

Retail is Taking Off, But From What Launch Pad

SUSE Linux Enterprise Point of Service Provides the Foundation for Innovative Services

by Meike Chabowski

Retail is recovering quickly from the dark days of the past few economic years. Holiday sales in the United States, for example, turned in numbers across all retail categories from apparel to electronics that rocketed past the predictions of even the preseason optimists. And that should be good news for retail IT departments. Well, relatively good news. Retail still has a number of hurdles to overcome.

Retail has traditionally lagged in technology, especially at the foundation level. And even though IT budgets are now beginning to increase, IT departments are saddled with outdated hodgepodge systems, licensing fees, maintenance and multiyear rollouts.

At the same time, retail customers are more technology savvy than ever, and they want to use their technology to shop. This presents a real dilemma for IT. How does it come from behind the curve, keep ahead of customers and do it on growing but still limited budgets?

One answer is to ensure retail systems from the data center to the point of service (POS) systems are built on a solid, secure, flexible and cost-efficient platform. Many retailers are turning to open source systems due to their security, dependability, scalability and lower costs. And because they aren't locked into a hardware platform, they can scale on a moment's notice.

> Enterprise-class Linux Operating System Tailored for Retail

[SUSE Linux Enterprise Point of Service](#) from Novell is the only enterprise-class Linux solution that is designed specifically for retail environments, including branch and POS devices.

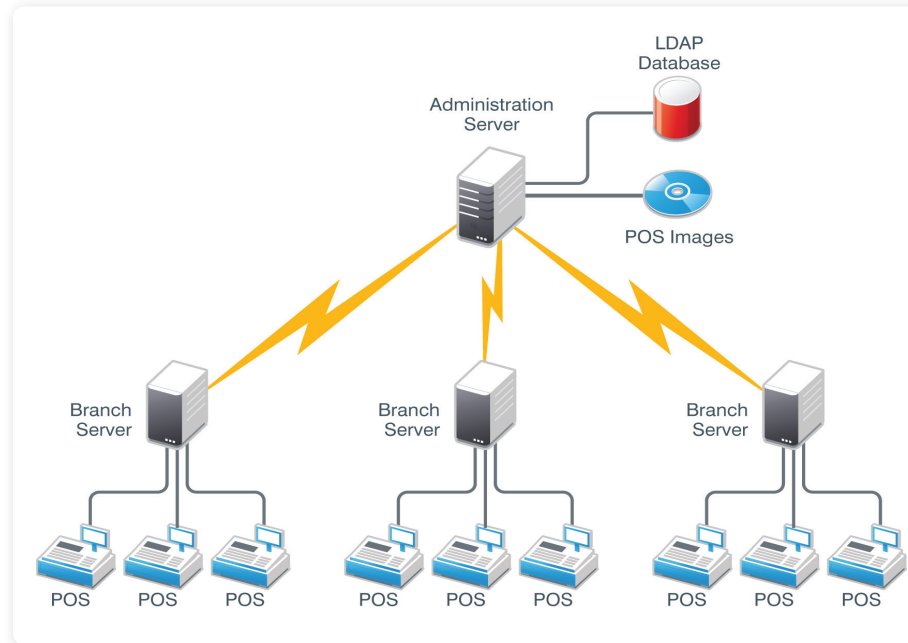
SUSE Linux Enterprise Point of Service includes an operating system that runs on any x86-64 or x86 hardware. A typical architecture includes one central administrative server that communicates with branch servers. The branch servers are connected to POS terminals, which run retail applications or specialized cash registers and kiosks. (See [Figure 1](#).)

> The Administration Server Manages the Entire Infrastructure

The administration server hosts an LDAP database and creates the images that are sent to the branch offices and POS devices. The LDAP database stores the configuration of each POS client configuration.

The functions of the administration server include the following:

- Maintaining the master LDAP directory for each branch server system
- Providing the tools such as the YaST Image Creator, which is a graphical front end to the KIWI image building technology for building custom system images and holding the images for distribution
- Storing branch server configuration parameters
- Providing the infrastructure to distribute the system images and software updates
- Supporting the Network Time Protocol (NTP) for synchronizing the branch servers
- Consolidating the syslog output from the branch servers



SUSE Linux Enterprise Point of Service architecture

Figure 1: The SUSE Linux Enterprise Point of Service architecture comprises the centralized administration server, branch servers and POS terminals.

You manage all administrative tasks for the branch and POS terminals at the administrative server, including building and distributing images. The branch servers may also automatically download images based on daemons you set up.

> Branch Servers Boot POS Terminals

The branch servers play several roles. They serve as the boot servers and provide the system management infrastructure for the POS terminals, and they may host store applications, databases and POS applications. The branch server functions include the following:

- Running domain name services (DNS) for the local network
- Running dynamic host configuration protocol (DHCP) services to control the boot process
- Providing a multicast boot infrastructure for POS terminals (PXE, tftp)
- Transferring system images from the administration server to the terminals

The branch server automatically pulls new system images from the administration server and downloads them to the POS terminals. You can also distribute images as delta files with only the changes between image versions.

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> Creating Images

To easily roll out [SUSE Linux Enterprise Point of Service](#), you can build customized application images that graphical and non-graphical terminals automatically download from the branch servers when they boot.

Creating images is easy. To start, SUSE Linux Enterprise Point of Service ships with templates that are proven to work out of the box.

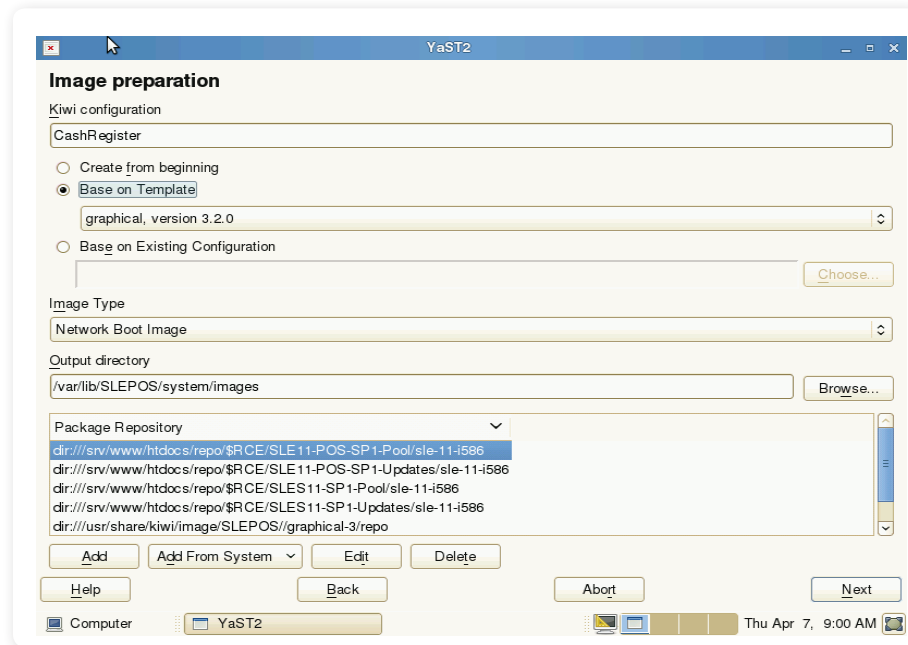
Each image file contains the Linux operating system, drivers, configuration settings and application files. Each terminal requires two images: a boot image that contains the kernel and a bootstrap image, and the system image.

You can build images using the KIWI command-line tool, but it's much easier to use the YaST Image Creator, which is a front end for KIWI and ships with SUSE Linux Enterprise Point of Service. This YaST for building images is the same as YaST for building new systems.

When you start Image Creator, you'll see the Configuration Overview dialog, which lists image configurations that have been saved in the `/var/lib/SLEPOS/system` directory. You can add, delete or edit configurations right in the dialog box. You can also build images from a newly added configuration or from the configuration opened in Edit.

To create a new image configuration from a template shipped with SUSE Linux Enterprise Point of Service, follow these steps:

1. In the YaST Control Center, click Miscellaneous followed by Image Creator.
2. In the Image Creator Configuration Overview dialog, press Add, which brings up the Image Preparation dialog. Enter the name of the new configuration in the Kiwi Configuration.
3. Select Base on Template and choose the template to use from the list. If you want to re-use previously created configurations, select Base on Existing Configuration and choose the directory with the configuration to use.
4. Select the Image Type you want to create. To create a bootable live CD with a system image, choose Live ISO Image. To create a bootable USB memory device with a system image, choose USB Stick Image. If you need to boot clients from the network using PXE/DHCP and then download a system image from the network, select Network Boot Image. The path in which the directory with the image will be created is set in the Output Directory. The default value is determined by the template, and you can leave it as it is.
5. Package repositories used for creating the image are listed in the Package Repository table. The templates include paths to the copies of the SUSE Linux Enterprise Server and SUSE Linux Enterprise Point of Service source media located in the default distribution directory, `/var/lib/SLEPOS/dist/`. These copies should be created using the POSCopyTool before creating images. (See [Figure 2](#).)



The Package Repository

Figure 2: You will use the packages in the repository to build images.

6. To add a new repository, click Add, select the type of the repository and enter the required information. If the image-building server is on the same architecture as the terminals (i586), it is possible to use update repositories defined in the operating system. To add a system repository, configure the update repository according to the SUSE Linux Enterprise Server Administration Guide and use Add From System in Image Creator.
7. You can also add selected packages manually to the `/var/lib/SLEPOS/system/image_name/repo/` directory.
8. Click Next to proceed with creating the image configuration. Image Creator now downloads the repository metadata, which may take some time. If the configured repositories are not valid, Image Creator will report that.
9. In the Image Configuration dialog, add root and other needed users. Otherwise, you can use the default values defined in the template.
10. Create the image by selecting Yes. If you choose No, the image configuration will be saved but no image will be built. A window showing logs opens. After successfully creating the image, click OK. The path to the directory containing the new image is shown. Click OK.

> Managing POS Terminals Remotely and Securely

A daemon enables you to connect to POS terminals located in remote locations via the branch server to shut down terminals, reload configurations and restart applications. You manage remote POS terminals using easy command line options. You can also back up and restore all system information for each branch server and POS terminal from the administration server. All information is stored in an LDAP directory on the administration server.

Security comes via several barriers. First you should ensure that each server, administration and particularly each branch server, is physically secure. SUSE Linux Enterprise Point of Service then uses AppArmor to maintain profiles to restrict applications to accessing only files and directories they are authorized.

> A Dedicated Solution for a Recovering Industry

The retail industry's unique use of POS devices connected through branch offices or stores requires unique technology solutions. This industry has traditionally lagged behind other industries in its investments in technology to provide solutions due to low margins and tight IT budgets. This has been compounded by the recent recession. But the retail industry is pulling back into the black and is boosting its IT budgets. [SUSE Linux Enterprise Point of Service](#) is a dedicated operating system solution for this industry and offers a secure, flexible and low-cost solution that lets retailers make use of their current hardware to manage their POS devices from a central location without vendor lock-in. It is an ideal foundation from which to launch a market recovery.

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