Power Systems

Upgrading the system and data migration

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Note

Before using this information and the product it supports, read the information in "Notices," on page 65, "Safety notices" on page v, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125–5823.

This edition applies to IBM Power Systems servers that contain the POWER6 processor and to all associated models.

Contents

Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

IBM® servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

(C026)

CAUTION:
Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:
This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Upgrading the system and data migration

You can upgrade from an IBM POWER5™ or POWER6® System p® model or hardware feature or IBM POWER®5 or POWER6 System i® model or hardware feature to an IBM POWER6 Power Systems™ server. For certain systems, you can also upgrade the server firmware so that you can use IBM i logical partitions and your system can create and run combinations of IBM i, AIX®, and Linux® logical partitions.

What's new in Upgrading the system

Read about new or significantly changed information in Upgrading the system since the previous update of this topic collection.

October 2009

Content updates include the following:

- Added "Upgrading Power Systems using Linux" on page 47, which provides considerations for upgrading Power Systems using native Linux.
- Updated information to include the 8261-E4S machine type and model.
- Added Linux migration links in the "Data migration" on page 64 section.
- Added "Considerations for upgrading from RIO/HSL to PCI-X and PCIe" on page 17, which provides considerations for upgrading from RIO/HSL to PCI-X or PCIe using AIX, IBM i, or Linux operating systems.

May 2009

Content updates include the following:

- "Upgrading the system and data migration " provides a single procedure for upgrading to Power Systems. The "Installing software" on page 36 section provides instructions for updating or upgrading AIX, IBM i, and Linux operating systems.
- Added graphics in "Upgrade paths" on page 7 that show the available upgrade paths for the Power 520 Express™, Power 550 Express, Power 570, and Power 595 systems.

December 2008

Content updates include the following:

- Added "Enabling POWER6 systems to support AIX, IBM i, or Linux on Power 520, Power 550, and Power 570 servers" on page 2, which provides information and instructions for upgrading server firmware so that Power 520, Power 550, and Power 570 systems can create and run combinations of IBM i, AIX, and Linux logical partitions.

Upgrades road map

You can use this road map as a guide to upgrade from an IBM POWER5 or POWER6 System p model or hardware feature or from an IBM POWER5 or POWER6 System i model or hardware feature to a POWER6 Power Systems server.

The steps in this road map link to a series of chronological tasks for upgrading or migrating your server. At the completion of each step, return to this road map to determine the next appropriate step.

Road map

1. To upgrade server firmware, see “Enabling POWER6 systems to support AIX, IBM i, or Linux on Power 520, Power 550, and Power 570 servers.”
2. To plan for the upgrade, see “Upgrade checklist” on page 15.
3. To order an upgrade, see “Order tasks for upgrading your server” on page 19.
4. To prepare the server for an upgrade, see “Preparation tasks for upgrading your server” on page 20.
5. For preinstallation tasks, see “Preinstallation tasks for upgrading your server” on page 32.
6. To perform the upgrade, see Installation tasks.
7. To test the server upgrade, see “Testing your server” on page 64.

Enabling POWER6 systems to support AIX, IBM i, or Linux on Power 520, Power 550, and Power 570 servers

You can upgrade the server firmware of an IBM System p 570 9117-MMA system to an IBM Power 570 9117-MMA system. You can also upgrade the server firmware of an IBM Power 550 Express 8204-E8A system to use IBM i logical partitions and upgrade the server firmware of an IBM Power 520 Express 8203-E4A or an IBM Smart Cube 8261-E4S system to use IBM i logical partitions.

Updating the system firmware enables Power 520, Power 550, and Power 570 systems to create and run combinations of IBM i, AIX, and Linux logical partitions. By updating server firmware, your system supports new hardware as it is announced.

This topic provides instructions for upgrading server firmware and for upgrading the POWER6 9406-MMA system to a Power 570 9117-MMA system. It also provides instructions for upgrading the Power 520 9407-M15 or 9408-M25 system to an 8203-E4A or an 8261-E4S system, for upgrading the Power 520 9408-M25 system to an 8203-E4A or an 8261-E4S system, and for upgrading the Power 550 9409-M50 system to an 8204-E8A system.

You use a Hardware Management Console (HMC) to perform most tasks in this topic collection. However, you can upgrade server firmware on 8203-E4A and 8204-E8A systems without using an HMC. For more information, see “Upgrading server firmware without using an HMC” on page 6.

Planning tasks for upgrading server firmware

Planning tasks include determining the Hardware Management Console (HMC) code level and the server-firmware code level.

Determining HMC and server-firmware code levels

Before you upgrade the server firmware, you determine the applicable HMC and server-firmware code levels.

Use the information in the following table to determine the correct code level.
Information in the table applies to Power Systems models 9117-MMA and 9406-MMA.

HMC code-level prerequisite (for any HMC that accesses the server)	**Server-firmware code-level prerequisite**
For systems shipped prior to May 2008 • HMC V7R3.3 (HMC running V7R3.2 or later) For systems shipped beginning May 2008 • HMC V7R3.3 with MH01105 (Service pack 1) • HMC V7R3.3 with MH01119 (Service pack 2) is available.	Server firmware 01EM320_076 or later

Information in the following table applies to Power Systems models 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, and 9409-M50.

HMC code-level prerequisite (for any HMC that accesses the server)	Server-firmware code-level prerequisite
HMC V7R3.4 with required fixes	Server firmware 01EL340_039_039 or later

Order tasks for upgrading server firmware

Order tasks include ordering the required prerequisite code levels for the HMC and the server firmware.

Order the HMC code level only if the system is attached to an HMC.

Ordering HMC and server firmware code

Before you upgrade the server firmware, order the required prerequisite HMC and server-firmware code levels.

Follow these steps to order HMC and server firmware code:

1. If the system is attached to an HMC, download the required prerequisite HMC software code from Hardware Management Console Support and downloads.
2. Download the required prerequisite server-firmware software from Microcode downloads.

Preinstallation tasks for upgrading server firmware

Preinstallation tasks include performing an HMC backup and determining the method to use for installing the server firmware from an HMC.

The tasks in this topic are HMC related. However, you can upgrade server firmware on 8203-E4A, 8204-E8A, and 8261-E4S systems without using an HMC. For information about upgrading without using an HMC, see "Upgrading server firmware without using an HMC" on page 6.

Perform an HMC backup only if the system is attached to an HMC.

Upgrading server firmware can be a disruptive process that requires you to shut down the server and all logical partitions and to perform another initial program load (IPL).

Performing a backup for the HMC

A backup of critical console data saves the HMC in its current state, including copies of all existing partition profiles and HMC customization.

Perform this task only if the system is attached to an HMC.

1. Back up HMC data. For instructions, see Back up HMC data.

   This backup is for historical purposes.
2. Optional: To document the system, create a system plan of the current server and print the file. For instructions, see Create system plan.
3. Optional: If the HMC code is not at the supported level for your server, upgrade the code. For instructions, see Hardware Management Console Support and downloads.
   a. When the HMC is at the correct level, perform another data backup.

      The second backup saves the HMC in its current state, including copies of all existing partition profiles and HMC customization.

Determining your server-firmware installation method

From an HMC, you can install server firmware concurrently or nonconcurrently. Understand the two methods and the recommendation.

The two installation methods are as follows:

Concurrent installation
A concurrent installation is one in which you install firmware while the system and all partitions are running.

Nonconcurrent installation
A nonconcurrent installation is one in which you shut down the system and all partitions before you install the firmware. When you perform a nonconcurrent installation, you must perform another IPL for the system and all logical partitions.

Determining the server-firmware installation method for Power 570 systems:

For Power 570 systems, you must perform a server IPL after you enable IBM i through the Advanced Systems Management Interface (ASMI).

Use the information in the following table to determine your method of installing server firmware.

Server level	installation method
If your server is at level 01EM310	You must upgrade to level 01EM320 **nonconcurrently**. You can upgrade directly to level 01EM320_076.
If your server is at level 01EM320_031 or level 01EM320_040	You cannot upgrade **concurrently** in one step to level 01EM320_076, but you can do so **nonconcurrently**.

If desired, you can **concurrently** upgrade to an intermediate level, 01EM320_046, and then **concurrently** upgrade from level 01EM320_046 to level 01EM320_076.

Notes:
1. Because of the time required to concurrently install two upgrades, IBM Product Engineering recommends that you go directly to level 01EM320_076 **nonconcurrently** during a planned maintenance timeframe.
2. If you do not upgrade to level 01EM320_076 at this time, upgrade to level 01EM320_046. Both releases contain high impact or pervasive authorized program analysis report (APAR) (HIPER) fixes.

Installation tasks for upgrading server firmware

Installation tasks include installing server firmware concurrently from an HMC, installing server firmware nonconcurrently from an HMC, upgrading server firmware without using an HMC, and configuring the upgraded system.

Installing server firmware concurrently from an HMC

When you install server firmware concurrently, you install the firmware while the system and all partitions are running.

Determine the correct firmware level for your model. For information, see “Determining HMC and server-firmware code levels” on page 2.

Follow these steps to install server firmware concurrently:
1. In the HMC navigation pane, select **Updates**.
2. In the topic pane, select the server you want to update.
3. Select **Change Licensed Internal Code** for the current release.
4. Select **Start Change License Internal Code wizard**.
5. Wait until the automatic readiness check is complete.
6. From the **Specify LIC Repository** menu, select the location of the code.
   The following menu options are available:
   - IBM service Web site

- IBM support system
- Removable media

  Note: If you select **Removable media**, a list of currently available media appears. Select the applicable media device, and follow the prompts to complete the task.
- FTP site
- Hard drive

Note: If the firmware level on a 9117-MMA or 9406-MMA system is earlier than 01EM320_046, perform this step to reach level 01EM320_046, and then repeat the step to reach the desired level.

7. Follow the prompts to complete the upgrade.

The 9406-MMA, 9407-M15, 9408-M25, and 9409-M50 system that you are upgrading to a Power 520, Power 550, or Power 570 system is ready for the System Services Representative (SSR) to replace the vital product data (VPD) card and, on an MMA system, the cover.

To ensure that the enabled capabilities are activated, the SSR enters the new memory on demand (MoD), processor on demand (PoD), and virtualization engine technology (VET) codes. Retrieve these codes from Capacity on demand, and have the codes available for the SSR.

Installing server firmware nonconcurrently from an HMC

When you install server firmware nonconcurrently, you shut down the server and all partitions and then perform a server IPL.

Determine the correct firmware level for your model. For information, see "Determining HMC and server-firmware code levels" on page 2

Follow these steps to install server firmware nonconcurrently:

1. Shut down all logical partitions.
2. Download the required firmware or load the optical media that contains the firmware needed to enable support for AIX, IBM i, or Linux in your HMC DVD drive.

   Note: You can download the required firmware to a USB Flash Memory drive or optical media.
3. In the HMC navigation pane, select **Updates**.
4. In the topic pane, select the server you are updating.
5. Select one of the following options.

Your firmware level	Option to select
A release level lower than the required release level	**Upgrade Licensed Internal Code to a new release**
The same release level as the required release level	**Change Licensed Internal Code for the current release**

6. Wait until the automatic readiness check is complete.
7. From the **Specify LIC Repository** menu, specify the Licensed Internal Code repository from which the firmware update or upgrade will be loaded.
8. Follow the prompts to complete the upgrade.
9. Perform another server IPL to the Standby state.
10. Optional: Restart the logical partitions.

The 9406-MMA, 9407-M15, 9408-M25, and 9409-M50 system that you are upgrading to a Power 520, Power 550, or Power 570 system is ready for the System Services Representative (SSR) to replace the vital product data (VPD) card and, on an MMA system, the cover.

To ensure the enabled capabilities are activated, the SSR enters new memory on demand (MoD), processor on demand (PoD). and virtualization engine technology (VET) codes. Retrieve these codes from Capacity on demand, and have the codes available for the SSR.

Upgrading server firmware without using an HMC

You can upgrade server firmware on 8203-E4A, 8204-E8A, and 8261-E4S systems without using an HMC.

To load and apply required firmware levels, see the instructions at Getting firmware fixes.

Configuring upgraded systems

If you plan to add IBM i logical partitions on upgraded Power Systems 8234-EMA, 9117-MMA, and 9119-FHA systems, you must enable the logical partitions. You use the Advanced System Management Interface (ASMI) to verify that IBM i logical partitions are enabled.

Shut down all logical partitions before you perform this procedure.

Note: IBM i is always enabled on 8203-E4A, 8204-E8A, and 8261-E4S systems.

Follow these steps to configure the upgraded system:

1. In the HMC navigation pane, select **Systems Management > Servers**.
2. In the topic pane, select the server you want to access.
3. From the Tasks menu, select **Operations > Launch Advanced System Management (ASM)**.
4. Select the primary flexible service processor, and then log on as `admin`.
5. In the navigation pane, select **Power/Restart Control**, and then select **Power On/Off System**.
6. At the bottom of the screen, ensure that IBM i is **Enabled**, and then select **Save Settings**.
7. Perform a full system IPL to activate the changes.

Postinstallation tasks for upgrading server firmware

Postinstallation tasks include verifying the HMC connection and bringing the upgraded system back into production.

Performing postinstallation tasks

After you install the firmware, you bring the system back to production. This task applies to 8203-E4A, 8261-E4S, and 9117-MMA systems and to 8204-E8A systems with an HMC.

Follow these steps to bring the system back to production:

1. Verify that the HMC connection to the service processor is successfully established.
2. Optional: If communication errors occur, determine the problem. For instructions, see Managing the HMC.
3. Using the HMC, bring the system to logical partition standby. The server runs tests as it turns on and as components report.
4. Optional: If you have a 9117-MMA or 8204-E8A system and want to run 5250 applications on IBM i, insert the virtualization enablement technology (VET) code that enables the 5250 applications.
5. Start existing logical partitions.

Upgrading the system and data migration

You can upgrade from an IBM POWER5 or POWER6 System p model or hardware feature or IBM POWER5 or POWER6 System i model or hardware feature to an IBM POWER6 Power Systems server. For certain systems, you can also upgrade the server firmware so that you can use IBM i logical partitions and your system can create and run combinations of IBM i, AIX, and Linux logical partitions.

Upgrade concepts

Learn the concepts that apply to this topic collection, and access definitions of upgrade terminology.

An *upgrade* is the process of changing from one system type or model, feature, or software version to another system type or model, feature, or software version and retaining the serial number of the source server (or system).

Related information

Power Systems glossary

Upgrade paths

Learn about supported upgrade paths for Power 520, Power 550, Power 570, and Power 595 systems.

You can upgrade the capacity of select models without upgrading to a new model by activating one or more standby processors on that server. Before you can upgrade your server, all the processors on that server must be activated. For more information, see Capacity on demand.

Upgrade paths for Power 520 systems

Learn about the supported paths for upgrading Power 520 systems to Power Systems systems.

The following upgrade paths are supported:

- POWER5 System i 9406-520 to POWER6 Power Systems 2–core 8203-E4A or 8261-E4S
- POWER5 System i 9406-520 to POWER6 Power Systems for IBM i 2–core 9408-M25 and then to POWER6 Power Systems 2–core 8203-E4A or 8261-E4S
- POWER5+™ System i 9406-525 to POWER6 Power Systems 2–core 8203-E4A or 8261-E4S
- POWER5+ System i 9406-525 to POWER6 Power Systems for IBM i 2–core 9408-M25 and then to POWER6 Power Systems 2–core 8203-E4A or 8261-E4S
- POWER6 Power Systems for IBM i 1–core 9407-M15 to POWER6 Power Systems 1–core 8203-E4A or 8261-E4S

The following figure shows the supported paths for upgrading Power 520 systems to Power Systems systems.

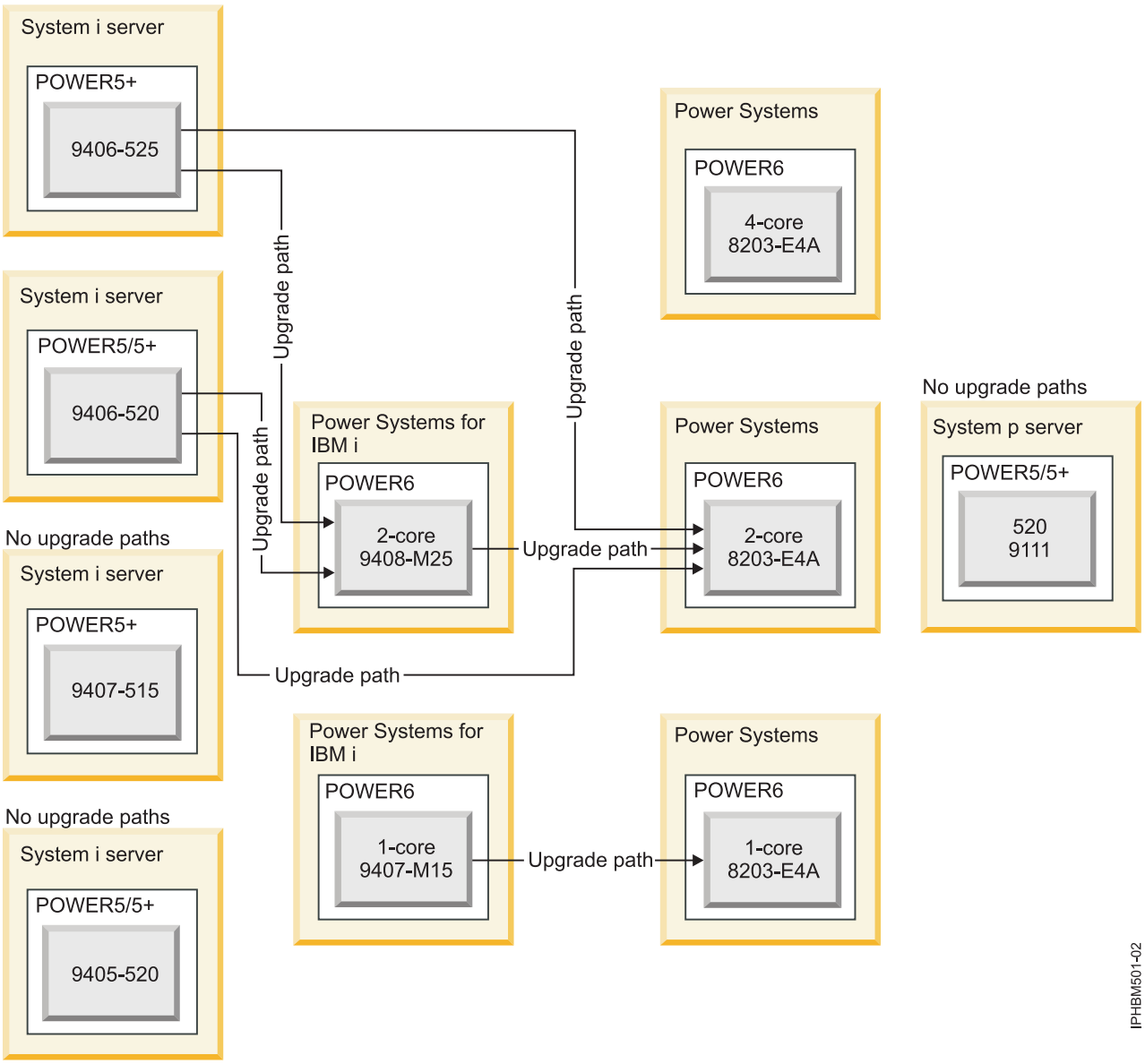

Figure 1. Supported paths for upgrading Power 520 systems to Power Systems systems

Upgrade paths for Power 550 systems

Learn about the supported paths for upgrading Power 550 systems to Power Systems systems.

The following upgrade paths are supported:

- POWER5 System i 9406-550 to POWER6 Power Systems 4–core 8204-E8A
- POWER5 System i 9406-550 to POWER6 Power Systems for IBM i 4-core 9409-M50 and then to POWER6 Power Systems 4–core 8204-E8A

You can also upgrade the following POWER6 Power Systems 8204-E8A systems:

- POWER6 Power Systems 2–core 8204-E8A to POWER6 Power Systems 4–core 8204-E8A
- POWER6 Power Systems 4–core 8204-E8A to POWER6 Power Systems 6–core 8204-E8A
- POWER6 Power Systems 6–core 8204-E8A to POWER6 Power Systems 8–core 8204-E8A

The following figure shows the supported paths for upgrading Power 550 systems to Power Systems systems.

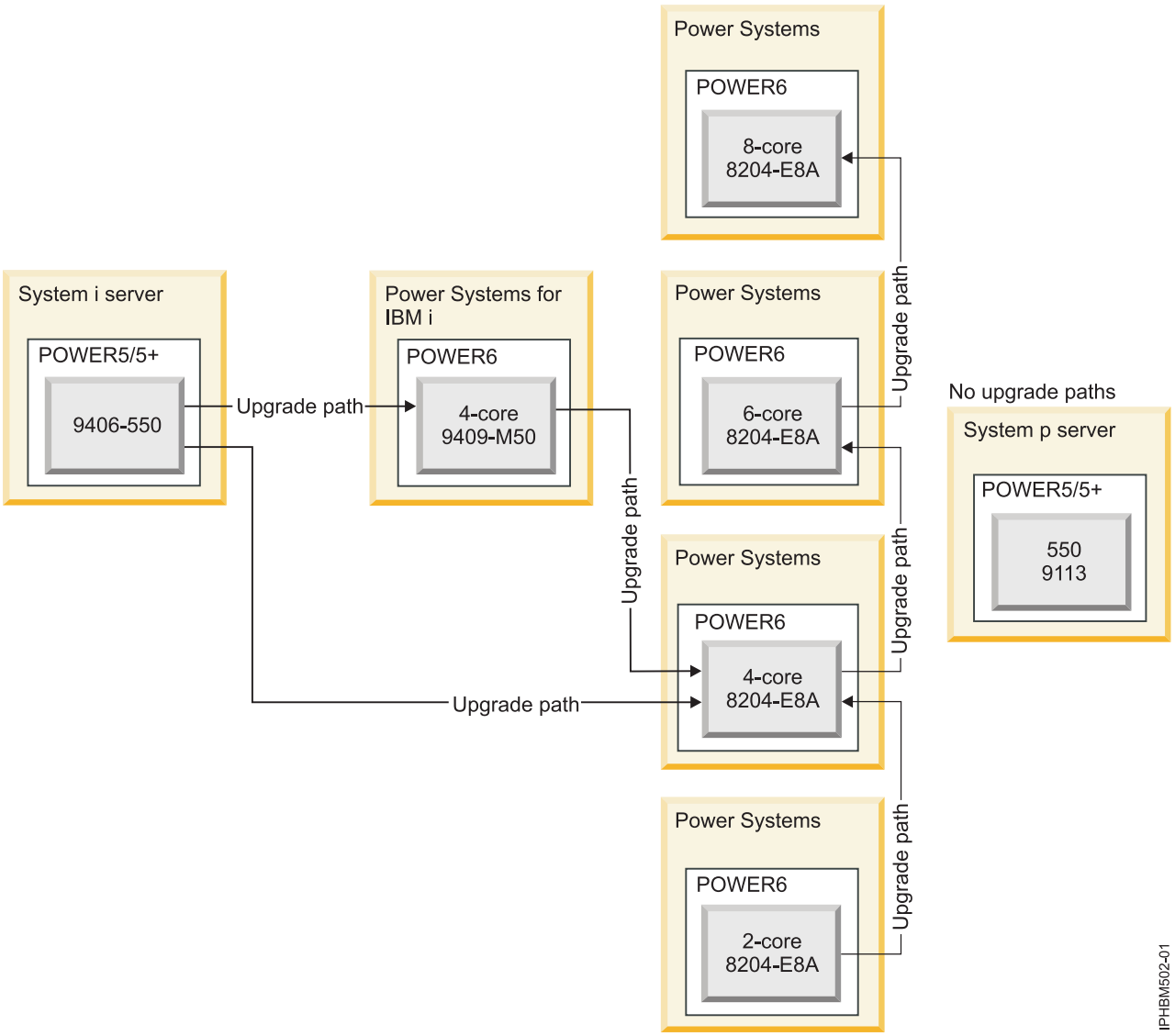

Figure 2. Supported paths for upgrading Power 550 systems to Power Systems systems

Upgrade paths for Power 570 and Power 595 systems

Learn about the supported paths for upgrading Power 570 and Power 595 systems to Power Systems systems.

The following upgrade paths are supported:

- POWER5 System i 9406-570 to POWER6 Power Systems 9117-MMA
- POWER5 System i 9406-570 to POWER6 Power Systems 9119-FHA
- POWER5 System i 9406-570 to POWER5 System i 9406-595 and then to POWER6 Power Systems 9119-FHA
- POWER6 System i 9406-MMA to POWER6 Power Systems 9117-MMA
- POWER5 9117-570 to POWER6 Power Systems 9117-MMA
- POWER5 System p 9119-590/9119-595 to POWER6 Power Systems 9119-FHA
- POWER6 System p 9117-MMA to POWER6 Power Systems 9117-MMA (with latest firmware)

Note: If you are adding an IBM i logical partition, you must enable IBM i in Advanced System Management Interface (ASMI).

The following figure shows the supported paths for upgrading Power 570 and Power 595 systems to Power Systems systems.

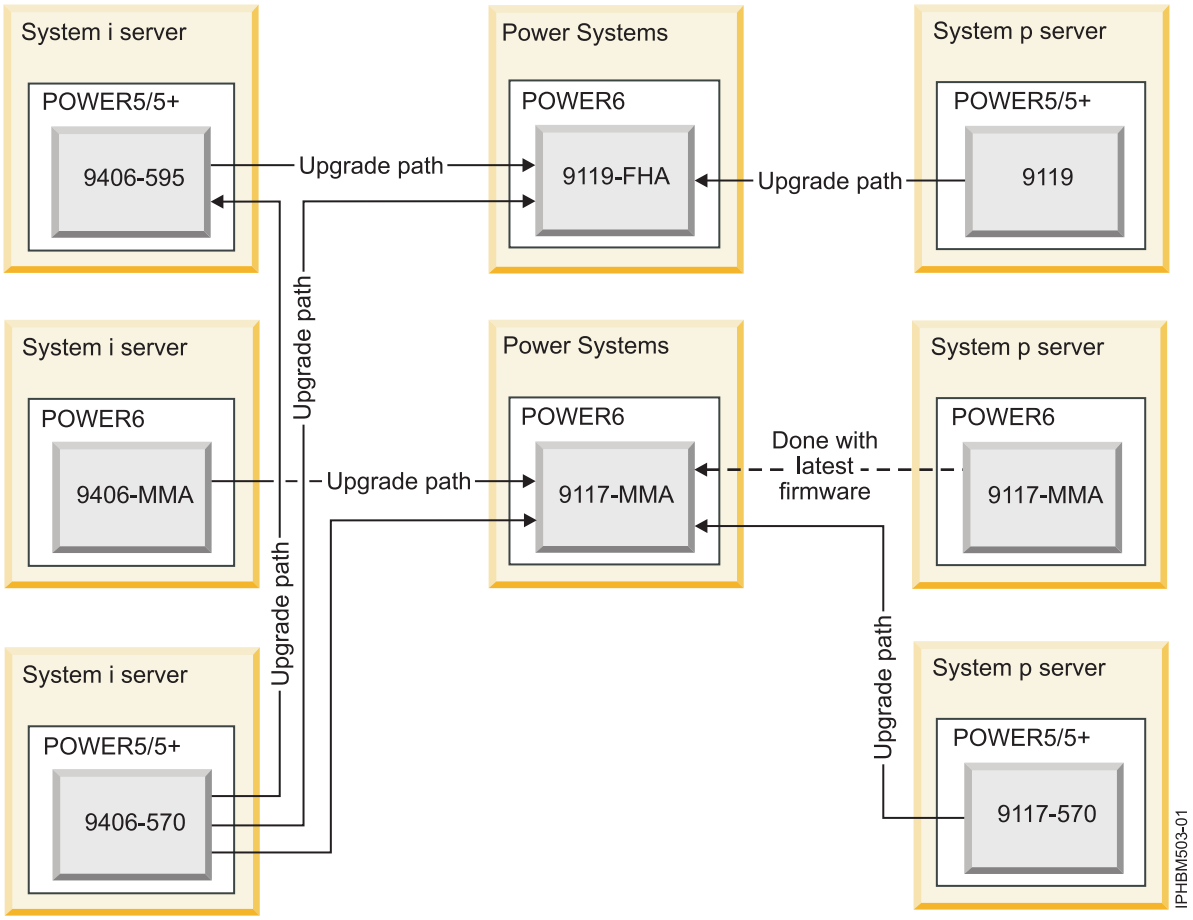

Figure 3. Supported paths for upgrading Power 570 and Power 595 systems to Power Systems systems

Upgrade paths for POWER6 Power 570 systems

Learn about the supported paths for upgrading to the POWER6 Power 570 9117-MMA system.

The following upgrade paths are supported:

- POWER5 System i 9406-570 to POWER6 Power 570 9117-MMA
- POWER5 System p 9117-570 to POWER6 Power 570 9117-MMA
- Structure upgrade, which requires a new vital product data (VPD) card at no additional charge, for the System i to POWER6 Power 570 9117-MMA
- Firmware only upgrade, at no additional charge, for the System p 9117-MMA to POWER6 Power 570 9117-MMA

  Note: If you are adding an IBM i logical partition, you must enable IBM i in the Advanced System Management Interface (ASMI).
- 2–core processor cards to 4–core processor cards for the POWER6 Power 570 9117-MMA

The following figure shows the supported paths for upgrading Power 570 systems to Power Systems systems.

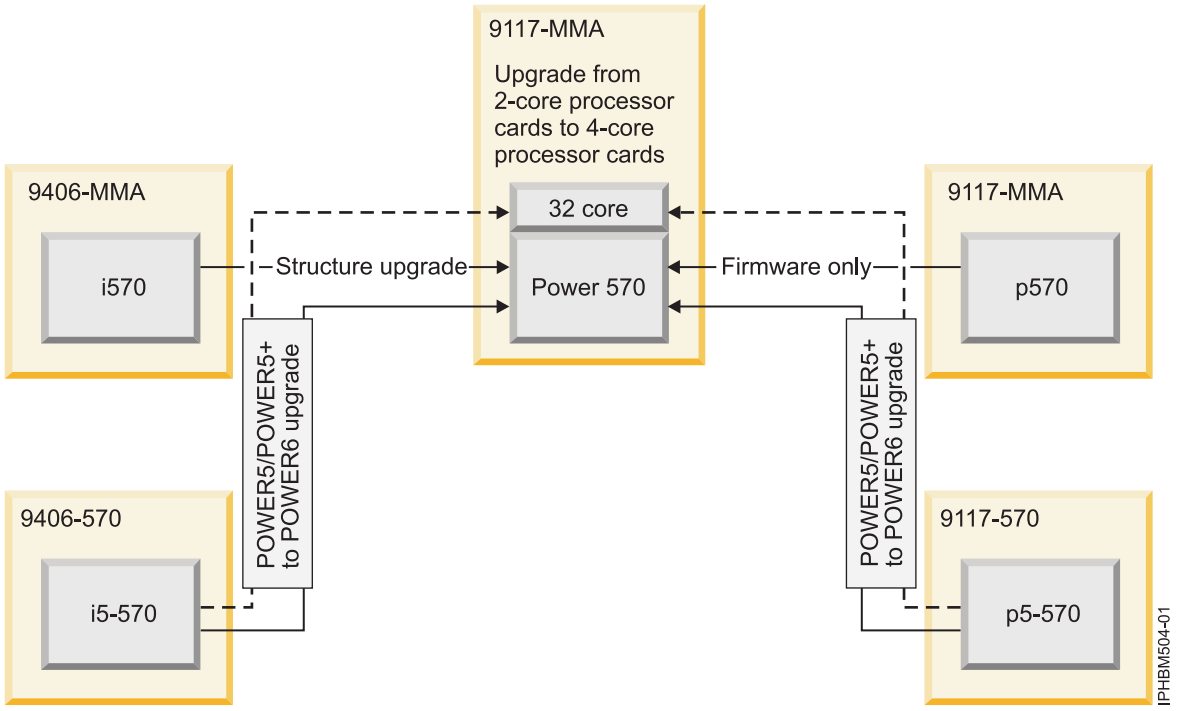

Figure 4. Supported paths for upgrading Power 570 systems to Power Systems systems

The following figure shows the upgrade paths for the POWER5 System p 9117-570 to POWER6 Power 570 9117-MMA.

From POWER5 POWER5+		To initial POWER6				To additional POWER6		
		3.5 GHz FN 5620	4.2 GHz FN 5622	4.2 GHz FN 5621	4.7 GHz FN 7380	4.4 GHz FN 7387	5.0 GHz FN 7388	4.2 GHz FN 7540
1.5 GHz FN 7834	DDR1	No	**Yes**	No	No	**Yes**	No	**Yes**
1.65 GHz FN 7830	DDR1	No	**Yes**	No	No	**Yes**	No	**Yes**
1.9 GHz FN 7832	DDR1	No	**Yes**	No	No	**Yes**	No	**Yes**
1.9 GHz FN 7833	DDR2	No	**Yes**	No	No	**Yes**	No	**Yes**
1.9 GHz FN 7782	DDR2	No	**Yes**	**Yes**	No	**Yes**	No	**Yes**
2.2 GHz FN 8338	DDR2	No	**Yes**	**Yes**	No	**Yes**	No	**Yes**

IPHBM505-01

FN = Feature Number

Figure 5. Upgrade paths for the POWER5 System p 9117-570 to POWER6 Power 570 9117-MMA

The following figure shows the upgrade paths for the POWER5 System i 9406-570 to POWER6 Power 570 9117-MMA.

From POWER5 POWER5+		To initial POWER6				To additional POWER6		
		3.5 GHz FN 5620	4.2 GHz FN 5622	4.2 GHz FN 5621	4.7 GHz FN 7380	4.4 GHz FN 7387	5.0 GHz FN 7388	4.2 GHz FN 7540
1.65 GHz FN 1641 (8971)	DDR1	No	No	No	**Yes**	No	**Yes**	**Yes**
2.2 GHz FN 1651 (8338)	DDR2	No	No	No	**Yes**	No	**Yes**	**Yes**

IPHBM506-01

FN = Feature Number

Figure 6. Upgrade paths for the POWER5 System i 9406-570 to POWER6 Power 570 9117-MMA

The following figure shows the upgrade paths from initial power to additional power for the POWER6 Power 570 9117-MMA.

Initial POWER6		To additional POWER6		
		4.4 GHz FN 7387	5.0 GHz FN 7388	4.2 GHz FN 7540
35 GHz FN 5620	POWER6 DDR2	No	No	**Yes**
4.2 GHz FN 5622	POWER6 DDR2	No	No	**Yes**
4.2 GHz FN 5621	POWER5+ DDR2	No	No	No
4.7 GHz FN 7380	POWER6 DDR2	No	No	**Yes**

IPHBM507-01

FN = Feature Number

Figure 7. Upgrade paths from initial power to additional power for the POWER6 Power 570 9117-MMA

Upgrade timeline

The upgrade timeline describes the common stages that occur during an upgrade. By understanding the common stages of an upgrade, you can determine how much time you need for an upgrade.

The timeline incorporates the entire process from the time that you first start planning for an upgrade until the time you finish preparing the target server for production. Listed next to each stage are more detailed descriptions about what the stage entails and what needs to be accomplished when you finish the stage. In the right column of the table, you see an estimated amount of time needed to complete that stage. This estimate applies to situations in which resources are dedicated to the tasks. For complex upgrades or situations without dedicated resources, your upgrade might take longer.

Your unique upgrade might include some or all of the upgrade stages.

Stage	Stage description	Time it will take
Plan	Develop a detailed project plan. Focus your plan on items such as a solution, a task list, a timeline, and a project schedule. Determine the hardware, software, and the services that are required for your new server as a result of your desired solution. You must also determine the prerequisites that are required to support your new hardware and software. You should consider such items as backup and recovery, time you can afford to be down for the upgrade, and whether or not side-by-side services will be needed.	2 weeks
Order	Analyze your detailed plan that you developed in the planning stage with your reseller or IBM. Consider whether your upgrade is feasible, the risk involved with your upgrade, and whether your requirements will be met. If everything appears acceptable after analyzing your detailed plan, place your order.	1 day
Preparation	Prepare your server for an upgrade. Tasks in this stage include: • Preparing your environment and your server. This includes adding, replacing, or removing a hardware feature, activating inactive resources, and converting an expansion unit. Depending on your hardware compatibility, you might need to upgrade your software prior to changing a hardware feature or converting an expansion unit. • Cleaning up your server by doing tasks such as removing failed or nonreporting resources, removing unsupported disk units and deleting device configurations. • Backing up your data. • Installing any hardware or software prerequisites. • Ensuring that checklists are complete, including the hardware installation readiness checklist.	2 weeks
Preinstallation	Examine what you have done so far and determine whether you are now ready for the upgrade. You must also gather all necessary server information for the authorized service provider. Determine if you need to complete any remaining work items. If you determine that you are ready, your next step is to establish a meeting with your authorized service provider. In this meeting, you can then display all pertinent information to them such as your target server configuration.	1 day

Stage	Stage description	Time it will take
Installation	One of the first tasks required is to install your software. Install the software on your source server several weeks before the hardware upgrade. Nearly all of the responsibilities for planning, ordering, preparing, and preinstalling are customer responsibilities. If you need assistance with these stages of the upgrade, services are available to assist you. When you have completed these stages, the authorized service provider performs the hardware upgrade at this time. Following the hardware upgrade, you are presented with the new server and its physical configuration for review.	1 day
Postinstallation	After you have reviewed your new server and the physical configuration, configure your target server. This includes configuring your Hardware Management Console, migrating existing logical partition configurations, rearranging hardware as needed for logical partitions, and setting up and changing your logical partitions. You must also migrate any applications and data at this time. After you have completed the preceding items, finish your upgrade by testing your server as detailed in your test methodology plan.	1–2 days

Common deviations

Many reasons or situations could change the previous timeline. The following list includes a few of the more common deviations that might affect your timeline.

1. Unassigned resource

   Ensure that you have the appropriate people and skills assigned to the correct upgrade tasks. If the resources are incorrectly assigned to the upgrade tasks, your upgrade will take longer.

2. Logical partitions

   The preparation and installation time increase with each logical partition on the server. With proper planning and preparation, this might not be a problem; however, servers with multiple logical partitions will require a longer timeline than servers with fewer partitions or servers with only one partition.

3. Unsupported I/O devices

   If you do not plan for the removal or replacement of unsupported I/O devices, but realize during the upgrade that you have unsupported I/O devices, you must remove those devices, and perhaps replace those devices with supported I/O devices, which will increase the time it takes to complete your upgrade.

4. Unsupported software

   You must understand what software is compatible with your server and hardware features. For example, if you are changing a hardware feature before upgrading your server, you might need to upgrade your software prior to making the hardware feature change depending on the requirements and compatibility of that hardware feature. If you do not need to upgrade your software during the preparation stage, you might need to during the installation stage as a requirement prior to upgrading your server. If your software is not properly planned, it might add several unexpected hours by forcing you to reschedule the upgrade to another time, or require that your upgrade be removed and rescheduled, which might result in additional costs.

Related information

Estimates for i5/OS software installation time

Upgrade checklist

The upgrade checklist is comprised of a complete list of all the tasks for upgrading a server. You can obtain a list of the tasks associated with upgrading your server and learn who is responsible for each task.

If the responsibility states client and reseller, or client and IBM, you should ensure that you work in cooperation with your reseller or IBM to complete that task.

Several of the tasks in the checklist are embedded in other tasks. A higher-level task might state client and reseller, or client and IBM; however, the majority of the tasks within that section might be your responsibility, meaning that for a few of the tasks within that section, ensure that you work in cooperation with your reseller or IBM.

Use this checklist as a guide to complete your upgrade. If you prefer not to use this checklist, you can read through all the tasks in "Upgrading the server" on page 16. The tasks in that section are in the same order as they appear in this checklist.

The term reseller often refers to your IBM Business Partner. IBM refers to your authorized service provider.

Before you begin

__ The Upgrade checklist is divided into stages. Before completing this checklist, ensure that you understand the stages involved when upgrading the server. To understand the basics of each stage and where certain tasks fall, see "Upgrade timeline" on page 12.

Server upgrade tasks	**Responsibility**
__ "Planning tasks for upgrading your server" on page 17	Client and reseller
__ "Order tasks for upgrading your server" on page 19	
__ "Configuring your order" on page 19	Client and reseller
__ "Validating your order" on page 19	Client and reseller
__ "Validating your upgrade project plan" on page 20	Client, IBM, and reseller
__ "Placing your order" on page 20	Client and reseller
__ "Preparation tasks for upgrading your server" on page 20	
__ "Confirming your upgrade schedule" on page 20	Client
__ "Preparing your environment" on page 21	Client and IBM
__ "Adding, replacing, or removing a hardware feature" on page 21	Client and IBM
__ "Preparing for feature upgrade" on page 21	Client
__ "Performing the feature upgrade" on page 22	Client and IBM
__ "Performing resource management" on page 23	Client
__ "Activating inactive resources" on page 24	Client and IBM
__ "Converting expansion units for a partitioned server" on page 24	Client and IBM
__ "Expansion unit conversion paths and considerations" on page 25	Client
__ "Preparing to convert the expansion unit" on page 25	Client
__ "Resequencing SPCN addressing" on page 26	Client
__ "Printing and preparing the configuration for expansion unit conversion" on page 27	Client
__ "Cleaning up disk storage" on page 29	Client
__ "Cleaning up server hardware" on page 29	Client
__ "Adjusting memory and processing resources" on page 29	Client

Server upgrade tasks	Responsibility
__ "Changing configuration objects" on page 30	Client
__ "Gathering performance data" on page 30	Client
__ "Preparing your console" on page 30	Client
__ "Backing up data" on page 31	Client
__ "Developing your test plan" on page 31	Client
__ "Scheduling your acceptance review" on page 32	Client
__ "Preinstallation tasks for upgrading your server" on page 32	
__ "Printing server information for server upgrade" on page 32	Client
__ "Copying LPAR configuration" on page 35	Client
__ "Recording user IDs and passwords" on page 35	Client
__ "Preparing your location for the upgrade" on page 35	Client
__ "Reviewing your project and contingency plans" on page 36	Client
__ "Installation tasks" on page 36	
__ "Ensuring that you have completed the necessary tasks" on page 36	Client
__ "Installing software" on page 36	Client
__ "Updating, migrating, and preparing AIX for server upgrade" on page 37	Client
__ "Upgrading IBM i and related software" on page 47	Client
__ "Preparing for data migration from a Linux partition" on page 47	Client
__ "Preparing Red Hat Enterprise Linux for server upgrade" on page 47	Client
__ "Preparing SUSE Linux Enterprise Server for server upgrade" on page 49	Client
__ "Installing fixes" on page 50	Client
__ "Backing up the server" on page 51	Client
__ "Installing hardware" on page 51	Client and IBM
__ "Completing final server preparations for upgrade" on page 51	Client
__ "Providing checklists and server information" on page 52	Client and IBM
__ "Shutting down the server" on page 52	Client
__ "Performing hardware installation (authorized service provider)" on page 52	IBM
__ "Receiving the target server" on page 53	Client and IBM
__ "Postinstallation tasks for upgrading your server" on page 53	
__ "Completing server configuration" on page 53	Client
__ "Saving server logical partitions and all firmware" on page 64	Client
__ "Testing your server" on page 64	Client

After you complete the tasks in the preceding checklist, consider the following task.

After you finish

__ You might want to monitor and tune the performance of the server. For more information, see Tuning performance.

Upgrading the server

Learn how to perform all the tasks that are associated with a server upgrade. The tasks are in chronological order starting from the time you first start planning for your server upgrade until the time you have finished preparing your target server for production.

These tasks are separated into several stages. To see all these tasks, including who is responsible for each task, in a checklist format, see the "Upgrade checklist" on page 15.

For a fee, IBM Migration Services for Power Systems or System i Planning and Migration Services can help you plan and upgrade to the latest models. Service includes a planning session to discuss all known client requirements. The outcome of this planning session is a final hardware and software configuration and an installation plan.

You are responsible for planning your server upgrade. Planning your upgrade is a critical step for a successful upgrade. You might need to plan for the following items:

- Hardware feature additions or replacements
- Software upgrades
- Expansion unit conversions
- External storage device upgrades

To determine hardware and software compatibility, see the IBM Prerequisite.

Planning tasks for upgrading your server

Read about the items that you need to consider before you upgrade the server. These planning topics are essential and can assist you when you plan for hardware, software, and the physical site preparation.

The following list details some upgrade planning considerations to be aware of:

- If you are upgrading to a POWER6 processor-based system and you are using an attached Hardware Management Console (HMC), install firmware updates through the HMC instead of through the IBM i logical partition. POWER6 processor-based systems that are managed by the HMC require firmware updates to be completed through the HMC. This requirement also applies when you upgrade from a 9406-MMA to a 9117-MMA.

  If you are not using an HMC to manage your POWER6 processor-based system, you can install firmware updates through the IBM i logical partition.
- If you are performing a miscellaneous equipment specification (MES) processor upgrade for a 570 model, your server firmware and IBM i partitions must be at a minimum level of code prior to your MES upgrade. To see the current level of code required for this upgrade, see IBM Prerequisite.
- You must complete a System Power Control Network (SPCN) download in the following instances:
  1. If you are upgrading your IBM i
  2. If you are converting an expansion unit

  If you experience any RIO errors while performing an SPCN download, fix those errors immediately. If those errors are not fixed, the SPCN download might take several hours to complete.
- If you are migrating an expansion unit from a source server to a target server during your server upgrade, ensure that you plan for the following items:
  - If you are upgrading to a new model, perform the following tasks to ensure that the SPCN download runs correctly:
    1. Ensure that vital product data (VPD) has been added to the expansion unit before the upgrade.

       Note: The System Service Representative (SSR) updates the VPD when changing the VPD chip.
    2. Ensure that your HMC user ID has hmcsuperadmin authority. See for information about changing authority for an HMC user ID.
  - Remove the power needs from the expansion unit during the migration so that the target server owns the SPCN ID of the expansion unit.

Considerations for upgrading from RIO/HSL to PCI-X and PCIe:

You can upgrade from RIO/HSL to PCI-X or PCIe using AIX, IBM i, or Linux.

Learn about considerations for upgrading from RIO/HSL to PCI-X or PCIe using AIX, IBM i, or Linux operating systems.

AIX considerations for upgrading from RIO/HSL to PCI-X and PCIe:

Learn about AIX considerations for upgrading from a RIO/HSL to a PCI-X or PCIe.

When upgrading from a RIO PCI-X drawer to an InfiniBand PCI-X drawer (5794, 5791, 5796, or 7314-G30), the adapters stay the same. The same AIX image works for the new adapters. If the slots are not in the same location, some adapters are in defined state. The config mgr creates new devices for the new slots. For example, ent0 and ent1 are in slots 1 and 2 and on the new drawer the adapters were in slots 3 and 4. The migrated AIX would have ent0 and 1 in defined state. The two new devices ent2 and 3 are in available state.

When upgrading from a RIO PCI-X drawer to PCIe 5802 and 5877 drawers or to 5803 and 5873 drawers, the adapters are different. The drivers are different also. PCIe is a serial bus and the older PCI and PCI-X adapters are a parallel bus. Due to the difference in the adapters, the config mgr creates new devices since the previous devices would be different. For example, the VPD on the adapter has a different vendor ID.

IBM i considerations for upgrading from RIO/HSL to PCI-X and PCIe:

Learn about IBM i considerations for upgrading from a RIO/HSL to a PCI-X or PCIe.

Ring-level protection was available with RIO/HSL, but it is not available with PCI-X and PCIe. Ring-level protection is also called Loop-level protection. For more information, see Ring-level protection.

Users upgrading to a PCI-X or PCIe need to consider how the partition can achieve the same level of availability for the data that it had with HSL.

For more information, see:

- Switched disks
- IASP
- Cross-site mirroring
- Related information for High availability technologies

When upgrading from RIO to PCI-X or PCIe, the partition does not need to be reloaded. If the system has enough loop space to have both types of drawers attached at the same time, DLPAR out the RIO hardware, and DLPAR in the PCI-X or PCIe hardware. Do this action while the partition is up and running.

If the load source is in the RIO drawer, you need to power down the partition to move the load source. You will need to power up the partition again after the load source is moved to the new drawer.

Linux considerations for upgrading from RIO/HSL to PCI-X and PCIe:

Learn about Linux considerations for upgrading from a RIO/HSL to a PCI-X or PCIe.

When upgrading from a RIO PCI-X drawer to an InfiniBand PCI-X drawer (5794, 5791, 5796, or 7314-G30), the adapters stay the same. The same Linux image generally works for the new adapters. Pci_hotplug detects pci and pcie devices once plugged in. If the slots are not in the same location, the devices might be the same. For example, suppose eth0 and eth1 are in slots 1 and 2 on the old drawer and in slots 3 and 4 on the new drawer. In the migrated Linux system, eth0 and eth1 might be the same as before, but could also vary between distributions.

When upgrading from a RIO PCI-X drawer to PCIe 5802 and 5877 drawers or to 5803 and 5873 drawers, the adapters are different. The drivers are different also. PCIe is a serial bus and the older PCI and PCI-X adapters are a parallel bus. Due to the difference in the adapters, the pci_hotplug creates new devices since the previous devices would be different.

Editing HMC user information and roles:

Describes how to change HMC user description.

To edit HMC user information and roles, do the following:

1. In the Navigation area, expand the **HMC Management** folder.
2. Click the **HMC users** icon.
3. In the Contents area, click **Manage HMC Users and Access**. The User Profiles window opens.
4. Click **User** > **Modify**. Fill in the appropriate fields and click **OK**.

Order tasks for upgrading your server

Learn how to configure and validate your order as well as how your order is placed.

In this stage, you and your reseller or marketing representative must analyze the detailed plan that you developed in the previous step. Some items to be taken into consideration include whether your upgrade is feasible, the risk involved with your upgrade, and whether your requirements can be met. If everything appears acceptable after analyzing your detailed plan, place your order.

Configuring your order:

Learn how to develop a solution package that is appropriate for you.

After planning for your upgrade, determine if your solution is correct and available. The configurator tool helps validate your hardware and software order. This tool examines your source server configuration by analyzing potential problems with your disk space and console requirements. It can examine your target server configuration by analyzing items such as performance, I/O structure, and availability. It also provides a price estimate on your new solution. The configurator allows certain combinations of hardware and software based on your configuration and order availability. Your reseller assists you when using the configurator tool.

Validating your order:

Ensure that your order is complete. Analyze the order in a solutions-assurance review.

Finalize your order based on your solution by completing a solutions assurance review. Consider whether to complete the tasks yourself or whether to use a services representative to complete the tasks. Validate the following items with your reseller or marketing representative when you examine your order:

- The target server meets solution-performance requirements.
- A thorough hardware and feature-placement and cabling plans are in place.
- Software requirements are identified for all logical partitions.
- The ability to maintain data, hardware configuration, and business continuity requirements such as backup and recovery plans and side-by-side upgrade consideration is assured.
- Customer acceptance criteria are established.
- A backup plan is in place.
- The System Planning Tool (SPT) information, which is used to plan LPAR configurations, is appropriate.
- Ensure the interoperability of applications and utilities between different software releases if the system shares data or interconnects with other systems.

Validating your upgrade project plan:

Use this information to ensure that you have developed a thorough upgrade schedule and project plan.

Ensure that your upgrade project plan is extensive and detailed. Your project manager for this upgrade, and any other key personnel, must be available during the upgrade to answer questions and provide direction and confirmation that your plan is being implemented. Validate that your plan includes the following information:

- A list of responsibilities for the tasks involved in an upgrade
- The people with the appropriate skills have been assigned to complete the tasks
- There are adequate backup or contingency plans
- A contact sheet exists with the names of the people assigned to the upgrade tasks
- An upgrade schedule exists that includes your expectations and limitations
- A list of the parts or features that will be returned to IBM following the upgrade

Items that are billable during or after the upgrade include the following:

- Moving or rearranging existing hardware, except when necessary to physically install new IBM hardware.
- Developing a plan that consists of unnecessary actions where the same result could be attained without those actions.
- Moving items that are not affected by your new hardware, or moving items to provide for placement of your new hardware for items other than placing them in a supported location within the system. An example of moving items for reasons other than to place them in a supported location is if you move items to support a specific environment such as placement for logical partitioning or clustering considerations.

Placing your order:

Use this information to understand who places your order and how your order will be placed.

Place your order with your reseller or IBM after you have configured and validated it. Your reseller or IBM ensures that your order has been properly placed and that everything is correct. They also ensure that you sign your contract. Your reseller or IBM confirms with you what parts or features will be returned to IBM at the conclusion of the upgrade.

A common way your reseller or IBM assists you in placing your order is through the Advanced Administration System (AAS) or Passport Advantage®. Your reseller or IBM confirms with you what parts are returned to IBM.

Preparation tasks for upgrading your server

Find guidance for tasks such as adding, replacing, or removing a hardware feature; activating inactive resources; and converting expansion units. You can also learn how to complete other preparation tasks such as cleaning the server, preparing the console, and developing a test plan.

During this stage, you prepare the server for an upgrade. The major tasks associated with this stage include adding, replacing, or removing a hardware feature; activating inactive resources; and converting expansion units. You must also clean up and back up the server, and ensure that your target console is prepared and running. For information on how to clean up your server, see Cleaning up disk storage and Cleaning up server hardware.

Confirming your upgrade schedule:

By confirming your schedule, you ensure that everyone understands when the upgrade tasks will be completed. Learn who you need to confirm your upgrade schedule with.

Confirm your schedule among all parties involved. This includes IBM and your IBM Business Partner if they are involved. Each person can view the schedule to see when they must be available to support the portion of the upgrade for which they are responsible, if questions or problems arise. In this way you can resolve any potential conflicts immediately.

Preparing your environment:

This task encompasses several different subtasks. Depending on your situation, you might need to add, replace, or remove a hardware feature, activate inactive resources, or convert expansion units depending on your situation. At this time, you also need to clean up storage and hardware on your server, prepare your console, and back up your data.

Adding, replacing, or removing a hardware feature:

Use this information to determine whether you need to change a hardware feature, why you might need to change a hardware feature, and how to change a hardware feature.

Attention: You cannot use the SCSI Adapter for External Media Devices (2768) feature in any IBM eServer™ i5 model (model unit or expansion unit). Damage to the model hardware might occur if the 2768 feature is installed.

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before upgrading the IBM i or upgrading to a new server. For example, you might need to add more memory, or you might need to replace a tape drive that is not compatible with the target server. The unique requirements of the hardware feature indicate when you change the hardware feature. Some examples include:

- If you have hardware features that do not work with IBM i 6.1, you need to replace these hardware features before upgrading IBM i to 6.1.
- If you are adding a hardware feature that works only with IBM i 6.1, you need to upgrade to 6.1 before adding the hardware features.
- If you have hardware features that do not work with the Linux version you intend to use, you need to replace these hardware features before upgrading the Linux version.
- If you are adding a hardware feature that works only with the Linux version you intend to use, you need to upgrade your Linux version before adding the hardware features.
- If you have hardware features that do not work with the new model, you need to replace these hardware features either before or when you upgrade to the new server.

You might need to change more than one hardware feature. If you plan to upgrade both the IBM i and the model, ensure that all hardware features are compatible with both IBM i 6.1 and the new model. Identify these hardware feature changes when you plan for your upgrade. For information about hardware features that you might need to replace, see the IBM Prerequisite.

To upgrade a hardware feature, perform the following tasks:

Preparing for feature upgrade:

Use this information to understand and complete the prerequisites for adding or replacing a hardware feature.

To prepare for adding or replacing a hardware feature, perform the following tasks:

1. Install fixes (also known as program temporary fixes or PTFs) on all logical partitions of the server. Use the Install fixes on servers with logical partitions topic to install the fixes on the server before adding or replacing the hardware feature.

Note: If you are performing a miscellaneous equipment specification (MES) processor upgrade for a 570 model, your server firmware and IBM i partitions must be at a minimum level of code prior to your MES upgrade. To view the current level of code required for this upgrade, see IBM Prerequisite.

2. If you are replacing disk units, use the **Disk migration while active** option of the STRASPBAL (Start ASP Balance) command to reduce the downtime associated with removing a disk unit. With this option, you can move data from specified disk units while your server is running. For information, see STRASPBAL (Start ASP Balance) command.
3. See "Printing the server configuration when changing a hardware feature."
4. Save the entire server on a tape drive that is compatible with the tape drive on the target server. For instructions about saving the server and logical partitions, see the Save your server and each logical partition using GO SAVE option 21 topic.

   Note: To determine if your tape drives are compatible, see IBM Prerequisite. If you are upgrading a partitioned server, ensure that you save all the data on the logical partitions. Saving this data is vital for recovery if you experience errors when you upgrade the server.

Printing the server configuration when changing a hardware feature:

Understand the steps you must complete to document your server. Documenting your server assists you in not only ensuring that your upgrade is successful. It can also help when troubleshooting if problems arise.

To ensure that the server is fully documented before you add, replace, or remove a hardware feature, perform these tasks:

1. If you are changing the disk configuration, perform the following steps:
   a. If the source server is partitioned, print the disk configuration status from each logical partition of the server. Be sure to record the serial number of the load-source disk unit for each logical partition. See "Printing disk configuration status" on page 33 for more information.
   b. If the source server is partitioned, print the hardware resource information from each logical partition of the server. Be sure to mark each printout for the logical partition it represents.

      You can use this information to analyze and plan for disk-unit configuration and protection. You can also use the information to correct any problems that occur during the upgrade. See "Printing parity set configuration and status" on page 34 for more information.
2. If you are changing a workstation, communications, or LAN, you need to collect information. Record the hardware resource information so that you can perform the necessary resource management after the hardware feature change is completed. Collect this information for each logical partition if your source server is partitioned. See "Displaying, verifying, and printing hardware resource information" on page 34 for more information.
3. Ensure that you create a System Plan of your source system. Complete the step 'Creating a System Plan' at Copying LPAR configuration.

Performing the feature upgrade:

Use this information to learn how to add, replace, or remove a hardware feature.

For any single upgrade order, some of the hardware features might be installed by the authorized service provider and others might be installed by you. Discuss this in advance with the authorized service provider so that you know which, if any, responsibilities are yours, and which are the responsibility of the authorized service provider.

If you are responsible for installing a hardware feature, follow the instructions that come with the feature, or use the procedure for the feature in the Installing a feature using the Hardware Management Console topic.

Performing resource management:

Learn about the final steps you need to perform after you add, replace, or remove a hardware feature. Also, understand why you need to complete resource-management tasks.

After you change a hardware feature, you might need to perform the following tasks:

1. If your server is partitioned, assign resources to logical partitions as necessary. For information about assigning resources to a logical partition, see Dynamically moving logical partition resources.
2. If you changed the disk configuration, perform disk-unit management for the following reasons:
   - To protect data when using RAID or mirroring.
   - To configure the disks on your server.

   To perform disk management, you can use the Work with Disk Units option from the Dedicated Service Tools display. See Work with disk units

   Note: After you complete your disk configuration, you can remove or reassign disk units using dedicated service tools (DST). For information, see Moving and removing disk units.

   Disk units that you remove from the configuration need to also be physically removed to prevent them from being added back into the configuration when you restart the server.
3. Update the hardware resource names of workstations, communications, removable media, Local Area Network (LAN), Wide Area Network (WAN), or Integrated xSeries® Server (IXS) as necessary. For information about changing hardware resource names, see "Correcting hardware resource names after an upgrade."
4. If you changed the console type, perform the IPL and resource management tasks in "Completing server configuration" on page 53.
5. If you made changes to enable clusters or independent disk pools, ensure that they are created and configured correctly, using the information in the Configure a cluster and Configure independent disk pools topics.

Correcting hardware resource names after an upgrade:

Following an upgrade or migration, you might have hardware resources that are in different locations than they were on your source server. Learn how to change hardware resource names following an upgrade.

To adjust these hardware resource names, perform these steps for each IBM i partition:

1. At the IBM i command line, enter `WRKHDWPRD`.
2. On the Work with Hardware Products display, select option 5 (Change description label locations), and then press Enter.
3. Read the information on the Using Change Label Locations display, and then press Enter.
4. Compare the label information on the display with the source server's label locations. Label information matches if the Label column on the display matches that of the source server. Label information does not match if any one of the following conditions is true:
   - The display has label information, but the source server did not have label information in that location.
   - The source server label information does not match the information found in the Label column on the display.
   - `*NONE` appears in the Label column on the display, and there is label information for the source server. **Note:** When `*NONE` appears in the Label column for a controller or device that was added or upgraded, select option 2 (Change). Then, select the correct label description from the list provided. If you experience any problems, call your authorized service provider.

- *INCORRECT or *INVALID appears in the Label column. This means that the type and model number of the hardware resource information does not match the type and model of the configuration description that is currently associated with that resource. The server cannot vary on the configuration description.
- *INCORRECT, where the physical location is also **. This identifies a controller or device description that no longer has a valid resource on the server.

5. If there are any locations where the server label information is not the same as the (physical) label, on the Change Description Label Locations display, type 2 in the Opt column for each location that requires a label change. Press Enter. The Change Description Label display appears.

   Note: You might make more than one selection at a time, but if More appears on the bottom of the display, do not press **Enter**. Instead, page forward to select the remaining labels.
6. Type 1 in the Opt column for each location that you want to change, and press **Enter** to select the label name (on the display), which matches the label that was on the source server.

   Note: If you cannot find the label (on the display) that matches the label on the source server, contact your authorized service provider.

   If you chose to change more than one label, the Change Description Label display appears for the next label. A message at the bottom of the display indicates whether the previous change was successful.
7. For all the labels that need a change, repeat the previous three steps starting with step 4 on page 23.
8. Scroll forward to view more information if More appears on the bottom of the display. This occurs after you change the last label. The Change Description Label Locations display appears with the updated information. A message at the bottom of the display indicates whether the last change was successful.
9. Press the F17 key on the Change Description Label display to request a printout of the new information for your records.

   Note: The printout is in the default output queue for your workstation. You can print it later when you vary on the printer devices and start printer writers.
10. Verify that the labels on the printout match the labels in the Label column on your source server. If you find any errors, go back to step 5 and repeat the steps.

    Attention: Do not exchange cards for problem analysis purposes. Card and device serial numbers are part of the server configuration.

Activating inactive resources:

Learn why you might need to activate inactive resources, and learn how to activate those resources.

If you are upgrading from a server that is enabled for Capacity on Demand (CoD) and you have standby processors that are not activated, activate all these processors before upgrading your software or server. CoD offers you the capability to dynamically activate one or more central processors or memory units of select models temporarily, permanently, or on a no-charge trial period.

To activate inactive resources on a System i model, see Capacity on demand.

Converting expansion units for a partitioned server:

Learn why you might need to convert an expansion unit, how to convert an expansion unit, and the conversion paths that you can use.

If you are converting expansion units as part of a server upgrade, prepare for the expansion unit conversion. The authorized service provider will perform the expansion unit conversion when the server is upgraded. You must perform resource management on the new expansion unit after the authorized service provider has performed the server upgrade.

Expansion unit conversion paths and considerations:

Use this information to understand the conversion paths, potential billable services, and effect that an expansion unit conversion might have on your existing hardware configuration.

When you convert any of the following expansion units, it is essential that you do detailed planning prior to the beginning of the conversion.

Tips:

- Be sure that all of the logical partition (LPAR) configuration actions are performed by an LPAR-trained service representative.
- If the expansion units are converted as a part of a server upgrade, perform the expansion unit conversion and stabilize the server environment before performing a server upgrade.

Billable services: Activities for existing features associated with converting multiple expansion units are potentially billable. Only the contents of an expansion unit being converted might be moved to the new expansion unit by an authorized service provider. Any other relocation or movement of features or server components is a billable service, which requires a contract for services with IBM.

For example, an expansion unit conversion might be a good opportunity to consolidate the contents of one or more expansion units into the converted expansion unit. Movement of features from other expansion units or from any part of the server other than the expansion unit being converted is billable, as is removing other expansion units from the server, rearranging the server within its physical environment, or any other activity not necessary to convert the expansion unit and its content.

For a fee, High Availability or LPAR Planning and Implementation services will provide a planning session to discuss your requirements and provide a final hardware and software configuration, and implementation plan. The LPAR service specialist can also install and configure the new LPAR configuration. For more information concerning Integrated Technology Services (ITS) LPAR Planning and Implementation services, contact your IBM marketing representative or IBM Business Partner, or see Technical Support Services A - Z.

Preparing to convert the expansion unit:

Use this information to prepare for an expansion unit conversion.

Ensure that you read “Expansion unit conversion paths and considerations.”

To prepare for the expansion unit conversion, perform the following tasks:

1. Upgrade to IBM i 6.1.

   If you have not upgraded the IBM i to 6.1, upgrade now. For more information about upgrading your operating system, see “Upgrading IBM i and related software” on page 47.
2. From the System Planning Tool (SPT) application, print the SPT output before you begin the expansion unit conversion.

   You can ask your IBM marketing representative or IBM Business Partner to help you obtain this output during the order process.

   Note: The SPT output can help determine the logical partition to which the new bus numbers should be assigned and how to handle resource names.

3. If you are using a Linux operating system on your expansion unit, perform the following tasks. If you are not using a Linux operating system on an expansion unit, you can skip this step.
   a. Locate a Linux distribution kernel that is compatible with an IBM Power Systems model.

      Note: Even though you are upgrading from an IBM System i model, you need to install a POWER Linux kernel to ensure compatibility with an IBM System i model.
   b. Obtain access to an installation kernel through either of the following methods:
      - Linux installation CDs or DVDs
      - Network-based installation source
   c. Download the latest POWER Linux kernel to the partition virtual disk. For SUSE Linux Enterprise Server 9, this kernel is on the first installation CD or DVD in the /suse/ppc directory.
   d. Back up all server partitions using the GO SAVE option 21 option. See the GO SAVE option 21 topic to back up all logical partitions of the server.

      Note: Backing up the server partitions is vital for recovery in case you experience errors during the expansion unit conversion.
4. If you are migrating an expansion unit from a source server to a target server during your server upgrade, ensure that you plan for the following items:
   - If you are upgrading to a new IBM System i model, perform the following tasks to ensure that the SPCN download runs correctly:
     a. Ensure that the vital product data (VPD) has been added to the expansion unit before the upgrade.

        Note: The System Service Representative (SSR) updates the VPD when changing the VPD chip.
     b. Ensure that your HMC user ID has hmcsuperadmin authority. See "Editing HMC user information and roles" on page 19 for information about changing authority for an HMC user ID.
   - Remove the power from the expansion unit during the migration so that the target server owns the SPCN ID of the expansion unit.

Resequencing SPCN addressing:

Resequence the SPCN addressing to ensure that minimal sequencing changes occur during the conversion. Learn how to resequence the SPCN addressing.

Before generating any printouts, resequence the system power control network (SPCN) addressing. This ensures that when the authorized service provider performs the SPCN address resequencing after the expansion unit conversion, minimal sequencing changes occur.

To resequence the SPCN addressing, complete the following steps:

1. At an IBM i command line, enter `STRSST` to start system service tools (SST) and sign on to SST.

   Note: To use SST, you need a valid service tools user ID. See Work with service tools user IDs for more information.
2. From the SST main menu, select option 5 (Work with system partitions), and then press Enter. The Work with System Partitions display is shown.
3. Select option 2 (Work with partition status). The Work with Partition Status display is shown.
4. Type `10` next to the Partition, and then press Enter to place the logical partition in manual mode.
5. From the Work with Partition Status display, type `33` next to the partition, and press Enter to resequence the SPCN addressing.

Result: The status message `Reorder SPCN addressing was successful` appears.

Printing and preparing the configuration for expansion unit conversion:

Understand all the necessary steps to ensure that you are ready for the expansion unit conversion.

Ensure that the currently installed server and logical partitions are fully documented before the authorized service provider arrives to perform the expansion unit conversion. Make sure that these documents represent the most recent configuration of the server and that no hardware changes were made since printing the documentation. If you make changes before the service representative arrives, print the server and logical partition documentation again.

To print and prepare the configuration for expansion unit conversion, complete the following steps:

1. Print the disk configuration status from each logical partition of the server. See "Printing disk configuration status" on page 33 for more information.
2. Print the parity set configuration and status from each logical partition of the server. Be sure to mark each printout with the name of the logical partition that it represents. See "Printing parity set configuration and status" on page 34 for more information.
3. Print the hardware resource information for each logical partition of the server. See "Displaying, verifying, and printing hardware resource information" on page 34 for more information.
4. Assign all unassigned I/O resources. See "Assigning all unassigned I/O resources" on page 28. These should be assigned to an active partition.
5. Remove failed or nonreporting resources. See "Removing failed or nonreporting resources" on page 28. Use the Hardware Service Manager (HSM) on the logical partition.
6. Print the system configuration for logical partitions. See Print the system configuration for logical partitions.
7. Use the printouts from step 8 to determine any load-source resources in a bus that will be changing bus numbers, for instance, when a bus is converted or recabled.

   Perform the following tasks for each logical partition with a load source disk unit in a converted or recabled bus:

   a. Count one drive if the logical partition has RAID or unprotected drives.
   b. Count two drives if the logical partition has mirrored drives.
   c. Record the total number of load source disk units.
   d. Record the serial number of the load source disk (unit 1) for each converted or recabled bus.

   You will need this information when you reconfigure bus or IOP ownership.

   Example: Partition 3 has a load source redundant array of independent disks (RAID) of 1. Partition 4 has a load source mirrored value of 2. The value of Partition 3 added to the value of Partition 4 equals 3. Record 3 as the total number of load source disk units.
8. Use the printouts from step 8 to determine the frame IDs and bus numbers associated with all hardware that is changing. This information must be given to the authorized service provider and is required for the expansion unit conversion.
9. Follow the instructions in "Changing the system value settings" on page 28.
10. Save your logical partition configuration data. To save your logical partition information, see "Copying LPAR configuration" on page 35.
11. Turn off your system. See Power Off.
12. Gather the following documents for the authorized service provider:

    System Planning Tool (SPT) output
    This document should not change as a result of the conversion.

    Disk configuration printouts for each logical partition.
    These documents should not change as a result of the conversion.

    Parity set configuration printout for each logical partition.
    These documents should not change as a result of the conversion.

Description label locations printout for each logical partition.
These documents should not change as a result of the conversion.

Server configuration list printouts for each logical partition.
This can be obtained from the Hardware Service Manager (HSM)

Partition information printouts for each logical partition.

Assigning all unassigned I/O resources:

To ensure that any hardware resources that were originally intended to be unassigned are operational before the expansion unit conversion, you must now assign the resources to a logical partition. These resources can then be unassigned as wanted after the expansion unit conversion. Learn how to assign unassigned I/O resources.

To assign unassigned I/O resources, complete the following step:

To find unassigned I/O resources and have them assigned, you can make these changes by right-clicking your logical partitions and selecting **properties**.

Removing failed or nonreporting resources:

Learn how to remove resources. Completing this task might help increase your server performance.

Attention: Resolve all hardware problems before continuing. Do not remove any I/O resources that are non-reporting because they switched between logical partitions and currently are not owned by the logical partition you are working in. Careful planning is required when switched I/O is involved.

Perform the following steps for each IBM i partition:

1. Enter `STRSST` on a command line to start system service tools (SST) on the logical partition. Sign on to SST.

   Note: To use system service tools, you need a valid service tools user ID. See Work with service tools user IDs for more information.
2. Select option 1 (Start a Service Tool).
3. Select option 7 (Hardware Service Manager (HSM)).
4. Select option 4 (Failed and non-reporting hardware resources), and then press Enter. Identify and record all resources that are switched between logical partitions. You might need to reassign or rename these resources following the expansion unit conversion.
5. Select option 4 (Remove) to remove any failed or non-reporting resources. If you receive a message saying `No failed or non-reporting logical hardware resources found`, skip to step 8.
6. Confirm removal of failed or non-reporting resources.
7. Press F12.
8. Press F6 to print the system configuration list.

Changing the system value settings:

Change the system value settings on your partitions by completing the following steps:

1. From a command line, type `WRKSYSVAL` command (Work with System Values).
2. Record the value for each system value setting. These values need to be restored later.
   - _____ QAUTOCFG (Autoconfigure devices)
   - _____ QIPLTYPE (Type of IPL to perform)
   - _____ QPFRADJ (Performance adjustment)
3. Change the settings to the following values:

- QAUTOCFG (Autoconfigure devices) = 0 (Off)
- QIPLTYPE (Type of IPL to perform) = 2 (Attended IPL, console in debug mode)
- QPFRADJ (Performance adjustment) = 2 (Adjustment at IPL and automatic adjustment)

Cleaning up disk storage:

Learn how to and why you need to clean up your disk storage.

You must clean up your disk storage before you back up your data and eventually perform your upgrade. Cleaning up your disk storage is important for these reasons:
- It shortens the amount of time it takes you to back up your data.
- It might improve performance.
- It releases additional storage space.
- If you need to perform an unplanned recovery from media, the recovery time is shorter.

To clean up your disk storage, see Cleaning up disk storage space.

Cleaning up server hardware:

Understand how to clean up your server prior to upgrading your server.

Perform the following tasks to clear the server from unwanted resources and disk units:
1. Perform device configuration cleanup as follows:
   a. Use the Work with Line Descriptions (WRKLIND) command to view and delete unused lines and line descriptions.
   b. Use the Work with Device Descriptions (WRKDEVD) command to delete unused device descriptions.

   Note: You can use these commands to view and verify that all of the descriptions listed are in use. If you are sure one is not in use, delete it. If you are not sure, you should leave it.
2. Assign all unassigned I/O resources to active logical partitions if your server is partitioned. See Dynamic movement of logical partition resources for more information.
3. Remove failed or non-reporting resources that are no longer associated with existing hardware. Do so for each logical partition if your server is partitioned. See “Removing failed or nonreporting resources” on page 28 for more information.
4. Logically remove any configured disk units that will be removed during the upgrade.
   For information, see the "How to Remove a Disk Unit from an Auxiliary Storage Pool" in the section Working with Auxiliary Storage Pools of the Recovering your system topic collection in the IBM i Information Center.

   Note: Disk units that are not physically removed might be inadvertently added back into the configuration when you restart the server.

Adjusting memory and processing resources:

Learn how to adjust memory and processing resources. Adjusting those resources can help you adjust to changing workloads.

If the target server has fewer processors or less memory than the source server, adjust the minimum, desired, and maximum processor and memory values in the partition profile prior to the server upgrade. Consider activating the adjusted partition profile to verify the changes.

Configuring the Virtual I/O Server for POWER6 systems:

Before you upgrade an existing POWER5 Virtual I/O Server (VIOS) to a POWER6 VIOS, you must configure the maximum virtual I/O slot number and any virtual Ethernet, virtual serial, or virtual SCSI adapters that use VIOS slots 0 through 10.

The following configuration rules apply:

- The maximum virtual I/O slot number must be set to at least 11 plus the number of virtual I/O slots that you require.

  Notes:
  - A maximum that is lower than 11 can be incompatible with newer versions of the Hardware Management Console (HMC).
  - The maximum slot number can be greater than 11.
  - Excess virtual slots use a small amount of additional memory but have no other effects.
- All customer-defined virtual Ethernet, virtual serial, and virtual SCSI slots must use virtual slot IDs 11 or greater.

  Note: For existing virtual SCSI adapters, you must map all client profiles to the new server adapters.

These configuration rules apply to partitions on POWER6 systems only. In a mixture of POWER5 and POWER6 systems on a V7 HMC, the POWER5 systems can use slots 0 through 10.

Changing configuration objects:

You can learn how to change configuration objects. You might need this configuration source if any configuration objects must be manually changed or recreated.

Use the Retrieve Configuration Source (RTVCFGSRC) command to build a source file member for the specified existing line, controller, and device descriptions.

Gathering performance data:

Performance data from the source server can help you compare its performance with the performance you are receiving from the target server. Learn how to gather performance data.

Gather performance data from the source server during your most critical performance time period. Compare this data with the target server's performance after the upgrade is completed. This ensures that you are obtaining the desired level of efficiency with the new server. See Collection services for information on how to collect performance data from your server.

Preparing your console:

If you plan to use a different console after the server upgrade, ensure that the target console is prepared. This information can assist you in preparing for a different console.

Ensure that the target console is set up and ready. The target console must be running and tested as a stand alone server before the authorized service provider arrives.

When possible, use the Hardware Management Console (HMC) to manage your system. The HMC provides the easiest, most reliable method to access a console session during your upgrade. Ensure that your HMC is at the correct code level (one that supports your POWER6 system).

If you are upgrading to a POWER6 system and you are currently using a twinaxial console to manage your source system, you will need to also use an HMC in conjunction with your twinaxial console to manage your target system. A twinaxial console without an HMC is not supported on POWER6 systems.

If you are currently using a twinaxial console and upgrading without an HMC, you must replace the twinaxial console with a supported console prior to initiating the server upgrade.

Related information

Working with consoles, terminals, and interfaces

Backing up data:

Learn why you must and how to back up your data before you develop a test plan.

Save the data on the entire server and all partitions, if applicable, on a tape unit that is compatible with the tape unit on the target server. See Overview of the GO SAVE command.

Saving data is vital for recovery if you experience errors when upgrading the server. To determine if your tape units are compatible, see the IBM Prerequisite.

Note: Ensure that you retrieve your tape media from your source server and properly store it before shutting it down.

Developing your test plan:

Use this information to develop acceptance criteria, a test plan, and a test schedule. You can also learn why you should develop these items.

Before you develop a test plan, determine your acceptance criteria. These criteria must establish the requirements and steps to bring the new server to the appropriate level of function, performance, availability and risk following the upgrade. These criteria can help promote a quick and easy transition from the time the authorized service provider presents the server to you until you formally accept your new server.

When developing your test plan, assess your business situation to determine the level of testing that you need. Examine the risk involved by not testing and whether that risk justifies the time, expense, and resources required to complete the test.

Determine the preliminary tasks for your test plan, and then develop the actual test plan, which should be partially based on your criteria and risk assessment. Complete the following tasks to develop your test plan:

- Identify focus areas to be covered by testing
- Identify resources that can be used during this testing
- Assign appropriate personnel to develop a test strategy and test schedule

After you have completed those tasks, complete the next set of steps:

- Develop a test strategy, plan, and timeline
- Ensure that you have enough resources to complete the test. Some of the resources you might need are:
  - Hardware
  - Software
  - Labor
  - Tools
  - Licenses
  - Location
- Verify that you have taken into consideration physical planning and installation requirements

Review the plan thoroughly before implementing it. Use this review to focus on your timeline, requirements, cost, and steps necessary to complete your plan.

Scheduling your acceptance review:

Learn why you need an acceptance review and who should be involved.

An acceptance review is a meeting where you can evaluate whether the system matches your plan and needs. This meeting can include your seller, key management personnel in your company, and anyone else who needs to evaluate the new server. The seller presents the new server and its physical configuration to you.

Use the information provided during the review to prepare the server for production. Determining whether the current server hardware configuration matches your plan is important.

Preinstallation tasks for upgrading your server

The major tasks in this stage include printing the server information, copying the logical partitioning configuration, preparing the location, and reviewing the project and contingency plans.

Use this stage as a checkpoint to examine what you did so far and to determine whether you can begin the upgrade process. Also, gather all necessary information for the authorized service provider. Determine if any work items still need to be done. When everything is ready, the next step is to establish a meeting with your authorized service provider and review all pertinent information.

Printing server information for server upgrade:

Print the server information so that you can provide it to the authorized service provider.

Ensuring that the server information is available is a critical step in your upgrade. This information is essential to the authorized service provider if problems arise during the installation. This server information should be written clearly and thoroughly.

If applicable, ensure that you document the following requirements for each logical partition. This information should be easy to read and clearly labeled for the authorized service provider.

To ensure that the source server is fully recorded before the upgrade, perform these tasks:

1. From the System Planning Tool (SPT) application, print the SPT output before you begin the expansion unit conversion.

   You can ask your IBM marketing representative or IBM Business Partner to help you obtain this output during the order process.

   Note: The SPT output can help determine the logical partition to which the new bus numbers should be assigned and how to handle resource names. These procedures assume a high level of experience with logical partitions.
2. Use one of the following methods to document the source server:
   a. If your country or region supports the Work with Order Information Files (WRKORDINF) command, and if the installed server is capable of using electronic customer support, do the following:
      1) On the command line, enter `WRKORDINF`.
      2) On the next panel, type option 1 (Send to IBM) next to QMA*nnnnn* where *nnnnn* is the serial number of the server, and then press Enter.
   b. If you cannot use the Work with Order Information Files (WRKORDINF) command, do the following:
      1) On the command line, enter `DSPSFWRSC *PRINT`.
      2) Print the spooled file.
3. Print the disk configuration status. For more information, see “Printing disk configuration status” on page 33.

4. To analyze and plan for disk unit configuration and protection, print the parity set configuration and status. This analysis can also correct any problems that occur during the upgrade. See “Printing parity set configuration and status” on page 34 for more information.
5. Record the hardware resource information so that you can perform the necessary resource management after the upgrade is completed. See “Displaying, verifying, and printing hardware resource information” on page 34 for more information.
6. Print the server configuration.

   This output gives you specific logical partition information, such as server resources, processors, main memory, and any unique system values associated with logical partitions. Complete this task based on your source system.

Source system	Task
8xx model	• If your source server is not partitioned, see Printing the system configuration list. • If your source server is partitioned, see Printing system configuration for logical partitions.
POWER5 or POWER6 processor-based model	Make a system plan. For more information, see mksysplan.

7. If your server is partitioned, record the logical partition owner and serial number of resources on buses 1, 2, and 3 using the server configuration printout. Those resources might not be on buses 1, 2, or 3 after the upgrade is completed. If not, you can use this information to reassign the resources to the correct logical partitions.
8. Print the status of all fixes on the source server by entering the following command:

   ```
   DSPPTF LICPGM(*ALL) OUTPUT(*PRINT)
   ```

   You can use this information to verify that you have the most current fixes on the source server.
9. Record the IPL type and IPL mode for all logical partitions of the source server so that you can return the server to this mode after the upgrade is completed.
   - IPL type = _____
   - IPL mode = _____

Gather the following printouts for the authorized service provider:

- Server configuration list printouts
- Disk configuration status printouts
- Parity set configuration and status printout
- Device descriptions printout (as described in Changing configuration objects)
- Controller descriptions printout (as described in Changing configuration objects)
- PTF level printout
- Description label locations printout
- System Planning Tool output

Printing disk configuration status:

Perform the following steps to print your disk configuration status.

To print the disk configuration status of your server, you need security officer authority. If the server is partitioned, repeat steps 1 through 7 for each logical partition. Be sure to mark each printout for the logical partition it represents.

To print the disk configuration status, complete the following steps:

1. Enter `STRSST` on a command line to start system service tools (SST). Sign on to SST.

2. Select option 3 (Work with Disk Units), and then press Enter. The Work with Disk Units display appears.
3. Select option 1 (Display Disk Configuration), and then press Enter. The Display Disk Configuration display appears.
4. Select option 1 (Display Disk Configuration Status), and then press Enter.
5. At the Display Disk Configuration Status display, print the disk configuration by pressing the Print Screen key on your keyboard.
6. Page down and repeat until you have printed the entire disk configuration (if you have more disk units than your screen can display, continue down through the list until the last disk unit is displayed). Ensure that all the disk configuration information is printed.
7. Write the serial number on the printout of the load-source disk unit (unit number 1) for each logical partition.

Printing parity set configuration and status:

Perform the following steps to print your parity set configuration and status.

If the server is partitioned, repeat these steps from each logical partition. Be sure to mark each printout for the logical partition it represents.

To print the parity set configuration and status of the server, complete the following steps:
1. Enter STRSST on a command line to start system service tools (SST). Sign on to SST. To use system service tools, you need a valid service tools user ID. For more information, see Work with service tools user IDs.
2. Select option 3 (Work with Disk Units), and then press Enter. The Work with Disk Units display appears.
3. Select option 1 (Display Disk Configuration), and then press Enter. The Display Disk Configuration display appears.
4. At the Display Disk Configuration Status display, select option 5 (Display Device Parity Status), and then press Enter. The Display Device Parity Status display appears.
5. Print the parity set configuration by pressing the Print Screen key.
6. Page down and repeat step 5 until you have printed the entire parity set configuration.

Displaying, verifying, and printing hardware resource information:

Learn how to ensure that you have properly documented your hardware resources.

If the server is partitioned, repeat these steps from each logical partition. Be sure to mark the printout for the logical partition it represents. To display, verify, and print the hardware resource information, complete the following steps:
1. At the IBM i command line, enter the Work with Hardware Products (WRKHDWPRD) command.
2. Select option 4 (Display Description Label Locations), and then press Enter to display the label information associated with the hardware resources.
3. On the Display Description Label Locations display, verify that the label information about the hardware resources is accurate.
4. Delete the configuration descriptions (also called configuration objects) that are not associated with any physical hardware at this time.
5. Press F17 (Print) to print the description label locations. Give this information to the authorized service provider.
6. At the IBM i command line, enter the following commands to create a report of your hardware and configuration objects:

```
DSPHDWRSC TYPE(*LWS) OUTPUT(*PRINT)
DSPHDWRSC TYPE(*STG) OUTPUT(*PRINT)
DSPHDWRSC TYPE(*CMN) OUTPUT(*PRINT)
DSPHDWRSC TYPE(*PRC) OUTPUT(*PRINT)
```

Copying LPAR configuration:

Your logical partitioning configuration data is essential to get the source server into production. Learn how to copy LPAR configuration information.

To save your logical partition configuration data, complete the following steps based on your source system:

For POWER5 AND POWER6 processor-based source systems:

1. Create a system plan. For instructions, see Create System Plan.
2. Export the plan using the information in Export System Plan.

Note: If your upgrade involves an expansion unit conversion, collect your logical partition configuration data after the expansion unit is converted.

Recording user IDs and passwords:

Learn the types of user IDs and the passwords you need to record so that the authorized service provider can perform the server upgrade.

The authorized service provider needs access to the server to perform the upgrade. Record the user IDs and passwords for the following items:

- Server signon
- Console
- Service tools, which includes dedicated service tools (DST), system service tools (SST), and System i Navigator

Preparing your location for the upgrade:

You must complete several tasks to prepare your location for the upgrade. Use this information to understand what you need to do to ensure that your location is ready for the authorized service provider and the upgrade.

To prepare your location, perform the following tasks:

- Validate that all of your existing cables are labeled appropriately with the port and location they plug into the server and the destination information on both ends.
- Assemble and lay out all of the new cables. The authorized service provider connects the cables to your new server.
- Install any network or telephone connections such as twinaxial, coaxial, telephone twisted pair, or Ethernet cables.
- Rearrange hardware, whenever possible, to ensure that it is located in its final location. This might involve billable services, and you might need to have a plan to determine when the hardware relocation activity should occur.
- Prepare a work space that provides enough room for the authorized service provider to lay out their ESD-protective mat and display their input/output devices and other items.
- Ensure that, when the authorized service provider arrives, the server is available to the authorized service provider with all users off the system and no production jobs running. The authorized service provider can then power the machine off and perform other jobs.

Reviewing your project and contingency plans:

Validate that your project and contingency plans are thorough, and that they cover the necessary areas.

Review your project plan to ensure that you have correctly planned for everything in the upgrade. This prepares you for the installation and postinstallation stages. Also, understand all billable items and the responsibilities of all the parties involved.

Discuss the target hardware configuration with your reseller or IBM. Focus on any changes that you want to make because they need to be examined to determine if additional services are required and if they cause any problems with the configuration.

If you experience problems during an upgrade, ensure that you understand your recovery or installation backout plan when reviewing your contingency plans. Include these items in these contingency plans:

- Alternate site processing
- Alternate backup schedule
- Availability of a backup server to run critical applications

Installation tasks

Understand the installation process and complete the tasks that you are required to do. In this stage, focus on installing the required level of software. You can also learn what is expected of you when the authorized service provider arrives.

Install the software on your source server several weeks before the authorized service provider performs all necessary hardware upgrades. This step helps reduce problems and, if needed, facilitates troubleshooting when the authorized service provider performs the hardware installation. Following the upgrade, configure the server, test the server, and verify that the hardware is reporting in.

Ensuring that you have completed the necessary tasks:

You must spend the time to complete the necessary planning, order, preparation, and preinstallation tasks. Your authorized service provider cannot proceed until you have completed each preceding task.

Provide the following to the authorized service provider:

- The server information you printed in the preinstallation stage
- All software prerequisites that have been installed
- Physical server hardware configuration plan
- Power plan
- Physical plan
- Plan for I/O placement for the entire server
- Plan for racks and expansion units
- Cabling plans
- Disk unit plans
- Documentation of existing configurations to ensure that the source server is re-created

Before the authorized service provider proceeds with the server upgrade, the authorized service provider must check to see whether you have accepted all the necessary license agreements. For example, you must accept the two license agreements that exist on the Hardware Management Console. Ensure that you print the license agreements before the authorized service provider arrives, if they need to be sent in the mail for verification.

Installing software:

Install this software several weeks before the authorized service provider performs the hardware upgrade. This step validates that the new software on your source server is working correctly. It also reduces possible problems that might occur during the hardware upgrade. Learn what software you must install before the server upgrade.

Before any of the hardware can be installed, you might need to perform several software installations on the source server. For example, if you have not yet upgraded your IBM i to 6.1, you must do so at this time.

Updating, migrating, and preparing AIX for server upgrade:

If you plan to transfer an AIX logical partition when you upgrade to your new server, you might need to complete several tasks before the server upgrade.

Ensure that you properly planned for your server upgrade to understand the tasks that you need to complete when you transfer an AIX partition from your source server to your target server. Ensure that you properly planned for your upgrade before you complete the following tasks.

Before you upgrade the server to a new model, read and understand the following topics:

- AIX considerations. Understand AIX issues you should consider before you perform an upgrade.
- AIX backup requirements. Understand ways to back up your AIX logical partition before you perform an upgrade.
- Running the AIX pre_migration command. Understand how to run the AIX pre_migration script.

Depending on your situation, you might have to perform other AIX tasks such as updating or migrating your AIX logical partition to a new version. See the following topics for more information:

- Updating AIX with a new maintenance level. Understand how to perform an update of your maintenance level of AIX to AIX 5L™ Version 5.3 with the 5300-08 Technology Level.
- Backing up AIX to a CD or DVD. Understand how to back up your current AIX logical partition.

AIX considerations:

Understand what you need to account for before migrating your AIX operating system.

Many options are available for upgrading an existing AIX environment. You can use the following methods to upgrade an existing environment:

Using a mksysb backup
: If you can migrate your server to AIX 5L Version 5.3 with the 5300-08 Technology Level or later, you can create a **mksysb** backup of the older server. You can then use the **mksysb** command to reinstall AIX on the new server.

Using alternate disk migration
: If you want to decrease the amount of time that your production environment is down, you can use the **nimadm** command to perform an alternate disk migration. This method requires more resources than the other methods. You must have an existing AIX Network Installation Management (NIM) master that is running the same version of AIX that you are migrating the new server to.

Note: The 2849 card that is compatible with an IBM eServer i5 server, is not compatible with an AIX logical partition.

System backup requirements:

Understand the options to back up your current server before you perform an upgrade. Before performing an upgrade, you can back up your server using a mksysb image or alternate disk installation.

Before you perform any upgrade tasks, verify that you have a current system backup in the IBM AIX environment of your rootvg and all of your data. An AIX system backup is called a mksysb image. You can either create a mksysb backup image or use alternate disk installation.

If you create a mksysb backup image, you can record a backup on any of the following media:

- Tape
- Network file system
- CD-RW
- DVD-RW
- DVD-RAM

To make recovery flexible and reliable, back up to more than one media if possible. For additional information on creating a mksysb backup, see Creating system backups.

To back up your system using alternate disk installation, you can clone a copy of your running system to another drive. For additional information about using alternate disk installation, see Alternate disk installation.

Running the AIX pre_migration command:

Learn when you should run and how to run the AIX **pre_migration** command.

Before you migrate AIX, ensure that your server does not have existing installation issues.

If you are migrating to AIX 5.3 or later, you can run the **pre_migration** command on the CD or DVD that runs a set of tests and verifications on your server before you start the migration process. All output from the **pre_migration** command is saved in the /home/pre_migration.*date* directory. To run the **pre_migration** command, complete the following steps:

1. Mount the AIX 5.3 CD or DVD using the following command:
   ```
   # mount -v cdrfs -o ro /dev/cd0 /mnt
   ```
2. Copy the script to your server. The script is located in the /mnt/usr/lpp/bos/pre_migration directory. Run the following command:
   ```
   # cp /mnt/usr/lpp/bos/pre_migration /tmp/pre_migration
   ```
3. Run the script using the following command:
   ```
   # /tmp/pre_migration
   ```

The script performs the following checks:

- Placement and size of boot logical volume
- Requirements for disk space
- Verification of current system installation

If any problems are found, they are logged and reported to you. The premigration script does not make any changes on the server. The script verifies the current environment and checks for specific circumstances that might cause problems during a migration.

Run the premigration script before starting any migration, including alternate disk migration. Although all of the checks are also done before migration, it is easier to correct problems on a running server.

Updating AIX with a new maintenance level:

Your current version and release of AIX must match the level of AIX to which you are updating. Learn how to update your current maintenance level of IBM AIX.

Attention: This procedure requires that you restart AIX. Whenever you restart AIX, schedule your downtime when it least impacts your workload to protect yourself from a possible loss of data or functionality. Before you update AIX with a new maintenance level, ensure that you have reliable backups of your data and any customized applications or volume groups. For instructions on how to create a system backup, see Creating system backups.

The following steps show you how to use an optical drive to update AIX with a new maintenance level.

Step 1. Prepare for the update procedure

Before starting the update procedure, complete the following prerequisites:

- You must be logged in to the server as the root user.
- Either insert the media that contains the optional software or service updates into the appropriate drive or know the local or routed path to the software.
- If system files have been modified, back them up separately before updates are applied, because the update process might replace configuration files.
- Ensure that other users who have access to your server are logged off.
- Verify that your applications run on the new AIX maintenance level.
- Verify that all currently installed software is correctly entered in the Software Vital Product Database (SWVPD), by using the **lppchk** command. To verify that all filesets have all required requisites and are completely installed, type the following:

  ```
  # lppchk -v
  ```
- Check that your hardware firmware is up-to-date.
- Ensure that all requisite hardware, including any external devices or optical drives, are physically connected and powered on. If you need further information, refer to the hardware documentation that accompanied your server.
- Use the **errpt** command to generate an error report from entries in the system error log. To display a detailed report, type the following command:

  ```
  # errpt -a
  ```
- Ensure that adequate disk space and memory are available. For additional release information, see the *AIX Release Notes* that correspond to the maintenance level that you are installing.
- Make a backup copy of your server software and data. For instructions on how to create a system backup, see Creating system backups.

You can perform the update procedure either using the SMIT interface or the command line. Use one of the following sets of instructions, depending on whether you are using the SMIT interface or the command line:

Step 2. Perform the update procedure using the SMIT interface

1. Insert the AIX maintenance level CD or DVD into the optical device.
2. Type `smitty update_all` at the command line.
3. Type or select the input device that contains the AIX maintenance level CD or DVD, and then press Enter.
4. Type or select values in all entry fields, and then press Enter.

   When you press Enter to start the installation, the COMMAND STATUS panel is displayed. As the installation proceeds, a series of messages is displayed. The amount of time that the installation takes varies depending on your server and the software that you are installing and updating.

   When the installation is complete, the panel returns to the top of the list of messages that are displayed during installation. The **Command: status** field on the COMMAND STATUS panel changes to **OK** or **failed**. **OK** indicates that the installation ran to completion, although some filesets might not

have installed successfully. The **failed** status means that there was a problem with the installation. Although a preview installation always finishes with an **OK** status, always check the summaries.

5. Press F10 (or Esc+0) to exit SMIT.
6. Review the **smit.log** file (**/smit.log** or **/home/***user_id***/smit.log**).
7. Remove all installation media for the maintenance level from the drives.
8. When you are directed, restart your server by typing the following command:

   ```
   # shutdown -Fr
   ```

Step 2. Perform the update procedure using the command line

1. Use the **install_all_updates** command to install all installp updates on the `/dev/cd0` device and to verify the current recommended maintenance level:

   ```
   # install_all_updates -d /dev/cd0
   ```

2. Remove all installation media for the maintenance level from the drives.
3. When you are directed, restart your server by typing the following command:

   ```
   # shutdown -Fr
   ```

For more information about the **install_all_updates** command, see the **install_all_updates** command in the AIX Commands reference.

Step 3. Verify server configuration after installation

After the update procedure is complete and AIX has been restarted, verify the server configuration, as follows:

1. Verify that all currently installed software is correctly entered in the Software Vital Product Database (SWVPD), by using the **lppchk** command. To verify that all filesets have all required requisites and are completely installed, type the following:

   ```
   # lppchk -v
   ```

2. Use the **errpt** command to generate an error report from entries in the system error log. To display a detailed report, type the following:

   ```
   # errpt -a
   ```

Migrating AIX to a new version or release:

Using this procedure, you can migrate a server from an earlier version or release of AIX to AIX 5.3.

Before you migrate AIX, review the information in "Saving your existing partition profiles from a Hardware Management Console" on page 42. In this procedure, you perform a migration installation from an earlier version or release of AIX to AIX 5.3 using the following options:

- Use English as the primary language
- Use the default options in the **Advanced Options** menu

If you are overwriting an existing server, get the TCP/IP information before you begin this procedure.

Attention: This procedure requires shutting down and reinstalling the base operating system. Whenever you reinstall any operating system, schedule your downtime when it least impacts your workload to protect yourself from a possible loss of data or functionality. Before you perform a migration installation, ensure that you have reliable backups of your data and any customized applications or volume groups. For instructions on how to create a system backup, see Creating system backups.

Use the following steps to use the server's built-in optical device to perform a migration installation of the base operating system.

Step 1. Boot from the AIX product CD or DVD

Before you begin: Ensure that you run the **pre_migration** command and that you are logged in as the root user. For more information about running the **pre_migration** command, see "Running the AIX pre_migration command" on page 38.

1. If they are not already on, turn on your attached devices.
2. Insert the *AIX Volume 1* CD or DVD into the optical device.
3. Verify that the boot list is set to boot from the optical device, by typing the following command:
   ```
   # bootlist –m normal –o
   ```
4. Add the optical device to the boot list, if the optical device is not in the boot list. For example, to add the cd0 device to the boot list to include both the optical device and the hard disk in the boot list, type the following command:
   ```
   # bootlist –m normal –o cd0 hdisk0
   ```
5. Restart the server by typing the following command:
   ```
   # shutdown -r
   ```
6. When the server beeps twice, press F5 on the keyboard (or 5 on a nongraphical terminal). If you have a graphics display, the keyboard icon is displayed when the beeps occur. If you have a nongraphical terminal (also called a tty terminal), the word `keyboard` is displayed when the beeps occur.

   Note: If your server does not boot using the F5 key (or the 5 key on a nongraphical terminal), see your hardware documentation for information about how to start your server from an AIX product CD or DVD.
7. Select the server console by pressing F1 (or 1 on a nongraphical terminal), and then press Enter.
8. Select the English language for the BOS Installation menus by typing a 1 at the **Choice** field, and then press Enter. The Welcome to Base Operating System Installation and Maintenance menu opens.
9. Type 2 to select **2 Change/Show Installation Settings and Install** in the **Choice** field, and then press Enter.

Step 2. Verify migration installation settings and begin installation

1. Verify that migration is the method of installation. If migration is not already selected as the method of installation, select it now. Select the disk or disks that you want to install.
2. Select **Primary Language Environment Settings (AFTER Install)**.
3. Type 3, and then press Enter to select **More Options**. To use the Help menu to learn more about the options available during a migration installation, type 88, and then press Enter in the Installation Options menu. For more information about the installation options available in AIX 5.3, see BOS installation options.
4. Verify the selections in the Migration Installation Summary panel, and then press Enter.
5. When the Migration Confirmation menu appears, follow the menu instructions to list the server information, or continue with the migration by typing `0` and then pressing Enter.

Step 3. Verify server configuration after installation

After the migration is complete, the server restarts. Verify the server configuration, as follows:

1. On servers with a graphics display, after a migration installation, the Configuration Assistant opens. On servers with a nongraphical display, after a migration installation, the Installation Assistant opens.

   For more information about the Configuration Assistant or the Installation Assistant, see Configuring AIX.
2. Select the **Accept Licenses** option to accept the electronic licenses for the operating system.
3. Verify the administrator (root user) password and network communications (TCP/IP) information.

   Use any other options at this time. You can return to the Configuration Assistant by typing `configassist` or the Installation Assistant or by typing `smitty assist` at the command line.

4. Select **Exit the Configuration Assistant** and select **Next**. Or, press F10 (or ESC+0) to exit the Installation Assistant.
5. If you are in the Configuration Assistant, select **Finish now, and do not start Configuration Assistant when restarting AIX** and select **Finish**.
6. When the login prompt is displayed, log in as the root user to perform system administration tasks.
7. Run the **post_migration** command, which is located in the /user/lpp/bos directory on your server.
8. Verify the output files, which are saved in the /home/post_migration.date directory.

Saving your existing partition profiles from a Hardware Management Console:

Saving your existing partition profiles allows for an easier restoration of your partitions following your upgrade. Learn how to save your existing partition profiles from a Hardware Management Console (HMC).

You can use this procedure to save the logical partition definition information from a HMC. Ensure that your HMC is at the correct code level (one that supports your POWER6 system). In this procedure, the managed server is named 7038-6M2*10A59BC.

The following steps show you how to use the HMC to save the logical partition definition information:

1. Log in to the HMC that is connected to the managed server using an SSH client application.
2. Run the **lssyscfg** command to list all the partitions on the server, as follows:

   ```
   lssyscfg -r lpar -m "7038-6M2*10A59BC" -F name
   ```
3. Save this information. For example:
   a. On your local system, redirect the output to a file when you issue the **ssh** command. For example, type the following:

      ```
      ssh username@hmchostname lssyscfg -r lpar -m "7038-6M2*10A59BC" -F name > outputfile
      ```
4. On the HMC, run the **lssyscfg** command to list the partition profiles for each partition on the server, as follows (where *name_from_step2* is one of the partition names returned in step 2):

   ```
   lssyscfg -r prof -m "7038-6M2*10A59BC" -p name_from_step2 //
   -F name:boot_mode:desired_cpu:minimum_cpu:maximum_cpu:desired_mem:minimum_mem:maximum_mem://
   desired_io:required_io:service_authority:sfp_surveillance:sni_device_id
   ```

   Note: You do not need to perform this step for the FullSystemPartition name that was returned in step 2.
5. Save this information. For example:
   a. On your local system, redirect the output to a file when you issue the **ssh** command. For example, type the following:

      ```
      ssh username@hmchostname lssyscfg -r lpar -m "7038-6M2*10A59BC" -F name > outputfile
      ```
6. On the HMC, run the **lshwres** command to list all the slot information for the server, as well as the partition that the slot is assigned, as follows:

   ```
   lshwres -m "7038-6M2*10A59BC" -r slot -F phys_loc:drawer_id:slot_id:slot_type:assigned_to
   ```
7. Save this information. For example:
   a. On your local system, redirect the output to a file when you issue the **ssh** command. For example, type the following:

      ```
      ssh username@hmchostname lssyscfg -r lpar -m "7038-6M2*10A59BC" -F name > outputfile
      ```

After you save the partition profile information, do the following:

1. Use the HMC to create an AIX logical partition and partition profile on your new server. For more information, see Creating logical partitions .

2. Update your partition profile on the new server using the information from the partition profile that you saved. For more information, see "Restoring an AIX system backup from a CD or DVD."

Note: Restoring your partition profile needs to be completed on the target system shortly after you have turned the system on.

Restoring an AIX system backup from a CD or DVD:

In this procedure, you restore an IBM AIX system backup, also called a mksysb, on a logical partition using the logical partition's optical device.

This procedure assumes that there is a Hardware Management Console (HMC) attached to the managed server.

Note: Ensure that you follow the sequence of steps for the installation method that you choose. Within each procedure, some steps are completed in AIX and some steps are completed using the HMC interface.

Prerequisites

Before you begin this procedure, ensure that you have already used the HMC to create an AIX logical partition and partition profile with the information from "Saving your existing partition profiles from a Hardware Management Console" on page 42. Ensure that the AIX logical partition has the following resources assigned:

- A device adapter attached to the optical drive
- A network adapter
- A hard disk with the minimum amount of space needed for AIX

Set the boot mode for this partition to be **Normal** mode. After you have successfully created the logical partition and partition profile, leave the logical partition in the *Ready* state.

Step 1. Activate and install the partition (performed in the HMC interface)

1. Insert the AIX system backup CD or DVD into the optical device of the AIX logical partition.
2. Right-click the partition to open the menu.
3. Click **Activate**. The **Activate Partition** menu opens with a selection of partition profiles. Ensure that the correct profile is highlighted.
4. Click **Open a terminal window or console session** from the menu to open a virtual terminal (vterm) window.
5. Click **Advanced** to open the **Advanced options** menu.
6. Click **SMS** for the Boot mode.
7. Click **OK** to close the **Advanced options** menu.
8. Click **OK** again. A vterm window opens for the partition.

Step 2. Select the boot device

Note: The default password for the administrator is `admin`.

In the SMS menu on the vterm window, complete the following steps:

1. Press the 5 key, and then press Enter to select **5. Select Boot Options**.

```
Firmware
--------------------------------------------------------------------------------
Main Menu

1. Select Language
2. Setup Remote IPL (Initial Program Load)
3. Change SCSI Settings
4. Select Console
5. Select Boot Options


--------------------------------------------------------------------------------
Navigation Keys:

                X = eXit System Management Services
--------------------------------------------------------------------------------
Type the number of the menu item and press Enter or select Navigation Key: 5
```

2. Press the 2 key, and then press Enter to select **2. Select Boot Devices**.
3. Press the 1 key, and then press Enter to select **1. Select 1st Boot Device**.
4. Press the 3 key, and then press Enter to select **3. CD/DVD**.
5. Select the media type that corresponds to the optical device, and then press Enter.
6. Select the device number that corresponds to the optical device, and then press Enter.
7. Set the boot sequence to configure the first boot device. The optical device is now the first device in the Current Boot Sequence list.
8. Press the x key to exit the SMS menu and confirm that you want to exit SMS.

Step 3. Restore the AIX system backup

Install the AIX system backup, as follows:

Note: As you exit the SMS menus, the AIX base operating system (BOS) installation environment loads. It might take a few minutes for the boot image to load before the BOS Installation menus are displayed.

1. Define the System Console, and then press Enter.
2. Select the language for the Base Operating System (BOS) Installation menus, and then press Enter to open the **Welcome to Base Operating System Installation and Maintenance** menu.
3. Type 1 to select **Start Install Now with Default Settings** in the **Choice** field, and then press Enter.

```
Welcome to Base Operating System
                     Installation and Maintenance

Type the number of your choice and press Enter.  Choice is indicated by >>>.

    1 Start Install Now with Default Settings

    2 Change/Show Installation Settings and Install

    3 Start Maintenance Mode for System Recovery

    88  Help ?
    99  Previous Menu
>>> Choice [1]: 1
```

4. Verify that the selections are correct in the **Installation Summary** menu.

```
                    System Backup Installation Summary

   Disks: hdisk0
   Use Physical Location Maps: No
   Shrink File System: No
   Import User Volume Groups: Yes
   Recover Devices: No

>>> 1 Continue with Install

88  Help ?
99  Previous Menu

>>> Choice [1]: 1
```

5. Type 1 in the **Choice** field, and then press Enter to confirm the installation options and begin the installation. If the AIX system backup spans multiple CDs, the BOS installation program prompts you to switch to the next volume, and then press Enter. Repeat as many times as necessary until all the system backup volumes have been processed.

The server automatically restarts after installation is complete.

Step 4. Log in to AIX

When AIX has been successfully restored, the login prompt is displayed. Complete the following steps:

1. Log in to AIX using your user name and password.
2. Run the errpt command to verify that there are no errors on the server, as follows:
   ```
   # errpt –a | pg
   ```

Preinstallation tasks for upgrading System p:

The major tasks in this stage include reviewing system requirements, preparing your location, and reviewing your project and contingency plans. Find links to instructions for preparing for your upgrade.

Use this stage as a checkpoint to examine what you have done so far and to determine whether you are now ready for the upgrade. Also, gather all necessary information for the authorized service provider. Determine if any tasks still exist that need to be done. If you determine that you are ready, your next step is to establish a meeting with your authorized service provider. In this case, you can then show them all pertinent information.

Running the AIX pre_migration command:

Learn when you should run and how to run the AIX **pre_migration** command.

Before you migrate AIX, ensure that your server does not have existing installation issues.

If you are migrating to AIX 5.3 or later, you can run the **pre_migration** command on the CD or DVD that runs a set of tests and verifications on your server before you start the migration process. All output from the **pre_migration** command is saved in the /home/pre_migration.*date* directory. To run the **pre_migration** command, complete the following steps:

1. Mount the AIX 5.3 CD or DVD using the following command:
   ```
   # mount -v cdrfs -o ro /dev/cd0 /mnt
   ```
2. Copy the script to your server. The script is located in the /mnt/usr/lpp/bos/pre_migration directory. Run the following command:
   ```
   # cp /mnt/usr/lpp/bos/pre_migration /tmp/pre_migration
   ```
3. Run the script using the following command:
   ```
   # /tmp/pre_migration
   ```

The script performs the following checks:

- Placement and size of boot logical volume
- Requirements for disk space
- Verification of current system installation

If any problems are found, they are logged and reported to you. The premigration script does not make any changes on the server. The script verifies the current environment and checks for specific circumstances that might cause problems during a migration.

Run the premigration script before starting any migration, including alternate disk migration. Although all of the checks are also done before migration, it is easier to correct problems on a running server.

Backing up AIX to a CD or DVD:

Ensuring you have a current backup of your operating system is essential for a smooth upgrade. Learn how to back up your current environment and then restore it on your new server.

This procedure provides information about how to back up the IBM AIX operating system to a CD or DVD. This procedure assumes that your server might not have an optical drive. If your server does not have an optical drive, you can back up AIX to a file, and then use FTP to send the AIX backup file to a server that does have an optical drive.

If you can migrate your existing server to AIX 5300-06 or later or AIX 6100-02 or later, you can create a mksysb backup image of the older server. You can then use the mksysb image to reinstall AIX on the new server.

This procedure involves performing the following tasks:

1. Backing up AIX to an ISO image file
2. Transferring the ISO image to another server
3. Burning the ISO image to a CD or DVD

The following steps show you how to back up the AIX operating system to a CD or DVD.

1. Log in to the server as the root user.
2. Verify your running server.
3. Check the firmware code level from AIX, and update the firmware, if necessary.
4. Use the **errpt** command to generate an error report from entries in the system error log. To display a complete detailed report, type the following command:

   ```
   # errpt -a
   ```

   Note: There must be adequate disk space and memory available. For additional release information, see the *AIX 5L Release Notes*.
5. Run the **smitty mkcd** command as follows

   ```
   # smitty mkcd
   ```
6. Select **No** from the **Use an existing mksysb image** menu. When you select **No**, you can create a new system backup that reflects your current running environment.
7. Select the options that are appropriate to your environment from the **Back Up This System to CD** menu. You can also leave the default options as they are.
8. Select **Yes** for the **Do you want the CD to be bootable** option.
9. Select **No** for the **Remove final images after creating CD** option.
10. Select **No** for the **Create the CD now** option.
11. Press Enter to begin the system backup creation when you finish making selections. When the operation completes successfully, there is a file or files located in the `/mkcd/cd_images` directory.

12. Transfer the ISO backup image to a server that has an optical drive.
13. Create a bootable CD or DVD from the ISO backup image using the CD or DVD-burning software available in your environment.

Upgrading Power Systems using Linux:

You can upgrade your Power Systems using the Linux operating system.

The following are considerations for upgrading Power Systems using the Linux operating system:
- Ensure that the operating system level you are using is supported.
- Check the minimum and current operating systems supported on the Power Systems models. For more information, see Supported Linux distributions.
- Check the supported features for Linux on Power Systems servers. For more information, see Supported features for Linux on Power Systems servers.
- The IBM Installation Toolkit for Linux provides some tools to help with upgrading Power Systems models. For more information, see the Welcome Center Overview.

Upgrading IBM i and related software:

Complete these steps to upgrade your IBM i operating system and related software.

If you are upgrading to an IBM Power Systems model based on the POWER6 processor, you must install the correct level of software and firmware on the source server. To determine the correct level of software and firmware you need, see IBM Prerequisite.

In addition to upgrading to IBM i 6.1, you might also need to install related licensed programs on the source server. To view a list of licensed programs that are compatible with 6.1, see Licensed program releases and sizes.

Note: If you are upgrading from a 9406-MMA model to a 9117-MMA, IBM i software keys do not need to be reentered.

To perform an initial program load (IPL) from Storage Area Network (SAN), you must have installed the latest IBM i version 5 release 3 modification 5 or V5R4 Licensed Internal Code (or later), which requires the 17 GB minimum load-source requirement. For more information about the load source requirement and to complete your upgrade of IBM i and related software applications, see Upgrading or replacing i5/OS® or related software.

To finish completing the software upgrade, perform the following tasks:
1. To verify that all applications are running properly, use the server with the new software release operating with the new production environment. Use the server for a minimum of two weeks in production on your existing configuration before the hardware upgrade is performed.
2. Complete the tasks located at Managing job logs and Messages. Use this information to help you identify and fix any problems that might occur with the newly installed software.

Preparing for data migration from a Linux partition:

This information helps you to prepare to migrate your data from a server running Red Hat Enterprise Linux or SUSE Linux Enterprise Server to a target server running Red Hat Enterprise Linux version 3 or SUSE Linux Enterprise Server 9.

Depending on your version of Linux, see the following topics for instructions on how to prepare your Linux partition for the data migration.

Preparing Red Hat Enterprise Linux for server upgrade:

If your Red Hat Enterprise Linux installation is hosted by IBM i, complete these steps to upgrade and prepare your Red Hat Enterprise Linux for the upgrade.

If you have a Red Hat Enterprise Linux operating system that is obtaining resources from an IBM i partition on your source server and you intend to create a Red Hat Enterprise Linux partition on the target server, you must complete several steps. Completing these steps ensures that your Linux operating system migrates successfully. Complete the following steps to upgrade and prepare your Red Hat Enterprise Linux operating system for a migration:

1. Ensure that your IBM i is running version 5 release 3 or later.
2. Upgrade to Red Hat Enterprise Linux version 3 before migrating to the target server. To upgrade to Red Hat Enterprise Linux version 3, perform the following steps:
   a. Obtain a copy of the RHEL4.5 or later installation CD or DVD.
   b. Vary off the Linux server by completing the following steps:
      1) Type `WRKCFGSTS *NWS`, and then press Enter.
      2) Type 2 next to the NWSD that you want to shut down, and then press Enter.
   c. Place the first CD or DVD into the optical drive of the IBM i logical partition that is sharing its resources.
   d. Change the NWSD of the Linux server to point to the installation stream file of the CD or DVD by completing the following steps. Write down the information that you currently have for your NWSD.
      1) Enter `CHGNWSD`
      2) Specify the following information:

         ```
         NWSD (servername)
         IPLSRC (*STMF)
         IPLSTMF ('/QOPT/Red_Hat/ppc/iseries/boot.img')
         IPLPARM (*NONE)
         ```

   e. Open a virtual console session to your Linux server.
   f. Vary on your NWSD. Complete the following steps to vary on your NWSD:
      1) Type `WRKCFGSTS *NWS`, and then press Enter.
      2) Type 1 next to the NWSD that you want to start, and then press Enter.
   g. Follow the distribution documentation to complete the steps in the console.
3. After you have upgraded to Red Hat Enterprise Linux version 3, vary off your NWSD by completing the following steps:
   a. Type `WRKCFGSTS *NWS`, and then press Enter.
   b. Type 2 next to the NWSD that you want to shut down, and then press Enter.
4. Change the NWSD of the Linux server to point to the NWSSTG. Enter in the information that you previously wrote down before you changed the NWSD. Enter `CHGNWSD` to change the NWSD.
5. Vary on your NWSD. Complete the following steps to vary on your NWSD:
   a. Type `WRKCFGSTS *NWS`, and then press Enter.
   b. Type 1 next to the NWSD that you want to start, and then press Enter.
6. Locate a Linux distribution kernel that is compatible with an IBM System i model.

   Note: Even though you are upgrading from an IBM System i model, you need to install a POWER Linux kernel to ensure the compatibility with an IBM System i model.
7. Obtain access to an installation kernel through either of the following methods:
   - Linux installation CDs or DVDs
   - Network-based installation source
8. Mount the CD or DVD by entering the following command:

   ```
   mount /dev/iseries/vcda /mnt/cdrom
   ```

Note: Enter the appropriate name for your virtual device in the previous command.

9. Download the latest Red Hat Enterprise Linux version 3 POWER Linux kernel to the partition's virtual disk of the partition.

   A POWER Linux kernel is required to ensure the compatibility with the IBM System i. If you have upgraded the Linux server to RHEL4.5 or later, you are still running theIBM i kernel and must obtain the POWER Linux kernel. For Red Hat Enterprise Linux version 3, this kernel might be on the second installation CD or DVD under the /Red_Hat/RPMS directory. The following example shows how to download this kernel. Enter the first command, and then the second command to retrieve the name of your Linux kernel. Enter the last command to copy the kernel.

   ```
   cd /media/
   find . -name "kernel*ppc64*"
   cp cdrom/Red_Hat/RPMS/(name of your POWER Linux kernel) /root/
   ```

10. Shut down your Linux logical partition.
11. Save the entire server using option 21 of the GO SAVE command. For more information, see the GO SAVE topic. Complete the following steps:
    a. Vary off the network server...*ALL
    b. Unmount file systems.....Y

    Note: Create two copies of the backup media.
12. Using Linux back up tools, save any critical data contained within the virtual disk.

Preparing SUSE Linux Enterprise Server for server upgrade:

If your SUSE Linux Enterprise Server 9 installation is hosted by IBM i, complete these steps to upgrade and prepare your SUSE Linux Enterprise Server 9 for the upgrade.

If you have a SUSE Linux Enterprise Server 9 operating system that is obtaining resources from an IBM i partition on your source server and you intend to create a SUSE Linux Enterprise Server 9 partition on your target server, you must complete several steps. Completing these steps ensures that your Linux operating system migrates successfully. Complete the following steps to upgrade and prepare your SUSE Linux Enterprise Server 9 operating system for a migration:

1. Ensure that your IBM i is running Version 5 Release 3.
2. Upgrade Linux to SUSE Linux Enterprise Server 9 before migrating to your target server. To upgrade to SUSE Linux Enterprise Server 9, perform the following steps:
   a. Obtain a copy of the SLES 9 SP1 or later installation CDs or DVDs.
   b. Vary off the Linux server by completing the following steps:
      1) Type `WRKCFGSTS *NWS` and press Enter.
      2) Type 2 next to the NWSD that you want to shut down, and then press Enter.
   c. Place the first CD or DVD into the optical drive of the IBM i logical partition that is sharing its resources.
   d. Change the NWSD of the Linux server to point to the installation stream file of the CD or DVD by completing the following steps:
      1) Enter `CHGNWSD`
      2) Specify the following information:

         ```
         NWSD (servername)
         IPLSRC (*STMF)
         IPLSTMF ('/QOPT/SU90.001/ISERIES64')
         IPLPARM (*NONE)
         ```

   e. Open a virtual console session to the Linux server.
   f. Vary on your NWSD. Complete the following steps to vary on your NWSD:
      1) Type `WRKCFGSTS *NWS`, and then press Enter.

2) Type 1 next to the NWSD that you want to start, and then press Enter.

g. Follow the distribution documentation to complete the steps in YaST.

3. After you have upgraded to SUSE Linux Enterprise Server 9, vary off your NWSD by completing the following steps:
   a. Type `WRKCFGSTS *NWS`, and then press Enter.
   b. Type 2 next to the NWSD that you want to shut down, and then press Enter.
4. Change the NWSD of the Linux server to point to the NWSSTG. Enter `CHGNWSD` and specify the following information:

   ```
   NWSD (servername)
   IPLSRC (*NWSSTG)
   IPLSTMF (*NONE)
   IPLPARM ('/root=/dev/iseries/vda')
   ```

5. Vary on your NWSD. Complete the following steps to vary on your NWSD:
   a. Type `WRKCFGSTS *NWS`, and then press Enter.
   b. Type 1 next to the NWSD that you want to start, and then press Enter.
6. Locate a Linux distribution kernel that is compatible with an IBM System i model.

   Note: Even though you are upgrading from an IBM System i model, you need to install a POWER Linux kernel to ensure the compatibility with an IBM System i model.
7. Obtain access to an installation kernel through either of the following methods:
   a. Linux installation CDs or DVDs
   b. Network-based installation source
8. Mount the CD or DVD by entering the following command:

   ```
   mount /dev/iseries/vcda /mnt/cdrom
   ```

   Note: Enter in the appropriate name for your virtual device in the previous command.
9. Download the latest POWER Linux kernel to your partition's virtual disk.

   APOWER Linux kernel is required to ensure the compatibility with the IBM System i model. If you have upgraded your Linux server to SLES 9 SP1 or later, you are still running the IBM i kernel and must obtain the POWER Linux kernel. For SUSE Linux Enterprise Server 9, this kernel might be on the second installation CD or DVD under the /suse/ppc directory. The following example shows how to download this kernel. Enter the first command, and then the second command to retrieve the name of your Linux kernel. Enter the last command to copy the kernel.

   ```
   cd /media/
   find . -name "kernel*ppc64*"
   cp cdrom/suse/ppc/(name of your POWER Linux kernel) /root/
   ```

10. Shut down your Linux logical partition.
11. Save the entire server using option 21 of the GO SAVE command. For more information, see the GO SAVE topic. Specify the following options:
    a. Vary off the network server...*ALL
    b. Unmount file systems.....Y

    Note: Create7047-185 two copies of the backup media.
12. Using Linux backup tools, save any critical data contained within the virtual disk.

Installing fixes:

Complete this task, depending on the level of software and firmware that is installed.

To ensure a successful upgrade, your operating system, firmware, and Hardware Management Console (HMC) must be at the correct fix level. This includes the upgrade from a 9406-MMA or other 570 model to a 9117-MMA. To determine the correct levels, see IBM Prerequisites.

After you install or upgrade your software, apply the most current level of fixes on your operating system. For information about installing cumulative fix (PTF) packages for IBM i, see Installing fixes or Install fixes on systems with logical partitions.

Before the authorized service provider arrives, ensure that you have the latest level of firmware for your server and your Hardware Management Console.

To obtain HMC machine code updates, see Obtaining HMC machine code updates and upgrades.

To obtain the latest level of firmware, see Managed system updates.

Backing up the server:

Learn how to create a backup of the data on the server in the event a problem occurs during the hardware installation. This is essential if the authorized service provider needs to handle a problem when installing the hardware.

Save your IBM i partitions on a tape unit that is compatible with the tape unit on the target server. See the Performing a complete save using GO SAVE checklist for this procedure.

Backing up the server is vital for recovery if you experience errors when upgrading the server. To determine if your tape units are compatible, see the IBM Prerequisite Web site.

Note: Ensure that you retrieve your tape media from your source server and properly store it before you shut the server down.

Installing hardware:

This topic contains information on cabling your server, installing features, or replacing parts in your system or expansion unit.

Note: If you are installing a new server and have not created a customized setup checklist, see Creating a customized initial server setup checklist.

To find license information and notices for programs or code that is included with the service processor go to Programs provided under separate license agreements.

Completing final server preparations for upgrade:

Complete the final tasks before the authorized service provider arrives.

Set system values

On each logical partition of the server, record the setting for each of the following system values:
- QAUTOCFG = ___
- QIPLTYPE = ___
- QPFRADJ = ___

Then change the values of these settings to the following:
- QAUTOCFG = 0
- QIPLTYPE = 2

- QPFRADJ = 2

For information about working with system values, see Compare and update system values.

Providing checklists and server information:

Provide the documents that are needed to the authorized service provider to complete the hardware installation process.

Provide the authorized service provider a complete plan or diagram of the target server configuration. Also, ensure that the diagram includes cabling. The authorized service provider cannot proceed without these documents.

Ensure that you give the following printouts to the authorized service provider:
- Server configuration list printouts
- Disk configuration status printouts
- Parity set configuration and status printout
- Device descriptions printout (as described in Changing configuration objects)
- Controller descriptions printout (as described in Changing configuration objects)
- PTF level printout
- Description label locations printout
- System Planning Tool (SPT) output

Clearing LAN console data:

If you are using a LAN console to manage your source system and plan to use it to manage your target system after the upgrade, you need to clear the local console on a network data.

To clear this information, complete the following tasks.
1. At an IBM i command line, enter STRSST to start system service tools (SST) and sign on to SST.

   Note: To use SST, you need a valid service tools user ID. See Creating service tools device IDs on the server for more information.
2. From the SST main menu, select option 8 (Work With Service Tools User IDs And Devices).
3. Press F6 (Clear LAN adapter configuration on hard disk drive).
4. Press Enter.
5. Press F3 to exit.
6. Press F3 to exit.

Shutting down the server:

Shut down the server to make it available to the authorized service provider.

After you have given the authorized service provider all pertinent documents and information, and after the authorized service provider has instructed you to do so, shut down the server. After you have shut down the server, give the server to the authorized service provider for the hardware installation.

Performing hardware installation (authorized service provider):

Understand the basics of what the authorized service provider is doing during the hardware installation.

To upgrade the server, the authorized service provider performs the following tasks:
- Performs the server upgrade

- Verifies that all server components are functional
- Performs any contracted relocation or rearrangement services prior to returning the server to you
- Provides you with the following information, for use when you return the server to production:
  - System Planning Tool (SPT) output
  - Disk configuration printouts
  - Parity set configuration printout
  - Description label locations printout
  - Server configuration list printouts (from Hardware Service Manager)
  - List of hardware resources that were replaced or moved during the conversion (Resource Conversions form A880 or equivalent list)
  - Cable migration worksheet (form A805) for each logical partition
- Ensures that your hardware is reporting in
- Works to maintain bus numbering, preserve data, and identify changes that are necessary for the LPAR configuration data.
- Prepares any parts to be returned to IBM

Receiving the target server:

After the authorized service provider completes the hardware installation, confirm that the hardware configuration matches your plan.

When the authorized service provider is finished, you are presented with the new server and its physical configuration for review. Confirm that the hardware configuration matches your plan. After the authorized service provider gives the server back to you, you can finalize the server configuration.

Postinstallation tasks for upgrading your server

After you have accepted your new server from the authorized service provider, use these tasks to configure the new server for production. Save and test the server in this stage to complete your server upgrade.

Configure the target server after you have accepted the new server from the authorized service provider. This includes configuring your Hardware Management Console, migrating existing configurations, rearranging hardware as needed for logical partitions, and setting up and modifying your logical partitions. You must also migrate any applications and data. After you have completed the preceding items, test the server as detailed in your test plan.

These steps will assist when you return your server back into production.

Completing server configuration:

Complete the steps that are required when configuring your new server for production.

To finalize the server configuration, perform the following tasks:

1. Finish the setup of the Hardware Management Console (HMC) by using the Guided Setup wizard until it has been completely set up. For more information about using the Guided Setup, see Configuring the HMC using the fast path through the Guided Setup wizard.
2. If you are using an Operations Console over a LAN connection to manage your system, ensure that the console PC and the system meet the BOOTP requirements. For instructions, see Operations Console networking.
3. Use the validated output from the System Planning Tool to position the hardware in the correct location on the server.

4. Connect the server to a power source. Then, turn on the managed server firmware to partition standby. Complete this step from the HMC by right-clicking the server and selecting **Power on managed system**.

   Note: If you have a nonpartitioned system and are not using an HMC , IBM i requires a D-mode IPL to locate the load source. For more information, see Setting IPL type to D.
5. Install fixes on the HMC and server firmware. For instructions about how to retrieve and install fixes, see Obtaining HMC machine code updates and upgrades. For firmware fixes, see the following information, based on your situation.

System-management type	Task
Hardware Management Console (HMC) managed systems	Complete the steps in Managed System Updates, and return to this task.
Non-HMC managed systems	Complete the steps in one of the following topics, and return to this task: • Getting server firmware fixes through AIX or Linux without an HMC • Getting server firmware fixes through IBM i • Installing firmware using the USB port on the service processor on a system that is not managed by an HMC

6. Verify that HMC central processor complex (CPC) properties displays all migrated hardware.
7. From the HMC, reassign I/O hardware that was displaced when it was migrated from the source server unit enclosure, configure new hardware, and reassign any changed buses for each logical partition. Complete the following steps:
   a. Select the logical partition.
   b. In the Tasks area, select **Configuration**, and then select **Managed Profiles**.
   c. Select the managed profile you want to update.
   d. Select **Actions**, and then select **Edit**.
8. Set the logical partition profiles to B mode manual and hold for IBM i logical partitions. To complete this task, complete the following steps from the HMC:
   a. Select the logical partition.
   b. In the Tasks area, select **Operations**, and then select **Activate**.
   c. Select **Advanced**.
   d. Enter **manual** for the keylock position.
   e. Enter **B** for the IPL type.
9. Verify that the I/O hardware is reporting to the server and HMC. To do this, complete the following tasks:
   a. While performing a manual IPL, enter dedicated service tools (DST).
   b. Log on to DST using `QSECOFR`, and then select **Start a Service Tool**.
   c. Verify that your I/O hardware is reporting.
   d. Exit DST, and then continue the initial program load (IPL).
10. Sign on as the security officer using the QSECOFR user profile.
11. At the IPL Options display, enter the correct date and time. Verify that the following values are set as indicated:

```
Start print writers = N
Start to system to restricted state = Y
Define or change system at IPL = Y
```

12. At the Define or Change the System at IPL display, select option 3 (System value commands).
13. At the System Value Commands display, select option 3 (Work with system values).

14. Restore the system values to the settings that you recorded in “Completing final server preparations for upgrade” on page 51. Use the Work System Value commands to restore those values.
15. Display a list of devices. Use the Work with Configuration Status (WRKCFGSTS) command with parameter *DEV to display the devices. Note that the console is assigned to the QCTL controller. Vary off all devices except the display station that you are using for the console.
16. Ensure that all communication lines are varied off. Use the Work with Configuration Status (WRKCFGSTS) command with parameters *LIN *ALL to vary off these lines, after the IPL is completed.
17. Vary off all controllers. Use the Work with Configuration Status (WRKCFGSTS) command with parameters *CTL *ALL to vary off the controllers.
18. Find the label location information worksheet for the source server. The authorized service provider returned this to you. On this worksheet, the authorized service provider indicates controllers and devices that are in different locations than they were on the source server. To access the devices on your server, see Rename resources for each logical partition.
19. Perform an IPL as follows for each logical partition on your server:
    a. Make sure that each logical partition is set to IPL type B and Normal operating mode. To set each logical partition, right-click your partition in the Hardware Management Console and select **IPL Mode**. Change the IPL mode to type B.
    b. Shut down and perform an IPL on the logical partitions. For instructions about starting and shutting off your operating system, see “Restarting and shutting down IBM i in a logical partition” on page 56.

    Note: When powering off the service partition for System i and eServer i5 models, system reference code D6xx430B or D6xx430A might be displayed for an extended amount of time. The *"xx"* should increment periodically and is a normal part of processing where server firmware code is being updated. Allow the server to complete the processing, do not interrupt this process.
20. If necessary, Rename resources for each logical partition.
21. Optional: Start device parity on any nonconfigured disk units. To learn how to do this, see Starting device parity protection.
22. Perform disk unit management to configure and protect the disks on your server. To do this, you can use the Work with Disk Units option from the Dedicated Service Tools display. To learn how to do this, see Procedural sequences for configuring disks and protection.
23. Save each logical partition of the server using GO SAVE option 21. See Performing a complete save using GO SAVE checklist for more information.
24. Generate reports of the hardware and configuration objects (for each IBM i logical partition) by issuing the following commands:

```
DSPHDWRSC TYPE(*LWS) OUTPUT(*PRINT)
DSPHDWRSC TYPE(*STG) OUTPUT(*PRINT)
DSPHDWRSC TYPE(*CMN) OUTPUT(*PRINT)
DSPHDWRSC TYPE(*PRC) OUTPUT(*PRINT)
DSPPTF LICPGM(*ALL) OUTPUT(*PRINT)
```

25. If you are migrating a Red Hat Enterprise Linux version 3, see “Finalizing Red Hat Enterprise Linux version 3 migration” on page 56 to complete additional steps.
26. If you are migrating a SUSE Linux Enterprise Server 9, see “Finalizing SUSE Linux Enterprise Server 9 migration” on page 60 to complete additional steps.
27. Install other software that was part of the original solution plan. See Installing additional licensed programs for more information. You might have received additional software as a part of a package feature. For information about package features, see the Power hardware for System i Web site.
28. If you need to update the usage limit for each IBM i logical partition when upgrading the server, see Processor pricing on certain 6.1 models in the Memo to users.
29. Resume normal operations and verify that all applications run.

Restarting and shutting down IBM i in a logical partition:

At times you will need to perform an initial program load (IPL) or shut down an IBM i logical partition. For example, if you want to apply a delayed fix to IBM i, you must perform an IPL before IBM i can apply the fix.

The preferred method for restarting and shutting down IBM i logical partitions is through the IBM i command line. The Hardware Management Console (HMC) does not shut down the IBM i operating system before it shuts down the logical partition. Using the HMC to restart or shut down an IBM i logical partition can result in an abnormal IPL and the loss of data. However, you might need to use the HMC to change the operating mode or IPL type of the IBM i logical partition before you restart or shut down the IBM i logical partition using the IBM i command line.

It is important to remember that, when you perform an IPL of an IBM i logical partition, you are powering off only the logical partition and not the entire managed system. Other logical partitions on your managed system continue to run when you perform an IPL on the IBM i logical partition. However, when you shut down the last logical partition that is running on a managed system, then the managed system is set to power off automatically by default. If you want, you can set the managed system properties on the HMC so that the managed system remains powered on when you shut down the last running logical partition.

Removing profile data:

Explains how to remove the previously backed-up file on the HMC.

To remove stored profile data from the HMC hard disk drive, you must be a member of one of the following roles:

- super administrator
- service representative

To remove stored profile data, do the following:

1. In the Contents area, select the managed system.
2. From the menu, select **Selected > Profile Data > Remove**.
3. Select the profile data that you want to remove.
4. Click **OK**.

Finalizing Red Hat Enterprise Linux version 3 migration:

Complete these steps to finalize the Red Hat Enterprise Linux version 3 migration.

1. Create a virtual SCSI server and client environment. Create this environment by completing the following steps from your client partition (Linux partition):
   a. Right-click its partition profile in the HMC and select **Properties**.
   b. Select the **Virtual I/O** tab.
   c. If no client SCSI adapters are available, create a client SCSI adapter at the bottom of the tab. When creating a client SCSI adapter, ensure that you specify the following:
      - Select **Client** for the adapter type.
      - Ensure that it points to the correct server partition that is sharing its resources with your client partition under **Remote partition**.
      - Ensure that the **Remote partition virtual slot number** matches the slot number for the SCSI server on the partition that is sharing its resources.
   d. Select the **Power controlling** tab.

e. Select **Power controlling partitions to add**, and then select the partition that is sharing its resources.

From the server partition that is sharing its resources (IBM i logical partition):

a. Right-click its partition profile in the HMC, and then select **Properties**.

b. Select the **Virtual I/O** tab.

c. If no client SCSI adapters are available, create a client SCSI adapter at the bottom of the tab. When creating a client SCSI adapter, ensure that you specify the following:

- Select **Server** for the adapter type.
- Ensure that it points to the correct client partition that is obtaining resources from it under **Remote partition**.
- Ensure that the **Remote partition virtual slot number** matches the slot number for the SCSI client on the Linux partition.

2. Create and configure your network server description (NWSD) to use virtual SCSI. To create and configure your NWSD, complete the following steps:

a. Create your NWSD and link your migrated network server storage space (NWSSTG). To create and link this, complete the following steps:

1) At an IBM i command line on the partition that shares resources, type `CRTNWSD`, and then press F4 for prompts.

2) Specify the following information:

```
NWSD (Provide a name for the NWSD)
RSRCNAME (*AUTO)
TYPE(*GUEST)
ONLINE (*NO or *YES)
PARTITION ('Provide the name of your AIX or Linux logical partition')
CODEPAGE (437)
TCPPORTCFG (*NONE)
RSTDDEVRSC (for virtual CD and tape devices) (*NONE)
SYNCTIME (*TYPE)
IPLSRC (*STMF)
IPLSTMF (*QOPT)
IPLPARM (rescue)
PWRCTL (*YES)
```

Notes:

a) After the installation, if your root file system (/) is not installed on the first partition of the first disk, set a root parameter.

b) For the IPLSTMF, use the path as recommended by the distributor's installation document. One example is /QOPT/RED_HAT/images/netboot.img.

c) Enter in the partition name or the partition number, but not both.

3) Link the network server storage space by completing the following steps:

a) At an IBM i command line, type the command `ADDNWSSTGL`, and then press F4.

b) Enter the following parameter values on the Add Network Server Storage Link (ADDNWSSTGL) display, and then press Enter.

- In the Network server description field, specify the name of the network server description (NWSD).
- In the Dynamic storage link field, specify `*YES` to make the network server storage space dynamically available to the partition (that is, available without rebooting the Linux partition).
- In the Drive sequence number field, specify the link sequence position you want to use.

b. Locate the type 290B communication adapters, which are the virtual SCSI connections. Enter `WRKHDWRSC *CMN` and then enter a **7** (display resource detail). Match the adapter to the slot and enter the resource name for the adapter (for example, CTL07) in the resource name file of your NWSD.

3. Activate the Linux partition from the HMC if you have not already done so. To activate the partition, right-click your partition in the HMC and select **Activate**.
4. Open a terminal window for the Linux partition. To open a terminal window, right-click your Linux partition and select **Open Terminal Window**. Activating and shutting down your Linux partition are essential steps to prepare the partition before you vary on the NWSD.
5. Shut down your Linux partition from the HMC. To shut down the partition, right-click your partition in the HMC, and then select **Shut Down Partition**.
6. Put CD or DVD 1 into the optical drive of your IBM i partition that is sharing its resources.
7. Vary on your NWSD by completing the following steps:
   a. Type `WRKCFGSTS *NWS`, and then press Enter.
   b. Type `1` next to the NWSD that you want to start, and then press Enter.
8. If the vary on is successful, Linux will boot into the rescue system in your terminal window. Answer the prompts for the appropriate language.

   Note: Allow the rescue system to search for the installation.
9. Ensure that your root partition is mounted correctly. From the shell command prompt, enter the command:

   ```
   chroot/mnt/sysimage
   ```

   a. Change the format for System i virtual devices. Normally, you make these changes in the /etc/fstab file. Edit the fstab file by changing the names based on the following table.

Virtual device	Previous name	New name
Virtual disk	/dev/iseries/vdxx	/dev/sdxx
Virtual CD	/dev/iseries/vcdxx	/dev/srxx
Virtual tape	/dev/iseries/vtxx	/dev/stxx

   To edit the fstab file, complete the following steps:
   1) To find your file, enter `cd /`
   2) Enter `cd etc`
   3) Enter `vi fstab`
   4) Change the virtual devices based on the preceding table.

      Note: Because Red Hat uses disk labeling, change the swap partition's device path along with any other custom mount points you might have added to the fstab file. For example, the line `/dev/iseries/vda2 swap swap defaults 0 0` becomes `/dev/sda2 swap swap defaults 0 0`.
   5) Save and exit by pressing ESC, and then entering `:wq!`
10. Change the System i virtual console by editing the /etc/inittab file. To edit the inittab file, complete the following steps:
    a. To find the file, enter cd /
    b. Enter cd /etc
    c. Enter `vi inittab`
    d. Near the bottom of the file, find the following six lines:

       ```
       1:2345:respawn:/sbin/mingetty tty1
       2:2345:respawn:/sbin/mingetty tty2
       3:2345:respawn:/sbin/mingetty tty3
       4:2345:respawn:/sbin/mingetty tty4
       5:2345:respawn:/sbin/mingetty tty5
       6:2345:respawn:/sbin/mingetty tty6
       ```

    e. Comment out each of these lines by entering # at the beginning of each line.
    f. Add the following line before the six lines listed above:

```
co:2345:respawn:/sbin/agetty hvc0 38400 vt100
```

11. Change the symbolic link to the optical device by completing the following tasks:
    a. Enter `rm /dev/cdrom`
    b. Enter `ln –s /dev/scd0 /dev/cdrom`

    Note: Perform this step for other optical devices that you might have.
12. Install the new kernel by completing the following steps:
    a. Enter `vi /etc/modules.conf`
    b. Change the line `alias scsi_hostadapter viodasd` to `alias scsi_hostadapter ibmvscsic`
    c. If you are using virtual ethernet, change the line `alias eth0 veth` to `alias eth0 ibmveth`
    d. Enter `ln –s /sbin/ybin /usr/sbin/ybin`
    e. Create an /etc/yaboot.conf configuration file by entering `vi /etc/yaboot.conf`. The file should contains:

```
boot=/dev/sda1 (The location of your PReP boot partition)

partition=2 (The partition number for your root partition)
timeout=30
install=/usr/lib/yaboot/yaboot
delay=10
nonvram

image=/boot/vmlinux-2.4.21-18.EL (Kernel file based on your version of Red Hat.)
 Label=2.4.21-18.EL.img (Name for this kernel)
 read-only
 initrd=/boot/initrd-2.4.21-18.EL.img (Path to initrd file based on Red Hat version.)
 append="console=hvc0 root=LABEL=/
```

    f. Install the POWER Linux kernel RPM by entering:

```
rpm -ivh <kernel version number>.ppc64.rpm
```

    Notes:
    1) Ensure that you are in the directory in which you transferred your save file to. Add `/root/` before your kernel version number if the installation is not working correctly in your current directory.
    2) Ensure that the mkinitrd command or the kernel installation return no errors. If mkinitrd returns an error, check the changes that you made in the /etc/modules.conf file. You might see errors that can be ignored that are returned by the tar command if you do not have the time and date properly set on your partition.
13. Edit the /etc/securetty file and perform the following steps:
    a. To find the file, enter `cd /`
    b. Enter `cd /etc`
    c. Enter `vi securetty`
    d. On a new line at the end of the file, enter `hvc0`
    e. Save and exit the file by pressing ESC, and then entering `:wq!`
14. Enter `exit` twice to exit the rescue system. The system shuts down.
15. Complete the following steps to vary off the NWSD:
    a. Type `WRKCFGSTS *NWS`, and then press Enter.
    b. Type `2` next to the NWSD that you want to start, and then press Enter.
16. Reconfigure the NWSD to start the partition from NWSSTG. See the distributor's documentation for more details.

    Specify the following information:

```
NWSD (Provide a name for the NWSD)
TYPE(*GUEST)
ONLINE (*NO or *YES)
PARTITION ('Provide the name of your AIX or Linux logical partition')
CODEPAGE (437)
TCPPORTCFG (*NONE)
RSTDDEVRSC (for virtual CD and tape devices) (*NONE)
SYNCTIME (*TYPE)
IPLSRC (*NWSSTG)
IPLSTMF (*NONE)
IPLPARM (*NONE)
PWRCTL (*YES)
```

17. Complete the following steps to vary on the NWSD:
    a. Type `WRKCFGSTS *NWS`, and then press Enter.
    b. Type 1 next to the NWSD that you want to start, and then press Enter.
18. To enable power control of the Linux partition from IBM i and the HMC, download the DynamicRM and Diagela RPMs. The Linux support Web site contains all the directions necessary for you to get the applications installed.

Finalizing SUSE Linux Enterprise Server 9 migration:

To finalize your SUSE Linux Enterprise Server 9 migration, complete these steps.

1. Create a virtual SCSI server and client by completing the following steps from your client partition (Linux partition):
   a. Right-click its partition profile in the HMC, and then select **Properties**.
   b. Select the **Virtual I/O** tab.
   c. If no client SCSI adapters are available, create a client SCSI adapter at the bottom of the tab. When creating a client SCSI adapter, ensure that you specify the following:
      - Select **Client** for the adapter type.
      - Ensure that it points to the correct server partition that is sharing its resources with it under **Remote partition**.
      - Ensure that the **Remote partition virtual slot number** matches the slot number for the SCSI server on the partition that is sharing its resources.
   d. Select the **Power controlling** tab.
   e. Select **Power controlling partitions to add**, and then select the partition that is sharing its resources.

   From your server partition that is sharing its resources (IBM i logical partition):
   a. Right-click its partition profile in the HMC and select **Properties**.
   b. Select the **Virtual I/O** tab.
   c. If no client SCSI adapters are available, create a client SCSI adapter at the bottom of the tab. When creating a client SCSI adapter, ensure that you specify the following:
      - Select **Server** for the adapter type.
      - Ensure that it points to the correct client partition that is obtaining resources from it under **Remote partition**.
      - Ensure that the **Remote partition virtual slot number** matches the slot number for the SCSI client on the Linux partition.
2. Create and configure your network server description (NWSD) to use virtual SCSI by completing the following steps:
   a. Create your NWSD and link your migrated network server storage space (NWSSTG). by completing the following steps:
      1) At an IBM i command line on the partition that shares resources, type `CRTNWSD`, and then press F4 for prompts.

2) Specify the following information:

```
NWSD (Provide a name for the NWSD)
RSRCNAME (*AUTO)
TYPE(*GUEST)
ONLINE (*NO or *YES)
PARTITION ('Provide the name of your AIX or Linux logical partition')
CODEPAGE (437)
TCPPORTCFG (*NONE)
RSTDDEVRSC (for virtual CD and tape devices) (*NONE)
SYNCTIME (*TYPE)
IPLSRC (*STMF)
IPLSTMF (*QOPT)
IPLPARM (*NONE)
PWRCTL (*YES)
```

Notes:

a) After the installation, if the root file system (/) is not installed on the first partition of the first disk, you must set a root parameter.

b) For the IPLSTMF, use the path as recommended by the distributor's installation document. One example is /QOPT/SU90.001/install.

c) Enter in the partition name or the partition number, but not both.

3) Link the network server storage space by completing the following steps:

a) At an IBM i command line, type the command ADDNWSSTGL, and then press F4.

b) Enter the following parameter values on the Add Network Server Storage Link (ADDNWSSTGL) display, and then press Enter.

- In the Network server description field, specify the name of the network server description (NWSD).
- In the Dynamic storage link field, specify *YES to make the network server storage space dynamically available to the partition (that is, available without rebooting the Linux partition).
- In the Drive sequence number field, specify the link sequence position you want to use.

b. Locate the type 290B communication adapters, which are the virtual SCSI connections. Enter WRKHDWRSC *CMN and then enter a 7 (display resource detail). Match the adapter to the slot and enter the adapter's resource name (for example, CTL07) in the resource name file of your NWSD.

3. Activate your Linux partition from the HMC if you have not already done so. To activate your partition, right-click your partition in the HMC and select **Activate**.
4. Open a terminal window for your Linux partition. To open a terminal window, right-click your Linux partition and select **Open Terminal Window**. Activating and shutting down your Linux partition are essential steps to prepare your partition before you vary on your NWSD.
5. Shut down your Linux partition from the HMC. To shut down the partition, right-click your partition in the HMC and select **Shut Down Partition**.
6. Put CD or DVD 1 into the optical drive of the IBM i partition that is sharing its resources.
7. Vary on your NWSD by completing the following steps:
   a. Type WRKCFGSTS *NWS, and then press Enter.
   b. Type 1 next to the NWSD that you want to start, and then press Enter.
8. If the vary on is successful, choose the 'boot installed system' option from your terminal window.
9. Your boot fails because your /etc/fstab file is not correct. Enter your root password and complete the following steps to correct your fstab file:
   a. Remount your root partition by entering the command:

```
mount -t <your FS type> -o remount,rw <your root device> /
```

Note: An example of an FS type is reiserfs and an example of a root device is /dev/sda3.

b. Change the format for System i virtual devices. These changes normally will be in the /etc/fstab file. Edit the fstab file by changing the names based on the following table.

Virtual device	Previous name	New name
Virtual disk	/dev/iseries/vdxx	/dev/sdxx
Virtual CD	/dev/iseries/vcdxx	/dev/srxx
Virtual tape	/dev/iseries/vtxx	/dev/stxx

To edit the fstab file, complete the following steps:

1) To find your file, enter `cd /`
2) Enter `cd etc`
3) Enter `vi fstab`
4) Change your virtual devices based on the preceding table.
5) Save and exit by pressing ESC, and then entering `:wq!`

10. Type `Exit` to restart your Linux logical partition.

Note:

a. At this point, the Linux partition will return to the installation server where you can start the installed server.
b. Before starting, you might need to install modules for any hardware that is connected to your partition. See the distributor's documentation for more details.
c. When starting, you might see some network error messages. These errors can be ignored.

11. After your server has finished restarting, add `ibmvscsic` and remove 'viodasd' if present to the 'INITRD' line in the file /etc/sysconfig/kernel.
12. Edit the /etc/lilo.conf file by making the following changes:
    a. Change the boot line to 'boot=<the path to your PReP boot partition>'
    b. Change the root line to 'root=<the path to your root partition>'
    c. Add 'activate' under boot
    d. Delete any extra boot lines listed near the top of the file.

    Note: An example path to your PReP boot partition is /dev/sda1 and an example path to your root partition is ″/dev/sda3″.
13. Install your new kernel using the command:

    ```
    rpm -Uvh <kernel rpm>
    ```

    Note: Ensure that you are in the current directory that you transferred your save file to.
14. Shut down the Linux logical partition.
15. Reconfigure the NWSD to start the partition from NWSSTG. See the distributor's documentation for more details.

    Specify the following information:

    ```
    NWSD (Provide a name for the NWSD)
    TYPE(*GUEST)
    ONLINE (*NO or *YES)
    PARTITION ('Provide the name of your AIX or Linux logical partition')
    CODEPAGE (437)
    TCPPORTCFG (*NONE)
    RSTDDEVRSC (for virtual CD and tape devices) (*NONE)
    SYNCTIME (*TYPE)
    IPLSRC (*NWSSTG)
    IPLSTMF (*NONE)
    IPLPARM (*root)
    PWRCTL (*YES)
    ```

Note: Use the directory that your Linux kernel is in for the IPLPARM.

16. Start the Linux logical partition.
17. To enable power control of the Linux partition from IBM i and the HMC, download the DynamicRM and Diagela RPMs. The Linux support Web site contains all the directions necessary for you to get the applications installed.

Rename resources for each logical partition:

To ensure that your server is running smoothly, learn how to reset logical partition resource names to previous values.

To reset resource names for each logical partition, perform the following steps:

1. Access system service tools (SST) or dedicated service tools (DST) and sign on.
2. From the SST main menu, select option 1 (Start a Service Tool), and then press Enter.
3. Select option 7 (Hardware Service Manager (HSM)), and then press Enter.
4. From the main Hardware Service Manager (HSM) display in DST, select option 2 (Logical hardware resource), and then press Enter.
5. Select option 1 (System Bus Resources), and then press Enter.
6. For each new bus on this logical partition, perform the following steps on the Logical Hardware Resource on System Bus display:
   a. Fill in the following fields:
      - **System buses to work with** _____ (Enter the new bus number assigned to the logical partition.)
      - **Subset by** _____ (Enter the default value *ALL for the field.)
   b. Press Enter. Only the resources for the selected bus are now displayed.
   c. Type option 9 (Resources associated with IOP) next to an IOP.
   d. Determine the resource names to be changed from the CUII document **Resource conversions** (form A880) and the system configuration list printouts (from HSM) for each logical partition.
   e. Change the resource names by typing option 2 (Change detail) for each resource that requires renaming.
   f. Repeat step 6c through 6e for each IOP on the selected bus.
   g. Repeat all of step 6 for each new bus assigned to this logical partition.
7. Repeat step 6a through 6g for each logical partition on the server.
8. Return the system value settings to their original values (as recorded in "Changing the system value settings" on page 28) on your partitions by completing the following steps:
   a. Ensure that all logical partitions are in manual mode.
   b. Exit DST.
   c. Select option 1 (IPL) for your partition.
   d. At the IPL options display, set the Define or Change System at IPL field to **Yes**.
   e. On the Define or change system display, select option 3 (System Value Commands) and press Enter.
   f. On the System Value Commands display, select option 2 (Change System Value) and press Enter.
   g. On the Change System Value display, enter the following values:
      - **System Value** ___QIPLTYPE_____
      - **New Value** __'0'_____
   h. Press F3 twice to continue the IPL.
   i. After the IPL has completed, enter the Work with System Values (WRKSYSVAL) command on a command line to work with the system values QAUTOCFG (Autoconfigure devices) and QPFRADJ (Performance adjustment).

j. Restore the original setting for each of the following system values:
   - QAUTOCFG
   - QPFRADJ

Saving server logical partitions and all firmware:

Use this information to assist you when saving the data on the new server, any logical partitions that you have, and all firmware.

To save your server, perform the following steps:
1. Save the data on your system using the GO SAVE option 21 command. See GO SAVE: Option 21 (saving the entire system) for more information.
2. Back up your partition profile data. See "Backing up partition profile data" for more information.

Backing up partition profile data:

Describes how to back up profile data on the HMC.

This topic describes how to back up logical partition profile data.

To back up partition profile data, you must be a member of one of the following roles:
- super administrator
- service representative

To back up partition profile data, do the following:
1. In the Contents area, select the managed system.
2. From the menu, click **Selected > Profile Data > Backup**.
3. Type the name you want to use for this backup file.
4. Click **OK**.

Testing your server:

Complete this task to ensure that the new server is running as desired.

Test the server as you have previously planned. After you finish testing, track and report, to the appropriate people, any problems that arose. Develop a readiness report. After you complete a readiness report, finish returning your server to production.

Data migration

Perform a data migration only if you are moving to a new model with a different serial number for an operating system.

Related information

System i data migration

Performing a migration

Using the migration wizard

Appendix. Notices

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European Community contact:
IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Tele: 0049 (0)711 785 1176
Fax: 0049 (0)711 785 1283
E-mail: tjahn@de.ibm.com

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