ESCALA

AIX 5L Installation

Partitioned Environment

AIX

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Partitioned Environment

AIX

Software

October 2002

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About This Book

This book describes different ways to install the AIX 5L Version 5.2 operating system in a partitioned environment, including using a CD–ROM device to install AIX, the Network Installation Management (NIM) interface, and alternate disk installation.

Before continuing, ensure that the service representative has completed the following tasks:

- Installation of all hardware components of the ESCALA managed system
- Configuration of the Hardware Management Console (HMC)

If either of these processes has not been completed, contact your service representative.

To learn more about the planning issues associated with creating logical partitions, see the *Hardware Management Console Installation and Operations Guide* for information on the following tasks:

- Preparing for Logical Partitioning
- Partition Management
- Logical Partitioning Mode Tasks

For more information on ESCALA systems and the AIX operating system, refer to the Bull Servers Information Center at the following URL:

`http://www.bull.com/servers/open/`

Who Should Use This Book

This guide is for system administrators who manage the installation, configuration, and maintenance of one or more logical partitions that run the AIX operating system. Readers should be familiar with the installation concepts, understand AIX system administration, and know how to manage a network environment.

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Case–Sensitivity in AIX

Everything in the AIX operating system is case–sensitive, which means that it distinguishes between uppercase and lowercase letters. For example, you can use the **ls** command to list files. If you type `LS`, the system responds that the command is ”not found.” Likewise, **FILEA**, **FiLea**, and **filea** are three distinct file names, even if they reside in the same directory. To avoid causing undesirable actions to be performed, always ensure that you use the correct case.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Related Publications

The following publications contain related information:

- *Hardware Management Console Installation and Operations Guide*
- *AIX 5L Version 5.2 Installation Guide and Reference*
- *AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
- *AIX 5L Version 5.2 System Management Guide: Communications and Networks*
- *AIX 5L Version 5.2 Commands Reference*
- *AIX 5L Version 5.2 Files Reference*
- *AIX 5L Version 5.2 General Programming Concepts: Writing and Debugging Programs*
- *AIX 5L Version 5.2 System User’s Guide: Operating System and Devices*
- *AIX 5L Version 5.2 System User’s Guide: Communications and Networks*

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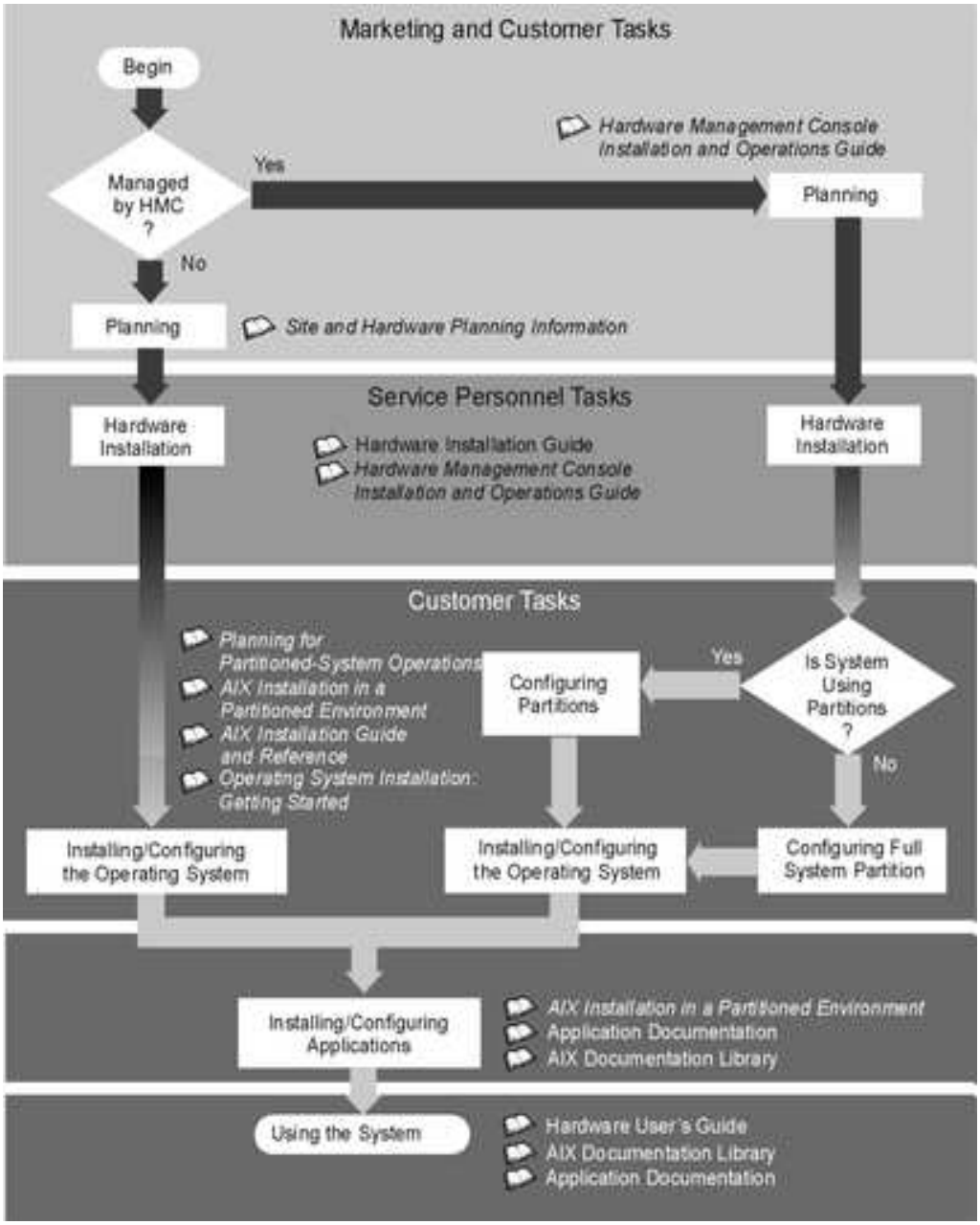
Chapter 1. Getting Started

This chapter helps you get started with installing and configuring an ESCALA managed system environment. The following information is included in the chapter:

- ESCALA Roadmap
- ESCALA Materials – List of ESCALA materials
- Documentation Overview – Brief description of the printed and softcopy documentation shipped including targeted audience
- Configuring Online Documentation – How to install and view the online documentation

The ESCALA Roadmap helps you locate marketing, service, and customer task information. The roadmap guides you through the tasks and the publications that document those tasks.

Figure 1. The ESCALA Roadmap This flow chart shows marketing, service, and customer tasks. The roadmap guides you through the tasks and the publications that document those tasks. The specific tasks shown in the flow chart are planning, hardware installation, configuring partitions, configuring full system partitions, installing and configuring the operating system, installing and configuring applications, and using the system.



List of Materials

Based on your order request, the ESCALA shipment may include the following materials:

CD–ROM Media:

- AIX 5.2 CDs
- AIX 5L Bonus Pack
- AIX 5L Expansion Pack
- AIX 5L Documentation CD

Documentation:

- *ESCALA Installation Guide*
- *Hardware Management Console Installation and Operations Guide*
- *AIX Installation in a Partitioned Environment*

- *AIX 5L Version 5.2 Installation Guide and Reference*
- *AIX 5L Version 5.2 Release Notes*
- *ESCALA User's Guide*
- *System Unit Safety Information*

Documentation Overview

This section provides descriptions, and target audience information for the ESCALA and AIX 5L documentation libraries. Some of the documentation may only be available in printed form or in softcopy form. Based on the documentation content, the books are divided into the following categories: **Planning**, **Installing and Configuring**, and **Using the System**.

Table 1. Planning

Documentation Title	Description	Audience	Type
Site Preparation for Racks Systems	Contains information to help plan for site preparation tasks, such as floor–planning, electrical needs, air conditioning, and other site–planning considerations.	Marketing, system administrators	softcopy
Planning for Partitioned–System Operations	Describes planning considerations for partitioned systems, including information on dynamic partitioning and Capacity Upgrade on Demand.	System administrators	printed and softcopy
Hardware Management Console Installation and Operations Guide	Provides information on how to install, configure, and use a Hardware Management Console (HMC). Logical partition (LPAR) tasks, such as configuring and managing partitions on multiple host servers, are included.	System administrators	printed and softcopy

Table 2. Installing and Configuring

Documentation Title	Description	Audience	Type
Hardware Installation Guide	Provides information on how to install system hardware, cable the system, and verify operations.	Service personnel	printed and softcopy
Planning for Partitioned–System Operations	Describes planning considerations for partitioned systems, including information on dynamic partitioning and Capacity Upgrade on Demand.	System administrators	printed and softcopy
Hardware Management Console Installation and Operations Guide	Provides information on how to install, configure, and use a Hardware Management Console (HMC). Logical partition (LPAR) tasks, such as configuring and managing partitions on multiple host servers, are included.	System administrators	printed and softcopy
AIX Installation in a Partitioned Environment (this book)	Provides information on how to install the AIX operating system in an LPAR environment.	System administrators	printed and softcopy
AIX Operating System Installation: Getting Started	Provides information on how to install and configure the AIX operating system on a standalone system using a CD–ROM device.	System administrators	printed and softcopy

Documentation Title	Description	Audience	Type
AIX 5L Installation Guide and Reference	Provides information on installing the AIX 5L operating system on standalone systems, as well as on client systems using the Network Installation Management (NIM) interface.	System administrators	printed and softcopy
AIX 5L Documentation CD	AIX documentation library (system management guides, user guides, application programmer guides, commands and files references, AIX man pages, and so on).	System administrators	softcopy

Table 3. Using the System

Documentation Title	Description	Audience	Type
Hardware Management Console Installation and Operations Guide	Provides information on how to install, configure, and use a Hardware Management Console (HMC). Logical partition (LPAR) tasks, such as configuring and managing partitions on multiple host servers, are included.	System administrators	printed and softcopy
Hardware User's Guide	Provides using, problem determination, and service processor information.	System administrators	printed and softcopy
Diagnostic Information for Multiple Bus Systems	Combines operating instructions for hardware diagnostic programs with common MAPs and SRNs (Service Request Numbers).	Service personnel	printed and softcopy

Documentation Title	Description	Audience	Type
Hardware Management Console Maintenance Guide	Contains MAPs, removal and replacement, error code, and parts information to help diagnose and repair the system.	Service personnel	printed and softcopy
Adapters Information for Multiple Bus Systems	Provides information about adapters that are attached to or used within the system.	System administrators	printed and softcopy
System Unit Safety Information	Contains the English version of safety notices, as well as translations of those safety notices into other languages.	System administrators, service personnel	printed and softcopy
AIX 5L Documentation CD	AIX documentation library (system management guides, user guides, application programmer guides, commands and files references, AIX man pages, and so on).	System administrators	softcopy

Configuring Online Documentation

The AIX online documentation is delivered on the following CD-ROM:
– 86 X2 03EG: Hypertext Library. Full Set for AIX 5.2

Instructions for installing the *Hypertext Library* are contained in the CD-ROM booklet and must be scrupulously followed.

The *Hypertext Library* comes with a set of tools called *The Hypertext Library Utilities.* This set of tools contains a **Search** function allowing to search for information through the entire Library and a **Multi-Print** capability allowing to print several documents with a single click in the Search Results window, plus features allowing to create and manage **notes** through the entire Library and to **add** (or remove) **user** documentation to the Library.

The *Hypertext Library* and the *Hypertext Library Utilities* have both a graphical and character interface.

The contents of the *Hypertext Library* and the *Hypertext Library Utilities* are described in the *Hypertext Library* home page.

More information can be found in the leaflet: *"About the Documentation CD-ROM"*.

Chapter 2. Overview of Partitioning

Partitioning your system is similar to partitioning a hard drive. When you partition a hard drive, you divide a single physical hard drive so that the operating system recognizes it as a number of separate logical hard drives. You have the option of dividing the system's resources by using the Hardware Management Console (HMC) to partition your system. On each of these divisions, called *partitions*, you can install an operating system and use each partition as you would a separate physical system.

Managed System

A managed system is a system that is physically attached to and managed by the HMC. The HMC can perform tasks that affect the entire managed system, such as powering the system on and off. You can also create partitions and partition profiles within each managed system. These partitions and partition profiles define the way that you configure and operate your partitioned system.

Logical Partitions

A *logical partition* (LPAR) is the division of a computer's processors, memory, and hardware resources into multiple environments so that each environment can be operated independently with its own operating system and applications. The number of logical partitions that can be created depends on the system's processor model and resources available. Typically, partitions are used for different purposes, such as database operation, client/server operations, Web server operations, test environments, and production environments. Each partition can communicate with the other partitions as if each partition is a separate machine.

Beginning with AIX 5.1, the AIX operating system supports partitioned environments. Although the AIX installation concepts are the same, the ability to configure and manage a partitioned environment with the AIX operating system is available in AIX 5.2. This guide assumes the reader has some familiarity with partition management. For more information about partition management, refer to the *Hardware Management Console Installation and Operations Guide*.

A logical partition must contain a minimum set of resources, as follows:

- 1 GB of available system memory
- One available system processor
- One boot device on an assigned I/O slot
- One available network adapter (for error reporting)
- Any other adapters you may need on an assigned I/O slot

Processors, memory, and I/O slots can be allocated to any partition, regardless of their location. However, if you attempt to activate a partition, but the resources you specified are not available at the time, partition activation fails. It is important to keep track of your system's resources to avoid activation failures. PCI slots are assigned individually to partitions, and memory can be allocated in 256 MB increments. The granularity of the resources that can be assigned to partitions is very fine, providing flexibility to create systems with just the desired amount of resources. Each partition runs its own copy of the AIX operating system and is isolated from any activity in other partitions. Software failures

do not propagate through the system, and the hardware facilities and microcode isolate the resources.

Dynamic Logical Partitioning

Dynamic logical partitioning provides the ability to logically attach and detach a managed system's resources to and from a logical partition's operating system without rebooting. In addition, failing resources can be dynamically released from the owning partition, serviced and reattached, or replaced without disturbing the partitions' activities.

For more information on dynamic logical partitioning, see the following:

- The Reassigning Partition Resources Dynamically section in the *Hardware Management Console Installation and Operations Guide*.
- The Dynamic Reconfiguration section in the *AIX 5L Version 5.2 General Programming Concepts: Writing and Debugging Programs*.
- The Dynamic Reconfiguration Safe and Aware Programs section in the *AIX 5L Version 5.2 General Programming Concepts: Writing and Debugging Programs*.

Affinity Logical Partitions

Some systems have the ability to create affinity logical partitions. Check your hardware specifications to see if your managed system is capable of using affinity logical partitions. An *affinity logical partition* is a special type of logical partition that uses system resources that are in close physical proximity to each other. When creating an affinity logical partition, the HMC automatically determines which system resources are to be used, based on their physical location to each other. The system resources that are automatically managed by the HMC are processors and memory. The user determines the I/O requirements for each of these partitions. The HMC then creates a profile for each affinity logical partition and a system profile for the managed system.

Working with Logical Partitions

The logical partition resource allocation provides the ability to select individual components to be added to a partition without dependencies between these resources. The slots can be freely allocated in any I/O drawer on the system. Other devices may be required for specific application requirements. It is a good idea to configure more PCI slots in the partition than are required for the number of adapters. This provides flexibility by allowing additional adapters to be hot–plugged into the empty slots that are part of an active partition. Because each partition requires its own separate boot device, the system must have at least one boot device and associated adapter per partition.

There are a few differences in how AIX runs within a logical partition, as opposed to how it runs on a standalone server:

- In order for AIX to run inside a logical partition, AIX calls the Hypervisor in place of its traditional direct access to the hardware and address–mapping facilities.
- Some direct–access calls are presented for diagnostic purposes, and alternate return codes for Run–Time Abstraction Services (RTAS) calls are used whenever an illegal operation is issued.
- No physical console exists on the partition. While the physical serial ports on the system can be assigned to the partitions, they can only be in one partition at a time. To provide an output for console messages and also for diagnostic purposes, the firmware implements a virtual tty that is seen by AIX as a standard tty device. Its output is sent to the HMC. The AIX diagnostics subsystems use the virtual tty as the system console.

- Certain platform operations are constrained in LPARs. For example, in non–LPAR systems, platform firmware updates can be performed from AIX by a root user. Because firmware updates can affect all partitions in an LPAR system, the LPAR administrator can specify that a particular partition (or no partition) has this authority. Within that partition, firmware updates work in the same way as they do for non–LPAR systems.

Apart from these considerations, AIX runs within a partition the same way it runs on a standalone server. No differences are observed either from the application or the administrator's point of view. Third–party applications need only be certified for a level of AIX that runs in a partition, and *not* for the LPAR environment itself.

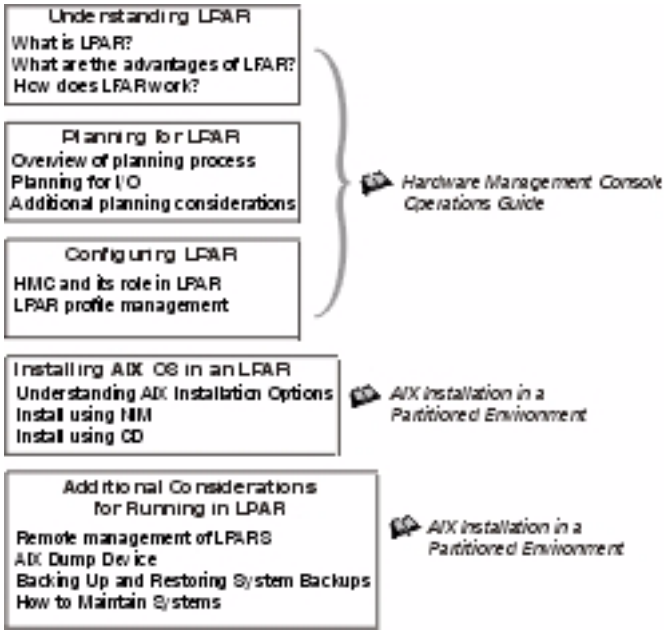
Full System Partition

A special partition called the *Full System Partition* assigns all of your managed system's resources to one large partition. The Full System Partition is similar to the traditional, non–partitioned method of operating a system. Because all resources are assigned to this partition, no other partitions can be started when the Full System Partition is running. Likewise, the Full System Partition cannot be started while other partitions are running. It is recommended that you choose to use either the Full System Partition or create other partitions. It is not recommended that you switch between these two options frequently, because your I/O usage might be affected.

Partition Roadmap

Use the following illustration to help you locate information about understanding, planning for, and configuring partitions, as well as information about installing the AIX operating system.

Figure 2. Partition Roadmap This illustration shows the logical partition concepts and the books that contain this information. The *Hardware Management Console Installation and Operations Guide* contains information about understanding LPAR, planning LPAR, and configuring LPAR. The *AIX 5L Version 5.2 AIX Installation in a Partitioned Environment* guide contains information about installing AIX in an LPAR (such as CD installation and Network Installation Management installation); and additional considerations for running in LPAR (such as remote management, dump devices, system backup and restore, and system maintenance).



When to Implement Logical Partitions

A logically partitioned environment adds to a portfolio of solutions that can provide better management, improved availability, and more efficient use of resources. This section provides some scenarios where a logically partitioned environment brings significant benefits, as well as other scenarios where it may not be appropriate.

Server Consolidation

A server with sufficient processing capacity that is capable of being partitioned can address the need for server consolidation by logically subdividing the server into a number of separate smaller systems. In this way the application–isolation needs can be met in a consolidated environment, with the additional benefits of reduced floor space, a single point of management, and easier redistribution of resources as workloads change.

Mixed Production and Test Environments

Generally, production and test environments should be isolated from each other. Partitioning enables separate partitions to be allocated for the production and test systems, eliminating the need to purchase additional hardware and software. When testing has been completed, the resources allocated to the test partition can be returned to the production partition or elsewhere as required. It might be that the test environment later becomes the production environment, and extra resources can then be added to the partition. As new projects are developed, they can be built and tested on the same hardware on which they will eventually be deployed.

Consolidation of Multiple Versions of the Same Operating System

Starting with AIX 5.1, different versions of AIX can exist within different LPARs in the same system. This enables a single system to have different versions of the operating system installed to accommodate multiple application requirements. Furthermore, an LPAR can be created to test applications under new versions of the operating system *prior* to upgrading the production environments. Instead of having a separate server for this function, a minimum set of resources can be temporarily used to create a new LPAR where the tests are performed. When the partition is no longer needed, its resources can be incorporated back into the other LPARs.

Chapter 3. Logical Partition Scenarios and Recommendations

This chapter provides an overview of the AIX installation process and various installation scenarios you can use. Because the managed system may be the first AIX system in your environment (or the first AIX 5.1 system in an AIX 4.3 environment), this information and accompanying recommendations will help guide you on decisions about installation, maintenance, and system backup.

Overview of AIX Installation Process

Due to the physical configuration of a managed system, use of the Network Installation Management (NIM) environment to install AIX is recommended. The following table compares how different forms of media proceed through the AIX installation process:

Steps	CD–ROM Product Media	NIM	mksysb on CD–R or DVD–RAM	mksysb on tape
Booting	Boot image is stored and retrieved from CD.	Boot image is stored on NIM server. Boot image is retrieved from network by firmware.	Boot image is stored and retrieved from CD–R or DVD.	Boot image is stored and retrieved from the first image on tape.
Making BOS Installation Choices	Manually step through the BOS menu selections for disks, kernel, language, and so on.	Perform nonprompted installation using a bosinst.data file to answer the BOS menu questions.	Manually proceed through the BOS menu selections for disks.	Manually proceed through the BOS menu selections for disks and other choices.
Executing Commands During Installation	CD–file system is mounted and commands are executed.	SPOT file system is NFS mounted and commands are run from the SPOT.	CD–file system is mounted and commands are executed.	Command files are retrieved from second image on tape to RAM–file system in memory.

Installing Product Images	Installation images stored on CD in a file system.	Installation images are stored in LPP_Source, which is NFS mounted during installation.	Backup image is stored on CD–R or DVD–RAM in a file system.	Backup image is stored and retrieved from fourth image on tape.
Rebooting System and Logging into System	Use Configuration Assistant (or Installation Assistant) to accept license agreements, set paging space, and so on.	No Configuration Assistant (or Installation Assistant). Boot to login prompt.	No Configuration Assistant (or Installation Assistant). Boot to login prompt.	No Configuration Assistant (or Installation Assistant). Boot to login prompt.

Introduction to Network Installation Management

This section provides an introduction to the NIM environment and the operations you can perform to manage the installation of the Base Operating System (BOS) and optional software on one or more machines. NIM gives you the ability to install and maintain not only the AIX operating system, but also any additional software and fixes that may be applied over time. NIM also allows you to customize the configuration of machines both during and after installation. NIM eliminates the need for access to physical media, such as tapes and CD–ROMs, because the media is a NIM resource on a server. System backups can be created with NIM, and stored on any server in the NIM environment, including the NIM master. Use NIM to restore a system backup to the same partition or to another partition. Before you begin configuring the NIM environment, you should already have the following:

- NFS and TCP/IP installed
- TCP/IP configured correctly
- Name resolution configured

For any installation procedure, you need a software source to install from, such as the AIX product CD–ROM. The AIX product CD–ROM contains boot images used to boot the system from the CD–ROM, installation images, and the installation commands used to install the installation images, as shown in the following illustration:

Figure 3. An example of an AIX product CD–ROM

This illustration shows an AIX product CD–ROM contains boot images used to boot the system from the CD–ROM, installation images, and the installation commands used to install the installation images.

In the NIM environment, the software source is separated into two NIM resources, the LPP_Source and the SPOT. The LPP_Source is a directory on your NIM server. When the LPP_Source is created, installation images are copied from the product CD–ROM to the LPP_Source directory, as shown in the following illustration:

Figure 4. An example of an LPP_Source resource.

This illustration shows that when an LPP_Source resource is created, installation images are copied from the product CD–ROM to the LPP_Source directory.

The product CD–ROM also contains boot images that enable the system to boot from the CD–ROM and installation commands that are used to install the installation images. This equivalent NIM resource is called the SPOT (Shared Product Object Tree). The SPOT is a directory that contains the installation commands that are used to install the installation images from the LPP_Source onto a system. The SPOT is also used to build the necessary boot images to boot a client system. Separate boot images exist for each type of adapter (Ethernet, token ring, and so on).

Figure 5. An example of a SPOT resource.

This illustration shows that a SPOT resource contains the installation commands used to install the installation images from the LPP_Source resource onto a system. The SPOT is also used to build the necessary boot images to boot a client system.

Scripts are available that configure the NIM environment for you and create the resources necessary to perform a **mksysb** installation. The **nim_master_setup** script creates an LPP_Source and SPOT resource for you and defines the resources in the NIM environment. The **nim_master_setup** script will also copy the update images from your update CD to the LPP_Source and then install the update images into the SPOT resource.

In addition to the LPP_Source and SPOT resources, several NIM resources can help customize the BOS installation process and basic network configuration. The following table shows all the NIM resources that are created with the **nim_master_setup** script:

NIM Resource	Name Given	Description
spot*	520spot_res	Commands used during installation. The network boot images are built from the SPOT.
lpp_source	520lpp_res	Directory containing installation images.
mksysb	generic_sysb	System backup image
bosinst_data	bosinst_ow	Answers questions asked during the BOS installation, which allows for a non–prompted new and complete overwrite installation.
resolv_conf	resolv_res	Provides the domain name and name server information.
res_group	basic_res_grp	Used by the **nim_clients_setup** script to allocate the bosinst_data, mksysb, lpp_source, spot, and resolv_conf to install the client partitions.

* Required resource for installation

Each partition you install will be defined in the NIM environment as a standalone system resource, also referred to as a *NIM client*. The **nim_clients_setup** script allows you to define the partitions as NIM clients and initiates a BOS installation on the NIM clients.

Installation Scenarios

This section contains several scenarios for installing AIX.

Migrating to AIX 5.2 and Configuring Partition Support

In this scenario, you are adding a managed system to an existing environment of systems running AIX 5.1. The managed system is the first system in your environment that requires AIX 5.2. If you have a system available to use as a NIM master, or you already have a NIM master, perform the following steps:

1. Migrate the system to AIX 5.2. For the procedure, refer to Migrate a System to the AIX 5.2 Partition–Ready State on page 4-19.
2. Configure the system to be a NIM master. You will use the NIM master to install the system backup on your partitions. If you do not have an available system to use as a AIX 5.2 NIM master, refer to Configure an Initial Partition as a NIM Master to Use NIM to Install the Remaining Partitions on page 4-2.

First AIX System in Your Environment

In this scenario, the managed system is the first AIX system in your environment, and you do not have another system with a graphics adapter available. In this case, you must use the HMC as both your software and hardware console.

If you do not have a great deal of experience using AIX, use the procedure described in Configure an Initial Partition as a NIM Master to Use NIM to Install the Remaining Partitions on page 4-2. This procedure will create a NIM master on one of the partitions and use its system image to install the other partitions.

NIM enables you to install and customize your logically partitioned environment. Using the NIM environment enables you to perform future installation and maintenance tasks more efficiently.

Installing a Partition Using Alternate Disk Installation

You can clone an existing disk image to another disk or disks without using NIM. You may want to do this if your network is not fully set up, or if you are not sure about your network configuration. However, you may choose to use NIM at a later time.

You can use the **alt_disk_install** command to clone a system image to another disk, but you must use the **–O** option to remove references in the object data manager (ODM) and device (/**dev**) entries to the existing system. The **–O** flag tells the **alt_disk_install** command to call the **devreset** command, which resets the device database. The cloned disk can now be booted as if it were a new system.

An example of this scenario is as follows:

1. Boot the managed system as a Full System Partition so you have access to all the disks in the managed system.
2. Configure the system and install the necessary applications.
3. Run the **alt_disk_install** command to begin cloning the **rootvg** on `hdisk0` to `hdisk1`, as follows:

   ```
   # /usr/sbin/alt_disk_install -O -B -C hdisk1
   ```

   The cloned disk (`hdisk1`) will be named **altinst_rootvg** by default.
4. Rename the cloned disk (`hdisk1`) to `alt1`, so you can repeat the operation with another disk.

   ```
   # /usr/sbin/alt_disk_install -v alt1 hdisk1
   ```

5. Run the **alt_disk_install** command again to clone to another disk and rename the cloned disk, as follows:

```
# /usr/sbin/alt_disk_install -O -B -C hdisk2
# /usr/sbin/alt_disk_install -v alt2 hdisk2
```

6. Repeat steps 3 through 5 for all of the disks that you want to clone.
7. Use the HMC to partition the managed system with the newly cloned disks. Each partition you create will now have a **rootvg** with a boot image.
8. Boot the partition into SMS mode. Use the SMS **MultiBoot** menu to configure the first boot device to be the newly installed disk. Exit the SMS menus and boot the system.

   For a full description of alternate disk installation, see the **alt_disk_install** man page and the *AIX 5L Version 5.2 Installation Guide and Reference*.

Advanced Installation Options

You can use several other scenarios to install your partitions by using some AIX advanced functions. These procedures are documented in the **/usr/lpp/bos/README.PARTITION_INSTALL** file.

Some installation scenarios covered are the following:

- Preparing an existing root volume group (**rootvg**) to move to a managed system
- Using the **devreset** command to rebuild the device ODM database and reset all devices to default configurations

Chapter 4. Installing AIX in a Partitioned Environment

This chapter contains procedures to install the AIX operating system in a partitioned environment. For more information on concepts and the considerations involved when performing a base operating system installation of AIX, refer to the *AIX 5L Version 5.2 Installation Guide and Reference*. For more information on concepts and the requirements involved when using the Network Installation Management (NIM) environment to install and maintain AIX, you can also refer to the *AIX 5L Version 5.2 Installation Guide and Reference*.

For instructions on how to create a partition and allocate I/O resources to a partition, see the *Hardware Management Console Installation and Operations Guide*, order number SA38–0590. To help you keep track of the LPAR environment system resources, see the tracking worksheets in the *Hardware Management Console Installation and Operations Guide*.

Note: For the installation method that you choose, ensure that you follow the sequence of steps as shown. Within each procedure, you must use AIX to complete some installation steps, while other steps are completed using the HMC interface.

Table 6. AIX Installation Procedures and Considerations

Installation Procedure	Considerations
Configure an Initial Partition as a NIM Master to Use NIM to Install the Remaining Partitions on page 4-2	– NIM environment offers the most flexibility and customization options for installation and management. – NIM environment allows for multiple installations at the same time. – The **nim_master_setup** and **nim_clients_setup** scripts provide a way to set up the NIM environment. – Requires one LPAR with approximately 1.5 GB of disk space dedicated as the NIM master partition.
Use a Separate AIX System as a NIM Master to Use NIM to Install Each Partition on page 4-9	– You need not dedicate an LPAR as the NIM master. – NIM environment offers the most flexibility and customization options for installation and management. – NIM environment allows for multiple installations at the same time. – The **nim_master_setup** and **nim_clients_setup** scripts provide a way to set up the NIM environment. – Requires an available AIX 5.2 system that can be used as the NIM master.

Use the CD Device to Manually Install a Partition on page 4-15	– You need not set up the NIM environment. – Installing AIX from CD can be time–consuming. – No convenient way to do systems management functions. – More work required on Hardware Management Console (HMC) to activate and deactivate LPARs.
Migrate a System to the AIX 5.2 Partition–Ready State on page 4-19	– Some applications on the pre–migrated operating system may not be certified or compatible with AIX 5.2. – For currently available applications, see http://www–1.ibm.com/servers/aix/products/ibmsw/list/
Update an Existing NIM Environment to the Latest AIX Recommended Maintenance Level on page 4-22	The **nim_update_all** script provides a one–step method to update an existing NIM environment and its resources created with the **nim_master_setup** script to the latest recommended maintenance level.

Configure an Initial Partition as a NIM Master to Use NIM to Install the Remaining Partitions

In this procedure, you will set up an initial logical partition as a NIM master and server. This procedure refers to this initial logical partition as the **Master_LPAR**. It is assumed that AIX is already installed and configured for network communication in the Master_LPAR. Make sure your network environment is already defined and working correctly before configuring the NIM environment.

After you verify the correct level of the AIX operating system has been installed on the Master_LPAR, as the root user, you will set up the NIM environment using the **nim_master_setup** script. The **nim_master_setup** script automatically installs the **bos.sysmgt.nim.master** file set, configures the NIM master, and creates the required resources for installation, including a mksysb system backup.

Note: The **nim_master_setup** script uses the **rootvg** volume group and creates an **/export/nim** file system, by default. You can change these defaults using the **volume_group** and **file_system** options. The **nim_master_setup** script also allows you to optionally not create a generic system backup, if you plan to use a mksysb image from another system.

You will then use the **nim_clients_setup** script to define your NIM clients, allocate the installation resources, and initiate a NIM BOS installation on the clients. Then using the HMC, you will activate the client partitions and configure them to boot off the network.

Prerequisites

Before you begin this procedure, you should have already performed the following tasks:

- Use the HMC to create the Master_LPAR logical partition and partition profile. Be sure the Master_LPAR partition has a network adapter, enough hard–disk space for the NIM

resources, and an assigned CD device. Set the boot mode for the Master_LPAR partition to be Normal mode. After you have successfully created the partition and partition profile, leave the partition in the *Ready* state. Do *not* activate the partition yet.

- Use the HMC to create logical partitions and partition profiles for each NIM client. Be sure each LPAR has a network adapter assigned. Set the boot mode for each partition to be SMS mode. After you have successfully created the partitions and partition profiles, leave the partitions in the *Ready* state. Do *not* activate the partitions yet.
- Configure AIX for network communication on the Master_LPAR. If AIX is not currently installed on any of the disks in the system, then refer to Use the CD Device to Manually Install a Partition on page 4-15 for the procedure.

1. Activate the Master_LPAR (Perform this Step in the HMC Interface)

After you have successfully created the Master_LPAR, it is in the *Ready* state.

Use the HMC to activate the Master_LPAR partition, as follows:

__ Step 1.

To activate the Master_LPAR, do the following:

a. Select the Master_LPAR partition.

b. Right–click on the partition to open the menu.

c. Select **Activate**. The Activate Partition menu opens with a selection of partition profiles. Be sure the correct partition profile is highlighted.

d. Select **Open terminal** at the bottom of the menu to open a virtual terminal (vterm) window.

e. Select **OK**. A vterm window opens for the partition. After several seconds, the login prompt displays in the vterm window.

2. Configure NIM Master and Initiate Installation of Partitions (Perform These Steps in the AIX Environment)

__ Step 1.

Run the **oslevel** command as follows:

```
# oslevel
```

Output similar to the following displays:

```
5200
```

- The **oslevel** command reports the maintenance level of the operating system using a subset of all filesets installed on your system. If the output from the **oslevel** command does not show the expected OS level, see Migrate a System to the AIX 5.2 Partition–Ready State on page 4-19 for information about migrating the AIX operating system to the correct OS level.

__ Step 2.

Verify network configuration by running the following commands:

```
# smitty mktcpip
```

- Select the Network Interface and press Enter.
- Confirm or enter your host name, IP address, name server, domain name, default gateway, as well as ring speed or cable type. Press Enter. You can also test the network status by using the following **netstat** command options:

```
# netstat -C
```

- The **–C** flag shows the routing table information. Check to make sure your gateway information is correct.

```
# netstat -D
```

- The **–D** flag shows the number of packets received, transmitted, and dropped in the communications subsystem. Check to make sure the network device is sending and receiving packet information.

__ Step 3.

Insert the **AIX 5L for POWER Version 5.2 Volume 1** in the CD device.
Run the **nim_master_setup** command as follows:

```
# nim_master_setup
```

- This command configures the NIM environment on the AIX system by installing the **bos.sysmgt.nim.master** fileset, configuring the NIM environment, and creating the boot, nim_script, resolv_conf, bosinst_data, LPP_Source, and SPOT resources. If you plan to use a mksysb image from another system, the **–B** flag is used to prevent creating the mksysb resource. The **nim_master_setup** script uses the **/dev/cd0** device as the default device. You can specify an alternate location using the **–a device=** ***full_path_name*** option.
- The **nim_master_setup** script uses the **rootvg** volume group and creates an **/export/nim** file system, by default. You can change these defaults by using the **volume_group** and **file_system** options.

Note: The output from the **nim_master_setup** script is stored in the **/var/adm/ras/nim.setup** log file.

__ Step 4.

If you are adding new client machines that cannot be resolved on the name server, edit the **/etc/hosts** file to add the IP addresses and client host names.

__ Step 5.

There are two ways to define the client systems and initiate the BOS Installation. The first method uses the SMIT interface to define the clients and then uses the **nim_clients_setup** script to initiate the installation. The second method allows you to manually edit the **client.defs** file and then use the **nim_clients_setup** script to define the clients with this file and then initiate the installation. This section describes both methods:

- Use SMIT and the **nim_clients_setup** script, as follows:

  a. Run the **smitty nim_mkclient** fast path and the **nim_clients_setup** script to define the client partitions in the NIM environment.

  ```
  # smitty nim_mkclient
  ```

  . Select **Add a NIM Client**.

  . Enter a host name and press Enter.

  ```
                  Define a Machine

   Type or select a value for the entry field.
   Press Enter AFTER making all desired changes.


                                        [Entry Fields]
   * Host Name of Machine                    [lpar1]
       (Primary Network Install Interface)
  ```

  . If a menu prompts you for the Type of Network Attached to Primary Network Install Interface, select the network adapter from the list and press Enter.

  . In the Define a Machine menu, supply the necessary information by typing in the entry fields or using the F4 key to open a selection menu. Verify all information is

correct, especially the Hardware Platform Type (chrp), Kernel to Use for Network Boot (mp), and Network Type. Press Enter when you are finished.

```
                        Define a Machine

 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

 [TOP]                                            [Entry Fields]
 * NIM Machine Name                              [lpar1]
 * Machine Type                                  [standalone]     +
 * Hardware Platform Type                        [chrp]           +
   Kernel to use for Network Boot                [mp]             +
   Primary Network Install Interface
 *   Cable Type                                   bnc              +
 *   NIM Network                                 [ent-Network1]
 *     Network Type                               ent
 *     Ethernet Type                              Standard         +
 *     Subnetmask                                 []
 *     Default Gateway Used by Machine            []
 *     Default Gateway Used by Master             []
 *   Host Name                                    lpar1
     Network Adapter Hardware Address             [0]
```

b. Repeat for each client partition. Use the F3 key to return to the previous menu, and change the information for each client.

c. Run the **nim_clients_setup** script as follows:

```
# nim_clients_setup
```

The **nim_clients_setup** command creates a NIM machine group with the clients you just defined using the SMIT interface, then allocates the LPP_Source, SPOT, mksysb, bosinst.data, and resolv.conf resources, and finally initiates a NIM mksysb installation. The NIM mksysb installation uses the **generic_sysb** resource that was created with the **nim_master_setup** script. If you want to use another mksysb image, use the **–m *mksysb_path*** option, and the script defines and uses it to install the partitions. The path must be local to the master.

- Use a text editor to manually edit the **client.defs** file and use the **nim_clients_setup** script, as follows:

a. Use the **vi** editor to customize the /**export**/**nim**/**client.defs** file as follows:

```
# vi /export/nim/client.defs
```

. Edit the **client.defs** file according to your environment. For more information, see the instructions and examples in the **client.defs** file. When you are finished editing the **client.defs** file, save it and exit the vi editor.

b. Run the **nim_clients_setup** script to define the client partitions in the NIM environment as follows:

```
# nim_clients_setup -c
```

. The **–c** option specifies using the **client.defs** file for your client definitions. The **nim_clients_setup** command creates a NIM machine group with all the resources created from the **nim_master_setup** script and initiates a NIM mksysb installation. If you want to use another mksysb image, use the **–m *mksysb_path*** option, and the script defines and uses it to install the partitions. The path must be local to the master.

3. Activate and Install Partitions (Perform These Steps in the HMC Interface)

__ Step 1.

To activate the partitions, do the following:

a. Select the partition (or partition profile) you want to activate.

b. Right–click on the partition (or partition profile) to open the menu.

c. Select **Activate**. The Activate Partition menu opens with a selection of partition profiles. Select a partition profile that is set to boot to the SMS menus.

d. Select **Open terminal** at the bottom of the menu to open a virtual terminal (vterm) window.

e. Select **OK**. A vterm window opens for each partition. After several seconds, the System Management Services (SMS) menu opens in the vterm window.

__ Step 2.

In the SMS menu on the vterm window, do the following:

a. Press the 6 key to select **6 Multiboot**.

```
Version RHxxxx_xxxxxx
 (c) Copyright IBM Corp. 2001  All rights reserved.
 ------------------------------------------------------------------
 Utilities

 1  Password Utilities NOT available in LPAR mode
 2  Display Error Log
 3  Remote Initial Program Load Setup
 4  SCSI Utilities
 5  Select Console NOT available in LPAR mode
    6  MultiBoot
 7  Select Language
 8  OK Prompt


                                                        .------.
                                                        |X=Exit|
                                                        `------'
 ===>   6
```

b. Press the 4 key to select **4 Select Boot device**.

c. Press the 3 key to select **3 Configure 1st boot device**.

```
Version RHxxx_xxxxxx
 (c) Copyright IBM Corp. 2001  All rights reserved.
 ------------------------------------------------------------------
 Select Boot Devices

 1  Display Current Settings
 2  Restore Default Settings
 3  Configure 1st Boot Device
 4  Configure 2nd Boot Device
 5  Configure 3rd Boot Device
 6  Configure 4th Boot Device
 7  Configure 5th Boot Device


                                                        .------.
                                                        |X=Exit|
                                                        `------'
 ===>   3
```

d. Select the network adapter from the list of available devices.

e. Press the x key until you return to the Utilities menu.

f. Press the 3 key to select **3 Remote Initial Program Load Setup**.

```
Version RHxxxx_xxxxxx
 (c) Copyright IBM Corp. 2001  All rights reserved.
 ------------------------------------------------------------------
 Utilities

 1  Password Utilities NOT available in LPAR mode
 2  Display Error Log
 3  Remote Initial Program Load Setup
 4  SCSI Utilities
 5  Select Console NOT available in LPAR mode
 6  MultiBoot
 7  Select Language
 8  OK Prompt


                                                        .------.
                                                        |X=Exit|
                                                        `------'
 ===>   3
```

g. Press the `1` key to select **1. IP Parameters**.

h. Type the appropriate information for Client IP Address, Server IP Address, Gateway IP Address, and Subnet Mask. Press the `x` key to exit to the Network Parameters menu.

```
Version RHxxxx_xxxxxx
 (c) Copyright IBM Corp. 2001  All rights reserved.
 ------------------------------------------------------------------
 IP Parameters

 1.  Client IP Address                  [000.000.000.000]
 2.  Server IP Address                  [000.000.000.000]
 3.  Gateway IP Address                 [000.000.000.000]
 4.  Subnet Mask                        [255.255.255.000]


                                                        .------.
                                                        |X=Exit|
                                                        `------'
 ===>
```

i. Press the `2` key to select **2 Adapter Parameters**.

j. Select the network device you want to use and press Enter. If a menu prompts for further configuration of the network device, select the appropriate settings. When you are finished, press Enter to exit to the Network Properties menu.

k. Press the `x` key to exit to the previous menu.

l. Press the `3` key to select **3 PING Test**.

m. Select the network adapter for the ping test and press Enter.

n. If another menu displays the network adapter configuration information, press the `x` key to exit to the previous menu.

o. Press the `x` key to exit to the previous menu.

p. Press the `e` key to execute the ping operation.

```
Version RHxxx_xxxxxx
 (c) Copyright IBM Corp. 2001  All rights reserved.
 ------------------------------------------------------------------------
 Ping IP Address

 1.  Client IP Address                    [000.000.000.000]
 2.  Server IP Address                    [000.000.000.000]
 3.  Gateway IP Address                   [000.000.000.000]
 4.  Subnet Mask                          [255.255.255.000]


.---------.                                          .------.
|E=Execute|                                          |X=Exit|
`---------'                                          `------'
 ===>   e
```

- If the ping operation does not return successfully, return to the **1. IP Parameters** menu selection to make sure all information is correctly entered. Also, check the **2 Adapter Parameters** selection to make sure the network adapter configuration is correct according to your network. You may also want to make sure the network adapter is functioning correctly.
- If the ping operation returns successfully, proceed with the network boot. Press the `x` key until you exit the SMS menus and begin the network boot.

4. Log in to Your Partition (Perform This Step in the AIX Environment)

When the installation has completed and the system has rebooted, the vterm window displays a login prompt.

At this point, you may want to perform several common system–administration procedures. The following table lists where to find information about performing these procedures.

Procedure	**Location**
Partition Backup and Storage Management	System Backup, Dump, and Storage Management on page 5-1
Remote System Management	Remote Management on page 6-1
User and Group Management	*AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
Software Installation	*AIX 5L Version 5.2 Installation Guide and Reference*
Performance Management	*AIX 5L Version 5.2 Performance Management Guide*
Printer Configuration	*AIX 5L Version 5.2 Guide to Printers and Printing*

Use a Separate AIX System as a NIM Master to Use NIM to Install Each Partition

In this procedure, you will use a separate system running AIX 5.2 as a NIM master and server, to use NIM to install your logical partitions. As with any NIM environment, you must make sure your network environment is already defined and working correctly.

After the correct level of the AIX operating system has been installed on this separate system, as the **root** user, you will set up the NIM environment using the **nim_master_setup** script. The **nim_master_setup** script automatically installs the **bos.sysmgt.nim.master** fileset from your media, configures the NIM master, and creates a generic system backup that will be used to install the partitions, as well as the SPOT and LPP_Source resources.

Note: The **nim_master_setup** script uses the **rootvg** volume group and creates an /**export**/**nim** file system, by default. You can change these defaults using the **volume_group** and **file_system** options. The **nim_master_setup** script also allows you to optionally not create a generic system backup, if you plan to use a **mksysb** image from another system to install your partitions.

You will then define your clients using SMIT or using the NIM **clients.def** file, then use the **nim_clients_setup** script to allocate the installation resources, and initiate a NIM BOS installation on the clients. Then using the HMC, you will activate the partitions and configure them to boot off the network.

Prerequisites

Before you begin this procedure, you should have used the HMC to create partitions and partition profiles for each partition that you want to install. Be sure each partition has a network adapter assigned. Set the boot mode for each partition to be SMS mode. After you have successfully created the partitions and partition profiles, leave the partitions in the *Ready* state. Do *not* activate the partitions yet.

1. Configure NIM Master and Initiate Installation of Partitions (Perform These Steps in the AIX Environment)

__ Step 1.

Run the **oslevel** command as follows:

```
# oslevel
```

Output similar to the following displays:

```
5200
```

- The **oslevel** command reports the maintenance level of the operating system using a subset of all filesets installed on your system. If the output from the **oslevel** command does not show the expected OS level, see Migrate a System to the AIX 5.2 Partition–Ready State on page 4-19 for information about migrating the AIX operating system to the correct OS level.

__ Step 2.

Verify network configuration by running the following commands:

```
# smitty mktcpip
```

- Select the Network Interface and press Enter.
- Confirm or enter your host name, IP address, name server, domain name, default gateway, as well as ring speed or cable type. Press Enter. You can also test the network status by using the following **netstat** command options:

```
# netstat -C
```

- The **–C** flag shows the routing table information. Check to make sure your gateway information is correct.

```
# netstat -D
```

- The **–D** flag shows the number of packets received, transmitted, and dropped in the communications subsystem. Check to make sure the network device is sending and receiving packet information.

__ Step 3.

Insert the **AIX 5L for POWER Version 5.2 Volume 1** in the CD device.
Run the **nim_master_setup** command as follows:

```
# nim_master_setup
```

- This command configures the NIM environment on the AIX system by installing the **bos.sysmgt.nim.master** fileset, configuring the NIM environment, and creating the boot, nim_script, resolv_conf, bosinst_data, LPP_Source, and SPOT resources. If you plan to use a mksysb image from another system, the **–B** flag is used to prevent creating the mksysb resource. The **nim_master_setup** script uses the /**dev**/**cd0** device as the default device. You can specify an alternate location using the **–a device=** ***full_path_name*** option.
- The **nim_master_setup** script uses the **rootvg** volume group and creates an /**export**/**nim** file system, by default. You can change these defaults by using the **volume_group** and **file_system** options.

Note: The output from the **nim_master_setup** script is stored in the /**var**/**adm**/**ras**/**nim.setup** log file.

__ Step 4.

If you are adding new client machines that cannot be resolved on the name server, edit the /**etc**/**hosts** file to add the IP addresses and client host names.

__ Step 5.

There are two ways to define the client systems and initiate the BOS Installation. The first method uses the SMIT interface to define the clients and then uses the **nim_clients_setup** script to initiate the installation. The second method allows you to manually edit the **client.defs** file and then use the **nim_clients_setup** script to define the clients with this file and then initiate the installation. This section describes both methods:

- Use SMIT and the **nim_clients_setup** script, as follows:

  a. Run the **smitty nim_mkclient** fast path and the **nim_clients_setup** script to define the client partitions in the NIM environment.

```
# smitty nim_mkclient
```

  . Select **Add a NIM Client**.

  . Enter a host name and press Enter.

```
                    Define a Machine

Type or select a value for the entry field.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
* Host Name of Machine                  [lpar1]
    (Primary Network Install Interface)
```

  . If a menu prompts you for the Type of Network Attached to Primary Network Install Interface, select the network adapter from the list and press Enter.

. In the Define a Machine menu, supply the necessary information by typing in the entry fields or using the F4 key to open a selection menu. Verify all information is correct, especially the Hardware Platform Type (chrp), Kernel to Use for Network Boot (mp), and Network Type. Press Enter when you are finished.

```
                    Define a Machine

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[TOP]                                          [Entry Fields]
* NIM Machine Name                            [lpar1]
* Machine Type                                [standalone]     +
* Hardware Platform Type                      [chrp]           +
  Kernel to use for Network Boot              [mp]             +
  Primary Network Install Interface
*   Cable Type                                 bnc             +
*   NIM Network                               [ent-Network1]
*     Network Type                             ent
*     Ethernet Type                            Standard        +
*     Subnetmask                              []
*     Default Gateway Used by Machine         []
*     Default Gateway Used by Master          []
*   Host Name                                  lpar1
    Network Adapter Hardware Address          [0]
```

b. Repeat for each client partition. Use the F3 key to return to the previous menu, and change the information for each client.

c. Run the **nim_clients_setup** script as follows:

```
# nim_clients_setup
```

The **nim_clients_setup** command creates a NIM machine group with the clients you just defined using the SMIT interface, then allocates the LPP_Source, SPOT, mksysb, bosinst.data, and resolv.conf resources, and finally initiates a NIM mksysb installation. The NIM mksysb installation uses the **generic_sysb** resource that was created with the **nim_master_setup** script. If you want to use another mksysb image, use the **–m *mksysb_path*** option, and the script defines and uses it to install the partitions. The path must be local to the master.

- Use a text editor to manually edit the **client.defs** file and use the **nim_clients_setup** script, as follows:

a. Use the **vi** editor to customize the **/export/nim/client.defs** file as follows:

```
# vi /export/nim/client.defs
```

. Edit the **client.defs** file according to your environment. For more information, see the instructions and examples in the **client.defs** file. When you are finished editing the **client.defs** file, save it and exit the vi editor.

b. Run the **nim_clients_setup** script to define the client partitions in the NIM environment as follows:

```
# nim_clients_setup -c
```

. The **–c** option specifies using the **client.defs** file for your client definitions. The **nim_clients_setup** command creates a NIM machine group with all the resources created from the **nim_master_setup** script and initiates a NIM mksysb installation. If you want to use another mksysb image, use the **–m *mksysb_path*** option, and the script defines and uses it to install the partitions. The path must be local to the master.

2. Activate and Install Partitions (Perform These Steps in the HMC Interface)

__ Step 1.

To activate the partitions, do the following:

a. Select the partition (or partition profile) you want to activate.

b. Right–click on the partition (or partition profile) to open the menu.

c. Select **Activate**. The Activate Partition menu opens with a selection of partition profiles. Select a partition profile that is set to boot to the SMS menus.

d. Select **Open terminal** at the bottom of the menu to open a virtual terminal (vterm) window.

e. Select **OK**. A vterm window opens for each partition. After several seconds, the System Management Services (SMS) menu opens in the vterm window.

__ Step 2.

In the SMS menu on the vterm window, do the following:

a. Press the 6 key to select **6 Multiboot**.

```
 Version RHxxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
------------------------------------------------------------------------
Utilities

1  Password Utilities NOT available in LPAR mode
2  Display Error Log
3  Remote Initial Program Load Setup
4  SCSI Utilities
5  Select Console NOT available in LPAR mode
6  MultiBoot
7  Select Language
8  OK Prompt


                                        .------.
                                        |X=Exit|
                                        `------'
===> 6
```

b. Press the 4 key to select **4 Select Boot device**.

c. Press the 3 key to select **3 Configure 1st boot device**.

```
 Version RHxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
------------------------------------------------------------------------
Select Boot Devices

1  Display Current Settings
2  Restore Default Settings
3  Configure 1st Boot Device
4  Configure 2nd Boot Device
5  Configure 3rd Boot Device
6  Configure 4th Boot Device
7  Configure 5th Boot Device


                                        .------.
                                        |X=Exit|
                                        `------'
===> 3
```

d. Select the network adapter from the list of available devices.

e. Press the x key until you return to the Utilities menu.

f. Press the 3 key to select **3 Remote Initial Program Load Setup**.

```
 Version RHxxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
------------------------------------------------------------------------
Utilities

1  Password Utilities NOT available in LPAR mode
2  Display Error Log
3  Remote Initial Program Load Setup
4  SCSI Utilities
5  Select Console NOT available in LPAR mode
6  MultiBoot
7  Select Language
8  OK Prompt


                                  .------.
                                  |X=Exit|
                                  `------'
===> 3
```

g. Press the `1` key to select **1. IP Parameters**.

h. Type the appropriate information for Client IP Address, Server IP Address, Gateway IP Address, and Subnet Mask. Press the `x` key to exit to the Network Parameters menu.

```
 Version RHxxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
------------------------------------------------------------------------
IP Parameters

1.  Client IP Address                  [000.000.000.000]
2.  Server IP Address                  [000.000.000.000]
3.  Gateway IP Address                 [000.000.000.000]
4.  Subnet Mask                        [255.255.255.000]


                                  .------.
                                  |X=Exit|
                                  `------'
===>
```

i. Press the `2` key to select **2 Adapter Parameters**.

j. Select the network device you want to use and press Enter. If a menu prompts for further configuration of the network device, select the appropriate settings. When you are finished, press Enter to exit to the Network Properties menu.

k. Press the `x` key to exit to the previous menu.

l. Press the `3` key to select **3 PING Test**.

m. Select the network adapter for the ping test and press Enter.

n. If another menu displays the network adapter configuration information, press the x key to exit to the previous menu.

o. Press the `x` key to exit to the previous menu.

p. Press the `e` key to execute the ping operation.

```
 Version RHxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
-------------------------------------------------------------------------
Ping IP Address

1.  Client IP Address                    [000.000.000.000]
2.  Server IP Address                    [000.000.000.000]
3.  Gateway IP Address                   [000.000.000.000]
4.  Subnet Mask                          [255.255.255.000]


.---------.                                  .------.
|E=Execute|                                  |X=Exit|
`---------'                                  `------'
===> e
```

- If the ping operation does not return successfully, return to the **1. IP Parameters** menu selection to make sure all information is correctly entered. Also, check the **2 Adapter Parameters** selection to make sure the network adapter configuration is correct according to your network. You may also want to make sure the network adapter is functioning correctly.
- If the ping operation returns successfully, proceed with the network boot. Press the `x` key until you exit the SMS menus and begin the network boot.

3. Log in to Your Partition (Perform This Step in the AIX Environment)

When the installation has completed and the system has rebooted, the vterm window displays a login prompt.

Procedure	Location
Partition Backup and Storage Management	System Backup, Dump, and Storage Management on page 5-1
Remote System Management	Remote Management on page 6-1
User and Group Management	*AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
Software Installation	*AIX 5L Version 5.2 Installation Guide and Reference*
Performance Management	*AIX 5L Version 5.2 Performance Management Guide*
Printer Configuration	*AIX 5L Version 5.2 Guide to Printers and Printing*

Use the CD Device to Manually Install a Partition

In this procedure, you will use the system's built–in CD device to perform a New and Complete Base Operating System Installation on a partition.

Prerequisites

Before you begin this procedure, you should have already used the HMC to create a partition and partition profile for the client. Assign the SCSI bus controller attached to the CD–ROM device, a network adapter, and enough disk space for the AIX operating system to the partition. Set the boot mode for this partition to be SMS mode. After you have successfully created the partition and partition profile, leave the partition in the *Ready* state. For step–by–step instructions on how to create a partition and allocate I/O resources to a partition, refer to the *Hardware Management Console Installation and Operations Guide*.

1. Activate and Install the Partition (Perform These Steps in the HMC Interface)

__ Step 1.

Activate the partition, as follows:

a. Insert the **AIX 5L for POWER Version 5.2 Volume 1** CD into the CD device of the managed system.

b. Right–click on the partition to open the menu.

c. Select **Activate**. The Activate Partition menu opens with a selection of partition profiles. Be sure the correct profile is highlighted.

d. Select **Open terminal** at the bottom of the menu to open a virtual terminal (vterm) window.

e. Select **OK**. A vterm window opens for the partition. After several seconds, the login prompt displays in the vterm window.

__ Step 2.

In the SMS menu on the vterm, do the following:

a. Press the 6 key to select **6 Multiboot**.

```
 Version RHxxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
-------------------------------------------------------------------
Utilities

1  Password Utilities NOT available in partition mode
2  Display Error Log
3  Remote Initial Program Load Setup
4  SCSI Utilities
5  Select Console NOT available in partition mode
6  MultiBoot
7  Select Language
8  OK Prompt


                                                  .------.
                                                  |X=Exit|
                                                  `------'
===> 6
```

b. Press the 4 key to select **4 Select Boot device**.

c. Press the 3 key to select **3 Configure 1st boot device**.

```
 Version RHxxx_xxxxxx
(c) Copyright IBM Corp. 2001  All rights reserved.
-------------------------------------------------------------------
Select Boot Devices

1  Display Current Settings
2  Restore Default Settings
3  Configure 1st Boot Device
4  Configure 2nd Boot Device
5  Configure 3rd Boot Device
6  Configure 4th Boot Device
7  Configure 5th Boot Device


                                                  .------.
                                                  |X=Exit|
                                                  `------'
===> 3
```

d. Select the device number that corresponds to the SCSI CD–ROM device and press Enter. The SCSI CD–ROM device is now the first device in the Current Boot Sequence list.

e. Press the x key to exit to the previous menu.

f. Press the 4 key to select **4 Configure 2nd Boot Device**.

g. Select the device number that corresponds to the hard disk and press Enter.

h. Press the x key until you exit the SMS Utilities menu. After you exit the last SMS menu, you will be booting from the CD–ROM device.

__ Step 3.

Boot from the **AIX 5L for POWER Version 5.2 Volume 1**, as follows:

a. Select console and press Enter.

b. Select language for BOS Installation menus, and press Enter to open the Welcome to Base Operating System Installation and Maintenance menu.

c. Type 2 to select **Change/Show Installation Settings and Install** in the **Choice** field and press Enter.

```
            Welcome to Base Operating System
            Installation and Maintenance

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

    1 Start Install Now with Default Settings

    2 Change/Show Installation Settings and Install

    3 Start Maintenance Mode for System Recovery

    88  Help ?
    99  Previous Menu
>>> Choice [1]: 2
```

__ **Step 4.**

Verify or Change BOS Installation Settings, as follows:

a. Type `1` in the **Choice** field to select the **System Settings** option.

b. Type `1` for New and Complete Overwrite in the **Choice** field and press Enter.

Note: The installation methods available depend on whether your disk has a previous version of AIX installed.

c. When the Change Disk(s) screen displays, you can change the destination disk for the installation. If the default shown is correct, type `0` in the **Choice** field and press Enter. To change the destination disk, do the following:

1. Type the number for each disk you choose in the **Choice** field and press Enter. *Do not* press Enter a final time until you have finished selecting all disks. If you must deselect a disk, type its number a second time and press Enter.
2. When you have finished selecting the disks, type `0` in the **Choice** field and press Enter. The Installation and Settings screen displays with the selected disks listed under `System Settings`.

d. If needed, change the primary language environment. Use the following steps to change the primary language used by this installation to select the language and cultural convention you want to use.

Note: Changes to the primary language environment do not take effect until after the Base Operating System Installation has completed and your system is rebooted.

1. Type `2` in the **Choice** field on the Installation and Settings screen to select the **Primary Language Environment Settings** option.
2. Select the appropriate set of cultural convention, language, and keyboard options. Most of the options are a predefined combination, however, you can define your own combination of options.
   - To choose a predefined Primary Language Environment, type that number in the **Choice** field and press Enter.
   - To configure your own primary language environment, do the following:
     a. Select **MORE CHOICES**.
     b. Select **Create Your Own Combination**.
     c. When the Set Primary Cultural Convention screen displays, type the number in the **Choice** field that corresponds to the cultural convention of your choice and press Enter.
     d. When the Set Primary Language screen displays, type the number in the **Choice** field that corresponds to your choice for the primary language and press Enter.
     e. When the Set Keyboard screen displays, type the number in the **Choice** field that corresponds to the keyboard attached to the system and press Enter.

e. To set advanced options, type `3` and press Enter. The advanced options available in AIX 5.2 allow you to change the desktop application, enable or disable the Trusted Computing Base option, enable the 64–bit kernel, enable the Enhanced Journaled File System (JFS2) option, install graphics software, install the documentation services software, and more. For more information about the advanced options available in AIX 5.2, see the *AIX 5L Version 5.2 Installation Guide and Reference*.

f. After you have made all of your selections, verify that the selections are correct. Press Enter to confirm your selections and to begin the BOS Installation. The system automatically reboots after installation is complete.

__ Step 5.

Complete the BOS Installation, as follows:

a. Type `vt100` as the terminal type.

```
                    Set Terminal Type
The terminal is not properly initialized.  Please enter a terminal type
and press Enter.  Some terminal types are not supported in
non-English languages.

     ibm3101          tvi912          vt330
     ibm3151          tvi920          vt340
     ibm3161          tvi925          wyse30
     ibm3162          tvi950          wyse50
     ibm3163          vs100           wyse60
     ibm3164          vt100           wyse100
     ibmpc            vt320           wyse350
     lft              sun


                  +-----------------------Messages-------------------------
                  | If the next screen is unreadable, press Break (Ctrl-c)
    88  Help ?    | to return to this screen.
    99  Exit      |
                  |
>>> Choice []:   vt100
```

b. In the License Agreement menu, select **Accept License Agreements**.

c. Select **yes** to ACCEPT Installed License Agreements.

d. Press F10 (or Esc+0) to exit the License Agreement menu.

e. In the Installation Assistant main menu, select **Set Date and Time**.

```
               Installation Assistant

Move cursor to desired item and press Enter.

  Set Date and Time
  Set root Password
  Configure Network Communications
  Install Software Applications
  Using SMIT (information only)


F1=Help             F2=Refresh          F3=Cancel         F8=Image
F9=Shell            F10=Exit            Enter=Do
```

f. Set the correct date, time, and time zone. Press the F3 (or Esc+3) key to return to the Installation Assistant main menu.

g. Select **Set root Password**. Set a root password for the partition.

h. Select **Configure Network Communications**. Select **TCP/IP Startup**. Select from the Available Network Interfaces and press Enter. Enter the appropriate network information in the Minimum Configuration and Startup menu and press Enter. Use the F3 (or Esc+3) key to return to the Installation Assistant main menu.

i. Exit the Installation Assistant by typing F10 (or Esc+0).

2. Manage Your Partition (Perform This Step in the AIX Environment)

When the installation has completed and the system has rebooted, the vterm window displays a login prompt.

At this point, you may want to perform several common system–administration procedures. The following table lists where to find information about performing these procedures.

Procedure	Location
Partition Backup and Storage Management	System Backup, Dump, and Storage Management on page 5-1
Remote System Management	Remote Management on page 6-1
User and Group Management	*AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
Software Installation	*AIX 5L Version 5.2 Installation Guide and Reference*
Performance Management	*AIX 5L Version 5.2 Performance Management Guide*
Printer Configuration	*AIX 5L Version 5.2 Guide to Printers and Printing*

Migrate a System to the AIX 5.2 Partition–Ready State

Use this procedure to migrate a separate system from AIX 5.1 or earlier to AIX 5.2. You could then make a system backup (**mksysb**) of this system, and install this **mksysb** to a partition or partitions on your managed system.

Prerequisites

Before you begin this procedure, you should have already performed the following tasks:

- There must be adequate disk space and memory available. AIX 5.2 requires 128 MB of memory and 2.2 GB of physical disk space.
- Create a backup of the system. For instructions on how to create a system backup, refer to the *AIX 5L Version 5.2 Installation Guide and Reference*.
- If the system you are installing must communicate with other systems and access their resources, determine the following information for this host: network interface, IP address, host name, and route to the network.

1. Migrate the System to AIX 5.2 (Perform These Steps in the AIX Environment)

__ **Step 1.**

Turn the system unit power switch from Off (0) to On (|). The system begins booting from the installation media.

__ **Step 2.**

Select the console. If you have more than one console, each might display a screen that directs you to press a key to identify your system console. The *system console* is the keyboard and display device used for installation and system administration. A different key is specified for each console displaying this screen. If this screen displays, press the specified key *only* on the device to be used as the system console. Press a key on one console only.

__ **Step 3.**

Select the language you prefer to use for installation instructions.

__ **Step 4.**

When the Welcome to Base Operating System Installation and Maintenance screen displays, select **Change/Show Installation Settings and Install** to verify the installation and system settings.

__ **Step 5.**

Verify the settings for Migration Installation, by following these steps:

a. Select **Migration** as the Method of Installation. Select the disk or disks you want to install.

```
  1  System Settings:
        Method of Installation.............Migration
        Disk Where You Want to Install.....hdisk0...
```

b. Select **Primary Language Environment Settings (AFTER Install)**.

c. Select **Advanced Options** and press Enter. To learn about the advanced options available, type `88` and press Enter in the Advanced Options menu to use the Help menu.

d. After you have made all of your selections, verify that the selections are correct and start the migration installation process.

e. When the Migration Confirmation menu displays, follow the menu instructions to list system information or to continue with the migration.

```
                              Migration Confirmation

   Either type 0 and press Enter to continue the installation, or type the
   number of your choice and press Enter.

     1  List the saved Base System configuration files which will not be
        merged into the system.  These files are saved in /tmp/bos.
     2  List the filesets which will be removed and not replaced.
     3  List directories which will have all current contents removed.
     4  Reboot without migrating.

     Acceptance of license agreements is required before using system.
     You will be prompted to accept after the system reboots.

 >>> 0  Continue with the migration.
    88  Help ?


+-------------------------------------------------------------------------------
 WARNING: Selected files, directories, and filesets (installable options)
 from the Base System will be removed.  Choose 2 or 3 for more information.


 >>> Choice[0]:
```

__ **Step 6.**

After the migration is complete, the system reboots. If the Set Terminal Type menu displays, type `vt100` for the terminal type.

```
                            Set Terminal Type
The terminal is not properly initialized.  Please enter a terminal type
and press Enter.  Some terminal types are not supported in
non-English languages.

     ibm3101          tvi912          vt330
     ibm3151          tvi920          vt340
     ibm3161          tvi925          wyse30
     ibm3162          tvi950          wyse50
     ibm3163          vs100           wyse60
     ibm3164          vt100           wyse100
     ibmpc            vt320           wyse350
     lft              sun


                   +-----------------------Messages-------------------------
                   | If the next screen is unreadable, press Break (Ctrl-c)
    88  H?         | to return to this screen.
    99  E          |
                   |
>>> Choice []:    vt100
```

__ **Step 7.**

In the License Agreement menu, select **Accept License Agreements**.

__ **Step 8.**

Select **yes** to ACCEPT Installed License Agreements.

__ **Step 9.**

Press F10 (or Esc+0) to exit the License Agreement menu.

__ **Step 10.**

Verify the settings in the Installation Assistant.

```
                Installation Assistant

Move cursor to desired item and press Enter.

  Set Date and Time
  Set root Password
  Configure Network Communications
  Install Software Applications
  Using SMIT (information only)


F1=Help             F2=Refresh          F3=Cancel           F8=Image
F9=Shell            F10=Exit            Enter=Do
```

__ **Step 11.**

Press F10 (or Esc+0) to exit the Installation Assistant.

__ **Step 12.**

When the login prompt displays, log in as the root user to perform system administration tasks.

2. Manage Your Migrated System (Perform This Step in the AIX Environment)

When the installation has completed and the system has rebooted, the terminal window displays a login prompt.

At this point, you may want to perform several common system–administration procedures. The following table lists where to find information about performing these procedures.

Procedure	Location
Partition Backup and Storage Management	System Backup, Dump, and Storage Management on page 5-1
Remote System Management	Remote Management on page 6-1
User and Group Management	*AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
Software Installation	*AIX 5L Version 5.2 Installation Guide and Reference*
Performance Management	*AIX 5L Version 5.2 Performance Management Guide*
Printer Configuration	*AIX 5L Version 5.2 Guide to Printers and Printing*

Update an Existing NIM Environment to the Latest AIX Recommended Maintenance Level

Use this procedure to update an existing NIM environment that was created with the **nim_master_setup** script to the latest recommended maintenance level of AIX.

Prerequisites

Before you begin this procedure, you should have already created a backup of the system. For instructions on how to create a system backup, refer to the *AIX 5L Version 5.2 Installation Guide and Reference*.

1. Update Your NIM Environment to the Latest Recommended Maintenance Level (Perform These Steps in the AIX Environment)

__ **Step 1.**

Insert the latest AIX update CD into the CD–ROM drive.

__ **Step 2.**

Update the **bos.rte.install** fileset by using the **geninstall** command as follows:

```
# geninstall -d /dev/cd0 bos.rte.install
```

__ **Step 3.**

Run the **install_all_updates** script, as follows:

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

- The **install_all_updates** script will first check if your system is at the latest known recommended maintenance level.
- If your system is not at the latest known recommended maintenance level, then the **install_all_updates** script updates the system to the latest maintenance level of AIX.

Note: The output from the **install_all_updates** script is in the **/var/adm/ras/install_all_updates.log** log file.

__ **Step 4.**

After the update is complete, the system will instruct you to reboot the system. Reboot the system by using the **shutdown** command as follows:

```
# shutdown -Fr
```

__ **Step 5.**

Run the **nim_update_all** script to update the NIM resources that were created by the **nim_master_setup** script, as follows:

```
# nim_update_all  Output similar to the following displays:

############################ NIM update all ###################################
#                                                                             #
#  During script execution, NIM client and resource updating times            #
#  may vary. To view the install log at any time during nim_update_all,       #
#  run the command: tail -f /var/adm/ras/nim.update in a separate screen.     #
#                                                                             #
###############################################################################


 NSORDER=local,bind
 Adding updates to lpp_res lpp_source....done
 Updating spot_res using updated lpp_source lpp_res....done

 Attempting to replace mksysb resource generic_sysb...
 Removing old mksysb resource generic_sysb....done
 Creating image.data file....done
 Checking /export/nim space requirement...

 Generating list of client objects in NIM environment...
```

Note: The **nim_update_all** script will use the device /**dev**/**cd0** by default. The output from the **nim_update_all** script is shown in the /**var**/**adm**/**ras**/**nim.update** log file.

__ **Step 6.**

A new generic system backup (**mksysb**) will be created and will replace the existing generic **mksysb**, unless the **–B** flag is specified. *All clients* in the environment will be updated, unless the **–u** flag is specified.

2. Manage Your Partition (Perform This Step in the AIX Environment)

When the installation has completed and the system has rebooted, the terminal window displays a login prompt.

At this point, you may want to perform several common system–administration procedures. The following table lists where to find information about performing these procedures.

Procedure	**Location**
Partition Backup and Storage Management	System Backup, Dump, and Storage Management on page 5-1
Remote System Management	Remote Management on page 6-1
User and Group Management	*AIX 5L Version 5.2 System Management Guide: Operating System and Devices*
Software Installation	*AIX 5L Version 5.2 Installation Guide and Reference*
Performance Management	*AIX 5L Version 5.2 Performance Management Guide*
Printer Configuration	*AIX 5L Version 5.2 Guide to Printers and Printing*

Chapter 5. System Backup, Dump, and Storage Management

Most system backup, dump, and storage–management solutions depend on I/O devices. On a partitioned system, I/O devices (such as tape or CD–ROM) are not always available to all partitions. This chapter offers recommended solutions to minimize transfer of I/O devices among partitions.

System Backup

A system backup is a copy of the root volume group (**rootvg**) of your system and is often referred to as a *mksysb*, in reference to the command used to create the system backup. The root volume group contains the following:

- Startup commands
- Base Operating System commands and files
- System configuration information
- Optional software products

All mounted JFS (Journaled File Systems) and JFS2 (Enhanced Journaled File Systems) in the **rootvg** are backed up. Paging space and logical volume information is saved so that the **rootvg** will be recreated as it was when the system backup is reinstalled. If there are JFS or JFS2 file systems that are not to be backed up, you can use an exclude list or you can unmount them before the backup is made.

The following table describes the methods you can use to back up a system.

Table 12. System Backup Methods

Backup Method	Considerations
NIM*	Allows fast backup and recovery of a partition. Because all images are backed up to one system (NIM master), you should also back up that system and images to other physical media (tape, CD–RW, DVD–RAM).
mkcd command	Allows creation of a bootable system backup to CD–ROM or DVD–RAM. You can provide an existing **mksysb** image from another partition if the backup device is not available at the partition being backed up. The **mkcd –r** command allows backup (not bootable) of images and files to a CD–RW or DVD–RAM.
mksysb command with a tape device	Creates a bootable backup only on the partition the drive is connected to. Must boot from CD or tape to reinstall. Remote tape drives are supported with Sysback (for more information, see http://sysback.services.ibm.com).

* Recommended Method

For more information regarding system backups, refer to the *AIX 5L Version 5.2 Installation Guide and Reference*. Other options offered during backup creation are excluding file or directories, as well as creating map files so that the system is restored to exactly the same physical partitions on the disk.

Creating a System Backup

You can create a system backup by using one of the following methods:

Using NIM

With the NIM environment, you can create a system backup that is a selectable resource. That selectable resource can be used to reinstall the partition on which it was created, or it can be cloned to another partition. Because of its flexibility, NIM is the recommended method to back up and reinstall your partitions.

To use NIM to create a system backup, do the following:

1. If your partitions were installed with NIM, go to step 5.
2. On your NIM master, to determine whether your partition is already defined as a NIM client, type:

```
# lsnim -t standalone
```

3. If the target partition is not already a NIM client, configure it by running the following on the target partition:

```
# smitty niminit
```

4. On your NIM master, run the following to define the target partition (the partition to be backed up) as a NIM client:

```
# smitty nim_mkmac
```

5. On your NIM master, type the following to open the Define a Resource menu:

```
# smitty nim_mkres
```

6. Select **mksysb** and type the appropriate information. This menu defines the **mksysb** resource and also creates the system backup image.

   Note: Be sure to change the **CREATE system backup image?** selection to **yes**.

```
                                Define a Resource

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                        [Entry Fields]
* Resource Name                                         [P1_backup]
* Resource Type                                          mksysb
* Server of Resource                                    [master]
* Location of Resource                                  [export/nim/mksysb/P1_backup]
  Comments                                              []

  Source for Replication                                []
                  -OR-
  System Backup Image Creation Options:
    CREATE system backup image?                          yes
    NIM CLIENT to backup                                [system1]
    PREVIEW only?                                        no
    IGNORE space requirements?                           no
    EXPAND /tmp if needed?                               no
    Create MAP files?                                    no
    Number of BLOCKS to write in a single output        []
     (leave blank to use system default)
    Use local EXCLUDE file?                              no
     (specify no to include all files in backup)
                  -OR-
    EXCLUDE_FILES resource                              []
     (leave blank to include all files in backup)
```

Using CD Media

If you have a CD–RW or DVD–RAM connected to one of your partitions, you can create bootable system backups. You can use the **mkcd** command to create a bootable image on or mount a **mksysb** image to another partition or system that has the device to create and burn the bootable image. Therefore, the device can be assigned to only one partition when creating backup CDs from multiple partitions. To reinstall the systems, you must assign a CD device to the partition being reinstalled.

To create a backup to CD media, do the following:

1. Type:

```
# smitty mkcd
```

   – You are asked whether you are using an existing **mksysb** image. If you want a backup of this partition, answer No to this question.

   – If you do use an existing **mksysb** image (possibly from another partition), answer yes. You must enter the location (including the image name) of the existing **mksysb**.

2. If you want to save the bootable CD image to burn later, answer no to the **Create the CD or DVD now?** selection.

To burn the CD or DVD at a later time (or to burn additional media), run the following:

```
# burn_cd /dev/cd1 /mkcd/cd_images/   cd_image_12510
```

The image name *cd_image_12510* includes the process ID. The process ID displays when the **mkcd** command executes.

For further information about creating system backups on CD or DVD, see the *AIX 5L Version 5.2 Installation Guide and Reference*, as well as the **/usr/lpp/bos.sysmgt/mkcd.README.txt** file.

Using Tape Media

If you have a tape drive assigned to your partition, you can create a system backup to tape. To create a backup to tape, type the following:

```
smitty mksysb
```

If you want to back up to a file, you can use a separate file system (ensure that you exclude that file system when you create the backup) or a file in a user volume group. For further information about creating a root volume group backup to tape or file, see the *AIX 5L Version 5.2 Installation Guide and Reference*.

Installing a System Backup Using NIM

You can use the NIM environment to install a system backup onto one or more of your partitions. NIM is recommended because of its flexibility and customizing options for installation and system management. Also, NIM allows for multiple installations at the same time. When you install a system backup onto a partition other than the original partition, you are cloning a partition system image onto a target partition.

Before you can use NIM to install a system backup, make sure that the following conditions are met:

- Your network environment must be working correctly. The NIM master must be configured correctly, and the lpp_source, SPOT, and mksysb resources must be defined. Refer to either Use a Separate AIX System as a NIM Master to Use NIM to Install Each Partition on page 4-9 or Configure an Initial Partition as a NIM Master to Use NIM to Install the Remaining Partitions on page 4-2 for instructions on setting up NIM in a partitioned environment.
- The target partitions might not contain the same hardware devices or adapters. If this is the case, then the mksysb, SPOT, and lpp_source resources will be needed to install the needed device support.
- Because NIM configures TCP/IP at the end of an installation, it is recommended that a bosinst_data resource be allocated for cloning mksysb installations with the **RECOVER_DEVICES** field set to **no**. This action prevents the BOS installation process from attempting to configure the devices as they were on the source machine of the mksysb.

1. To use a **mksysb** resource to install a NIM client, enter the **smit nim_bosinst** fast path.
2. Select a target for the operation.

```
                  Select a TARGET for the operation

Move cursor to desired item and press Enter.

  lpar1     machines       standalone
  lpar2     machines       standalone
  lpar3     machines       standalone
```

3. Select **mksysb** as the installation TYPE.
4. Select the **mksysb** to use for the installation.
5. Select the SPOT to use for the installation.
6. The Install the Base Operating System on Standalone Clients panel looks similar to the following:

```
Type or select values in entry fields.

Press Enter AFTER making all desired changes.

[TOP]                                                  [Entry Fields]
* Installation Target                                 lpar1
* Installation TYPE                                   mksysb
* SPOT                                                520spot_res
  LPP_SOURCE                                          []
  MKSYSB                                              520mksysb

  BOSINST_DATA to use during installation             []                      +
  IMAGE_DATA to use during installation               []                      +
  RESOLV_CONF to use for network configuration        []                      +
  Customization SCRIPT to run after installation      []                      +
  Customization FB Script to run at first reboot      []                      +
    ACCEPT new license agreements?                    [no]                    +
  Remain NIM client after install?                    [yes]                   +
 [MORE...35]
```

7. Select a **bosinst_data** resource to perform a non–prompted installation. Select the **bosinst_ow** resource for a new and complete overwrite installation.
8. Select a **resolv_conf** resource to establish network configuration for the client partition.
9. Set the **Accept new License Agreements** field to yes.

   The Install the Base Operating System on Standalone Clients menu looks similar to the following:

```
Type or select values in entry fields.

Press Enter AFTER making all desired changes.

[TOP]                                                  [Entry Fields]

* Installation Target                                  lpar1
* Installation TYPE                                    mksysb
* SPOT                                                 520spot_res
  LPP_SOURCE                                          []
  MKSYSB                                              520mksysb


  BOSINST_DATA to use during installation             [bosinst_ow]       +
  IMAGE_DATA to use during installation               []                 +
  RESOLV_CONF to use for network configuration        [resolv_res]       +
  Customization SCRIPT to run after installation      []                 +
  Customization FB Script to run at first reboot      []                 +
    ACCEPT new license agreements?                    [yes]              +
  Remain NIM client after install?                    [yes]              +
  PRESERVE NIM definitions for resources on           [yes]              +
    this target?

  FORCE PUSH the installation?                        [no]               +

  Initiate reboot and installation now?               [yes]              +
    -OR-
  Set bootlist for installation at the                [no]               +
     next reboot?

  Additional BUNDLES to install                       []                 +
  -OR-
  Additional FILESETS to install                      []                 +
    (bundles will be ignored)

[MORE...20]
```

10. Press Enter to install the NIM client.
11. If the client partition being installed is not already a running, configured NIM client, NIM will not automatically reboot the machine over the network for installation. If the client was not rebooted automatically from SMIT, initiate a network boot from the client to install it. For instructions on how to do this procedure, refer to “2. Activate and Install Partitions (Perform These Steps in the HMC Interface)” on page 4-12.

System Dump Management

If your machine has more than 4 GB of real memory, a dedicated dump device is created at installation time. Otherwise, the /**dev**/**hd6** paging space is used as the dump device. If a system crash occurs and paging space was used as the dump device, the dump is copied to the /**var**/**adm**/**ras**/**vmcore.** ***n*** file by default, where ***n*** is a sequence number. If there is not enough space to perform the copy, the user is prompted during reboot to save the dump to some other media.

To avoid losing a dump due to a lack of a tape drive configured to the partition, always create a separate dump device that is the same size as your paging space, given that paging space is currently your dump device.

To verify your dump device, type `smitty dump`, and select **Show Current Dump Devices**. If paging space is your dump device, the output will be similar to the following:

```
                              COMMAND STATUS

 Command: OK            stdout: yes           stderr: no

 Before command completion, additional instructions may appear below.

 primary              /dev/hd6
 secondary            /dev/sysdumpnull
 copy directory       /var/adm/ras
 forced copy flag     TRUE
 always allow dump    FALSE
 dump compression     OFF
```

To create and change to a dedicated dump device, do the following:

1. Determine the size of the hd6 paging space (in logical partitions) by running the following:

```
# lsvg -l rootvg
```

   The output will be similar to the following:

```
rootvg:
 LV NAME             TYPE       LPs   PPs   PVs  LV STATE      MOUNT POINT
 hd5                 boot       2     2     1    closed/syncd  N/A
 hd6                 paging     53    53    1    open/syncd    N/A
 hd8                 jfslog     1     1     1    open/syncd    N/A
 hd4                 jfs        9     9     1    open/syncd    /
 hd2                 jfs        130   130   1    open/syncd    /usr
 hd9var              jfs        2     2     1    open/syncd    /var
 hd3                 jfs        8     8     1    open/syncd    /tmp
 hd1                 jfs        1     1     1    open/syncd    /home
 hd10opt             jfs        5     5     1    open/syncd    /opt
 In the preceding example, the paging space is 53 LPs (logical  partitions)
in size.
```

2. To create a dump logical volume, type:

```
smitty mklv  When you are prompted for the volume group, type  rootvg .
```

3. In the next menu, fill in the **Logical volume NAME** and the **Number of LOGICAL PARTITIONS** fields. Type `dump` for Logical Volume TYPE. Press Enter after you make your selections.

```
                                Add a Logical Volume

 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
   Logical volume NAME                               [dumplv]
 * VOLUME GROUP name                                  rootvg
 * Number of LOGICAL PARTITIONS                      [53]                    #
   PHYSICAL VOLUME names                             [hdisk0]                +
   Logical volume TYPE                               [dump]
   POSITION on physical volume                        middle                 +
   RANGE of physical volumes                          minimum                +
   MAXIMUM NUMBER of PHYSICAL VOLUMES                []                      #
     to use for allocation
   Number of COPIES of each logical                   1                      +
     partition
   Mirror Write Consistency?                          active                 +
   Allocate each logical partition copy               yes                    +
     on a SEPARATE physical volume?
   RELOCATE the logical volume during                 yes                    +
     reorganization?
   Logical volume LABEL                              []
   MAXIMUM NUMBER of LOGICAL PARTITIONS              [512]                   #
   Enable BAD BLOCK relocation?                       yes                    +
   SCHEDULING POLICY for reading/writing              parallel               +
     logical partition copies
   Enable WRITE VERIFY?                               no                     +
   File containing ALLOCATION MAP                    []
   Stripe Size?                                      [Not Striped]           +
```

4. To change the primary dump device, type:

```
smitty dumpchgp
```

You will be prompted for the new dump device.

```
                          Change Primary Dump Device

 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
 * Primary dump device                                [/dev/dumplv]
```

5. To validate your dump devices, type the following:

```
smitty dump
```

Select **Show Current Dump Devices** . The output will be similar to the following:

```
                              COMMAND STATUS

 Command: OK            stdout: yes           stderr: no

 Before command completion, additional instructions may appear below.

 primary              /dev/dumplv
 secondary            /dev/sysdumpnull
 copy directory       /var/adm/ras
 forced copy flag     TRUE
 always allow dump    FALSE
 dump compression     OFF
```

Storage Management

If you have multiple **mksysb** images stored on a NIM master (or on some other partition), you can use the **mkcd –r** command to store them to CD–R or DVD–RAM. The images to be written to CD–R or DVD–RAM must be in one directory structure, so that a directory can be passed to the **mkcd** command as the starting point of the backup.

Use the **mkcd** command as follows:

```
mkcd {-d cd_device} [-r directory] [-R | -S] [-I cd_image_dir] [-D] [-L]
```

Where:

–d	Specifies the CD–R or DVD–RAM device
–S	Indicates to stop the backup before burning the image (image can be burned at a later time)
–r	Specifies the directory from which to create your CD image
–I	Specifies the directory in which to write the CD image
–R	Saves the CD images (use this flag if you want to burn multiple copies)
–D	Enables debugging for the **mkcd** command
–L	Creates final CD images that are DVD–sized (up to 4.38 GB)

For example, to back up the stored **mksysb** images in the **/export/nim/mksysbs** directory to a DVD–RAM device (**/dev/cd1**), and use a temporary file system mounted on the **/largefilesystem** directory to use as temporary CD image storage, type the following:

```
# mkcd -d /dev/cd1 -r /export/nim/mksysbs -I /largefilesystem -L
```

To verify the **mksysb**, run the following commands:

```
# mount -o ro /dev/cd0/mnt
# cd /mnt
# ls
```

Chapter 6. Remote Management

This chapter discusses how you can use the Hardware Management Console (HMC) to manage your system remotely. For information about how you can remotely manage partitions through the command line on the HMC, see the *Hardware Management Console* ESCALA*Installation and Operations Guide*.

Each of the following system–management methods can be performed using the HMC interface or from the command line.

- Use the HMC client to remotely manage any AIX partition or system. All AIX plug–ins on the AIX system can be managed remotely from the HMC client, provided that the Web-based System Manager framework version is compatible. The operating system checks each plug–in for compatibility with the Web–based System Manager framework. If it is not compatible for that plug–in, a message displays, indicating that the plug–in cannot be managed by the client.
- Use an AIX partition or system to remotely manage an HMC. All HMC plug–ins on the HMC server may be managed remotely from the AIX system, provided that the AIX system is at a compatible Web-based System Manager framework version. Otherwise, an error message displays indicating that the AIX system cannot manage the HMC server.
- Use Web-based System Manager Remote Client to remotely manage an HMC server. For instructions on how to install the Remote Client, refer to the *AIX 5L Version 5.2* Web-based System Manager *Administration Guide*. All HMC plug–ins on the HMC server may be managed remotely from the Remote Client, provided that the Remote Client is at a compatible Web–based System Manager framework version. Otherwise, an error message displays, indicating that the Remote Client cannot manage the HMC server. The only plug–in that is an exception is the Service Agent plug–in.
- Use an HMC client remotely manage another HMC client. All HMC plug–ins on the HMC server may be managed remotely from the HMC client. The only plug–in that is an exception is the Service Agent plug–in.

Note: When remotely managing the HMC, the command–line tasks you can perform are limited to configuration tasks.

For more information on remote management, see either of the following readme files:

- **/usr/websm/readme.html**
- **/usr/websm/readme.txt**

Remote Management From the HMC to AIX Partitions

After the partition is configured on the network, you can add the partition as a host in the HMC interface, as follows:

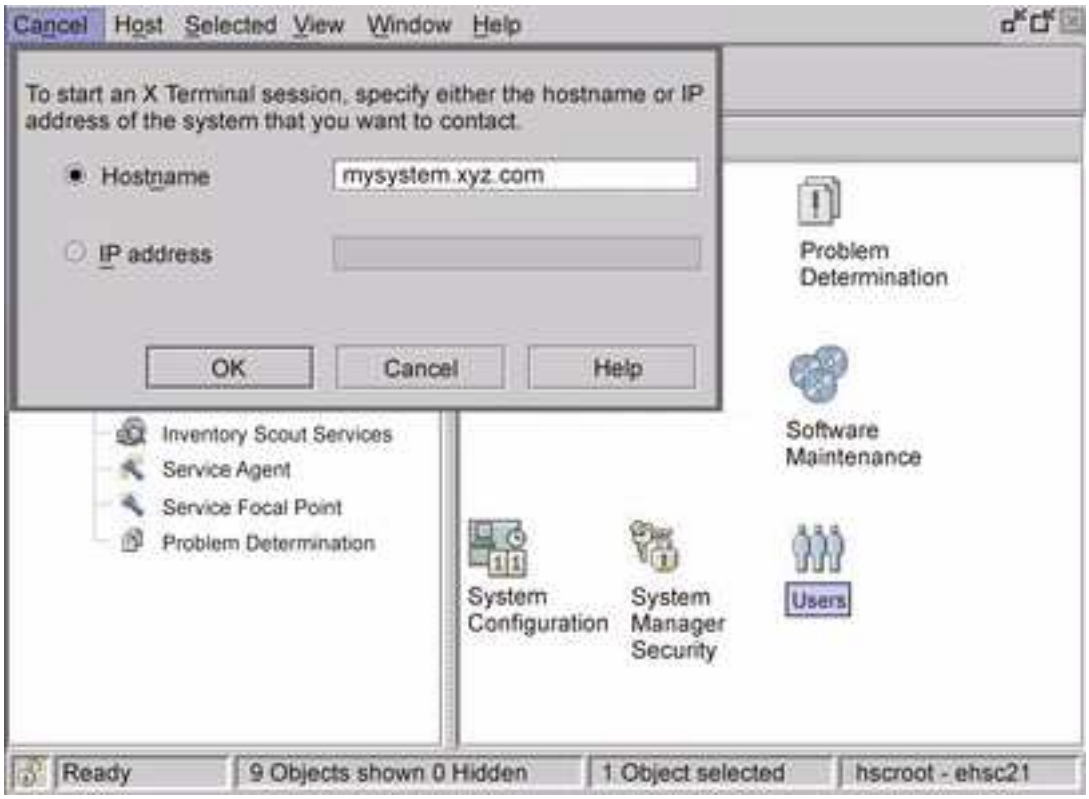
1. Select **Console** –> **Add** –> **Hosts**.

Figure 6. Adding a host using the console menu. This illustration shows how to navigate from the console menu to the hosts selection. To add the partition as a host in the HMC interface, select **Console** from the menu bar, then select **Add**, and then select **Hosts**.

2. Type the host name of the partition to add. The host will be added to the list.

After the partition is configured on the network, you can open an xterm window to connect to the partition within the HMC interface by selecting **Console** –> **Open Terminal**. Enter either the host name or the IP address of the system.

Figure 7. Opening an xterm window. This illustration shows how to open an xterm window to connect to a partition. To open an xterm window in the HMC interface, select **Console** from the menu bar, and then select **Open Terminal**. Enter the host name or IP address of the system.


Cancel
Host
Selected
View
Window
Help
To start an X Terminal session, specify either the hostname or IP address of the system that you want to contact.
Hostname
mysystem.xyz.com
IP address
OK
Cancel
Help
Problem Determination
Software Maintenance
Inventory Scout Services
Service Agent
Service Focal Point
Problem Determination
System Configuration
System Manager Security
Users
Ready
9 Objects shown 0 Hidden
1 Object selected
hscroot - ehsc21

Chapter 7. Hints and Tips

This chapter provides hints and tips to help you when working with AIX in a partitioned environment.

Naming Your Operating System Host Name

Each partition, including the Full System Partition, must have a unique host name that can be resolved. Host names cannot be reused between the Full System Partition and the logical partitions.

If the host name of the partition must be changed, before changing the host name of the partition, do the following:

1. If your system's level of AIX is earlier than the `5100-02` maintenance package level, skip this step and go to step 2.

```
/usr/sbin/rsct/bin/runact -c IBM.ManagementServer SetRTASPollingInterval
Seconds=0
```

2. Run the following command:

```
/usr/sbin/rsct/bin/lsrsrc IBM.ManagementServer Hostname
```

If the partition is managed by multiple HMCs, multiple entries might exist, because each HMC has its own entry. The output will be similar to the following:

```
resource 1:
          Hostname="hmc1.mydomain.mycompany.com"
```

3. For each entry, remove the resource using the host name shown. For example, run the following command:

```
/usr/sbin/rsct/bin/rmrsrc -s 'Hostname="hmc1.mydomain.mycompany.com"'
IBM.ManagementServer
```

You can verify that all entries have been removed by running Step 2 again.

4. Run the following command:

```
/usr/sbin/rsct/bin/rmcctrl -z
```

5. Change the host name of the partition.

6. After the host name has been changed, run the following command:

```
/usr/sbin/rsct/bin/rmcctrl -A
```

For information on updating the partition information on the HMC, see the *Hardware Management Console Installation and Operations Guide*.

Network Adapter Communication Between Partitions and the HMC

After a partition has been started, it uses the network adapter to communicate with the HMC. Both the HMC and the partition must be configured so they can use the network adapters to communicate with each other. The partition must be configured to identify the HMC (or HMCs) on the network. It is recommended that the network be configured using a Domain Name Service (DNS) server.

You can use either fully qualified host names or short host names to identify partitions and HMCs. However, it is recommended that each partition and HMC be identified using a fully

qualified host name, as this identification ensures unique naming of all the partitions and the HMC in the network. Fully qualified host names cannot be more than 100 bytes in length.

The HMC and partitions can also be configured using a short host name, where the domain name is not defined. This is typically done in a private or test network. If the HMC is defined using a short host name, you must perform extra network configuration steps to ensure correct communications between the partitions and the HMC. If you use short host names rather than fully qualified host names, make sure that the short host names are unique and that the mappings to IP addresses are properly specified.

The search order between the local **/etc/hosts** file and the DNS can be specified using the **/etc/netsvc.conf** file or **/etc/irs.conf** file.

The following examples illustrate the scenarios supported:

- If you are using DNS and your partition and the HMC are using fully qualified host names, then no additional network configuration is required.
- If you are using DNS and your partition is using a short host name, such as `partition_1` and the HMC is also using a short host name, such as `hmc123`, both must be added to the local **/etc/hosts** file, as shown in the following:

```
 root@partition_1
-> cat /etc/hosts

127.0.0.1   loopback localhost

9.3.3.151   partition_1
9.3.3.152   hmc123
```

- If you are not using DNS and your partition is using a fully qualified host name, such as `partition_1.mydomain.mycompany.com`, and the HMC is also using a fully qualified host name, such as `hmc123.mydomain.mycompany.com`, both must be added to the local **/etc/hosts** file, as shown in the following:

```
 root@partition_1.mydomain.mycompany.com
-> cat /etc/hosts

127.0.0.1   loopback localhost

9.3.3.151   partition_1.mydomain.mycompany.com
9.3.3.152   hmc123.mydomain.mycompany.com
```

- If you are not using DNS and your partition is using a short host name, such as `partition_1` and the HMC is also using a short host name, such as `hmc123`, both must be be added to the local **/etc/hosts** file, as shown in the following:

```
 root@partition_1
-> cat /etc/hosts

127.0.0.1   loopback localhost

9.3.3.151   partition_1
9.3.3.152   hmc123
```

- Your HMC is using a short host name, such as `hmc123`, and you would like to use both a fully qualified host name and a short host name for the HMC. In order for your partition to correctly communicate with the HMC, you must specify the short host name before the fully qualified host name in the partition's **/etc/hosts** file, as shown in the following:

```
 root@partition_1.mydomain.mycompany.com
-> cat /etc/hosts

127.0.0.1   loopback localhost

9.3.3.151   partition_1.mydomain.mycompany.com
9.3.3.152   hmc123 hmc123.mydomain.mycompany.com
```

Shutting Down a Partition

This section provides information about how to shut down a partition by using the HMC and by using AIX.

Using AIX to Shut Down a Partition

When a partition is up, it is in the *Running* state. To use AIX to shut down a partition, do the following:

1. To restart AIX, on the AIX command prompt, type `shutdown -Fr`.

   The partition eventually changes to the *Starting* state, and the operator panel values display, which indicates AIX is now rebooting.

2. When the reboot is issued within AIX, the partition will boot according to the contents of the bootlist. To check the order of the boot devices, type `bootlist -m normal -o`

3. To shut down AIX, on the AIX command prompt, type `shutdown -F`.

The partition will eventually change to the *Ready* state. You have now shut down AIX and its partition.

To start AIX, on the HMC, select **Activate**. When you select **Activate**, the HMC uses the boot mode selection in the partition profile.

Using the HMC Interface to Shut Down a Partition

To use the HMC to shut down a partition, do the following:

1. Select the partition you want to shut down.
2. Right–click on the partition to open the menu.
3. Select **Operating System Reset**.
4. Select **Hard Reset**. This action sends a **halt** signal indicating which instance of AIX is to be shut down. If a vterm window was open while the hard reset was done, the vterm window remains open. The partition will then be in the *Ready* state.

To activate the partition, select the partition and press the right mouse button. Select **Activate**. When you select **Activate**, the HMC uses the boot mode selection in the partition profile.

Closing a vterm window does not shut down a partition. However, closing the window logs you off that session and kills any processes that you are running from that vterm window.

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AIX

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