Introduction
Linux for POWER is a compelling environment for running Linux. The POWER architecture is well worth exploring as both a high-power workstation and a server environment.

Linux is available for both the IBM iSeries™ and pSeries POWER servers. This article covers the installation of Linux on a pSeries system. Linux for pSeries is available from Red Hat, SUSE, and TurboLinux.

Linux installation options
There are two general paths available for installing Linux on pSeries. You can perform a monolithic installation or a hosted installation.

In a monolithic installation, Linux owns the entire server and all of its resources. With the advent of the 2.6 kernel, the problem of processor limitations that existed before has been corrected. You can now run Linux on a 32-way system, which makes Linux a powerful option indeed.

In a hosted installation, Linux runs along with another operating system. It could be AIX 5L™ or other instances of Linux. The pSeries box is partitioned using the OpenFirmware to assign the system resources, such as CPU, memory, storage, and other devices. Hosted installations provide a very robust use of the hardware and allow sharing of resources between AIX 5L and Linux. The new POWER5™ architecture allows Micro-Partitioning™, which means that you can subdivide a processor among more than one operating system. You can give Linux a portion of a processor to work with on an underutilized system, rather than adding an x86 box for a small task.

A hosted installation of Linux on a pSeries system requires a Hardware Management Console (HMC), which is a specialized computer designed to manage pSeries hardware. Through the HMC you will allocate which resources you wish to make available to Linux and which you will reserve for other partitions. This is also where you will assign resources, such as file systems, which are to be shared between multiple partitions. For example, you may allocate a shared file space, which
would be used by both AIX 5L and Linux. An in-depth look at partitioning a pSeries system can be found in the IBM Redbook *The Complete Partitioning Guide for IBM pSeries Servers.*

**Performing the installation**

Now, let's walk through a monolithic installation of Linux on a pSeries box. The example in this article uses SUSE SLES 9 on a p270. In general, you will perform a default installation, accepting the defaults the installation recommends.

If you are using a different distribution of Linux or different pSeries hardware, your procedures may vary from what you see here. Consult your Linux distribution and pSeries hardware manuals for details. You should be familiar with the POWER system that you are installing.

1. Turn on the POWER system and insert the first install CD. Once the POST has completed, you will hear 2 beeps and see the keyboard symbol on the screen, as shown in Figure 1. At this point, interrupt the boot process with the key that brings up the SMS menu. On the p270, the key is F1, but the sequence may vary with your system. Consult your hardware manual to confirm the correct key sequence.

   **Figure 1. Power-Up screen**

2. This will bring up the System Management Service. Select the **Multiboot** option.

   **Figure 2. SMS multiboot selection**
3. Select **Install From**.

**Figure 3. SMS install from**

4. You are presented with a device list. Select the **SCSI CD-ROM**, which contains your SLES 9 CD and install.

**Figure 4. SMS boot device select**

5. SMS will confirm the CD that you are installing. Select the SLES 9 install to begin.

**Figure 5. SMS install confirmation**

6. The system will boot from the CD and start the Linux installation. The yaboot menu will come up, and you have the option to select the 64-bit or 32-bit kernel. Select the 64-bit kernel by typing `install` and pressing **Enter**.

**Listing 1. Install commands for kernels**

```bash
Welcome to SUSE LINUX!
Use "install" to boot the ppc64 kernel
Use "install32" to boot the 32bit RS/6000 kernel
You can pass the option "noinitrd" to skip the installer.
Example: install noinitrd root=/dev/sda4
Welcome to yaboot version 1.3.11.SUSE
Enter "help" to get some basic usage information
boot: install
```
7. The Linux graphical install will begin. Select your preference of language for the installation process. (You will select the run-time languages later in the installation.)

**Figure 6. Install language select**

8. Confirm the installation settings. Accept all of the defaults, except those for the Packages. Scroll down, and select **Packages**. You are taken to another menu where you can select items to be installed. Check the development packages.

**Figure 7. Install settings**

9. YaST will confirm that you are ready to start copying files onto your system. Select **Yes, Install** to start the installation.
10. SLES 9 will copy files onto your system. Swap CDs if prompted.

**Figure 9. Installing files**

11. After the files have been copied, you are prompted to select a password for the root user. Root has full administrative control of the system and is known as a superuser. Select a very secure password for root, and only log in as root when absolutely necessary.
12. Next you are prompted to configure your network devices. The default setting is to receive IP configuration from DHCP for all devices. If your network environment requires static settings, click on the "Network Interfaces" link, and you can enter the IP settings for each network device.

**Figure 11. Network configuration**

13. The Certificate Authority configuration is next, a new feature of SLES 9. Linux has been able to act as a Certificate Authority for some time, but the option has become popular enough that it is now included as part of the main installation. (Running a certificate authority is beyond the scope of this article. See Related topics for some pointers to useful information regarding Certificate Authority.) If you don't need a Certificate Authority, you can skip this configuration.
14. Select the authentication method for your system. If you are setting up a single Linux system, the authentication will be local. However, for a networked installation, you probably want to use LDAP or NIS. Both are effective ways to centralize user information. If you are using an external authentication system, such as the Tivoli® Access Manager, select local for now and adjust the configuration later.

Figure 13. Network configuration

15. Next you are prompted to create new local users. If you chose external authentication source in the previous step, you can get by without additional users. The LDAP or NIS will already have your other users populated. If this is a stand alone system, create an additional user,
other than root. The root user is very powerful. It is easy to do harmful things to your system through carelessness. Having another user available for general usage is a good safeguard.

**Figure 14. Add a new local user**

16. You now have a chance to make any final tweaks on your hardware configuration. Simply click on the component you want to edit and adjust the settings appropriately. You can also adjust these settings once the installation is complete.

**Figure 15. Hardware Configuration**

17. At this point, the installation is complete and your system will reboot.
Conclusion

Installing Linux on POWER is a fairly straightforward procedure. Linux operates well on POWER systems and works very nicely with other operating systems in a partitioned environment. Installing Linux allows you to leverage the advanced hardware with the advantages of open source tools and open standards. It is a powerful combination that gives administrators and developers a great deal of control over their environment.

By applying Linux, it is now possible to develop a single solution, which scales from the IBM® xSeries® to POWER to IBM® zSeries® systems.
Related topics

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  - Logical Partitions on IBM PowerPC: A Guide to Working with LPAR on POWER5 for IBM eServer i5 Servers
  - The Complete Partitioning Guide for IBM pSeries Servers
  - Linux on the IBM iSeries Server: An Implementation Guide
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