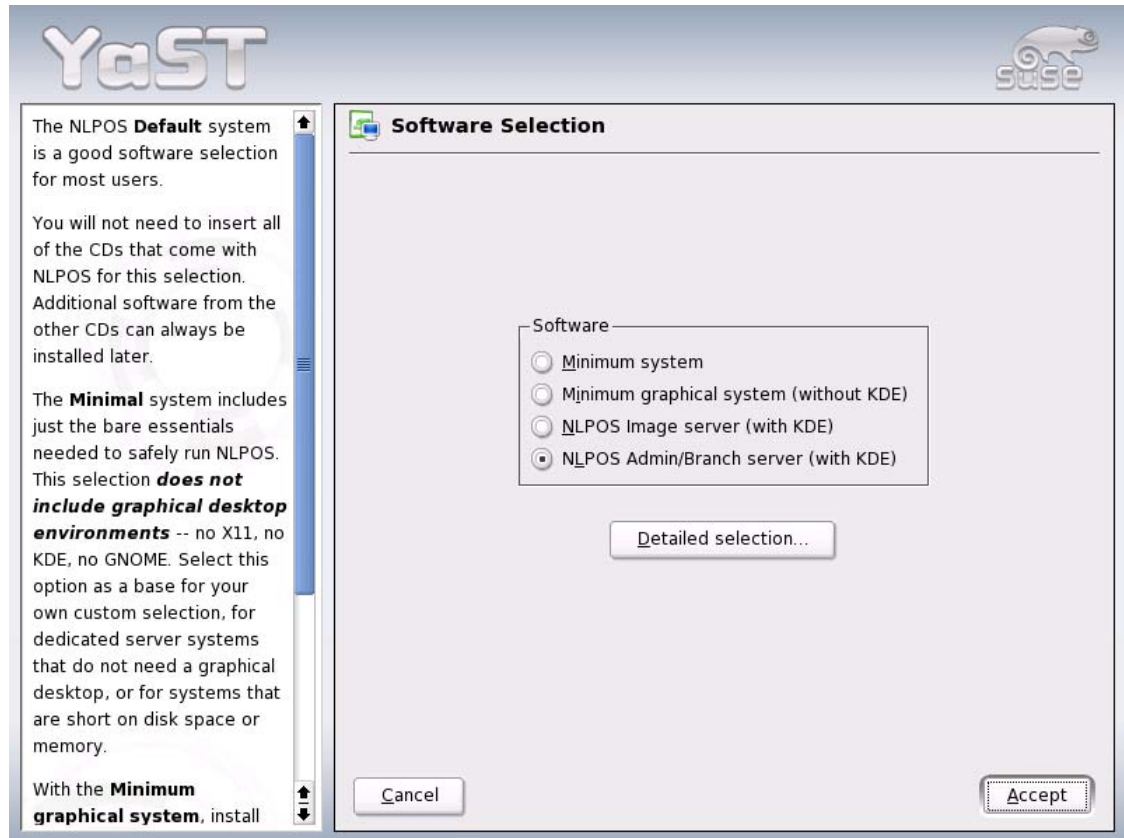
* These directories will grow during production and should be as large as possible.

For more detailed information about partitioning, refer to “Expert Partitioning with YaST” in Chapter 1 of the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

Software Selection Screen

Figure 2-8 shows the Software Selection screen, which lets you select the software packages to be installed on the server.

Figure 2-8 Software Selection screen



The Minimum system includes the core operating system with various services but without any graphical user interface. The machine can only be operated using ASCII consoles. This system type is especially suitable for server scenarios that require little direct user interaction.

The Minimum graphical system (without KDE) includes The X Window System* and a basic window manager. It lets you run programs that have their own graphical user interface. This option is for those who do not want the KDE desktop or for machines with insufficient disk space for a desktop environment.

Depending on what type of Novell Linux Point of Service server you are installing, you will select one of these two options:

- ◆ *NLPOS Image Server (with KDE)* includes the Novell Linux Point of Service image building utility (ImageBuilder) and the image templates. It also includes all the packages required to run the Administration and Branch Servers along with the KDE desktop, most of the KDE programs, and the CUPS print server.
- ◆ *NLPOS Admin/Branch Server (with KDE)* includes all the packages required to run the Administration and Branch Servers. It does not include ImageBuilder or the image templates.

Table 2-3 identifies the software selection options you should select to create each server.

Table 2-3 Software selections for Novell Linux Point of Service servers

Server Type	Software Selection Option
Administration Server with Image Building Tools	NLPOS Image Server
Administration Server without Image Building Tools	NLPOS Admin/Branch Server (with KDE)
Dedicated Image Building Server	NLPOS Image Server
Admin/Branch Server Combination	NLPOS Image Server
Branch Server	NLPOS Admin/Branch Server (with KDE)
High Availability Branch Server	NLPOS Admin/Branch Server (with KDE) plus High-Availability packages

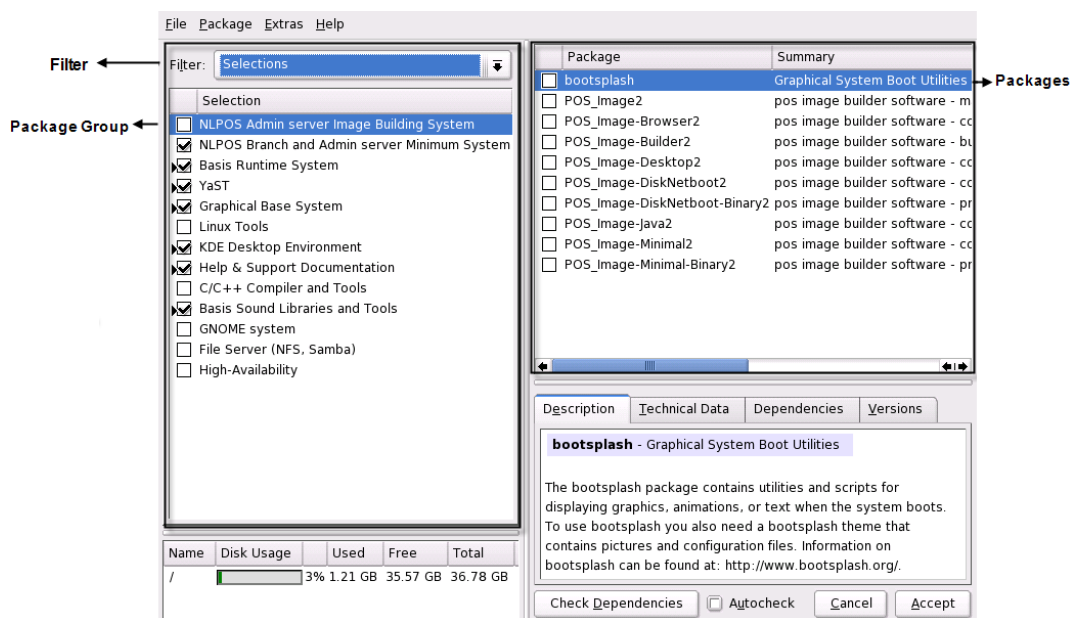
NOTE: You must select the High Availability packages under the Software Selection Details.

To add or remove individual packages from one of the default software selections:

- 1 Select one of the default software selections as a starting point for your software selection.
- 2 Click *Detailed Selection*.

The YaST Package Manager screen appears, as shown in [Figure 2-9](#).

Figure 2-9 YaST Package Manager.



The Filter box is located at the top left under the menu bar. The default filter is Selections, which groups program packages by function, such as Image Building System or Administration and Branch Server. The Package window lists the individual packages included in each package group. The package groups and individual packages that are included in the current software selection are preselected.

Table 2-4 lists the package groups you see when installing Novell Linux Point of Service software.

Table 2-4 Software package groups for Novell Linux Point of Service

Software Selection	Description
NLPOS Admin Server Image Building System	Installs the ImageBuilder scripts (scr and xscr) and the image templates.
NLPOS Branch and Admin Server Minimum System	Installs the services and scripts required to run the Administration and Branch Servers.
Basis Runtime System	Installs base components necessary for the Linux operating system.
YaST	Installs the YaST2 configuration modules. This option is recommended because it provides an easy-to-use configuration program and online update services.
Graphical Base System	Installs the minimal system with X11.
Linux Tools	Installs the Linux operating system tools.
KDE Desktop Environment	Installs the KDE graphical desktop environment.
Help & Support Documentation	Installs the SLES Administration Guide and SUSE Help System.
C/C++ Compiler and Tools	Installs the C/C++ Compiler and tools.
Basis Sound Libraries and Tools	Adds the Advanced Linux Sound Library (ALSA) which provides audio and MIDI functionality.
GNOME system	Installs the GNOME* graphical desktop environment.
File Server (NFS, Samba)	Installs NFS and Samba file services.
High-Availability	Installs drbd and heartbeat services for two-node clustering.

- 3 Click the check boxes to select or deselect the packages you want to install on the server, then click *Accept*.

Appendix A, “Installation RPM Lists,” on page 147 lists the RPMs that are installed on the Administration and Branch Servers by default.

- 4 Click *Check Dependencies* to verify that you have selected all the packages required to run the selected options.

IMPORTANT: If you selected Minimum System instead of Minimum Graphical System as the base system, you are asked to resolve a dependency for the GL graphics subsystem when you add the NLPOS Branch and Admin Server Minimum System package. We recommend that you select the MesaSoft package.

- 5 Click *Accept* to add the selected packages to the installation.

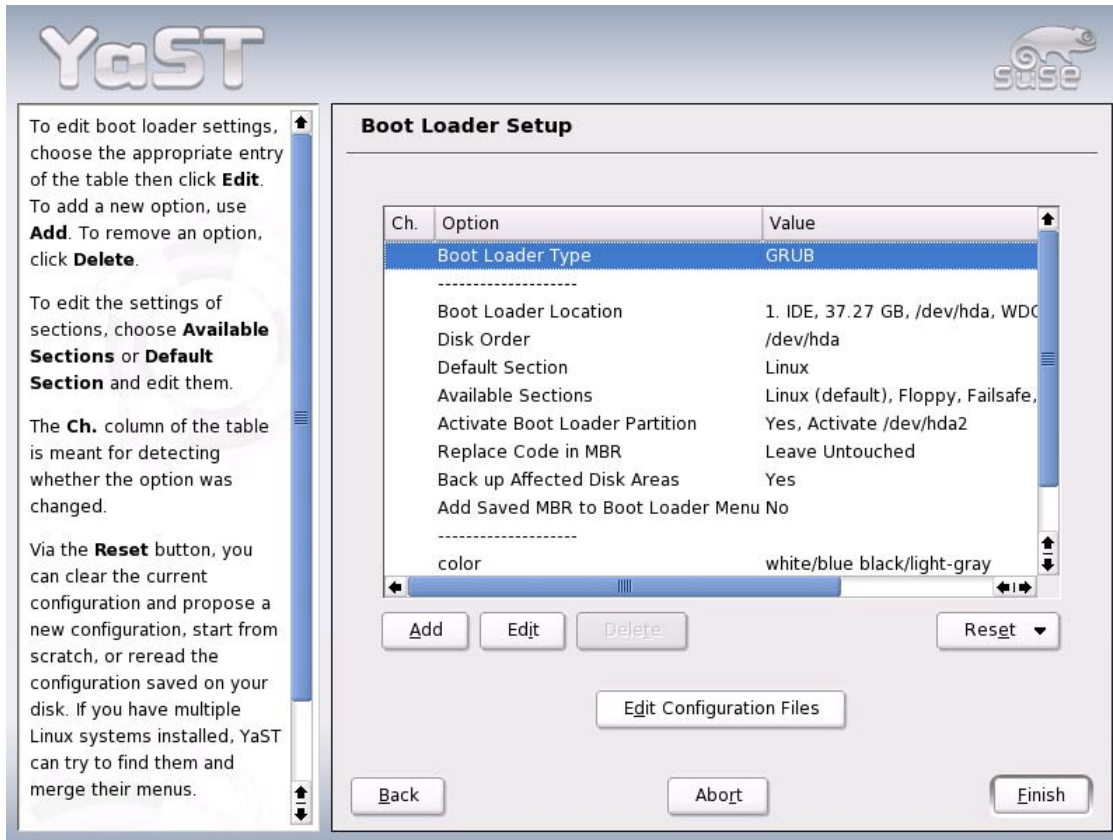
YaST informs you of packages that it has automatically added to the software selection to resolve dependences.

- 6 Click *Continue* to return to the Installation Settings screen.

Boot Loader Setup Screen

Figure 2-10 shows the Boot Loader Setup screen, which provides a suggested boot configuration for your system. In most cases, you can leave these settings unchanged. However, if you need a custom setup, you can modify the proposal for your system.

Figure 2-10 Boot Loader Setup screen



One possibility is to configure the boot mechanism to rely on a special boot floppy. Although this has the disadvantage that it requires the floppy to be in the drive when booting, it leaves an existing boot mechanism untouched. Normally this should not be necessary because YaST can configure the boot loader to boot existing operating systems as well. Another possibility with the configuration is to change the location of the boot mechanism on the hard disk.

For detailed information about creating a custom boot configuration, see “Configuring the Boot Loader with YaST” in Chapter 8 of the *SUSE LINUX Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

Clock and Time Zone Configuration Screen

The Clock and Time Zone Configuration screen shown in [Figure 2-11](#) allows you to set the clock and time zone for the server.

Figure 2-11 Clock and Time Zone Configuration screen



YaST guesses the default time zone based on the language selected during the installation (see [“Language Selection” on page 26](#)). To change the time zone, select the desired region and time zone from the lists provided.

To change the system time and date, click *Change Time or Date*, make the desired setting, and then click *Apply*.

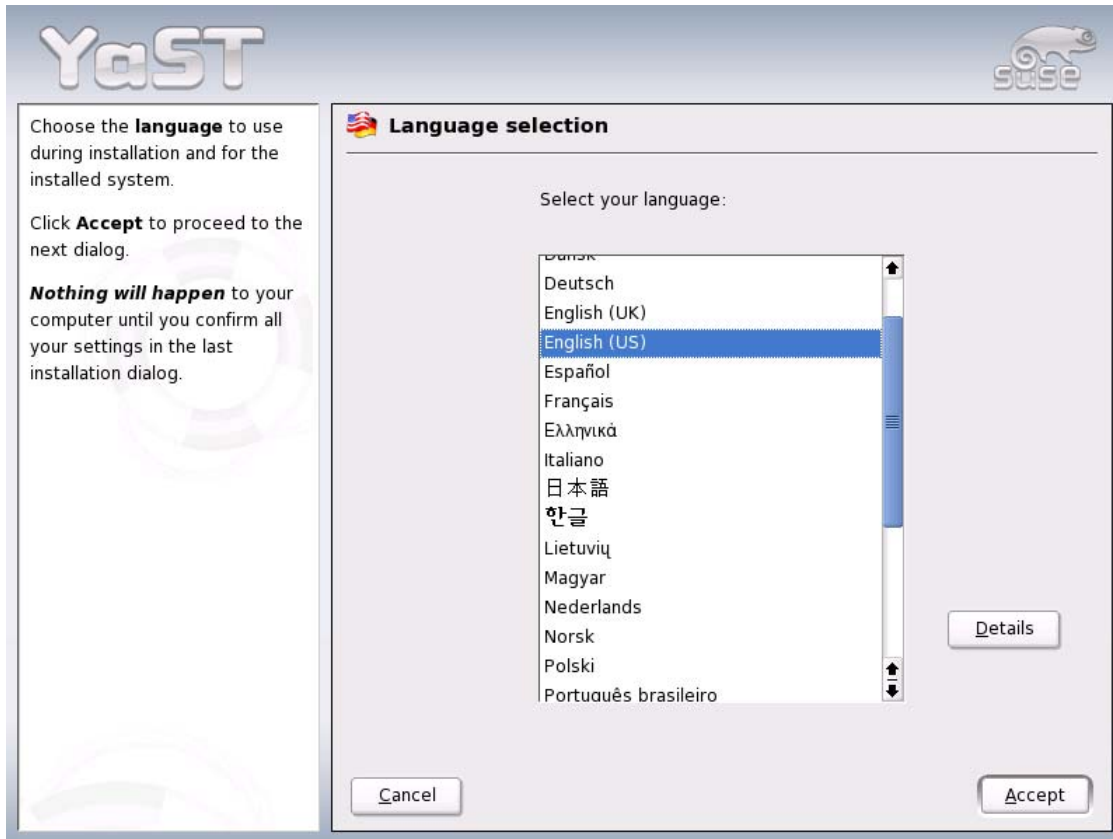
To set the hardware clock to UTC or local time, click the *Hardware clock set to* drop-down menu. In general, you can choose UTC (Universal Time Coordinated) for servers that have only Linux installed. UTC corresponds to GMT (Greenwich Mean Time) and allows Linux to switch from standard time to daylight saving time and back automatically. Choose Local Time for servers that have other operating systems installed. When finished, click *Accept*.

Language Selection Screen

The Language Selection screen shown in [Figure 2-12](#) allows you to change the language on the current system. The language selected in YaST applies to the entire system, including YaST and the desktop environment (KDE or GNOME). You can also click *Details* to set the locale setting for the root user and to specify whether or not to use UTF-8 encoding.

NOTE: Currently, Novell Linux Point of Service is available only in English; therefore, the language selection does not affect the Novell Linux Point of Service scripts or utilities.

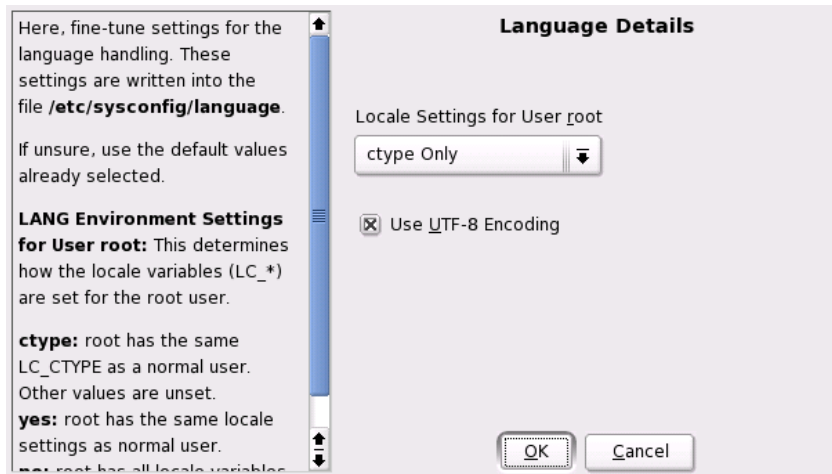
Figure 2-12 Language Selection screen.



IMPORTANT: If you change the Language setting after installing Novell Linux Point of Service, you must copy over the RPMs required to support the desktop (KDE or GNOME) you are running on the Administration or Branch Server and modify the system language file. For more information, see [Section B.1, “Changing the Language Selection,”](#) on page 151.

Click *Details* to view the Language Details screen shown in [Figure 2-13](#).

Figure 2-13 Language Details screen



Click the *Locale Settings for User root* drop-down menu to select the desired setting.

NOTE: The value of the LC_CTYPE variable in the `/etc/sysconfig/language` file is adopted for the user root. This variable sets the localization for language-specific function calls. If the value is set to Yes, the user root has the same language settings as the local user. If the value is set to No, the language settings for the user root are not affected by the language selection.

Click the *Use UTF-8 Encoding* option if you want this server to use UTF-8 encoding for multi-national language support.

When finished, click *OK*.

Default Runlevel Screen

[Figure 2-14](#) shows the Set Default Runlevel screen, which lets you set the runlevel to be used when the server is booted.

Figure 2-14 Set Default Runlevel screen



Usually you select the standard runlevel 5, which offers multiuser mode, network access, and the graphical user interface (X Window System). If you encounter problems with a particular service (X or network), you can boot the system to a lower runlevel to repair the service. You can select from the following options:

- ◆ 2: Local multiuser without remote network
- ◆ 3: Full multiuser with network

WARNING: Incorrect settings for runlevels and system services can render your system useless. To retain the operability of your system, consider the possible consequences before modifying any of these settings.

Click *OK* to apply your setting.

2.5.3 The YaST Configuration Phase

After you have accepted your selections in the Installation Settings screen, YaST proceeds with the Base Installation which includes partitioning the hard drive, setting the system language, applying the installation settings, and copying the files from the NLPOS and SLES 9 CDs to disk.

The system then reboots and YaST starts again for the Configuration portion of the installation.

Root Password Screen

The Root Password screen shown in [Figure 2-15](#) prompts you to enter the password for the root user. For verification purposes, the password must be entered twice.

WARNING: After the root password is entered, it cannot be retrieved. Therefore, we recommend you make a record of the root password and store it in a secure location.

Figure 2-15 Root Password screen

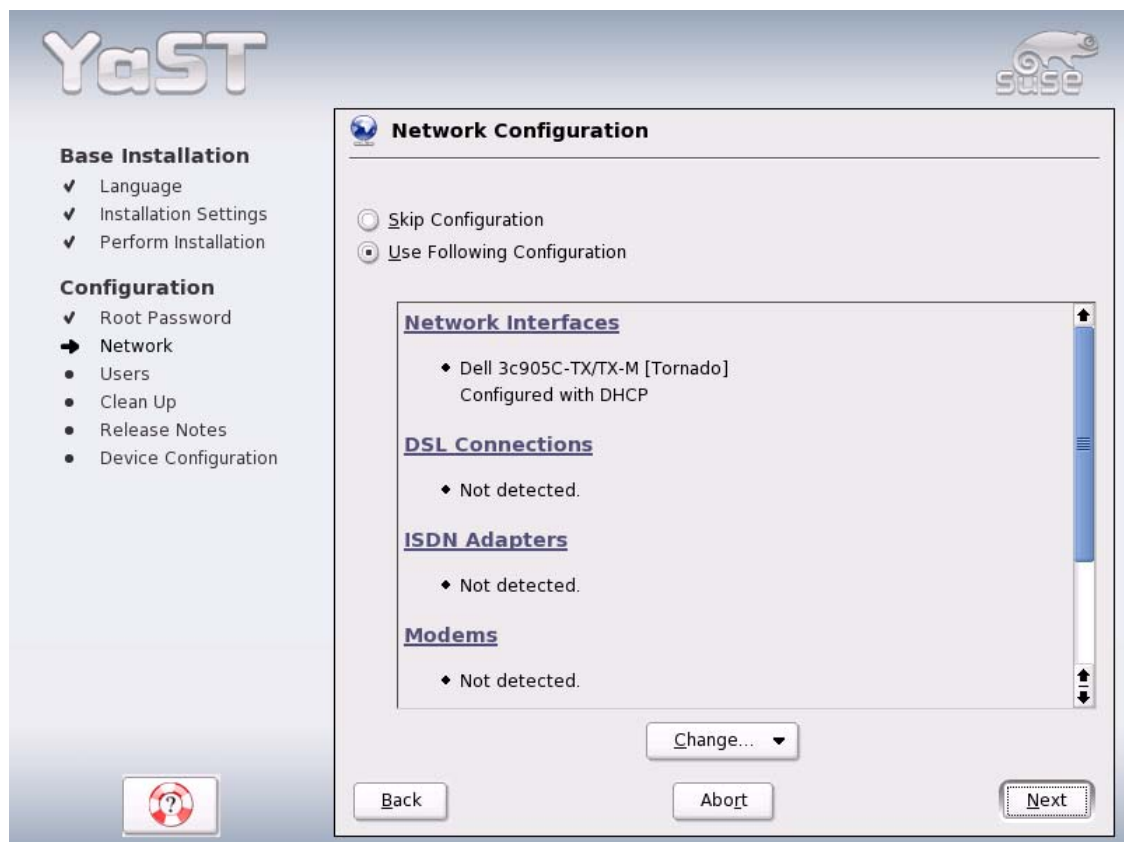


The name of the superuser, or administrator of the system, is root. Unlike regular users, which may or may not have permission to do certain things on the system, root has unlimited power to do anything: change the system configuration, install programs, and set up new hardware. If users forget their passwords or have other problems with the system, root can help. The root account should only be used for system administration, maintenance, and repair. Logging in as root for daily work is not recommended because a single mistake could lead to the irretrievable loss of many system files.

Network Configuration Screen

Figure 2-16 shows the Network Configuration screen where you can click the headlines to configure your network settings.

Figure 2-16 Network Configuration screen



Following is a brief explanation of each option in the Network Configuration screen:

- ◆ Click *Network Interfaces* to configure the Network Interface Cards (NICs).
For more information, see “[Network Interfaces](#)” on page 43.
- ◆ Click *DSL Connections* to configure a DSL connection if this server uses one to connect to other servers in your Point of Service network.

For detailed information on this procedure, see “DSL” in Chapter 21 of the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

- ◆ Click *ISDN Adapters* to configure an ISDN connection if this server uses one to connect to other servers in your Point of Service network.

For detailed information on this procedure, see “ISDN” in Chapter 21 of the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>)

- ◆ The *Modems* option is not applicable to Novell Linux Point of Service servers.
- ◆ Click *Proxy* if your system uses an Internet connection with a Proxy server to connect to other servers in your Point of Service network.

For more information, see “Proxy” on page 50.

- ◆ Click *VNC Remote Administrator* if you want to have remote administrative access to the current server.

For more information, see “VNC Remote Administration” on page 51.

Network Interfaces

In most instances, YaST correctly detects the server NICs. However, if it does not detect a NIC, or if you want to modify a NIC configuration, you can manually add and configure server NICs.

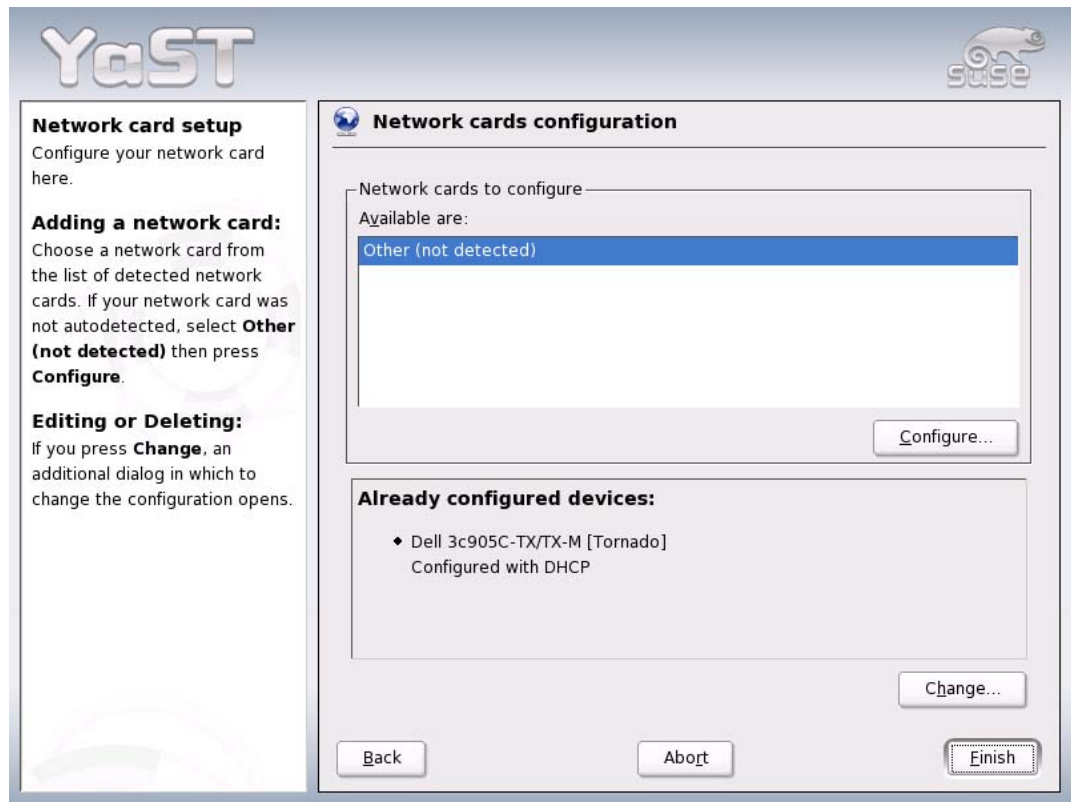
NOTE: Branch Servers require a minimum of two NICs, and in the case of High Availability Branch Servers, you will need four NICs. For more information, see Chapter 6, “Setting Up a Branch Server,” on page 71 and Chapter 7, “Setting Up High Availability Branch Servers,” on page 81.

To manually configure a NIC:

- 1 Click *Network Interfaces* in the Network Configuration screen.

The Network Cards Configuration screen (Figure 2-17) displays the currently configured devices.

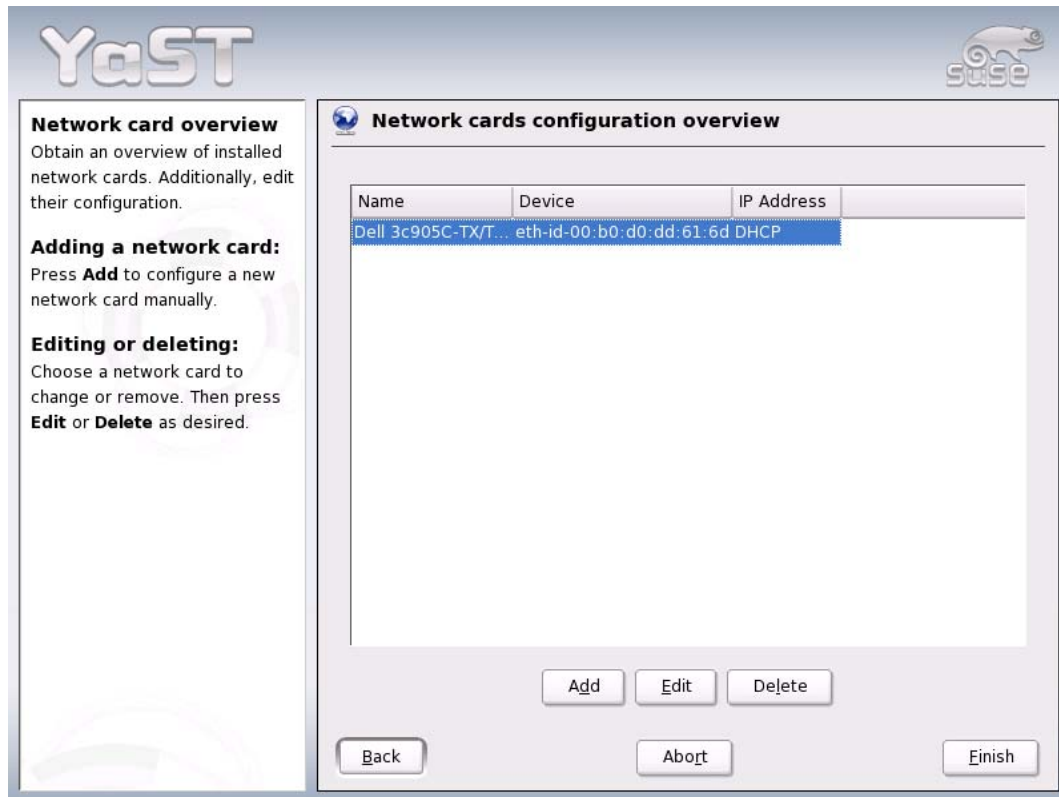
Figure 2-17 Network Cards Configuration screen



2 Click *Change* to manually configure a NIC.

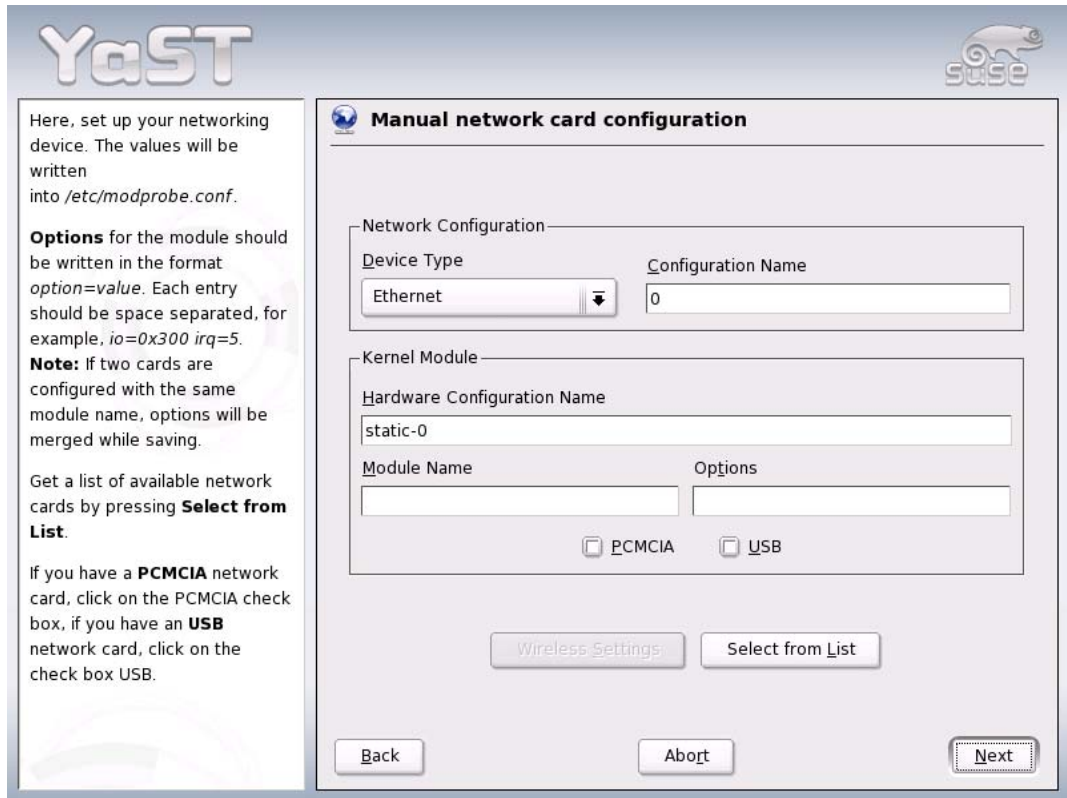
- 3 In the Network Card Configuration Overview screen (Figure 2-18), click *Add* to create a new NIC configuration.

Figure 2-18 Network Card Configuration Overview screen



4 In the Manual Network Card Configuration screen (Figure 2-19), configure the network card.

Figure 2-19 Manual Network Card Configuration screen



Following is a brief description of each option in the Manual Network Card Configuration screen. The network card configuration values are written to `/etc/modprobe.conf`.

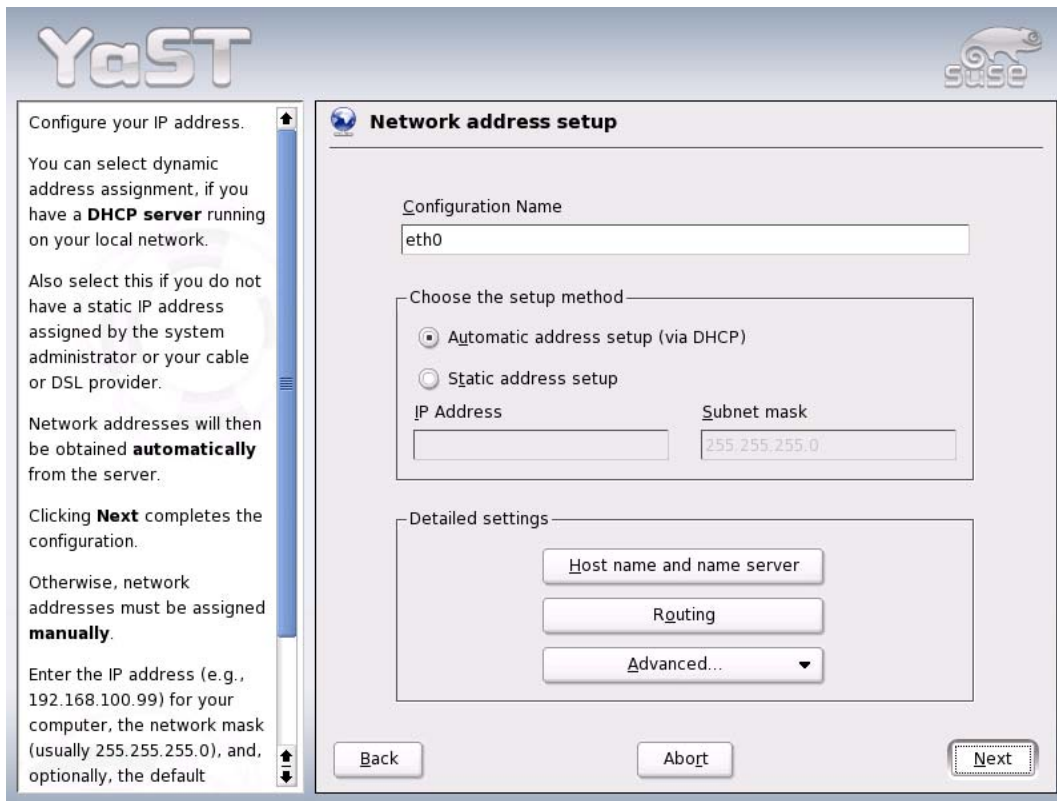
- ◆ *Device Type* is the type of NIC you are configuring. Available device types include the following:
 - ◆ ARCnet
 - ◆ Dummy
 - ◆ Ethernet
 - ◆ FDDI
 - ◆ Myrinet
 - ◆ Token Ring
 - ◆ USB
 - ◆ Wireless
- ◆ *Configuration Name* is the number to be appended to the default name for the current network card (for example, eth for Ethernet cards). Standard convention dictates that numbering starts with zero (0).
- ◆ *Hardware Configuration Name* is a user-defined name for the current configuration profile.
- ◆ *Module Name* is the network card driver. If two cards are configured with the same module name, options are merged while saving.

- ◆ *Options* is where you specify the network card driver options. Options should be written in the format *option=value*. Each entry should be space separated. For example, `io=0x300 irq=5`.
- ◆ Select *PCMCIA* if the NIC is a PCMCIA card. The PCMCIA card configuration database file, `/etc/pcmcia/config`, is created during installation.
- ◆ Select *USB* if the NIC is a USB card. The required USB drivers are installed during installation.
- ◆ Click *Wireless Settings* to configure the settings for a wireless network card.
- ◆ Click *Select from List* to get a list of available network cards.

When finished, click *Next*.

- 5 The Network Address Setup screen (Figure 2-20) displays the configuration name of the card you are configuring (for example, `eth0`).

Figure 2-20 Network Address Setup screen

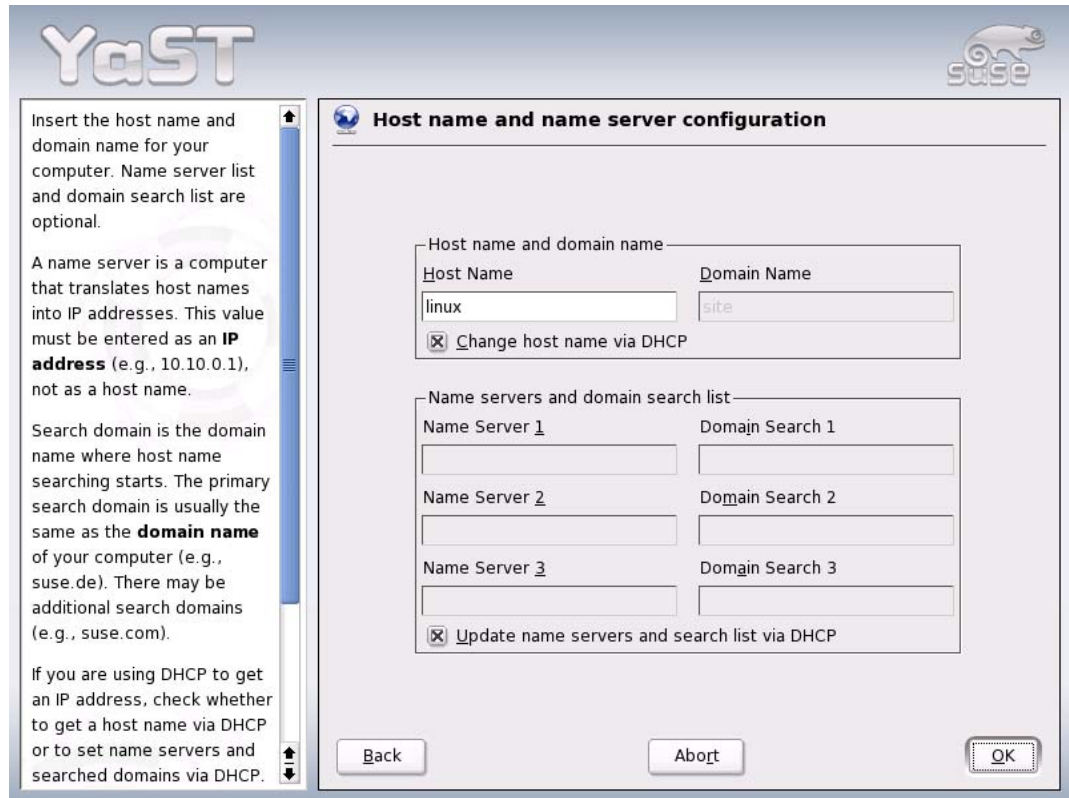


Choose the setup method for the IP address:

- ◆ Select *Automatic Address Setup (via DHCP)* if you have a DHCP server running on your local network and you want the IP address to be automatically obtained from the DHCP server.
 - ◆ Select *Static Address Setup* if you have a valid static IP address for the network card. Specify the address and the subnet mask (such as `255.255.255.0`) in the appropriate fields.
- 6 Click *Host Name and Name Server* in the Detailed Settings section to define the host and domain names for the server.

Figure 2-21 shows the Host Name and Name Server Configuration screen.

Figure 2-21 Host Name and Name Server Configuration screen



- 6a Specify the hostname; for example, `admnsrv` for the Administration Server and `bs1` for a Branch Server.

IMPORTANT: The hostname defined for a Branch Server during installation must match the Common Name (cn) assigned to the corresponding `scBranchServer` object in the LDAP directory. For example, if you enter the hostname of `bs1` when installing a Branch Server, make sure you specify `bs1` as the `--cn` attribute for the Branch Server's object in LDAP. For more information on creating Branch Server objects in LDAP, see [Section 6.2.4, "Adding an `scBranchServer` Object," on page 74.](#)

- 6b Deselect *Change host name via DHCP* and specify the domain name, such as `mycorp.com`.
Use a domain name that fits within your organization's DNS naming system. The server's DNS name is formed by adding the domain name to the host name; for example, `bs1.mycorp.com`.
- 6c (Optional) Specify the DNS name servers and domain search lists.
- 6d When finished, click *OK*.
- 7 Click *Routing* in the Detailed Settings section to define the default gateway.

Figure 2-22 shows the Routing Configuration screen.

Figure 2-22 Routing Configuration screen



7a Select the Default Gateway from the drop-down list or type the IP address of a known gateway.

7b Select *Expert Configuration* to manually define the routing table.

The route's destination is in the first column. This column can contain the IP address of a network or host or, in the case of reachable name servers, the fully qualified network or hostname.

The second column contains the default gateway or a gateway through which a host or a network can be accessed.

The third column contains the netmask for networks or hosts behind a gateway. For example, the mask is 255.255.255.255 for a host behind a gateway.

The last column is only relevant for networks connected to the local host such as loopback, ethernet, ISDN, PPP, and dummy device. The device name must be entered here.

NOTE: The routing table is set up in Linux using the configuration files `/etc/sysconfig/network/routes` and `/etc/sysconfig/network/ifroute-*`. All the static routes required by the various system tasks are located in the `routes` file; that is, routes to a host, routes to a host via a gateway, and routes to a network.

7c Select *Enable IP Forwarding* if the system is a router.

7d When finished, click *OK*.

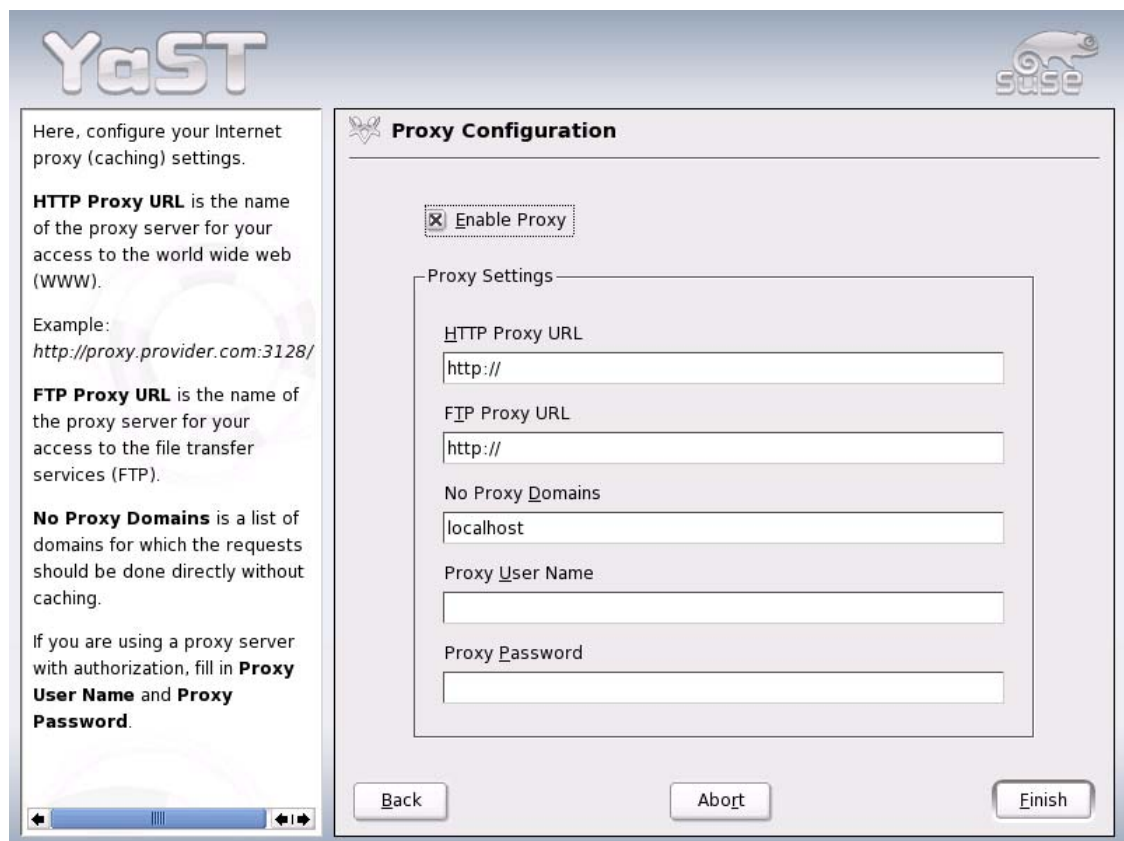
- 8 (Optional) Click *Advanced* in the Network Address Setup screen to define Hardware Details (NIC configuration), DHCP Client Options, Detailed Settings (Maximum Transfer Unit and Device Activation), and Virtual Aliases. When you have finished defining these options, click *OK*.
- 9 After you have completed the NIC configuration in the Network Address Setup screen, click *Next* then *Finish* to return to the Network Configuration screen.

Proxy

If your system uses an Internet connection with a proxy server to connect to Branch Servers in your Point of Service network, click *Proxy* in the Network Configuration screen to define your Internet proxy settings.

Figure 2-23 shows the Proxy Configuration screen.

Figure 2-23 Proxy Configuration screen



To define your Internet proxy settings:

- 1 In the Proxy Configuration screen, select *Enable Proxy*.
- 2 Configure the proxy settings as follows:
 - ♦ *HTTP Proxy URL* is the name of the proxy server you use to access the World Wide Web. For example, `http://proxy.provider.com:3128/`.
 - ♦ *FTP Proxy URL* is the name of the proxy server you use to access file transfer services (FTP).

- ♦ *No Proxy Domains* is a list of domains for which requests should be directly processed without caching.
- ♦ If you are using a proxy server with authorization, fill in *Proxy User Name* and *Proxy Password*.

3 When finished, click *Finish* to return to the Network Configuration screen.

For more information on proxy server configuration, see “Internet” in the *SUSE LINUX Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

VNC Remote Administration

VNC (virtual network computing) is a client/server solution that allows a remote X server to be managed via a slim and easy-to-use client.

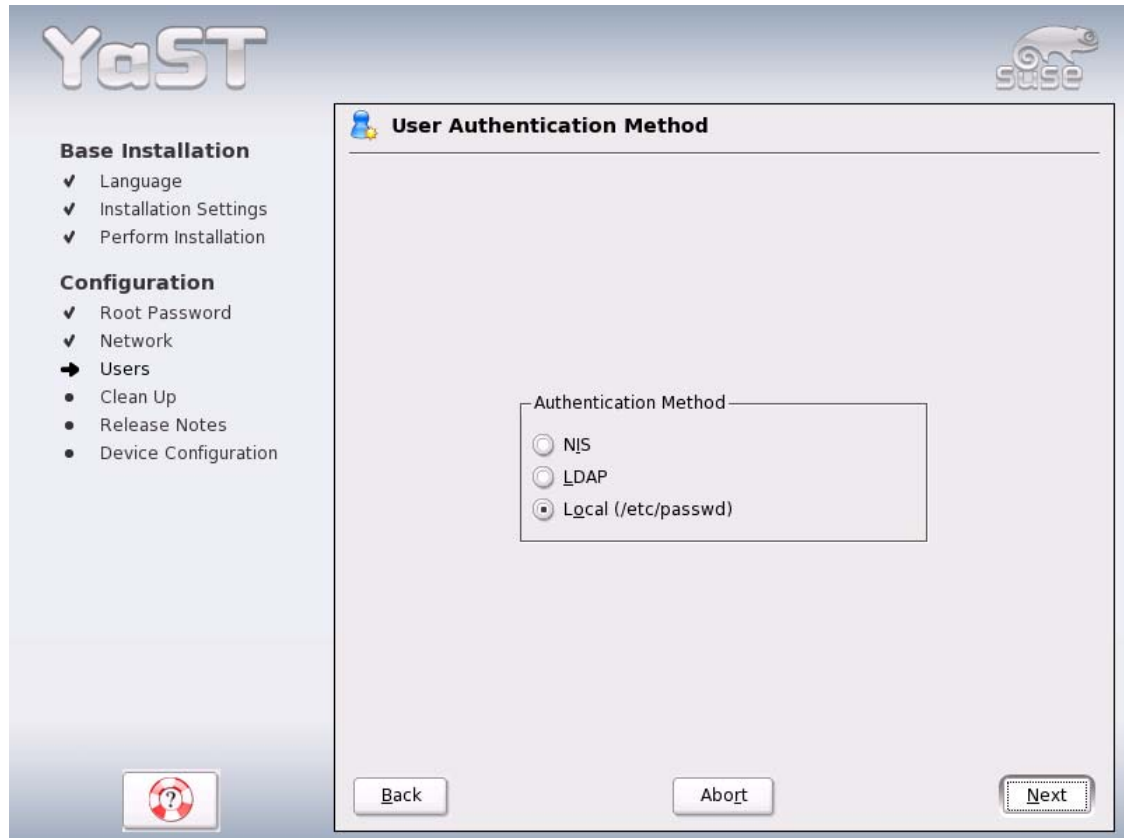
To enable remote VNC administrative access on the server:

- 1** Click *VNC Remote Administrator* in the Network Configuration screen.
- 2** Select *Allow Remote Administration*.
This installs the VNC server on the server.
- 3** Click *Finish* to return to the Network Configuration screen.

User Authentication Method Screen

Figure 2-24 shows the User Authentication Method screen, where you select an authentication method for users.

Figure 2-24 User Authentication Method screen



The options for user authentication method are:

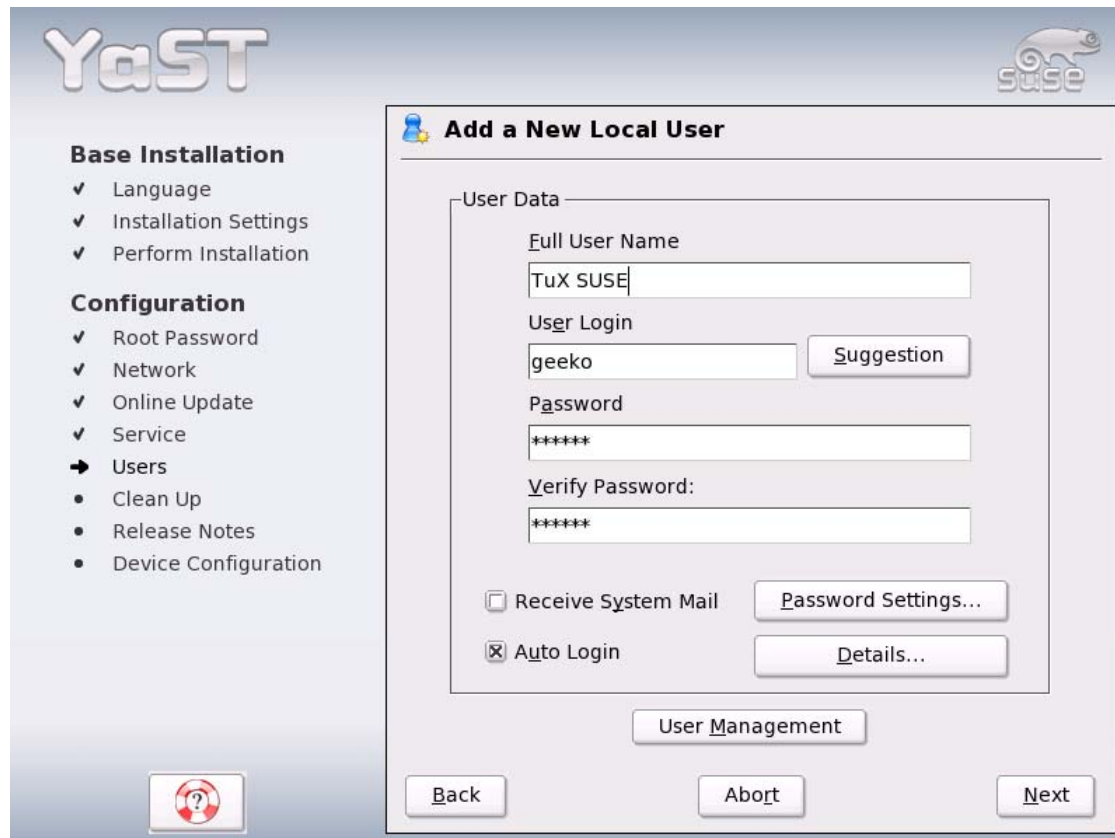
- ◆ *NIS*. User account data is managed centrally by a Network Information Service (NIS) server. For information on managing user accounts through NIS, see “Configuring the Host as a NIS Client” in the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>)
- ◆ *LDAP*. User account data is centrally managed by an LDAP server. For more information on managing user accounts through LDAP, see “LDAP-A Directory Service” in the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>)
- ◆ *Local*. This default setup permits users to log in without a network connection. All data related to local user accounts (name, login, password, etc.) are stored and managed on the server using the `/etc/passwd` file. This authentication method does not support users logging in from remote locations.

If you select this method, continue with “[Creating Local User Accounts](#)” on page 53.

Creating Local User Accounts

If you selected the Local user authentication method, YaST displays the Add a New Local User screen (Figure 2-25) for you to create local user accounts on the server.

Figure 2-25 Add a New Local User screen



It is recommended that you do not use the root user account to manage the server. Therefore, you should create a local user with root rights.

If you do not want to create a local administrative user account at this time, click *Next*. When warned that the user options are blank, answer Yes to continue the installation. Skip to “[SUSE Linux Release Notes](#)” on page 54.

Enter the user data according to these guidelines:

- ◆ *Full User Name* is the user’s first and last name.
- ◆ *User Login* is the name the user will use to log in. Click *Suggestion* for the system to automatically generate a user login name.
- ◆ You are required to enter the user’s password twice for confirmation.

To provide effective security, a password should be between five and eight characters long. The maximum length for a password is 128 characters. However, if no special security modules are loaded, only the first eight characters are used to discern the password. Passwords are case-sensitive. Special characters like umlauts are not allowed. Other special characters (7-bit ASCII) and the digits 0 to 9 are allowed.

- ◆ Select *Receive System Mail* if you want the user to receive messages created by the system services.

By default, system messages are sent to user root. This option allows other administrative accounts to receive system messages.

- ◆ Select *Auto Login* to automatically log the current user into the system when it starts. This is useful if the computer is operated by only one user. For the automatic login to work, the option must be explicitly enabled. (This option is available only if KDE is used as the default desktop environment.)

WARNING: With the automatic login enabled, the system boots straight into your desktop with no authentication. Therefore, if you store sensitive data on your system, you should not enable this option if the computer can be accessed by other users.

- ◆ Select *Password Settings* to configure the user's password expiration settings.
- ◆ Select *Details* to define user profile options such as the user ID, home directory, login shell, and default group.
- ◆ Select *User Management* to select the User and Group Administration console. From this screen you can add, modify, or delete users and groups, set filters, and configure expert options such as Defaults for New Users, Password Encryption, Authentication and User Sources, Login Settings, and filter options.

SUSE Linux Release Notes

Read the Release Notes for the version of SUSE Linux Enterprise Server you have installed, then click *Next*.

Hardware Configuration Screen

Figure 2-26 shows the Hardware Configuration screen, which provides configuration information about the server's graphics cards, printers, and sound configuration. For the most part, YaST

automatically detects and configures these hardware devices. However, you can click a headline to review or modify a device configuration.

Figure 2-26 Hardware Configuration screen



Following is a brief explanation of the options in the Installation Settings screen, with references to more complete documentation:

- ◆ Click *Graphics Cards* to modify the default graphics card configuration. Although the display settings automatically configured by YaST should be generally acceptable, you can customize the resolution, color depth, and other graphics features.

For more information on Graphics Card configuration, see “Graphics Card and Monitor (SaX2)” in Chapter 2 of the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

- ◆ Click *Printers* to configure the server’s available printers.

For more information on printer configuration, see “Printer” in Chapter 2 of the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

- ◆ Click *Sound* to modify the default sound card configuration.

For more information on sound card configuration, see “Sound” in Chapter 2 of the *SUSE Linux Enterprise Server Installation and Administration Guide* (<http://www.novell.com/documentation/sles9/treetitl.html>).

Migrating from SLRS 8 to Novell Linux Point of Service 9

3

If you are currently using SUSE® Linux Retail Solution 8 (SLRS 8), you can migrate your existing LDAP directory to Novell® Linux Point of Service 9. Furthermore, if you want to continue using your SLRS 8 images, you can migrate the images to your Novell Linux Point of Service 9 Administration Server so they can be distributed to your Point of Service terminals.

NOTE: This migration procedure does not migrate Novell eDirectory™ or IBM* Directory. You must use the respective directory tools to migrate eDirectory or IBM Directory.

To migrate from SLRS 8 to Novell Linux Point of Service 9:

- 1 Execute the following commands to export the SLRS 8 LDAP directory to an LDIF file:

```
rclldap stop
slapcat -l ldif_file
```

- 2 Save the LDIF file to a location off the box.

- 3 (Optional) If you want to continue using your SLRS 8 images, do the following:

- 3a** Back up the `/opt/SLES/POS/rsync/` directories to a location off the box.

- ♦ `/opt/SLES/POS/rsync/image/`

You must copy both the client images and their MD5 checksums.

- ♦ `/opt/SLES/POS/rsync/boot/`

You must back up the DiskNetboot images (`initrd` and `linux`) to provide the Linux kernel required to boot the SLRS 8 images.

- ♦ `/opt/SLES/POS/rsync/config/`

You must copy all the configuration files required for existing `scConfigFileSyncTemplate` objects in the LDAP directory.

- 3b** Rename the SLRS 8 `initrd.gz` file to `initrd-slrs8.gz`.

- 3c** Rename the SLRS 8 `linux` file to `k_pos_ibm`.

NOTE: Leave the `pxelinux.0` and `pxelinux.cfg` files as they are. They are not needed for the migration.

- 4 (Optional) Maintain an SLRS 8 image server from your SLRS 8 system. This is required only if you want to continue to generate SLRS 8 images.

- 5 Install the Novell Linux Point of Service 9 Administration Server.

For specific instructions, see [Chapter 4, “Setting Up the Administration Server,” on page 59](#).

- 6 Copy the LDIF file you exported in [Step 1](#) to a location where the Novell Linux Point of Service 9 Administration Server can see it (for example, a floppy drive, pen drive, or NFS server).

- 7 Run the following command to import the LDIF file:

```
posInitLdap.sh --ldif=path_to_ldif_file
```

This command performs the following functions:

- ♦ Imports the SLRS 8 LDAP Directory.
- ♦ Creates the SLRS 8 scDistributionContainer object.
- ♦ Moves all existing scPosImage objects under the SLRS 8 scDistributionContainer object.
- ♦ Updates all existing scCashRegister objects to point to scPOSImage objects in the SLRS 8 Distribution Container.
- ♦ Changes the `initrd.gz` property in the scCashRegister objects to `initrd-slrs8.gz`.

8 Copy the files you backed up in [Step 3a](#) to the corresponding RSYNC directories on the Novell Linux Point of Service 9 Administration Server.

9 Use the following command to copy the `initrd` file to the `/opt/SLES/POS/rsync/boot/` directory as `initrd.gz` (type the command all on one line):

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.gz  
/opt/SLES/POS/rsync/boot/initrd.gz
```

IMPORTANT: The Novell Linux Point of Service 9 `initrd` file is required to boot SLRS8 images.

10 Use the following command to copy the linux kernel file to the `/opt/SLES/POS/rsync/boot/` directory as `linux` (type the command all on one line):

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-  
date.kernel.kernel_version /opt/SLES/POS/rsync/boot/linux
```

IMPORTANT: The Novell Linux Point of Service 9 kernel file is required to boot SLRS8 images.

11 Install the Branch Servers.

For specific instructions, see [Chapter 6, “Setting Up a Branch Server,” on page 71](#).

12 Run `possyncimages.pl` to pull the SLRS8 and Novell Linux Point of Service 9 images down to the Branch Servers.

IMPORTANT: The Novell Linux Point of Service 9 kernel and `initrd` files are required to boot SLRS8 images; therefore, you must run `possyncimages.pl` to download `linux` and `initrd.gz` from the `/rsync/boot/` directory on the Administration Server to the `/tftpboot/boot/` directory on each Branch Server before you can boot SLRS 8 images on your Point of Service terminals.

13 Run either `posldap2crconfig.pl --dumpall` or `posAdmin --updateconfig` to update the hardware configuration information on the Branch Server.

These commands regenerate the hardware configuration and `config.MAC_address` files for all Point of Service terminals found in LDAP. For more information on the `posldap2crconfig.pl` command, see [“posldap2crconfig.pl”](#) in the *Novell Linux Point of Service 9 Administration Guide*. For information on the `posAdmin --updateconfig` command, see [“Updating config.MAC_address and Hardware Configuration Files”](#) in the *Novell Linux Point of Service 9 Administration Guide*.

Setting Up the Administration Server

4

The Administration Server is the central administration point for Novell® Linux Point of Service. All system information (system structure, the configuration and deployment method for each Branch Server and Point of Service terminal, image information, and so forth) is stored in an LDAP directory on the Administration Server. The Administration Server is also the central distribution point for the images required to boot and configure Point of Service terminals and can run the utilities required to build those images.

NOTE: The utilities required to build Point of Service images can be installed with the Administration Server or you can install them on a dedicated image building server. For more information on creating a dedicated image building server, see [Chapter 5, “Setting Up a Dedicated Image Building Server,”](#) on page 67.

This section presents the procedures required to set up an Administration Server, either with or without the Image Builder software:

- ♦ [“Meeting System Requirements”](#) on page 59
- ♦ [“Installing the Administration Server”](#) on page 59
- ♦ [“Initializing the LDAP Directory”](#) on page 61
- ♦ [“Copying the Default Boot Images”](#) on page 63
- ♦ [“Creating Point of Service Images”](#) on page 64
- ♦ [“Copying the Client Image Files”](#) on page 64

4.1 Meeting System Requirements

The following list identifies the system requirements for an Administration Server:

- ♦ One server with an x86 processor
- ♦ A minimum of 4 GB hard disk space; recommended 15 GB

NOTE: This will vary depending on the size of your images.

- ♦ A minimum of 256 MB RAM; recommended 512 MB - 3 GB (at least 256 MB per CPU)
- ♦ One network card

4.2 Installing the Administration Server

This section describes how to install the Novell Linux Point of Service software and set up an Administration Server.

4.2.1 Installing the Novell Linux Point of Service Software

To install the Novell Linux Point of Service software on the Administration Server:

- 1 Start the YaST utility by inserting *Novell Linux Point of Service 9 CD 1* into the drive and rebooting the computer.
- 2 At the SuSE boot screen, select *Installation*.
- 3 Go through the rest of the initial installation screens as outlined in [Section 2.5.1, “Starting the YaST Utility,” on page 23](#).
- 4 When you get to the Installation Settings screen, make your settings as outlined in [Section 2.5.2, “The Installation Settings Screen,” on page 28](#).

For the *Software* option, choose the software selection for the type of Administration Server you are installing:

- ♦ If you want to install a standalone Administration Server that won't be used to build Point of Service images, select the NLPOS Admin/Branch Server software selection.
This selection installs all Administration and Branch Server packages to the server, but none of the Image Builder packages.
- ♦ If you want to use the Administration Server to build Point of Service images, select the NLPOS Image Server software selection.
This selection installs all Administration and Branch Server packages to the server, plus the Image Builder components listed in [Table 4-1](#).

Table 4-1 *Image Builder components*

Description	Location
ImageBuilder scripts (scr and xscr)	/usr/bin/
Image Description Trees	/opt/SLES/POS/system/image_name-version/
Distribution.xml template	/opt/SLES/POS/system/templates/
Image Specification Document templates	/opt/SLES/POS/system/templates/support/templates
Default configuration information for kernel drivers	/opt/SLES/POS/system/templates/drivers/
Child Image Specification Documents for client image add-on options	/opt/SLES/POS/system/templates/addons/

- 5 When you have finished making your installation settings, click *Accept*.
- 6 When prompted, answer Yes to start the installation.
YaST partitions the drive, applies the installation settings, and copies the necessary files from NLPOS CD 1 to disk.
- 7 When prompted, insert each requested CD, then click *OK*.
- 8 When it finishes with the basic installation, the system reboots and YaST starts again.

Continue through the screens as outlined in [Section 2.5.3, “The YaST Configuration Phase,” on page 41](#).

- 9 After you have completed the options in the Hardware Configuration screen, click *Next*.
- 10 Remove any CDs from the drive, and then click *Finish* to complete the installation.
The system reboots.
- 11 Log in as root.
You are now ready to initialize the Novell Linux Point of Service LDAP directory.

4.3 Initializing the LDAP Directory

All system information (system structure, the configuration and deployment method for each Branch Server, available client images, and Point of Service terminal types) is stored in an LDAP directory on the Administration Server.

Novell Linux Point of Service can use the following LDAP directories: OpenLDAP, eDirectory™, or IBM Directory Services. The `posInitLdap` script defines the LDAP directory schema and the initial records for OpenLDAP. Likewise, the `posInitEdir` script defines the directory schema and the initial records required for eDirectory.

NOTE: To run the LDAP directory on IBM Directory Services, run `posInitLdap`, then import the `/etc/opt/SLES/POS/template/ldif.pos` file into IBM Tivoli* Directory Server.

The following sections review the procedure required to run `posInitLdap` or `posInitEdir` and verify the LDAP directory.

- ♦ [Section 4.3.1, “Running posInitLdap.sh,” on page 61](#)
- ♦ [Section 4.3.2, “Running posInitEdir.sh,” on page 62](#)
- ♦ [Section 4.3.3, “Verifying the LDAP Directory,” on page 63](#)

4.3.1 Running posInitLdap.sh

The `posInitLdap` script defines the LDAP directory schema and the initial records for OpenLDAP. It cannot add the Novell Linux Point of Service LDAP directory to an existing openLDAP tree; it creates an entirely new LDAP directory tree.

To create the Novell Linux Point of Service LDAP directory for OpenLDAP:

- 1 After you have installed the Novell Linux Point of Service Administration Server, log in as root on the Administration Server.
- 2 Run `posInitLdap.sh`.
- 3 Specify your company name without spaces or special characters.
- 4 Specify your country abbreviation.
Use `de` for Germany, `us` for United States, `uk` for United Kingdom, and so forth.
- 5 Specify the LDAP administrator password.

NOTE: You are assigning the password for the LDAP directory administrator account. The Branch Server uses this account to access the LDAP directory and this account is required to use `posAdmin` to add objects to the LDAP directory.

- 6 Determine if you want to use SSL when the Branch Server connects to the LDAP directory on the Administration Server.
 - ♦ Select *Y* to use an SSL connection when the Branch Server connects to the LDAP Directory.
 - ♦ Select *N* to disable SSL.

`posInitLdap` creates the certificates and keys required to run SSL regardless of whether or not SSL is enabled. This allows you to switch to SSL at a later time if desired.

NOTE: The keys and certificates are located in the `/etc/opt/SLES/POS/keys/` directory on both the Administration and Branch Servers.

- 7 `posInitLdap` provides a summary of the LDAP directory data based on your input. If all data is correct, press *Enter*.

If there is something wrong with the input data, abort the installation by pressing *Ctrl+C*.
- 8 The script initializes the basic LDAP database structure and performs some tests, then displays a summary of the configuration and test results. When the tests are successfully completed, the script displays a success message. To complete the initialization, press *Enter*.

4.3.2 Running `posInitEdir.sh`

The `posInitEdir` script defines the LDAP directory schema and the initial records for eDirectory. It cannot add the Novell Linux Point of Service LDAP directory to an existing eDirectory tree; it creates an entirely new tree.

To create the Novell Linux Point of Service LDAP directory for eDirectory:

- 1 After you have installed the Novell Linux Point of Service Administration Server, log in as root on the Administration Server.
- 2 Install eDirectory on the Administration Server.
- 3 Run `posInitEdir.sh`.
- 4 Specify the eDirectory tree name you want to create.

IMPORTANT: `posInitEdir` does not add to an existing eDirectory tree.

- 5 Specify your company name without spaces or special characters.
- 6 Specify your country abbreviation.

Use *de* for Germany, *uk* for United Kingdom, *us* for United States, and so forth.
- 7 Specify the LDAP administrator password.

NOTE: This password is for the account the Branch Server uses to access the LDAP directory.

- 8 `posInitEdir` provides a summary of the LDAP directory data based on your input. If all data is correct, press *Enter*.

If there is something wrong with the input data, abort the installation by pressing *Ctrl+C*.

- 9 The script initializes the basic LDAP database structure and performs some tests, then displays a summary of the configuration and test results. When the tests are successfully completed, the script displays a success message. To complete the initialization, press *Enter*.

4.3.3 Verifying the LDAP Directory

After you run `posInitLdap` or `posInitEdir`, the LDAP directory has been initialized on the Administration Server and the LDAP service is available. At this point, you should have a basic tree structure with a root, a Country container, and an Organization container.

You can verify that the LDAP structure is accessible using a GUI-based LDAP browser, such as GQ, or an `ldapsearch` command. [Table 4-2](#) lists the parameters required to access the LDAP directory using GQ.

Table 4-2 Parameters for accessing the LDAP directory with GQ

Parameter	Value
LDAP Host	IP address of the Administration Server
LDAP Port	Port assigned to LDAP; for example, 389
Base DN	Distinguished name of the base container; for example, <code>o=mycorp,c=us</code>
Bind DN	Distinguished name of the administrative user; for example, <code>cn=admin,o=mycorp,c=us</code>
Bind Password	LDAP administrator password defined when you ran <code>posInitLdap</code> or <code>posInitEdir</code> .

Before you create a Branch Server, you must use the `posAdmin` command to create the LDAP objects required to configure the Branch Server and boot its Point of Service terminals. For detailed instructions on creating these objects, see [Section 6.2, “Creating Branch Server Objects in LDAP,” on page 72](#).

4.4 Copying the Default Boot Images

This section explains how to copy the default boot images (`initrd` and the Linux kernel file) to the appropriate directories on the Administration Server so they are ready to be transferred to the Branch Servers.

NOTE: These steps apply only if you selected to install the Image Builder components on the Administration Server.

- 1 Use the following command to copy the `initrd` file to the `/opt/SLES/POS/rsync/boot/` directory as `initrd.gz` (type the command all on one line):

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.gz /opt/SLES/POS/rsync/boot/initrd.gz
```
- 2 Use the following command to copy the kernel file to the `/opt/SLES/POS/rsync/boot/` directory as `linux` (type the command all on one line):

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.kernel.kernel_version /opt/SLES/POS/rsync/boot/linux
```

4.5 Creating Point of Service Images

Before you can deploy Point of Service terminals, you must first create image files that contain the operating system and application files required to boot the terminals.

Novell Linux Point of Service provides image templates that can be customized and generated using the Image Builder tool. When you select the NLPOS Image Server during the Administration Server installation, the ImageBuilder utilities (scr and xscr) are installed on the Administration Server along with all the files and directories required to create Point of Service images.

To create the Point of Service images required to deploy your Point of Service terminals:

1. Copy the image source files to your image building server.

For detailed instructions, see “[Copying the Novell Linux Point of Service CDs](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

2. Define the location of the image source files.

For detailed instructions, see “[Generating AdminServer.conf or Distribution.xml](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

3. Build the Point of Service image files.

For detailed instructions, see “[Building Images with the scr ImageBuilder Tool](#)” or “[Building Images with the xscr ImageBuilder Tool](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

After you have created the images required for your Point of Service terminals, you must copy the images to the appropriate directories on the Administration Server so that the RSYNC service can transmit the images to the Branch Server. Proceed with [Section 4.6, “Copying the Client Image Files,”](#) on page 64.

4.6 Copying the Client Image Files

Client images must be located in the `/opt/SLES/POS/rsync/image/` directory on the Administration Server. The boot image must be located in `/opt/SLES/POS/rsync/boot/`. The Branch Servers can then download the image files and deploy them on Point of Service terminals.

- 1 Use the following command to copy the client images to the `/opt/SLES/POS/rsync/image/` directory (type the command all on one line):

```
cp /opt/SLES/POS/image/image_filename /opt/SLES/POS/rsync/image/image_filename
```

- 2 Use the following command to copy the corresponding MD5 checksum files to the `/opt/SLES/POS/rsync/image/` directory (type the command all on one line):

```
cp /opt/SLES/POS/image/MD5_checksum_filename /opt/SLES/POS/rsync/image/MD5_checksum_filename
```

IMPORTANT: Both the client image files and their MD5 checksum files must be located in the `/opt/SLES/POS/rsync/image/` directory on the Administration Server before the Branch Server can distribute the images to Point of Service terminals.

4.7 What's Next

If you need to install a dedicated Image Building Server, follow the instructions in [Chapter 5, “Setting Up a Dedicated Image Building Server,”](#) on page 67 before you install your Branch Servers.

The next step is to set up your Branch Servers. Refer to the section corresponding to the type of Branch Server you want to install:

- ◆ [Chapter 6, “Setting Up a Branch Server,”](#) on page 71
- ◆ [Chapter 7, “Setting Up High Availability Branch Servers,”](#) on page 81
- ◆ [Chapter 8, “Setting Up an Admin/Branch Server Combo,”](#) on page 99
- ◆ [Chapter 9, “Setting Up a POSBranch Terminal,”](#) on page 107
- ◆ [Chapter 10, “Automatic Branch Server Installation,”](#) on page 115

Setting Up a Dedicated Image Building Server

5

Although a dedicated image building server requires an additional server on your Novell® Linux Point of Service network, it provides several advantages, particularly for large systems that manage a large number of Point of Service images. Providing a dedicated image building server offloads the processor and memory load required to generate images from the Administration Server and it protects the Administration Server and LDAP directory from any possible corruption or user errors that might occur while building Point of Service images.

This section reviews the procedures required to set up a dedicated image building server:

- ♦ [Section 5.1, “Meeting System Requirements,” on page 67](#)
- ♦ [Section 5.2, “Installing a Dedicated Image Building Server,” on page 67](#)
- ♦ [Section 5.3, “Creating Point of Service Images,” on page 69](#)
- ♦ [Section 5.4, “Copying the Client Image Files to the Administration Server,” on page 69](#)

5.1 Meeting System Requirements

The following list identifies the system requirements for a dedicated image building server:

- ♦ One server with an x86 processor
- ♦ A minimum of 4 GB hard disk space; recommended 25 GB

NOTE: This will vary depending on the size of your images.

- ♦ A minimum of 512 MB RAM; recommended 512 MB - 3 GB (at least 256 MB per CPU)
- ♦ One network card

5.2 Installing a Dedicated Image Building Server

You should have already installed the Administration Server as described in [Chapter 4, “Setting Up the Administration Server,” on page 59](#).

The following procedure outlines the steps required to set up a dedicated image building server.

5.2.1 Installing the Novell Linux Point of Service Software

To install the Novell Linux Point of Service software on the image building server:

- 1 Start the YaST utility by inserting *Novell Linux Point of Service 9 CD 1* into the drive and rebooting the computer.
- 2 At the SuSE boot screen, select *Installation*.
- 3 Go through the rest of the initial installation screens as outlined in [Section 2.5.1, “Starting the YaST Utility,” on page 23](#).

- 4 When you get to the Installation Settings menu, make your settings as outlined in [Section 2.5.2, “The Installation Settings Screen,”](#) on page 28.

For the *Software* option, select the NLPOS Image Server software selection.

This selection installs all Administration and Branch Server packages to the server, plus the Image Builder components listed in [Table 4-1](#).

Table 5-1 *Image Builder components*

Description	Location
ImageBuilder scripts (scr and xscr)	/usr/bin/
Image Description Trees	/opt/SLES/POS/system/image_name-version/
Distribution.xml template	/opt/SLES/POS/system/templates/
Image Specification Document templates	/opt/SLES/POS/system/templates/support/
Default configuration information for kernel drivers	/opt/SLES/POS/system/templates/drivers/
Child Image Specification Documents for client image add-on options	/opt/SLES/POS/system/templates/addons/

- 5 When you have finished making your installation settings, click *Accept*.
- 6 When prompted, answer Yes to start the installation.
YaST partitions the drive, applies the installation settings, and copies the necessary files from NLPOS CD 1 to disk.
- 7 As prompted, insert each requested CD, then click *OK*.
- 8 When it finishes with the basic installation, the system reboots and YaST starts again.
Continue through the screens as outlined in [Section 2.5.3, “The YaST Configuration Phase,”](#) on page 41.
- 9 After you have completed the options in the Hardware Configuration menu, click *Next*.
- 10 Remove any CDs from the drive, and then click *Finish* to complete the installation.
The system reboots.
- 11 Log in as root.
You are now ready to copy the default boot images to the Administration Server.

5.2.2 Copying the Boot Images to the Administration Server

To copy the default boot images from the image building server to the Administration Server:

- 1 Copy `/opt/SLES/POS/image/initrd-disknetboot-version-date.gz` on the image server to the `/opt/SLES/POS/rsync/boot/` directory on the Administration Server as `initrd.gz`.

- 2 Copy `/opt/SLES/POS/image/initrd-disknetboot-version-date.kernel.kernel_version` on the image server to the `/opt/SLES/POS/rsync/boot/` directory on the Administration Server as `linux`.

5.3 Creating Point of Service Images

With the image building server up and running, you can create client images required for your Point of Service terminals. Before doing so, however, you must copy the image source files from the Novell Linux Point of Service CDs to the image building server and define their location.

- 1 Copy the image source files to your image building server using either the `POSCDTool` or the `POSCopyTool` script.

For detailed instructions, see “[Copying the Novell Linux Point of Service CDs](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- 2 Define the location of the image source files in either the `AdminServer.conf` file (used by `scr`) or the `Distribution.xml` file (used by `xscr`).

These files define the paths to the distribution directories where you have copied the Novell Linux Point of Service CDs. `ImageBuilder` searches these paths to locate the RPM packages required to build images.

For detailed instructions, see “[Generating AdminServer.conf or Distribution.xml](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- 3 Build the Point of Service image files.

For detailed instructions, see “[Building Images with scr](#)” or “[Building Images with xscr](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

5.4 Copying the Client Image Files to the Administration Server

After you have created the client images you need, you must copy the image files and their corresponding MD5 checksums from the image server to the `/opt/SLES/POS/rsync/image/` directory on the Administration Server.

IMPORTANT: Client image files and their MD5 checksum files must be located in the `/opt/SLES/POS/rsync/image/` directory on the Administration Server before the Branch Servers can distribute the images to Point of Service terminals.

For detailed instructions, see “[Copying the Client Image Files](#)” on page 64.

Setting Up a Branch Server

6

The Branch Server provides the network boot and system management infrastructure for the Novell® Linux Point of Service terminals as well as a generic system platform for in-store applications, such as database systems and back ends for the Point of Service applications.

This section reviews the procedures required to set up a standard Branch Server:

- ◆ [Section 6.1, “Meeting System Requirements,” on page 71](#)
- ◆ [Section 6.2, “Creating Branch Server Objects in LDAP,” on page 72](#)
- ◆ [Section 6.3, “Installing and Configuring the Branch Server,” on page 77](#)
- ◆ [Section 6.4, “Downloading Images from the Administration Server,” on page 79](#)
- ◆ [Section 6.5, “Starting the Core Script,” on page 79](#)

If you are setting up a high-availability Branch Server, follow the instructions in [Chapter 7, “Setting Up High Availability Branch Servers,” on page 81](#).

If you are setting up an Admin/Branch Server combination, follow the instructions in [Chapter 8, “Setting Up an Admin/Branch Server Combo,” on page 99](#).

If you are setting up a POS Branch Terminal, follow the instructions in [Chapter 9, “Setting Up a POSBranch Terminal,” on page 107](#).

If you want to create a CD to automatically set up a remote Branch Server, follow the instructions in [Chapter 10, “Automatic Branch Server Installation,” on page 115](#).

6.1 Meeting System Requirements

The following list identifies the system requirements for a Branch Server:

- ◆ One server with an x86 processor
- ◆ A minimum of 4 GB hard disk space; recommended 10 GB

NOTE: This will vary depending on the size of the images you distribute to your Point of Service terminals.

- ◆ A minimum of 256 MB RAM; recommended 512 MB - 3 GB (at least 256 MB per CPU)
- ◆ At least two network cards per server:
 - ◆ One network card for the Administration Server’s public network
 - ◆ One network card for the Branch Server’s private network

WARNING: Because Branch Servers contain sensitive information, they should be secured. We recommend that you close unused ports and allow only the root user to have access to the server console.

6.2 Creating Branch Server Objects in LDAP

Before you can configure and deploy a Branch Server, you must first create the necessary objects in the LDAP directory. These objects include:

- ◆ One or more **organizationalUnit** objects to represent your organizational structure.
- ◆ An **scLocation** object for each site where a Branch Server is located.
- ◆ An **scServerContainer** to contain all the Branch Server objects for a given site.
- ◆ An **scBranchServer** object and its associated configuration objects for each Branch Server in your system.
- ◆ **Additional objects** for the Point of Service terminals associated with each Branch Server.

NOTE: Each LDAP object has two types of attributes: must and may attributes. The must attributes are required for an object; the may attributes are optional. The tables in this section list only those may attributes that are relevant to Novell Linux Point of Service.

6.2.1 Creating organizationalUnit Objects

In a Novell Linux Point of Service system, Organizational Unit (`organizationalUnit`) objects are containers that typically represent regions, divisions, or branches within a company. These objects can be nested to visually represent the structure or organization of your company. Branch location objects are created in `organizationalUnit` containers within the LDAP directory.

Here is the `posAdmin` command syntax for adding an `organizationalUnit` object in LDAP (type the command all on one line):

```
posAdmin.pl --user dn_of_admin_user --password password
--base base_context --add --organizationalUnit --ou ou_name
[--description 'string']
```

Table 6-1 summarizes the `organizationalUnit` object attributes.

Table 6-1 Attributes for `organizationalUnit` objects

Attribute	Type	Explanation
<code>--ou <i>ou_name</i></code>	must	Specifies the name of the organizational unit. For example, <code>--ou boston</code> .
		IMPORTANT: Use only alphanumeric characters.
<code>--description '<i>string</i>'</code>	may	Contains a human-readable description of the object.

For example, the following command adds the `boston` organizational unit to the LDAP directory and gives it the description “main headquarters”:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret --base
o=mycorp,c=us --add --organizationalUnit --ou boston --description
'main headquarters'
```

The LDAP context of the newly created `organizationalUnit` is `ou=boston,o=mycorp,c=us` directory.

6.2.2 Creating an scLocation Object

An scLocation object typically is used to represent a branch office; that is, a site where a Branch Server and Point of Service terminals are located. scLocation containers are used to store information about the Branch Servers and the deployed Point of Service terminals. This and all other information that can be modified at the Branch Server should be stored or referenced in the Location containers to limit the need to grant write privileges to subtrees.

Here is the posAdmin command syntax to add an scLocation object in LDAP (type the command all on one line):

```
posAdmin.pl --user dn_of_admin_user --password password
--base base_context --add --scLocation --cn location_name
--ipNetworkNumber ip_address --ipNetmaskNumber subnet_mask
--scDhcpRange ip_address,ip_address --scDhcpFixedRange
ip_address,ip_address --scDefaultGw ip_address --scDynamicIp TRUE |
FALSE --scWorkstationBasename string --scEnumerationMask number
[--associatedDomain ldap_context]
```

Table 6-2 summarizes the command options which correspond to the scLocation object attributes.

Table 6-2 Attributes for scLocation objects

Attribute	Type	Explanation
--cn location_name	must	Specifies the common name of the location object.
--ipNetworkNumber ip_address	must	Identifies the network address of the subnet of the branch. For example, 192.168.1.0.
--ipNetmaskNumber subnet_mask	must	Identifies the netmask of the subnet of the branch. For example, 255.255.255.0.
--scDhcpRange ip_address,ip_address	must	Specifies the dynamic IP address range of the subnet's DHCP server. This is needed to register the Point of Service terminals. It is a comma-separated value pair. For example, 192.168.1.10, 192.168.1.50.
--scDhcpFixedRange ip_address,ip_address	must	Specifies the DHCP server's fixed IP address range reserved for the Point of Service terminals. It is also a comma-separated value pair, such as 192.168.1.51, 192.168.1.150.
--scDefaultGw ip_address	must	Identifies the default gateway for this location. This is normally a router to the corporate wide area network.
--scDynamicIp TRUE FALSE	must	Enables (TRUE) or disables (FALSE) the dynamic IP address range of the DHCP server.
--scWorkstationBasename string	must	Specifies the base name of the Point of Service terminals of a branch. The base name, in combination with the scEnumerationMask, is used to create a unique name for each terminal, which is then associated with an IP address in the scDhcpFixedRange. For example, if the DHCP fixed range starts at 192.168.1.51, the scWorkstationBasename is CR, and the scEnumerationMask is 000, the first terminal to register gets the name CR001 and the IP address 192.168.1.51, the next terminal is named CR002 and gets the IP address 192.168.1.52, and so on.

Attribute	Type	Explanation
<code>--scEnumerationMask</code> <i>number</i>	must	Specifies the last portion of the Point of Service terminal name. Refer to the explanation of <code>scWorkstationBasename</code> above.
<code>--associatedDomain</code> <i>ldap_context</i>	may	This optional entry configures the DNS domain and the domain part of the hostnames of the Point of Service terminals to be in the stated domain. If this entry is left empty (the default), the domain is derived from the LDAP structure of the <code>scLocation</code> entry DN. With this entry, a different domain can be chosen.

For example, the following command adds the Harbor `scLocation` to the LDAP directory, sets the IP addresses and DHCP ranges to the indicated values, and specifies a base name of CR and an enumeration mask of 000 (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base ou=boston,o=mycorp,c=us --add --scLocation --cn harbor
--ipNetworkNumber 192.168.1.0 --ipNetmaskNumber 255.255.255.0
--scDhcpRange 192.168.1.10,192.168.1.50 --scDhcpFixedRange
192.168.1.51,192.168.1.151 --scDefaultGw 192.168.1.254
--scDynamicIp TRUE --scWorkstationBasename CR --scEnumerationMask 000
```

6.2.3 Adding an `scServerContainer` Object

Before you can add the `scBranchServer` object to an `scLocation` object, you must define an `scServerContainer`.

Here is the `posAdmin` command syntax for adding an `scServerContainer` object in LDAP (type the command all on one line):

```
posAdmin.pl --user dn_of_admin_user --password password
--base base_context --add --scServerContainer --cn object_name
```

For example, the following command adds an `scBranchServer` object named `server` to the LDAP directory:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=east,ou=boston,o=mycorp,c=us --add --scServerContainer
--cn server
```

6.2.4 Adding an `scBranchServer` Object

The next step is to add an `scBranchServer` object to the new `scServerContainer`. The `scBranchServer` object stores configuration information that is specific to each Branch Server. It is located in the LDAP tree via an `scLocation` object. There must be an `scBranchServer` object for every Branch Server in the Novell Linux Point of Service system.

IMPORTANT: The location of the `scBranchServer` object in the LDAP directory must correspond to the hostname defined for the Branch Server during installation. For example, if the hostname is `bs.east.boston.mycorp.us`, the dn of the `scBranchServer` object would be `cn=bs,cn=server,cn=east,ou=boston,o=mycorp,c=us`. You must create the `scBranchServer` object and its supporting organizational structure before you can run `posInitBranchserver` and deploy the Branch Server. For more information on defining the server hostname during installation, see [“Network Interfaces” on page 43](#).

Here is the posAdmin command syntax for adding an scBranchServer object in LDAP (type the command all on one line):

```
posAdmin.pl --user dn_of_admin_user --password password
--base base_context --add --scBranchServer --cn branch_server_name
```

As a may attribute, you can define the reference hardware with the --scRefServerDn option, specifying a pointer (Distinguished Name) to the global directory.

For example, the following command adds a Branch Server object named bs1 in the server container:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scBranchServer --cn bs1
```

6.2.5 Defining the Branch Server Hardware

The scBranchServer object must contain at least one defined scNetworkcard object. You can define other hardware objects as necessary.

Here is the posAdmin command syntax for adding a network interface card to the Branch Server object (type the command all on one line):

```
posAdmin.pl --user dn_of_admin_user --password password
--base base_context --add --scNetworkcard --scDevice device_name
--ipHostNumber ip_address
```

Table 6-3 summarizes the command options which correspond to the scNetworkcard object attributes.

Table 6-3 Attributes for scNetworkcard objects

Attribute	Type	Explanation
--scDevice <i>device_name</i>	must	Specifies the name of network device of the card. For example, eth0 or eth1.
--ipHostNumber <i>ip_address</i>	must	Specifies the IP address assigned to the card. For example, 192.168.1.1.
--macAddress	may	Identifies the MAC address of the network interface card.
--scModul	may	Specifies the name of the Linux kernel module for the network interface card.
--scModulOption	may	Specifies the module options of the Linux kernel module for the network interface card.
--ipNetmaskNumber	may	Adds the netmask belonging to the IP address assigned to the network interface card, if the ipHostNumber is not inside the defined subnet of the location.

For example, the following command adds a network interface card with a static IP address from the defined subnet (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth0 --ipHostNumber 192.168.1.1
```

6.2.6 Defining the Branch Server Services

The `scBranchServer` also contains objects representing services such as DHCP and DNS. At a minimum, you should define the required DHCP, DNS, and TFTP.

Here is the `posAdmin` command syntax for defining an `scService` object in LDAP (type the command all on one line):

```
posAdmin.pl --user dn_of_admin_user --password password
--base base_context --add --scService --cn service_name
--ipHostNumber ip_address --scDnsName dns_name --scServiceName string
--scServiceStartScript filename --scServiceStatus TRUE; | FALSE;
```

Table 6-4 provides a description of `scService` attributes.

Table 6-4 Attributes for `scService` objects

Attribute	Type	Explanation
--cn <i>service_name</i>	must	Specifies the common name of the service.
--ipHostNumber <i>ip_address</i>	must	Specifies the IP address of the Branch Server hosting the service.
--scDnsName <i>dns_name</i>	must	Specifies the DNS name of the service.
--scServiceName <i>string</i>	must	Specifies the name of the service. For example: dhcp, dns, or tftp.
--scServiceStartScript <i>filename</i>	must	The name of the init script in <code>/etc/init.d</code> . For example, <code>atftpd</code> for the tftp service.
--scServiceStatus TRUE FALSE	must	The service status. TRUE or FALSE are possible values.

The following examples demonstrate how to add the DHCP, DNS, and TFTP services (type the commands all on one line).

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scService --cn dhcp --ipHostNumber 192.168.1.1
--scDnsName dhcp --scServiceName dhcp --scServiceStartScript dhcpd
--scServiceStatus TRUE
```

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scService --cn dns --ipHostNumber 192.168.1.1
--scDnsName dns; --scServiceName dns --scServiceStartScript named
--scServiceStatus TRUE
```

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scService --cn tftp --ipHostNumber 192.168.1.1
--scDnsName tftp --scServiceName tftp --scServiceStartScript atftpd
--scServiceStatus TRUE
```

6.2.7 Creating Point of Service Terminal Objects

Before you can boot the Point of Service terminals associated with a Branch Server, you must create additional objects in the branch portion of the LDAP directory. These include an `scCashRegister` object and its associated configuration objects for each type of Point of Service terminal in your system, and `scPosImage` objects for the client image files you want the Branch Server to distribute to Point of Service terminals.

For instructions on how to create these objects, see [Section 11.2, “Creating the LDAP Objects Required for the Point of Service Terminals,”](#) on page 126.

6.3 Installing and Configuring the Branch Server

This section describes how to install the Novell Linux Point of Service software and set up a Branch Server.

6.3.1 Installing the Novell Linux Point of Service Software

To install the Novell Linux Point of Service software on the Branch Server:

- 1 Start the YaST utility by inserting *Novell Linux Point of Service 9 CD 1* into the drive and rebooting the computer.
- 2 At the SuSE boot screen, select *Installation*.
- 3 Go through the rest of the initial installation screens as outlined in [Section 2.5.1, “Starting the YaST Utility,”](#) on page 23.
- 4 When you get to the Installation Settings menu, make your settings as outlined in [Section 2.5.2, “The Installation Settings Screen,”](#) on page 28.

For the *Software* option, choose the NLPOS Admin/Branch Server software selection option.

This selection installs all the necessary Branch Server packages to the server. For more information, see [“Software Selection Screen”](#) on page 34.

- 5 When you have finished making your installation settings, click *Accept*.
- 6 When prompted, answer Yes to start the installation.
YaST partitions the drive, applies the installation settings, and copies the necessary files from NLPOS CD 1 to disk.
- 7 When prompted, insert each requested CD, then click *OK*.
- 8 When it finishes with the basic installation, the system reboots and YaST starts again.
Continue through the screens as outlined in [Section 2.5.3, “The YaST Configuration Phase,”](#) on page 41.
- 9 After you have completed the options in the Hardware Configuration menu, click *Next*.
- 10 Remove any CDs from the drive, and then click *Finish* to complete the installation.
The system reboots.
- 11 Log in as root on the Branch Server.
You are now ready to configure the Branch Server.

6.3.2 Configuring the Branch Server

This section describes the Branch Server configuration with the `posInitBranchServer.sh` script.

IMPORTANT: You must have created the `scBranchServer` object and its supporting organizational structure before you can run `posInitBranchserver.sh` to configure the Branch Server. For more information, see [Section 6.2, “Creating Branch Server Objects in LDAP,” on page 72](#).

- 1 Before starting the configuration script, ensure that the Branch Server can find its object in the LDAP directory.

IMPORTANT: The Branch Server’s hostname must resolve to the IP address defined in the `--ipHostNumber` attribute of the `scNetworkcard` object; for example, 192.168.2.1. Otherwise, the Branch Server cannot find the `scBranchServer` object in the LDAP directory.

To ensure this resolution, add the following line to the Branch Server’s `/etc/hosts` file:

```
ip_address_of_scNetworkcard fully_distinguished_name hostname
```

For example,

```
192.168.2.1 bs1.boston.mycorp.com bs1
```

- 2 Execute `posInitBranchserver.sh` at the Branch Server console.

- 3 Specify your company name without spaces or special characters.

- 4 Specify your country abbreviation.

Use `de` for Germany, `uk` for United Kingdom, `us` for United States, and so forth.

- 5 Specify the IP address of the Administration Server.

Set the value according to the IP address you assigned when you configured the Administration Server.

- 6 The script attempts to connect to the Administration Server. If it fails, you are prompted again for the company name, country name, and password.

Otherwise, the script tries to determine the Branch Server’s IP address, hostname, and domain name as it is defined in the LDAP database. If it fails, you are prompted for the Branch Server’s IP address.

If the Branch Server configuration is successful, the script displays the Branch Server’s name, IP address, and domain name, along with a success message.

- 7 Verify that the necessary LDAP objects have been created by using a GUI-based LDAP browser or an `ldapsearch` command. For example:

```
ldapsearch -x -h administration_server_name -b base_context -s base  
-D dn_of_admin_user -w password
```

6.4 Downloading Images from the Administration Server

After the Branch Server is up and running, you can run the `possyncimages.pl` script to download the Point of Service images that have been created from the Administration Server to the `/tftpboot/` directories on the Branch Server.

- 1 Verify the `scPosImage` object settings for the Point of Service images in the `/tftpboot/image/` directory.

IMPORTANT: You must create the `scPosImage` objects and set the `scPosImageVersion` attribute to `Active` before you boot the Point of Service terminals. The Point of Service terminals require an `scPosImage` object with an active `scPosImageVersion` attribute before they can download the corresponding physical image from the Branch Server at boot time. For more information on setting the `scPosImageVersion` attribute to `Active`, see “[Activating Images](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- 2 Run `possyncimages.pl` at the Branch Server console to download the Point of Service images.

NOTE: The `possyncimages.pl` script can also be used to update Point of Service images on the Branch Server. However, to implement image version changes, you must also activate the version changes inside the corresponding `scPosImage` objects in the LDAP directory. Otherwise Point of Service terminals already registered in LDAP and on the Branch Server cannot boot the new image version.

- 3 Verify the result of the `possyncimages.pl` command by checking the contents of the following Branch Server directories:
 - ♦ `/tftpboot/boot/`
 - ♦ `/tftpboot/image/`

For more information on the Administration and Branch Server directory structure, see “[Novell Linux Point of Service Files and Directory Structure](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

6.5 Starting the Core Script

Start the core script (`posleases2ldap`) as a daemon process on the Branch Server.

- ♦ To verify that `posleases2ldap` is currently running, execute the following command:

```
rcposleases2ldap status
```

- ♦ To manually start the `posleases2ldap` service, execute the following command:

```
rcposleases2ldap start
```

- ♦ To ensure the Branch Server automatically starts the core script at boot time, execute the following command:

```
chkconfig posleases2ldap on
```

You are now ready to deploy the Point of Service terminals. For more information on this process, see [Chapter 11, “Deploying Point of Service Terminals,” on page 125](#).

Setting Up High Availability Branch Servers

7

In a Novell® Linux Point of Service system, it is possible to deploy Branch Servers in a high availability (HA) setup. High availability, in this context, means an HA cluster of two nodes in an active/passive setup. One of the nodes runs all services. The other node is a hot standby which can take over all services in the event the active node fails.

This section outlines the requirements and procedures needed to configure an HA Branch Server pair.

- ◆ [Section 7.1, “Meeting System Requirements,” on page 81](#)
- ◆ [Section 7.2, “Creating Objects for High Availability Branch Servers in LDAP,” on page 83](#)
- ◆ [Section 7.3, “Installing and Configuring High Availability Branch Servers,” on page 87](#)
- ◆ [Section 7.4, “Downloading Images from the Administration Server,” on page 93](#)
- ◆ [Section 7.5, “Starting the Core Script,” on page 93](#)
- ◆ [Section 7.6, “Heartbeat Configuration Files,” on page 94](#)
- ◆ [Section 7.7, “drbd Configuration File,” on page 96](#)
- ◆ [Section 7.8, “Updating High Availability Branch Servers,” on page 96](#)

7.1 Meeting System Requirements

The following list identifies the system requirements for an HA Branch Server configuration:

- ◆ Two servers with x86 processors
- ◆ A minimum of 4 GB hard disk space; recommended 10 GB

NOTE: This will vary depending on the size of the images you distribute to your Point of Service terminals.

- ◆ A minimum of 256 MB RAM; recommended 512 MB - 3 GB (at least 256 MB per CPU)
- ◆ heartbeat software

The Linux heartbeat software package is used to monitor nodes in a cluster. It exchanges “heartbeats” on the network interfaces of the cluster members to find out which nodes in the cluster are active. If a node fails, it stops emitting a signal. In this case, heartbeat ensures that another node takes over the relevant tasks and identity and makes the failover known within the network. This means that the cluster remains consistent. At present, the heartbeat failover function is limited to two nodes.

- ◆ drbd software

Distributed replicated block device (drbd) mirrors partitions and logical volumes (data areas) by means of a normal TCP/IP network. Each node has a particular drbd resource active and all changes are mirrored over the network as secure transactions.

In comparison with RAID1, drbd has additional features for local disks that enable the resynchronization time to be minimized after the two nodes have been disconnected briefly. It

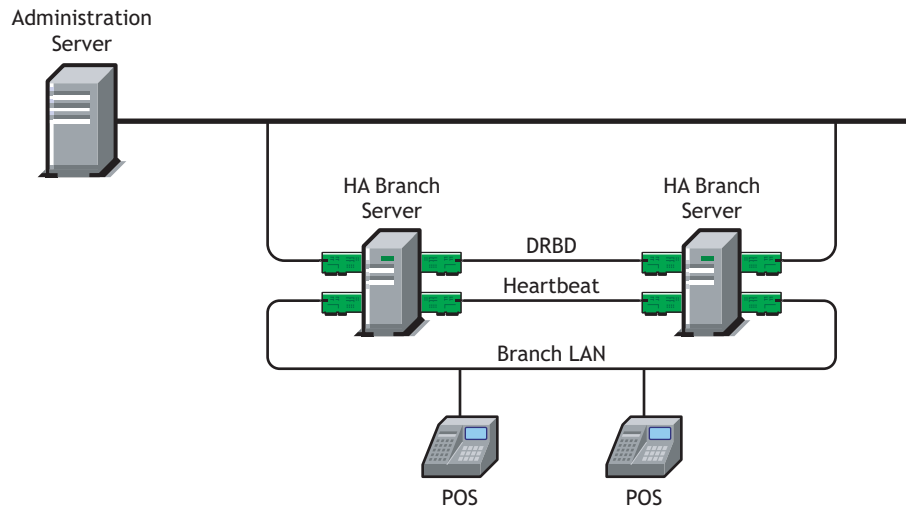
also performs a robust check after various malfunctions to establish which side has the latest, consistent data.

- ◆ Network devices for mirroring and heartbeat

NOTE: The Branch Server uses a network block device to replicate the data to the standby node; therefore, no shared storage device is needed.

- ◆ Two crosslink network cables to connect the drbd and heartbeat interfaces
- ◆ At least two network cards per server; however, the recommend configuration calls for four cards as illustrated in [Figure 7-1](#).

Figure 7-1 Recommended network card configuration for HA Branch Servers



- ◆ One network card for the Administration Server's public network; for example:
node1: eth0 151.158.181.28 node2: eth0 151.155.181.29
- ◆ One network card for the Branch Server's network from the private range; for example:
node1: eth1 192.168.1.1 node2: eth1 192.168.1.2
virtual IP eth1:0 192.168.1.3
- ◆ One network card for drbd (a gigabit network card is preferred) from the private range; for example:
node1: eth2 192.168.2.1 node2: eth2 192.168.2.2
- ◆ One network card for the Linux HA Heartbeat from the private range; for example:
node1: eth3 192.168.3.1 node2: eth3 192.168.3.2

WARNING: Because Branch Servers contain sensitive information, they should be secured. We recommend that you close unused ports and allow only the root user to have access to the server console.

7.2 Creating Objects for High Availability Branch Servers in LDAP

Before you can configure and deploy a high availability Branch Server pair, you must first create the necessary objects in the LDAP directory. HA Branch Servers require the same LDAP objects as standard Branch Servers, with the following differences:

- ♦ The `scNetworkcard` objects include a virtual IP address (`eth1:0`) that represents both servers.
- ♦ The `scHAService` objects must reference the virtual IP address.
- ♦ Branch Server services are configured with `scHAService` objects instead of `scService` objects.

NOTE: Each LDAP object has two types of attributes: must and may attributes. The must attributes are required for an object; the may attributes are optional.

7.2.1 Creating Branch Objects

This section outlines the steps to add the necessary HA branch objects to the LDAP directory. The `posAdmin` command examples are based on the sample configuration shown in [Figure 7-1 on page 82](#). Modify the commands as necessary for your particular scenario.

NOTE: For ease of reference, the following procedure refers to the active node as BS1 and the standby node as BS2.

The branch objects you will create include:

- ♦ One or more `organizationalUnit` objects to represent your organizational structure.
- ♦ An `scLocation` object for each site where a Branch Server is located.
- ♦ An `scServerContainer` to contain all the Branch Server objects for a given site.
- ♦ An `scBranchServer` object and its associated configuration objects for the active and static Branch Servers (BS1 and BS2) in your HA configuration.

1 Create an `organizationalUnit` object.

For example:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base o=mycorp,c=us --add --organizationalUnit --ou boston
```

2 Create the `scLocation` object.

For example:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base ou=boston,o=mycorp,c=us --add --scLocation --cn branch
--ipNetworkNumber 192.168.1.0 --ipNetmaskNumber 255.255.255.0
--scDhcpRange 192.168.1.4,192.168.1.99
--scDhcpFixedRange 192.168.1.100,192.168.1.199
--scDefaultGw 192.168.1.1 --scDynamicIp TRUE
--scWorkstationBasename CR --scEnumerationMask 000
```

3 Create an `scServerContainer` object.

For example:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=branch,ou=boston,o=mycorp,c=us --add --scServerContainer
--cn server
```

4 In the new server container, create two Branch Server objects.

For example:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scBranchServer --cn bs1
```

and

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scBranchServer --cn bs2
```

5 Define the network interface cards for each Branch Server.

Depending on network traffic and the desired performance, you can configure one to four network interface cards per Branch Server. The recommended four-card configuration is illustrated in [Figure 7-1 on page 82](#). For more information on entering the network interface card configuration in YaST, see [“Network Interfaces” on page 43](#).

[Table 7-1](#) summarizes the command options which correspond to the `scNetworkcard` object attributes.

Table 7-1 Attributes for `scNetworkcard` objects

Attribute	Type	Explanation
<code>--scDevice</code>	must	Specifies the name of network device of the card. For example, <code>eth0</code> or <code>eth1</code> .
<code>--ipHostNumber</code>	must	Specifies the IP address. For example, <code>192.168.1.1</code> .
<code>--macAddress</code>	may	Specifies the MAC address of the network interface card.
<code>--scModul</code>	may	Specifies the name of the Linux kernel module for the network interface card.
<code>--scModulOption</code>	may	Specifies the module options of the Linux kernel module for the network interface card.
<code>--ipNetmaskNumber</code>	may	Adds the netmask belonging to the IP address assigned to the network interface card, if the <code>ipHostNumber</code> is not inside the defined subnet of the location.

The following examples demonstrate how to add network interface cards for the Branch Server, `drbd`, and `heartbeat` interfaces.

Branch Server 1 Network Interface Card Configuration

`eth0` on BS1 for the public interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password novell
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth0 --ipHostNumber
151.155.173.111
```

`eth1` on BS1 for the Branch Server interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth1 --ipHostNumber 192.168.1.1
--ipNetmaskNumber 255.255.255.0
```

eth2 on BS1 for the drbd interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth2 --ipHostNumber 192.168.2.1
```

eth3 on BS1 for the heartbeat interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth3 --ipHostNumber 192.168.3.1
```

eth1:0 on BS1 for the Branch Server interface virtual IP:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth1:0 --ipHostNumber 192.168.1.3
```

Branch Server 2 Network Interface Card Configuration

eth0 on BS2 for the public interface:

```
posAdmin.pl --user cn=admin,o=a35,c=us --password secret
--base cn=bs2,cn=server,cn=branch,ou=provo,o=a35,c=us
--add --scNetworkcard --scDevice eth0 --ipHostNumber
151.155.173.112
```

eth1 on BS2 for the Branch Server interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth1 --ipHostNumber 192.168.1.2
--ipNetmaskNumber 255.255.255.0
```

eth2 on BS2 for the drbd interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth2 --ipHostNumber 192.168.2.2
```

eth3 on BS2 for the Heartbeat interface:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth3 --ipHostNumber 192.168.3.2
```

eth1:0 on BS1 for the Branch Server interface virtual IP:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scNetworkcard --scDevice eth1:0 --ipHostNumber 192.168.1.3
```

6 Add DHCP, DNS, and TFTP as HA services.

Table 7-2 summarizes the command options which correspond to the `scHAService` object attributes.

Table 7-2 Attributes for *scHAService* objects

Attribute	Type	Explanation
--cn	must	Specifies the common name of the service.
--ipHostNumber	must	Specifies the virtual IP address of the HA service.
--scDnsName	must	Specifies the DNS name of the service.
--scServiceName	must	Specifies the name of the service. For example: tftp, dns, dhcp.
--scServiceStartScript	must	Specifies the name of the init script in <code>/etc/init.d</code> . For example, <code>atftpd</code> for the tftp service.
--scServiceStatus	must	The status of the service. TRUE or FALSE are possible values.
--scPrimaryService	must	This flag is used to describe if this a primary service or not. TRUE or FALSE are the possible values. If you define a primary server, this flag is always TRUE. On a secondary server, this flag is always FALSE.

The following commands demonstrate how to add DHCP, DNS, and TFTP as HA services in the example scenario.

Branch Server 1 HA Services Configuration

For DHCP on BS1 as the primary service:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scHAService --cn dhcp --ipHostNumber 192.168.1.3
--scDnsName dhcp --scServiceName dhcp --scServiceStartScript dhcpcd
--scServiceStatus TRUE --scPrimaryService TRUE
```

For DNS on BS1 as the primary service:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scHAService --cn dns --ipHostNumber 192.168.1.3
--scDnsName dns --scServiceName dns --scServiceStartScript named
--scServiceStatus TRUE --scPrimaryService TRUE
```

For TFTP on BS1 as the primary service:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs1,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scHAService --cn tftp --ipHostNumber 192.168.1.3
--scDnsName tftp --scServiceName tftp --scServiceStartScript atftpd
--scServiceStatus TRUE --scPrimaryService TRUE
```

Branch Server 2 HA Services Configuration

For DHCP on bs2 as the backup service:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scHAService --cn dhcp --ipHostNumber 192.168.1.3
```

```
--scDnsName dhcp --scServiceName dhcp --scServiceStartScript dhcpd
--scServiceStatus TRUE --scPrimaryService FALSE
```

For DNS on BS2 as the backup service:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scHAService --cn dns --ipHostNumber 192.168.1.3
--scDnsName dns --scServiceName dns --scServiceStartScript named
--scServiceStatus TRUE --scPrimaryService FALSE
```

For TFTP on BS2 as the backup service:

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=bs2,cn=server,cn=east,ou=boston,o=mycorp,c=us
--add --scHAService --cn tftp --ipHostNumber 192.168.1.3
--scDnsName tftp --scServiceName tftp --scServiceStartScript atftpd
--scServiceStatus TRUE --scPrimaryService FALSE
```

7.2.2 Creating Point of Service Terminal Objects

Before you can boot the Point of Service terminals associated with a Branch Server, you must create additional objects in the branch portion of the LDAP directory. These include an `scCashRegister` object and its associated configuration objects for each type of Point of Service terminal in your system, and `scPosImage` objects for the client image files you want the Branch Server to distribute to Point of Service terminals.

For instructions on how to create these objects, see [Section 11.2, “Creating the LDAP Objects Required for the Point of Service Terminals,”](#) on page 126.

7.3 Installing and Configuring High Availability Branch Servers

This section outlines the steps required to set up a highly available Branch Server pair.

NOTE: For ease of reference, the following procedure refers to the active node as BS1 and the passive (standby) node as BS2.

7.3.1 Installing the Novell Linux Point of Service Software

To install the Novell Linux Point of Service software on each Branch Server:

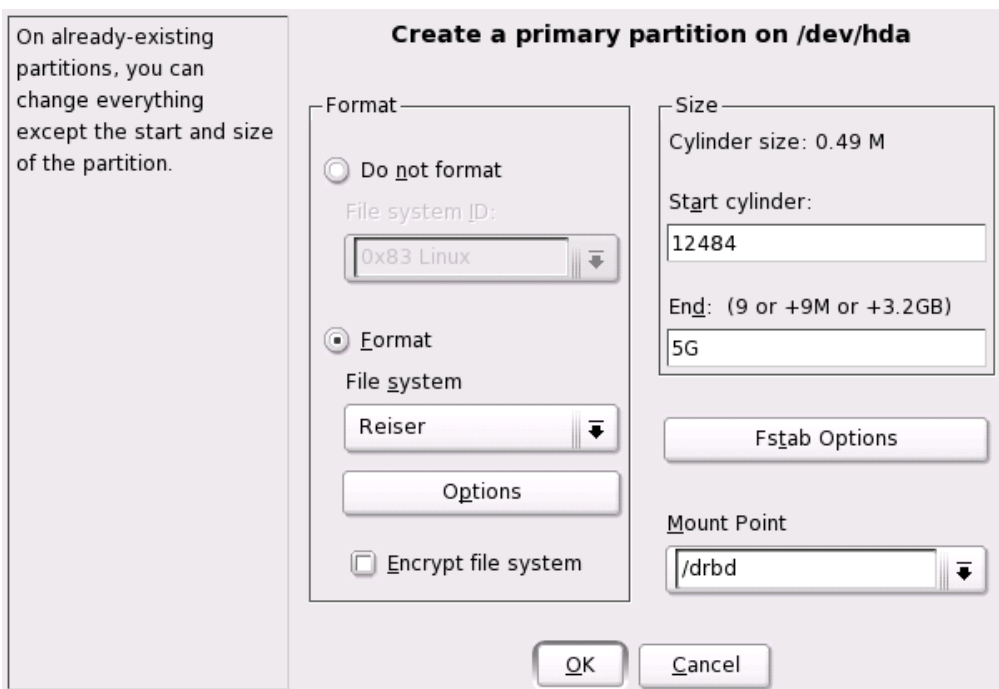
- 1 Start the YaST utility by inserting *Novell Linux Point of Service 9 CD 1* into the drive and rebooting the computer.
- 2 At the SuSE boot screen, select *Installation*.
- 3 Go through the rest of the initial installation screens as outlined in [Section 2.5.1, “Starting the YaST Utility,”](#) on page 23.
- 4 When you get to the Installation Settings menu, make your settings as outlined in [Section 2.5.2, “The Installation Settings Screen,”](#) on page 28.

For the *Partitioning* option, you must set up `drbd` partitions on BS1 and BS2.

- 4a Select *Create Custom Partition Setup* and then click *Next*.
- 4b Make sure the primary and SWAP partitions are defined on the drive.

4c Click *Create* to define the drbd partition. [Figure 7-2](#) shows the partition creation screen.

Figure 7-2 drbd partition creation screen.



4d Specify the size of the partition.

The size depends on your needs. The partition accommodates all your images plus several configuration files. A size of 5 GB should be sufficient for most installations.

IMPORTANT: The drbd partitions must be the same size on both Branch Servers.

4e Set the Mount Point as /drbd.

4f Click *OK* to apply your changes.

The drbd partition is now listed in the partition table.

5 For the *Software* option, choose the NLPOS Admin/Branch Server software selection and add the High Availability packages (heartbeat and drbd) via *Detailed Selection*.

This selection installs all the necessary Branch Server and High Availability packages to the server. For more information, see [“Software Selection Screen” on page 34](#).

6 When you have finished making your installation settings, click *Accept*.

7 When prompted, answer Yes to start the installation.

YaST partitions the drive, applies the installation settings, and copies the necessary files from NLPOS CD 1 to disk.

8 As prompted, insert each requested CD and click *OK*.

9 When it finishes with the basic installation, the system reboots and YaST starts again.

10 In the Root Password screen, enter the password for the root user twice, then click *Next*.

11 In the Network Configuration screen, set up the network cards for drbd, heartbeat, and the Administration Server and Branch Server networks. Make sure they can communicate. The recommended four-card configuration is illustrated in [Figure 7-1 on page 82](#). For more

information on entering the network interface card configuration in YaST, see “[Network Interfaces](#)” on page 43.

- 12** Continue through the screens as outlined in [Section 2.5.3, “The YaST Configuration Phase,”](#) on page 41.

After you have completed the options in the Hardware Configuration screen, click *Next*.

- 13** Remove any CDs from the drive, and then click *Finish* to complete the installation.

The system reboots.

- 14** Login in as root on each Branch Server.

- 15** Unmount the drbd partition on both BS1 and BS2.

```
umount /drbd
```

- 16** On BS1 and BS2, edit the `/etc/fstab` file and remove the line that mounts the drbd partition.

- 17** Verify that the LDAP database on the Administration Server is accessible using a GUI-based LDAP browser or an `ldapsearch` command.

For example:

```
ldapsearch -x -h administration_server_name -b base_context -s base -D dn_of_admin_user -w password
```

- 18** Temporarily configure the heartbeat software on BS1 and BS2.

- 18a** Copy the `ha.cf` file from `/etc/opt/SLES/POS/ha/` to the `/etc/ha.d/` directory and make the following changes:

- ◆ Configure either the `bcast` or `ucast` line. If you activate `bcast`, the interface should be the heartbeat interface (`eth3`). If you activate `ucast`, the IP address is the heartbeat interface IP address on BS2 (for example, `eth3 192.168.3.2`).
- ◆ Make sure the node lines have the correct server names for BS1 and BS2.

- 18b** Copy the `authkeys` file from `/etc/opt/SLES/POS/ha/` to the `/etc/ha.d/` directory and change the permissions as follows:

```
chmod 600 authkeys
```

- 18c** Copy the `haresources` file from `/etc/opt/SLES/POS/ha/` to the `/etc/ha.d/` directory. Set the last line to the virtual IP address as follows:

```
bs1 192.168.1.3 #drbddisk::r0 Filesystem::/dev/drbd0::/  
drbd::ext3 # named dhcpd atftpd
```

NOTE: The rest of the line is commented out because drbd is not yet configured.

- 19** Use the following command to start heartbeat on BS1:

```
rheartbeat start
```

- 20** Execute `ifconfig` on BS1 to verify that the virtual IP interface (`eth1:0`) is active.

NOTE: This can take some time.

For more information on the `ha.cf`, `authkeys`, and `haresources` files, see [Section 7.6, “Heartbeat Configuration Files,”](#) on page 94.

7.3.2 Configuring the Branch Servers

This section describes the Branch Server configuration with the `posInitBranchServer.sh` script. Follow these steps for both nodes in the high availability Branch Server pair.

IMPORTANT: You must have created the `scBranchServer` object and its supporting organizational structure before you can run `posInitBranchserver.sh` and configure the Branch Server. For more information, see [Section 6.2, “Creating Branch Server Objects in LDAP,” on page 72](#).

- 1 Before starting the configuration script, ensure that the Branch Server can find its objects in the LDAP directory.

IMPORTANT: The Branch Server’s hostname must resolve to the IP address defined in the `--ipHostNumber` attribute of the `scNetworkcard` object; for example, 192.168.2.1. Otherwise, the Branch Server cannot find the `scBranchServer` object in the LDAP directory.

To ensure this resolution, make sure that, on each node, the `/etc/hosts` file includes the other node. For example:

```
192.168.1.1 bs1.east.boston.mycorp.us bs1
192.168.1.2 bs2.east.boston.mycorp.us bs2
```

- 2 Execute `posInitBranchserver.sh` at the BS1 server console only.
- 3 Specify your company name without spaces or special characters.
- 4 Specify your country abbreviation.
Use `us` for United States, `uk` for United Kingdom, `de` for Germany, and so forth.
- 5 Specify the IP address of the Administration Server.
Set the value according to the IP address you assigned when you configured the Administration Server.
- 6 The script attempts to connect to the Administration Server. If it fails, you are prompted again for the company name, country name, and password.
Otherwise, the script tries to determine the IP address, hostname, and domain name as it is defined in the LDAP database. If it fails, you are prompted for the Branch Server’s IP address.
If the Branch Server configuration is successful, the script displays the Branch Server’s name, IP address, and domain name, along with a success message.
- 7 Verify that the LDAP objects have been created for the Branch Servers using a GUI-based LDAP browser or an `ldapsearch` command. For example:

```
ldapsearch -x -h administration_server_name -b base_context -s base -D dn_of_admin_user -w password
```

7.3.3 Configuring drbd

Continue with these steps to configure the drbd service.

- 1 Configure drbd on BS1 and BS2.
 - 1a Copy the `drbd.conf` file from `/etc/opt/SLES/POS/ha/` to the `/etc/` directory.
 - 1b Make sure you have the right drbd partitions in the BS1 and BS2 sections of the `drbd.conf` file.

1c Make sure the IP addresses designated in the `drbd.conf` file are the `drbd` interface IP addresses.

In this example, the IP addresses are 192.168.2.1 and 192.168.2.2.

1d Execute the following command to make sure `drbd` is started automatically:

```
chkconfig drbd on
```

For more information, see [Section 7.7, “drbd Configuration File,” on page 96](#).

2 Execute the following commands on BS1 to start `drbd` and define BS1 as the primary server:

```
rcdrbd start
abort the wait
drbdsetup /dev/drbd0 primary
mke2fs -j /dev/drbd0
```

3 Start `drbd` on BS2 and control the synchronization of the network block device `/dev/drbd0`:

```
rcdrbd start
```

Wait for the sync to finish. This can take a while, and you might have to check the `/var/log/messages` file or run `rcdrbd status` and monitor progress.

4 Mount the `drbd` partition on BS1:

```
mount /dev/drbd0 /drbd
```

5 (optional) Verify that `drbd` is working.

5a Write to a file on the `/drbd` partition on BS1.

5b Unmount the `drbd` partition on BS1.

5c Define BS1 as the secondary server:

```
drbdsetup /dev/drbd0 secondary
```

5d Define BS2 as the primary server:

```
drbdsetup /dev/drbd0 primary
```

5e Mount the `drbd` partition on BS2.

```
mount /dev/drbd0 /drbd
```

5f Verify that the file with the correct data is there.

5g Unmount the `drbd` partition on BS2.

5h Define BS2 as the secondary server:

```
drbdsetup /dev/drbd0 secondary
```

5i Define BS1 as the primary server:

```
drbdsetup /dev/drbd0 primary
```

5j Mount the `drbd` partition on BS1.

```
mount /dev/drbd0 /drbd
```

6 Execute the following commands to stop all Branch Server services on BS1 and BS2:

```
rcdhcpd stop
rcnamed stop
rcatftpd stop
```

7 Change permissions for the `bsha_config.sh` file on BS1 and BS2.

```
chmod to a+rx bsha_config.sh
```

8 Run the `/bsha_config.sh` script on BS1 and BS2.

This script performs the following functions:

- ♦ It creates the following directories on the Branch Server:
 - ♦ drbd/etc/
 - ♦ drbd/tftpboot/
 - ♦ drbd/var/
- ♦ It moves all the data required for the Branch Server services to the drbd directories on the Branch Server.
- ♦ It creates the following links on the Branch Server:
 - ♦ /etc/opt/SLES/POS is linked to /drbd/etc/opt/SLES/POS.
 - ♦ /var/lib/named is linked to /drbd/var/lib/named.
 - ♦ /var/lib/dhcp is linked to /drbd/var/lib/dhcp.

9 Modify the last line of the /etc/ha.d/haresources file on BS1 and BS2 as follows:

```
bs1 192.168.1.3 drbddisk::r0 Filesystem::/dev/drbd0::drbd::ext3 #
named dhcpd atftpd
```

NOTE: The drbd portion no longer needs to be commented out because drbd is now configured. However, leave the services commented out until after you test data replication.

10 Start heartbeat on BS1:

```
umount /dev/drbd0
rheartbeat start
```

11 Start heartbeat on BS2:

```
rheartbeat start
```

12 Execute `ifconfig` on BS1 to verify that the virtual IP interface (eth1:0) is active.

NOTE: This can take several seconds.

13 Verify that the drbd partition is mounted on BS1.

14 (optional) Verify that heartbeat is failing over and failing back correctly:

14a Stop heartbeat on BS1:

```
rheartbeat stop
```

14b After a few seconds, verify that the virtual IP interface and drbd partition are unmounted on BS1 and activated on BS2.

14c Start heartbeat on BS1:

```
rheartbeat start
```

14d After a few seconds, verify that the virtual IP interface and drbd partition migrated back to BS1.

15 Modify the last line of the /etc/ha.d/haresources file on BS1 and BS2 as follows:

```
bs1 192.168.1.3 drbddisk::r0 Filesystem::/dev/drbd0::drbd::ext3
named dhcpd atftpd
```

NOTE: The entire line can now be uncommented because drbd is configured and data replication has been tested.

16 Execute the following commands on BS1 and BS2 to turn off automatic startup of the services during boot. Heartbeat takes care of starting these services.

```
chkconfig dhcpd off
chkconfig named off
chkconfig atftpd off
chkconfig heartbeat on
```

For information about testing a newly installed Novell Linux Point of Service system, refer to [Chapter 12, “Testing Your Novell Linux Point of Service Environment,”](#) on page 143.

7.4 Downloading Images from the Administration Server

After the primary Branch Server is up and running, you can run the `possyncimages.pl` script to download the Point of Service images that you have created from the Administration Server to the `/tftpboot/` directories on the Branch Server. They are then copied to the secondary Branch Server via `drbd`.

- 1 Verify the `scPosImage` object settings for the Point of Service images in the `/tftpboot/image/` directory.

IMPORTANT: You must create the `scPosImage` objects and set the `scPosImageVersion` attribute to `Active` before you boot the Point of Service terminals. The Point of Service terminals require an `scPosImage` object with an active `scPosImageVersion` attribute before they can download the corresponding physical image from the Branch Server at boot time. For more information on setting the `scPosImageVersion` attribute to `Active`, see [Section 11.2.7, “Activating Images,”](#) on page 132.

- 2 On BS1 only, run `possyncimages.pl` to download the Point of Service images.

NOTE: The `possyncimages.pl` script can also be used to update Point of Service images on the Branch Server. However, to implement image version changes, you must also activate the version changes inside the corresponding `scPosImage` objects in the LDAP directory. Otherwise Point of Service terminals already registered in LDAP and on the Branch Server cannot boot the new image version.

- 3 Verify the result of running the `possyncimages.pl` script by checking the contents of the following Branch Server directories:
 - ♦ `/tftpboot/boot`
 - ♦ `/tftpboot/image`

For more information on the Administration and Branch Server directory structure, see [“Novell Linux Point of Service Files and Directory Structure”](#) in the *Novell Linux Point of Service 9 Administration Guide*.

7.5 Starting the Core Script

Start the core script (`posleases2ldap`) as a daemon process on BS1.

- ♦ To verify that `posleases2ldap` is currently running, execute the following command:

```
rcposleases2ldap status
```

- ♦ To manually start the `posleases2ldap` service, execute the following command:

```
rcposleases2ldap start
```

- ♦ To ensure the Branch Server automatically starts the core script at boot time, execute the following command:

```
chkconfig posleases2ldap on
```

You are now ready to deploy the Point of Service terminals. For more information on this process, see [Chapter 11, “Deploying Point of Service Terminals,” on page 125](#).

7.6 Heartbeat Configuration Files

Three files are required to configure the Linux heartbeat software for Novell Linux Point of Service:

- ♦ `ha.cf`
- ♦ `authkeys`
- ♦ `haresources`

IMPORTANT: Templates of these files are provided in the `/etc/opt/SLES/POS/ha/` directory; however, all three files must be copied to the `/etc/ha.d/` directory on the active and standby servers to run HA services.

The following sections provide explanations and samples of these heartbeat configuration files.

7.6.1 `ha.cf`

`ha.cf` is the High Availability configuration file. There are many options in this file; however, the only parameters you must set are a set of nodes and the port or interface (serial, bcast, mcast, or ucast) for heartbeat.

IMPORTANT: The configuration file is read line by line, so the order of the configuration entries is very important. In particular, make sure that the timings and `udpport` are set before the heartbeat media are defined. If you maintain the original order of the items in the template file, everything will work correctly.

During the configuration of the HA Branch Server pair, you must modify the following parameters in the `ha.cf` file:

```
#       What UDP port to use for communication?
#               [used by bcast and ucast]
#udpport694
#
#       What interfaces to broadcast heartbeats over?
#bcast eth0          # Linux
#bcast eth1 eth2    # Linux
bcast eth3          # Linux
#bcast le0           # Solaris
#bcast le1 le2      # Solaris
#
#       Tell what machines are in the cluster node
#       nodename ...-- must match uname -n
#
ucast eth2 192.168.2.2
```

```
#
# Watchdog is the watchdog timer. If our own heart doesn't beat
# for a minute, then our machine will reboot.
#
# Tell what machines are in the cluster node
# nodename ...-- must match uname -n
node bs1
node bs2
```

7.6.2 authkeys

`authkeys` is the authentication file used to authenticate failover between the active (BS1) and standby (BS2) servers.

The available authentication methods are CRC, SHA1, and MD5. The default method is CRC; however, this method only verifies packet integrity—it provides no security. Therefore, it should be used only on physically secure networks.

To run HA services, this file must be in mode 600. For more information, see [Step 18b on page 89](#).

The file format is as follows:

```
auth 1
1 crc
#2 sha1 HI!
#3 md5 Hello!
```

7.6.3 haresources

IMPORTANT: The `haresources` files must be identical on all nodes of the cluster. The node name listed in front of the resource group information is the name of the preferred node to run the service. It is not necessarily the name of the current machine. If you are running `nice_failback OFF`, these services start on the preferred node any time it is up. If you are running with `nice_failback ON`, the node information is used for a simultaneous start-up. In either case, the `haresources` files must be identical. If your files are different, the HA services do not work.

`haresources` contains a list of resources that move from machine to machine as nodes go down and come up in the cluster. These resources are represented either as IP addresses or the name of scripts to run to “start” or “stop” the given resource.

The format is as follows:

```
node-name resource1 resource2 resource3 ...
```

If a resource name contains an `::` in the middle, the part after the `::` is passed to the resource script as an argument. Multiple arguments are separated by the `::` delimiter.

In IP addresses, the resource script name `IPAddr` is implied. For example, the IP address `135.9.8.7` could also be represented as `IPAddr::135.9.8.7`.

IMPORTANT: Do not include “administrative” or fixed IP addresses in this file.

7.7 drbd Configuration File

drbd is a block device which is designed to build high availability clusters by mirroring a whole block device using a dedicated network. It can be seen as a network RAID-1.

To simplify a high availability configuration, the configuration scripts soft-link the configuration files for the DHCP and DNS service. For this reason, the DHCP daemon must not run in chroot(1) environments. Choose the configuration `DHCPD_RUN_CHROOTED='no'` in the `/etc/sysconfig/dhcpd` file.

The `drbd.conf` file is the configuration file for the drbd service. It defines the following parameters:

NOTE: These parameters are required to run drbd; additional parameters can be defined for fine tuning. For more information on these parameters, refer to the comments in the `drbd.conf` file.

- ♦ The hostnames for BS1 and BS2.
- ♦ The device name of your drbd disk.
- ♦ The drbd disk.
- ♦ (optional) drbd meta-disks.

Meta-disk is either “internal” or “/dev/ice/name [idx].”

You can use a single block device to store meta-data for multiple drbd’s. For example, use meta-disk /dev/hde6[0]; and meta-disk /dev/hde6[1]; for two different resources. In this case the meta-disk would need to be at least 256 MB in size.

“internal” means that the last 128 MB of the lower device are used to store the metadata.

NOTE: Do not give an index with “internal.”

- ♦ The IP address and port of the drbd network on the server.

The format of these parameters in the `drbd.conf` file is defined as follows:

```
on bs1 {
    device      /dev/drbd0;
    disk        /dev/hda3;
    address     192.168.2.1:7788;
    meta-disk   internal;
}
on bs2 {
    device      /dev/drbd0;
    disk        /dev/hda3;
    address     192.168.2.2:7788;
    meta-disk   internal;
}
```

7.8 Updating High Availability Branch Servers

This section outlines the procedure to update a high availability Branch Server pair to a new support pack release of Novell Linux Point of Service 9. For ease of reference, the steps refer to the primary

Branch Server as BS1 and the secondary Branch Server as BS2. Substitute your own server names as necessary.

- 1** On the secondary Branch Server (BS2), stop Heartbeat by entering the command `rheartbeat stop`.
- 2** Upgrade the primary Branch Server (BS1) to the latest SLES 9 support pack release, following the steps in the Novell Linux Point of Service 9 [Support Pack Readme \(http://www.novell.com/documentation/nlpos9\)](http://www.novell.com/documentation/nlpos9).
- 3** Reboot BS1.
- 4** Upgrade BS1 to the latest Novell Linux Point of Service 9 support pack release, following the steps in the Novell Linux Point of Service 9 Support Pack Readme.
- 5** Restart Heartbeat on BS2 with the command `rheartbeat start`.
- 6** Stop Heartbeat on BS1 and wait for BS2 to become the primary.
- 7** Repeat Steps 2 through 4 to upgrade SLES 9, reboot the server, and upgrade the Novell Linux Point of Service 9 software on BS2 (the secondary Branch Server now acting as the primary).
- 8** On BS1, enter `rheartbeat start` to switch it back to being the primary Branch Server.
- 9** After updating the Branch Servers, turn off automatic startup of the `dhcp`, `named`, and `atftpd` services during boot by entering the following commands on both servers:

```
chkconfig dhcpd off
chkconfig named off
chkconfig atftpd off
```

- 10** Enable automatic startup of Heartbeat by entering the following command:

```
chkconfig heartbeat on
```


Setting Up an Admin/Branch Server Combo

8

For single store installations, the Administration and Branch Servers can be deployed on a single server. The Administration/Branch Server combination provides full Novell® Linux Point of Service system functionality (Administration Server, Branch Server, and Image Building Server) from a single server.

The Admin/Branch Server combination is supported only for self-contained installations. No additional Branch Servers can connect to the Admin/Branch Server. You can, however, create a two-node heartbeat cluster by installing two Admin/Branch Servers and configuring one as the primary and the other as the secondary.

This section reviews the procedures required to set up an Admin/Branch Server combination:

- ◆ [Section 8.1, “Meeting System Requirements,” on page 99](#)
- ◆ [Section 8.2, “Installing an Admin/Branch Server Combo,” on page 99](#)
- ◆ [Section 8.3, “Initializing the LDAP Directory,” on page 101](#)
- ◆ [Section 8.4, “Creating the Required LDAP Objects,” on page 103](#)
- ◆ [Section 8.5, “Copying the Default Boot Images,” on page 104](#)
- ◆ [Section 8.6, “Creating Point of Service Images,” on page 104](#)
- ◆ [Section 8.7, “Copying the Client Image Files,” on page 104](#)
- ◆ [Section 8.8, “Configuring the Branch Server,” on page 105](#)

8.1 Meeting System Requirements

The following list identifies the system requirements for an Administration/Branch Server combination:

- ◆ One server with an x86 processor
- ◆ A minimum of 4 GB hard disk space; recommended 25 GB

NOTE: This will vary depending on the size of your images.

- ◆ A minimum of 512 MB RAM; recommended 512 MB - 3 GB (at least 256 MB per CPU)
- ◆ One network card

WARNING: Because Admin/Branch Servers contain sensitive information, they should be secured. We recommend that you close unused ports and allow only the root user to have access to the server console.

8.2 Installing an Admin/Branch Server Combo

The following procedure outlines the steps required to set up an Admin/Branch Server combo.

8.2.1 Installing the Novell Linux Point of Service Software

To install the Novell Linux Point of Service software on the Admin/Branch Server:

- 1 Start the YaST utility by inserting *Novell Linux Point of Service 9 CD 1* into the drive and rebooting the computer.
- 2 At the SuSE boot screen, select *Installation*.
- 3 Go through the rest of the initial installation screens as outlined in [Section 2.5.1, “Starting the YaST Utility,”](#) on page 23.
- 4 When you get to the Installation Settings menu, make your settings as outlined in [Section 2.5.2, “The Installation Settings Screen,”](#) on page 28.

For the *Software* option, choose the *NLPOS Image Server* software selection.

This selection installs all Administration and Branch Server packages to the server, plus the Image Builder components listed in [Table 4-1](#).

Table 8-1 *Image Builder components*

Description	Location
ImageBuilder scripts (scr and xscr)	/usr/bin/
Image Description Trees	/opt/SLES/POS/system/image_name-version/
Distribution.xml template	/opt/SLES/POS/system/templates/
Image Specification Document templates	/opt/SLES/POS/system/templates/support/
Default configuration information for kernel drivers	/opt/SLES/POS/system/templates/drivers/
Child Image Specification Documents for client image add-on options	/opt/SLES/POS/system/templates/addons/

- 5 When you have finished making your installation settings, click *Accept*.
- 6 When prompted, answer Yes to start the installation.
YaST partitions the drive, applies the installation settings, and copies the necessary files from NLPOS CD 1 to disk.
- 7 As prompted, insert each requested CD and then click *OK*.
- 8 When it finishes with the basic installation, the system reboots and YaST starts again.
Continue through the screens as outlined in [Section 2.5.3, “The YaST Configuration Phase,”](#) on page 41.
- 9 After you have completed the options in the Hardware Configuration menu, click *Next*.
- 10 Remove any CDs from the drive, and then click *Finish* to complete the installation.
The system reboots.

You are now ready to initialize the Novell Linux Point of Service LDAP directory.

8.3 Initializing the LDAP Directory

All system information (system structure, the configuration and deployment method for the Branch Server, available client images, and Point of Service terminal types) is stored in an LDAP directory on the Admin/Branch Server.

Novell Linux Point of Service can use the following LDAP directories: IBM Directory Services, eDirectory™, or OpenLDAP. The `posInitLdap` script defines the LDAP directory schema and the initial records for OpenLDAP. Likewise, the `posInitEdir` script defines the directory schema and the initial records required for eDirectory.

NOTE: To run the LDAP directory on IBM Directory Services, run `posInitLdap`, then import the `/etc/opt/SLES/POS/template/ldif.pos` file into IBM Tivoli* Directory Server.

The following sections review the procedure required to run `posInitLdap` or `posInitEdir` and verify the LDAP directory.

- ♦ [Section 4.3.1, “Running posInitLdap.sh,” on page 61](#)
- ♦ [Section 4.3.2, “Running posInitEdir.sh,” on page 62](#)
- ♦ [Section 4.3.3, “Verifying the LDAP Directory,” on page 63](#)

8.3.1 Running posInitLdap.sh

The `posInitLdap` script defines the LDAP directory schema and the initial records for OpenLDAP. It cannot add the Novell Linux Point of Service LDAP directory to an existing openLDAP tree; it creates an entirely new LDAP directory tree.

To create the Novell Linux Point of Service LDAP directory for OpenLDAP:

- 1 After you have installed the Novell Linux Point of Service Admin/Branch Server, log in as root on the server.
- 2 Execute `posInitLdap.sh`.
- 3 Specify your company name without spaces or special characters.
- 4 Specify your country abbreviation.
Use `de` for Germany, `uk` for United Kingdom, `us` for United States, and so forth.
- 5 Specify the LDAP administrator password.

NOTE: You are assigning the password for the LDAP directory administrator account. The Admin/Branch Server uses this account to access the LDAP directory and this account is required to use `posAdmin` to add objects to the LDAP directory.

- 6 Determine if you want to use SSL when the Admin/Branch Server connects to the LDAP directory.
 - ♦ Select `Y` to use an SSL connection when the Admin/Branch Server connects to the LDAP directory.
 - ♦ Select `N` to disable SSL.
- 7 `posInitLdap` creates the certificates and keys required to run SSL regardless of whether or not SSL is enabled. This allows you to switch to SSL at a later time if desired.

NOTE: The keys and certificates are located in the `/etc/opt/SLES/POS/keys/` directory on the Admin/Branch Server.

- 8 `posInitLdap` provides a summary of the LDAP directory data based on your input. If all data is correct, press *Enter*.

If there is something wrong with the input data, abort the installation by pressing *Ctrl+C*.

- 9 The script initializes the basic LDAP database structure and performs some tests, then displays a summary of the configuration and test results. When the tests are successfully completed, the script displays a success message. To complete the initialization, press *Enter*.

8.3.2 Running `posInitEdir.sh`

The `posInitEdir` script defines the LDAP directory schema and the initial records for eDirectory. It cannot add the Novell Linux Point of Service LDAP directory to an existing eDirectory tree; it creates an entirely new tree.

To create the Novell Linux Point of Service LDAP directory for eDirectory:

- 1 After you have installed the Novell Linux Point of Service Admin/Branch Server, log in as root on the server.
- 2 Install eDirectory on the Admin/Branch Server.
- 3 Execute `posInitEdir.sh`.
- 4 Specify the eDirectory tree name you want to create.

IMPORTANT: `posInitEdir` does not add to an existing eDirectory tree.

- 5 Specify your company name without spaces or special characters.
- 6 Specify your country abbreviation.
Use `de` for Germany, `uk` for United Kingdom, `us` for United States, and so forth.
- 7 Specify the LDAP administrator password.

NOTE: This password is for the account the Admin/Branch Server uses to access the LDAP directory.

- 8 `posInitEdir` provides a summary of the LDAP directory data based on your input. If all data is correct, press *Enter*.
If there is something wrong with the input data, abort the installation by pressing *Ctrl+C*.
- 9 The script initializes the basic LDAP database structure and performs some tests, then displays a summary of the configuration and test results. When the tests are successfully completed, the script displays a success message. To complete the initialization, press *Enter*.

8.3.3 Verifying the LDAP Directory

After you run `posInitLdap` or `posInitEdir`, the LDAP directory has been initialized on the Admin/Branch Server and the LDAP service is available. At this point, you should have a basic tree structure with a root, a Country container, and an Organization container.

You can verify that the LDAP directory is accessible and that these objects have been created by using a GUI-based LDAP browser or an `ldapsearch` command.

For example:

```
ldapsearch -x -h administration_server_name -b o=mycorp,c=us -s base -  
D cn=admin,o=mycorp,c=us -w password
```

8.4 Creating the Required LDAP Objects

Next, you must use the `posAdmin` command to create the LDAP objects required to configure the Branch Server and boot its Point of Service terminals.

- ◆ Branch Objects
 - ◆ One or more **organizationalUnit** objects to represent your organizational structure.
 - ◆ An **scLocation** object for the site where the Admin/Branch Server is located.
 - ◆ An **scServerContainer** to contain the BranchServer objects.
 - ◆ An **scBranchServer** object and its associated configuration objects for the Branch Server.

IMPORTANT: You must create the `scBranchServer` object and its supporting organizational structure before you can run `posInitBranchserver.sh` to configure the Branch Server.

The Common Name (cn) of the `scBranchServer` object in the LDAP directory must match the hostname defined when you installed the Admin/Branch Server. For example, if the hostname is `bs1`, specify that for the `--cn` attribute of the `scBranchServer` object. For more information on defining the Branch Server hostname during installation, see [“Network Interfaces” on page 43](#).

- ◆ An **scCashRegister** object and its associated configuration objects for each type of Point of Service terminal in your system:

IMPORTANT: You must create `scCashRegister` and its associated objects before you can boot the Point of Service terminals.

- ◆ **scHarddisk** or **scRamDisk**
- ◆ **scConfigFileTemplate** (optional)
- ◆ **scConfigFileSyncTemplate** (optional)
- ◆ An **scPosImage** objects for each client image file that you want the Branch Server to distribute to Point of Service terminals.

IMPORTANT: You must create the `scPosImage` objects and set the `scPosImageVersion` attribute to Active before you boot the Point of Service terminals. The Point of Service terminals require an `scPosImage` object with an active `scPosImageVersion` attribute before they can download the corresponding physical image from the Branch Server at boot time. For more information on setting the `scPosImageVersion` attribute to Active, see [“Activating Images” on page 132](#).

For detailed instructions on creating these objects, see [Section 6.2, “Creating Branch Server Objects in LDAP,” on page 72](#).

8.5 Copying the Default Boot Images

This section explains how to copy the default boot images (initrd and the Linux kernel file) to the appropriate directories on the Admin/Branch Server so they are ready to be distributed to the Point of Service terminals.

- 1 Use the following command to copy the default initrd file to the `/opt/SLES/POS/rsync/boot/` directory as `initrd.gz` (type the command all on one line):

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.gz  
/opt/SLES/POS/rsync/boot/initrd.gz
```
- 2 Use the following command to copy the default kernel file to the `/opt/SLES/POS/rsync/boot/` directory as `linux` (type the command all on one line):

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.kernel.  
kernel_version /opt/SLES/POS/rsync/boot/linux
```

8.6 Creating Point of Service Images

Before you can deploy Point of Service terminals, you must first create image files that contain the operating system and application files required to boot the terminals. Before doing so, however, you must copy the image source files from the Novell Linux Point of Service CDs to the Admin/Branch Server and define their location.

- 1 Copy the image source files to your Admin/Branch Server using either the `POSCDTool` script or the `POSCopyTool` script.

For detailed instructions, see “[Managing Image Source Files with POSCDTool and POSCopyTool](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- 2 Define the location of the image source files in either the `AdminServer.conf` file (used by `scr`) or the `Distribution.xml` file (used by `xscr`).

For detailed instructions, see “[Generating AdminServer.conf or Distribution.xml](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- 3 Build the Point of Service image files.

For more information on this procedure, see “[Building Images with scr](#)” or “[Building Images with xscr](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

8.7 Copying the Client Image Files

After you have created the client images you need, you must copy the image files and their corresponding MD5 checksum files to the `/opt/SLES/POS/rsync/image/` directory. The Admin/Branch Server can then distribute the image files to the Point of Service terminals.

IMPORTANT: Both the client image files and their MD5 checksum files must be located in the `/opt/SLES/POS/rsync/image/` directory on the Admin/Branch Server before they can be distributed to Point of Service terminals when they are booted up.

The boot image files must be located in `/opt/SLES/POS/rsync/boot/`, as explained in [Section 8.5, “Copying the Default Boot Images,” on page 104](#).

8.8 Configuring the Branch Server

This section describes the Branch Server configuration with the `posInitBranchServer.sh` script.

8.8.1 Running the Initialization Script

IMPORTANT: You must have created the `scBranchServer` object and its supporting organizational structure before you can run `posInitBranchserver.sh` to configure the Branch Server. For more information, see [Section 6.2.1, “Creating organizationalUnit Objects,” on page 72](#).

- 1 Before starting the configuration script, ensure that the Branch Server can find its object in the LDAP directory.

IMPORTANT: The Branch Server’s hostname must resolve to the IP address defined in the `--ipHostNumber` attribute of the `scNetworkcard` object; for example, 192.168.2.1. Otherwise, the Branch Server cannot find the `scBranchServer` object in the LDAP directory.

To ensure this resolution, add the following line to the Branch server’s `/etc/hosts` file:

```
ip_address fully_distinguished_name hostname
```

For example,

```
192.168.2.1 bs1.boston.mycorp.com bs1
```

- 2 Execute `posInitBranchserver.sh` at the Branch Server console.
- 3 Specify your company name without spaces or special characters.
- 4 Specify your country abbreviation.

Use `de` for Germany, `uk` for United Kingdom, `us` for United States, and so forth.

- 5 Specify the IP address of the Administration Server.

NOTE: Because in this case the Administration and Branch Server are on the same machine, they have the same IP address. You can specify the machine’s actual IP address or use loopback (127.0.0.1) or `localhost`.

- 6 The script attempts to connect to the Administration Server. If it fails, you are prompted again for the company name, country name, and password.

Otherwise, the script tries to determine the Branch Server’s IP address, hostname, and domain name as it is defined in the LDAP database. If it fails, you are prompted for the Branch Server’s IP address.

If the Branch Server configuration is successful, the script displays the Branch Server’s name, IP address, and domain name, along with a success message.

- 7 Verify that the necessary LDAP objects have been created by using a GUI-based LDAP browser, such as GQ, or an `ldapsearch` command. For example:

```
ldapsearch -x -h administration_server_name -b o=mycorp,c=us -s  
base -D cn=admin,o=mycorp,c=us -w password
```

8.8.2 Copying Images to the tftpboot Directories

After the Branch Server has been configured, you can run the `possyncimages.pl` script to copy the Point of Service images you have created to the `/tftpboot/` directories.

- 1 Verify the `scPosImage` object settings for the Point of Service images in the `/tftpboot/image/` directory.

IMPORTANT: You must create the `scPosImage` objects and set the `scPosImageVersion` attribute to `Active` before you boot the Point of Service terminals. The Point of Service terminals require an `scPosImage` object with an active `scPosImageVersion` attribute before they can download the corresponding physical image from the Branch Server at boot time. For more information on setting the `scPosImageVersion` attribute to `Active`, see “[Activating Images](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- 2 Run `possyncimages.pl` to copy the Point of Service images to the `/tftpboot/` directories on the Branch Server.
- 3 Verify the results of running the script by checking the contents of the following directories:
 - ♦ `/tftpboot/boot/`
 - ♦ `/tftpboot/image/`

For more information on the Administration and Branch Server directory structure, see “[Novell Linux Point of Service Files and Directory Structure](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

NOTE: The `possyncimages.pl` script can also be used to update Point of Service images on the Branch Server. However, to implement image version changes, you must also activate the version changes inside the corresponding `scPosImage` objects in the LDAP directory. Otherwise Point of Service terminals already registered in LDAP and on the Branch Server cannot boot the new image version.

8.8.3 Starting the Core Script

Start the core script (`posleases2ldap`) as a daemon process on the Admin/Branch Server.

- ♦ To verify that `posleases2ldap` is currently running, execute the following command:

```
rcposleases2ldap status
```
- ♦ To manually start the `posleases2ldap` service, execute the following command:

```
rcposleases2ldap start
```
- ♦ To ensure that the Admin/Branch Server automatically starts the core script at boot time, execute the following command:

```
chkconfig posleases2ldap on
```

You are now ready to boot the Point of Service terminals. For more information on this process, see [Section 11.4, “Booting the Point of Service Terminal,” on page 136](#).

Setting Up a POSBranch Terminal

9

For stores where the Branch Server is only running the Novell® Linux Point of Service infrastructure (that is, the Branch Server is running no additional applications), the Branch Server can be deployed as a control terminal running on Point of Service hardware.

This configuration requires that you build a POSBranch image using `xscr` and install the image on a Point of Service terminal. For more information on building images using `xscr`, see “[Building Images with the xscr ImageBuilder Tool](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

WARNING: Because the POSBranch terminal contains sensitive information, it should be secured. We recommend that you close unused ports and allow only the root user to have access to the server console.

This section reviews the steps required to build a POSBranch image and use it to boot a POSBranch terminal.

- ◆ [Section 9.1, “Preparing the Administration Server,” on page 107](#)
- ◆ [Section 9.2, “Building the POSBranch Image,” on page 108](#)
- ◆ [Section 9.3, “Creating a Bootable CD for the POSBranch Terminal,” on page 110](#)
- ◆ [Section 9.4, “Booting the POSBranch Terminal,” on page 114](#)

9.1 Preparing the Administration Server

To prepare for creating the POSBranch image:

- ◆ You must have installed the ImageBuilder tools either on the Administration Server or on a dedicated Image Building Server.

For more information on installing ImageBuilder, see [Chapter 4, “Setting Up the Administration Server,” on page 59](#) or [Chapter 5, “Setting Up a Dedicated Image Building Server,” on page 67](#).

- ◆ Copy the SLES image source files from the Novell Linux Point of Service CDs to a central distribution directory.

For more information, see “[Copying the Novell Linux Point of Service CDs to a Central Distribution Directory](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- ◆ Define the location of the image source files in the `AdminServer.conf.sles` file. This file is automatically generated when you create `AdminServer.conf`.

For more information, see “[Defining the Location of the Image Source Files](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

- ◆ Provide access to a CD writer to create the boot media.

NOTE: The CD writer does not need to be installed on the Administration Server if the CD images can be transferred through the network to a machine equipped with a CD recorder.

9.2 Building the POSBranch Image

This section explains how to build the image for the POSBranch terminal.

9.2.1 Cloning the Image Description Tree

xscr builds images using a specific file system directory structure known as the Image Description Tree. The Image Description Tree provides the XML documents, scripts, configuration files, and other components required to build client images for Point of Service systems.

To create a POSBranch image, you can use any of the client Image Description Trees provided with Novell Linux Point of Service (Minimal, Java, Browser, or Desktop). The Image Description Trees are located at `/opt/SLES/POS/system/image_name-version/`.

To maintain a standardized source tree and simplify the upgrade process, it is recommended that you maintain the default Image Description Trees provided with Novell Linux Point of Service as master copies. To build a POSBranch image, you can clone one of the default Image Description Trees, then modify the cloned tree.

When you clone an Image Description Tree using xscr, you can define the image distribution as NLD or SLES (`--dist nld | sles`). POSBranch images require the SLES distribution.

NOTE: NLD is the default distribution type. Therefore, if you do not specify the image distribution when cloning the Image Description Tree, xscr defaults to NLD.

When you define the image distribution as SLES, xscr adds a child document (`image_name-sles.xml`) to the parent Image Specification Document that includes the SLES RPMs in the image.

Here is the syntax to clone an Image Description Tree to create a POSBranch image (type the command all on one line):

```
xscr --create image_name-version --image image_name-version --dist sles
```

For example, the following command clones the Desktop-2.0.21 Image Description Tree to create a new SLES-based Image Description Tree named myImage-1.1.1:

```
xscr --create myImage-1.1.1 --image desktop-2.0.21 --dist sles
```

The new Image Description Tree is located at `/opt/SLES/POS/system/myImage-1.1.1`. You can then modify this cloned Image Description Tree as required to create the POSBranch image.

For a description of the individual Image Description Tree components, see “[Image Description Tree](#)” and “[Novell Linux Point of Service Files and Directory Structure](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

9.2.2 Adding branch.xml to the Parent Image Specification Document

Image Specification Documents contain XML elements that define the structure, configuration, and other components required to build images for Point of Service terminals. In general, a master Image Specification Document (or parent document) defines general image parameters and individual

image subcomponents such as add-on features, custom applications, and so forth are defined in sub-documents referred to as child documents.

The default Image Description Trees provided with Novell Linux Point of Service have a parent Image Specification Document at the root of the tree. After you clone the tree you want to use to build the POSBranch image, you must add `branch.xml` as a child document in the `IncludeSpecificationList` element within the parent Image Specification Document. For more information, see “[IncludeSpecificationList](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

The syntax to include the `branch.xml` document in the `IncludeSpecificationList` element is as follows:

```
<IncludeSpecificationList>
  <IncludeSpecification URI="/opt/SLES/POS/system/templates/
    support/branch.xml"/>
</IncludeSpecificationList>
```

The `branch.xml` document provides the following Branch Server components:

- ◆ All the RPMs required for a functional Branch Server.
- ◆ The RPM database so YAST2-Online Update can be used to update the image.
- ◆ The Linux Kernel Crash Dump (LKCD) to provide a system for detecting, saving and examining system crashes.
- ◆ Branch Server configuration information obtained from the LDAP directory.

9.2.3 Generating the POSBranch Image

The POSBranch image must be deployed on a bootable CD. This requires that you generate the POSBranch image with a CDBoot image.

Novell Linux Point of Service provides a default Image Description Tree (`/opt/SLES/POS/system/cdboot-version`) and Image Specification Document (`/opt/SLES/POS/system/templates/support/cdboot.xml`) for CDBoot images. You can use these components to generate the CDBoot image.

You must also create a `config.image` file. ImageBuilder uses the parameters defined in the `config.image` file to build the CDBoot and POSBranch images. For information on creating this file, see [Section 9.3.2, “Creating the config.image File,” on page 110](#).

To build the CDBoot image, you must use ImageBuilder’s CD boot feature. This feature requires the CD setup directory as a parameter so ImageBuilder can locate the `config.image` file. It then uses the parameters defined in the `config.image` file to create the CDBoot image. When you generate the CDBoot image, ImageBuilder also builds the client image designated in the `config.image` file’s `IMAGE` parameter.

IMPORTANT: You must designate the POSBranch image in the `config.image` file’s `IMAGE` parameter.

Here is the syntax to generate the CDBoot and POSBranch images (type the command all on one line):

```
xscr --prepare --build --image image_name-version --feature
boot_cd:config=CD_setup_directory --destdir directory
```

For example, the following command creates the CDBoot and client images as specified in the `config.image` file in the `/tmp/cdsetup` directory and saves the images to `/tmp/mycd`.

```
xscr --prepare --build --image cdboot-2.0.21 --feature
boot_cd:config=/tmp/cdsetup --destdir /tmp/mycd
```

9.3 Creating a Bootable CD for the POSBranch Terminal

After the CDBoot and client images are generated, you are ready to create the final ISO image.

The ImageBuilder utility includes an option to generate CDBoot images. ImageBuilder generates an ISO9660-compliant CD image that is bootable according to the El Torito specification. The resulting CD contains a minimal Linux system image (CDBoot), a Linux system client image (Minimal, Java, Browser, or Desktop), and a `config.image` configuration file. The configuration file controls whether the client image is written into a RAM disk or if it must be placed on the hard disk of the booting node.

To create a CDBoot image, you must complete the following steps:

- 1 Create the CD setup directory.
- 2 Create the `config.image` file.
- 3 Generate the CDBoot image and its associated client image.
- 4 Generate the CD ISO image.

These steps are discussed in the following sections.

9.3.1 Creating the CD Setup Directory

Because all the files for a CDBoot image must be part of the CD, they must be centrally located in a setup directory. Therefore, the first step in preparing the CDBoot image is putting all the required configuration files into a centralized setup directory. This includes the `config.image` file and any other files required to configure the Point of Service terminal, such as `XF86Config` files.

Use the following command to create a CD setup directory:

```
mkdir /tmp/cdsetup_directory
```

After you have created the CD setup directory, you are ready to create the `config.image` file and copy other configuration files required for the CDBoot image.

9.3.2 Creating the `config.image` File

The `config.image` file contains the parameters required to configure a specific Point of Service terminal during a CDBoot; that is, it indicates which client image the terminal should load and how to do it. The `config.image` file is an ASCII, line-based file that can be created in a text editor. It must be named “`config.image`” and it must be located in the CD setup directory.

The format of the `config.image` file is as follows:

```
IMAGE=device;name;version
CONF=source;dest,...,source;dest
PART=size;id;Mount,...,size;id;Mount
JOURNAL=ext3
```

DISK=*device*
 FEATURE=contents of the --feature option
 EXTEND=contents of the --extend option
 PARAMS=additional options of type bool

Table 9-1 provides a detailed description of each parameter in `config.image`.

Table 9-1 Parameters for the `config.image` file

Parameter	Description
IMAGE= <i>device;name;version</i>	<p>Specifies the client image (<i>name</i>) and version (<i>version</i>) that will be loaded on the Point of Service terminal. When you generate the CDBoot image, ImageBuilder uses this information to generate the client image with the CDBoot image.</p> <ul style="list-style-type: none"> ◆ <i>device</i> is the storage device to which the image is linked; for example, <code>/dev/hda2</code> or <code>/dev/ram1</code>. <hr/> <p>NOTE: For a Point of Service terminal with a hard disk, partition <code>hda1</code> is used for the swap partition and <code>hda2</code> defines the root (<code>/</code>) file system. The RAM device should not be confused with the hard disk device which uses a partition table. On a RAM disk device, <code>/dev/ram0</code> is used for the initial RAM disk and cannot be used as storage device for the client image. It is recommended that you use <code>/dev/ram1</code> for the RAM disk.</p> <hr/> <ul style="list-style-type: none"> ◆ <i>name</i> is the client image to load on the Point of Service terminal. ◆ <i>version</i> is the version of the client image to load on the Point of Service terminal.
CONF= <i>source;dest, . . . ,source;dest</i>	<p>Specifies the configuration files to download to the Point of Service terminal. The data is provided in a comma-separated list in the form <i>source;dest</i> where</p> <ul style="list-style-type: none"> ◆ <i>source</i> is the path to the source configuration file. ◆ <i>dest</i> in an absolute path below the client image where the configuration file is saved.
PART= <i>size;id;Mount, ...,size;id;Mount</i>	<p>Specifies hard disk partitioning data. The data is provided in a comma-separated list in the form <i>size;id;Mount</i> where</p> <ul style="list-style-type: none"> ◆ <i>size</i> is the size of the partition <p>If a partition should take all the space left on a disk, use a lowercase <code>x</code> as the size specification.</p> <ul style="list-style-type: none"> ◆ <i>id</i> is the partition type number ◆ <i>Mount</i> is the partition mount point <hr/> <p>IMPORTANT: The swap partition must not contain a mount point. A lowercase letter <code>x</code> must be set instead.</p> <hr/> <p>The first element of the list defines the swap partition. The second element of the list defines the root partition.</p>

Parameter	Description
JOURNAL=ext3	<p>Specifies a journal to be added to the file system.</p> <p>The value for this parameter must be set to ext3 because that is the only journaled filesystem Novell Linux Point of Service supports.</p> <hr/> <p>NOTE: If you have an existing ext2 image, you can change the file system by setting a flag in the scCashRegister or scWorkstation object rather than re-creating the image. If ext3 is specified in either LDAP object, the Point of Service terminal extends the file system to ext3 when the image is deployed.</p> <hr/> <p>The JOURNAL parameter is evaluated only if the DISK parameter is set.</p>
DISK=device	<p>Defines the device through which the hard disk can be addressed; for example /dev/hda.</p> <p>This parameter is used only with PART.</p>
FEATURE=string	<p>The value of the --feature option used for building the client image. This optional parameter is only pertinent while the client image is created.</p> <p>For information, refer to “scr Commands” or “xscr Commands” in the <i>Novell Linux Point of Service 9 Administration Guide</i>.</p>
EXTEND=string	<p>The value of EXTEND is the value of the --extend option used to extend an image with an additional RPM package. This optional parameter is only pertinent while the client image is created.</p> <hr/> <p>IMPORTANT: The EXTEND parameter can be used only for CDBoot images generated with scr. The xscr utility uses the <code>ImageSpecification.xml</code> document to add additional packages to the CDBoot image.</p> <hr/> <p>For information, refer to “scr Commands” in the <i>Novell Linux Point of Service 9 Administration Guide</i>.</p>
PARAMS=string	<p>The value consists of bool options that are used for special actions. This optional parameter is only pertinent while the client image is created.</p> <p>This parameter can be used with the --gzip option to compress the image. The CDboot linuxrc recognizes a compressed image referring to the <code>suffix.gz</code>. A compressed CD image is uncompressed on the fly while the image is installed.</p> <p>For POSBranch images, it is recommended that you add the following line to the <code>config.image</code> file:</p> <pre>PARAMS=--keep-rpm</pre> <p>This allows you to use the YaST2 interface to configure POSBranch terminals. However, it adds approximately 30 MB to the size of the image. If the size of the image is an issue, you can leave out the RPMs; however, you will not have YaST2 functionality.</p>

9.3.3 Generating the CDBoot Image

To build the CDBoot image, you must use ImageBuilder's CD boot feature. This feature requires the CD setup directory as a parameter so ImageBuilder can locate the `config.image` file. It then uses the parameters defined in the `config.image` file to create the CDBoot image. When you generate the CDBoot image, ImageBuilder also builds the client image designated in the `config.image` file's `IMAGE` parameter. For information on the `config.image` file's format and parameters, see [Section 9.3.2, "Creating the config.image File," on page 110](#).

IMPORTANT: Because ImageBuilder automatically generates the client image when it builds the CDBoot image, the Image Description Trees for both the CDBoot and client images must be complete before generating the CDBoot image.

The CDBoot build syntax is as follows (type the command all on one line):

```
xscr --prepare --build --image image_name-version --feature  
boot_cd:config=CD_setup_directory --destdir directory
```

For example, the following command creates the CDboot and client images as specified in the `config.image` file in the `/tmp/cdsetup` directory and saves the images to `/tmp/mycd/`:

```
xscr --prepare --build --image cdboot-2.0.21 --feature  
boot_cd:config=/tmp/cdsetup --destdir /tmp/mycd
```

NOTE: The syntax and example shown above are for using `xscr`; however, the processes are the same for `scr` and `xscr`; only the executable changes.

9.3.4 Creating the CD ISO Image

After the CDBoot and client images are generated, you are ready to create the final ISO image. ImageBuilder's `--create-iso` option builds the following components in the ISO image:

- ◆ The CD directory structure
- ◆ All necessary boot manager files
- ◆ The CDBoot and client images

The `--create-iso` command syntax is as follows:

```
xscr --create-iso image_name.iso --destdir directory
```

For example, the following command creates an ISO image named `mycd.iso` in the `/tmp/mycd` directory.

```
xscr --create-iso mycd.iso --destdir /tmp/mycd
```

The `--destdir` parameter defines the target and the source directory. The CDBoot and client images you previously created must be located in the destination directory. At the end of the process, you will have three images in the directory: the CDBoot image, the client image, and the final ISO image.

NOTE: The syntax and example shown above are for `xscr`; however, the processes are the same for `scr` and `xscr`; only the executable changes.

9.3.5 Burning the Boot CD

When the process is complete, use a CD recording program to burn the ISO image (for example, `/tmp/mycd/mycd.iso`) to a CD.

9.4 Booting the POSBranch Terminal

After you have burned the CDBoot ISO image to a CD, you can use the CD to boot and configure the POSBranch terminal.

NOTE: If there are multiple CD drives in the Point of Service terminal, there is no way to designate which CD drive to use; the system chooses the first one it finds. If the Point of Service terminal does not find the drive with the boot CD, it returns BIOS errors. To correct the problem, insert the CD in the bootable CD drive.

Depending on the client image you used to build the POSBranch image (Minimal, Java, Browser, or Desktop), you should note the following restrictions:

- ◆ The Point of Service terminal needs to be upgraded with enough RAM to hold the client image.
- ◆ There must be enough available RAM on diskless Point of Service terminals to load the first and second stage boot images. Otherwise, the terminal returns a kernel panic error.

NOTE: Keep in mind that onboard VGA reduces the Point of Service terminal's available RAM.

The behavior of Point of Service terminals booting from CD is similar to Point of Service terminals that receive the first and second stage boot image over the LAN from a Branch Server:

1. The POSBranch image is installed to a RAM or hard disk drive on the Point of Service terminal.

The partition information resides in the `config.image` file located on the CD.

NOTE: For electronic distributions, the partition information is created based on LDAP entries on the Administration Server.

2. The installed client image is booted from the RAM or hard disk drive on the Point of Service terminal.

Automatic Branch Server Installation

10

In the two-tiered Administration Server and Branch Server architecture, the Branch Servers are assumed to be in a remote environment, sometimes far from knowledgeable Linux administrators. To simplify Branch Server installation, Novell® Linux Point of Service 9 provides a toolkit that enables administrators to create autoinstall media to automatically install and set up Branch Servers with very little on-site effort.

This functionality is provided through AutoYaST. AutoYaST provides an automatic installation option that allows new branches to be set up at minimal expense. An AutoYaST control file is provided for the basic setup and the description files are generated from the LDAP directory. The resulting ISO file is then burned to a CD for deployment at the Branch Server site.

NOTE: Automatic Branch Server images are created only in ISO format; therefore, CD is the only supported media.

This section outlines the steps required to build an Automatic Branch Server Installation image:

- ♦ [Section 10.1, “Preparing the Administration Server,” on page 115](#)
- ♦ [Section 10.2, “Creating the Branch Server Definition in the LDAP Directory,” on page 116](#)
- ♦ [Section 10.3, “Modifying the Branch Server Configuration Template \(template.xml\),” on page 119](#)
- ♦ [Section 10.4, “Generating the Automatic Branch Server Installation Image,” on page 120](#)
- ♦ [Section 10.5, “Creating the Boot Media,” on page 121](#)
- ♦ [Section 10.6, “Starting Up the Branch Server,” on page 122](#)

10.1 Preparing the Administration Server

To prepare for creating the POSBranch image:

- ♦ You must have installed the ImageBuilder tools either on the Administration Server or on a dedicated Image Building Server.

For more information on installing ImageBuilder, see [Chapter 4, “Setting Up the Administration Server,” on page 59](#) or [Chapter 5, “Setting Up a Dedicated Image Building Server,” on page 67](#).

- ♦ Copy the SLES image source files from the Novell Linux Point of Service CDs to a central distribution directory.

For more information, see [“Copying the Novell Linux Point of Service CDs to a Central Distribution Directory”](#) in the *Novell Linux Point of Service 9 Administration Guide*.

- ♦ Define the location of the image source files in the `AdminServer.conf.sles` file. This file is automatically generated when you create `AdminServer.conf`.

For more information, see [“Defining the Location of the Image Source Files”](#) in the *Novell Linux Point of Service 9 Administration Guide*.

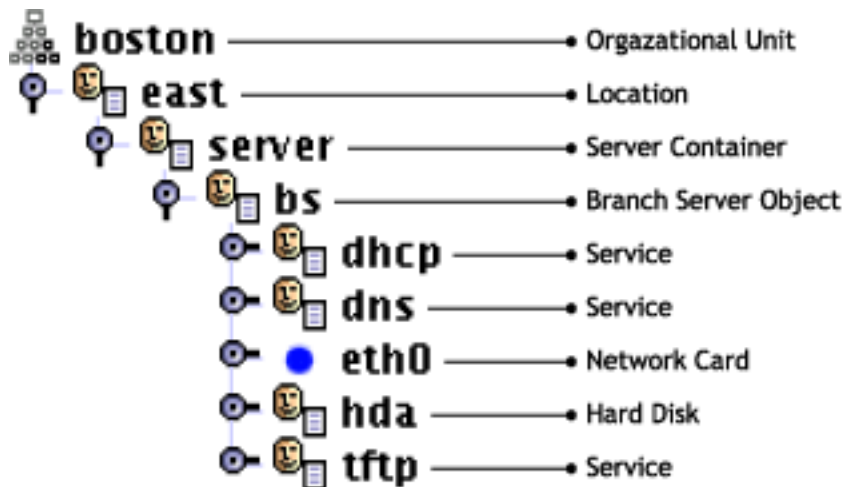
- ◆ Provide access to a CD writer to create the boot media.

NOTE: The CD writer does not need to be installed on the Administration Server if the CD images can be transferred through the network to a machine equipped with a CD recorder.

10.2 Creating the Branch Server Definition in the LDAP Directory

To enable the autoinstall system to configure the branch server, detailed information about the hard disk and the network interfaces must be defined in the LDAP directory. [Figure 10-1](#) represents the LDAP objects required to define the structure for a Branch Server.

Figure 10-1 LDAP objects required for Branch Server definition



[Table 10-1](#) reviews the attributes for each LDAP object required to provide the Branch Server definition. For more information about the LDAP directory, refer to “[The Novell Linux Point of Service LDAP Directory](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

Table 10-1 Attributes for Branch Server LDAP objects.

LDAP Object	Required Properties
scLocation	Defines general information about the Branch Server network. Required attributes include the following: <ul style="list-style-type: none"> ◆ cn ◆ ipNetworkNumber ◆ ipNetmaskNumber ◆ scDhcpRange ◆ scDhcpFixedRange ◆ scDefaultGw ◆ scDynamicIp

For more information, see “[Creating an scLocation Object](#)” on page 73.

LDAP Object	Required Properties
scServerContainer	<p>Specifies a container for the Branch Server definition. The only required attribute for this container object is the cn.</p> <p>For information, see “Adding an scBranchServer Object” on page 74.</p>
scBranchServer	<p>Specifies a container for the hardware objects that provide the Branch Server definition. The only required attribute for this container object is the cn.</p> <p>For more information, see “Adding an scBranchServer Object” on page 74.</p>
scNetworkcard	<p>Provides the configuration for a Branch Server network interface card. Required attributes include the following:</p> <ul style="list-style-type: none"> ◆ scDevice, the network device (such as eth0 or eth1) ◆ ipHostNumber, the IP address of the Branch Server ◆ ipNetmaskNumber, the netmask of the Branch Server’s network ◆ scModul, the loadable module (driver) that is necessary to activate the network card <p>For example:</p> <pre>posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret --base cn=bs,cn=server,cn=lab,ou=boston, o=mycorp,c=us --add --scNetworkcard --scDevice eth2 --ipHostNumber 192.168.1.150 --ipNetmaskNumber 255.255.248.0 --scModul e100</pre>

LDAP Object	Required Properties
scHarddisk	<p>Provides the configuration for the Branch Server's boot hard disk. Required attributes include the following:</p> <ul style="list-style-type: none"> ◆ cn ◆ scDevice ◆ scHdSize ◆ scPartitionsTable <p>The partitioning scheme for Branch Servers is the same as for Point of Service terminals. For scPartitionsTable, use the form '<i>size type mount,...</i>', where <i>size</i> is specified in megabytes, <i>type</i> is either L for Linux file systems or S for swap space, and <i>mount</i> specifies where in the file system hierarchy the partition is mounted.</p> <p>For <i>size</i>, you can use the wildcard "x" to automatically compute the size of the file system as follows:</p> <ul style="list-style-type: none"> ◆ S partitions are created at twice the RAM size ◆ L partitions with mount point /boot get approximately 20 megabytes ◆ (Optional) The last partition entry in the list can specify an x to use up the remaining space on the hard disk. <p>Separate partition entries with a semicolon (;). For swap space partitions, "x" must be used as the mount point.</p> <p>For a simple branch server, the scPartitionsTable value of 'x S x;x L /' is suggested, which creates the default swap space and one large root file system.</p> <p>For example:</p> <pre>posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret --base cn=bs,cn=server,cn=lab,ou=boston,o=mycorp,c=us --add --scHarddisk --cn sda --scDevice /dev/sda --scHdSize 40960 --scPartitionsTable 'x S x;x L /'</pre>
scService	<p>Defines Branch Server services, which can include DHCP, DNS, FTFP, NTP, and RSYNC. Required attributes include the following:</p> <ul style="list-style-type: none"> ◆ cn ◆ ipHostNumber ◆ scDnsName ◆ scServiceName ◆ scServiceStartScript ◆ scServiceStatus <hr/> <p>NOTE: High Availability services (scHAServices) are not supported for Automatic Branch Server Installation.</p> <hr/> <p>For more information, see "Adding an scBranchServer Object" on page 74.</p>

For more information about using posAdmin to create LDAP objects, see ["Using posAdmin to Manage the LDAP Directory"](#) in the *Novell Linux Point of Service 9 Administration Guide*.

10.3 Modifying the Branch Server Configuration Template (template.xml)

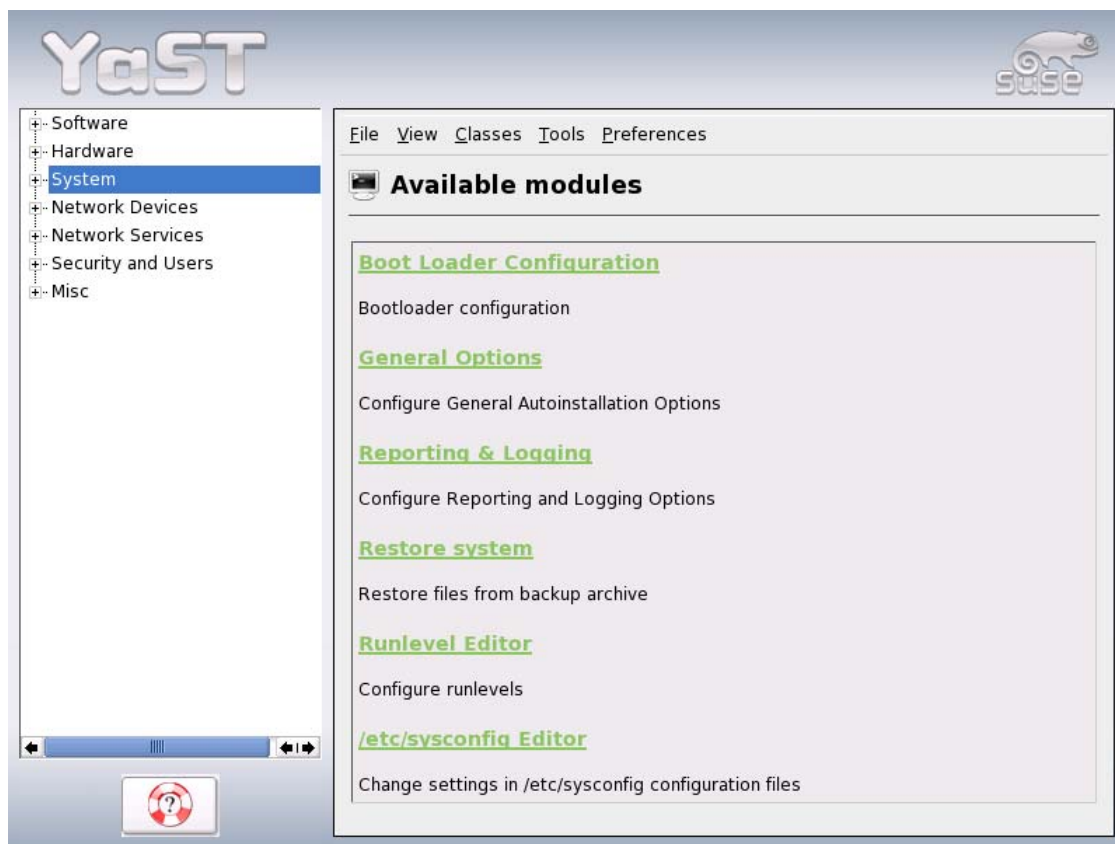
The default Branch Server configuration is defined in the XML template file, `/opt/SLES/POS/xml/template.xml`. The DTD (document type definition) which defines the template document's structure is found in `/usr/share/YaST2/include/autoinstall/profile.dtd`.

NOTE: As with the Image Specification and Distribution Source Documents, this template can be defined in an XML editor or in a standard text editor. However, it is strongly recommended that you modify the document only with the AutoYaST GUI system. The modification procedure described in this section uses the AutoYaST GUI system.

To modify the `template.xml` document using the AutoYaST system:

- 1 Start YaST with the `yast2 autoyast` command to display the YaST configuration management system (see [Figure 10-2](#)).

Figure 10-2 AutoYaST configuration management system



- 2 Select *Preferences* to set the profile repository to the template file directory (`/opt/SLES/POS/xml/`).
- 3 Click *File > Open* and select the template file (`/opt/SLES/POS/xml/template.xml`). Modify the sections of the template.

You can change time zone, add software packages, and change system parameters.

A menu system similar to the YaST configuration interface allows you to modify specific sections of the template.

- 4 After the XML template has been modified with AutoYaST, remove the DOCTYPE entry because it cannot be parsed correctly by the XSLT processor that is used to transform the file.

To perform this operation, run the following command to clean the template file:

```
xmllint --dropdtd template-yast2.xml >template.xml
```

10.4 Generating the Automatic Branch Server Installation Image

The `posldap2autoinstcd.pl` script is used to create the Automatic Branch Server Installation images. It generates an ISO file (`autoinst.iso`) and an XML document (`autoinst.xml`). This utility is located in the `/usr/sbin` directory.

Here is the command syntax to generate the Automatic Branch Server Installation images:

```
posldap2autoinstcd.pl [options]
```

Table 10-2 gives a description of the command options.

Table 10-2 Command options for `posldap2autoinstcd.pl`

Option	Description
<code>--DN <i>branchserverdn</i></code>	<p>Defines the distinguished name (DN) of the Branch Server, which is used to create the following:</p> <ul style="list-style-type: none">◆ An ISO image, <code>autoinst.iso</code>, that fits the description in the template file. It contains all necessary software.◆ An XML template file, <code>autoinst.xml</code>, that instructs AutoYaST to install the system, set up network interfaces, and configure the Branch Server system so it is ready to use. <p>This parameter is required.</p>
<code>[--user <i>ldapuser</i>]</code>	<p>Defines the user account the Branch Server uses to connect to the LDAP directory on the Administration Server.</p> <p>This parameter is optional. If it is not defined, the Branch Server uses the admin account and password created by the <code>posInitLdap.sh</code> or <code>posInitEdir.sh</code> script during the initial configuration of the Administration Server.</p>
<code>[--password <i>ldap_password</i>]</code>	<p>Defines the password the Branch Server uses to connect to the LDAP directory on the Administration Server.</p> <p>This parameter is optional. If it is not defined, the Branch Server uses the admin account and password created by the <code>posInitLdap.sh</code> or <code>posInitEdir.sh</code> script during the initial configuration of the Administration Server.</p>

Option	Description
<code>--SLES <i>distribution_directory</i></code>	<p>Defines the path to the distribution directory where the SLES RPMs required to build the Automatic Branch Server Installation image are located.</p> <p>This parameter is optional. If it is not defined, the script uses the default distribution directory, <code>/opt/SLES/POS/dist/</code>.</p>
<code>--SP <i>directory</i></code>	<p>Specifies the directory where an SLRS or SLES service pack is available. This option is used to integrate a service pack into the boot or installation system.</p> <p>This parameter is optional. If it is not defined, the script uses only the SLES RPM packages specified in the <code>AdminServer.conf</code> file or the <code>Distribution.xml</code> document. For more information on these files, see “AdminServer.conf” or “Distribution Source Document (Distribution.xml)” in the <i>Novell Linux Point of Service 9 Administration Guide</i>.</p>
<code>--output <i>directory</i></code>	<p>Defines the directory where the Automatic Branch Server Installation images, <code>autoinst.iso</code> and <code>autoinst.xml</code>, are created.</p> <p>This parameter is optional. If it is not defined, the images are created in the directory where the script is executed.</p>
<code>--tmp <i>directory</i></code>	<p>Defines the directory the script uses for temporary files. The default is <code>/tmp/</code>.</p>
<code>--xml <i>document</i></code>	<p>Defines the name of the Automatic Branch Server Installation XML document produced in the output.</p> <p>This parameter is optional. If it is not defined, the XML document is named <code>autoinst.xml</code>.</p>
<code>--template <i>template</i></code>	<p>Defines the directory where the template file used to create the Automatic Branch Server Installation image is located.</p> <p>This parameter is optional. If it is not defined, the script uses the default template, <code>/opt/SLES/POS/xml/template.xml</code>.</p>

The following example command creates an Automatic Branch Server Installation image with the following parameters:

- ◆ The Branch Server is associated with `scBranchServer` object `bs.server.branch.boston.mycorp.us`.
- ◆ The branch server uses the user account `cn=admin,o=mycorp,c=us` to log in to the LDAP directory, and the password for this account is “secret.”

```
posldap2autoinstcd.pl --DN cn=bs,cn=server,cn=branch,ou=boston,o=mycorp,c=us --user cn=admin,o=mycorp,c=us --password secret
```

10.5 Creating the Boot Media

After you generate the Automatic Branch Server Installation images, you are ready to create the CD and floppy disk used to boot and configure the Branch Server.

10.5.1 Creating the Boot CD

To create the boot CD:

NOTE: In this example, `cdrecord` is used to burn the CD image on a CD recorder. `cdrecord` is a Linux command line program that can burn data or audio onto a CD or DVD recorder.

- 1 Use the following command to find your CD recorder device:

```
cdrecord -scanbus
```

Linux returns the following information:

```
cdrecord dev=2,0,0
          2,0,0 200) 'PIONEER' 'DVD-RW DVR-106D' '1.07' Removable CD-ROM
```

- 2 Burn the Automatic Branch Server Installation ISO image (`autoinst.iso`) to the CD:

```
cdrecord dev=2,0,0 autoinst.iso
```

10.5.2 Creating the Floppy Disk

To create the floppy disk;

- 1 Create a file named `info` to control the AutoYaST process. It must contain the following lines:

```
install=cd:///
autoyast=floppy:///autoinst.xml
autoyast2=floppy:///autoinst.xml
```

- 2 Create a file named `posInitBranchserver.auto.cfg` to control the automatic setup of the branch server software. It must contain the following lines:

```
COMPANYNAME="your_company_name"
COUNTRY="country"
ADMINSERVER="IP_address"
POSADMINDN="dn"
PASSWORD="username_password"
```

If the password should not be set up automatically for security reasons, it can be omitted. In this case, `posInitBranchserver.sh` requests the password when the Branch Server starts.

- 3 Copy the three files to an MS-DOS formatted floppy disk:

- ♦ `info`
- ♦ `posInitBranchserver.auto.cfg`
- ♦ `autoinst.xml`

10.6 Starting Up the Branch Server

At the Branch Server site, boot and configure the Branch Server as follows:

- 1 Set the branch server to boot from CD.
- 2 Insert the floppy disk and CD into the appropriate drives.
- 3 Boot the server.

The automatic installation system starts. It requests confirmation at the start of the installation, but otherwise runs without interaction.

- 4 After the system is installed, log in as the root user to start the automatic configuration of the Branch Server software.

The `posInitBranchserver.sh` script automatically starts, sets the parameters as specified in the `posInitBranchserver.auto.cfg` file, and requests any missing parameters.

- 5 Run `possyncimages.pl` to download the client images from the Administration Server.

Deploying Point of Service Terminals

11

Point of Service terminals are the end point in the Novell® Linux Point of Service architecture. They provides customer service functions such as a Point of Sale terminal or bank teller workstation.

This section reviews the procedures required to deploy Point of Service terminals.

- ♦ [Section 11.1, “Creating Point of Service Images,” on page 125](#)
- ♦ [Section 11.2, “Creating the LDAP Objects Required for the Point of Service Terminals,” on page 126](#)
- ♦ [Section 11.3, “Distributing Images to Point of Service Terminals,” on page 134](#)
- ♦ [Section 11.4, “Booting the Point of Service Terminal,” on page 136](#)

11.1 Creating Point of Service Images

Before you can deploy Point of Service terminals, you must first create image files that contain the operating system, application files, and system settings required to boot the terminals.

Novell Linux Point of Service provides image templates that can be customized and generated on an Administration Server or a dedicated image building server using the ImageBuilder tool. For information on the available image templates, see “[Point of Service Images](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

To create the Point of Service images required to deploy your Point of Service terminals, you must do the following:

1. Copy the image source files to your image building server.

For detailed instructions, see “[Copying the Novell Linux Point of Service CDs](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

2. Define the location of the image source files.

For detailed instructions, see “[Generating AdminServer.conf or Distribution.xml](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

3. Build the Point of Service image files.

For detailed instructions, see “[Building Images with scr](#)” or “[Building Images with xscri](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

11.2 Creating the LDAP Objects Required for the Point of Service Terminals

Before you can boot the Point of Service terminals, you must use posAdmin to create the following objects in the LDAP directory:

- ◆ An **scCashRegister** object and its associated configuration objects for each type of Point of Service terminal in your system:
 - ◆ **scHarddisk** or **scRamDisk**
 - ◆ **scConfigFileTemplate** (optional)
 - ◆ **scConfigFileSyncTemplate** (optional)
- ◆ An **scPosImage** object for each client image file that you want the Branch Server to distribute to Point of Service terminals.

IMPORTANT: You must create the scPosImage objects and set the scPosImageVersion attribute to Active before you boot the Point of Service terminals. The Point of Service terminals require an scPosImage object with an active scPosImageVersion attribute before they can download the corresponding physical image from the Branch Server at boot time. For more information on setting the scPosImageVersion attribute to Active, see [“Activating Images” on page 132](#).

With posAdmin, you can add, remove, and modify Point of Service terminal hardware assets such as Point of Service terminals, hard disks, network interface cards, and configuration files with the use of reference objects in the LDAP directory. Hardware reference objects are typically located in the global container in the LDAP directory.

NOTE: Each LDAP object has two types of attributes: must and may attributes. The must attributes are the minimum requirements for an object; the may attributes are optional.

The following sections review the procedures required to create and manage these objects.

- ◆ [Section 11.2.1, “Creating an scCashRegister Object,” on page 126](#)
- ◆ [Section 11.2.2, “Creating an scRAMDisk Object,” on page 128](#)
- ◆ [Section 11.2.3, “Creating an scHarddisk Object,” on page 128](#)
- ◆ [Section 11.2.4, “Creating an scConfigFileTemplate Object,” on page 129](#)
- ◆ [Section 11.2.5, “Creating an scConfigFileSyncTemplate Object,” on page 130](#)
- ◆ [Section 11.2.6, “Creating scPosImage Objects,” on page 131](#)
- ◆ [Section 11.2.7, “Activating Images,” on page 132](#)
- ◆ [Section 11.2.8, “Assigning an Image to a Point of Service Terminal,” on page 133](#)
- ◆ [Section 11.2.9, “Removing an Assigned Image,” on page 134](#)

11.2.1 Creating an scCashRegister Object

The first step to register new Point of Service hardware is to define the name and model type of the Point of Service terminal. The scCashRegister object stores information about Point of Service hardware. Typically, you should define a scCashRegister object for each type of terminal used on the Novell Linux Point of Service system; however, if a Point of Service terminal does not have an

scCashRegister object for its specific hardware type, it uses the configuration defined in the default scCashRegister object.

NOTE: To create a default scCashRegister object, define the object's **scCashRegisterName** attribute as Default.

The scCashRegister objects are stored in the Global container so they can be accessed by all Branch Servers.

Table 11-1 lists the scCashRegister attributes.

Table 11-1 Attributes for scCashRegister objects

Attribute	Type	Explanation
--cn	must	The common name of the Point of Service terminal.
--scCashRegisterName	must	The model name of the Point of Service terminal; for example, IBM. If this field is defined as "default," the current scCashRegister object is used as the default Point of Service configuration. If a Point of Service terminal does not have an scCashRegister object for its specific hardware type, it will use the configuration defined in the default scCashRegister object. IMPORTANT: Define only one default scCashRegister object in the Global container. Also, scCashRegisterName values must be unique; do not create more than one scCashRegister object with the same model name.
--scPosImageDn	must	The distinguished name of the default client image defined for this Point of Service terminal type. NOTE: A specific client image can be defined in the scWorkstation object. The setting in the scWorkstation object overrides the default image defined in the scCashRegister object. For information on this procedure, see Section 11.2.8, "Assigning an Image to a Point of Service Terminal," on page 133.
--scDiskJournal	may	A Boolean field that is set to TRUE if journaling should be enabled. Journaling is only added on diskful machines. The default is FALSE.

The following example adds a default scCashRegister object below the global container (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=global,o=mycorp,c=us --add --scCashRegister
--cn crtype3 --scCashRegisterName 1234567
--scPosImageDn cn=browser,cn=global,o=mycorp,c=us --default
```

11.2.2 Creating an scRAMDisk Object

The scRamDisk object stores configuration information for a Point of Service terminal RAM disk. If no hard disk is available, you must configure a RAM disk for the Point of Service terminal.

Table 11-2 lists the scRamDisk attributes.

Table 11-2 Attributes for scRamDisk objects

Attribute	Type	Explanation
--base	must	The base distinguished name of the Hardware Reference object. For example, cn=crtype3, cn=global,o=mycorp,c=us.
--cn	must	The common name of the device. For example, ram.
--scDevice	must	The RAM disk device.

IMPORTANT: The device /dev/ram0 cannot be used because it is used for the initial RAM disk. Therefore, we recommend using /dev/ram1.

The RAM device should not be confused with the hard disk device, which uses a partition table.

The following example adds an scRamDisk object below the Hardware Reference object, crtype3 (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=crtype3,cn=global,o=mycorp,c=us
--add --scRamDisk --cn ram --scDevice /dev/ram1
```

11.2.3 Creating an scHarddisk Object

The scHarddisk object stores configuration information for a Point of Service terminal hard disk.

Table 11-3 lists the scHarddisk attributes.

Table 11-3 Attributes for scHarddisk objects

Attribute	Type	Explanation
--base	must	The base distinguished name of the Hardware Reference object. For example, cn=crtype3, cn=global,o=mycorp,c=us.
--cn	must	The common name of the device. For example, hda.
--scDevice	must	The device of the hard disk. For example, /dev/hda.
--scHdSize	must	The size of the hard disk in megabytes.
--scPartitionsTable	must	A semicolon-separated (';') list of partition entries. Each entry has four parameters: the size in megabytes, the partition type ID (82 for swap, 83 for a Linux partition), the mount point, and the file system (swap or ext3).

The following example adds an `scHarddisk` object below the `scCashRegister` object, `crtype3` (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=crtype3,cn=global,o=mycorp,c=us --add --scHarddisk
--cn hda --scDevice /dev/hda2 --scHdSize 9000
--scPartitionsTable '1000 82 swap swap;4000 83 / ext3;'
```

11.2.4 Creating an `scConfigFileTemplate` Object

The `scConfigFileTemplate` is an optional object used when you run services, such as the X Window system, that require hardware-dependent configuration files. An `scConfigFileTemplate` object contains the configuration file data that a Point of Service terminal needs to run a given service.

When you define the `scConfigFileTemplate` object, you designate a source configuration file (`--scConfigFileData`). `posAdmin` extracts the configuration data from the source file and stores it in the `scConfigFileTemplate` object. When a Point of Service terminal registers with a Branch Server (or when you run `posAdmin.pl --updateconfig` or `posldap2crconfig.pl --dumpall`), the Branch Server retrieves the configuration data in the `scConfigFileTemplate` object to create a configuration file in `/tftpboot/CR/MAC_address/` directories on the Branch Server.

Using TFTP, the configuration file is then distributed from the Branch Server to the appropriate Point of Services terminals at boot time.

NOTE: The `scCashRegister` or `scPosImage` object under which the `scConfigFileTemplate` object is created determines which Point of Service terminals receive the configuration file.

If the `scConfigFileTemplate` object is defined under an `scCashRegister` object, all terminals that correspond to the type defined in the `scCashRegister` object receive the configuration file defined in the `scConfigFileTemplate` object.

If the `scConfigFileTemplate` object is defined under an `scPosImage` object, all terminals that load the client image that corresponds to the `scPosImage` object receive the configuration file defined in the `scConfigFileTemplate` object.

Table 11-4 lists the `scConfigFileTemplate` attributes.

Table 11-4 Attributes for `scConfigFileTemplate` objects

Attribute	Type	Explanation
<code>--cn</code>	must	The common name of the configuration file.
<code>--scMust</code>	must	This flag is used to enable or disable the configuration file. Allowed values are TRUE to enable or FALSE to disable the configuration file.
<code>--scConfigFile</code>	must	Specifies the path where the configuration file is installed on the Point of Service terminal. For example, <code>/etc/ntp.conf</code> or <code>/etc/X11/XF86Config</code> .
<code>--scBsize</code>	must	Specifies the block size for the TFTP download.
<code>--scConfigFileData</code>	must	The source path of the configuration file. For example, <code>/tmp/XF86Config.mydata</code> .

The following example adds a `scConfigFileTemplate` object below the Hardware Reference object, `crtype3` (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=crtype3,cn=global,o=mycorp,c=us
--add --scConfigFileTemplate --cn XF86Config
--scConfigFile /etc/X11/XF86Config --scBsize 1024
--scConfigFileData /mydata/XF86Config.1234567
```

11.2.5 Creating an `scConfigFileSyncTemplate` Object

The `scConfigFileSyncTemplate` is an optional object used when you run services, such as the X Window system, that require hardware-dependent configuration files. This object points to the configuration file that a Point of Service terminal needs to run a given service. This object differs from `scConfigFileTemplate` objects because the configuration data is not stored in the object; rather, the object points to a configuration file outside the LDAP directory.

When a Point of Service terminal registers with a Branch Server (or when you run `posAdmin.pl --updateconfig` or `posldap2crconfig.pl --dumpall`), the Branch Server uses RSYNC to transfer the configuration file designated in the `scConfigFileSyncTemplate` object from the `/opt/SLES/POS/rsync/config/` directory on the Administration Server to `/tftpboot/CR/MAC_address/` directories on the Branch Server.

IMPORTANT: Any configuration files referenced in the `scConfigFileSyncTemplate` object must be located in the `/opt/SLES/POS/rsync/config/` directory on the Administration Server.

Using TFTP, the configuration file is then distributed from the Branch Server to the appropriate Point of Service terminals at boot time.

NOTE: The `scCashRegister` or `scPosImage` object under which the `scConfigFileSyncTemplate` object is created determines which Point of Service terminals receive the configuration file.

If the `scConfigFileSyncTemplate` object is defined under an `scCashRegister` object, all terminals that correspond to the type defined in the `scCashRegister` object receive the configuration file designated in the `scConfigFileSyncTemplate` object.

If the `scConfigFileSyncTemplate` object is defined under an `scPosImage` object, all terminals that load the client image that corresponds to the `scPosImage` object receive the configuration file designated in the `scConfigFileSyncTemplate` object.

Table 11-5 lists the `scConfigFileSyncTemplate` attributes.

Table 11-5 Attributes for `scConfigFileSyncTemplate` objects

Attribute	Type	Explanation
<code>--cn</code>	must	The common name of the configuration file.
<code>--scMust</code>	must	This flag is used to enable or disable the configuration file. Allowed values are TRUE to enable or FALSE to disable the configuration file.

Attribute	Type	Explanation
--scConfigFile	must	Specifies the path where the configuration file is installed on the Point of Service terminal; for example, /etc/ntp.conf or /etc/X11/XF86Config.
--scBsize	must	Specifies the block size for the TFTP download.
--scConfigFileLocalPath	must	The local source path of the configuration file; for example, /opt/SLES/POS/rsync/config/XF86Config.mydata.

The following example adds an scConfigFileSyncTemplate object below the hardware reference object, crtype3 (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=crttype3,cn=global,o=mycorp,c=us
--add --scConfigFileSyncTemplate --cn XF86Config
--scConfigFile /etc/X11/XF86Config --scMust TRUE --scBsize 1024
--scConfigFileLocalPath /opt/SLES/POS/rsync/config/XF86Config.1234567
```

11.2.6 Creating scPosImage Objects

Images are managed in LDAP with scPosImage objects. Each scPosImage object stores information about an image stored on the Administration Server. Every client image that you want to distribute to Point of Service terminals must have a corresponding scPosImage object in the LDAP directory.

IMPORTANT: You must create the scPosImage objects and set the scPosImageVersion attribute to Active before you boot the Point of Service terminals. The Point of Service terminals require an scPosImage object with an active scPosImageVersion attribute before they can download the corresponding physical image from the Branch Server at boot time.

The scPosImage objects that correspond to the client images you want to distribute to Point of Service terminals are typically organized within Distribution Container objects under the Global container in the LDAP tree.

NOTE: Boot images do not have scPosImage objects; they are referenced in the scInitrdName attribute in the scDistributionContainer object.

After the installation and configuration of the Novell Linux Point of Service, an scPosImage object for the Minimal image is automatically added to the Default Distribution Container. This default LDAP entry is intended to serve as an example and should not be deleted. You must manually add an scPosImage object for each client image you want to distribute to Point of Service terminals.

IMPORTANT: The images that ship with Novell Linux Point of Service 9 are built on Novell Linux Desktop (NLD) which runs the Linux 2.6 kernel. Therefore, the reference objects for Novell Linux Point of Service 9 images must be created in the Default Distribution Container.

If you migrate from SLRS 8 to Novell Linux Point of Service 9, the migration script creates the SLRS 8 distribution container. This container references the SLRS 8 kernel and therefore must store all the scPosImage objects for SLRS 8 images. For more information, see [Chapter 3, “Migrating from SLRS 8 to Novell Linux Point of Service 9,”](#) on page 57.

Table 11-6 lists the scPosImage attributes.

Table 11-6 Attributes for *scPosImage* objects

Attribute	Type	Explanation
--base	must	The base distinguished name of the <i>scPosImage</i> object; for example, <code>cn=global,o=mycorp,c=us</code> .
--cn	must	The common name of the client image; for example, <code>myjava</code> .
--scImageName	must	The name of the client image; for example, <code>myjava</code> .
--scPosImageVersion	must	The version number of the client image, followed by the flag <code>passive</code> or <code>active</code> ; for example, <code>2.3.10; active</code> . The version number and the flag are semicolon-separated (<code>;</code>). Possible combinations of this attribute are described in Table 11-7 .
--scDhcpOptionsRemote	must	The boot option of the Point of Service terminal. The mandatory value is <code>/boot/pxelinux.0</code> .
--scDhcpOptionsLocal	reserved	This attribute is reserved for future extension of Novell Linux Point of Service and is not used at this time.
--scImageFile	must	The filename of the image, which the terminal will download from the Branch Server; for example, <code>myjava</code> .
--scBsize	must	Specifies the block size for the TFTP download of the client image; for example, <code>8192</code> . Possible values are: <code>4096</code> (4 KB) for image sizes less than 128 MB, <code>8192</code> (8 KB) for image sizes less than 256MB, <code>16384</code> (16 KB) for image sizes less than 512 MB and <code>32768</code> (32 KB) for image sizes less than 1GB. You must select a TFTP block size of 32 KB for the full-featured Desktop image, because there is a limitation of the block counter for TFTP.
--scConfigFile	may	Specifies the path where the configuration file is installed on the Point of Service terminal; for example, <code>/etc/ntp.conf</code> or <code>/etc/X11/XF86Config</code> .

The following example adds a *scPosImage* object below the Global container for a modified Java client image (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--base cn=global,o=mycorp,c=us --add --scPosImage --cn myJava
--scImageName myJava --scPosImageVersion "2.0.21;active"
--scDhcpOptionsRemote /boot/pxelinux.0 --scDhcpOptionsLocal LOCALBOOT
--scImageFile myJava --scConfigFile /etc/X11/XF86Config
```

11.2.7 Activating Images

Each image can be available in several versions, as shown in [Table 11-7](#). The *scPosImageVersion* attribute in each *scPosImage* object must be set to either `active` or `passive`. Active versions are downloaded by the Branch Server. If there are multiple active versions of a single image, the Branch Server selects the highest active version. Passive image versions are never downloaded to the Branch Server unless they are explicitly configured in the *scWorkstation* entry for the individual Point of Service terminal.

Table 11-7 Image version examples

Value	Explanation
1.1.2	The version number is set to 1.1.2, but this client image is disabled in LDAP and cannot be used for a new Point of Service terminal, even when the scCashRegister object that corresponds to the Point of Service terminal matches the scPosImageDn attribute entry.
1.1.2;passive	Same behavior as above.
1.1.2;active	This client image with version 1.1.2 is enabled.
1.1.2;active 1.1.3;active 1.1.5;active	All image versions are enabled. The latest image version is used for download to the Point of Service terminal.
1.1.2;passive 1.1.3;active 1.1.5;passive	Only image version 1.1.3 is enabled.

To activate a registered image, set its scPosImageVersion attribute to active. This is done with posAdmin using the modify and multivalue options as follows (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret  
--modify --scPosImage --multival  
--scPosImageVersion '2.3.10;passive=>2.3.10;active'  
--DN cn=browser,cn=default,cn=global,o=mycorp,c=us
```

To activate the new image version on a Branch Server, run posldap2crconfig.pl with the --dumpall option and possyncimages.pl as follows:

```
posldap2crconfig --dumpall  
possyncimages
```

11.2.8 Assigning an Image to a Point of Service Terminal

You can assign a specific image to a Point of Service terminal through its scWorkstation object.

For example, the following command assigns browser image 2.3.10 to the CR001 scWorkstation object in the boston1 container (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret  
--modify --scWorkstation  
--scPosImageDn cn=browser,cn=global,o=mycorp,c=us  
--scPosImageVersion 2.3.10  
--DN cn=CR001,ou=boston1,ou=boston,o=mycorp,c=us
```

When you explicitly assign an image in the scWorkstation entry, the active or passive flag set for the scPosImage object in the global container is ignored.

NOTE: The scWorkstation object is automatically created in the LDAP directory the first time you boot a Point of Service terminal. The posleases2ldap daemon automatically triggers posldap2crconfig.pl which then creates an scWorkstation object and hardware configuration files for each Point of Service terminal that registers on the Branch Server. For more information on this process, see “[The hwtype.MAC_address File](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

11.2.9 Removing an Assigned Image

To remove the image assigned to a workstation, run the following command (type the command all on one line):

```
posAdmin.pl --user cn=admin,o=mycorp,c=us --password secret
--remove --scWorkstation --scPosImageDn --scPosImageVersion
--DN cn=CR001,ou=boston1,ou=boston,o=mycorp,c=us
```

11.3 Distributing Images to Point of Service Terminals

To electronically distribute new or updated client images, you must first copy the images into the central RSYNC directory of the Administration Server and then transfer the images to the Branch Servers. From there the images are distributed to the Point of Service terminals when they boot.

This section reviews each step in the electronic distribution process.

- ◆ “Copying Images to the Administration Server RSYNC Directory” on page 134
- ◆ “Distributing Images to the Branch Server” on page 135
- ◆ “Distributing Images to Point of Service Terminals” on page 136
- ◆ “Image Install Notification” on page 136

NOTE: If you are unable to electronically distribute Point of Service images over your network, you must manually distribute the images using CDBoot images. For more information on creating a CDBoot image, see “Building a CDBoot Image” in the *Novell Linux Point of Service 9 Administration Guide*.

11.3.1 Copying Images to the Administration Server RSYNC Directory

The first step to distribute new client images is to copy the images from the `/opt/SLES/POS/image` directory to the RSYNC directory, `/opt/SLES/POS/rsync/`. Before the RSYNC service can transmit the images to the Branch Server, client images must be located in the `/opt/SLES/POS/rsync/image/` directory on the Administration Server, and the boot image must be located in `/opt/SLES/POS/rsync/boot/`.

NOTE: Copying the client images to the RSYNC directory is done manually to control which client image types and versions are distributed to the Branch Servers.

Copying Client Images to the Administration Server’s RSYNC Directory

The following example demonstrates how to put a previously-extended Browser client image in the Administration Server’s RSYNC directory so it can be received, on request, by the Branch Server:

- 1 Copy the extended Browser client image:

```
cp /opt/SLES/POS/image/Browser-2.0.21-2004-12-05
/opt/SLES/POS/rsync/image/browser-2.0.21
```

- 2 Copy the corresponding Browser image MD5 checksum file:

```
cp /opt/SLES/POS/image/Browser-2.0.21-2004-12-05.md5
/opt/SLES/POS/rsync/image/Browser-2.0.21.md5
```

Copying Boot Images to the Administration Server's RSYNC Directory

The following example demonstrates how to copy the first and second stage boot images to the Administration Server's RSYNC directory so they can be received, on request, by the Branch Server:

NOTE: Point of Service terminals boot two images, a first stage image (`initrd.gz`) and a second stage image (`linux`). For more information, see [Section 11.4, "Booting the Point of Service Terminal,"](#) on page 136.

- 1 Copy the `initrd-disknetboot` image as `initrd.gz`:

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.gz
/opt/SLES/POS/rsync/boot/initrd.gz
```

- 2 Copy the kernel image as `linux`:

```
cp /opt/SLES/POS/image/initrd-disknetboot-version-date.kernel.
kernel_version /opt/SLES/POS/rsync/boot/linux
```

11.3.2 Distributing Images to the Branch Server

If you create a new image or change an image version, you can run the `possyncimages.pl` command at the Branch Server to transfer new or updated images to the Branch Server after the images are in the Administration Server's RSYNC directory.

IMPORTANT: The RSYNC service must be properly configured and running on the Administration Server for the `possyncimages.pl` script to run. For more information, see ["Adding an `scBranchServer` Object"](#) on page 74.

Additionally, each client image must have an associated `scPosImage` object in LDAP and the object's `scPosImageVersion` attribute must be set to active before `possyncimages.pl` will transfer the images to the Branch Server. For more information, see ["Activating Images"](#) on page 132.

The basic process is as follows:

- 1 The `possyncimages.pl` script initially checks via the PID file to determine if an instance is already running.
- 2 The image files are then copied from the Administration Server to the Branch Server. Boot images are copied from the `/opt/SLES/POS/rsync/boot/` directory on the Administration Server to the `/tftpboot/boot/` directory on the Branch Server. Client images and their associated MD5 checksum files are copied from `/opt/SLES/POS/rsync/image/` to `/tftpboot/image/`.

During this process, the TFTP server must be stopped or otherwise prevented from transmitting the image files to clients.

For more information on the `possyncimages.pl` script, see ["possyncimages.pl"](#) in the *Novell Linux Point of Service 9 Administration Guide*.

IMPORTANT: Remember that distributing client images from the Administration Server to the Branch Servers is only one part of the process required to deploy new versions of a client image. You must also update the `scPosImageVersion` attribute within the Image Reference object (`scPosImage`) in the LDAP tree; otherwise, Point of Service terminals already registered in LDAP cannot boot the new client image version.

For more details, refer to [“Creating `scPosImage` Objects” on page 131](#) and [“`posldap2crconfig.pl`”](#) in the *Novell Linux Point of Service 9 Administration Guide*. For an illustration of Novell Linux Point of Service system dependencies, see [“Dependencies Between LDAP, Branch Server, and Point of Service Terminal”](#) in the *Novell Linux Point of Service 9 Administration Guide*.

After executing the `possyncimages.pl` script, verify the result by checking the contents of the following directories:

- ♦ `/tftpboot/image`
- ♦ `/tftpboot/boot`

11.3.3 Distributing Images to Point of Service Terminals

New or updated images are distributed to Point of Service terminals at boot time. For information on this process, see [Section 11.4, “Booting the Point of Service Terminal,” on page 136](#).

11.3.4 Image Install Notification

When the Branch Server distributes a new image to a Point of Service terminal, the system provides notification that the image was successfully installed on the Point of Service terminal. The notification is stored in the `scWorkstation` object in the LDAP directory on the Administration Server.

When the image is successfully installed on the Point of Service terminal, the `linuxrc` script running on the Point of Service terminal creates the `bootversion.MAC_Address` file in the `/tftpboot/upload` directory on the Branch Server. The `posleases2ldap` process then transfers the information to the `scNotifiedimage` attribute in the `scWorkstation` object in LDAP and deletes the `bootversion.MAC_address` file.

11.4 Booting the Point of Service Terminal

IMPORTANT: Before you can boot the Point of Service terminals, you must create an `scCashRegister` object and its associated objects. For more information, see [“Creating an `scCashRegister` Object” on page 126](#).

Typically, when you boot a Point of Service terminal, it first tries to boot from CD. If a CD is not available, the terminal attempts a network PXE boot. If the network is not available, it then boots from the hard drive.

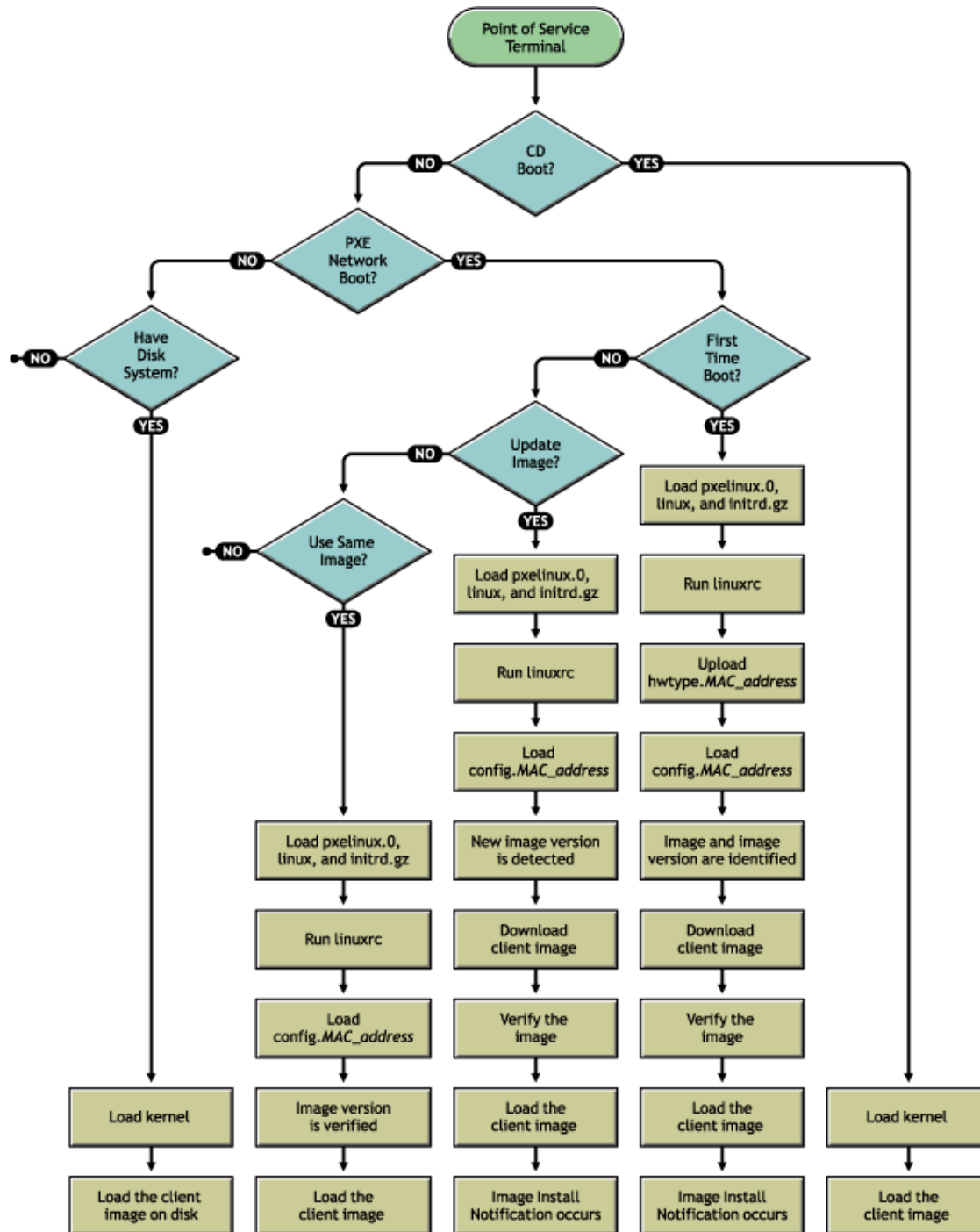
NOTE: You can override this order with the BIOS settings.

The first time you boot the Point of Service terminals, the `posleases2ldap` daemon automatically triggers `posldap2crconfig.pl` which then creates a Workstation (`scWorkstation`) object and hardware configuration files for the Point of Service terminals that register on the Branch Server.

For more information on this process, see “[The hwtype.MAC_address File](#)” in the *Novell Linux Point of Service 9 Administration Guide*.

Figure 11-1 provides a simplified overview of the Point of Service boot process for a network PXE boot, a hard disk boot, and a CD boot.

Figure 11-1 Point of Service terminal boot process.



Detailed information of each boot process is provided in the following sections:

- ◆ [Section 11.4.1, “Network PXE Boot,” on page 138](#)
- ◆ [Section 11.4.2, “CDBoot,” on page 140](#)

11.4.1 Network PXE Boot

To boot Point of Service terminals from the network, the following conditions must be met:

- ◆ The terminal must have a network connection to the Branch Server.
- ◆ The TFTP service must be properly configured and running on the Branch Server.
For more information on Branch Server configuration, see [Chapter 6, “Setting Up a Branch Server,” on page 71](#).
- ◆ The terminal must have an associated `scCashRegister` object in the LDAP directory.
For more information, see [Section 11.2, “Creating the LDAP Objects Required for the Point of Service Terminals,” on page 126](#).
- ◆ The Point of Service boot images must be located in the `/tftpboot/boot/` directory on the Branch Server and the client images must be located in the `/tftpboot/image/` directory.
For more information, see [Section 11.3, “Distributing Images to Point of Service Terminals,” on page 134](#).
- ◆ The Point of Service client images must have an associated `scPosImage` object in the LDAP directory and the object’s `scPosImageVersion` attribute must be set to Active.
For more information, see [Section 11.2.6, “Creating scPosImage Objects,” on page 131](#).

If these conditions are met, the Point of Service terminal can successfully boot from the network.

The following is a detailed description of what takes place when a Point of Service terminal boots from the network:

1. The Point of Service terminal makes a DHCP request.
2. The Point of Service terminal downloads `pxelinux.0`.
The `pxelinux.0` image is the first bootstrap image used to PXE boot the Point of Service terminals.
3. The Point of Service terminal downloads the `linux` file.
The `linux` file is actually the `DiskNetboot-version-date.kernel.version-SLRS` image. The Linux image provides the Linux kernel used to PXE boot the Point of Service terminals.
4. Using PXE network boot or boot manager (GRUB), the Point of Service terminal boots the `initrd` image (`initrd.gz`) that it receives from the Branch Server.
If no PXE boot is possible, the Point of Service terminal tries to boot via hard disk, if one is accessible.
5. The `linuxrc` script begins.
6. The file systems required to receive system data are mounted; for example, the `proc` file system.
7. The Point of Service hardware type (`hwtype`) is detected.

The Point of Service hardware manufacturer provides a program to do this. The first time the Point of Service terminal boots, this information is used to register the Point of Service terminal and create the terminal's `config.MAC_address` file. This information is also used to determine which configuration files the terminal should use.

8. The Point of Service BIOS version (*hwbios*) is detected.

The Point of Service hardware manufacturer provides a program to do this.

9. Network support is activated. The required kernel module is determined from a static table by selecting the entry corresponding to the hardware type. If no known hardware type is detected, a default list of modules is used and types are tried one after the other.
10. The module is loaded using `modprobe`. Any dependencies to other modules are cleared at that time.
11. The network interface is set up via DHCP.
12. After the interface has been established, the DHCP variables are exported into the `/var/lib/dhcpd/dhcpd-eth0.info` file and the contents of DOMAIN and DNS are used to generate a `/etc/resolv.conf` file.
13. The TFTP server address is acquired.
During this step, a check is first made to determine whether the hostname `tftp.\$DOMAIN` can be resolved. If not, the DHCP server is used as the TFTP server.
14. The Point of Service configuration file, `config.MAC_address`, is loaded from the Branch Server's `/tftpboot/CR` directory over TFTP.

If this is the Point of Service terminal's first time booting, the terminal's `config.MAC_address` file does not yet exist. The Point of Service terminal must first register on the system.

A new Point of Service terminal registers as follows:

- a. An optional alias name can be set for the new Point of Service terminal. During the creation of one of the boot images, you can enable the system alias setting using the `POSSetAlias` feature module. By default, there is no question for the system alias name.
 - b. A Point of Service control file (`hwtype.MAC_address`) is uploaded to the TFTP server's upload directory: `/tftpboot/upload`.
The `hwtype.MAC_address` file indicates the Point of Service hardware type, the BIOS version, and the Point of Service alias name. The system uses this information to create the terminal's `config.MAC_address` file. For more information on this process, see "The `hwtype.MAC_address` File" in the *Novell Linux Point of Service 9 Administration Guide*.
 - c. After the upload, the Point of Service terminal renews the DHCP lease (`dhcpd -n`).
 - d. The Point of Service terminal attempts to load its new `config.MAC_address` file from the TFTP server.
 - e. If the `config.MAC_address` file is not yet available, the Point of Service terminal waits 60 seconds before repeating steps c and d.
15. When the `config.MAC_address` file loads, the system begins an analysis of its contents.
For more information about the content and file format of the `config.MAC_address` file, refer to "The `config.MAC_address` File" in the *Novell Linux Point of Service 9 Administration Guide*.
 16. First, the **PART** line in the `config.MAC_address` file is analyzed (if there is a PART line).

A check is made using the image version to see whether any local system needs to be updated.

- ♦ If no system update is required, no image download occurs and the Point of Service terminal boots from the hard drive.
- ♦ If a system update is required, the Point of Service hard disk is partitioned according to the parameters specified in the PART line.

17. Next, the **SYNC** line in the Point of Service configuration file is evaluated.

The file indicated in the SYNC line is downloaded over TFTP. The only value the file contains is the number of seconds to wait (sleep) before the multicast download of the client image starts.

If the file is not present, the boot process proceeds immediately.

18. Indicated images are downloaded with multicast TFTP.

19. If the image is compressed, it is copied then decompressed.

20. The image checksums are verified.

If they do not match, the images are re-downloaded.

21. The **CONF** line in the Point of Service configuration file is evaluated.

All the indicated files are loaded from the TFTP server and stored in a `/config/` path.

22. All the user-land processes based on the boot image (`dhcpcd -k`) are terminated.

23. The client image is mounted.

24. The configuration files stored in the `/config/` path are copied to the mounted client image.

25. If this is a new image, Image Install Notification occurs.

- a. The `bootversion.MAC_Address` file is created in `/tftpboot/upload`.
- b. `posleases2ldap` transfers the information to the `scNotifiedimage` attribute in the `scWorkstation` object in LDAP.

26. The system switches to the mounted client image.

27. The root file system is converted to the client image using `pivot_root`.

All the required configuration files are now present because they had been stored in the client image or have been downloaded via TFTP.

The file systems that are mounted read-only can be stored in cramfs-compressed RAM file systems to save Point of Service RAM resources.

28. The boot image is unmounted using an `exec umount` call.

29. When `linuxrc` or the `exec` call terminates, the kernel initiates the `init` process, which starts processing the boot scripts as specified in `/etc/inittab`.

11.4.2 CDBoot

If you are unable to electronically distribute Point of Service images over your network, you must manually distribute the images using CDBoot images. For more information on creating a CDBoot image, see “[Building a CDBoot Image](#)” in the *Novell Linux Point of Service 9 Administration Guide*

Depending on the client image that resides on the boot CD (Minimal, Java, Browser, or Desktop), you should note the following restrictions:

- ♦ The Point of Service terminal needs to be upgraded with enough RAM to hold the client image.

- ◆ On diskless Point of Service terminals, there must be enough available RAM to load the first and second stage boot images. Otherwise, the terminal returns a kernel panic error.

NOTE: Keep in mind that onboard VGA reduces the Point of Service terminal's available RAM.

The behavior of Point of Service terminals booting from CD is similar to Point of Service terminals that receive the first and second stage boot images over the LAN from a Branch Server. The following is a general description of what takes place when a Point of Service terminal boots from CD:

1. The client image (for example, the Browser image) is installed to a RAM or hard disk drive on the Point of Service terminal.

The partition information resides in the **config.image** file located on the CD. For more information, see “**The config.image File**” in the *Novell Linux Point of Service 9 Administration Guide*.

2. The installed client image is booted from the RAM or hard disk drive on the Point of Service terminal.

Testing Your Novell Linux Point of Service Environment

12

To complete the Novell® Linux Point of Service installation process, it is recommended that you verify the installation by booting at least one Point of Service client attached to Branch Server.

- ♦ [Section 12.1, “Monitoring the Terminal Bootup,” on page 143](#)
- ♦ [Section 12.2, “Troubleshooting Terminal Bootup Problems,” on page 144](#)

12.1 Monitoring the Terminal Bootup

To verify and test your Novell Linux Point of Service installation:

- 1 Attach a Point of Service client to the Branch Server network.
- 2 (Optional) Verify the LDAP structure on the Administration Server using a GUI-based LDAP browser, such as GQ, or an `ldapsearch` command.

For example:

```
ldapsearch -x -h administration_server_name -b o=mycorp,c=us -s  
base -D cn=admin,o=mycorp,c=us -w password
```

- 3 Verify the following LDAP object settings:
 - ♦ The `scCashRegister` object which matches the model type of the Point of Service client must exist in LDAP; for example, `IBMSurePOS300Series`.
 - ♦ There must be an `scPosImage` object for each image in the `/tftpboot/image/` directory on the Branch Server. The `scPosImageDn` attribute within each object must correspond to an existing Point of Service image.

IMPORTANT: You must create the `scPosImage` objects and set the `scPosImageVersion` attribute to Active before you boot the Point of Service terminals. The Point of Service terminals require an `scPosImage` object with an active `scPosImageVersion` attribute before they can download the corresponding physical image from the Branch Server at boot time. For more information on setting the `scPosImageVersion` attribute to Active, see [“Activating Images” on page 132](#).

For further information how to modify and add LDAP entries for your specific Novell Linux Point of Service system environment, refer to [“Using posAdmin to Manage the LDAP Directory”](#) in the *Novell Linux Point of Service 9 Administration Guide*.

- 4 Verify that the Point of Service client images and their corresponding MD5 checksum files are available in `/tftpboot/image/` directory on the Branch Server.
- 5 Verify that the `initrd.gz` and `linux` images are available in the `/tftpboot/boot/` directory on the Branch Server.
- 6 Power on the Point of Service client.
You can watch the Branch Server log messages using the following command:

```
tail -f /var/log/messages
```
- 7 While the Point of Service client is booting, check if there are `tftpd` entries.

For example:

```
.. bs1 tftpd[31434]: Serving /boot/pxelinux.0 to 192.168.2.15:2070
.. bs1 tftpd[31435]: Serving /boot/pxelinux.cfg/C0A8020F to 192.168.2.15:57217
.. bs1 tftpd[31436]: Serving /boot/pxelinux.cfg/C0A8020 to 192.168.2.15:57090
.. bs1 tftpd[31437]: Serving /boot/pxelinux.cfg/C0A802 to 192.168.2.15:56963
.. bs1 tftpd[31438]: Serving /boot/pxelinux.cfg/C0A80 to 192.168.2.15:56836
.. bs1 tftpd[31439]: Serving /boot/pxelinux.cfg/C0A8 to 192.168.2.15:56709
.. bs1 tftpd[31440]: Serving /boot/pxelinux.cfg/C0A to 192.168.2.15:56582
.. bs1 tftpd[31441]: Serving /boot/pxelinux.cfg/C0 to 192.168.2.15:56455
.. bs1 tftpd[31442]: Serving /boot/pxelinux.cfg/C to 192.168.2.15:56328
.. bs1 tftpd[31443]: Serving /boot/pxelinux.cfg/default to 192.168.2.15:56201
.. bs1 tftpd[31444]: Serving /boot/linux to 192.168.2.15:56202
.. bs1 tftpd[31445]: Serving /boot/initrd.gz to 192.168.2.15:56203
.. bs1 dhcpd: DHCPDISCOVER from 00:06:29:e3:02:e6 via eth0
.. bs1 dhcpd: DHCP OFFER on 192.168.2.15 to 00:06:29:e3:02:e6 via eth0
.. bs1 dhcpd: DHCPREQUEST for 192.168.2.15 (192.168.2.1) from 00:06:29:e3:02:e6 via
  eth0
.. bs1 dhcpd: DHCPACK on 192.168.2.15 to 00:06:29:e3:02:e6 via eth0
.. bs1 tftpd[31454]: Serving CR/config.00:06:29:E3:02:E6 to 192.168.2.15:32768
.. bs1 tftpd[31455]: Fetching from 192.168.2.15 to upload/hwtype.00:06:29:E3:02:E6
```

The Point of Service terminal performs a PXE boot to receive the Linux kernel and its first stage boot image, `initrd.gz`. For detailed information on the Point of Service boot process, see [Section 11.4, “Booting the Point of Service Terminal,” on page 136](#).

- 8 Watch for the `hwtype.MAC_address` file below the `/tftpboot/upload` directory (for example, `hwtype.00:06:29:E3:02:E6`). This file contains the information required to create the terminal’s workstation object (`scWorkstation`) in LDAP and determine which image and configuration settings should be included in the terminal’s configuration file. For more information, see [“The `hwtype.MAC_address` File”](#) in the Novell Linux Point of Service 9 Administration Guide.
- 9 Watch to see if the Point of Service client is able to boot the second stage image. This is the client image configured in LDAP (`scPosImage`) and downloaded from the `/tftpboot/image/` directory on the Branch Server (for example, the `browser-2.0.21` image).
- 10 If everything proceeds normally, the Point of Service terminal boots and you will see the login prompt.

If the boot is successful, the `config.MAC_address` for the terminal is written below the `/tftpboot/CR/MAC_address/` directory on the Branch Server. For example, if a terminal’s MAC address is `00:06:29:E3:02:E6`, the `config.00:06:29:E3:02:E6` file will be located in the `/tftpboot/CR/00:06:29:E3:02:E6` directory. Additionally, the `scWorkstation` object for the Point of Service terminal is created in the LDAP directory.

12.2 Troubleshooting Terminal Bootup Problems

If the Point of Service terminal does not successfully boot, check the following:

- ◆ Verify that an `scCashRegister` object exists for the Point of Service terminal. For more information, see [Section 11.2.1, “Creating an `scCashRegister` Object,” on page 126](#).

- ◆ Verify the configuration of the `scCashRegister` object for the Point of Service terminal:
There must either be an `scCashRegister` object that corresponds to the `HWTYPE` attribute in the Point of Service terminal's `hwtype.MAC_address` file in the `/tftpboot/upload/hwtype` directory, or a default `scCashRegister` object that will work for the Point of Service terminal.
- ◆ Verify that the Point of Service image configured in the `scPosImageDn` attribute of the `scCashRegister` object is available in the `/tftpboot/image/` directory on the Branch Server.
- ◆ Verify that the `scPosImageVersion` attribute in the `scPosImage` object is set to `Active`. For more information, see [Section 11.2.7, “Activating Images,” on page 132](#).
- ◆ Do not delete any of the default LDAP objects that are created when you install Novell Linux Point of Service 9.
In particular, do not delete the global default “minimal” `scPosImage` object that is created in the “default” Distribution Container, even if you do not plan to use the minimal image. Deleting this LDAP object prevents Point of Service terminals from performing a successful PXE boot.
- ◆ Each type of Point of Service terminal hardware must have a unique model name defined in the `scCashRegisterName` attribute of the `scCashRegister` object in LDAP.
If two terminals have the same hardware name defined in their `scPosImage` objects, neither of them boots successfully, but a “HWtype” error is displayed on the Branch Server. To resolve the problem, change the `scCashRegisterName` value for one of the Point of Service terminals.

Installation RPM Lists

A

This section lists the RPM packages included in the Novell[®] Linux Point of Service 9 software.

NOTE: This list does not include the SUSE[®] Linux Enterprise Server (SLES) RPM packages. For more information on the RPM packages installed with SLES, see [SUSE LINUX Enterprise Server Package Descriptions \(http://www.novell.com/products/linuxenterpriseserver/packages.html\)](http://www.novell.com/products/linuxenterpriseserver/packages.html).

- ♦ [Section A.1, “NLPOS Admin/Branch Server RPMs,” on page 147](#)
- ♦ [Section A.2, “NLPOS Image Server RPMs,” on page 149](#)

A.1 NLPOS Admin/Branch Server RPMs

This section lists the packages installed with the NLPOS Admin/Branch Server software selection.

NOTE: For more information on this installation option, see [“Software Selection Screen” on page 34](#).

admind-client
alice-compat
atftp
audiofilea
utoyast2
bind9
bind9-utils
binutils
cups-libs
dhcp-base
dhcp-relay
dhcp-server
dhcp-tools
esound
expat
gdb
gdk-pixbuf
gettext
gnome-libs
gq
libpcap
libxslt
lkcdutils
mkisofs
mozilla
nfs-utils

openldap2
orbit
pcmcia
perl-Convert-ASN1
perl-Convert-BER
perl-Crypt-DES
perl-Curses
perl-CursesWidgets
perl-DateManip
perl-Digest-HMAC
perl-Digest-SHA1
perl-HTML-Parser
perl-HTML-Tagset
perl-IO-Socket-SSL
perl-ldap
perl-ldap-ssl
perl-libwww-perl
perl-Net_SSLeay
perl-NetAddr-IP
perl-Net-DNS
perl-Net-ext
perl-Net-IP
perl-Net-IPv4Addr
perl-Parse-Yapp
perl-TermReadKey
perl-TimeDate
perl-Time-Period
perl-Unix-Syslog
perl-URIperl-XML-DOM
perl-XML-Generator
perl-XML-Parser
perl-XML-RegExp
perl-XML-Writer
perl-XML-XQL
pidentd
POS_Server2
POS_Server-Admin2
POS_Server-AdminTools2
POS_Server-AutoInstall2
POS_Server-BranchTools2
POS_Server-Modules2
python
rsync
sablots

samba
samba-winbind
sudo
tcpdump
tripwire
ulibhttp
ulimit
unzip
xntp
yast2-firewall
yast2-printer
zip

A.2 NLPOS Image Server RPMs

In addition to the RPMs included in the NLPOS Admin/Branch Server package, Novell Linux Point of Service installs the following packages when you select the NLPOS Image Server installation:

NOTE: For more information on this installation option, see [“Software Selection Screen” on page 34](#).

bootsplash
POS_Image2
POS_Image-Browser2
POS_Image-Builder2
POS_Image-Desktop2
POS_Image-DiskNetboot2
POS_Image-DiskNetboot-Binary2
POS_Image-Java2
POS_Image-Minimal2
POS_Image-Minimal-Binary2

Changing the Server Language

B

If you need to change the language that was defined during the initial installation of a Novell® Linux Point of Service Administration Server or Branch Server, you can do so by rerunning the YaST utility and selecting a different system language. However, you must also manually copy the RPMs required to support the features you are running on the server (such as the KDE or GNOME desktop or the Mozilla browser) and modify the system language file.

- ♦ [Section B.1, “Changing the Language Selection,” on page 151](#)
- ♦ [Section B.2, “Copying the Required RPMs,” on page 151](#)
- ♦ [Section B.3, “Modifying the System Language File,” on page 153](#)

B.1 Changing the Language Selection

To change the language of your Administration or Branch Server:

- 1 Start the YaST2 utility.
- 2 In the YaST Control Center, select *System > Choose Language*.
- 3 Select the desired language, then click *Accept*.

The language selected in YaST applies to the operating system, including YaST and the desktop environment (KDE or GNOME). It does not affect the Novell Linux Point of Service scripts.

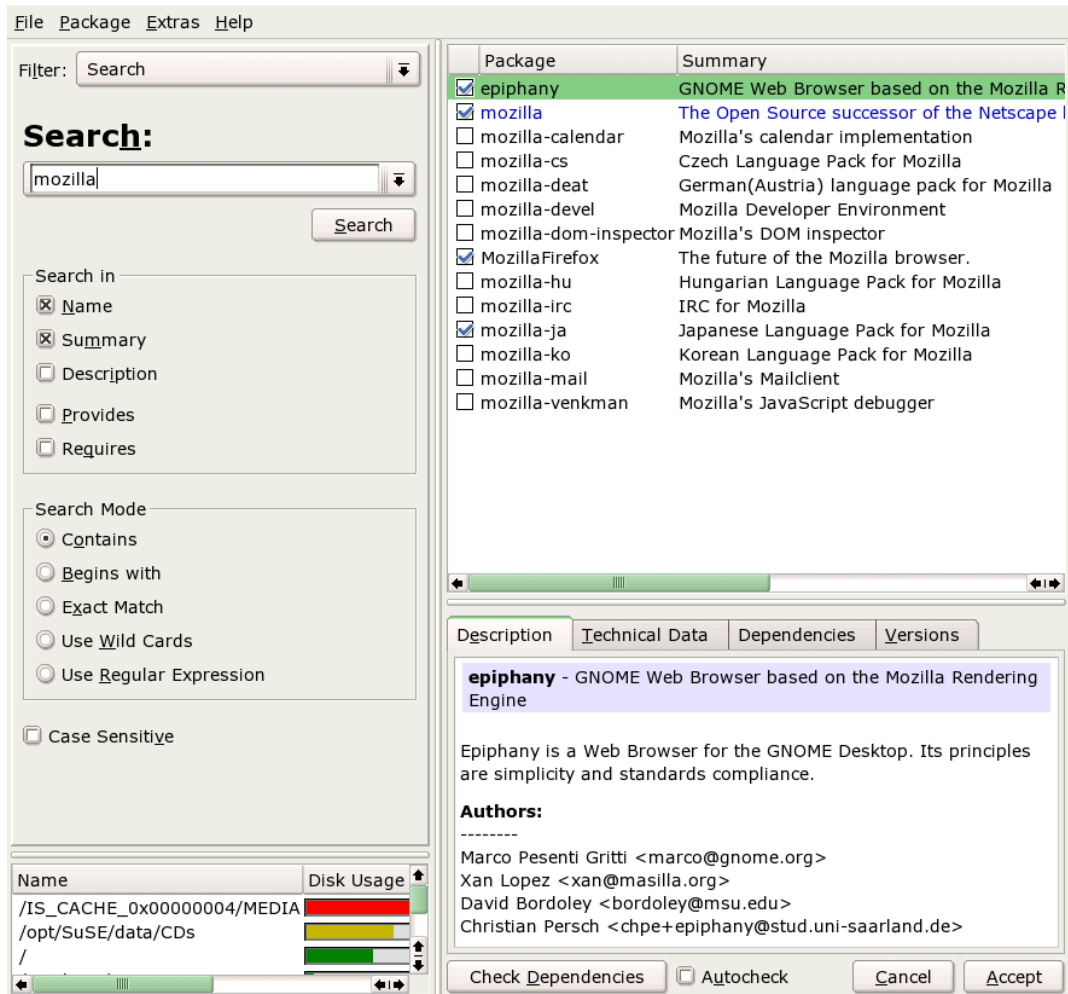
B.2 Copying the Required RPMs

To copy the RPMs required to support the features you are running on the server:

- 1 In the YaST Control Center, select *Install and Remove Software*.

The YaST Package Manager screen appears (see [Figure B-1](#)).

Figure B-1 YaST Package Manager



- 2 Use the Search option to verify that the RPMs required to provide language support for the Administration Server or Branch Server features are installed on your system.

[Table B-1](#) provides a listing of the RPMs required to provide language support for each feature (the KDE desktop environment, the GNOME desktop environment, the Mozilla browser, and the YaST configuration utility).

Table B-1 RPMs required for tstandard server features

	KDE	GNOME	Mozilla	YaST
French	kde3-i18n-fr	kde3-i18n-fr aspell-fr	na	yast2-trans-fr
German	kde3-i18n-de	kde3-i18n-de aspell-de	mozilla-deat	yast2-trans-de

	KDE	GNOME	Mozilla	YaST
Italian	kde3-i18n-it	kde3-i18n-it	na	yast2-trans-it
Japanese	kde3-i18n-ja	kde3-i18n-ja	mozilla-ja	yast2-trans-ja
Korean			mozilla-ko	yast2-trans-ko
Portuguese	kde3-i18n-pt	kde3-i18n-pt aspell-pt	na	na
Portuguese-- Brazil	kde3-i18n-pt_BR	kde3-i18n-pt_BR aspell-pt	na	na
Simplified Chinese	kde3-i18n-zh_CN	kde3-i18n-zh_CN	na	yast2-trans- zh_CN
Spanish	kde3-i18n-es	kde3-i18n-es aspell-es	na	yast2-trans-es
Traditional Chinese	kde3-i18n-zh_TW	kde3-i18n-zh_TW	na	yast2-trans- zh_TW

For each feature, enter the RPM name in the Search field, then click *Search*.

- ♦ If the returned RPM is selected, it is already installed on your system and you do not need to select it.
- ♦ If the returned RPM is not selected, it is not installed on your system. Select all required RPMs for installation.

3 Click *Accept* to install the selected RPMs.

4 Exit YaST.

B.3 Modifying the System Language File

To modify the system language file:

- 1** Open the `etc/sysconfig/language.dat` file.
- 2** Change the LANG variable to the language you selected in YaST. You can also define the encoding.

For example, the following syntax defines the German language with UTF8 encoding:

```
LANG=de_DE.UTF-8
```

TIP: To simultaneously change all the variables in the `language.dat` file, enter `LC_ALL=locale`.

- 3** Save the `etc/sysconfig/language.dat` file.

Documentation Updates

C

This section contains information about documentation content changes made to the *Novell Linux Point of Service 9 Installation Guide* since the initial release of Novell® Linux Point of Service 9. The information can help you to keep current on updates to the documentation.

All changes that are noted in this section were also made in the documentation. The documentation is provided on the Web in two formats: HTML and PDF. Both the HTML and PDF documentation are kept up-to-date with the documentation changes listed in this section.

The documentation update information is grouped according to the date the changes were published. Within a dated section, the changes are alphabetically listed by the names of the main table of contents sections for the guide.

If you need to know whether a copy of the PDF documentation you are using is the most recent, the PDF document contains the date it was published on the front title page.

This document was updated on the following dates:

- ♦ [Section C.1, “August 15, 2006 \(NLPOS 9 SSP3\),” on page 155](#)

C.1 August 15, 2006 (NLPOS 9 SSP3)

Throughout this document, version references have been updated, minor errors have been corrected, and the page design has been reformatted to comply with revised Novell documentation standards.

In addition, updates have been made to the following sections:

- ♦ [Section C.1.1, “Overview,” on page 155](#)
- ♦ [Section C.1.2, “Setting Up High Availability Branch Servers,” on page 155](#)
- ♦ [Section C.1.3, “Testing Your Novell Linux Point of Service Environment,” on page 156](#)
- ♦ [Section C.1.4, “Changing the Server Language,” on page 156](#)

C.1.1 Overview

The following changes have been made to this section:

Location	Change
Section 1.2, “Images Overview,” on page 12	This section is new.
Section 1.3.1, “Design Guidelines for Large Environments,” on page 16	Added this section to provide system design recommendations for large retail environments.

C.1.2 Setting Up High Availability Branch Servers

The following changes have been made to this section:

Location	Change
Section 7.8, "Updating High Availability Branch Servers," on page 96	This section is new.

C.1.3 Testing Your Novell Linux Point of Service Environment

The following changes have been made to this section:

Location	Change
Section 12.2, "Troubleshooting Terminal Bootup Problems," on page 144	Added new troubleshooting information.

C.1.4 Changing the Server Language

The following changes have been made to this section:

Location	Change
Appendix B, "Changing the Server Language," on page 151	Moved this information to an appendix to improve the logical flow of the installation procedures.
