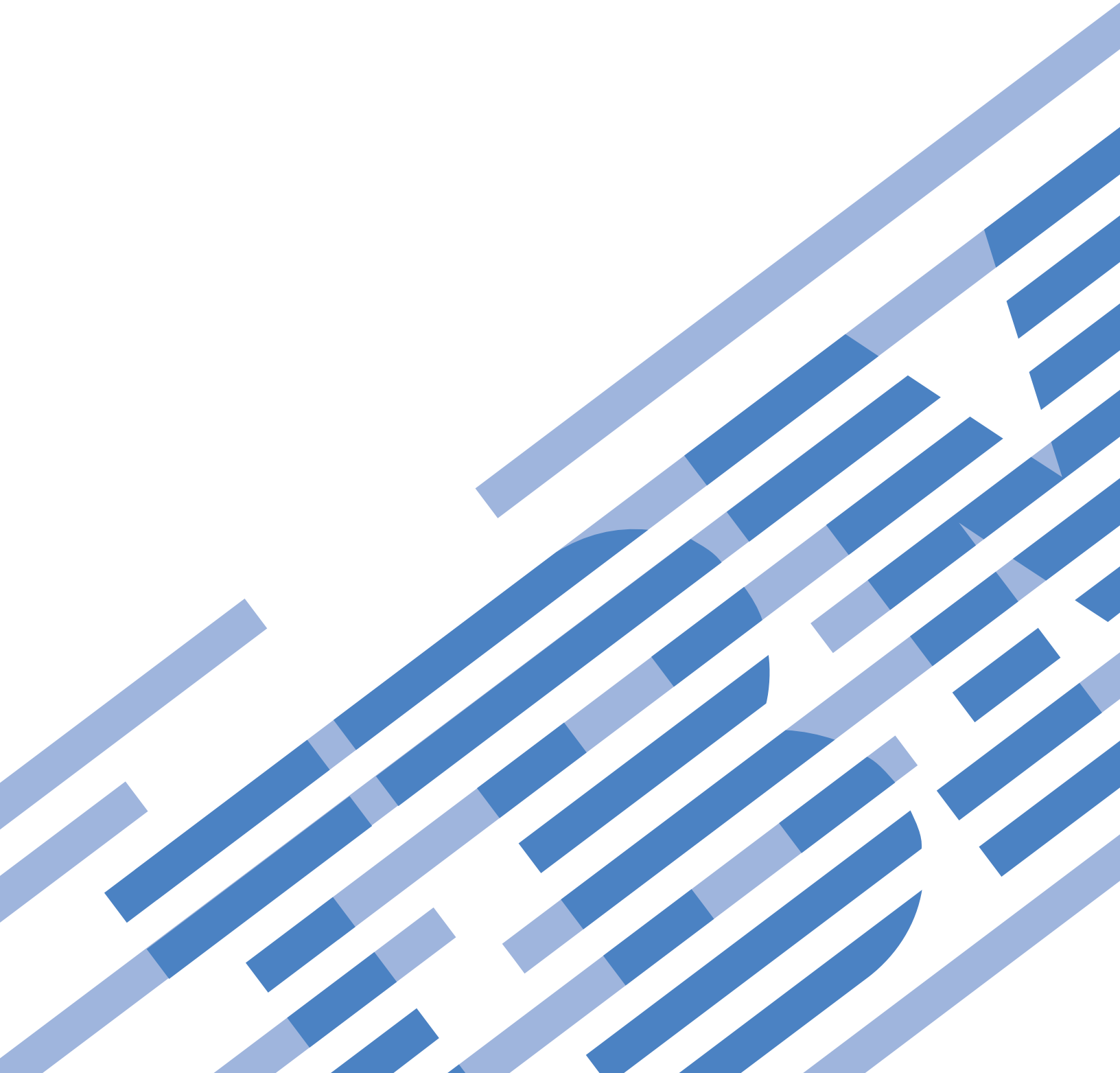




System i and System p
Installing Linux





System i and System p
Installing Linux

Note

Before using this information and the product it supports, read the information in “Notices” on page 41 and the *IBM Systems Safety Information* manual, G229-9054.

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About this topic

This PDF provides instructions for preparing and installing the Linux operating system on your system, how to install software to enable dynamic logical partitioning and other capabilities of your system, a detailed installation scenario, and other related information.

For information about the accessibility features of this product, for users who have a physical disability, see "Accessibility features," on page 39.

Installing Linux

A Linux® distribution is one of the operating systems that can be installed on your server or logical partition.



The following information includes instructions for preparation and installation of the Linux operating system on your server, how to find documentation for Linux for IBM® POWER® distributions, how to install software to enable dynamic logical partitioning and other capabilities of your system, a detailed installation scenario, and links to other related information.

PDF file for Installing Linux

You can view and print a PDF file of this information.



To view or download the PDF version of this document, select [Installing Linux](#)  (about 444 KB).

You can view or download these related topics:

- [Partitioning for Linux with an HMC](#)  (about 926 KB) contains the following topics:
 - What's new for Partitioning for Linux with an HMC
 - General concepts for partitioning the server
 - Scenarios for Linux logical partitions
 - Supported virtual devices for Linux logical partitions
 - Configuring Linux logical partitions
 - Managing Linux logical partitions
 - Using Linux installed on a logical partition
 - Troubleshooting Linux logical partitions
 - Related information for Linux logical partitions
- [Initial server setup](#)  (about 1500 KB) contains predefined initial server setup checklists.

Other information

You can also view or print any of the following PDFs:


- IBM Redbooks®:
 - [Partitioning Implementations for IBM eServer™ p5 Servers](#)  (about 3 MB)
 - [Linux Handbook: A Guide to IBM Linux Solutions and Resources](#)  (about 7 MB)

Saving PDF files

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF link in your browser.
2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep2.html) .

Preparing to install the Linux operating system

Learn how to prepare for installing a Linux distribution by completing these planning tasks.

For examples of installing Linux, see Scenario: Configuring a model 510 with the Linux operating system on a full system partition and Scenario: Configuring the model 710 server with Linux on two logical partitions using virtual I/O.

Initial Server Setup

This topic collection provides an end-to-end setup checklist for you to use throughout the entire initial setup of your server. The checklist is intended to ensure that the system is capable of starting and that it is functional before you perform more complex and custom configurations.

Upgrades

Find information about migrating your data or upgrading your hardware from older IBM Systems and eServer hardware, IBM System p[®] servers.

System i upgrades and data migration

Find information about migrating your data or upgrading your hardware from older IBM Systems and eServer hardware, IBM System i[®] servers.

Planning for Linux

Use this checklist to prepare a plan for installing the Linux operating system on IBM Systems and eServer hardware.

Planning for logical partitions

Use this checklist to plan for creating or changing logical partitions on your system.

Partitioning for Linux with an HMC

This topic provides the configuration, management, and troubleshooting information for Linux logical partitions.

Linux on IBM Web site at

<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html> 

Use this information access the latest installation information for Linux on your IBM POWER system. This link provides the latest information, fixes, and procedures that might help you avoid problems during the installation of Linux on IBM systems.

Planning for Linux

Learn about the planning tasks that are required before you install your Linux operating system on your server.

If you need more information to decide whether or not to partition, see the list of topics under Partitioning for Linux with an HMC in the IBM Systems Hardware Information Center.

Before you begin

- If you are planning to upgrade an existing server, document your current environment.
- If you are migrating from another operating system to Linux, document your migration path.

Linux planning tasks

— Identify the hardware requirements for your Linux system

The IBM eServer hardware and IBM System p5[®] hardware systems require a Linux for POWER distribution, that is, Linux distributions designed to run on POWER technology-based systems. For more information, see the Linux on Power Web site.

— Identify installation media (CD or Network)

— Identify whether or not to use the IBM Installation Toolkit for Linux on POWER to install Linux

For more information about the toolkit, see IBM Installation Toolkit for Linux on POWER.

— Identify the Linux distribution (for example, SUSE Linux Enterprise Server or Red Hat Enterprise Linux) and the release to be installed

For information, see the Linux on Power Web site.

— Identify your applications requirements

Some applications require a specific Linux distribution. For information, see the Linux on POWER applications Web site.

After you finish

- Identify and record the hardware requirements for your solution.
- Identify and record the appropriate Linux distribution for your solution.
- Ensure that the hardware requirements for your configuration have been met.
- Record a complete hardware feature placement plan, which includes your post installation strategy for moving features to match your configuration.

IBM Installation Toolkit for Linux on POWER

The IBM Installation Toolkit for Linux on POWER simplifies installing and managing Linux on your IBM POWER-based server.

The IBM Installation Toolkit for Linux on POWER is a bootable CD that provides access to the additional packages that you need to install to access more capabilities of your server and also allows you to set up an installation server to make your customized operating system installation files available for other server installations. Download the IBM Installation Toolkit for Linux on POWER from

<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/installtools/home.html> .


Use the IBM Installation Toolkit for Linux on POWER to:

- Facilitate the launch of the Linux distribution installation and help reduce errors during installation.
- Install RPM packages including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your server. For information about these RPMs that are required for IBM System i5[®] and eServer i5 hardware and will enhance your experience on IBM System p5 and eServer p5 hardware, see Installing required additional software for the Linux operating system.
- Run system configuration tools such as diagela, lsvpd, rpa-dlpar, rpa-pci-hotplug, sysdiag, and others.
- Browse and search Linux on POWER documentation such as Setting up a Virtual I/O Server, Setting up virtual partitions, Reference code documentation, Managing a server with an HMC, a Maintenance guide, an overview of Linux RAS tools, Initial server setup, Clustering solutions, and other topics.
- Register at IBM Support for Linux servers. This registration service provides technical information for users who maintain IBM System p5, System i5, and BladeCenter[®] servers.
- View the IBM Installation Toolkit for Linux on POWER users' manual and developers' manual on the CD.

Installing a customized Linux distribution

To facilitate installation and maintenance, distributors provide a customized Linux distribution in which the kernel is compiled specifically for the POWER architecture.

To install a Linux distribution on your server, use the installation documentation provided by the Linux distributor. You can find installation information for both Red Hat Enterprise Linux version 4 and for SUSE Linux Enterprise Server 9 in the documentation provided on the Linux installation CDs.

- For current information about Linux distributions, refer to the Linux at IBM  Web site.
- For detailed information about installing Red Hat Enterprise Linux version 4, see Red Hat Enterprise Linux 4 Installation Guide for the IBM POWER Architecture Web site at

<http://www.redhat.com/docs/manuals/enterprise/RHEL-4-Manual/ppc-multi-install-guide/> .

- For detailed information about installing SUSE Linux Enterprise Server 9, see the installation information at SUSE LINUX Enterprise Server Web site at

<http://www.novell.com/documentation/sles9/index.html> .

- After you have installed Linux, use the additional software described in the Installing additional software for Linux topic to enhance your Linux on POWER solutions.

Installing required additional software for the Linux operating system

Depending on your hardware, additional software for the Linux operating system is either required or can enhance the capabilities of your server.

Note: You must install the additional software to run a Linux distribution on an IBM System i5 or eServer i5 server. Installing the additional software on an IBM System p5 or eServer p5 server is an enhancement option.

First, install your Linux distribution using the documentation available at Linux operating system distribution installation documentation. Then, install the additional software to provide more capabilities, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

This software is available at the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for Red Hat on BladeCenter servers

Install the additional software for Red Hat Enterprise Linux version 4 or Red Hat Enterprise Linux version 3 to enhance the capabilities of your server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 1. Service and productivity tools for Red Hat Enterprise Linux version 4 and Red Hat Enterprise Linux version 3

Installation order	Package Title	Summary
1	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and the snapp command for capturing extended error data to aid analysis of intermittent errors.
2	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
3	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
4	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
5	Broadcom flash, diagnostic utility	This Broadcom diagnostic and flash utility, bcmflashdiag , provides diagnostic and flash functions for Broadcom dual-port Gigabit Ethernet adapters used on IBM JS20s. The use of flash functions as well as system requirements and configurations are described in the README file included in the RPM file for these utilities. This file, README.flash-js20 , describes device driver, Ethernet configuration, and flash memory upgrade functions, as well as diagnostic functions and error messages.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for Red Hat on IBM System i servers not managed by an HMC

Install the required additional software for Red Hat Enterprise Linux version 4 or Red Hat Enterprise Linux version 3 to access more capabilities, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 2. Service and productivity tools for Red Hat Enterprise Linux version 4

Installation order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
3	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	RSCT core	This package provides the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
5	CSM core	This package provides for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
6	CSM client	This package provides for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
7	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the Hardware Management Console (HMC).
8	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows a Hardware Management Console (HMC) to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition
9	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.
10	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
11	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.

Table 2. Service and productivity tools for Red Hat Enterprise Linux version 4 (continued)

Installation order	Package Title	Summary
12	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to <code>/var/log/platform</code> . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the <code>/etc/diagela/mail_list</code> file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
13	PCI Hotplug Tools	The <code>rpa-pci-hotplug</code> package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: <code>lsslot</code> , which lists the current status of the server's PCI slots, and <code>drslot_chrp_pci</code> , an interactive tool for performing hotplug operations.
14	Dynamic Reconfiguration Tools	The <code>rpa-dlpar</code> package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).
15	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a server, including, but not limited to, the following: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode IBM uses this information to determine required repair parts and to assist in configuring system upgrades. If you have an attached Hardware Management Console (HMC), you can initiate Inventory Scout functionality on a partition by using the Service Applications panel of the HMC.
16	icom Driver Firmware Binaries	The <code>icom Driver Firmware Binaries</code> RPM contains binaries for Linux running on IBM System i models. These firmware files are needed for <code>icom</code> adapter functionality when the adapter is used with Red Hat releases starting with Red Hat Enterprise Linux version 4 update 3 and Linux kernel releases later than 2.6.20. The <code>rpm -ivh</code> command must be used to install the RPM on System i models. The binary files are placed in the <code>/lib/firmware</code> directory. Thoroughly test these firmware binaries before using them in a production environment.

Table 3. Service and productivity tools for Red Hat Enterprise Linux version 3

Installation order	Package Title	Summary
1	Platform Enablement Library	The <code>librtas</code> package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
3	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	RSCT core	Reliable scalable cluster technology (RSCT) core and utilitiesThe RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
5	CSM core	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).

Table 3. Service and productivity tools for Red Hat Enterprise Linux version 3 (continued)

Installation order	Package Title	Summary
6	CSM client	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
7	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the Hardware Management Console (HMC).
8	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows a Hardware Management Console (HMC) to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition
9	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.
10	Hardware Inventory	Hardware Inventory (base tool - formerly called "lsvpd, lscfg commands")The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
11	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
12	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
13	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a server, including, but not limited to, the following: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring server upgrades. If you have an attached Hardware Management Console (HMC), you can initiate Inventory Scout functionality on a partition by using the Service Applications panel of the HMC.</p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for Red Hat on IBM System p servers managed by an HMC

Install the additional software for Red Hat Enterprise Linux version 4 or Red Hat Enterprise Linux version 3 to enhance the capabilities of your IBM System p server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 4. Service and productivity tools for Red Hat Enterprise Linux version 4

Installation order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
3	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	RSCT core	This package provides the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
5	CSM core	This package provides for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
6	CSM client	This package provides for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
7	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the Hardware Management Console (HMC).
8	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows a Hardware Management Console (HMC) to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition

Table 4. Service and productivity tools for Red Hat Enterprise Linux version 4 (continued)

Installation order	Package Title	Summary
9	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.
10	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
11	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
12	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
13	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot , which lists the current status of the server's PCI slots, and drslot_chrp_pci , an interactive tool for performing hotplug operations.
14	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).
15	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a server, including, but not limited to, the following: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring system upgrades. If you have an attached Hardware Management Console (HMC), you can initiate Inventory Scout functionality on a partition by using the Service Applications panel of the HMC.</p>

Table 5. Service and productivity tools for Red Hat Enterprise Linux version 3

Installation order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
3	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	RSCT core	Reliable scalable cluster technology (RSCT) core and utilitiesThe RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
5	CSM core	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
6	CSM client	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the Hardware Management Console (HMC).
7	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the Hardware Management Console (HMC).
8	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows a Hardware Management Console (HMC) to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition
9	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.

Table 5. Service and productivity tools for Red Hat Enterprise Linux version 3 (continued)

Installation order	Package Title	Summary
10	Hardware Inventory	Hardware Inventory (base tool - formerly called "lsvpd, lscfg commands")The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
11	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
12	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
13	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a server, including, but not limited to, the following: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring server upgrades. If you have an attached Hardware Management Console (HMC), you can initiate Inventory Scout functionality on a partition by using the Service Applications panel of the HMC.</p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for Red Hat on IBM System i servers not managed by an HMC

Install the required additional software for Red Hat Enterprise Linux version 4 or Red Hat Enterprise Linux version 3 to access more capabilities of your IBM System i server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 6. Service and productivity tools for Red Hat Enterprise Linux version 4

Installation Order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.
3	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
4	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
5	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
6	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
7	Service Agent	The Service Agent packages will create Serviceable Events from the output of the Error Log Analysis Tool (diagela), and use an attached modem to deliver these events directly to IBM Service. It is also capable of delivering system inventory retrieved from Inventory Scout. Refer to the "IBM Electronic Service Agent™ for Linux, on eServer p5 and pSeries®" for more information on the capabilities of Service Agent.
8	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot , which lists the current status of the server's PCI slots, and drslot_chrp_pci , an interactive tool for performing hotplug operations.
9	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).

Table 6. Service and productivity tools for Red Hat Enterprise Linux version 4 (continued)

Installation Order	Package Title	Summary
10	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pcnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown.</p> <p>After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: <code>/etc/init.d/evlog restart</code></p>
11	icom Driver Firmware Binaries	<p>The icom Driver Firmware Binaries RPM contains binaries for Linux running on IBM System i models. These firmware files are needed for icom adapter functionality when the adapter is used with Red Hat releases starting with Red Hat Enterprise Linux version 4 update 3 and Linux kernel releases later than 2.6.20. The <code>rpm -ivh</code> command must be used to install the RPM on System i models. The binary files are placed in the <code>/lib/firmware</code> directory. Thoroughly test these firmware binaries before using them in a production environment.</p>

Table 7. Service and productivity tools for Red Hat Enterprise Linux version 3

Installation Order	Package Title	Summary
1	Platform Enablement Library	<p>The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.</p>
2	Service Aids	<p>The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.</p>
3	Hardware Inventory	<p>The lsvpd package contains the lsvpd, lscfg, and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db, constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.</p>
4	Service log	<p>The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database.</p> <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
5	Error Log Analysis	<p>The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to <code>/var/log/platform</code>. If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the <code>/etc/diagela/mail_list</code> file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.</p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for Red Hat on IBM System p servers not managed by an HMC

Install the additional software for Red Hat Enterprise Linux version 4 or Red Hat Enterprise Linux version 3 to enhance the capabilities of your IBM System p server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 8. Service and productivity tools for Red Hat Enterprise Linux version 4

Installation Order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.
3	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
4	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
5	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
6	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.

Table 8. Service and productivity tools for Red Hat Enterprise Linux version 4 (continued)

Installation Order	Package Title	Summary
7	Service Agent	The Service Agent packages will create Serviceable Events from the output of the Error Log Analysis Tool (diagela), and use an attached modem to deliver these events directly to IBM Service. It is also capable of delivering system inventory retrieved from Inventory Scout. Refer to the "IBM Electronic Service Agent for Linux, on eServer p5 and pSeries" for more information on the capabilities of Service Agent.
8	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot, which lists the current status of the server's PCI slots, and drslot_chrp_pci, an interactive tool for performing hotplug operations.
9	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).
10	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the HMC, if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pcnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown.</p> <p>After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: /etc/init.d/evlog restart</p>

Table 9. Service and productivity tools for Red Hat Enterprise Linux version 3

Installation Order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and, the snap command for capturing extended error data to aid analysis of intermittent errors.
3	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
4	Service log	<p>The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database.</p> <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.

Table 9. Service and productivity tools for Red Hat Enterprise Linux version 3 (continued)

Installation Order	Package Title	Summary
5	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for SUSE Linux on BladeCenter servers

Install the additional software for SUSE Linux Enterprise Server 10 or SUSE Linux Enterprise Server 9 to access more capabilities of your server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 10. Service and productivity tools for SUSE Linux Enterprise Server 10

Installation Order	Package Title	Summary
1	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
3	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list . The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
4	Broadcom flash, diagnostic utility	This Broadcom diagnostic and flash utility, bcmflashdiag , provides diagnostic and flash functions for Broadcom dual-port Gigabit Ethernet adapters used on IBM JS20s. The use of flash functions as well as system requirements and configurations are described in the README file included in the RPM file for these utilities. This file, README.flash-js20, describes device driver, Ethernet configuration, and flash memory upgrade functions, as well as diagnostic functions and error messages.

Table 10. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
5	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pnet32; update evlog ELA scripts; and update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: <code>/etc/init.d/evlog restart</code></p>

Table 11. Service and productivity tools for SUSE Linux Enterprise Server 9

Installation Order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and the snap command for capturing extended error data to aid analysis of intermittent errors.
3	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
4	Service Log	<p>The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database.</p> <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
5	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.

Table 11. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
6	Broadcom flash, diagnostic utility	This Broadcom diagnostic and flash utility, <code>bcmflashdiag</code> , provides diagnostic and flash functions for Broadcom dual-port Gigabit Ethernet adapters used on IBM JS20s. The use of flash functions as well as system requirements and configurations are described in the README file included in the RPM file for these utilities. This file, <code>README.flash-js20</code> , describes device driver, Ethernet configuration, and flash memory upgrade functions, as well as diagnostic functions and error messages.
7	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to <code>evlog</code>, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The <code>evlog-drv-tmpl</code> tool requires <code>evlog-1.6.0-xx</code> (shipped with SLES9). This RPM will install the driver templates for <code>bcm5700</code>, <code>e100</code>, <code>e1000</code>, <code>emulex</code>, <code>ipr</code>, <code>olympic</code>, and <code>pcnet32</code>; update <code>evlog</code> ELA scripts; and update the <code>evlog</code> startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart <code>evlog</code> to load these new ELA rules. To restart <code>evlog</code>, run the following command: <code>/etc/init.d/evlog restart</code></p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Required software for SUSE Linux on IBM System i servers managed by an HMC

Install the additional software for SUSE Linux Enterprise Server 10 or SUSE Linux Enterprise Server 9 to access more capabilities of your IBM System i server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Table 12. Service and productivity tools for SUSE Linux Enterprise Server 10

Installation Order	Package Title	Summary
1	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
2	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.

Table 12. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
3	RSCT core	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	CSM core	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.
5	CSM client	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.
6	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the HMC.
7	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows an HMC to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition
8	Hardware Inventory	The lsvpd package contains the lsvpd, lscfg, and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db, constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some system-specific information.
9	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
10	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform. If a corrective action is required, notification is sent to the Service Focal Point on the HMC, if so equipped, or to users subscribed for notification through the file /etc/diagela/mail_list. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification may contain a Service Request Number. This number is listed in the "Diagnostics Information for Multiple Bus Systems" manual.
11	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot, which lists the current status of the server's PCI slots, and drslot_chrp_pci, an interactive tool for performing hotplug operations.
12	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached HMC.
13	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a system, including but not limited to: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring system upgrades. If you have an attached Hardware Management Console (HMC), you can initiate Inventory Scout functionality on a partition by using the "Service Applications" panel of the HMC.</p>

Table 12. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
14	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the HMC, if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pcnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: <code>/etc/init.d/evlog restart</code></p>
15	icom Driver Firmware Binaries	<p>The icom Driver Firmware Binaries RPM contains binaries for Linux running on IBM System i models. These firmware files are needed for icom adapter functionality when the adapter is used with Red Hat releases starting with Red Hat Enterprise Linux version 4 update 3 and Linux kernel releases later than 2.6.20. The <code>rpm -ivh</code> command must be used to install the RPM on System i models. The binary files are placed in the <code>/lib/firmware</code> directory. Thoroughly test these firmware binaries before using them in a production environment.</p>

Table 13. Service and productivity tools for SUSE Linux Enterprise Server 9

Installation Order	Package Title	Summary
1	Platform Enablement Library	<p>The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.</p>
2	SRC	<p>SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.</p>
3	RSCT utilities	<p>The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.</p>
4	RSCT core	<p>The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.</p>
5	CSM core	<p>The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.</p>
6	CSM client	<p>The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.</p>
7	ServiceRM	<p>Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the HMC.</p>
8	DynamicRM	<p>Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows an HMC to do the following:</p> <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition

Table 13. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
9	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and the snapp command for capturing extended error data to aid analysis of intermittent errors.
10	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
11	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
12	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the HMC, if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
13	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot , which lists the current status of the server's PCI slots, and drslot_chrp_pci , an interactive tool for performing hotplug operations.
14	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached HMC.
15	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a server, including, but not limited to, the following: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring system upgrades. If you have an attached HMC, you can initiate Inventory Scout functionality on a partition by using the Service Applications panel of the HMC.</p>
16	I/O Error Log Analysis	The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog , and notification will be sent to the Service Focal Point on the HMC, if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center. <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pcnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: /etc/init.d/evlog restart</p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> 

Required software for SUSE Linux on IBM System p servers managed by an HMC

Install the additional software for SUSE Linux Enterprise Server 10 or SUSE Linux Enterprise Server 9 to access more capabilities of your IBM System p server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> 

Table 14. Service and productivity tools for SUSE Linux Enterprise Server 10

Installation Order	Package Title	Summary
1	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
2	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
3	RSCT core	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	CSM core	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.
5	CSM client	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.
6	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the HMC.
7	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows an HMC to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition

Table 14. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
8	Hardware Inventory	The lsvpd package contains the lsvpd, lscfg, and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db, constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some system-specific information.
9	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
10	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform. If a corrective action is required, notification is sent to the Service Focal Point on the HMC, if so equipped, or to users subscribed for notification through the file /etc/diagela/mail_list. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification may contain a Service Request Number. This number is listed in the "Diagnostics Information for Multiple Bus Systems" manual.
11	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot, which lists the current status of the server's PCI slots, and drslot_chrp_pci, an interactive tool for performing hotplug operations.
12	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached HMC.
13	Inventory Scout	The Inventory Scout package provides an application to gather hardware inventory for a system, including but not limited to: <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring system upgrades. If you have an attached Hardware Management Console (HMC), you can initiate Inventory Scout functionality on a partition by using the "Service Applications" panel of the HMC.</p>

Table 14. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
14	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the HMC, if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pcnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: <code>/etc/init.d/evlog restart</code></p>

Table 15. Service and productivity tools for SUSE Linux Enterprise Server 9

Installation Order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
3	RSCT utilities	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
4	RSCT core	The RSC packages provide the Resource Monitoring and Control (RMC) functions and infrastructure needed to monitor and manage one or more Linux systems. RMC provides a flexible and extensible system for monitoring numerous aspects of a system. It also allows customized responses to detected events.
5	CSM core	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.
6	CSM client	The CSM packages provide for the exchange of host-based authentication security keys. These tools also set up distributed RMC features on the HMC.
7	ServiceRM	Service Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that creates the Serviceable Events from the output of the Error Log Analysis Tool (diagela). ServiceRM then sends these events to the Service Focal Point on the HMC.

Table 15. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
8	DynamicRM	Dynamic Resource Manager is a Reliable, Scalable, Cluster Technology (RSCT) resource manager that allows an HMC to do the following: <ul style="list-style-type: none"> • Dynamically add or remove processors or I/O slots from a running partition • Concurrently update system firmware • Perform certain shutdown operations on a partition
9	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and the snap command for capturing extended error data to aid analysis of intermittent errors.
10	Hardware Inventory	The lsvpd package contains the lsvpd , lscfg , and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db , constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
11	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
12	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform . If a corrective action is required, notification is sent to the Service Focal Point on the HMC, if so equipped, or to users subscribed for notification through the /etc/diagela/mail_list file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
13	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lslot , which lists the current status of the server's PCI slots, and drslot_chrp_pci , an interactive tool for performing hotplug operations.
14	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached HMC.

Table 15. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
15	Inventory Scout	<p>The Inventory Scout package provides an application to gather hardware inventory for a server, including, but not limited to, the following:</p> <ul style="list-style-type: none"> • Features installed • EC levels of hardware • Microcode <p>IBM uses this information to determine required repair parts and to assist in configuring system upgrades. If you have an attached HMC, you can initiate Inventory Scout functionality on a partition by using the Service Applications panel of the HMC.</p>
16	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the HMC, if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The <code>evlog-drv-tmpl</code> tool requires <code>evlog-1.6.0-xx</code> (shipped with SLES9). This RPM will install the driver templates for <code>bcm5700</code>, <code>e100</code>, <code>e1000</code>, <code>emulex</code>, <code>ipr</code>, <code>olympic</code>, and <code>pcnet32</code>; update <code>evlog</code> ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart <code>evlog</code>, run the following command: <code>/etc/init.d/evlog restart</code></p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> 

Required software for SUSE Linux on IBM System i servers not managed by an HMC

Install the required additional software for SUSE Linux Enterprise Server 10 or SUSE Linux Enterprise Server 9 to access more capabilities of your IBM System i server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> 

Table 16. Service and productivity tools for SUSE Linux Enterprise Server 10

Installation Order	Package Title	Summary
1	Hardware Inventory	The <code>lsvdp</code> package contains the <code>lsvdp</code> , <code>lscfg</code> , and <code>lsmcode</code> commands. These commands, along with a boot-time scanning script called <code>update-lsvdp-db</code> , constitute a hardware inventory system. The <code>lsvdp</code> command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The <code>lscfg</code> command provides a more human-readable format of the VPD, as well as some server-specific information.
2	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • <code>servicelog</code> is used to query the database. • <code>servicelog_notify</code> is used to configure tools to be notified when serviceable events occur on the system. • <code>log_repair_action</code> is used to indicate when a repair action has taken place on the system.
3	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to <code>/var/log/platform</code> . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the <code>/etc/diagela/mail_list</code> file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
4	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
5	Service Agent	The Service Agent packages will create Serviceable Events from the output of the Error Log Analysis Tool (<code>diagela</code>), and use an attached modem to deliver these events directly to IBM Service. It is also capable of delivering system inventory retrieved from Inventory Scout. Refer to the "IBM Electronic Service Agent for Linux, on eServer p5 and pSeries" for more information on the capabilities of Service Agent.
6	PCI Hotplug Tools	The <code>rpa-pci-hotplug</code> package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: <code>lsslot</code> , which lists the current status of the server's PCI slots, and <code>drsloc_chrp_pci</code> , an interactive tool for performing hotplug operations.
7	Dynamic Reconfiguration Tools	The <code>rpa-dlpar</code> package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).

Table 16. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
8	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The <code>evlog-drv-tmpl</code> tool requires <code>evlog-1.6.0-xx</code> (shipped with SLES9). This RPM will install the driver templates for <code>bcm5700</code>, <code>e100</code>, <code>e1000</code>, <code>emulex</code>, <code>ipr</code>, <code>olympic</code>, and <code>pcnet32</code>; update <code>evlog</code> ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart <code>evlog</code>, run the following command: <code>/etc/init.d/evlog restart</code></p>
9	icom Driver Firmware Binaries	<p>The <code>icom</code> Driver Firmware Binaries RPM contains binaries for Linux running on IBM System i models. These firmware files are needed for <code>icom</code> adapter functionality when the adapter is used with Red Hat releases starting with Red Hat Enterprise Linux version 4 update 3 and Linux kernel releases later than 2.6.20. The <code>rpm -ivh</code> command must be used to install the RPM on System i models. The binary files are placed in the <code>/lib/firmware</code> directory. Thoroughly test these firmware binaries before using them in a production environment.</p>

Table 17. Service and productivity tools for SUSE Linux Enterprise Server 9

Installation Order	Package Title	Summary
1	Platform Enablement Library	<p>The <code>librtas</code> package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.</p>
2	Service Aids	<p>The utilities in the <code>ppc64-utils</code> package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the <code>update_flash</code> command for installing system firmware updates; the <code>serv_config</code> command for modifying various serviceability policies; the <code>usysident</code> and <code>usysattn</code> utilities for manipulating system LEDs; the <code>bootlist</code> command for updating the list of devices from which the system will boot; and the <code>snap</code> command for capturing extended error data to aid analysis of intermittent errors.</p>
3	Hardware Inventory	<p>The <code>lsvpd</code> package contains the <code>lsvpd</code>, <code>lscfg</code>, and <code>lsmcode</code> commands. These commands, along with a boot-time scanning script called <code>update-lsvpd-db</code>, constitute a hardware inventory system. The <code>lsvpd</code> command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The <code>lscfg</code> command provides a more human-readable format of the VPD, as well as some server-specific information.</p>

Table 17. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
4	Service log	<p>The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database.</p> <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
5	Error Log Analysis	<p>The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform. If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the file /etc/diagela/mail_list. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification may contain a Service Request Number. This number is listed in the "Diagnostics Information for Multiple Bus Systems" manual.</p>
6	SRC	<p>SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.</p>
7	Service Agent	<p>The Service Agent packages will create Serviceable Events from the output of the Error Log Analysis Tool (diagela), and use an attached modem to deliver these events directly to IBM Service. It is also capable of delivering system inventory retrieved from Inventory Scout. Refer to the "IBM Electronic Service Agent for Linux, on eServer p5 and pSeries" for more information on the capabilities of Service Agent.</p>
8	PCI Hotplug Tools	<p>The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot, which lists the current status of the server's PCI slots, and drslot_chrp_pci, an interactive tool for performing hotplug operations.</p>
9	Dynamic Reconfiguration Tools	<p>The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).</p>
10	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: /etc/init.d/evlog restart</p>

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Required software for SUSE Linux on IBM System p servers not managed by an HMC

Install the required additional software for SUSE Linux Enterprise Server 10 or SUSE Linux Enterprise Server 9 to access more capabilities of your IBM System p server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system.

All of the packages must be installed in the order shown in the following tables.

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> 

Table 18. Service and productivity tools for SUSE Linux Enterprise Server 10

Installation Order	Package Title	Summary
1	Hardware Inventory	The <code>lsvpd</code> package contains the <code>lsvpd</code> , <code>lscfg</code> , and <code>lsmcode</code> commands. These commands, along with a boot-time scanning script called <code>update-lsvpd-db</code> , constitute a hardware inventory system. The <code>lsvpd</code> command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The <code>lscfg</code> command provides a more human-readable format of the VPD, as well as some server-specific information.
2	Service Log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • <code>servicelog</code> is used to query the database. • <code>servicelog_notify</code> is used to configure tools to be notified when serviceable events occur on the system. • <code>log_repair_action</code> is used to indicate when a repair action has taken place on the system.
3	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to <code>/var/log/platform</code> . If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the <code>/etc/diagela/mail_list</code> file. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification might contain a Service Request Number. This number is listed in the <i>Diagnostics Information for Multiple Bus Systems</i> manual.
4	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.

Table 18. Service and productivity tools for SUSE Linux Enterprise Server 10 (continued)

Installation Order	Package Title	Summary
5	Service Agent	The Service Agent packages will create Serviceable Events from the output of the Error Log Analysis Tool (diagela), and use an attached modem to deliver these events directly to IBM Service. It is also capable of delivering system inventory retrieved from Inventory Scout. Refer to the "IBM Electronic Service Agent for Linux, on eServer p5 and pSeries" for more information on the capabilities of Service Agent.
6	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot, which lists the current status of the server's PCI slots, and drslot_chrp_pci, an interactive tool for performing hotplug operations.
7	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).
8	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The evlog-drv-tmpl tool requires evlog-1.6.0-xx (shipped with SLES9). This RPM will install the driver templates for bcm5700, e100, e1000, emulex, ipr, olympic, and pcnet32; update evlog ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart evlog, run the following command: <code>/etc/init.d/evlog restart</code></p>

Table 19. Service and productivity tools for SUSE Linux Enterprise Server 9

Installation Order	Package Title	Summary
1	Platform Enablement Library	The librtas package contains a library that allows applications to access certain functionality provided by platform firmware. This functionality is required by many of the other higher-level service and productivity tools.
2	Service Aids	The utilities in the ppc64-utils package enable a number of reliability, availability, and serviceability (RAS) features. Among others, these utilities include the update_flash command for installing system firmware updates; the serv_config command for modifying various serviceability policies; the usysident and usysattn utilities for manipulating system LEDs; the bootlist command for updating the list of devices from which the system will boot; and the snap command for capturing extended error data to aid analysis of intermittent errors.

Table 19. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
3	Hardware Inventory	The lsvpd package contains the lsvpd, lscfg, and lsmcode commands. These commands, along with a boot-time scanning script called update-lsvpd-db, constitute a hardware inventory system. The lsvpd command provides Vital Product Data (VPD) about hardware components to higher-level serviceability tools. The lscfg command provides a more human-readable format of the VPD, as well as some server-specific information.
4	Service log	The Service Log package creates a database to store system-generated events that may require service. The package includes tools for querying the database. <ul style="list-style-type: none"> • servicelog is used to query the database. • servicelog_notify is used to configure tools to be notified when serviceable events occur on the system. • log_repair_action is used to indicate when a repair action has taken place on the system.
5	Error Log Analysis	The Error Log Analysis tool provides automatic analysis and notification of errors reported by the platform firmware. This RPM analyzes errors written to /var/log/platform. If a corrective action is required, notification is sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped, or to users subscribed for notification through the file /etc/diagela/mail_list. The Serviceable Event sent to the Service Focal Point and listed in the e-mail notification may contain a Service Request Number. This number is listed in the "Diagnostics Information for Multiple Bus Systems" manual.
6	SRC	SRC is a facility for managing daemons on a system. It provides a standard command interface for defining, undefining, starting, stopping, querying status and controlling trace for daemons.
7	Service Agent	The Service Agent packages will create Serviceable Events from the output of the Error Log Analysis Tool (diagela), and use an attached modem to deliver these events directly to IBM Service. It is also capable of delivering system inventory retrieved from Inventory Scout. Refer to the "IBM Electronic Service Agent for Linux, on eServer p5 and pSeries" for more information on the capabilities of Service Agent.
8	PCI Hotplug Tools	The rpa-pci-hotplug package contains two tools to allow PCI devices to be added, removed, or replaced while the server is in operation: lsslot, which lists the current status of the server's PCI slots, and drslot_chrp_pci, an interactive tool for performing hotplug operations.
9	Dynamic Reconfiguration Tools	The rpa-dlpar package contains a collection of tools allowing the addition and removal of processors and I/O slots from a running partition. These tools are invoked automatically when a dynamic reconfiguration operation is initiated from the attached Hardware Management Console (HMC).

Table 19. Service and productivity tools for SUSE Linux Enterprise Server 9 (continued)

Installation Order	Package Title	Summary
10	I/O Error Log Analysis	<p>The I/O Error Log Analysis package provides automatic analysis and notification of I/O errors on IBM POWER-based servers. I/O errors will be written to evlog, and notification will be sent to the Service Focal Point on the Hardware Management Console (HMC), if so equipped. The Serviceable Event sent to the Service Focal Point may contain a System Reference Code (SRC). These codes are documented in the IBM Systems Hardware Information Center.</p> <p>The <code>evlog-drv-tmpl</code> tool requires <code>evlog-1.6.0-xx</code> (shipped with SLES9). This RPM will install the driver templates for <code>bcm5700</code>, <code>e100</code>, <code>e1000</code>, <code>emulex</code>, <code>ipr</code>, <code>olympic</code>, and <code>pcnet32</code>; update <code>evlog</code> ELA scripts; and, update the evlog startup script to load or unload ELA rules during boot and shutdown. After installation, you must restart evlog to load these new ELA rules. To restart <code>evlog</code>, run the following command: <code>/etc/init.d/evlog restart</code></p>

For the most current version of the Service and productivity tools information, refer to the Service and productivity tools Web site at

<https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .

Scenario: Installing Linux to a full system partition on a model 510

See how to install the Linux operating system, configured to use all of the system's available resources, on a model 510 without a graphics adapter.

Situation

You want to install a Linux distribution from a CD on a full system partition on a model 510 that does not have a graphics adapter.

Objectives

The objective of this scenario is to install the Linux operating system from a CD on the model 510. You can attach a computer by using a null modem serial cable to the model 510 to use as the display to perform the installation.

Prerequisites and assumptions

These prerequisites describe the system that was tested with this scenario.

- Model 510 server
- Linux for POWER operating system distribution installation CDs
- Linux or Microsoft® Windows® PC or notebook computer with a serial port
- Null modem serial cable

Note: You need the null modem serial cable to connect the model 510 to the Linux or Windows PC or notebook computer when you are preparing your system.

- IP address and host name for the Linux system that you will install, as well as the other network information for your environment, such as name server, and routing information (gateway IP address).

For the latest information, fixes, and procedures that might help you avoid problems during the installation of Linux on IBM servers, see the Linux on IBM Web site at

<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html> 

Configuring the system for the scenario

1. Connect a computer with a terminal emulator by a null modem serial cable to the system port 1 on the model 510. Use these communication parameters in the terminal emulator: 19200 bps, 8N1. If you are using Linux, you can use the following command: `cu -l /dev/ttyS0 -s 19200` and press Enter twice.
2. Log in to the service processor over your serial connection using `admin` as both the default user ID and password.
3. To prepare your system for connecting to the Advanced System Management Interface (ASMI), at the main menu, select **Network Services > Network Configuration > Configure interface Eth0 > Static**. Enter the settings that are appropriate for your system.
4. Select **Save settings**.
5. Select **Return to the previous menu** until you return to the main menu.
6. At the main menu, select **Power/Restart Control > Power On/Off System > Boot to system server firmware > Standby**. You return to the previous menu.
7. Select **Power on** to power on the server. Press Enter to continue. Powering on the server can take several minutes.

Note: The terminal emulator stops working after the server is started. Do not close the terminal emulator window because it is used in a later step.

Using the Advanced System Management Interface to access the SMS Menu

1. When the server finishes powering on, open the Advanced System Management Interface (ASMI) by completing the following steps:
 - a. Configure the Ethernet interface on the PC or notebook computer to an IP address and subnet mask within the same subnet as the server so that your PC or notebook computer can communicate with the server. For instructions, see *Setting the IP address on your PC or notebook computer*.
 - b. Open a browser window on the PC or notebook computer.
 - c. Using a secure HTTP connection (HTTPS), direct the browser to the IP address that you entered in step 3 of the previous section.
 - d. Log in using `admin` as both the user ID and password.
2. From the ASMI, expand **Power/Restart Control > Power On/Off System**.
3. In the right pane, make the following selections:
 - **System boot speed: Fast**
 - **Firmware boot side for the next boot: Temporary**
 - **System operating mode: Normal**
 - **AIX/Linux partition mode boot: Boot to SMS menu**
 - **Boot to system server firmware: Running**
4. Click **Save settings**.
5. In the left pane, select **System reboot**, then select **Continue** to reboot the system.
6. Return to the terminal emulator window and wait for the System Management Services (SMS) menu to appear.

Changing the boot sequence

1. At the SMS Main Menu, select one of the following:
 - **Select Boot Options > Select/Install Boot Device > CD/DVD > IDE > Select your CD-ROM Device > Normal Mode Boot**

- **Select Boot Options > Select/Install Boot Device > CD/DVD > SCSI > Select your CD-ROM Device > Normal Mode Boot**

Note: Determine whether your CD-ROM drive is an IDE or SCSI device. Most systems have an IDE drive, but if your system has a DVD-RAM drive, it is probably a SCSI device. If you select a SCSI device, the Select Media Adapter menu is displayed.

Hard drives are generally connected to the first integrated adapter. CD-ROM drives are generally connected to the first adapter that is not listed as integrated. After you select an adapter, the server scans the bus and reports all devices of the appropriate type that it finds. Select the device that you want to use as the boot device.

2. Insert your Linux CD into the CD-ROM drive of the server.
3. Exit the SMS menu. The system starts from the CD, and the Linux installation will begin.
4. Follow the on-screen prompts to complete the Linux installation. For installation documentation, refer to Linux operating system distribution installation documentation.
5. To access more capabilities, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system, refer to Installing additional software for the Linux operating system and install the additional software.

Troubleshooting for Installing Linux

Find additional information to help you troubleshoot the installation of Linux.

Troubleshooting

If you have problems with a partitioned system, use the Troubleshooting topic to determine if the problem is specific to logical partitions or if it is a system problem. If your problem is specific to logical partitions, reference codes may help you to resolve the error. However, specific recovery actions and tasks might require the assistance of service support.

Linux on IBM Web site at

<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html> 

Use the information at this Web site to access the latest installation information for Linux on your IBM POWER server. This link provides the latest information, fixes, and procedures that might help you avoid problems during the installation of Linux on IBM servers.

Related information for Installing Linux

IBM Redbooks (in PDF format) and Web sites contain information related to the Installing Linux topic. You can view or print any of the PDF files.

IBM Redbooks









Partitioning Implementations for IBM eServer p5 Servers

(<http://www.redbooks.ibm.com/abstracts/SG247039.html>)  (3.8 MB)

Web sites

- For information and side-by-side comparison of the various systems available and many of their key specifications, see the Facts and features reports Web site at

<http://www.ibm.com/servers/eserver/pseries/hardware/factsfeatures.html>  .

- For the latest information, fixes, and procedures that might help you avoid problems during the installation of Linux on IBM servers, see the Linux on IBM Web site at <http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html> .
- For software that allows you to access more capabilities of your server, including software to enable dynamic logical partitioning, software that allows you to add, remove, or move resources between logical partitions without restarting a logical partition or system, and tools that can help you diagnose problems with your system, see the Service and productivity tools Web site at <https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html> .
- For detailed information about installing Red Hat Enterprise Linux version 4 on POWER hardware, see the Red Hat Enterprise Linux 4 Installation Guide for the IBM POWER Architecture Web site at <http://www.redhat.com/docs/manuals/enterprise/RHEL-4-Manual/ppc-multi-install-guide/> .
- For detailed information about installing SUSE Linux Enterprise Server 9, see the installation information at SUSE LINUX Enterprise Server Web site at <http://www.novell.com/documentation/sles9/index.html> .
- For Virtual I/O Server documentation, see the Virtual I/O Server Web site at <http://techsupport.services.ibm.com/server/vios> .
- For information about performance considerations when using the Virtual I/O Server, see *Virtual I/O Server performance/sizing/QOS considerations* at <http://techsupport.services.ibm.com/server/virtualization/vios/documentation/perf.html> .
- For benefits and support for IBM Business Partners to plan, build, market, sell, and service Linux solutions, see *Partnerworld benefits and support for Linux* at <http://www.ibm.com/partnerworld/linux> .
- For additional information about the IBM eServer OpenPower® servers, see *IBM eServer OpenPower* at <http://www.ibm.com/servers/eserver/openpower> .

Appendix. Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

The following list includes the major accessibility features:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are tactilely discernible and do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices

IBM and accessibility

See the IBM Accessibility Center at <http://www.ibm.com/able/> for more information about the commitment that IBM has to accessibility.

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