



System i
Migration
Upgrading your iSeries server

Version 5





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Note

Before using this information and the product it supports, read the information in "Notices," on page 59 and the manual *IBM eServer Safety Information*, G229-9054.

Fifth Edition (February 2006)

This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

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Upgrading your iSeries server

Use this information to upgrade from one IBM® eServer iSeries® server, hardware feature, or i5/OS® release to another iSeries server, hardware feature or i5/OS release.

Attention

You can no longer order a hardware upgrade for an iSeries-to-iSeries feature or server. To upgrade from either an 8xx system or more current models, see the Upgrades topic in the IBM Systems Hardware Information Center.

In an upgrade, the target server retains the same serial number as the source server. If you are moving to a new iSeries server with a different serial number, use the Data migrations topic. If you are upgrading your server capacity by activating standby processors, see the Capacity on Demand topic.
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IBM Migration Services can help you in planning and upgrading to the latest servers. This service includes a planning session to discuss all known customer requirements. The outcome of this planning session is a final hardware and software configuration and an installation plan. The services specialist can also perform on-site services such as upgrading the server to the new release of i5/OS, migrating disk storage, upgrading partitioned servers, and consolidating servers. For more information, see the IBM Migration Services Web site.

Related information



Upgrades

Migration

Capacity on Demand



IBM Migration Services

Printable PDF

Use this to view and print a PDF of this information.



Important additional resources


To view or download the PDF version of this document, select Upgrading your iSeries server (about 327 KB or 50 pages). To create a list of tasks specific to your upgrade, go to the Customizing your upgrade tasks online interview. After you have completed the interview, you will be able to print customized PDF versions of your upgrade information.



The Upgrades topic references information found in other topics in the Information Center. Use the online version of the Upgrades topic to link to these other topics directly. However, if you use the printed or PDF version of the Upgrades topic, you should also print the following resources to use in conjunction with the Upgrades PDF.


Note: To print a topic, use the print function of your browser. You might have the option to right-click in this frame to print or to open the frame into a new window and then print.

Prepare to change the hardware feature:	
Title	Details
Installing fixes	Install the most current fixes on your system before changing a hardware feature.
Installing fixes on systems with logical partitions	Install the most current fixes on your partitioned system before changing a hardware feature.

Prepare to change the hardware feature:	
Title	Details
STRASPBAL (Start ASP Balance) command	Use the Disk migrate while active option of the Start ASP Balance command to move data from disk units that are no longer supported.
GO SAVE command	Back up your system so that you can restore the system if you experience errors when changing the hardware feature.
Printing the system configuration list	Document the current server configuration before you change a hardware feature.
Printing the system configuration for logical partitions	Document the current partitioned server configuration before you change a hardware feature.
Perform the hardware feature change:	
Installing System i™ features	Find information about installing the hardware feature.
Perform resource management:	
Backup and Recovery  (about 570 pages)	Use this information to do the following: <ul style="list-style-type: none"> • Perform disk unit management (use Chapter 18. "Procedures for configuring disks and disk protection"). • Remove unused disk units from the configuration (use Chapter 19. "Working with Auxiliary Storage Pools").
Creating a cluster	Use this information to configure clusters if the hardware feature change affected clusters.
Configuring independent disk pools	Use this information to configure independent disk pools if the hardware feature change affected independent disk pools.
Activate all standby processors:	
Capacity on Demand	Find information about the capability to dynamically activate one or more central processors of select servers.
Upgrade to OS/400® Version 5 Release 3:	
Cumulative PTF packages	Find information about cumulative fix (PTF) packages.
Info APAR II13365 on the Support for IBM System i  Web site	Find information about the latest resave and cumulative fix (PTF) package of i5/OS V5R3.
Installing fixes	Install the most current fixes on your system before you upgrade the operating system.
Installing fixes on systems with logical partitions	Install the most current fixes on your partitioned server before upgrading the operating system.
Installing the new release of the i5/OS operating system and related software	Use this information to install i5/OS V5R3 as a part of the upgrade.
Managing job logs	Access the job logs to help you identify and fix any problems that might occur with the newly installed software.
Messages	Find information about checking server messages.
Plan to convert the expansion unit:	
GO SAVE command	Back up your system so that you can restore the system if you experience errors when converting an expansion unit.

Prepare to change the hardware feature:	
Title	Details
Document and prepare the server:	
Printing the system configuration list	Document the current partitioned server configuration before you convert the expansion unit.
Powering down a system with logical partitions	Turn off the secondary partitions. Find information about powering down the partitioned server before converting the expansion unit.
Performing dynamic movement of resources	Use this information to move the buses that are being converted and the buses that are being recabled into the primary partition.
Resolve LPAR configuration error:	
Accessing service tools	Find information about accessing the service tools that you need to perform the expansion unit conversion procedures.
Reassign buses and IOPs:	
Performing dynamic movement of resources	Find information about assigning resources to a partition.
Rename resources for each partition:	
Comparing and updating system values	Find information about working with system values.
Prepare to upgrade the server:	
Installing fixes	Install the most current software fixes before upgrading your server.
Backup and Recovery  (about 570 pages)	Remove unused disk units from the configuration (use Chapter 19. "Working with Auxiliary Storage Pools").
Operations Console	Find information to help you to set up a console.
Collecting performance data	Use this information to gather performance data so that you can compare system performance before and after the upgrade.
GO SAVE command	Back up your server so that you can restore the server if you experience errors when upgrading to the new model.
Printing the system configuration list	Document the current server configuration before you upgrade the server.
IPL type	Record the IPL type before you upgrade the server.
Operating mode of an IPL	Record the IPL mode before you upgrade the server.
Comparing and updating system values	Find information about working with system values.
Prepare to upgrade the partitioned server:	
Installing fixes on systems with logical partitions	Install the most current software fixes before upgrading your system.
Performing dynamic movement of resources	Find information about assigning resources to a partition.
Dynamically moving processing power	Use this information to adjust the source server configuration to reflect the target server's processing resources.
Dynamically moving memory	Use this information to adjust the minimum memory values per partition on the source server.

Prepare to change the hardware feature:	
Title	Details
Backup and Recovery  (about 570 pages)	Remove unused disk units from the configuration (use Chapter 19. "Working with Auxiliary Storage Pools").
Operations Console	Find information to help you choose and set up a console.
Collecting system performance data	Use this information to gather performance data so that you can compare system performance before and after the upgrade.
GO SAVE command	Back up your system so that you can restore the system if you experience errors when upgrading to the new model.
Printing system configuration for logical partitions	Document the current partitioned server configuration before you upgrade the server.
IPL type	Record the IPL type before you upgrade the server.
Operating mode of an IPL	Record the IPL mode before you upgrade the server.
Comparing and updating system values	Find information about working with system values.
Prepare the server for production:	
Changing your system IPL from the control panel	Use this information to change the IPL type and operating mode before returning the server to production.
Backup and Recovery  (about 570 pages)	Use this information to: <ul style="list-style-type: none"> • Start device parity on any nonconfigured disk units (use Chapter 20. "Working with Device Parity Protection") • Perform disk unit management to configure and protect disk units (use Chapter 18. "Procedures for configuring disks and disk protection").
GO SAVE command	Back up the upgraded server.
Printing the system configuration list	Document the new server configuration when the upgrade is complete.
Installing additional licensed programs	Use this information to install additional software on the upgraded server.
Tuning performance.	Find information about enabling your server to make the best use of the system resources, and enabling workloads to run as efficiently as possible.
Prepare the partitioned server for production:	
Changing your system IPL from the control panel	Use this information to change the IPL type and operating mode before returning the server to production.
Restarting and powering down a system with logical partitions	Use this information to perform a normal IPL on the partitioned server.

Prepare to change the hardware feature:	
Title	Details
Backup and Recovery  (about 570 pages)	Use this information to: <ul style="list-style-type: none"> • Start device parity on any nonconfigured disk units (use Chapter 20. "Working with Device Parity Protection") • Perform disk unit management prior to configure and protect disk units (use Chapter 18. "Procedures for configuring disks and disk protection").
GO SAVE command	Back up the upgraded server.
Printing system configuration for logical partitions	Document the new partitioned server configuration when the upgrade is complete.
Installing additional licensed programs	Use this information to install additional software on the upgraded server.
Tuning performance.	Find information about allowing your server to make the best use of the system resources, and to run workloads as efficiently as possible.

Other information

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

- Manuals:

- Memo to Users (about 50 pages)


This document provides information about software and hardware changes that could potentially affect your system operations.

- Data migrations  (about 126 KB)

You can use this information if you want to migrate your data to a different server with a different serial number. This information assumes that you are moving data from one server to another. If you are installing a new version of i5/OS on the same server, it is not necessary to perform an explicit data migration. You can just install the new version of i5/OS.

- Installing, upgrading, or deleting i5/OS and related software  (about 220 pages)

You can use this information if you are upgrading your system with a new i5/OS release.

- Logical partitions 

If you are upgrading from or to a partitioned server, you can use this topic to choose from a number of PDFs that contain information about logical partitions.

- Backup and Recovery  (about 570 pages)

You can use this information to back up your system before performing upgrade tasks. This allows you to recover a working configuration should you experience problems during any part of the upgrade.

For additional information closely related to upgrades, see the Related information topic.


Saving PDF files

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

1. Right-click the PDF in your browser (right-click the link above).
2. Click **Save Target As** if you are using Internet Explorer. Click **Save Link As** if you are using Netscape Communicator.

3. Navigate to the directory in which you would like to save the PDF.
4. Click **Save**.

Downloading Adobe Acrobat Reader

You need Adobe Acrobat Reader to view or print these PDFs. You can download a copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep.html) .

Related concepts

“Activating all standby processors” on page 21

Capacity on Demand offers you the capability to dynamically activate one or more central processors of select servers. If you are upgrading from a server that is enabled for Capacity on Demand and you have standby processors that have not been activated, you must activate all of these processors before upgrading your software or server.

Related tasks

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Upgrading to i5/OS Version 5 Release 4” on page 21

To complete the software upgrade, perform these tasks.

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

iSeries upgrade concepts

An **upgrade** is the process of changing from one server, hardware feature, or software version to another server, hardware feature, or software version while retaining the serial number of the source server.

This topic describes the process for upgrading your server and includes some considerations for upgrading a partitioned server. The topic also defines which servers you can upgrade to the iSeries servers and the process of activating additional processors.

Related information

Capacity on Demand

Upgrade terminology

These terms are specific to iSeries upgrades.

If you are moving your data or software from your current iSeries server to a server with a different serial number, see Migration terminology.

Capacity on Demand

The capability to activate additional processors on select iSeries servers. These servers are shipped with a number of processors that are active in your server when it is shipped. These models also include processors that are not available for use until you activate them. These processors can be either temporarily or permanently activated.

hardware upgrade

An upgrade that refers to any of the following:

- A hardware change to a later level of the server hardware that maintains the server serial number
- The addition of hardware to the server
- An enhanced hardware function

licensed program (LP) upgrade

A specific type of software upgrade for an existing server that refers to either of the following:

- A change to a more recent release of the LP
- An enhancement in the LP function

MES (miscellaneous equipment specification)

Any server hardware change (addition, improvement, removal, or any combination of these). The server's serial number does not change. Specific types include the following:

- Customer-installable feature (CIF) MES
- Install-by-IBM (IBI) MES

model upgrade

A specific type of hardware MES that causes a change to the hardware model. A model upgrade can involve adding, removing, or changing features. The server's serial number does not change.

operating system upgrade

A specific type of software upgrade for an existing server that refers to either of the following:

- A change to a more recent release of the operating system
- An enhancement in operating system function

Processors on Demand (POD)

Standby processors on a server that can be activated for permanent or temporary use

software upgrade

Any software change to an existing server, which can include any of the following:

- A software change to a more recent release
- A software addition
- An enhancement in software function

system product division (SPD)

A bus architecture that allows I/O to communicate to the processor. SPD-I/O refers to devices that use the SPD bus architecture to communicate with the rest of the server.

source server

The existing system that is being upgraded with new hardware or a new level of software.

target server

In upgrades, the planned hardware configuration and software level that exists when the upgrade is completed.

upgrade

Any hardware or software change to a later release, or any hardware addition or software addition. Contrast upgrade with migration, where data is moved from one server to another server.

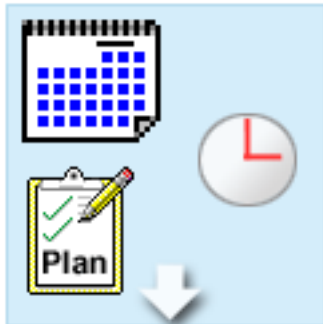
Related information

Migration terminology

Upgrade process

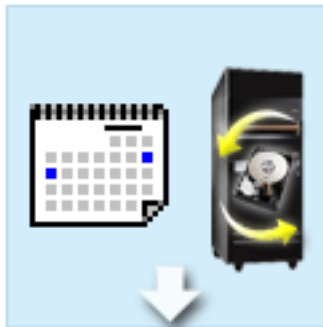
The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.

Your upgrade process is unique, and although you will perform each of these major tasks, how you perform them, in what order you perform them, and what they involve depends on your current environment and the environment that you want to achieve. Each of these major tasks is described here in more detail.



Plan your upgrade

The first task in every upgrade process is planning for your upgrade and ordering what you need. Planning is very important, and the time you invest in planning will make your upgrade as easy as it can be. Completing this task may require up to six weeks, depending on the complexity of your environment.



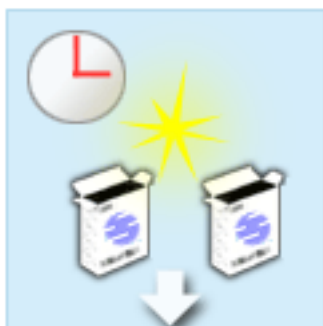
Replace hardware features

You may need to replace or eliminate hardware features that will not work in your target environment. You may need to replace or eliminate hardware features before you install i5/OS V5R4, before you upgrade to the new model, or both. For example, your SPD-attached hardware will not work on Models 810, 825, 870, or 890. This hardware must be replaced and new hardware features added as necessary before you upgrade the server. Replacing hardware features can typically be accomplished in a weekend.



Activate all standby processors

If you are upgrading from a server that is enabled for Capacity on Demand and you have standby processors that have not been activated, you must activate all of these processors before upgrading your software or server. Activating standby processors can be accomplished in minutes provided that you have the required POD activation code.



Install the new version of i5/OS

Another task in the upgrade process is installing the new version of the i5/OS operating system. You must install the latest resave and cumulative fix (PTF) package of i5/OS V5R4 on your server if you are upgrading to a new model. Installing i5/OS on a server that is not preloaded requires at least one hour. For information about the latest resave and cumulative fix (PTF) package, see Informational APAR II13365 on the Support for IBM System i Web site.



Convert expansion units

Some expansion units that will not work with the Model 810, 825, 870, or 890 can be converted to work with the new models. However, if you are upgrading a partitioned server, detailed planning before performing the expansion unit conversion is essential. Although this expansion unit conversion can usually be accomplished in a weekend, converting more than one expansion unit can increase the complexity of the conversion and therefore the time needed to complete this task.



Complete the server upgrade

The final task in the upgrade process is to upgrade the server. The actual upgrade is performed by a service representative, but preparing for the upgrade and returning the server to production are your responsibility. Upgrading from one server to another server requires up to three days.

Your unique upgrade may include some or all of the stages of a complete upgrade process. To accurately determine which upgrade activities you need to perform, be sure to use the information in the upgrade planning topic. Once your planning is complete, you can use the interview in the Upgrades topic to build an upgrade task list customized to your unique environment. The interview is only available in the online version of the Information Center.

Related concepts

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

“Activating all standby processors” on page 21

Capacity on Demand offers you the capability to dynamically activate one or more central processors of select servers. If you are upgrading from a server that is enabled for Capacity on Demand and you have standby processors that have not been activated, you must activate all of these processors before upgrading your software or server.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Upgrading to i5/OS Version 5 Release 4” on page 21

To complete the software upgrade, perform these tasks.

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

Related information

Capacity on Demand

Cumulative fix (PTF) package

 Support for IBM System i

Partitioned-server upgrades

Upgrading a partitioned server is more complex than upgrading a server without partitions. When upgrading a partitioned server, consider these points.

Upgrading multiple partitions takes longer

When you upgrade a partitioned server, you actually perform one upgrade for each partition. This upgrade process includes planning, preparing for, and performing the upgrade. Planning is most involved and may require up to six weeks, depending on the complexity of your environment. Installing the i5/OS release on a server that is not preloaded requires at least one hour. Upgrading from one server to another server requires up to three days for each partition. In addition, it is recommended that you stabilize the server after upgrading each partition, which means your total upgrade may take several weeks to complete.

Upgrading your server might change server resources

When you convert an expansion unit, two things happen. First, new buses with new bus numbers are created. You need to assign the new bus numbers to the correct partition before turning on the partition. Second, some new resource names are created. You need to reassign or rename the new resource names as appropriate. For information about converting from one expansion unit to another in a partitioned environment, see the *Converting expansion units in a partitioned environment* topic.

Upgrading your server might require additional resource management

If the target server has *fewer* processors than the source server, you must ensure that the target server can satisfy the minimum processor values per partition. You can redefine the partitions either before or after performing the upgrade. Either adjust the configuration on the source server to reflect the target server's processing resources or correct the configuration on the target server before starting the secondary partitions.

For example, if you are upgrading from a 4-way server to a 2-way server, you must define your partitions so they will work on the new 2-way server. You can do this before the upgrade, by defining the partitions so that only 2 of the 4 processors are used, or after the upgrade by defining the partitions to use only 2 instead of 4 processors.

If the target server has *more* processors than the current server, the configuration on the target server will indicate additional resources that must then be manually assigned to the appropriate partitions.

Similarly, you must ensure that target server can satisfy the minimum memory values per partition. The current memory values can be adjusted on the target server.

Running Linux® in a guest partition has unique requirements

If your solution includes Linux, be sure to use the Linux topic to help you identify the requirements for configuring Linux in an iSeries logical partition. If you are upgrading to a system with a POWER4™ processor and are running Linux in an iSeries logical partition, you must ensure that the version of Linux you are running supports the new hardware. See the *Linux on the System i platform* Web site for a list of Linux distributions that support the new hardware. If your current Linux distribution does not support the new hardware, you must upgrade your Linux distribution before upgrading to the new hardware.

Service representative responsibilities

In a server upgrade, the service representative upgrades all of the hardware on the partitioned server. However, the service representative does not reassign resources or upgrade software on individual partitions. IBM offers these and other services for a fee. For more information about these services, see the IBM Migration Services Web site.

Related concepts

“Upgrade planning”

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

Related tasks

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

Related information

Linux

 [Linux on the System i platform](#)

 [IBM Migration Services](#)

Logical partitions

Upgrade paths

In an upgrade, the target server retains the same serial number as the source server. Before you upgrade your server, consider this information regarding valid upgrade paths.

If you cannot upgrade your server to an 8xx model, you can migrate the data from your server to a new model. For information about migrating your data to a new server, see Migration.

You can upgrade the capacity of select servers without upgrading to a new server by activating one or more standby processors on that server. In fact, before you can upgrade your server, all of the processors on that server must be activated. For more information, see the Capacity on Demand topic.

For more information about valid upgrade paths, contact your marketing representative or business partner, or click the **Upgrade** link on the IBM FACT Web site.

Related information

Migration

Capacity on Demand

 [IBM FACT](#)

Upgrade planning

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

You might be upgrading from one server to another. Or, you might be upgrading your i5/OS release. If you have hardware features that will not work on the target server, you must plan to replace or convert those features either before or during the upgrade. There are additional considerations for upgrading a partitioned server.

You can view planning tasks or create a customized planning checklist using the information available in the Planning topic of the IBM Systems Hardware Information Center. To use this information, you need

to know specific information about your order, such as model release, features, and any additional solutions you have ordered. Return to this topic when you have completed the planning tasks in the checklist for your environment.

You can also review a number of scenarios that describes a current environment and a target environment, and then explains how to upgrade from that current environment to the target environment.

When you have completed the tasks in your custom planning checklist, your next step is to perform the upgrade.

Note: IBM offers its customers the option of running both the source and target servers side by side for a period of time. You can use that time to move your data, expansion units, and partitions to the target server. This option is available for purchase as RPQ 847156. For information regarding the terms and conditions of this request for price quotation (RPQ), contact your marketing representative.

If you choose, IBM Migration Services can help you in planning and upgrading to the latest iSeries models. This service includes a planning session to discuss customer requirements. For more information, see the IBM Migration Services Web site.

Related concepts

“Upgrade process” on page 7

The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.

“Partitioned-server upgrades” on page 10

Upgrading a partitioned server is more complex than upgrading a server without partitions. When upgrading a partitioned server, consider these points.

“Performing the upgrade on your iSeries” on page 13

Instructions are included for preparing for and performing all aspects of an upgrade such as adding or replacing a hardware feature, converting expansion units in a partitioned environment, upgrading the i5/OS release, and upgrading your server.

“Performing the hardware feature change” on page 18

To complete the hardware feature change, follow these guidelines.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Preparing to change the hardware feature” on page 15

Before you add or replace a hardware feature, follow these preparation procedures.

“Preparing to change the hardware feature for a partitioned server” on page 16

Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

Related information

 [Planning](#)

 [IBM Migration Services](#)

Performing the upgrade on your iSeries

Instructions are included for preparing for and performing all aspects of an upgrade such as adding or replacing a hardware feature, converting expansion units in a partitioned environment, upgrading the i5/OS release, and upgrading your server.

This topic includes instructions for both nonpartitioned and partitioned servers. You can see all of the information or use an interactive interview to create a customized list of tasks for your upgrade.

Once your upgrade planning is complete, you are ready to begin your upgrade. You can use an online interactive interview to create a customized task list for your upgrade. Or, if you prefer, you can view the entire list of upgrade tasks.

Related concepts

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

Performing all upgrade tasks

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

About this task

This topic contains **all** of the tasks for upgrading both a nonpartitioned and a partitioned server. To get a list of tasks **specific** to your upgrade, you can use the interactive interview to customize your upgrade tasks.

Results

In this topic you will also see the tasks for upgrading both a nonpartitioned server and a partitioned server.

To view or download the PDF version of this topic, select Upgrades (about 338 KB). To view or print other topics related to Upgrades, see Printable PDF.

Related concepts

“Activating all standby processors” on page 21

Capacity on Demand offers you the capability to dynamically activate one or more central processors of select servers. If you are upgrading from a server that is enabled for Capacity on Demand and you have standby processors that have not been activated, you must activate all of these processors before upgrading your software or server.

“Performing resource management” on page 19

After you change a hardware feature, you might need to perform these completion tasks.

“Performing resource management for a partitioned server” on page 20

After you change a hardware feature, you might need to perform these completion tasks.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Upgrading to i5/OS Version 5 Release 4” on page 21

To complete the software upgrade, perform these tasks.

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“Upgrading the server” on page 39
Follow these procedures to upgrade to a new iSeries server.

Related reference

“Printable PDF” on page 1
Use this to view and print a PDF of this information.

Related information



Adding or replacing a hardware feature

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

About this task

You might need to add more memory, or you might need to replace a tape drive that is not compatible with your target server. The unique requirements of the hardware feature will indicate when you change the hardware feature. Some examples are:

- If you have hardware features that will not work with i5/OS V5R4, you will need to replace these hardware features before upgrading the i5/OS release to V5R4.
- If you are adding a hardware feature that will work only with i5/OS V5R4, you will need to upgrade to V5R4 before adding the hardware features.
- If you have hardware features that will not work with the new server, you will need to replace these hardware features either before, or when you upgrade to the new server.

You may need to change more than one hardware feature. If you plan to upgrade both i5/OS and the server, ensure that all your hardware features are compatible with both i5/OS V5R4 and the new server. You should identify these hardware feature changes when you plan for your upgrade. For information about hardware features that you may need to replace, see the iSeries Upgrade Planning Web site.

Before you begin these tasks, be sure you have completed the necessary upgrade planning. Then, to change a hardware feature, perform the following tasks:

Related concepts

“Upgrade process” on page 7

The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.



IBM System i Support: Planning - Migration and upgrades

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

“Performing the hardware feature change” on page 18

To complete the hardware feature change, follow these guidelines.

“Performing resource management” on page 19

After you change a hardware feature, you might need to perform these completion tasks.

“Performing resource management for a partitioned server” on page 20

After you change a hardware feature, you might need to perform these completion tasks.

Related tasks

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

“Preparing to change the hardware feature” on page 15

Before you add or replace a hardware feature, follow these preparation procedures.

“Preparing to change the hardware feature for a partitioned server” on page 16
Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

“Adding or replacing a hardware feature” on page 14
You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

Related reference

“Printable PDF” on page 1
Use this to view and print a PDF of this information.

Preparing to change the hardware feature:

Before you add or replace a hardware feature, follow these preparation procedures.

About this task

Before you begin this procedure, be sure you have completed these prerequisite tasks:

- Obtain and review the preventive service planning (PSP) information.
The PSP document for V5R4 upgrades is SF98168. Review this document for the most current information about conditions that can affect your upgrade.
- Review the Memo to Users.
This document provides information about software and hardware changes that can potentially affect your system operations.
- View the Migration Web site.
This Web site includes information about the current migration and upgrade paths, a link to relevant Redbooks®, and information about converting from SPD to PCI-attached I/O.
- Review the *Performance Capabilities Reference* available on the Performance Management Web site.
This reference provides information about server performance that is useful for customers who plan to upgrade their servers and software.
- Plan the upgrade.

Then to prepare for adding or replacing the hardware feature, perform the following tasks:

Related concepts

“Upgrade planning” on page 11
Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

“Performing the hardware feature change” on page 18
To complete the hardware feature change, follow these guidelines.

Related tasks

“Adding or replacing a hardware feature” on page 14
You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Printing disk configuration status” on page 28
To print the disk configuration status of your server, complete these procedures.

“Printing parity set configuration and status” on page 29
To print the parity set configuration and status of the server, complete the following steps.

“Displaying, verifying, and printing hardware resource information” on page 30
To display, verify, and print the hardware resource information, complete these procedures.

Related information

Preventive service planning (PSP) information

Memo to Users

 Migration Web site

 Performance Management for IBM System i

Installing fixes

STRASPBAL (Start ASP Balance) command

Save the entire server using GO SAVE option 21

Printing the system configuration list

Preparing the server:

1. Install fixes (program temporary fixes or PTFs).
Use the information in this topic to put the fixes on the server before adding or replacing the hardware feature.
2. If you are replacing disk units, you can use the Disk migration while active option of the STRASPBAL (Start ASP Balance) command to reduce the downtime associated with removing a disk unit. This option allows you to move data from specified disk units while your server is running. For information, see the STRASPBAL (Start ASP Balance) command.
3. Save the entire server using GO SAVE option 21.
This is vital for recovery should you experience errors when changing the hardware feature.

Documenting the server:

About this task

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

1. If you are changing the disk configuration, follow these steps:
 - a. Print the disk configuration status of the server.
 - b. Print the parity set configuration and status of the server.
2. If you are changing a workstation, communications, or LAN, display, verify, and print the hardware resource information.

Use this information to record the hardware resource information so that you can perform the necessary resource management after the hardware feature change is complete.

3. Print the system configuration list.

This printout provides details of your current server configuration.

Results

Now that you have finished preparing for the hardware feature change, your next step is to perform the hardware feature change.

Preparing to change the hardware feature for a partitioned server:

Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

About this task

Before you begin this procedure, be sure you have completed these prerequisite tasks:

- Obtain and review the preventive service planning (PSP) information.

The PSP document for V5R4 upgrades is SF98168. Review this document for the most current information about conditions that can affect your upgrade.

- Review the Memo to Users.

This document provides information about software and hardware changes that can potentially affect your system operations.

- View the Migration Web site.

This Web site includes information about the current migration and upgrade paths, a link to relevant Redbooks, and information about converting from SPD to PCI-attached I/O.

- Review the *Performance Capabilities Reference* available on the Performance Management Web site.

This reference provides information about server performance that is useful for customers who plan to upgrade their servers and software.

- Plan the upgrade.

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

Related concepts

“Performing the hardware feature change” on page 18

To complete the hardware feature change, follow these guidelines.

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Printing disk configuration status” on page 28

To print the disk configuration status of your server, complete these procedures.

“Printing parity set configuration and status” on page 29

To print the parity set configuration and status of the server, complete the following steps.

“Displaying, verifying, and printing hardware resource information” on page 30

To display, verify, and print the hardware resource information, complete these procedures.

Related reference

STRASPBAL (Start ASP Balance) command

Related information

Preventive service planning (PSP) information

Memo to Users

 Migration Web site

 Performance Management for IBM System i

Installing fixes

Save each partition of the server using GO SAVE option 21

 Storage Solutions

Printing system configuration for logical partitions

Preparing the server:

1. Install fixes (program temporary fixes or PTFs) on all partitions of the server.
Use the information in this topic to put the fixes on the server before adding or replacing the hardware feature.
2. If you are replacing disk units, you can use the Disk migration while active option of the STRASPBAL (Start ASP Balance) command to reduce the downtime associated with removing a disk unit. This option allows you to move data from specified disk units while your server is running.
For more information, see the STRASPBAL (Start ASP Balance) command.

3. Save each partition of the server using GO SAVE option 21 on a tape drive that is compatible with the tape drive on the target server.

This is vital for recovery should you experience errors when upgrading the server. To determine if your tape drives are compatible, see the Storage Solutions.

Documenting the server:

About this task

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

1. If you are changing the disk configuration, follow these steps:
 - a. Print the disk configuration status from each partition of the server. Be sure to record the serial number of the load-source disk unit for each partition.
 - b. Print the parity set configuration and status of the server from each partition of the server. Be sure to mark each printout for the partition it represents.

You can use this information to analyze and plan for disk unit configuration and protection. It can also be used to correct any problems that occur during the upgrade.

2. If you are changing a workstation, communications, or LAN, display, verify, and print the hardware resource information for each partition.

Use this information to record the hardware resource information so that you can perform the necessary resource management after the hardware feature change is complete.

3. Print the system configuration for logical partitions.

This gives you specific partition information such as system resources, processors, main memory, and any unique system values associated with partitions.

Results

Now that you have finished preparing for the hardware feature change, your next procedure is to perform the hardware feature change.

Performing the hardware feature change:

To complete the hardware feature change, follow these guidelines.

Before you begin

Before you begin these tasks, be sure you have performed the necessary upgrade planning and performed the preparation procedure that is appropriate for your environment:

- For nonpartitioned servers, see Preparing to change the hardware feature.
- For partitioned servers, see Preparing to change the hardware feature for a partitioned server.

Install the hardware feature

For any single upgrade order, some of the hardware features may be installed by the service representative and others may be your responsibility to install. Discuss this in advance with the IBM service representative so that you know which, if any, responsibilities are yours, and which are the responsibility of the service representative. If you are responsible for installing this hardware feature, follow the instructions that come with the feature or use the procedure for this feature in Install iSeries features.

Next step

When the hardware feature installation is complete, the next step is to perform the resource management procedure that is appropriate for your environment:

- For nonpartitioned servers, see Performing resource management.
- For partitioned servers, see Performing resource management for a partitioned server.

Related concepts

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

“Performing resource management”

After you change a hardware feature, you might need to perform these completion tasks.

“Performing resource management for a partitioned server” on page 20

After you change a hardware feature, you might need to perform these completion tasks.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Preparing to change the hardware feature” on page 15

Before you add or replace a hardware feature, follow these preparation procedures.

“Preparing to change the hardware feature for a partitioned server” on page 16

Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

Related information

Install iSeries features

Performing resource management:

After you change a hardware feature, you might need to perform these completion tasks.

- If you have changed the disk configuration, perform disk unit management to first protect and then configure 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, see Chapter 18. “Procedures for Configuring Disks and Disk Protection” of the Backup and Recovery Guide.

Note: Once you have completed your disk configuration, you can remove any unused disk units from the configuration using dedicated service tools (DST). For information, see “How to Remove a Disk unit from an Auxiliary Storage Pool” in Chapter 19. “Working with Auxiliary Storage Pools” of the Backup and Recovery Guide. Disk units that you remove from the configuration should also be physically removed to prevent them from being added back into the configuration during an IPL.

- Update workstations, communications, removable media, LAN, WAN, or integrated server hardware resource names as necessary. For information about changing hardware resource names, see Fixing hardware resource names after an upgrade.
- If you have changed your console type, perform the IPL and resource management tasks in Preparing the server for production.
- If you have made changes to enable clusters or independent disk pools, use the information in Creating a cluster and Configuring independent disk pools.

Related concepts

“Performing the hardware feature change” on page 18

To complete the hardware feature change, follow these guidelines.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Fixing hardware resource names after an upgrade” on page 51

Following an upgrade or migration, you might have hardware resources that are in different locations than they were on your source server.

“Preparing the server for production” on page 48

To finish the resource management and prepare your new server for production, perform these procedures.

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

Related information



Backup and Recovery Guide

Creating a cluster

Configuring independent disk pools

Performing resource management for a partitioned server:

After you change a hardware feature, you might need to perform these completion tasks.

- Assign resources to partitions as necessary.

For information about assigning resources to a partition, see Perform dynamic movement of resources.

- If you have changed the disk configuration, perform disk unit management to first protect and then configure 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, see Chapter 18. “Procedures for Configuring Disks and Disk Protection” of the Backup and Recovery Guide.

Note: Once you have completed your disk configuration, you can remove any unused disk units from the configuration using dedicated service tools (DST). For information, see “How to Remove a Disk unit from an Auxiliary Storage Pool” in Chapter 19. “Working with Auxiliary Storage Pools” of the Backup and Recovery Guide.

Disk units that you remove from the configuration should also be physically removed to prevent them from being added back into the configuration during an IPL.

- Update workstations, communications, removable media, LAN, WAN, or integrated server hardware resource names as necessary.

For information about changing hardware resource names, see the Fixing hardware resource names after an upgrade topic.

- If you have changed your console type, perform the IPL and resource management tasks in Preparing the partitioned server for production.
- If you have made changes to enable clusters or independent disk pools, use the information in Creating a cluster and Configure independent disk pools.

Related concepts

“Performing the hardware feature change” on page 18

To complete the hardware feature change, follow these guidelines.

Related tasks

“Adding or replacing a hardware feature” on page 14

You might need to change one or more hardware features to satisfy capacity and compatibility requirements before you upgrade to V5R4 and to the new server.

“Fixing hardware resource names after an upgrade” on page 51

Following an upgrade or migration, you might have hardware resources that are in different locations than they were on your source server.

“Preparing the partitioned server for production” on page 53

To finish the resource management and prepare your new server for production, perform these procedures.

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

Related information

Performing dynamic movement of resources



Backup and Recovery Guide

Creating a cluster

Configuring independent disk pools

Activating all standby processors

Capacity on Demand offers you the capability to dynamically activate one or more central processors of select servers. If you are upgrading from a server that is enabled for Capacity on Demand and you have standby processors that have not been activated, you must activate all of these processors before upgrading your software or server.

Note: If you are performing certain processor upgrades with the Model 890, you may not need to activate all processors before upgrading. For more information, see the Capacity on demand Web site.

Related concepts

“Upgrade process” on page 7

The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.

Related tasks

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

Related reference

“Printable PDF” on page 1

Use this to view and print a PDF of this information.

Related information

Capacity on Demand



Capacity on Demand Web site

Upgrading to i5/OS Version 5 Release 4

To complete the software upgrade, perform these tasks.

About this task

1. Installing, upgrading, or deleting i5/OS and related software.
Use the information in this topic to install the i5/OS release, part of the i5/OS release, or licensed programs.
2. To verify that all your applications are running properly, use the system with the new software release until you feel comfortable with the new production environment. For example, many customers use the system for 2 weeks or longer.
3. Check job logs and server messages.

Use this information to help you identify and fix any problems that might occur with the newly installed software.

Related concepts

“Upgrade process” on page 7

The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.

Related tasks

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

Related reference

“Printable PDF” on page 1

Use this to view and print a PDF of this information.

Related information

Installing, upgrading, or deleting i5/OS and related software

Check job logs

Messages

Converting expansion units for a partitioned server

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

About this task

Recommendations:

- It is highly recommended that all of the logical partition (LPAR) configuration actions be performed by an LPAR-trained services person.
- If the expansion units are converted as a part of a server upgrade, it is recommended that the expansion unit conversions be performed and the server environment stabilized before performing a server upgrade.

This topic contains information for converting the following expansion units:

- Feature conversion 5065 to 5074
- Feature conversion 5066 to 5079
- Feature conversion 5075 to 5074

To convert these expansion units, perform the following tasks:

1. Plan to convert the expansion unit.
2. Prepare to convert the expansion unit.
3. Perform the expansion unit conversion.
4. Perform resource management.

Results

Attention: There are potentially billable activities for existing features associated with converting multiple expansion units. Only the contents of an expansion unit being converted may be moved to the new expansion unit by IBM service representatives. 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 may present a good opportunity to consolidate the content 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.

LPAR Planning and Implementation services will provide a planning session to discuss customer requirements and provide a final hardware and software configuration and implementation plan. The LPAR services 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, business partner, or see Services A-Z.

Related concepts

“Upgrade process” on page 7

The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.

“Partitioned-server upgrades” on page 10

Upgrading a partitioned server is more complex than upgrading a server without partitions. When upgrading a partitioned server, consider these points.

“Planning to convert the expansion unit”

An expansion unit conversion causes changes to the server resources.

“Performing the expansion unit conversion” on page 33

Converting the expansion unit is performed by the IBM service representative. After the expansion unit conversion is complete, the server should be powered on at dedicated service tools (DST).

Related tasks

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

“Preparing to convert the expansion unit” on page 25

To prepare for the expansion unit conversion, perform these tasks.

“Performing resource management” on page 34

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

Related reference

“Printable PDF” on page 1

Use this to view and print a PDF of this information.

Related information

 [Services A-Z](#)

Planning to convert the expansion unit:

An expansion unit conversion causes changes to the server resources.

- The converted expansion units report in to the system with new bus numbers. The new bus numbers are assigned to the primary partition by default and need to be assigned to the correct partition before the partition can be powered on.

Note: A 5065 expansion unit contains only one bus. After the conversion, the 5074 expansion unit has two buses reporting in to the system. A 5066 expansion unit contains two buses. After the conversion, four buses report in to the system. The combined function I/O processors in the 5065 or 5066 expansion units are replaced with new combined function I/O processors and these are positioned as planned with the LPAR Validation Tool (LVT). Significant I/O rearrangement may occur with this conversion.

- Nonconverted 5065 and older SPD-based expansion units may have bus numbering changes if the converted expansion unit is removed. Read the SPD cabling information to determine if any SPD-based expansion units remaining in the configuration after the conversion obtain a new bus number.
- Some new resource names may be created. The new resource names need to be reassigned or renamed as appropriate.

Before you begin: Before you start the expansion unit conversion or resource name planning, you need to have the following required items:

- **Valid output from the Logical Partition Validation Tool (LVT).**

Use the LVT tool with your IBM marketing representative or business partner during the order process. Print the LVT output before beginning the expansion unit conversion procedures.

- **A current backup of the data on all partitions of the server.**

Use the GO SAVE option 21 procedure to back up all partitions of the server. This is vital for recovery should you experience errors during the expansion unit conversion.

The expansion unit conversion procedures help determine the partition to which the new bus numbers should be assigned and how to handle resource names. These procedures assume a familiarity with the iSeries server and a high level of experience with logical partitions.

Related concepts

“Troubleshooting an iSeries upgrade” on page 56

This topic contains information related to some upgrade-specific problems that could occur when upgrading an iSeries server.

Related tasks

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“SPD cabling”

During a model upgrade or an expansion unit conversion of a partitioned system (moving a partition from one server to another or changing an expansion unit from a 5065 to a 5074), an SPD bus might be removed.

“Preparing to convert the expansion unit” on page 25

To prepare for the expansion unit conversion, perform these tasks.

Related information

 LVT tool

GO SAVE option 21

SPD cabling:

During a model upgrade or an expansion unit conversion of a partitioned system (moving a partition from one server to another or changing an expansion unit from a 5065 to a 5074), an SPD bus might be removed.

About this task

This has serious consequences to the LPAR configuration. SPD buses are cabled in pairs and are numbered by the system on each IPL. This numbering is done by determining to which port they are

connected from the bus adapter. When there are two buses connected to a bus adapter, the numbering of the buses is determined as follows. A cable runs from the top port of the bus adapter to the top port of the SPD bus; this is the first bus number. A cable then runs from the bottom port of the SPD bus to the top port of the second SPD bus; this is the next bus number. Finally, a cable runs back to the system to complete the loop.

Due to the way these buses are cabled, they always have the same bus number on each IPL. However, if the first bus is removed, the second bus takes the bus number of the first bus. If both of these buses are in the same partition, required LPAR configuration actions are minimal. If the hardware in these buses is spread between different partitions or if there is a required resource, for instance load source or console, LPAR configuration actions must be taken before the partitions are powered on. The following step should be performed any time an SPD bus is removed from a partitioned system:

Determine if the bus to be removed will result in another bus being renumbered.

1. Use the following table to determine if the bus that will be removed is cabled to the top or bottom port of the bus expansion adapter.
2. If the bus being removed is cabled to the **bottom** port of the bus expansion adapter, then no buses are being recabled due to the conversion of this tower.
3. If the bus being removed is cabled to the **top** port of the bus expansion adapter, then determine if there is also a bus attached to the bottom port (it will be one number higher than the bus being removed). If there is a bus attached to the bottom port of the bus expansion adapter, then there will be a bus recabled during this expansion unit conversion.

Results

iSeries server model	Bus numbers	
	Top port	Bottom port
720/620	Odd	Even
730/740/SX0	Even	Odd
820/830/840*	Odd	Even

* Only applies to buses 5 through 22.

Example: If bus 10 is to be removed on an iSeries Model 730 server, then bus 10 is cabled to the top port ("even" buses on an iSeries Model 730 server are attached to the top port) so the system must be checked to determine whether a bus 11 is present.

Related concepts

"Planning to convert the expansion unit" on page 23

An expansion unit conversion causes changes to the server resources.

Preparing to convert the expansion unit:

To prepare for the expansion unit conversion, perform these tasks.

About this task

Before you begin these preparation tasks, be sure you have completed the necessary planning. Then perform the following tasks.

1. Resequence SPCN addressing.
2. Document and prepare the server.

Results

Now that you have finished preparing for the expansion unit conversion, your next step is to perform the expansion unit conversion.

Related concepts

“Planning to convert the expansion unit” on page 23

An expansion unit conversion causes changes to the server resources.

“Performing the expansion unit conversion” on page 33

Converting the expansion unit is performed by the IBM service representative. After the expansion unit conversion is complete, the server should be powered on at dedicated service tools (DST).

Related tasks

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“Resequencing SPCN addressing”

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

“Documenting and preparing the server”

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

Resequencing SPCN addressing:

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

About this task

To resequence the SPCN addressing, complete the following steps:

1. At an i5/OS command line, enter STRSST to start system service tools (SST) on the primary partition and sign on to SST.

Note: To use system service tools, you need a valid service tools user ID.

2. From the SST main menu, select option 5 (Work with system partitions), and press Enter. The Work with System Partitions display appears.
3. Select option 2 (Work with partition status). The Work with Partition Status display appears.
4. Type 10 next to the Primary Partition (0) and press Enter to put the partition in manual mode.
5. From the Work with Partition Status display, type 33 next to the primary partition (0) and press Enter to resequence the SPCN addressing. Correct completion of the operation results in the status message Reorder SPCN addressing was successful.

Related tasks

“Preparing to convert the expansion unit” on page 25

To prepare for the expansion unit conversion, perform these tasks.

Related information

Service tools user IDs

Documenting and preparing the server:

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

About this task

Make sure that these documents represent the most recent configuration of the server and that no hardware changes have been made since printing the documentation. If changes are made before the service representative arrives, print the server and LPAR partition documentation again.

Complete steps 1 through 5 for the primary partition first; then repeat steps 1 through 3 and 5 for each secondary partition. Step 4 should be completed for the primary partition only.

1. Print the disk configuration status from each partition of the server.
2. Print the parity set configuration and status from each partition of the server. Be sure to mark each printout for the partition it represents.
3. Display, verify, and print the hardware resource information for each partition of the server.
4. On the **primary partition**, assign all unassigned I/O resources to active partitions.
5. Remove failed or nonreporting resources using the Hardware Service Manager (HSM) on the partition.
6. Repeat steps 1, 2, 3, and 5 above for each secondary partition that is configured.
7. Clear nonreporting logical partitioning resources on the primary partition.
8. Print the system configuration for logical partitions.
9. Use the printouts from step 8 to determine if there are load-source resources in a bus that will be changing bus numbers, for instance when a bus is converted or recabled. For each partition with a load source drive in a converted or recabled bus, count **one** drive if the partition has RAID or unprotected drives. Count **two** drives if the partition has mirrored drives. Record the total number of load source drives. Also 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: P3 has a load source redundant array of independent disks (RAID) of 1. P4 has a load source mirrored of 2. The value of P3 added to the value of P4 equals 3. Record 3 as the total number of load source drives.
10. 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 service representative and is required for the expansion unit conversion.
11. For each secondary partition, record the IPL System Action and then set the IPL System Action to HOLD as follows:
 - a. From the primary partition, enter STRSST to start system service tools (SST) and sign on to SST.

Note: To use system service tools, you need a valid service tools user ID.
 - b. From the SST main menu, select option 5 (Work with system partitions), and press **Enter**. The Work with System Partitions display appears.
 - c. Use the Work with System Partitions display to select each secondary partition. For each secondary partition, record the IPL System Action and then set the IPL System Action to HOLD.
12. Change the system value settings on both the primary partition and each secondary partition.
13. Use the appropriate procedure for your environment to turn off the secondary partitions.
14. The bus numbers change if buses are recabled. If you are running i5/OS V5R4 on all partitions, use the partition configuration displays to move the buses that are being converted and the buses that are being recabled into the primary partition. For more information about moving buses, see the Perform dynamic movement of resources topic.
15. Use the appropriate procedure for your environment to turn off the primary partition.
16. Prepare the following documents for the service representative:
 - LPAR Validation Tool output.

Note: This document should not change as a result of the conversion.

- Disk configuration printouts for each partition.

Note: These documents should not change as a result of the conversion.

- Parity set configuration printout for each partition.

Note: These documents should not change as a result of the conversion.

- Description label locations printout for each partition.

Note: These documents should not change as a result of the conversion.

- System configuration list printouts (from HSM) for each partition.
- Partition information printouts from the primary partition.

Related tasks

“Preparing to convert the expansion unit” on page 25

To prepare for the expansion unit conversion, perform these tasks.

“Printing disk configuration status”

To print the disk configuration status of your server, complete these procedures.

“Printing parity set configuration and status” on page 29

To print the parity set configuration and status of the server, complete the following steps.

“Displaying, verifying, and printing hardware resource information” on page 30

To display, verify, and print the hardware resource information, complete these procedures.

“Assigning all unassigned I/O resources” on page 31

Any hardware resources that were intended to be unassigned should be assigned to a partition. These resources can then be unassigned as required after the expansion unit conversion.

“Removing failed or nonreporting resources” on page 31

Any hardware resources that were intended to be unassigned should be assigned to a logical partition. These resources can then be unassigned as required after the expansion unit conversion.

“Clearing nonreporting logical partitioning resources” on page 32

To clear nonreporting logical partitioning resources on the primary partition, follow these procedures for the applicable OS/400 or i5/OS release.

“Changing the system value settings” on page 33

To change the i5/OS system value settings on both the primary partition and each secondary partition, complete these procedures.

“Cleaning up the server” on page 36

After the new bus numbers have been reassigned to the correct partitions and all partitions turn on successfully in manual mode, follow these procedures to remove the old I/O resources from the logical partition I/O resources.

Related information

Printing system configuration for logical partitions

Service tools user IDs

Performing dynamic movement of resources

Powering down a system with logical partitions

Printing disk configuration status:

To print the disk configuration status of your server, complete these procedures.

About this task

Ensure that you have security officer authority before you do this task.

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

Note: To use system service tools, you need a valid service tools user ID.

2. Select option 3 (Work with Disk Units) and press Enter. The Work with Disk Units display appears.
3. Select option 1 (Display Disk Configuration) and press Enter. The Display Disk Configuration display appears.
4. Select option 1 (Display Disk Configuration Status) and 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. Ensure that all the disk configuration information is printed.
7. Record the serial number of the load-source disk unit (unit number 1) for each partition on the server.

Results

Note: If the server is partitioned, repeat steps 1 on page 28 through 7 for each partition. Be sure to mark each printout for the partition it represents.

Related tasks

“Preparing to change the hardware feature” on page 15

Before you add or replace a hardware feature, follow these preparation procedures.

“Preparing to change the hardware feature for a partitioned server” on page 16

Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

Related information

Service tools user IDs

Printing parity set configuration and status:

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.

Note: To use system service tools, you need a valid service tools user ID.

2. Select option 3 (Work with Disk Units) and press Enter. The Work with Disk Units display appears.
3. Select option 1 (Display Disk Configuration) and press Enter. The Display Disk Configuration display appears.
4. Select option 1 (Display Disk Configuration Status) and press Enter.
5. At the Display Disk Configuration Status display, select option 5 (Display Device Parity Status) and press **Enter**. The Display Device Parity Status display appears.
6. Print the parity set configuration by pressing the Print Screen key on your keyboard.
7. Page down and repeat until you have printed the entire parity set configuration.

Results

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

Related tasks

“Preparing to change the hardware feature” on page 15

Before you add or replace a hardware feature, follow these preparation procedures.

“Preparing to change the hardware feature for a partitioned server” on page 16

Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

Related information

Service tools user IDs

Displaying, verifying, and printing hardware resource information:

To display, verify, and print the hardware resource information, complete these procedures.

About this task

1. At the i5/OS command line, enter the Work with Hardware Products (WRKHDWPRD) command.
2. Select option 4 (Display Description Label Locations) and 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. This information must be given to the service representative.
6. At the i5/OS command line, enter the following commands:

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

This creates a report of your hardware and configuration objects.

Results

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

Related tasks

“Preparing to change the hardware feature” on page 15

Before you add or replace a hardware feature, follow these preparation procedures.

“Preparing to change the hardware feature for a partitioned server” on page 16

Before you add or replace a hardware feature for a partitioned server, follow these preparation procedures.

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43
To prepare for the server upgrade, perform these tasks.

Assigning all unassigned I/O resources:

Any hardware resources that were intended to be unassigned should be assigned to a partition. These resources can then be unassigned as required after the expansion unit conversion.

About this task

To assign unassigned I/O resources, complete the following steps on the **primary partition**:

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

Note: To use system service tools, you need a valid service tools user ID.

2. Select option 5 (Work with System Partitions) and press Enter. The Work with System Partitions display appears.
3. Select option 3 (Work with Partition Configuration) and press Enter. The Work with Partition Configuration display appears.
4. Select option 3 (Add I/O resource) and press Enter to add any unassigned resources to an active partition. It is recommended that you add these unassigned resources to the primary partition. **Wait for the resources to become active before continuing to the next step.**

Note: For information about how to assign resources to partitions, see the Perform dynamic movement of resources topic. Buses with the ownership type of shared are always available and thus appear on this display. No action is needed for these shared buses.

Related tasks

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

Related information

Service tools user IDs

Performing dynamic movement of resources

Removing failed or nonreporting resources:

Any hardware resources that were intended to be unassigned should be assigned to a logical partition. These resources can then be unassigned as required after the expansion unit conversion.

About this task

To assign unassigned I/O resources, complete the following steps on the **primary partition**:

Attention: Any hardware problems must be resolved before continuing. I/O resources that are nonreporting because they are switched between partitions and currently are not owned by the partition you are working in should not be removed by you at this time. Careful planning is required when switched I/O is involved.

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

Note: To use system service tools, you need a valid service tools user ID.

2. Select option 1 (Start a Service Tool).
3. Select option 7 (Hardware Service Manager (HSM)).

4. Select option 4 (Failed and nonreporting hardware resources), and press Enter. Identify and record all resources that are switched between partitions. You may need to reassign or rename these resources following the expansion unit conversion.
5. Type option 4 (remove) to remove any failed or nonreporting resources. If you receive a message saying No failed or nonreporting logical hardware resources found, skip to step 6.
6. Confirm removal of failed or nonreporting resources.
7. Press F6 (Print) to print the system configuration list.

Related tasks

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

Related information

Service tools user IDs

Clearing nonreporting logical partitioning resources:

To clear nonreporting logical partitioning resources on the primary partition, follow these procedures for the applicable OS/400 or i5/OS release.

Related tasks

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

Related information

Service tools user IDs

Accessing service tools

Clearing nonreporting logical partitioning resources: V5R1, V5R2, and V5R3:

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

Note: To use system service tools, you need a valid service tools user ID.

2. From SST select option 5 (Work with System Partitions) and press Enter. The Work with System Partitions display appears.
3. From the primary partition’s console select option 4 (Recover configuration data).
4. Select option 4 (Clear nonreporting logical partitioning resources).
5. To confirm the deletion of nonreporting resources, press F10 (Clear nonreporting resources).

Clearing nonreporting logical partitioning resources: V4R5:

1. Start dedicated service tools (DST) on the primary partition with all secondary partitions active. Sign on to DST.

Note: To use dedicated service tools, you need a valid service tools user ID. A manual IPL is not required to start DST. The following steps can be performed by accessing DST by using function 21 from the system control panel.

2. From DST select option 11 (Work with System Partitions) and press Enter. The Work with System Partitions display appears.
3. From the primary partition’s console select option 4 (Recover configuration data).

4. Select option 4 (Clear nonreporting logical partitioning resources).
5. To confirm the deletion of nonreporting resources, press F10 (Clear nonreporting resources).
6. Select option 2 (Update).
7. Exit DST.

Changing the system value settings:

To change the i5/OS system value settings on both the primary partition and each secondary partition, complete these procedures.

About this task

1. From a command line, type the Work with System Values (WRKSYSVAL) command for the system values QAUTOCFG, QIPLTYPE, and QPFRADJ to work with the settings.
2. Record the value for each system value setting. These values need to be restored later.
 - ____ QAUTOCFG
 - ____ QIPLTYPE
 - ____ QPFRADJ
3. Change the settings to the following values:
 - QAUTOCFG = 0
 - QIPLTYPE = 2
 - QPFRADJ = 2

Results

For information about how to work with system values, see the i5/OS system values topic.

Related tasks

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

“Renaming resources for each partition” on page 37

Use the following instructions to set partition resource names to previous values.

Related information

i5/OS system values

Performing the expansion unit conversion:

Converting the expansion unit is performed by the IBM service representative. After the expansion unit conversion is complete, the server should be powered on at dedicated service tools (DST).

You should receive the following documents back from the service representative, including the original printouts from the beginning of this procedure that have been updated by the IBM service representative and two new documents:

- LPAR Validation Tool output.

Note: This output should not have changed as a result of the conversion.

- Disk configuration printouts for each partition.
- Parity set configuration printout for each partition.
- Description label locations printout for each partition.
- System configuration list printouts (from hardware service manager) for each partition.
- Partition information printouts from the primary partition.

- List of hardware resources that were replaced or moved during the conversion (Resource Conversions form A880 or equivalent list), provided by the IBM service representative.
- Cable migration worksheet (form A805), provided by the IBM service representative.

Use this information to assign the new bus numbers to the correct partition and to reassign or rename resources, as appropriate. Now that you have the new expansion unit, your next step is to perform resource management.

Related tasks

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“Preparing to convert the expansion unit” on page 25

To prepare for the expansion unit conversion, perform these tasks.

“Performing resource management”

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

Performing resource management:

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

About this task

To complete this resource management, perform these tasks.

Related concepts

“Performing the expansion unit conversion” on page 33

Converting the expansion unit is performed by the IBM service representative. After the expansion unit conversion is complete, the server should be powered on at dedicated service tools (DST).

Related tasks

“Converting expansion units for a partitioned server” on page 22

When performing any of the following expansion unit conversions in a partitioned environment, it is essential that detailed planning is performed before starting the expansion unit conversion.

“Resolving LPAR configuration error”

Perform the following steps if a logical partition configuration error was detected when powering on the system after the expansion unit conversion.

“Reassigning buses and IOPs” on page 35

To reassign the new buses and IOPs to the required partition or partitions, follow these procedures to correct the partition configuration errors.

“Cleaning up the server” on page 36

After the new bus numbers have been reassigned to the correct partitions and all partitions turn on successfully in manual mode, follow these procedures to remove the old I/O resources from the logical partition I/O resources.

“Renaming resources for each partition” on page 37

Use the following instructions to set partition resource names to previous values.

Resolving LPAR configuration error:

Perform the following steps if a logical partition configuration error was detected when powering on the system after the expansion unit conversion.

About this task

Attention: Partition configuration errors may exist at this point in the conversion process.

All converted buses will be owned with shared status by the primary partition. All recabled buses should also be owned by the primary partition. If it was determined in step 9 on page 27 that secondary partition load-source disk units would be in converted or recabled expansion units, the LPAR configuration errors should occur. If this is not the case, skip to the Reassign buses and IOPs section of this document.

Verify that the configuration error detail identifies a disk unit that is the load source for a secondary partition that owned the converted expansion unit.

1. Access dedicated service tools (DST) and sign on.
2. From the DST main menu, select option 11 (Work with system partitions) and press Enter.
3. Select option 4 (Recovery configuration data) and press Enter.
4. Select option 3 (Clear non-configured disk unit configuration data) and press Enter. This display should show the number of load-source disk units determined in step 9 on page 27. If the load-source disk units are not all reporting in, clear the ones that do report, wait a few minutes, and then re-enter this display. If the number of disk units expected does not show up after 10 minutes, you may have hardware or software problems. Call IBM software support for assistance.
5. Type option 1 (Select unit to clear) next to the displayed disk unit or units and press Enter.
6. Press Enter again to confirm.
7. Return to the DST main menu.

Related tasks

“Performing resource management” on page 34

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

“Reassigning buses and IOPs”

To reassign the new buses and IOPs to the required partition or partitions, follow these procedures to correct the partition configuration errors.

Related information

Access dedicated service tools (DST)

Reassigning buses and IOPs:

To reassign the new buses and IOPs to the required partition or partitions, follow these procedures to correct the partition configuration errors.

About this task

Note: For information about assigning resources to a partition, see Performing dynamic movement of resources.

1. Identify the new bus numbers for the converted or recabled expansion units. Use dedicated service tools (DST) and the Hardware Service Manager (HSM) to view the partitions' current resources and determine the new or reassigned bus numbers.
 - a. Access DST and sign on.
 - b. From the DST main menu, select option 7 (Start a Service Tool), and press Enter.
 - c. Select option 4 (Hardware Service Manager (HSM)), and press Enter.
 - d. Select option 1 (Packaging Hardware Resources), and press Enter.
 - e. Find the frame ID (from the front of the converted or recabled expansion unit) and enter option 8 (Associated logical resources) beside it and press Enter.

- f. For converted expansion units, two buses are identified on the resulting display. For recabled expansion units, there will be one bus identified on the resulting display. Enter option 5 (Display detail) beside each one and press Enter to identify and record the bus numbers for these expansion units.
 - g. Exit the HSM and return to the main DST menu.
 - h. From DST, select option 11 (Work with System Partitions), and press Enter. The Work with System Partitions display appears.
 - i. Select option 1 (Display Partition Information), and press Enter. The Display Partition Information display appears.
 - j. Select option 5 (Display System I/O Resources) to view the current partition resources. This view shows old buses and IOPs as well as the new and changed buses and IOPs. Compare the IOA serial numbers on the bus identified in step 1e on page 35 above to the original printout to ensure that they match.
2. Correct the bus ownership for the new buses. The old buses are still assigned to the same partitions. **Do not take any action on the old I/O resources at this time.** From the Work with Partitions display, type option 3 (Work with partition configuration), and press Enter.
 - If the new buses are to be owned by a secondary partition, type option 4 (Remove I/O resources) and remove them and all of the I/O on them from the primary partition.
 - If the buses are to be owned by the primary partition, type option 5 (Change bus ownership type) next to the primary partition to correct the bus ownership of the new buses.
 3. Assign the new buses and IOPs to the correct partition using the output from the LPAR Validation Tool (LVT) and the System I/O resources printouts. Add the bus and I/O resources to the required partition or partitions on the Work with Partition Configuration display using option 3 (Add I/O resources).
 4. If a partition's load source, console, alternate IPL or Electronic Customer Support resources are installed in a expansion unit that was converted or recabled, reselect those resources for each partition affected by the expansion unit conversion. Use the Work with Partition Configuration display (options 6, 7, 8, and 9) as needed to assign the critical partition resources.
 5. Turn on the secondary partitions in B manual mode.
 6. **Stop. Do not proceed until all secondary partitions turn on successfully.** If a secondary partition does not turn on successfully, a previous step may not have been performed properly. Verify that all hardware is assigned to the correct partition or partitions. If hardware has not been assigned to the correct partition or partitions, repeat steps 1 on page 35 through 5. If a secondary partition still does not turn on successfully, contact IBM software support for assistance.
 7. At this time all hardware should be operational and assigned to the required partitions. Verify all system hardware reports in correctly at this time.

Related tasks

"Performing resource management" on page 34

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

"Resolving LPAR configuration error" on page 34

Perform the following steps if a logical partition configuration error was detected when powering on the system after the expansion unit conversion.

Accessing service tools

Related information

Performing dynamic movement of resources

Cleaning up the server:

After the new bus numbers have been reassigned to the correct partitions and all partitions turn on successfully in manual mode, follow these procedures to remove the old I/O resources from the logical partition I/O resources.

1. Clear nonreporting logical partitioning resources by completing the following steps:
 - a. Access dedicated service tools (DST) on the primary partition, with all secondary partitions active. Sign on to DST.
 - b. From the DST main menu, select option 11 (Work with system partitions), and press Enter.
 - c. From the primary partition's console, select option 4 (Recover configuration data).
 - d. Select option 4 (Clear nonreporting logical partitioning resources), and press Enter.
 - e. To confirm the deletion of nonreporting resources, press F10 (Clear nonreporting resources).
2. **Stop.** At this point the old bus numbers and IOPs should not be seen in the LPAR Configuration I/O Resource displays. If old bus numbers are still displayed, then repeat the previous step after verifying the following:
 - All i5/OS partitions are powered on and at DST or higher. This means that all partitions must be powered on and the IPL has stopped at a dedicated service tools (DST) or at the i5/OS sign-on display.
 - No partitions are displaying any system reference codes (SRCs) (a partition reporting a Failure/Attention SRC causes the clear nonreporting logical partitioning resources to fail).

If old bus numbers or IOPs cannot be removed by following the procedure in step 1, contact IBM software support for assistance.

3. Change the secondary partitions from HOLD to the original state, changed in step 11 on page 27 of the Document and prepare the server procedure. **Do not restart the server at this time.**
4. On the primary partition and each secondary partition, remove nonreporting hardware entries using the Hardware Service Manager (HSM). Identify and record hardware resources that are switched among partitions. If you have hardware resources on the converted expansion unit that are switched among partitions, you may need to reassign or rename these resources on each partition that uses these resources.
 - a. From the DST main menu, select option 7 (Start a Service Tool), and press Enter.
 - b. Select option 4 (Hardware Service Manager (HSM)) and press Enter.
 - c. Select option 4 (Failed and nonreporting hardware resources) and press Enter.
 - d. Use option 4 (Remove) to remove any failed or nonreporting resources. If you receive a message saying, No failed or nonreporting logical hardware resources found, skip to step 4f.

Attention: Any hardware problems must be resolved before continuing. I/O resources that are nonreporting because they are switched between partitions and currently are not owned by the partition you are working in should not be removed at this time. Careful planning is required when switched I/O is involved.
 - e. Confirm removal of failed or nonreporting resources.
 - f. If printing capabilities are available to you in DST, press F6 (Print) to print the system configuration list.

Related tasks

“Performing resource management” on page 34

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

“Documenting and preparing the server” on page 26

Ensure that the currently installed server and logical partitions are fully documented before the service representative arrives to perform the expansion unit conversion.

Related information

Access dedicated service tools (DST)

Renaming resources for each partition:

Use the following instructions to set partition resource names to previous values.

About this task

For each partition, perform the following steps:

1. Access dedicated service tools (DST) and sign on.
2. From the DST main menu, select option 7 (Start a Service Tool), and press Enter.
3. Select option 4 (Hardware Service Manager (HSM)) and press Enter.
4. From the main Hardware Service Manager (HSM) display in DST, select option 2 (Logical hardware resource), and press Enter.
5. Select option 1 (System Bus Resources) and press Enter.
6. For each new bus on this partition, perform the following steps on the Logical Hardware Resource on System Bus display:
 - a. Fill in the following fields:
 - **System bus(es) to work with** _____ (Enter the new bus number assigned to the partition.)
 - **In the 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 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 partition.
7. Repeat step 6a through 6g above for each partition on the server.
8. Return the system value settings to their original values (as recorded on the Change the system value settings topic) on both the primary partition and each secondary partition by completing the following steps:
 - a. Ensure all partitions are in manual mode.
 - b. Exit DST on the primary partition and on each secondary partition.
 - c. Select option 1 (IPL) for the primary partition and each secondary 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. Once the IPL has completed, enter the Work With System Values (WRKSYSVAL) command on a command line for the system values QAUTOCFG and QPFRADJ to work with the settings.
 - j. Restore the original setting for each of the following system values:
 - QAUTOCFG
 - QPFRADJ

Related tasks

“Performing resource management” on page 34

Use the information from your preparation and from the service representative to resolve the LPAR configuration error if it appears and to reassign or rename resources, as appropriate.

“Changing the system value settings” on page 33

To change the i5/OS system value settings on both the primary partition and each secondary partition, complete these procedures.

Related information

Access dedicated service tools (DST)

Comparing and updating system values

Upgrading the server

Follow these procedures to upgrade to a new iSeries server.

About this task

Before you begin these tasks, be sure you have planned for your upgrade and upgraded to i5/OS Version 5 Release 4.

Note: You must install the latest resave and cumulative fix (PTF) package of i5/OS V5R4 before you upgrade to a new server. If you are upgrading a partitioned server, you must install this resave and cumulative fix (PTF) package of i5/OS V5R4 on all partitions of the source server. For more information, see Info APAR II13365 on the Support for IBM System i Web site.

Related concepts

“Upgrade process” on page 7

The upgrade process includes planning, ordering, preparing for, and performing the upgrade. Use this information to learn the flow and timing for upgrading a nonpartitioned server.

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

Related tasks

“Performing all upgrade tasks” on page 13

Use this topic, which is a complete list of all the possible upgrade tasks, if you are using a CD-ROM or PDF version of the information. This list of tasks is not customized for your upgrade.

“Upgrading to i5/OS Version 5 Release 4” on page 21

To complete the software upgrade, perform these tasks.

“Preparing to upgrade the server”

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

“Completing the server upgrade” on page 47

The service representative performs some of the completion tasks of a server upgrade. You perform other tasks along with the service representative, and some of the tasks are performed only by you. IBM offers fee-based services in which the service representative can perform additional upgrade tasks.

Related reference

“Printable PDF” on page 1

Use this to view and print a PDF of this information.

Related information

 [Support for IBM System i](#)

Preparing to upgrade the server:

To prepare for an iSeries server upgrade, perform these procedures.

About this task

Before you begin these tasks, be sure you have completed the necessary upgrade planning.

Related concepts

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

Related tasks

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

“Upgrading to i5/OS Version 5 Release 4” on page 21

To complete the software upgrade, perform these tasks.

“Removing failed or nonreporting resources” on page 31

Any hardware resources that were intended to be unassigned should be assigned to a logical partition. These resources can then be unassigned as required after the expansion unit conversion.

“Printing disk configuration status” on page 28

To print the disk configuration status of your server, complete these procedures.

“Printing parity set configuration and status” on page 29

To print the parity set configuration and status of the server, complete the following steps.

“Displaying, verifying, and printing hardware resource information” on page 30

To display, verify, and print the hardware resource information, complete these procedures.

“Completing the server upgrade” on page 47

The service representative performs some of the completion tasks of a server upgrade. You perform other tasks along with the service representative, and some of the tasks are performed only by you. IBM offers fee-based services in which the service representative can perform additional upgrade tasks.

“Preparing the server for production” on page 48

To finish the resource management and prepare your new server for production, perform these procedures.

Related information

Preventive service planning (PSP) information

Memo to Users

 [Migration Web site](#)

 [Performance Management for IBM System i](#)

 [Support for IBM System i](#)

Installing fixes

 [Backup and Recovery Guide](#)

Console

Collecting performance data

Save the entire server using GO SAVE option 21

 [Storage Solutions](#)

Printing the system configuration list

IPL type

Operating mode of an IPL

Local controllers and devices (QAUTOCFG)

Type of restart (QIPLTYPE)

Automatically adjust memory pools and activity levels (QPFRADJ)

i5/OS system values

Preparing for the upgrade:

1. Obtain and review the preventive service planning (PSP) information.
The PSP document for V5R4 upgrades is SF98168. Review this document for the most current information about conditions that can affect your upgrade.
2. Review the Memo to Users.
This document provides information about software and hardware changes that can potentially affect your system operations.
3. View the Migration Web site.
This Web site includes information about the current migration and upgrade paths, a link to relevant Redbooks, and information about converting from SPD to PCI-attached I/O.
4. Review the *Performance Capabilities Reference* available on the Performance Management Web site.
This reference provides information about server performance that is useful for customers who plan to upgrade their servers and software.
5. When your order arrives, contact the service representative and schedule the server upgrade.

Preparing the source server:

About this task

Ensure that you have installed latest resave and cumulative fix (PTF) package of i5/OS V5R4 on the source server.

For more information, see Info APAR II13365 on the Support for IBM System i Web site. For information about installing i5/OS, see Upgrading to i5/OS Version 5 Release 4.

1. Install fixes
Use the information in this topic to put fixes on the source server before upgrading to the target server.
2. Verify that all applications are running.
3. Perform device configuration cleanup as follows:
 - a. Use the Work with Line Descriptions command (WRKLIND) to view and delete unused lines and line descriptions.
 - b. Use the Work with Device Descriptions command (WRKDEVVD) 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.

4. Remove failed or nonreporting resources that are no longer associated with existing hardware.
5. Logically remove any configured disk units that will be removed during the upgrade, such as disk units in SPD-based expansion units that will be removed (not converted) during the server upgrade. For information, see "How to Remove a Disk Unit from an Auxiliary Storage Pool" in Chapter 19. "Working with Auxiliary Storage Pools" of the Backup and Recovery Guide.

Note: Disk units that are not physically removed may be inadvertently added back into the configuration during an IPL.

6. Ensure that your console is set up and ready.
7. Use the Retrieve Configuration Source (RTVCFGSRC) command to build a source file member for the specified existing line, controller, and device descriptions. You will need this configuration source if any configuration objects must be manually changed or re-created.
8. Collect performance data.

You can use the performance data you collect from the source server as a base with which to compare the target server's performance after the upgrade is complete.

9. Save the entire server using GO SAVE option 21 on a tape drive that is compatible with the tape drive on the target server.

This is vital for recovery should you experience errors when upgrading the server.

To determine if your tape drives are compatible, see the Storage Solutions Web site.

Documenting the source server:

About this task

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

1. Use one of the following to document the source server:
 - 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:
 - a. On the command line, enter WRKORDINF.
 - b. On the next display, type option 1 (Send to IBM) next to QMA *nnnnn* where *nnnnn* is the serial number of the server and press Enter.
 - If you cannot use the Work with Order Information Files (WRKORDINF) command, do the following:
 - a. On the command line, enter DSPSFWRSC *PRINT.
 - b. Print the spooled file.
2. Print the disk configuration status of the server.
3. Print the parity set configuration and status of the server. You can use this information to analyze and plan for disk unit configuration and protection. It can also be used to correct any problems that occur during the upgrade.
4. Display, verify, and print the hardware resource information. Use the information in this topic to record the hardware resource information so that you can perform the necessary resource management after the upgrade is complete.
5. Print the system configuration list. This printout provides details of your current server configuration.
6. Print the status of all fixes (program temporary fixes or PTFs) 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.
7. Record the IPL type and mode of the source server so you can return the server to this mode after the upgrade is complete.
 - IPL type = _____
 - IPL mode = _____

Preparing for the service representative:

1. Record the user IDs and passwords for the service representative to use.
2. Gather the following printouts for the service representative:
 - System configuration list printouts
 - Disk configuration status printouts
 - Parity set configuration and status printout
 - Device descriptions printout
 - Controller descriptions printout
 - PTF level printout
 - Description label locations printout

3. Record the setting for each of the following system values:

- Local controllers and devices (QAUTOCFG) = ___
- Type of restart (QIPLTYPE) = ___
- Automatically adjust memory pools and activity levels (QPFRADJ) = ___

Then change the values of these settings to the following:

- Local controllers and devices (QAUTOCFG) = Do not automatically configure local controllers and devices (0)
- Type of restart (QIPLTYPE) = Attended, console in debug mode (2)
- Automatically adjust memory pools and activity levels (QPFRADJ) = Periodically after restart (2)

For information about working with i5/OS system values, see System values.

4. Turn the server over to the service representative. This includes giving the service representative the printouts, the user IDs, and passwords that you have prepared.

Results

Now that you have finished preparing for the server upgrade, the next step is for the service representative to complete the server upgrade.

Preparing to upgrade the partitioned server:

To prepare for the server upgrade, perform these tasks.

About this task

Be sure that you have completed the necessary upgrade planning before you begin these tasks.

Related concepts

“Upgrade planning” on page 11

Every upgrade is unique. Adequate planning for an upgrade will help minimize your downtime and make performing the upgrade easier.

Related tasks

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

“Completing the server upgrade” on page 47

The service representative performs some of the completion tasks of a server upgrade. You perform other tasks along with the service representative, and some of the tasks are performed only by you. IBM offers fee-based services in which the service representative can perform additional upgrade tasks.

“Upgrading to i5/OS Version 5 Release 4” on page 21

To complete the software upgrade, perform these tasks.

Installing fixes

“Removing failed or nonreporting resources” on page 31

Any hardware resources that were intended to be unassigned should be assigned to a logical partition. These resources can then be unassigned as required after the expansion unit conversion.

“Printing disk configuration status” on page 28

To print the disk configuration status of your server, complete these procedures.

“Printing parity set configuration and status” on page 29

To print the parity set configuration and status of the server, complete the following steps.

“Displaying, verifying, and printing hardware resource information” on page 30

To display, verify, and print the hardware resource information, complete these procedures.

“Preparing the partitioned server for production” on page 53

To finish the resource management and prepare your new server for production, perform these procedures.

Related information

Preventive service planning (PSP) information

Memo to Users

 Migration Web site

 Performance Management for IBM System i

Cumulative fix (PTF) package

 Support for IBM System i

Performing dynamic movement of resources

Dynamic movement of processing power


Dynamic movement of memory

 Backup and Recovery Guide

Console

Gather performance data

Save each partition of the server using GO SAVE option 21

 Storage Solutions

Printing system configuration for logical partitions

IPL type

Operating mode of an IPL

Service tools user IDs

Local controllers and devices (QAUTOCFG)

Type of restart (QIPLTYPE)

Automatically adjust memory pools and activity levels (QPFRADJ)

i5/OS system values

Preparing for the upgrade:

1. Obtain and review the preventive service planning (PSP) information.
The PSP document for V5R4 upgrades is SF98168. Review this document for the most current information about conditions that can affect your upgrade.
2. Review the Memo to Users.
This document provides information about software and hardware changes that can potentially affect your system operations.
3. View the Migration Web site.
This Web site includes information about the current migration and upgrade paths, a link to relevant Redbooks, and information about converting from SPD to PCI-attached I/O.
4. Review the *Performance Capabilities Reference* available on the Performance Management Web site.
This reference provides information about server performance that is useful for customers who plan to upgrade their servers and software.
5. When your order arrives, contact the service representative and schedule the server upgrade.

Preparing the source server:

About this task

Ensure that you have installed the latest resave and cumulative fix (PTF) package of i5/OS V5R4 on all partitions of the source server.

For information about the resave and cumulative fix (PTF) package, see Info APAR II13365 on the Support for IBM System i Web site. For information about installing i5/OS, see Upgrade to i5/OS Version 5 Release 4.

1. Install fixes (program temporary fixes or PTFs) on all partitions of the source server. Use the information in this topic to put fixes on all partitions of the source server before upgrading to the target server.
2. Verify that all applications are running.
3. Perform device configuration cleanup as follows:
 - Use the Work with Line Descriptions command (WRKLIND) to view and delete unused lines and line descriptions for all partitions.
 - Use the Work with Device Descriptions command (WRKDEVD) to delete unused device descriptions for all partitions.

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.

4. Assign all unassigned I/O resources to active partitions.
For information about assigning resources to a partition, see Performing dynamic movement of resources.
5. If the target server has fewer processors than the source server, you can adjust the configuration on the source server to reflect the target server's processing resources. For information, see Dynamically moving processing power.
6. If necessary, you can adjust the minimum memory values per partition. For information, see Dynamically moving memory.
7. For each partition, remove failed or nonreporting resources that are no longer associated with existing hardware.
8. Logically remove any configured disk units that will be removed during the upgrade, such as disk units in SPD-based expansion units that will be removed (not converted) during the server upgrade. For information, see "How to Remove a Disk Unit from an Auxiliary Storage Pool" in Chapter 19. "Working with Auxiliary Storage Pools" of the Backup and Recovery Guide.

Note: Disk units that are not physically removed may be inadvertently added back into the configuration during an IPL.

9. Ensure that your console is set up and ready.
10. Use the Retrieve Configuration Source (RTVCFGSRC) command for each partition to build a source file member for the specified existing line, controller, and device descriptions. You will need this configuration source if any configuration objects must be manually changed or re-created.
11. Gather performance data.
You can use the performance data you collect from the source server as a base with which to compare the target server's performance after the upgrade is complete.
12. Save each partition of the server using GO SAVE option 21 on a tape drive that is compatible with the tape drive on the target server.

This is vital for recovery should you experience errors when upgrading the server.

To determine if your tape drives are compatible, see the Storage Solutions Web site.

Documenting all partitions of the source server:

About this task

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

1. Use one of the following to document each partition of the source server:
 - 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:
 - a. On the command line, enter WRKORDINF.
 - b. On the next display, type option 1 (Send to IBM) next to QMA *nnnnn* where *nnnnn* is the serial number of the server and press **Enter**.
 - If you cannot use the Work with Order Information Files (WRKORDINF) command, do the following:
 - a. On the command line, enter DSPSFWRSC *PRINT.
 - b. Print the spooled file.
2. Print the disk configuration status from each partition of the server. Be sure to record the serial number of the load-source disk unit for each partition.
3. Print the parity set configuration and status of the server from each partition of the server. Be sure to mark each printout for the partition it represents.

You can use this information to analyze and plan for disk unit configuration and protection. It can also be used to correct any problems that occur during the upgrade.
4. Display, verify, and print the hardware resource information for each partition.

Use the information in this topic to record the hardware resource information so that you can perform the necessary resource management after the upgrade is complete.
5. From the primary partition, Print the system configuration for logical partitions.

This gives you specific partition information such as system resources, processors, main memory, and any unique system values associated with partitions.
6. Using the system configuration printout, record the partition owner and serial number of each IOP on Bus 2.

These IOPs may not be on Bus 2 after the upgrade is complete. If not, you can use this information to reassign the IOPs to the correct partitions.
7. Print the status of all fixes (program temporary fixes or PTFs) for each partition of 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.
8. Record the IPL type and mode of the source server so you can return the server to this mode after the upgrade is complete.
 - IPL type = _____
 - IPL mode = _____

Preparing for the service representative:

1. Record the user IDs and passwords for the service representative to use.
2. Gather the following printouts for the service representative:
 - System configuration list printouts
 - Disk configuration status printouts
 - Parity set configuration and status printout
 - Device descriptions printout
 - Controller descriptions printout
 - PTF level printout

- Description label locations printout
 - Partition information printouts
 - LPAR Validation Tool output
3. For each secondary partition, record the IPL System Action and then set the IPL System Action to HOLD as follows:
 - a. From the primary partition, enter STRSST to start system service tools (SST) and sign on to SST.

Note: To use system service tools, you need a valid service tools user ID.
 - b. From the SST main menu, select option 5 (Work with system partitions), and press **Enter**. The Work with System Partitions display appears.
 - c. Use the Work with System Partitions display to select each secondary partition. For each secondary partition, record the IPL System Action and then set the IPL System Action to HOLD.
 4. On each partition of the server, record the setting for each of the following system values:
 - Local controllers and devices (QAUTOCFG) = ___
 - Type of restart (QIPLTYPE) = ___
 - Automatically adjust memory pools and activity levels (QPFRADJ) = ___

Then change the values of these settings on each partition of the server to the following:

 - Local controllers and devices (QAUTOCFG) = Do not automatically configure local controllers and devices (0)
 - Type of restart (QIPLTYPE) = Attended, console in debug mode (2)
 - Automatically adjust memory pools and activity levels (QPFRADJ) = Periodically after restart (2)

For information about working with i5/OS system values, see System values.
 5. Turn the server over to the service representative to perform the server upgrade. This includes giving the service representative the printouts, the user IDs, and passwords that you have prepared

Results

Now that you have finished preparing for the server upgrade, the next step is to complete the server upgrade.

Completing the server upgrade:

The service representative performs some of the completion tasks of a server upgrade. You perform other tasks along with the service representative, and some of the tasks are performed only by you. IBM offers fee-based services in which the service representative can perform additional upgrade tasks.

Related tasks

“Upgrading the server” on page 39

Follow these procedures to upgrade to a new iSeries server.

“Preparing to upgrade the server” on page 39

To prepare for an iSeries server upgrade, perform these procedures.

“Preparing to upgrade the partitioned server” on page 43

To prepare for the server upgrade, perform these tasks.

“Preparing the server for production” on page 48

To finish the resource management and prepare your new server for production, perform these procedures.

“Preparing the partitioned server for production” on page 53

To finish the resource management and prepare your new server for production, perform these procedures.

Performing the server upgrade:

The service representative performs these tasks to upgrade the server.

- Verifies that your preparation is complete
- Performs the server upgrade
- Verifies that all server components are functional
- Prepares any parts that need to be returned to IBM
- Performs any contracted relocation or rearrangement services before returning the server to you
- Provides you with the following information, which you will need to return the server to production:
 - LPAR Validation Tool output

Note: This is only used for a partitioned server.

- Disk configuration printouts
- Parity set configuration printout
- Description label locations printout
- System configuration list printouts (from HSM)
- Partition information printouts from the primary partition

Note: This is only used for a partitioned server.

- List of hardware resources that were replaced or moved during the conversion (Resource Conversions form A880 or equivalent list), provided by the IBM service representative
- Cable migration worksheet (form A805) for each partition (provided by the service representative)
- Performs normal cleanup tasks

IBM offers a fee-based service for additional upgrade tasks. For more information, see the IBM Migration Services Web site.

Now that the server upgrade is complete, your next step is to prepare the server for production.

Related tasks

“Preparing the server for production”

To finish the resource management and prepare your new server for production, perform these procedures.

Related information

 [IBM Migration Services](#)

Preparing the server for production:

To finish the resource management and prepare your new server for production, perform these procedures.

1. Continue the initial program load (IPL) by selecting option 1 (Perform an IPL) from the IPL or Install the System display.

Notes:

- a. You might see the Add All Disk Units to the System ASP display. You can add the disk units later in this procedure.
- b. You might see the system reference code (SRC) A900 2000 on the control panel display of the system unit. Or you might receive message CPF0975 Console did not vary on on the console display. This SRC and message appear if the QIPLTYPE is set to 2 or if there is no device description for the console display. This SRC and message are normal during the upgrade procedure. The SRC will disappear when you perform a normal IPL later in the upgrade procedure.

If no workstation on your server is operational when you receive SRC A900 2000, go to SRC A900 2000 recovery.

2. Sign on to the server as the security officer using the QSECOFR user profile.
3. 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 the system in restricted state = Y
 - Define or change system at IPL = Y
4. At the Define or Change the System at IPL display, select option 3 (System value commands).
5. At the System Value Commands display, select option 3 (Work with system values).
6. Use the Work System Value Commands display to restore the system values to the settings you recorded in step 3 on page 43 of the Preparing for the service representative procedure in the Preparing to upgrade the server topic.
7. After the IPL completes, use the Work with Configuration Status (WRKCFGSTS) command with parameters *LIN *ALL to ensure all communications lines are varied off.
8. Use the Work with Configuration Status (WRKCFGSTS) command with parameter *DEV to display a list of 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.
9. Use the Work with Configuration Status (WRKCFGSTS) command with parameters *CTL *ALL to vary off all controllers.
10. Find the label location information for the source server. Your service representative should have returned this to you.

On this worksheet, the service representative indicates controllers and devices that are in different locations than they were on your source server. You must use this information to fix hardware resource names after an upgrade to be able to access the devices on your server.
11. Set the server to IPL type B and Normal operating mode.

To find out how to set these values, see Changing your system IPL from the system control panel.
12. Once the server is set to IPL type B and Normal operating mode, follow these steps to stop and start the server:
 - a. Type PWRDWN SYS on the command line and press F4 (Prompt).
 - b. Make sure that you select these options for the PWRDWN SYS command:
 - **How to end:** *CNTRLD
 - **Delay time, if *CNTRLD:** 3600 (use the default value, in seconds, or the value that you consider appropriate given your software and system settings)
 - **Restart after power down:** *YES
 - **IPL Source:** *PANEL
13. If SRC A900 2000 appears on the control panel when the IPL completes and you are using Operations Console, follow these steps:
 - a. Perform an IPL in Manual operating mode on the server to arrive at the dedicated service tools (DST) menu.

To find out how to set the server to manual mode, see Changing your system IPL from the system control panel.
 - b. Then, from the DST main menu, follow these steps to set the console mode system value to Operations Console:
 - 1) Select option 5 (Work with DST environment) and press Enter.
 - 2) Select option 2, (System devices) and press Enter.
 - 3) Select **Console mode** and press Enter.
 - 4) Depending on your Operations Console configuration, select either **Operations Console (LAN)** or **Operations Console (Direct)** and press Enter.

5) Exit DST.

Note: For more information about setting the console mode in V5R3, see the Operations Console topic.

c. Continue the IPL to sign on.

This normal IPL should clear SRC A900 2000.

14. If you want to start device parity on any nonconfigured disk units, do it now. To learn how, see "Starting Device Parity Protection" in Chapter 20. "Working with Device Parity Protection" of the Backup and Recovery Guide.
15. 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, see Chapter 18. "Procedures for Configuring Disks and Disk Protection" of the Backup and Recovery Guide.
16. Save the entire server using GO SAVE option 21.
17. Generate reports of the hardware and configuration objects 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)
18. Print a new system configuration list.
19. Resume normal operations and verify that all applications run properly.
20. Tune server performance.

Related concepts

"Performing resource management" on page 19

After you change a hardware feature, you might need to perform these completion tasks.

"Performing the server upgrade" on page 47

The service representative performs these tasks to upgrade the server.

Related tasks

"Completing the server upgrade" on page 47

The service representative performs some of the completion tasks of a server upgrade. You perform other tasks along with the service representative, and some of the tasks are performed only by you. IBM offers fee-based services in which the service representative can perform additional upgrade tasks.

"System reference code (SRC) A900 2000 recovery" on page 51

If no workstation on your server is operational, follow these steps.

"Preparing to upgrade the server" on page 39

To prepare for an iSeries server upgrade, perform these procedures.

"Fixing hardware resource names after an upgrade" on page 51

Following an upgrade or migration, you might have hardware resources that are in different locations than they were on your source server.

Related information

Changing your system IPL from the control panel

Operations Console



Backup and Recovery Guide

Save the entire server


Printing the system configuration list

Install any additional software



System i Hardware

Memo to Users

 Support for IBM System i
Tuning performance

System reference code (SRC) A900 2000 recovery:

If no workstation on your server is operational, follow these steps.

About this task

Note: For information about alternative ways to change the console mode in V5R4, see the Operations Console topic.

1. Use the control panel to change your server IPL to manual mode.
2. Use the power pushbutton on the control panel to force power down on your server.
3. Perform an IPL on your server.
4. Sign on as QSECOFR.
5. On the IPL or Install the System display, select option 1 (Perform an IPL).
6. On the IPL Options display, specify Y for the Define or change the system at IPL prompt.
7. On the Define or Change the System at IPL display, select option 3 (System value commands).
8. On the System Value Commands display, select option 3 (Work with System Values).
9. On the Work with System Values display, type QIPLTYPE in the Position to field.
10. In the Option column for the QIPLTYPE system value, type 2 (Change).
11. On the Change System Value display for the QIPLTYPE system value, type 2 (Attended IPL, console in debug mode).
12. Press Enter. You see the Work with System Values display.
13. Press F3 twice to return to the Define or Change Your System display.
14. Press F3 (Exit and continue IPL) to continue your IPL.

Related tasks

“Preparing the server for production” on page 48

To finish the resource management and prepare your new server for production, perform these procedures.

“Preparing the partitioned server for production” on page 53

To finish the resource management and prepare your new server for production, perform these procedures.

Related information

Operations Console

Change your server IPL to manual mode

Use the power pushbutton

Fixing 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.

About this task

To fix these hardware resource names, follow these steps:

1. At the i5/OS command line, enter WRKHDWPRD.
2. On the Work with Hardware Products display, select option 5 (Change description label locations) and press Enter.

3. Read the information about the Using Change Label Locations display and 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 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 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 may 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. A list of possible label names is shown. To select the label name (on the display) that matches the label that was on the source server, type 1 in the Opt column for each location that you want to change and press Enter.

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

7. 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.
8. For all the labels that need a change, repeat the previous three steps.
9. 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. If More... appears on the bottom of the display, scroll forward to view more information.
10. Press the F17 key on the Change Description Label display to request a printout of the new information for your records.

Note: The printout will be in the default output queue for your workstation. You can print it later when you vary on your printer devices and start printer writers.

11. 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 tied to the server configuration.

Related concepts

"Performing resource management" on page 19

After you change a hardware feature, you might need to perform these completion tasks.

“Performing resource management for a partitioned server” on page 20

After you change a hardware feature, you might need to perform these completion tasks.

Related tasks

“Preparing the server for production” on page 48

To finish the resource management and prepare your new server for production, perform these procedures.

“Preparing the partitioned server for production”

To finish the resource management and prepare your new server for production, perform these procedures.

Preparing the partitioned server for production:

To finish the resource management and prepare your new server for production, perform these procedures.

1. Continue the initial program load (IPL) by selecting option 1 (Perform an IPL) from the IPL or Install the System display.

Notes:

- a. You might see the Add All Disk Units to the System ASP display. You can add the disk units later in this procedure.
 - b. You might see the system reference code (SRC) A900 2000 on the control panel display of the system unit. Or you might receive message CPF0975 Console did not vary on on the console display. This SRC and message appear if the QIPLTYPE is set to 2 or if there is no device description for the console display. This SRC and message are normal during the upgrade procedure. The SRC will disappear when you perform a normal IPL later in the upgrade procedure. If no workstation on your server is operational when you receive SRC A900 2000, go to SRC A900 2000 recovery.
2. Sign on to the server as the security officer using the QSECOFR user profile.
 3. 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
```
 4. At the Define or Change the System at IPL display, select option 3 (System value commands).
 5. At the System Value Commands display, select option 3 (Work with system values).
 6. Use the Work System Value Commands display to restore the system values to the settings you recorded in step 4 on page 47 of the Preparing for the service representative procedure.
 7. After the IPL completes, use the Work with Configuration Status (WRKCFGSTS) command with parameters *LIN *ALL to ensure all communications lines are varied off.
 8. Use the Work with Configuration Status (WRKCFGSTS) command with parameter *DEV to display a list of 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.
 9. Use the Work with Configuration Status (WRKCFGSTS) command with parameters *CTL *ALL to vary off all controllers.
 10. Find the label location information for the source server. Your service representative should have returned this to you. On this worksheet, the service representative indicates controllers and devices that are in different locations than they were on your source server. You must use this information to fix hardware resource names after an upgrade to be able to access the devices on your server.

11. Perform a normal IPL as follows:

Primary partition on a partitioned server	Secondary partition on a partitioned server
<p>Follow these steps:</p> <ol style="list-style-type: none"> 1. Verify that all of the secondary partitions are powered down. 2. Make sure that the server is set to IPL type B and Normal operating mode before the turning off and subsequent IPL of the server. To find out how to set these values, see Change your system IPL from the system control panel. 3. Once the server is set to IPL type B and Normal operating mode, follow these steps: <ol style="list-style-type: none"> a. Type PWRDWNSYS on the command line and press F4 (prompt). b. Make sure that you select these options for the PWRDWNSYS command: <ul style="list-style-type: none"> • How to end: *CNTRLD • Delay time: if *CNTRLD, 3600 (use the default value, in seconds, or the value that you consider appropriate given your software and system settings) • Restart after power down: *YES • IPL Source: *PANEL <p>For information about turning off and restarting a partitioned server, see Restart and turn off a system with logical partitions.</p>	<p>After successfully performing a normal IPL of the primary partition, follow these steps:</p> <ol style="list-style-type: none"> 1. Make sure that each secondary partition is set to IPL type B and Normal operating mode 2. Turn off and perform on IPL on the partitions. <p>For instructions on setting the IPL mode, turning off, and performing an IPL on secondary partitions, see Restart and turn off a system with logical partitions.</p>

12. If SRC A900 2000 appears on the control panel when the IPL completes and you are using Operations Console, follow these steps:
- a. Perform an IPL in Manual operating mode on the server to arrive at the dedicated service tools (DST) menu. To find out how to set the server to manual mode, see Restart and turn off a system with logical partitions.
 - b. Then, from the DST main menu, follow these steps to set the console mode system value to Operations Console:
 - 1) Select option 5 (Work with DST environment) and press **Enter**.
 - 2) Select option 2 (System devices) and press **Enter**.
 - 3) Select **Console mode** and press **Enter**.
 - 4) Depending on your Operations Console configuration, select either **Operations Console (LAN)** or **Operations Console (Direct)** and press **Enter**.

Note: For more information about setting the console mode in V5R4, see the Operations Console topic.
 - c. Use the information recorded in step 7 on page 46 under **Document all partitions of the source server** of Preparing to upgrade the partitioned server to identify the IOPs that were on Bus 2 before the upgrade. Follow these steps to assign the IOPs to the correct partition:
 - 1) From the DST main menu, select option 11 (Work with System Partitions) and press **Enter**.
 - 2) From the Work with Partitions display, type option 3 (Work with partition configuration) and press **Enter**.
 - 3) Use option 3 (Add I/O resources) on the Work with Partition Configuration display to assign the IOPs to the correct partition.

- 4) Exit DST.
- d. Continue the IPL to sign on. This normal IPL should clear SRC A900 2000.
13. If you want to start device parity on any nonconfigured disk units, do it now. To learn how, see "Starting Device Parity Protection" in Chapter 20. "Working with Device Parity Protection" of the Backup and Recovery Guide.
 14. 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, see Chapter 18. "Procedures for Configuring Disks and Disk Protection" of the Backup and Recovery Guide.
 15. Save each partition of the server by using GO SAVE option 21.
 16. Generate reports of the hardware and configuration objects (for each 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)
```
 17. Print the new system configuration for logical partitions.
 18. Resume normal operations and verify that all applications run properly.
 19. Tune server performance.

Related concepts

"Performing resource management for a partitioned server" on page 20

After you change a hardware feature, you might need to perform these completion tasks.

Related tasks

"Completing the server upgrade" on page 47

The service representative performs some of the completion tasks of a server upgrade. You perform other tasks along with the service representative, and some of the tasks are performed only by you. IBM offers fee-based services in which the service representative can perform additional upgrade tasks.

"System reference code (SRC) A900 2000 recovery" on page 51

If no workstation on your server is operational, follow these steps.

"Fixing hardware resource names after an upgrade" on page 51

Following an upgrade or migration, you might have hardware resources that are in different locations than they were on your source server.

"Preparing to upgrade the partitioned server" on page 43

To prepare for the server upgrade, perform these tasks.

Related information

Changing your system IPL from the control panel

Restart and power down a system with logical partitions

Operations Console



Backup and Recovery Guide

Save each partition of the server by

Printing system configuration for logical partitions

Installing additional licensed programs



System i Hardware

Memo to Users



Support for IBM System i

Tuning performance

Troubleshooting an iSeries upgrade

This topic contains information related to some upgrade-specific problems that could occur when upgrading an iSeries server.

In almost every case, the time you spend planning for the upgrade and performing the upgrade according to instructions can prevent these problems from occurring.

- The IPL takes longer than you expect.
Check the system reference code (SRC) on the control panel display. For information about the SRC, use the IPL system reference code finder topic. If the SRC indicates that SPCN code is being loaded, the IPL may take up to 45 minutes. Do not try to stop it. If you suspect a problem, contact your service provider.
- Bus numbers change.
An expansion unit conversion causes changes to the server resources. For information, see the Plan to convert the expansion unit topic.
- The console does not come up when you perform a normal IPL.
Call your service provider.

For more information, see the preventive service planning (PSP) document. The PSP document for V5R3 upgrades is SF98168. This PSP document describes High-Impact and PERvasive (HIPER) problems.

Related concepts

“Planning to convert the expansion unit” on page 23

An expansion unit conversion causes changes to the server resources.





Related information

IPL system reference code finder

Preventive service planning (PSP)

Related information for iSeries upgrades

Upgrades and migration

- **Data migrations**
Use this information if are moving data from one iSeries server that is running i5/OS V5R1, V5R2, or V5R3 to another iSeries server running V5R4. If you are installing a new version of i5/OS on the same server, it is not necessary to perform an explicit data migration. You can use the Software installation information.
- **Preventive service planning (PSP) information** 
The PSP document for V5R3 upgrades and data migrations is SF98168. Information within this PSP describes corrections that apply to upgrades. Review this information before you upgrade your server.
- **iSeries Server Migration: System Migration and Upgrades at V5R1 and V5R2** 
This book discusses the various topics that are involved in migrating to PCI technology. It also looks at other significant functions like High Speed Link (HSL) and concurrent maintenance capability. This book includes upgrade scenarios to assist with your planning. It explains such upgrade functions as load source migration and migrating to LPAR functions. And it describes the expansion unit options that preserve an investment in hardware or that migrate to new technology.
- **iSeries FACT** 
This Web site contains the Find and Compare Tools (FACT) that deal with iSeries models and upgrade paths.
- **IBM System i Hardware** 

This Web site contains information about the new servers.

Planning

- **System i Planning** 

This Web site provides links to a variety of planning tools and information.


- **System i Planning - Migration and upgrades** 

This Web site provides information about iSeries products or features that may not be supported in future releases of the i5/OS operating system or on future iSeries models, Product Previews, and Statements of Directions.

Software Installation

- **Memo to Users**

This document provides information about software and hardware changes that can potentially affect your system operations.

In addition to the Memo to Users in the i5/OS Information Center, you can access the Memo to Users from the Support for IBM System i  Web site (www.ibm.com/systems/support/i).

Follow these links (in order):

1. Technical databases
2. Preventive Service Planning - PSP
3. All Preventive Service Planning Documents by Release
4. R530
5. SF98076: Memorandum to Users

The *Memo to Users* is also available to customers who use electronic customer support. You can order this document for V5R3M0 by using the Send PTF Order (SNDPTFORD) command and specifying program temporary fix (PTF) number SF98076.

- **Info APAR II13365 on the Support for IBM System i**  Web site

This Info APAR contains information about the latest resave and cumulative fix (PTF) package of i5/OS V5R3. This level of i5/OS is required for the new servers.

To view the Info APAR, follow these links (in order):

1. Technical databases
2. Authorized Problem Analysis Reports APARs
3. V5R3 Info APARs
4. II13365

- **Installing, upgrading, or deleting i5/OS and related software**  (about 220 pages)

Use this information if you are upgrading your server with a new i5/OS release.

Performance management

- **Performance** 

This information guides you through the tasks and tools associated with performance management.

- **Performance Management for IBM System i** 

This reference provides highly technical information about server performance useful for performance benchmarking, capacity planning, and planning for server performance.


- **IBM Systems Workload Estimator** 

The Workload Estimator tool is a Web-based tool that provides users with a recommended model, processor, interactive feature, memory, and disk storage necessary for a mixed set of workloads.

Redbooks

- **IBM eServer i5 and iSeries System Handbook** 

This book provides hardware concepts and technical specifications for iSeries models and features.

- **IBM System i5™, eServer i5, and iSeries System Builder** 

This book provides detailed information and configuration rules for System i models and features.

Services

- **IBM Migration Services** 

This Web site contains information about the services IBM has available for helping you upgrade your server. These services can help you in planning for and upgrading to the new iSeries server. This service includes a planning session that concludes with a final hardware and software configuration and installation plan. The services specialist can also perform on-site services to upgrade the server to the latest release of i5/OS, convert your SPD-attached I/O to PCI-attached I/O, perform disk unit migration, server consolidation and more.

Logical partitions

- **Logical partitions**

Logical partitions allow you to distribute resources within a single iSeries server to make it function as if it were two or more independent servers. This information steps you through the logical partition process, from creation to management.

- **Dynamic logical partitioning** 

This Web site contains an introduction to logical partitioning as well as information about planning, services, and education.

- **IBM System Planning Tool (LPAR Validation tool)** 


The LPAR Validation tool is a Web-based tool that assists users in planning for a partitioned environment.

Saving PDF files

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

1. Right-click the PDF in your browser (right-click the link above).
2. Click **Save Target As** if you are using Internet Explorer. Click **Save Link As** if you are using Netscape Communicator.
3. Navigate to the directory in which you would like to save the PDF.
4. Click **Save**.

Downloading Adobe Acrobat Reader

You need Adobe Acrobat Reader to view or print these PDFs. You can download a copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep.html) .

Appendix. Notices

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Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, NY 10504

Telephone: 1-919-543-2193

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This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

VCCI Statement - Japan

<p>この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。</p> <p>VCCI-A</p>

The following is a summary of the VCCI Japanese statement in the box above.

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Electromagnetic Interference (EMI) Statement - People's Republic of China

Per GB 9254-1998, the user manual for a Class A product must carry the following warning message (English translation from the Chinese standard) about use in a residential environment in Chinese (*Simplified Chinese*):

声 明

此为 A 级产品, 在生活环境中, 该产品可能会造成无线电干扰。在这种情况下, 可能需要用户对其干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit Dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

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Federal Communications Commission (FCC) statement

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables or connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interferences, and (2) this device must accept any interferences received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, NY 10504

Telephone: 1-919-543-2193

Industry Canada Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

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In the Netherlands, the following applies:



EU Only

In Taiwan, the following applies. Please recycle batteries.



IBM Cryptographic Coprocessor Card Return Program

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