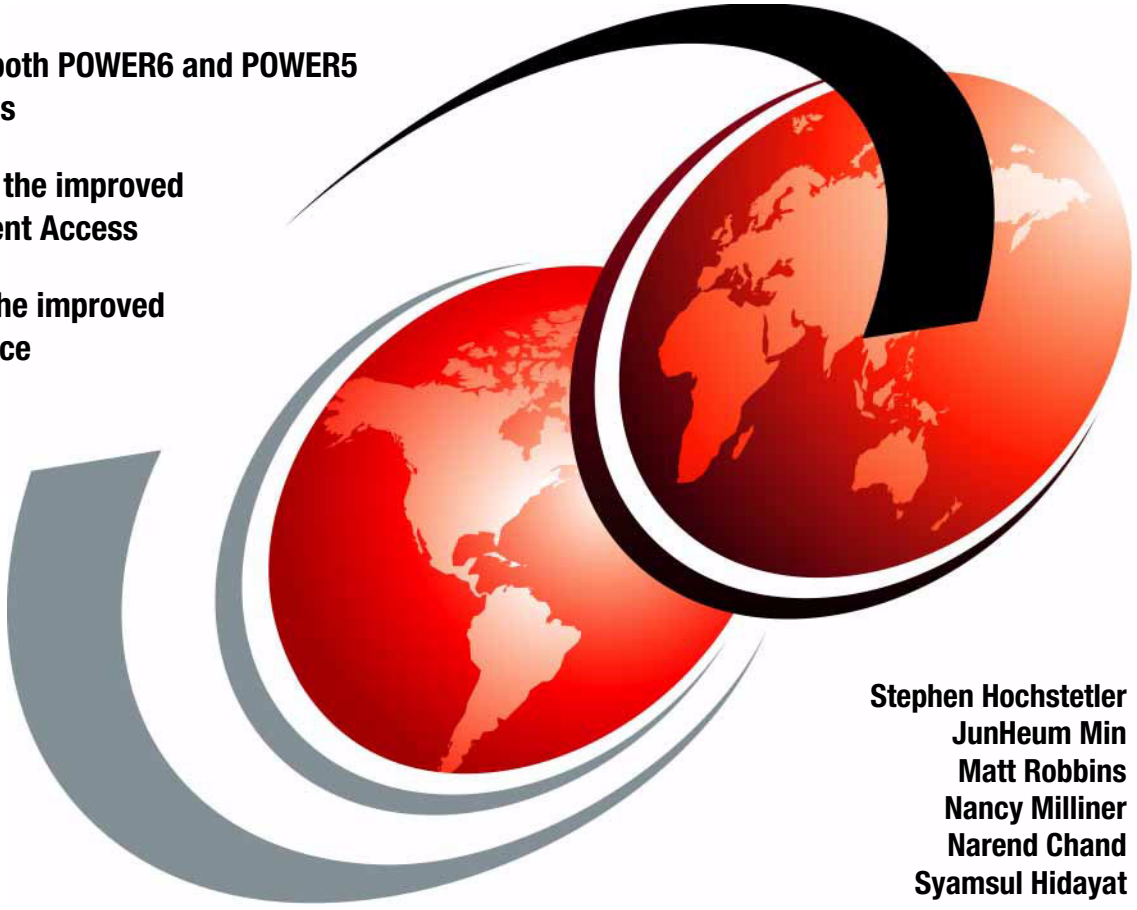
IBM

Hardware Management Console V7 Handbook

- Discusses both POWER6 and POWER5 technologies
- Documents the improved Remote Client Access
- Describes the improved user interface



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Note: Before using this information and the product it supports, read the information in “Notices” on page xi.

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This edition applies to Version 7, Release 3, Modification 10 of Hardware Management Console (product number 5639-N47).

Note: This book is based on a pre-GA version of a product and might not apply when the product becomes generally available. We recommend that you consult the product documentation or follow-on versions of this book for more current information.

Contents

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Preface

The IBM® Hardware Management Console (HMC) provides systems administrators a tool for planning, deploying, and managing IBM System p™ and IBM System i™ servers. This IBM Redbooks® publication is designed for system administrators to use as a desk-side reference when managing partition-capable System i and System p servers using the HMC.

The major functions that the HMC provides are server hardware management and virtualization (partition) management. You can find information about virtualization management in the following documents:

- *Advanced POWER Virtualization on IBM System p5: Introduction and Configuration*, SG24-7940
- *Virtualization and Clustering Best Practices Using IBM System p Servers*, SG24-7349
- *Logical Partitions on System i5: A Guide to Planning and Configuring LPAR with HMC on System i*, SG24-8000
- *LPAR Simplification Tools Handbook*, SG24-7231

In this book, we discuss how to:

- Configure the HMC
- Manage software levels on the HMC
- Use service functions on the HMC
- Update firmware of managed systems
- Move profiles from System i servers that previously did not connect to a HMC
- Use System Planning Tool deployments

In addition, we explain how to use the new HMC graphical user interface and the new HMC commands that are available with HMC Version 7, Release 3.

The team that wrote this book

This book was produced by a team of specialists from around the world working at the International Technical Support Organization (ITSO), Austin Center.

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- Mark Dewalt, IBM Austin
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- Stephanie L Jensen, IBM Austin
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1

HMC overview

The content of this book focuses on the Hardware Management Console (HMC), a member of the IBM Systems Director platform management family. IBM Systems Director provides IT professionals with the tools that they need to better coordinate and manage all of their virtual and physical resources in the data center.

The cost of managing the IT infrastructure has become the largest and fastest-growing component of overall IT spending for many organizations. Virtualization helps to address this cost through the consolidation of physical resources; however, virtualization also adds complexity to the system by creating a sharp increase in the number of managed virtual resources.

IT professionals are seeking more advanced capabilities and tools for managing both their physical and virtual systems across multiple architectures and environments. As virtualization becomes reality in today's IT infrastructures, the IBM Systems Director family can help businesses realize their full potential by providing a unified approach to platform management designed to lower IT operational costs and increase productivity. We discuss the HMC functions that manage the System p and System i servers in this book.

In this chapter, we tell you about the HMC concepts, the types of HMC, HMC connectivity, and enhancements in HMC Version 7.

For more detailed information about HMC, refer to the following sources:

- *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085
- Hardware Information Center

  http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp

1.1 HMC concepts

With the HMC, a system administrator can perform logical partitioning functions, service functions, and various system management functions using either the Web browser based user interface or the command line interface (CLI). The HMC uses its connection to one or more systems (referred to in this book as *managed systems*) to perform various functions, including:

- Creating and maintaining logical partitions in a managed system

  The HMC controls logical partitions in managed systems. We explain these tasks in detail in Chapter 7, “Partitioning” on page 219.
- Displaying managed system resources and status

  We explain these tasks in Chapter 2, “Basic operation” on page 17.
- Opening a virtual terminal for each partition

  The HMC provides virtual terminal emulation for AIX and Linux logical partitions and virtual 5250 console emulation for i5/OS® logical partitions.
- Displaying virtual operator panel values for each partition

  You can see the operator panel messages for all partition within managed systems in HMC.
- Powering managed systems on and off

  We explain these tasks in Chapter 2, “Basic operation” on page 17.
- Performing DLPAR operation

  With the HMC, you can perform DLPAR operations that change the resource allocation (such as processor, memory, physical I/O, and virtual I/O) dynamically for the specified partition. We explain these tasks in detail in Chapter 7, “Partitioning” on page 219.
- Managing Capacity on Demand operation

  We explain these tasks in Chapter 13, “Capacity on Demand” on page 373.
- Managing virtualization features

  We explain these tasks in Chapter 7, “Partitioning” on page 219.

- Managing platform firmware installation and upgrade

  We explain these tasks in Chapter 11, “Firmware maintenance” on page 303.

- Acting as a service focal point

  You can use the HMC as a service focal point for service representatives to determine an appropriate service strategy and to enable the Service Agent to call home to IBM. We explain these tasks in Chapter 12, “Service Management” on page 331.

1.1.1 User interface

HMC Version 7 uses a Web browser based user interface. This interface uses a tree-style navigation model that provides hierarchical views of system resources and tasks using drill-down and launch-in-context techniques to enable direct access to hardware resources and task management capabilities. It provides views of system resources and provides tasks for system administration. For more information about using the Web browser based user interface, see 2.1, “Using the Web browser based user interface” on page 18.

The remote interface has changed in this release to also use a browser interface instead of a WebSM interface.

1.1.2 User tasks and roles

Each HMC user can be a member of a different role. Each of these roles allows the user to access different parts of the HMC and to perform different tasks on the managed system. HMC roles are either *predefined* or *customized*. When you create an HMC user, you must assign that user a task role. Each task role allows the user varying levels of access to tasks that are available on the HMC interface.

You can assign managed systems and logical partitions to individual HMC users, allowing you to create a user that has access to managed system A but not to managed system B. Each grouping of managed resource access is called a *managed resource role*.

Table 1-1 lists the predefined HMC roles, which are the default on the HMC.

Table 1-1 Predefined HMC roles

User name	Role	Description
hmcoperator	Operator	The operator is responsible for daily system operation.
hmcsuperadmin	Super Administrator	The super administrator acts as the root user or manager of the HMC system. The super administrator has unrestricted authority to access and modify most of the HMC system.
hmcpe	Product Engineer	A product engineer assists in support situations but cannot access HMC user management functions. To provide support access for your system, you must create and administer user IDs with the product engineer role.
hmcservicerep	Service Representative	A service representative is an employee who is at your location to install, configure, or repair the system.
hmcviewer	Viewer	A viewer can view HMC information, but cannot change any configuration information.

1.2 HMC type

The HMC runs as an embedded application on an Intel® based workstation that can be a desktop or rack mounted system. The embedded operating system and applications take over the entire system, and no other applications are allowed to be loaded.

Whether you opt for a desktop or rack mounted version is a personal choice. Customers with space in their rack mounted systems would probably opt for the rack mounted version with the slide-away keyboard and display. The following options are available:

- 7042-C06 is a desktop HMC.
- 7042-CR4 is a rack mounted HMC.

All 7310 models are supported. The new machine type of the V7 HMC has the same hardware base with 7310-C06/CR4 as previous HMC versions. However,

the current POWER5™ HMC must be upgraded to POWER6™ HMC by order FC 0962.

Figure 1-1 is a picture of the IBM 7042 C06/CR4 HMC.

Figure 1-1 IBM 7042 Hardware Management Console

1.2.1 Desktop HMC

The supported desktop models are the 7042-C06 and older versions 7310 models. The older 7315 models are not supported by V7 of the HMC.

On the desktop you can connect a keyboard and mouse to either the standard keyboard, mouse PS/2 style connectors, or USB ports. You cannot connect any other devices to the HMC. Printers are not supported off the parallel port.

1.2.2 Rack mounted HMC

The supported rack mounted models are the 7042-CR4 and older versions 7310 models. The older 7315 models are not supported by V7 of the HMC. Figure 1-1 shows the HMC 7042-CR4 system unit as a standard 1 U unit and also the display and keyboard mounted in a standard 1 U pull-out tray. This model is a great choice for a dark machine room, where space is restricted.

You can find detail hardware information at this site:

http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp

1.2.3 HMC version matrix to support POWER servers

The HMC has several versions to support the different type of power processors (POWER4™, POWER5, and new POWER6). In this book, we focus on new

HMC supported POWER6. POWER5 servers must be at least GA7 SF240 firmware level to be managed by the new version of HMC.

Table 1-2 shows the interoperability between HMC and POWER™ processors.

Table 1-2 HMC and POWER Processors interoperability

HMC Version	Supported managed system
Version 7 and later	POWER6 and POWER5[a]
Version 4 and later, 5 and later, 6 and later	POWER5
Version 3 and later	POWER4

a. POWER5 servers must be at least GA7 SF240 firmware level.

You can find detailed information about HMC versions at:

http://www14.software.ibm.com/webapp/set2/sas/f/hmc/home.html

1.3 HMC connectivity

You can control your managed system through HMC directly or remote clients without installing any application. Figure 1-2 illustrates how HMCs might be implemented in your network.

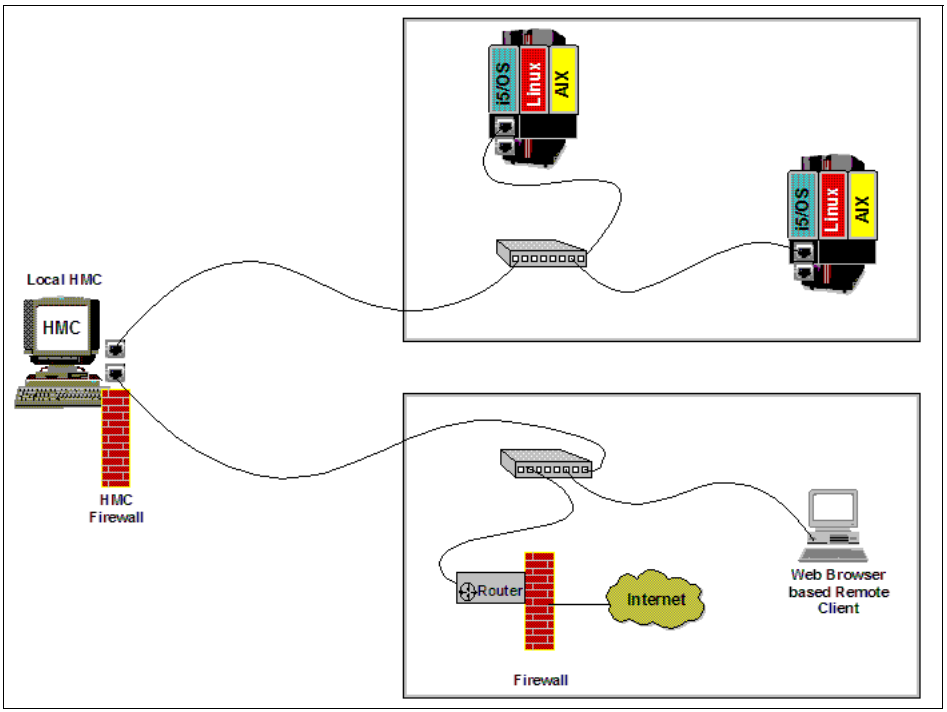


Figure 1-2 Implementations of HMCs

To provide flexibility and availability, you can implement HMCs as a local HMC or a redundant HMC, as shown in left side of Figure 1-3. To save space and to centralize multiple system management control points, you can configure multiple managed systems using a single HMC, as shown in right side of Figure 1-3.

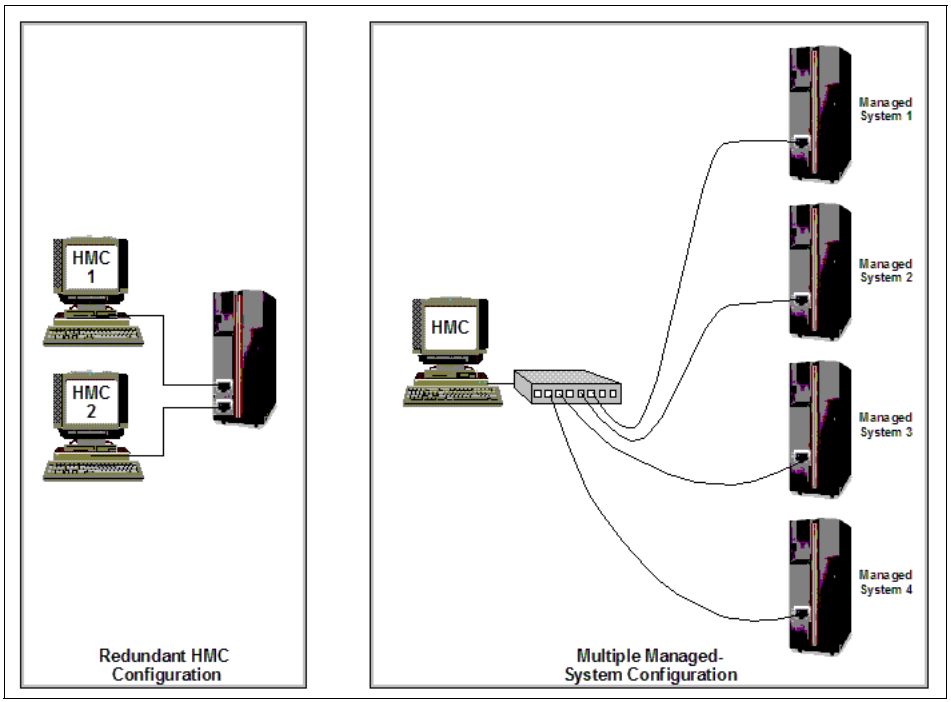


Figure 1-3 HMC connectivity option

1.3.1 Local HMC

A *local HMC* is one that is located physically close to the system that it manages and that is connected by either a private or public network. An HMC in a *private network* is a DHCP server for the service processors of the systems it manages. An HMC can also manage a system over a *public network* where the managed system's service processor IP address has been assigned manually using the Advanced System Management Interface (ASMI) or assigned by a DHCP server on the public network. For convenience of service personnel, an HMC is typically kept in close proximity to the servers that it manages.

1.3.2 Redundant HMC

A *redundant HMC* manages a system that is already managed by another HMC. When two HMCs manage one system, they are peers, and each can be used to control the managed system. If both HMCs are connected to the server using private networks, each HMC must be a DHCP server set up to provide IP addresses on two unique, non-routing IP ranges.

For best redundancy, redundant HMCs are kept on separate subnetworks and attach to different server support network ports.

1.4 Enhancements in HMC Version 7

HMC Version 7 includes several new functions that support new POWER6 technology features. The HMC also configures and manages IBM System p and System i systems based on the POWER5 technology.

In this section, we introduce the new functions of HMC Version 7 and POWER6. Several new functions in this version of the HMC for System i and System p come from System z™ HMC technology.

1.4.1 Web browser based user interface

To access remotely an HMC running HMC Version 4, 5, or 6, a special client program (WebSM) was required. WebSM is no longer required with HMC Version 7. Remote access to an HMC running Version 7 requires only a standard (and supported) Web browser.

Highlights of the new Web based user interface include:

- Persistent GUI session across login
- The ability to manage both POWER5 and POWER6

The differences in the GUI include:

- Simplified operations
- Reorganized panels
- More descriptive GUI settings
- Redesigned panels

For more information about the Web browser based user interface, see 2.1, “Using the Web browser based user interface” on page 18.

1.4.2 System Planning Tool

The System Planning Tool (SPT) is a tool for designing logically partitioned systems and is the replacement for the LPAR Validation Tool (LVT). SPT creates a system plan that is saved as a sysplan file. That system plan can be just one system or it can contain multiple systems, each with a unique system name.

A system plan, also referred to as *sysplan*, is a representation or data model of the resources that are included in the system and how they are allocated to each partition. When you create the sysplan in SPT, the file will reflect the intended LPAR configuration for a target server. This sysplan includes details on partition allocations of memory, processors, and the I/O hardware required for each partition.

For additional information about the SPT, see Chapter 4, “System plans and the HMC” on page 133.

1.4.3 Customizable Data Replication

Customizable Data Replication allows another HMC to obtain customized console data from or send data to this HMC. For more information, see 2.5.30, “Manage Data Replication” on page 63.

1.4.4 Custom groups

Custom groups provide a mechanism for you to group system resources together in a single view or a way to organize the systems or partitions into smaller business or workload entities. For more information, see 2.2.4, “Configuration” on page 31.

1.4.5 New System Reference Code look-up

There is a single repository for all System Reference Code (SRC) and Progress Code for POWER6 systems. The SRC is a sequence of data words (codes) that:

- Identifies a system status
- Describes a detected hardware, Licensed Internal Code (LIC), or software failure
- Describes the unit that is reporting the failure and its location

SRCs can be viewed on a system's control panel, as a system console message, or from the following three panels on the HMC:

- Managed Serviceable Events overview display
- The Reference code column of the Server display
- The Reference Code History display

For POWER6 servers, the HMC provides active Web links to the SRC repository. Clicking on these links displays the additional SRC information.

For more information, see 12.2.1, “Service events” on page 333.

1.4.6 Processor compatibility

POWER6 systems support running in one of the following modes:

- POWER5 compatible

  The POWER5 Compatible mode provides an application compatible execution mode on the POWER6 processor. In this mode, all new features of the POWER6 processor are disabled.

- POWER6 Architecture

  The POWER6 Architecture mode provides an execution mode compatible with Version 2.05 of the POWER Processor Architecture.

- POWER6 Enhanced

  The POWER6 Enhanced mode provides additional instructions not recognized by version 2.05 of the POWER Processor Architecture.

LPARs running on the same POWER6 system can run in different modes.

All POWER6 LPARs default to POWER6 Architecture mode. You can see and modify that mode in the command line interface. The GUI allows display of current LP compatibility mode but does not allow modification. The current status is shown in the Partition Properties window as shown in Figure 1-4.

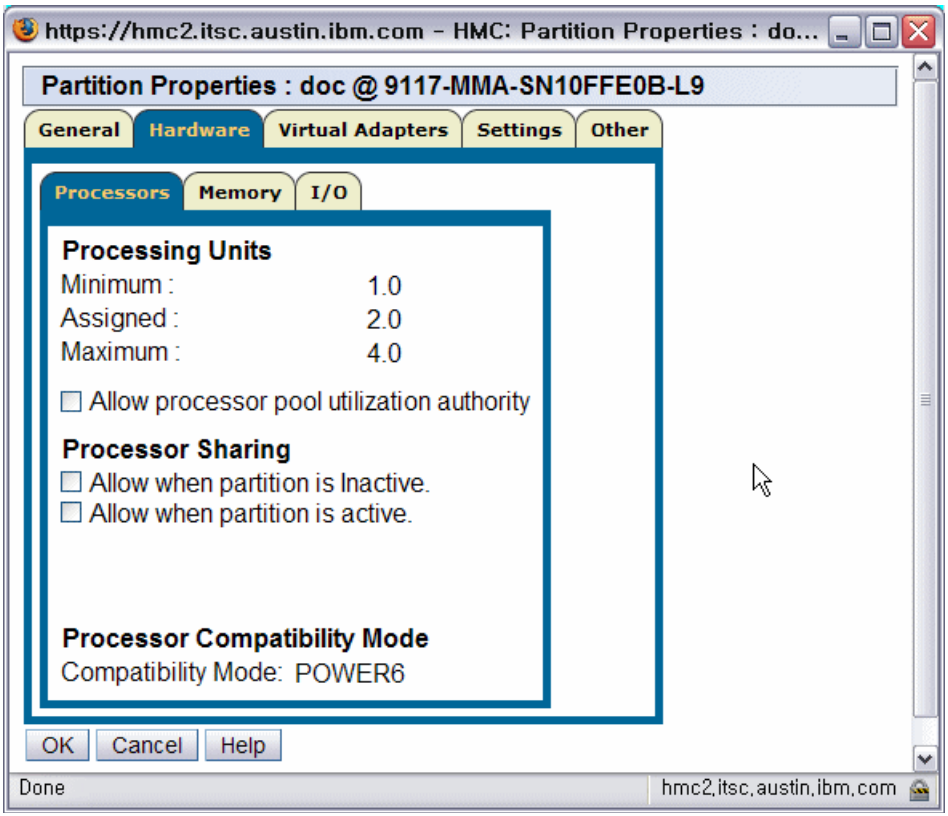


Figure 1-4 Processor capability mode

1.4.7 Host Ethernet Adapter

A Host Ethernet Adapter (HEA) allows multiple logical partitions to share a single special physical Ethernet adapter. Unlike most other types of I/O devices, you can never assign the HEA itself to a logical partition. Instead, virtual subsets called *logical HEAs* or *LHEAs* are defined on the physical HEA. These LHEAs can then be assigned to logical partitions. This allows these logical partitions to access external networks through the HEA without having to go through an Ethernet bridge on VIOS or another logical partition.

For more information, see 7.1.1, “Host Ethernet Adapter” on page 221.

1.4.8 Donating dedicated LPARs

POWER6 allows dedicated processors in LPAR to donate its idle processor cycles to the shared processor pool instead of being wasted as cycles in the dedicated partition as like shared processors LPAR. You can enable this function in the HMC. We explain how you can set up this function using HMC in 7.1.2, “Shared pool usage of dedicated capacity” on page 223.

1.4.9 Processor recovery and partition availability priority

The POWER6 processor supports enhanced RAS capabilities. One of enhanced RAS capacities make firmware checkpoint the state of a failed processor. The checkpoint state can be resumed on another good processor. This function is called *Processor Recovery*.

Sometimes, this causes a loss of entitled capacity for one or more Shared Processor LPARs. At that time, firmware notifies those partitions of the loss of capacity. To determine which LPARs prefer to be stolen capacity, you can set the *Partition Availability Priority* of LPAR using HMC.

All processor recovery actions as well as loss of entitled capacity are logged in the system error log.

1.4.10 Barrier Synchronization Register

POWER6 extends the Barrier Synchronization Register (BSR) support that was present in POWER5. BSR can now be partitioned and assigned in granules to individual LPARS. This BSR provides a low latency array of storage bytes to be used as synchronization points for parallel programming jobs.

When the BSR capability is enabled in HMC, as shown in Figure 1-5 on page 14, the managed system includes processors with BSR arrays and supports the use of the BSR arrays on the processors.

If an operating system supports the use of BSR arrays, a parallel-processing application running on that operating system can use a BSR array to perform barrier synchronization, which is a method for synchronizing the threads in the parallel-processing application. If you use logical partitions, BSR arrays can be assigned to logical partitions.

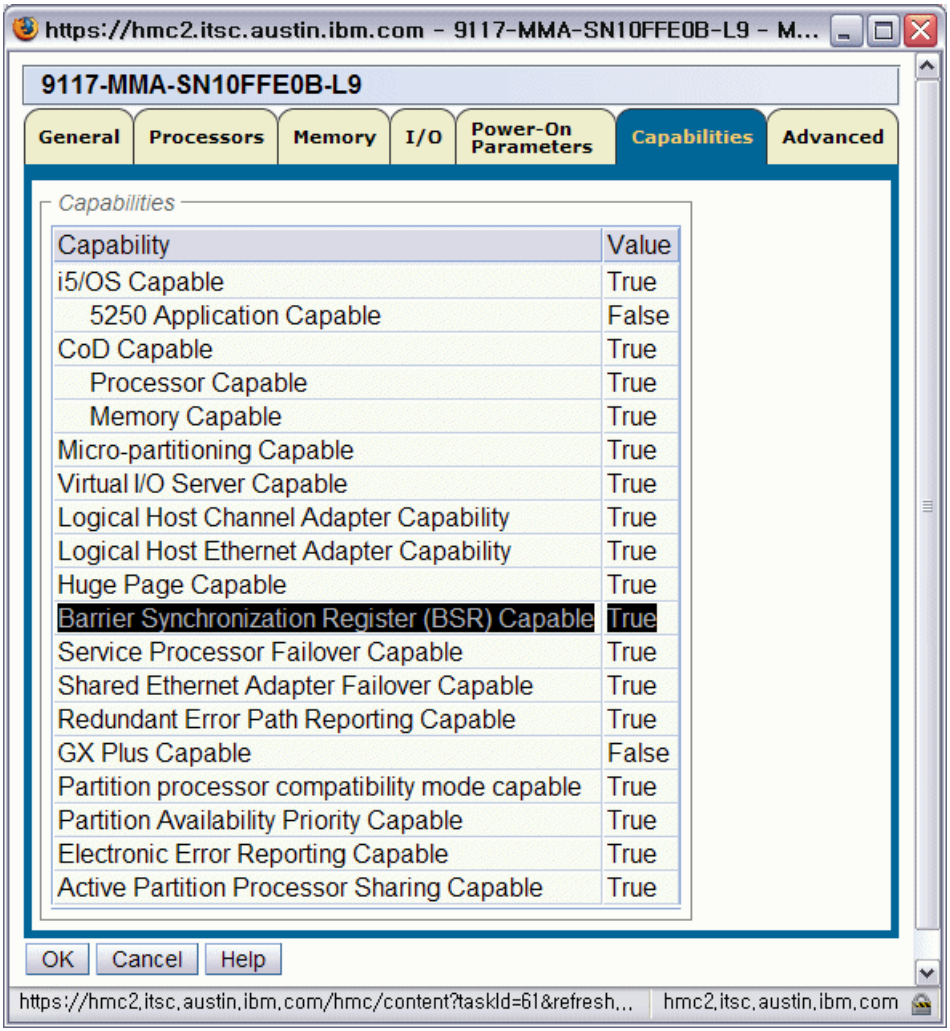


Figure 1-5 BSR capable

1.4.11 Capacity on Demand enhancement

The Capacity on Demand (CoD) can be configured with inactive processor and memory resources that can be enabled dynamically and non-disruptively to the system. The CoD offering provides flexibility and improved granularity in processor and memory upgrades and is a useful configuration option to support future growth requirements. CoD also eliminates the need to schedule downtime to install additional resources at a given point in time.

This CoD was introduced in POWER5 products. Throughout this book, we introduce two new types of CoD and some enhancements:

- Mobile CoD
- Utility CoD

We explain these tasks in Chapter 13, “Capacity on Demand” on page 373.

2

Basic operation

This chapter describes how to use the Web browser based user interface to perform tasks on the HMC or on your managed resources.

2.1 Using the Web browser based user interface

HMC Version 7 is migrated to a new framework, the System z HMC framework. All existing management functions and commands remain unchanged. However, there are new user interface improvements and changes due to the new framework.

A major change is the Web browser based user interface. With this interface, you do not have to install an application to access the HMC remotely, and you can connect to the HMC using your browser. Firefox and Internet Explorer® are supported.

2.1.1 Starting the HMC

First, start the HMC by setting both the display and system units to the on position. You should then see the initialization window that includes the IBM logo and copyright information.

After finishing the initialization step, the Welcome window displays as shown in Figure 2-1. This page includes the link to log on, to view the online help, and the summarized HMC status information.

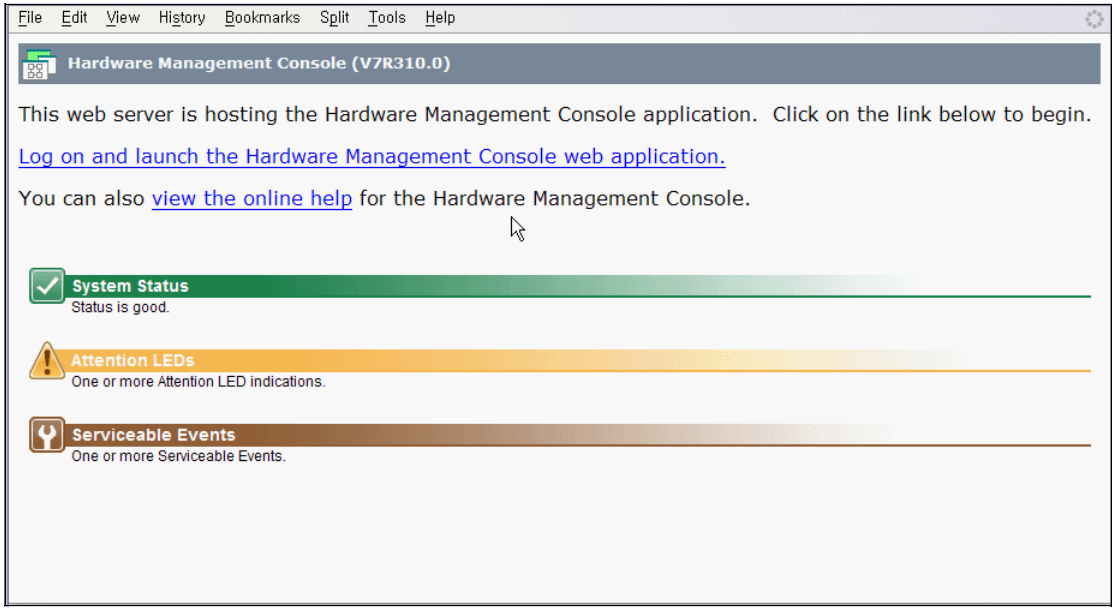


Figure 2-1 HMC Welcome window

To log on to the HMC, click **Log on and launch the Hardware Management Console web application** from the Welcome window. The Logon window opens as shown in Figure 2-2.

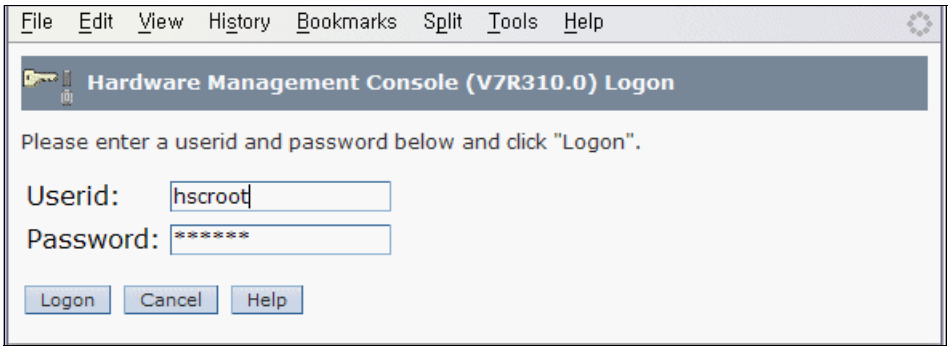


Figure 2-2 HMC Logon window

The HMC is supplied with a predefined user ID, *hscroot*, and the default password *abc123*. Both the user ID and password are case sensitive and must be entered exactly as shown. When you update your password, you can no longer keep it six characters. The minimum length for a password is now seven characters.

2.1.2 Session preservation

With HMC Version 7, you can remain in the GUI session across logins, as shown in Figure 2-3. If you want to preserve your session, then you should choose **Disconnect** and click **OK**.

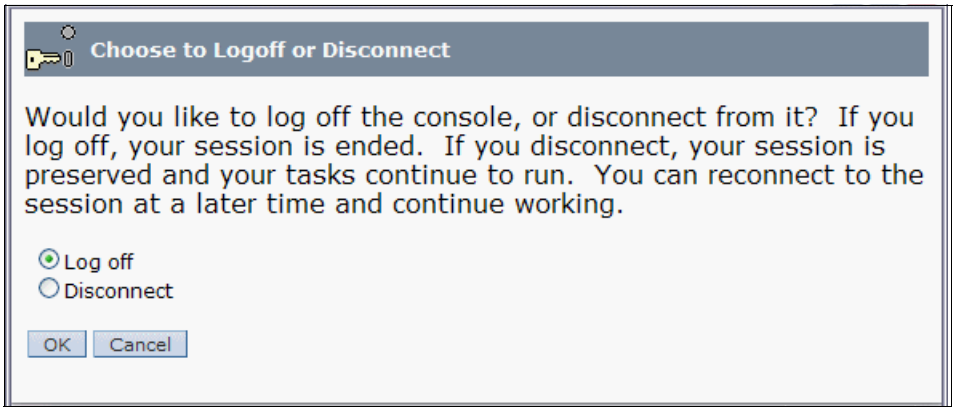


Figure 2-3 HMC Log off or disconnect

After disconnecting from the session, you can reconnect to the session by selecting the session that you want to connect. As shown in Figure 2-4, session ID 7 has are two running jobs. When you reconnect that session, the jobs that you were doing previously are displayed. You also see that there are three disconnected sessions for the userid *hscroot*. This situation is a typical situation when all users log in with the same user ID (for example, *hsroot*). The disconnect feature provides another reason to use separate user IDs for each user.

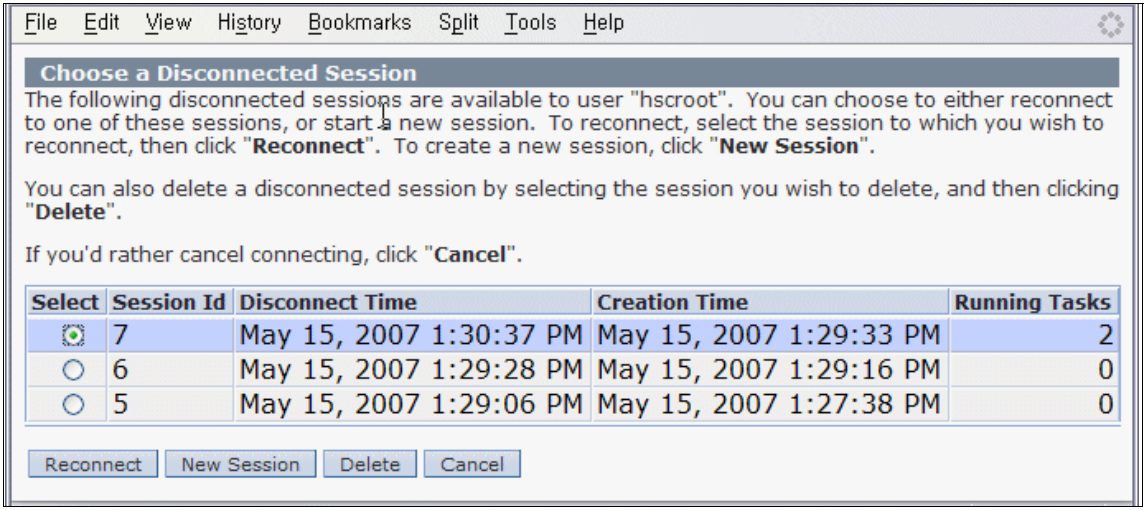


Figure 2-4 Reconnecting the previous session

2.1.3 Components of the Web browser based user interface

The HMC workplace window is comprised of several major components as shown in Figure 2-5:

- The Banner
- The Task bar
- The Navigation pane
- The Work pane
- The Status bar

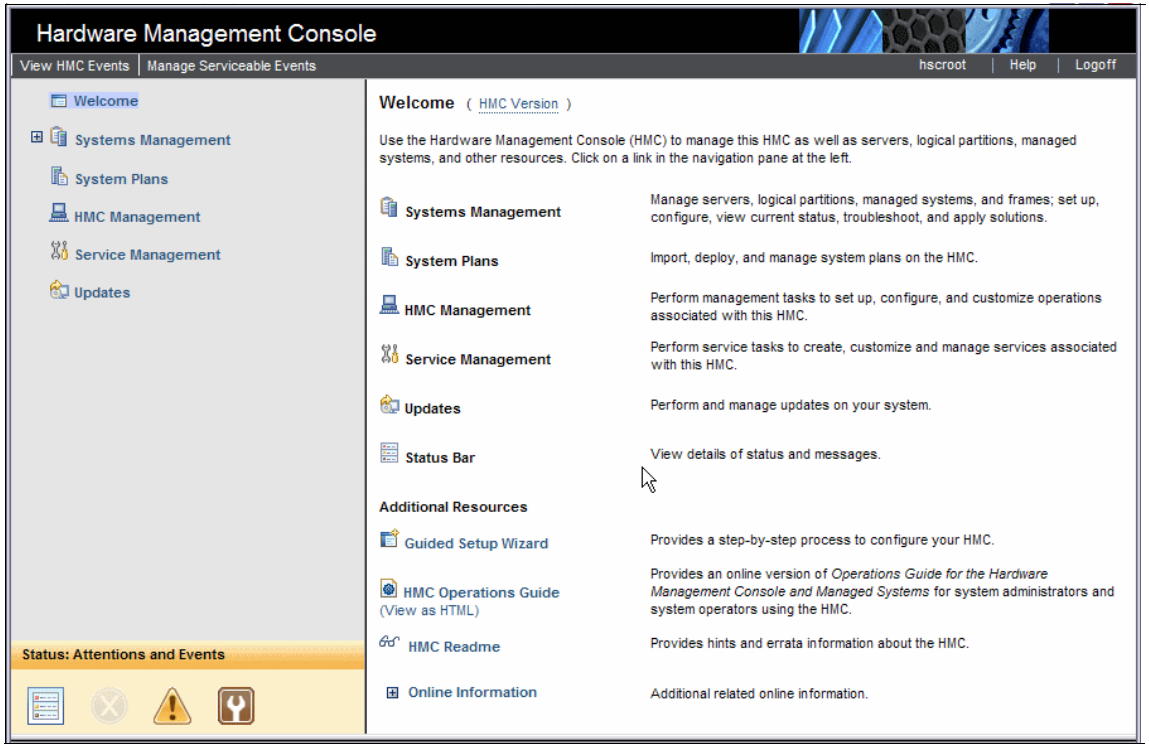


Figure 2-5 HMC workplace window

Banner

The *Banner*, across the top of the workplace window, identifies the product and logo. It is optionally displayed and is set by using the **Change User Interface Setting** task.

Task bar

The *Task bar*, located below the Banner, displays the names of any tasks that are running, the user ID you are logged in as, online help information, and the

ability to logoff or disconnect from console. It provides the capability of an active task switcher. You can move between tasks that were launched and have not yet been closed. However, the task switcher does not pause or resume existing tasks.

Navigation pane

The *Navigation pane*, in the left portion of the window, contains the primary navigation links for managing your system resources and the HMC. These include:

- Welcome
- Systems Management
- System Plans
- HMC Management
- Service Management
- Updates

Work pane

The *Work pane*, in the right portion of the window, displays information based on the current selection from the Navigation pane. For example, when you select **Welcome** in the navigation pane, the Welcome window content displays in the work pane, as shown in Figure 2-5 on page 21.

Status bar

The *Status bar*, in the bottom left portion of the window, provides visual indicators of current overall system status. It also includes a status overview icon that can be selected to display more detailed status information in the Work pane.

2.2 Systems Management - Servers

In the HMC workplace window, Systems Management includes a tree view of managed resources. Resources can include servers, partitions, frames, and custom groups. You control the activity about a managed system in this category: Power on/off, Activate/Shut down/Restart partitions, View properties of the managed system, and so on. Each managed server is a tree that includes the partitions that are defined.

This section describes the tasks to manage a server.

2.2.1 Servers

The *Servers* node represents the servers that are managed by this HMC. To add servers:

1. Click **Add Managed Systems**, as shown in Figure 2-6.
2. Then, select **Add a managed system**, and click **Next**.

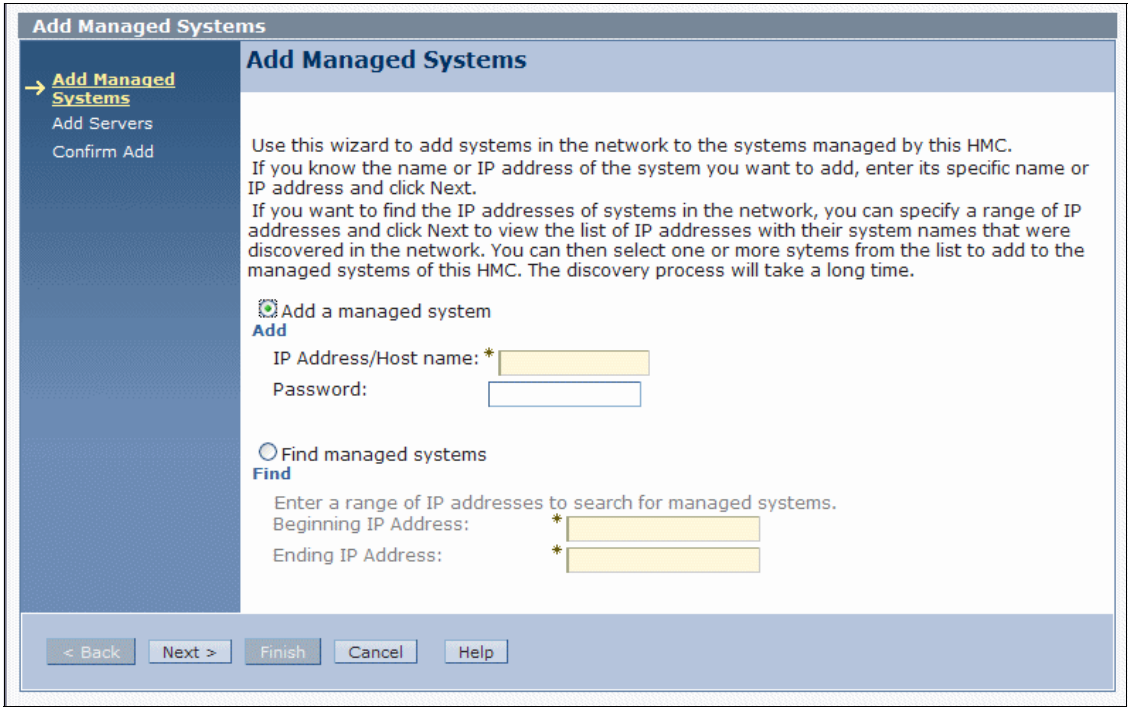


Figure 2-6 Add Managed Systems window

3. Click **Servers** to see a listing of individually defined servers in table form in the work pane, as shown in Figure 2-7.
4. Select the server that you want to add to the HMC.

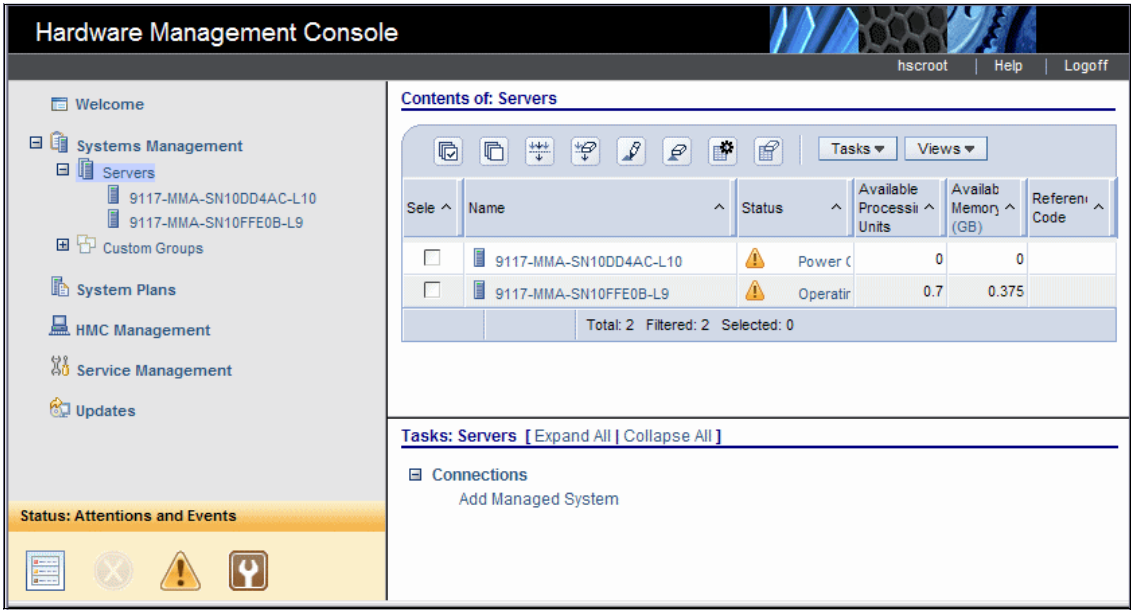


Figure 2-7 System Management servers window

By default, the contents of servers displays the following attributes:

- Name

  Specifies the user defined name of the managed system.

- Status

  Displays the current status of the managed system (for example, *Operating*, *Power off*, *Initializing*, and so forth). In addition, displays icons that represent an unacceptable state and active Attention LED.

- Available Processing Units

  Displays the number of processing units that are available for assignment to logical partitions on the managed system. This number is the total number of processing units that are activated on the managed system minus the number of processing units that are assigned to the logical partitions, including the logical partitions that are shut down, on the managed system. This number does not include any processing units that have not yet been activated with Capacity on Demand (CoD).

- Available Memory

  Displays the amount of memory that is available for assignment to logical partitions on the managed system. This amount is the total amount of memory that is activated on the managed system minus the amount of memory needed by managed system firmware minus the amount of memory that is assigned to the logical partitions, including the logical partitions that are shut down, on the managed system. This number does not include any memory that has not yet been activated with CoD. The available memory amount can be shown in MB or GB. Click **MB** or **GB** in the Available Memory column title.

- Reference Code

  Displays the progress System Reference Code (SRC). By clicking the displayed SRC, you can receive more information.

The table can also display the following optional attributes:

- Name
- Status
- Available Processing Units
- Reference Code
- Configurable Processing Units
- Configurable Memory
- Serial Number
- Type-Model
- CoD Processor Capable
- CoD Memory Capable
- Permanent Processors
- On/Off CoD Processor State
- Trial CoD Processor State
- Reserve CoD Processor State
- Utility CoD Processor State
- Permanent Memory
- On/Off CoD Memory State
- Trial CoD Memory State

These attributes display when you select the *Column configuration* icon on the table toolbar as shown in Figure 2-8. This function allows you to select additional attributes that you want displayed as columns in the table.

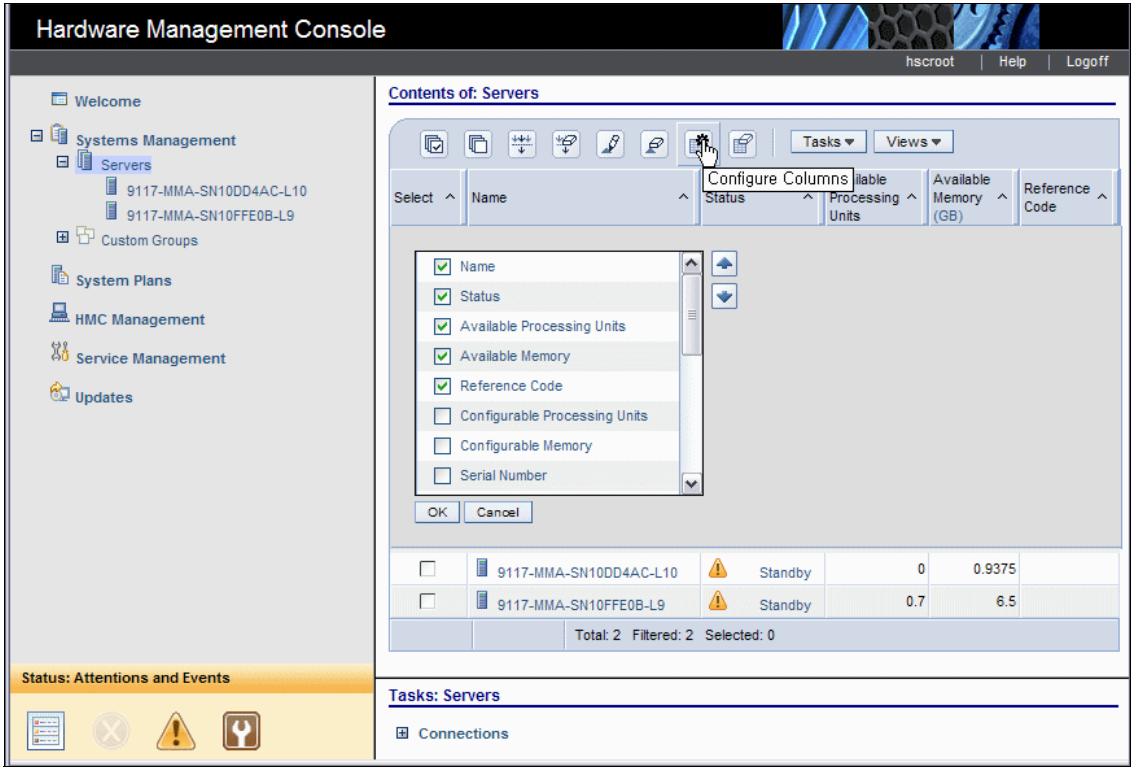


Figure 2-8 Column configuration

You can also use Views from the table toolbar to display the default server attributes in the table or to display the CoD server attributes in the table. After you make one of those selections, you need to select another item on the left pane, such as Systems Management, and then reselect **Servers** to see the change in the columns.

2.2.2 Properties

The Properties task displays the selected managed system's properties as shown in Figure 2-9.

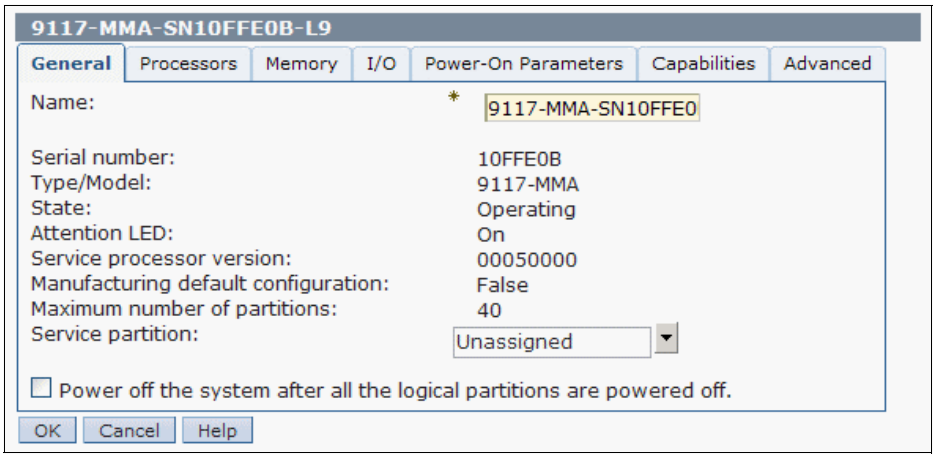


Figure 2-9 Properties task

These properties include:

- Identifying information
- Available and installed processors
- Available and installed memory
- Available and installed I/O
- Current system configuration settings
- Server capabilities

Use the Help button to get additional information for each property.

2.2.3 Operations

Operations includes the tasks for server operations. The following tasks are represented in the Operations tasks:

- Power On
- Power Off
- LED status
- Schedule Operations
- Advanced System Management Interface(ASMI)
- Utilization Data
- Rebuild
- Change Password

This section describes these tasks.

Power On

Use the Power On task to start a managed system. You can choose from three different options to start your managed system:

- **Partition standby**

  When the Partition standby is completed, the system is in standby mode. Partition standby mode allows you to create and activate logical partitions.

- **System profile**

  Turns on the system according to a predefined set of system profiles. Select the system profile that you want to use from the list.

- **Partition auto start**

  Turns on the managed system to partition standby mode and then activates all partitions that are marked as auto start or those partitions that were running when the system shut down. For example, if you create a partition with four processors, dynamically remove one processor from the logical partition, and then shut down the system, the partition auto start option activates this partition with three processors because the three-processor configuration was the last configuration used. The HMC ignores whatever is specified in the profile for the partition. You can create and activate logical partitions in partition auto start mode.

Power Off

This task shuts down the managed system. Turning off the managed system makes all partitions unavailable until the system is turned on again.

Before you turn off the managed system, ensure that all logical partitions have been shut down and that their states have changed from *Running* to *Ready*.

If you do not shut down all logical partitions on the managed system before you turn off the managed system, the managed system shuts down each logical partition before the managed system itself turns off. This can cause a substantial delay in turning off the managed system, particularly if the logical partitions are not responsive. Further, the logical partitions might shut down abnormally, which could result in data loss and further delays when you activate the logical partitions again.

You can choose from the following options (see Figure 2-10):

- **Normal power off**

  The system ends all active jobs in a controlled manner. During that time, programs running in those jobs are allowed to perform cleanup (end-of-job processing).

- **Fast power off**

  The system ends all active jobs immediately. The programs running in those jobs are not allowed to perform any cleanup. Some applications, such as Web servers that are providing information, might not have a problem with fast power off. Other applications, such as databases that have cached information, might loose data if the application cannot perform cleanup before the application ends.

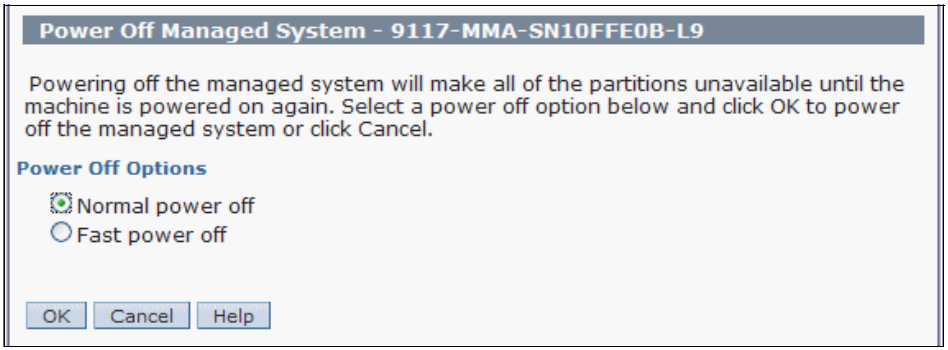


Figure 2-10 Power Off task

LED Status

LED Status includes the tasks for viewing system attention LED information, lighting specific LEDs to identify a system component, and testing all LEDs on a managed system.

You can choose from the following options:

- **View System Attention LED**

  Displays the current system attention LED and corresponding partition LED states for the selected system. From this task, you can activate or deactivate system attention LEDs.

- **Identify LED**

  Displays the current Identify LED states for all the location codes contained in the selected enclosure. From this task, you can select a single location code or multiple location codes to operate against and activate or deactivate the LEDs by selecting the corresponding button.

- **Test LED**

  Initiates an LED Lamp Test against the selected system. All LEDs activate for several minutes.

Schedule Operations

This task creates a schedule for certain tasks, such as activating a system or partition using a specific profile, backing up Profile Data, or turning on or off a managed system without operator assistance. This task can also be performed on a defined schedule.

Figure 2-11 shows what can be added for a scheduled operation.

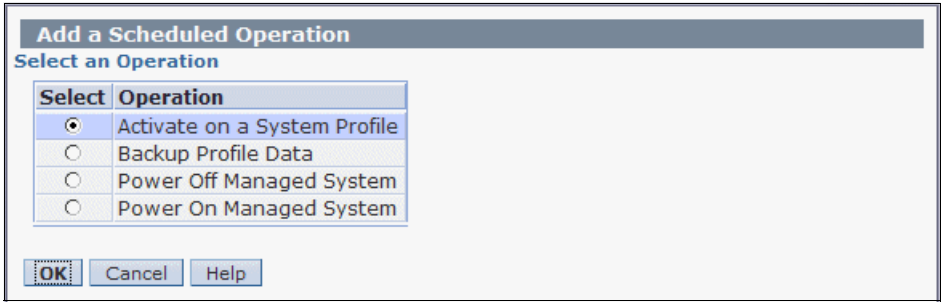


Figure 2-11 Scheduled Operations task

From this task you can:

- Create or delete scheduled operations
- View scheduled operations sorted by date, object, or operation

Advanced System Management

If configured to do so, the HMC connects directly to the Advanced System Management (ASM) interface for a selected system from this task. We explain this task in Chapter 14, “Advanced System Management Interface” on page 423.

Utilization Data

Utilization events are records that include information about the memory and processor utilization on a managed system at a particular time. You can set the HMC to collect utilization data in this task.

Rebuild

You can use this task to extract the configuration information from the managed system and to rebuild the information about the HMC. Rebuilding the managed system means that you update, or refresh, the information about the HMC about the managed system. Rebuilding the managed system can be helpful when the

state of the managed system is *Incomplete*. The Incomplete state means that the HMC has lost communication with the managed server and no longer has complete information.

Rebuilding the managed system is different from simply refreshing the HMC window. When the managed system is rebuilt, the HMC extracts the information from the managed system. You cannot start other tasks while the HMC rebuilds the managed system. This process can take several minutes.

Change Password

You can change the HMC access password. After the password is changed, it must be changed on all other systems assessing this HMC. We explain how to change the access password in 5.2.1, “Changing the user password” on page 185.

2.2.4 Configuration

Configuration includes the tasks for configuring your managed systems. The Configuration tasks include:

- Create Logical Partition
- System Plans
- Manage Custom Groups
- View Workload Management Groups
- Partition Availability Priority
- Manage System Profiles
- Manage Partition Data

Create Logical Partition

This task creates a new AIX, Linux, VIO Server, or i5/OS logical partition on a managed system. The Create LPAR Wizard helps you to create a new logical partition and a default profile for the partition. We explain these tasks in 7.2, “Creating logical partitions” on page 228.

System Plans

System Plans records or deploys specifications for logical partitions, partition profiles, or hardware specifications on a chosen system. We explain this task in 4.1, “System plans” on page 134.

Manage Custom Groups

Custom Groups are comprised of logical collections of objects. You can report status on a group basis, allowing you to monitor your system in a way that you

prefer. You can also nest groups (a group contained within a group) to provide hierachical or topology views.

There can be one or more user-defined groups already defined on your HMC. There are default groups listed under the Custom Groups node under Server Management. The default groups are *All Partitions* and *All Objects*. You can create others, delete the ones that were created, add to created groups, or delete from created groups by using the Manage Custom Groups task, as shown in Figure 2-12.

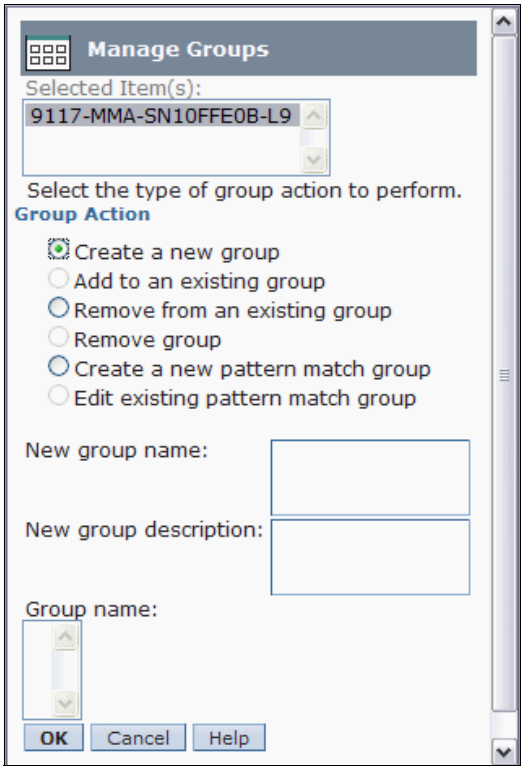


Figure 2-12 Manage Custom Groups

View Workload Management Groups

This task displays a detailed view of the workload management groups that you have specified for a managed system as shown in Figure 2-13. Each group displays the total number of processors, processing units for partitions using shared mode processing, and the total amount of memory allocated to the partitions in the group.

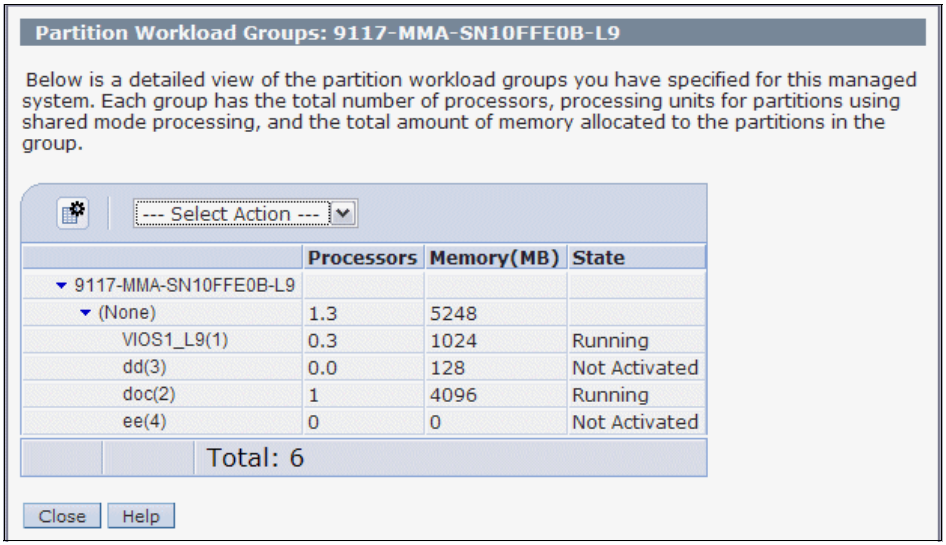


Figure 2-13 Partition Workload Groups

Partition Availability Priority

This task specifies the partition availability priority of each logical partition on a managed system. The managed system uses partition availability priorities in the case of processor failure.

If a processor fails on a logical partition, and there are no unassigned processors available on the managed system, the logical partition can acquire a replacement processor from logical partitions with a lower partition-availability priority. This allows the logical partition with the higher partition-availability priority to continue running after a processor failure. We explain this task in 7.1.3, “Partition availability priority” on page 225.

Manage System Profiles

A system profile is an ordered list of partition profiles that is used by the HMC to start the logical partitions on a managed system in a specific configuration.

When you activate the system profile, the managed system attempts to activate each partition profile in the system profile in the order specified. A system profile

helps you activate or change the managed system from one complete set of logical partition configurations to another. They can also be used to validate the resource configuration of multiple partitions to ensure that resource conflicts do not exist between partitions.

Manage Partition Data

This task provides four operations, backup, restore, initialize, and remove, to manage profile data. We explain this task in 7.3, “Managing partition data” on page 247.

2.2.5 Connection

The Connection tasks allow you to view the HMC connection status to service processors or frames, reset those connections, connect another HMC to the selected managed system, or connect another managed system to the HMC.

This section explains these tasks.

Service Processor Status

This task displays the HMC connection status to the service processor of a selected managed system, as shown in Figure 2-14. If you have selected a frame, Service Processor Status displays the state of the connection from the HMC to side A and side B of the bulk power assembly.

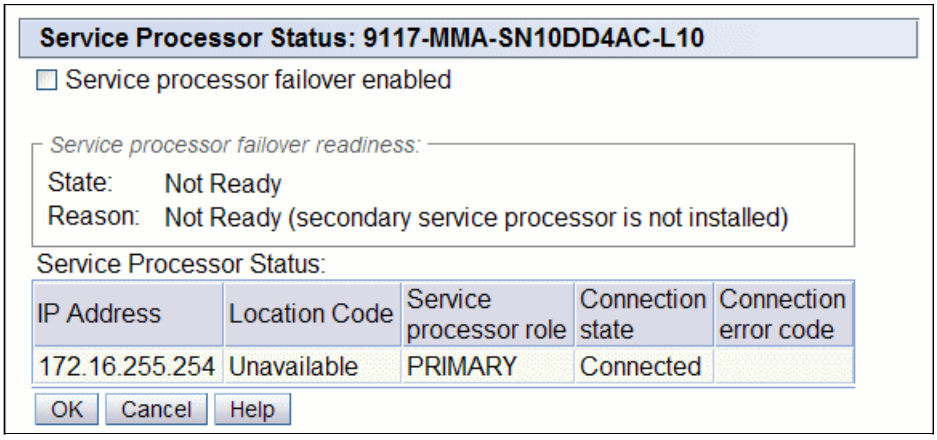


Figure 2-14 Service Processor Status

Reset or Remove Connections

This task removes or resets a managed system from the Contents area of the HMC.

When you remove the connection with a managed system, the connection is broken between the HMC and the managed system. Remove the connection with the managed system if you no longer want to manage the managed system using this HMC. Remove the connection before you physically disconnect the HMC from the managed system (or from the network).

When you reset the connection with a managed system, the connection is broken and then reconnected. Reset the connection with the managed system if the managed system is in a No Connection state and you have verified that the network settings are correct on both the HMC and the managed system.

Disconnect Another HMC

You can disconnect another HMC from the selected managed system as shown in Figure 2-15. Also, you can find which HMC has locked the selected managed system. This task releases any lock that the other HMC might have on the selected managed system. After the disconnection is complete, the other HMC automatically attempts to reconnect to the managed system.

When you use an HMC to change a managed system, the HMC locks the managed system so that no other HMC can make conflicting changes at the same time. Normally, the HMC unlocks the managed system after the change is complete. If there is an error and the managed system remains locked, you must disconnect the HMC from the managed system to reset the lock before other HMCs can change the managed system.

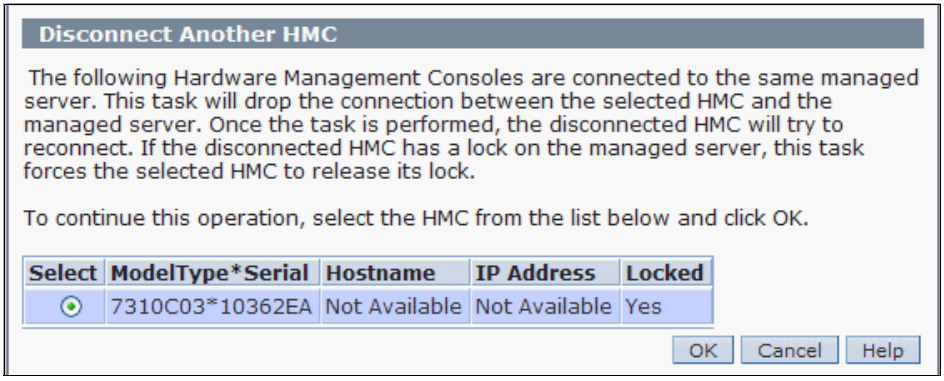


Figure 2-15 Disconnect another HMC

Add Managed System

This task guides you through adding systems in the network to systems managed by this HMC.

2.2.6 Hardware (Information)

Hardware (Information) includes the tasks for configuring your Host Ethernet Adapter (HEA) and Host Channel Adapter, for viewing RIO Topology.

This section explains these tasks.

Host Ethernet Adapter

This task display the port configuration and status of the physical HEAs on the managed system as shown in Figure 2-16.

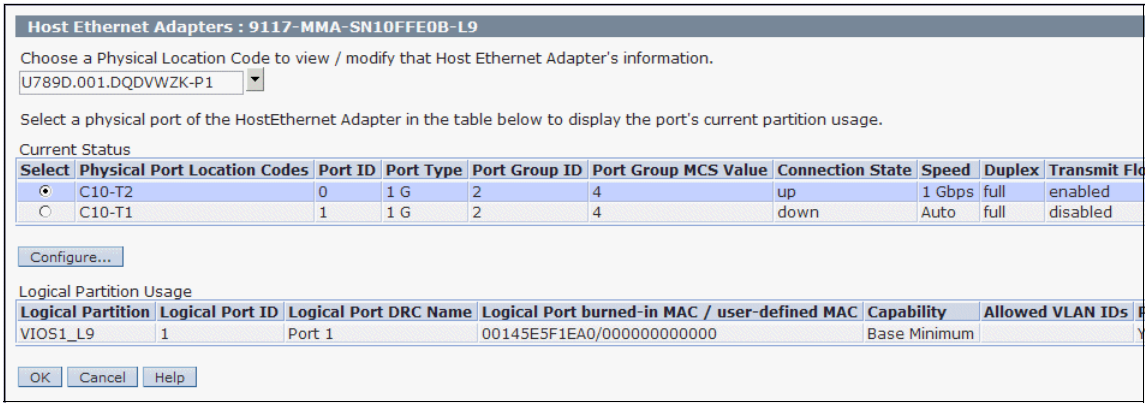


Figure 2-16 Displaying Host Ethernet Adapters configuration information

You can change the configuration of any of the ports on an HEA by selecting the HEA, selecting the port under Current Status, and clicking **Configure**. Then, the port configuration displays as shown in Figure 2-17. We explain these tasks in detail in 7.1.1, “Host Ethernet Adapter” on page 221.

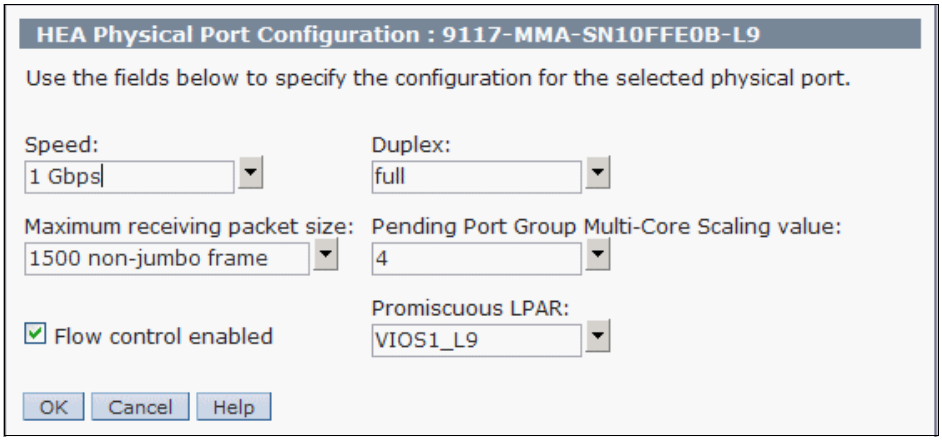


Figure 2-17 HEA Physical Port Configuration

Host Channel Adapter

A Host Channel Adapters (HCA) provides a managed system with port connections to other InfiniBand® devices. That port can be connected to another HCA, a target device, or an InfiniBand switch that redirects the data coming in on one of its ports out to a device attached to another of its ports.

This task shows a list of the HCA for the managed system. You can find more information at:

`http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp?topic=/iphae/iphaeinfinibandproducts.htm`

Virtual I/O Adapters

You use the Virtual I/O Adapters commands to view the topology of currently configured virtual SCSI and virtual Ethernet adapters on a selected partition.

You use the SCSI task to view the topology of virtual SCSI adapters on a partition. Displayed are:

- Adapter name
- Backing device
- Remote partition
- Remote Adapter
- Remote Backing Device

Use the Ethernet task to view the current virtual Ethernet configuration for the partition:

- Adapter name
- Virtual LANs
- I/O Server
- Server Virtual Adapter
- Shared Adapter

Partitions assigned to a VLAN that is bridged have access to a external network using a physical shared Ethernet adapter owned by a Virtual I/O Server.

View RIO Topology

Use this task to display the current RIO topology of the selected managed system. Current Topology displays the current topology. Any discrepancies between the current topology and the last valid topology are identified as errors. The following information is shown:

- The starting location of the physical RIO cable and the RIO connection (cable to port)
- The ending location of the physical RIO cable and the RIO connection (cable to port)
- Starting Node Type Displays the values of the node. Possible values are Local Bridge, Local NIC, Remote Bridge, and Remote NIC
- Link Status Displays the leading port status
- Cable Length Displays the length of the RIO cables. Errors occur when the actual cable lengths are different from the expected cable lengths
- The serial number of the power-controlling managed system
- The serial number of the function-controlling managed system

2.2.7 Updates

The Updates tasks perform a guided update of the managed system, power, and I/O Licensed Internal Code. You can see the current LIC level in the View system information task. We explain these tasks in detail in Chapter 11, “Firmware maintenance” on page 303.

2.2.8 Serviceability

Problem Analysis on the HMC detects error conditions automatically and reports any problem that requires service to repair it. These problems are reported as serviceable events. We explain these tasks in detail in Chapter 12, “Service Management” on page 331.

2.2.9 Capacity on Demand

Capacity on Demand (CoD) allows you to activate one or more resources dynamically on the server as your business peaks dictate. You can activate inactive processors or memory units that are already installed on your server on a temporary and permanent basis. We explain these tasks in detail in Chapter 13, “Capacity on Demand” on page 373.

2.3 System Managements - Partitions

Systems Management includes a tree view of managed resources. Resources can include servers, partitions, frames and custom groups. Each managed server is a tree that includes the partitions that are defined.

This section describes the tasks displayed when a partition is selected.

2.3.1 Operations

Operations include the tasks for server operations. The Operations tasks include:

- Activate
- Shut Down
- Restart
- Manage Attention LED
- Schedule Operations
- Delete

Activate

Use the Activate task to activate a partition on the managed system in the *Not Activated* state.

A list of profiles displays that are valid to start the selected partition. Select from the list of profiles and click **OK** to activate the partition. Select **Open a terminal window or console**.

Shut Down

Use this task to shut down the selected logical partition or partitions.

For i5/OS logical partitions, use this window only if you cannot shut down the i5/OS logical partition from the command line of the operating system. Using this window to shut down an i5/OS logical partition results in an abnormal IPL.

Choose from the following options:

- **Delayed**

  The HMC shuts down the logical partition using the delayed power off sequence, allowing the logical partition time to end jobs and write data to disks. If the logical partition is unable to shut down within the predetermined amount of time, it ends abnormally, and the next restart might be longer than normal.

- **Immediate**

  The HMC shuts down the logical partition immediately. The HMC ends all active jobs immediately. The programs running in those jobs are not allowed to perform any job cleanup. This option might cause undesirable results if data is updated partially. Use this option only after a controlled shutdown has been unsuccessfully attempted.

- **Operating System**

  The HMC shuts down the logical partition normally by issuing a shutdown command to the logical partition. During this operation, the logical partition performs any necessary shutdown activities. This option is only available for AIX logical partitions.

- **Operating System Immediate**

  The HMC shuts down the logical partition immediately by issuing a **`shutdown -F`** command to the logical partition. During this operation, the logical partition bypasses messages to other users and other shutdown activities. This option is only available for AIX logical partitions.

Restart

Restart Use this task to restart the selected logical partition or partitions.

For i5/OS logical partitions, use this window only if you cannot restart the i5/OS logical partition from the command line of the operating system. Using this window to restart an i5/OS logical partition will result in an abnormal IPL.

Choose one of the following options. The Operating System option and the Operating System Immediate option are only enabled if Resource Monitoring and Control (RMC) is up and configured:

- **Dump**

  The HMC shuts down the logical partition and initiates a main storage or system memory dump. For AIX and Linux logical partitions, the HMC also notifies the logical partition that it will be shut down. For i5/OS logical partitions, the processors are stopped immediately. After the shutdown is complete, the logical partition is immediately restarted. (i5/OS logical partitions are restarted multiple times so that the logical partition can store the dump information.) Use this option if a portion of the operation system appears to be hung and if you want a dump of the logical partition for analysis.

- **Operating System**

  The HMC shuts down the logical partition normally by issuing a **`shutdown -r`** command to the logical partition. During this operation, the logical partition performs any necessary shutdown activities. After the shutdown is complete, the logical partition is immediately restarted. This option is only available for AIX logical partitions. Immediate: The HMC shuts down the logical partition immediately. The HMC ends all active jobs immediately. The programs running in those jobs are not allowed to perform any job cleanup. This option might cause undesirable results if data has been partially updated. Use this option only after a controlled end has been unsuccessfully attempted.

- **Operating System Immediate**

  The HMC shuts down the logical partition immediately by issuing a **`shutdown -Fr`** command to the logical partition. During this operation, the logical partition bypasses messages to other users and other shutdown activities. After the shutdown is complete, the logical partition is immediately restarted. This option is only available for AIX logical partitions.

- **Dump Retry**

  The HMC retries a main storage or system memory dump on the logical partition. After this is complete, the logical partition is shut down and restarted. Use this option only if you have previously tried the Dump option without success. This option is only available for i5/OS logical partitions.

Manage Attention LED

Use the Manage Attention LED to activate or deactivate an attention LED on your partition. All attention LEDs for the partitions on the managed system are listed. Select an LED and choose to activate or deactivate.

Schedule Operations

Use this task to create a schedule for certain operations to be performed on the logical partition without operator assistance.

Scheduled operations are helpful for situations where automatic, delayed, or repetitious processing of system operations is necessary. A scheduled operation is started at a specified time, without operator assistance to perform the operation. A schedule can be set for one operation or repeated many times. For example, you could schedule an operation to remove resources from a logical partition or move resources from one logical partition to another.

Delete

The Delete task deletes the selected partition and all of the partition profiles associated with the partition from the managed system. When you delete a partition, all hardware resources currently assigned to that partition become available to other partitions.

2.3.2 Configuration

Configuration includes the tasks for configuring partitions. The Configuration tasks include:

- Manage Profiles
- Manage Custom Groups
- Save Current Configuration

Manage Profiles

Use the Manage Profiles task to create, edit, copy, delete, or activate a profile for the selected partition.

A partition profile includes the resource configuration for the partition. You can modify the processor, memory, and adapter assignments for a profile by editing the profile.

The default partition profile for a logical partition is the partition profile that is used to activate the logical partition if no other partition profile is selected. You cannot delete the default partition profile unless you first designate another partition profile as the default partition profile. The default profile is defined in the status column.

Choose **Copy** to create an exact copy of the selected partition profile. This allows you to create multiple partition profiles that are nearly identical to one another by copying a partition profile and changing the copies as needed.

Manage Custom Groups

Custom Groups are comprised of logical collections of objects. You can report status on a group basis, allowing you to monitor your system in a way that you prefer. You can also nest groups (a group contained within a group) to provide hierachical or topology views.

There can be one or more user-defined groups already defined on your HMC. There are default groups listed under the Custom Groups node under Server Management. The default groups are *All Partitions* and *All Objects*. You can create others, delete the ones that were created, add to created groups, or delete from created groups by using the Manage Groups task as shown in Figure 2-18.

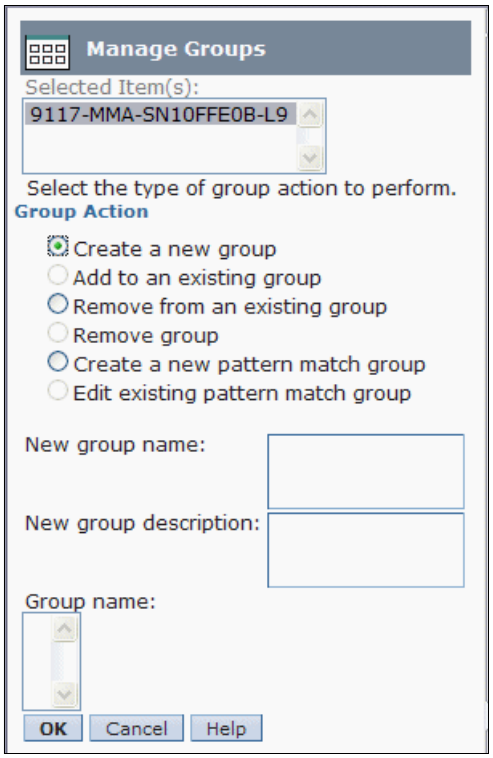


Figure 2-18 Manage Custom Groups

Save Current Configuration

Use this task to save the current configuration of a logical partition to a new partition profile by entering a new profile name. This procedure is useful if you change the configuration of a logical partition using dynamic logical partitioning and you do not want to lose the changes when you restart the logical partition.

You can perform this procedure at any time after you initially activate a logical partition.

2.3.3 Dynamic Logical Partitioning

Dynamic Logical Partitioning (DLPAR) tasks add or remove processors, memory, and adapters to and from logical partitions dynamically.

This section discusses these tasks.

Processor

Use DLPAR Processor tasks to add or remove processor resources from a logical partition or to move processor resources from one logical partition to another. These tasks include:

- **Add** or **Remove**

  Use the Add or Remove task to add processor resources to or remove processor resources from the selected logical partition without restarting the logical partition.

- **Move**

  Use the Move task to move processor resources from the selected logical partition to another logical partition without restarting either logical partition.

Memory

Use DLPAR Memory tasks to add or remove memory resources from a logical partition or to move memory resources from one logical partition to another. These tasks include:

- **Add** or **Remove**

  Use the Add or Remove task to add memory to or remove memory from the selected logical partition without restarting the logical partition.

- **Move**

  Use the Move task to move memory from the selected logical partition to another logical partition without restarting either logical partition.

Physical Adapters

Use the DLPAR Physical Adapters tasks to add I/O slots to a logical partition without restarting the partition or to move or remove I/O slots from a logical partition without restarting the partition.

These tasks include:

- **Add**

  Use the Add task to add I/O slots to a logical partition without restarting the partition. When you add an I/O slot to a logical partition, the I/O adapter in that I/O slot and the devices that are controlled by the I/O adapter can be used by the logical partition. This function is typically used to share infrequently used devices among logical partitions by moving these devices from one logical partition to another.

- **Move** or **Remove**

  Use the Move or Remove task to remove I/O slots from a logical partition or move I/O slots between logical partitions without restarting the logical partitions. When you remove an I/O slot from a logical partition, the I/O adapter in that I/O slot and the devices that are controlled by the I/O adapter are also removed from the logical partition. If you choose to move the I/O slot to another logical partition, the I/O adapter and the devices that are controlled by the I/O adapter are also moved to the other logical partition. This function is typically used to share infrequently used devices among logical partitions by moving these devices from one logical partition to another.

It is recommended that you vary off the I/O slot and all I/O adapters and devices connected to the I/O slot before you remove the I/O slot from the logical partition.

2.4 Systems Management - Frames

Systems Management includes a tree view of managed resources. Resources can include servers, partitions, frames and custom groups.

This section describes the tasks displayed when a frame is selected.

2.4.1 Properties

The Properties task displays the selected frame properties. These properties include:

- General

  The General tab displays the frame name and number, state, type, model, and serial number.

- Managed Systems

  The Managed Systems tab displays all of the managed systems included in the frame and their cage numbers. A cage is a division of the enclosure that holds the managed systems, the I/O units, and the bulk power assemblies (BPAs).

- I/O Units

  The I/O Units tab displays all of the I/O units contained in the frame, their cage numbers, and their assigned managed systems. A cage is a division of the enclosure that holds the managed systems, the I/O units, and the bulk power assemblies (BPAs). *Not owned* in the System column indicates that the corresponding I/O unit has not been assigned to a managed system.

2.4.2 Operations

Operations includes the tasks for frame operations. The Operations tasks include:

- Initialize
- Rebuild
- Change Password
- Power On or Power Off I/O Unit

Initialize

Use the Initialize task to initialize a frame.

When you initialize a managed frame, all of the frames managed by the HMC are powered on. As each individual frame is powered on, the I/O units that are contained within the frame are powered on as well. When all the I/O units for the frame have been powered on, then the managed systems that are contained within the frame are powered on. The complete initialization process can take several minutes to complete.

Rebuild

Use the Rebuild task to rebuild frame information about the HMC.

Updating, or rebuilding, the frame acts much like a refresh of the frame information. Rebuilding the frame is useful when the system's state indicator in the Work pane of the HMC is shown as Incomplete. The Incomplete indicator signifies that the HMC cannot gather complete resource information from the managed system within the frame.

No other tasks can be performed on the HMC during this process, which can take several minutes.

Change Password

Use the Change Password task to change the HMC access password on the selected managed frame. After the password is changed, you must update the HMC access password for all other HMCs from which you want to access this managed frame.

Enter the current password. Then enter a new password and verify it by entering it again.

Power On or Power Off I/O Unit

Use the Power On or Power Off I/O Unit task to power off an I/O unit.

Only units or slots that reside in a power domain can be turned off. The corresponding power on or off buttons are disabled for location codes that are not controllable by the HMC.

2.4.3 Configuration

Configuration includes the Manage Custom Groups task for configuring frames.

Manage Custom Groups

Custom Groups are comprised of logical collections of objects. You can report status on a group basis, allowing you to monitor your system in a way that you prefer. You can also nest groups (a group included within a group) to provide hierachical or topology views.

There can be one or more user-defined groups already defined on your HMC. There are default groups listed under the Custom Groups node under Server Management. The default groups are *All Partitions* and *All Objects*. You can create others, delete the ones that were created, add to created groups, or

delete from created groups by using the Manage Custom Groups task as shown in Figure 2-19.

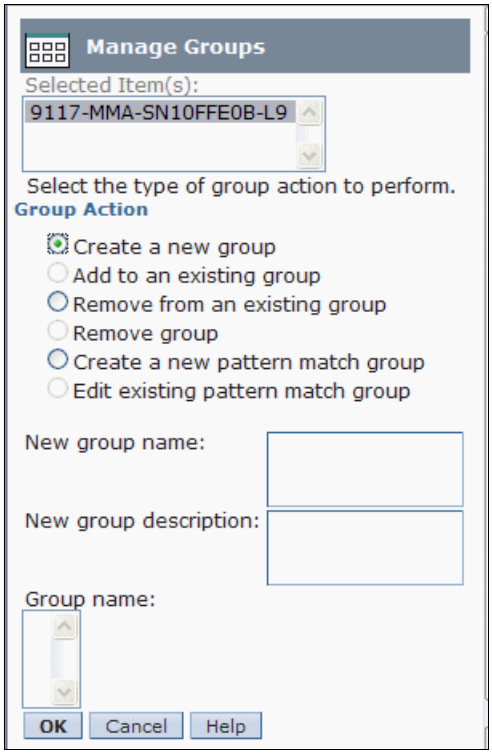


Figure 2-19 Manage Custom Groups

2.4.4 Connections

The Connections tasks allow you to view the HMC connection status to frames or reset those connections. This section describes these tasks.

Bulk Power Assembly Status

Use the Bulk Power Assembly Status task to view the state of the connection from the HMC to side A and side B of the bulk power assembly. The HMC operates normally with a connection to either side A or side B. However, for code update operations and some concurrent maintenance operations, the HMC needs connections to both sides.

Reset

Use the Reset task to reset the connection between the HMC and the selected managed frame.

When you reset the connection with a managed frame, the connection is broken and then reconnected. Reset the connection with the managed frame if the managed frame is in a *No Connection* state and you have verified that the network settings are correct on both the HMC and the managed frame.

2.4.5 Hardware (Information)

Hardware (Information) includes the task for configuring or viewing RIO Topology.

View RIO Topology

Use this task to display the current RIO topology of the selected managed frame. Current Topology displays the current topology. Any discrepancies between the current topology and the last valid topology are identified as errors.

The following information is shown:

- The starting location of the physical RIO cable and the RIO connection (cable to port)
- The ending location of the physical RIO cable and the RIO connection (cable to port)
- Starting Node Type Displays the values of the node. Possible values are Local Bridge, Local NIC, Remote Bridge, and Remote NIC
- Link Status Displays the leading port status
- Cable Length Displays the length of the RIO cables. Errors occur when the actual cable lengths are different from the expected cable lengths
- The serial number of the power-controlling managed system
- The serial number of the function-controlling managed system

2.4.6 Serviceability

Problem Analysis on the HMC detects error conditions automatically and reports any problem that requires service to repair it. These problems are reported as serviceable events. We explain these tasks in detail in Chapter 12, “Service Management” on page 331.

2.5 HMC Management

This task includes a categorized or alphabetical view of HMC management tasks and their descriptions. These tasks are used for setting up the HMC, maintaining its internal code, and securing the HMC.

To display the tasks in the work pane:

1. Select the HMC Management node in the Navigation Pane.
2. From the Work pane, select the task that you want to perform.
3. By default, a categorized listing of the tasks displays. The categories include:
   - Operations
   - Administration

If you want to see that level of the HMC with which you are currently working, point your mouse over **HMC Version** at the top of the work pane as shown in Figure 2-20.

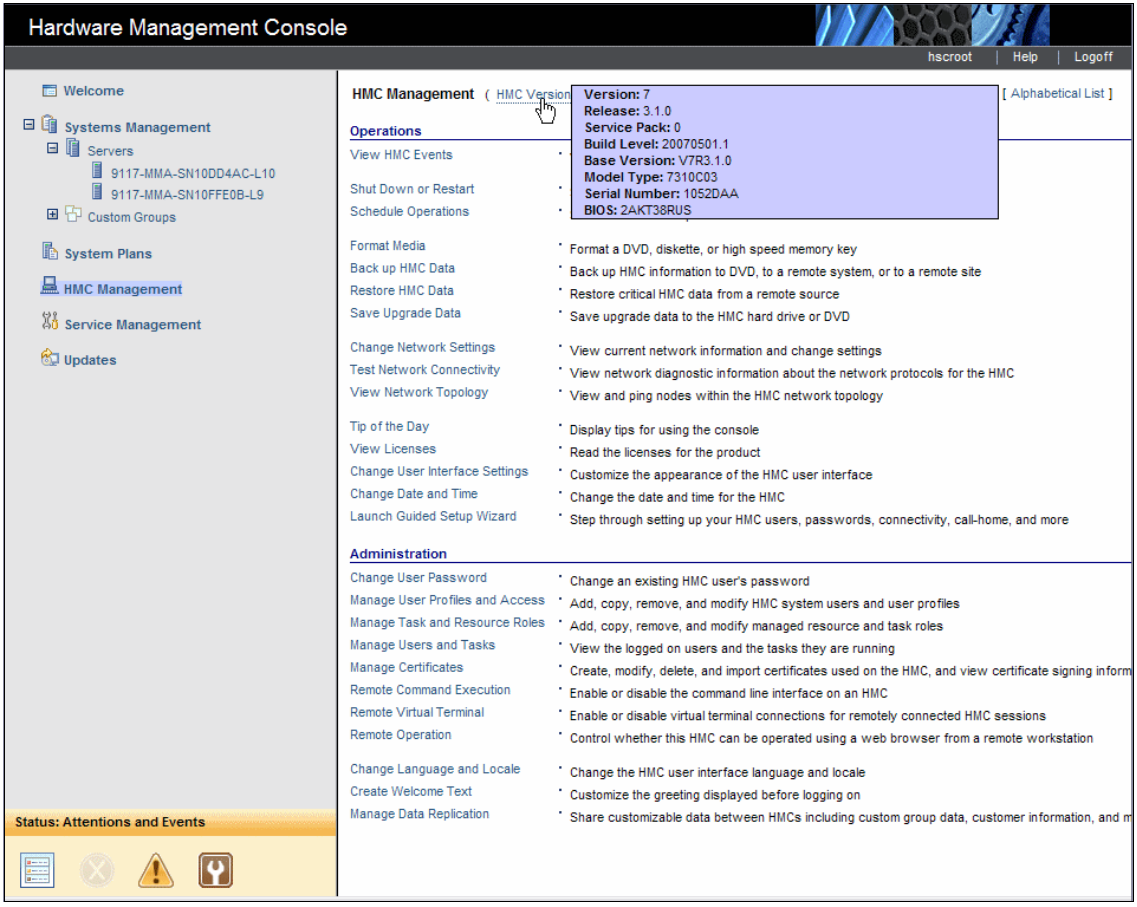


Figure 2-20 HMC Management

2.5.1 View HMC Events

This task shows the console event logs on the HMC. The HMC keeps a log of significant operations and activities automatically, referred to as *console events*, that occur while the application is running. Thus, system events are individual activities that indicate when processes occur, begin and end, and succeed or fail.

When an event occurs, the data and time it occurs and a brief description of the event are recorded in the event log, shown as Figure 2-21.

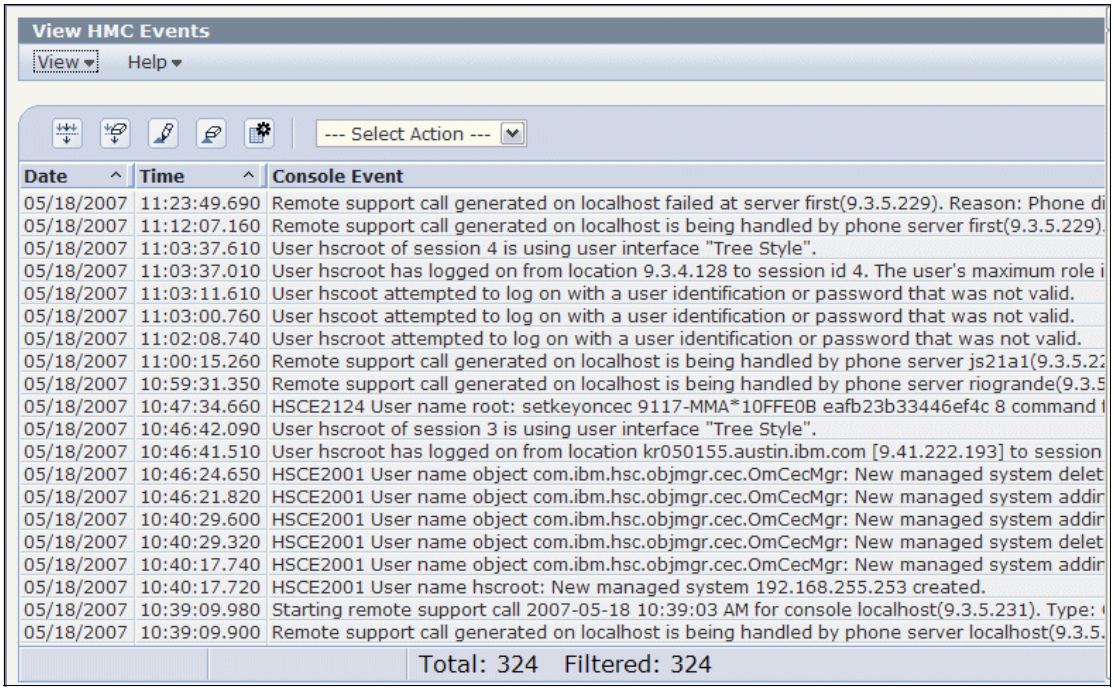


Figure 2-21 View HMC Events

2.5.2 Shut Down or Restart

This task enables you to shut down (turn off the console) or to restart the console. To shut down the console, make sure **Restart the HMC** is not selected, then click **OK** to proceed with the shutdown. To restart the console, make sure **Restart the HMC** is selected, then click **OK** to proceed with the shutdown.

2.5.3 Schedule Operations

This task creates a defined schedule for certain tasks, such as activating a system or partition using a specific profile, backing up Profile Data, or turning on or off a managed system without operator assistance.

2.5.4 Format Media

Note: You cannot perform this task remotely unless you have a already placed the media in the system.

This task formats a DVD-RAM, diskette, or high-speed memory key. We explain this task in detail in 12.2.3, “Managing HMC service data” on page 344.

2.5.5 Back up HMC Data

Note: This task backs up only the critical data associated with HMC.

This task backs up HMC information to DVD, to a remote system, or to a remote site and is critical to support Hardware Management Console operations. You should back up the HMC data after changes have been made to the HMC or information associated with logical partitions. We explain this task in detail in 11.1, “Critical Console Data backup” on page 304.

Using the HMC, you can back up all important data, such as:

- User-preference files
- User information
- HMC platform-configuration files
- HMC log files
- HMC updates through Install Corrective Service

2.5.6 Restore HMC Data

You can use this task to select a remote repository for restoring critical backup data for this HMC. You can choose to restore data from an Network File System (NFS) server or an File Transfer Protocol (FTP) server from the Remote Restore of Critical Data window as shown in Figure 2-22. We explain this task in detail in 11.1, “Critical Console Data backup” on page 304.

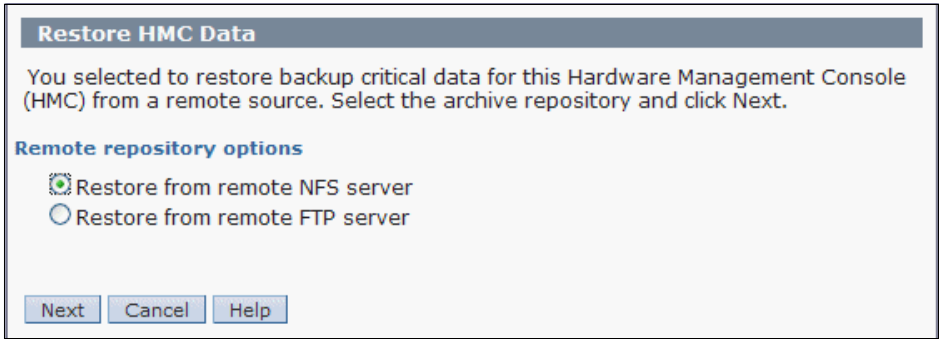


Figure 2-22 Remote restore of critical data

2.5.7 Save Upgrade Data

This task uses a wizard to save all of the customizable data for the HMC to the hard drive or to a DVD before performing an HMC software upgrade. We explain this task in detail in 11.3.6, “Upgrading the HMC machine code” on page 320.

2.5.8 Change Network Settings

This task allows you to view the current network information for the HMC and to change network settings. We explain this task in detail in 6.2.2, “LAN Adapters” on page 198.

2.5.9 Test Network Connectivity

This task displays network diagnostic information for the console's TCP/IP connection as shown in Figure 2-23.

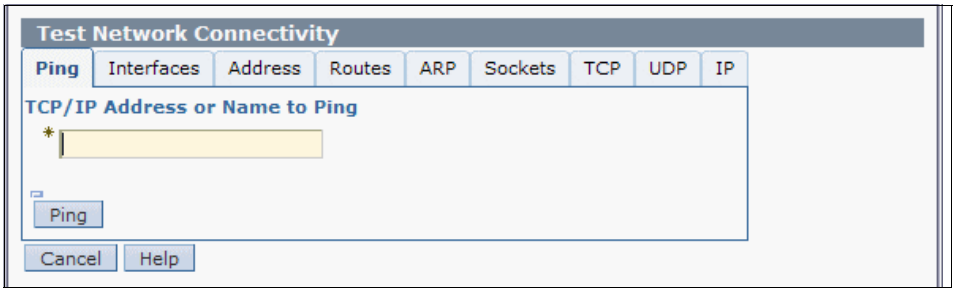


Figure 2-23 Test Network Connectivity

You can see information concerning the networking configuration on the HMC. There are tabs on this window (Ping, Interfaces, Address, Routes, Address Resolution Protocol (ARP), Sockets, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and Internet Protocol (IP)) to scroll through for information. This task also allows you to send a ping to a remote host. You can get additional information when you click **Help**.

2.5.10 View Network Topology

You can use this task to see a tree view of the network nodes known to this HMC. Examples of such nodes are managed systems, logical partitions, storage, and other HMCs. When you run this task, you can see the progress window as shown in Figure 2-24.

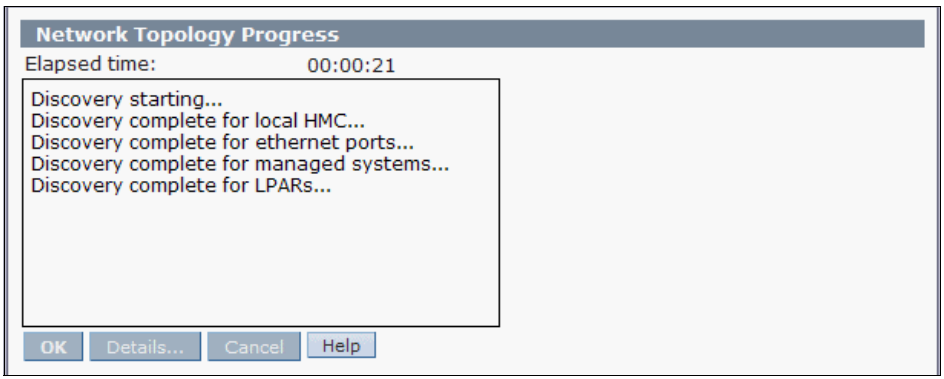


Figure 2-24 Network Topology Progress

After finishing this progress, you can view attributes of a node by selecting the node in the tree view that is shown in the left pane under Current Topology as shown in Figure 2-25.

Attributes vary according to the type of node. Some examples are IP address, host name, location code, and status. You can click **Refresh** to rediscover the topology and to query the nodes again for status and other attributes.

This task also allows you to save a snapshot of the current topology and to view that saved reference topology. You can view attributes of a node in this saved topology by selecting the node in the tree view that is shown in the left pane under Saved Topology. To test network connectivity to a node, you can select the node in either the current or the saved topology and click **Ping Current Node** or **Ping Saved Node**, available only for nodes that include an IP address or a host name.

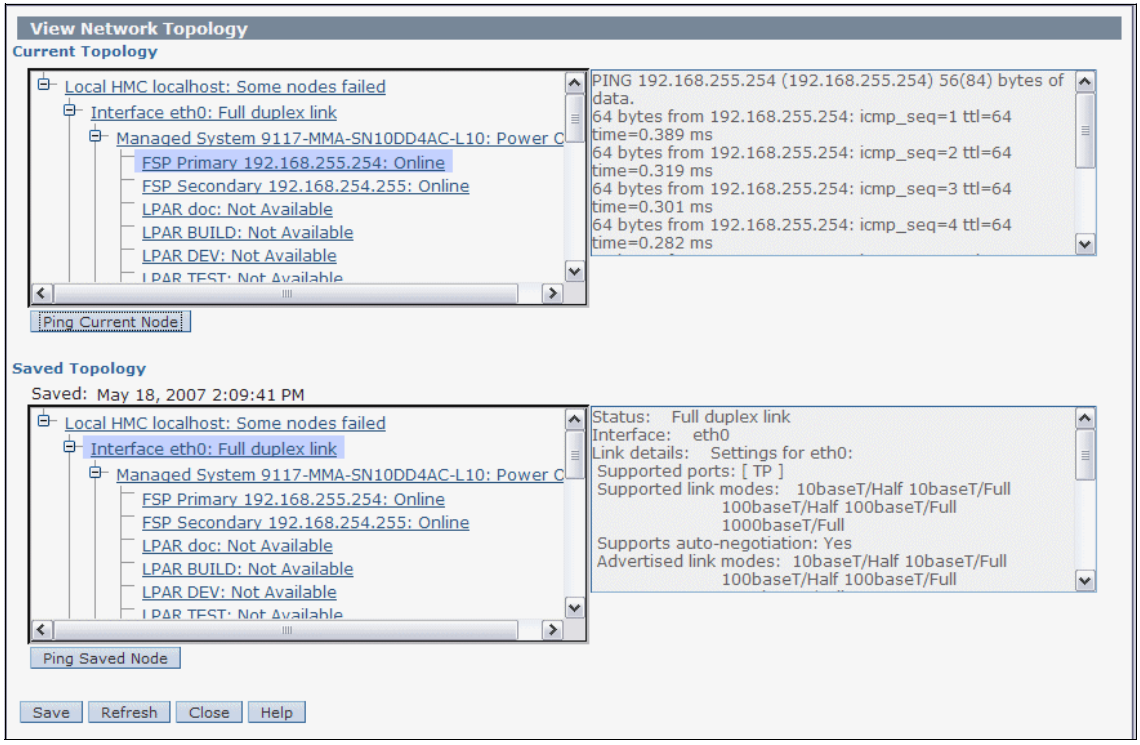


Figure 2-25 Network Topology Tree

Table 2-1 is a list of possible statuses for each node.

Note: *Unknown* is a possible status for any node where the node has been discovered, but for some reason, the status cannot be determined.

Table 2-1 Node status

Node	Possible status
Local HMC	All nodes OK, Some nodes failed, All nodes failed (cumulative status of all child nodes)
Remote HMC	Online, Offline
Interface	No link, Half duplex link, Full duplex link
Storage Facility	Status not reported.
Managed System	Managed system status reported by **`lssyscfg`** command (for example, Operating, Running)
FSP	Online, Offline
LPAR	LPAR status reported by **`lssyscfg`** command. LPARs can also carry a Connection status to report their current network status as one of the following Active, On, Off, Offline
BPA	BPA status reported by **`lssyscfg`** command.
BPC	Online, Offline

2.5.11 Tip of the Day

This task allows you to view information about using the HMC. A different fact or tip display each time you log on. The Tip of the Day window opens as long as the “Show tips each time you log on” option is selected. You can also look at additional information by clicking **Previous Tip** or **Next Tip**. When you are done viewing this window, click **Close**.

If you prefer not to have this window display each time you log on, you can clear the “Show tips each time you log on” option, and then click **Close**.

2.5.12 View License

The Licensed Internal Code (LIC) is subject to the IBM Agreement for Licensed Internal Code. LIC does not include programs and code provided under separate license agreements, including but not limited to open source license agreements.

2.5.13 Change User Interface Settings

The HMC user interface is made up of several major components: the Banner, the Navigation pane, the Work pane, the Task bar, the Status bar, and the Tasks pad.

This task enables you to customize settings that control how the HMC interface displays, including specific areas such as the user interface components and nodes that display in the Navigation pane as shown in Figure 2-26.

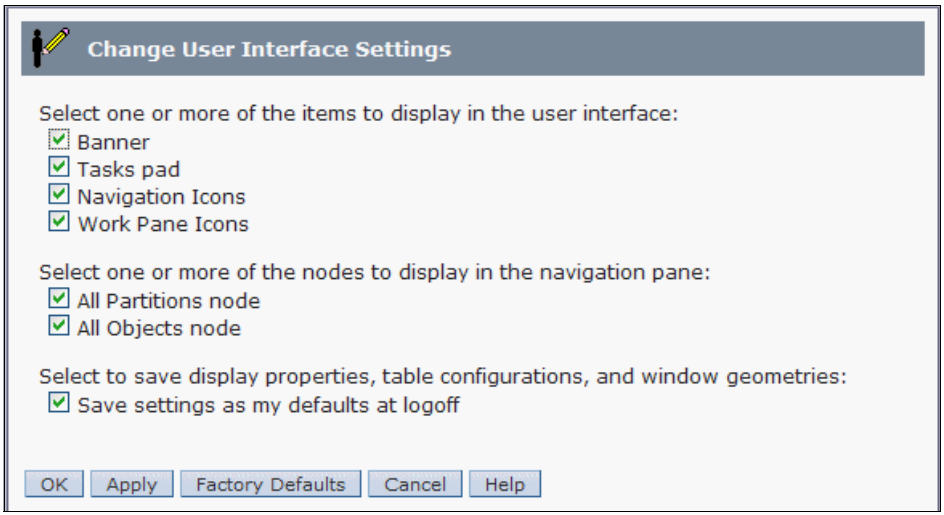


Figure 2-26 Change User Interface Settings

2.5.14 Change Date and Time

This task enables you to change the time and date of the battery operated HMC clock and to add or remove time servers for the Network Time Protocol (NTP) service as shown in Figure 2-27. The battery operated clock keeps the time and date for the HMC.

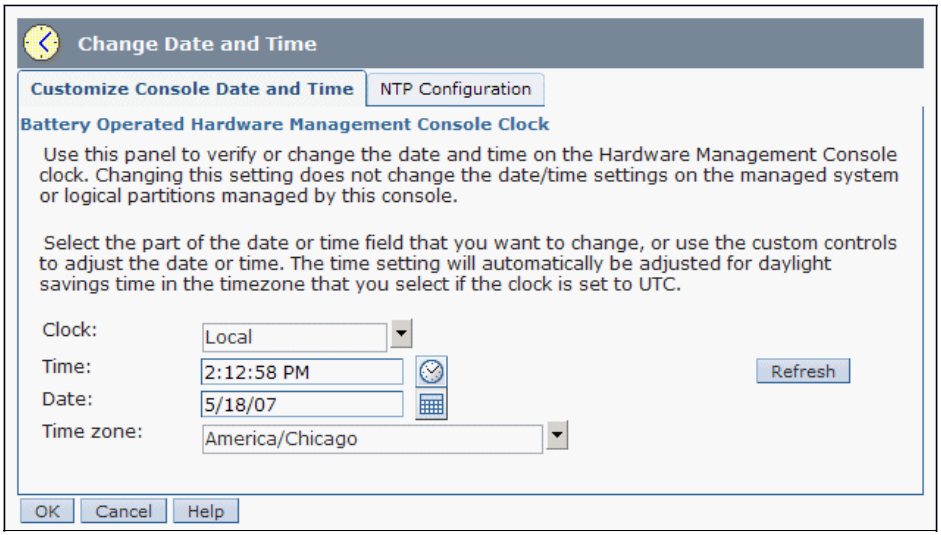


Figure 2-27 Change Date and Time

2.5.15 Launch Guided Setup Wizard

Note: You cannot perform this task remotely.

This wizard helps you set up your new system and the HMC. To set up your system and HMC successfully, complete all the tasks in the order that the wizard presents them. After you complete this wizard, you can use the properties for an object to make changes. We explain these tasks in detail in 3.2.2, “Using the HMC Guided Setup wizard” on page 80.

2.5.16 Locking the HMC screen

To lock the HMC screen, open the Lock HMC Screen task from the HMC Management work pane. The HMC screen is locked immediately.

To unlock the screen and return to the HMC workplace, press Enter and specify the password for the user ID for which you are logged in.

2.5.17 Opening a 5250 console

Use this task to open a 5250 emulator session so you can communicate with an i5/OS logical partition.

To open a 5250 console, open the Open 5250 Console task from the HMC Management work pane. The 5250 Setup window displays. From the 5250 Setup window, you can configure and start your 5250 emulator.

2.5.18 Open Restricted Shell Terminal

Use this task to acquire a command line session.

To open a restricted shell terminal, open the Open Restricted Shell Terminal task from the HMC Management work pane. The Restricted Shell window displays. From the Restricted Shell window, you can issue commands remotely through secure shell access to the managed system. This provides consistent results and automates administration of managed systems.

2.5.19 Launch Remote HMC

You can use this task to start a session to another HMC.

To open another HMC:

1. Open the Launch Remote Hardware Management Console task from the HMC Management work pane.
2. From the Remote Hardware Management Console Addressing Information window, specify the TCP/IP address or host name of the remote HMC to be contacted.
3. Click **OK** to proceed.

2.5.20 Change User Password

You can change the HMC access password. After the password is changed, it must be changed on all other systems assessing this HMC. We explain this task in detail in 5.2.1, “Changing the user password” on page 185.

2.5.21 Manage User Profiles and Access

This task manages system users who log on to the HMC. We explain this task in detail in 5.2.2, “Managing user profiles and access” on page 185.

2.5.22 Manage Task and Resource roles

This task is used to define and customize managed resource roles and task roles. We explain this task in detail in 5.2.3, “Customizing user task roles and managed resource roles” on page 190.

2.5.23 Manage Users and Tasks

This task display the list of users currently logged on and the list of all tasks running in this system. We explain this task in detail in 5.2.3, “Customizing user task roles and managed resource roles” on page 190.

2.5.24 Manage Certificates

This task manages the certificates that are used on the HMC. It provides the capability of getting information about the certificates that are used on the console. This task allows you to create a new certificate for the console, change the property values of the certificate, and work with existing and archived certificates or signing certificates. We explain this task in detail in 5.1, “Certificate management” on page 178.

2.5.25 Remote Command Execution

You can use this task to enable remote command execution using the **ssh** facility.

2.5.26 Remote Virtual Terminal

A *Remote Virtual Terminal* connection is a terminal connection to a Logical Partition from another remote HMC. You can use this task to enable Remote Virtual Terminal access for remote clients.

2.5.27 Remote Operation

This task controls whether the HMC can be operated using a Web browser from a remote workstation. By default, remote browser access to the HMC is disabled. This task allows you to enable or disable remote browser access easily.

2.5.28 Change Language and Locale

This task sets the language and location for the HMC. After you select a language, you can select a locale that is associated with that language. The language and locale settings determine the language, the character set, and other settings specific to the country or region (such as formats for date, time, numbers, and monetary units).

2.5.29 Create Welcome Text

You use this task to customize the welcome message or to display a warning message that opens before users log on to the HMC as shown in Figure 2-28. The text that you enter in the message input area for this task displays in the Welcome window after you initially access the console. You can, therefore, use this text to notify users of certain corporate policies or security restrictions that apply to the system.

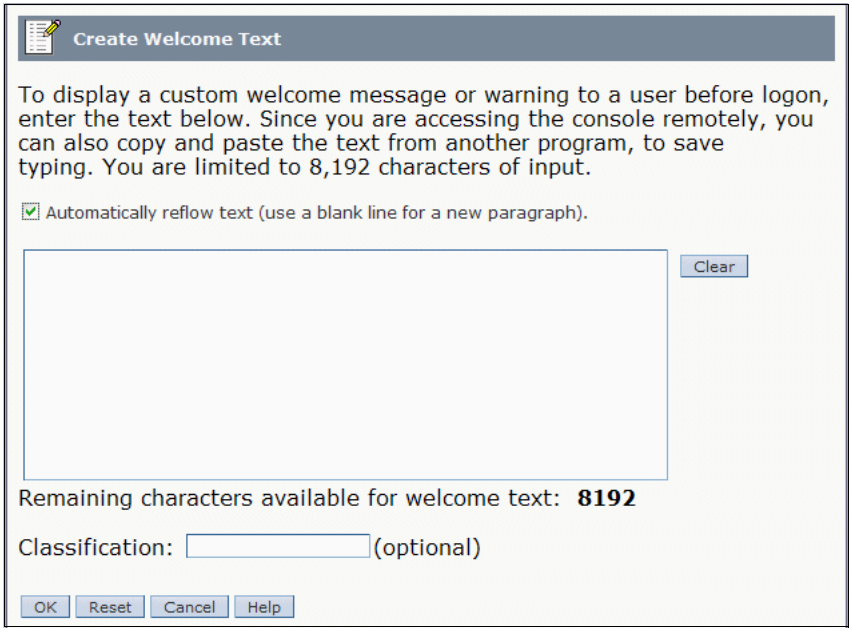


Figure 2-28 Create Welcome Text

2.5.30 Manage Data Replication

This task enables or disables customized data replication. *Customized data replication* allows another HMC to obtain customized console data from or to send data to this HMC.

Note:

- Customizable console data is accepted from other HMCs only after specific HMCs and their associated allowable customizable data types have been configured.
- Before enabling this replication service, you might want to save your original data settings in case you need to restore these settings in the future.

The Customizable Data Replication service provides the ability to configure a set of HMCs to replicate any changes automatically to certain types of data so that the configured set of HMCs keep this data synchronized without manual intervention.

You can configure the following types of data:

- Customer information data
  - Administrator information (customer name, address, telephone number, and so forth)
  - System information (administrator name, address, or telephone of your system)
  - Account information (customer number, enterprise number, sales branch office, and so forth)
- Group data
  - All user-defined group definitions
- Modem configuration data
  - Configure modem for remote support.
- Outbound connectivity data
  - Configure local modem to RSF
  - Enable an internet connection
  - Configure to an external time source.

Figure 2-29 shows the types of customizable console data that can be replicated.

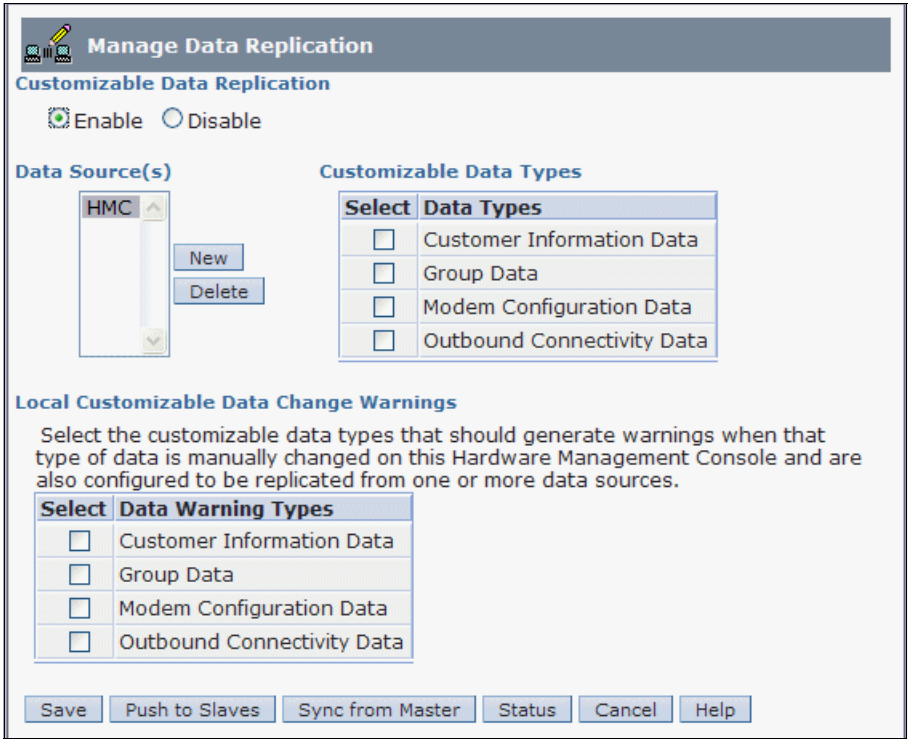


Figure 2-29 Manage Data Replication - Customizable Data Replication

You can enable the Customizable Data Replication service for the following types of operations:

- **Peer-to-peer replication**

  Provides automatic replication of the selected customized data types between peer HMCs. Changes made on any of these consoles are replicated to the other consoles.

- **Master-to-subordinate replication**

  Provides automatic replication of the selected customized data types from one or more designated master HMCs to one or more designated subordinate HMCs. Changes made on a masters console are replicated automatically to the subordinate consoles.

Configuring peer-to-peer replication

Figure 2-30 illustrates the process to configure peer-to-peer replication.

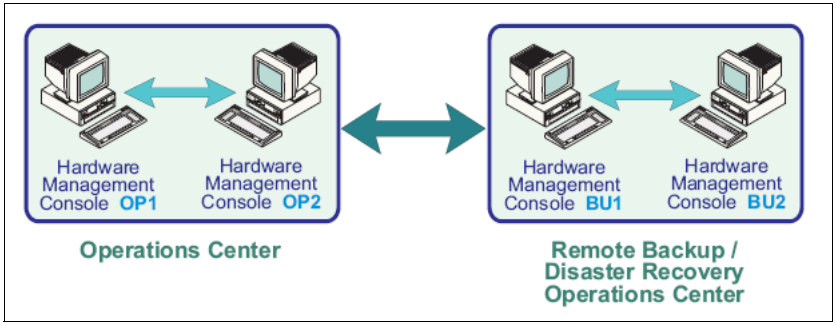


Figure 2-30 Peer-to-peer replication

To configure peer-to-peer replication, follow these steps:

1. Open the Manage Data Replication task. The Configure Customizable Data Replication window opens.
2. Select **Enable** in the Configure Data Replication panel.
3. The Configure Customizable Data Replication window opens.
4. Click **New** under Data Source(s). The Configure New Replication Source window opens.
5. Select an HMC to be used as a data source from the Discovered Console Information list, and click **Add**.

   Alternatively, you can enter the TCP/IP address of the HMC that you want to use as a data source in the TCP/IP Address Information field, and then click **Find**.
6. The Customizable Data Replication window opens again as shown in Figure 2-29 on page 65.
7. Select the types of data that you want to replicate from the Customizable Data Types list, from a peer HMC that is selected currently under Data Source(s).
8. Click **Save** to close the Customizable Data Replication window.
9. Repeat steps 1 through 8 on each of the HMCs that you want to act as peers with one another.

When communication is established between the HMCs, the requested types of customizable data are replicated automatically from one HMC to the other immediately following the change in the data itself.

Configuring master-to-subordinate replication

Figure 2-31 illustrates the process to configure master-to-subordinate replication.

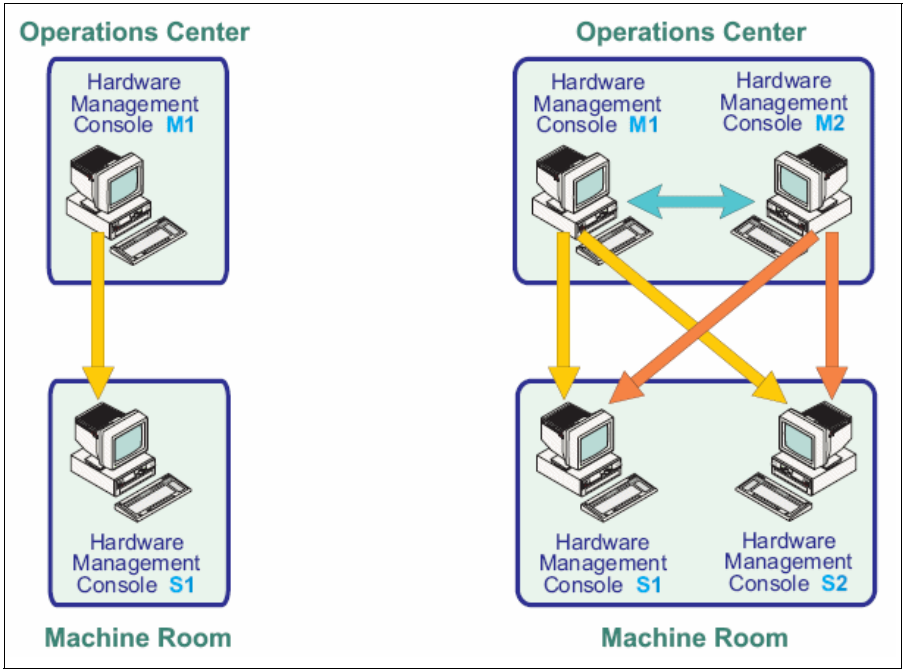


Figure 2-31 Master-to-subordinate replication

To configure master-to-subordinate replication involves two steps:

1. Setting up a master console.
2. Setting up the subordinate console.

Setting up a master console

To set up a master console:

1. Open the Manage Data Replication task. The Customizable Data Replication window opens.
2. Select **Enable** in the Configure Data Replication panel.
3. Click **Save** to close the Customizable Data Replication window.

> **Note:** If you want to configure additional master consoles, see “Configuring peer-to-peer replication” on page 66.

Setting up the subordinate console

To set up the subordinate console:

1. Open the Manage Data Replication task. The Customizable Data Replication window opens.
2. Select **Enable** in the Configure Data Replication panel.
3. The Customizable Data Replication window open.
4. Click **New** under Data Source(s). The Configure New Replication Source window opens.
5. Select a HMC to be used as a data source from the Discovered Console Information list, and click **Add**.

   Alternatively, you can enter the TCP/IP address of the HMC that you want to use as a data source in the TCP/IP Address Information field, and then click **Find**.
6. The Customizable Data Replication window opens again as shown in Figure 2-29 on page 65.
7. Select the types of data that you want to replicate from the Customizable Data Types list, from a peer HMC selected currently under Data Source(s).
8. Click **Save** to close the Customizable Data Replication window.
9. Repeat steps 1 through 8 on each of the HMCs that you want to act as peers with one another.

When open communication is established between the HMCs, the requested types of customizable data are replicated automatically from one HMC to the other immediately following the change in the data itself.

3

Installing the HMC

To set up the Hardware Management Console (HMC), you must complete the following groups of tasks:

- Cabling the HMC to the managed server
- Gathering configuration settings for your installation and configuring the HMC
- Connecting managed systems to the HMC

The HMC can be a stand-alone HMC or an HMC that you plan to install in a rack.

This chapter provides an overview of these tasks.

3.1 Cabling the HMC

Attention: Do not plug the power cords into electrical outlet until you are instructed to do so.

This section discusses how to connect the HMC cables, connect the Ethernet cable, and connect the HMC to a power source. You can use these instructions to help you cable your rack-mounted or stand-alone HMC.

To cable the HMC:

1. Use the specifications for the HMC to help ensure that you position the HMC in the correct location. HMC specifications provide detailed information for your HMC, including dimensions, electrical power, temperature, environment, and service clearances.

   Choose from the following options:

   a. If you are installing a rack-mounted HMC, continue with step 2.

   b. If you are installing a stand-alone HMC, skip to step 3 on page 72.

2. To install a rack-mounted HMC:

   a. First, identify the location of the connectors:

      - A rack-mounted HMC 7310-CR4 (Figure 3-1)
      - A rack-mounted HMC 7310-CR3 (Figure 3-2)
      - A rack-mounted HMC 7310-CR2 (Figure 3-3)

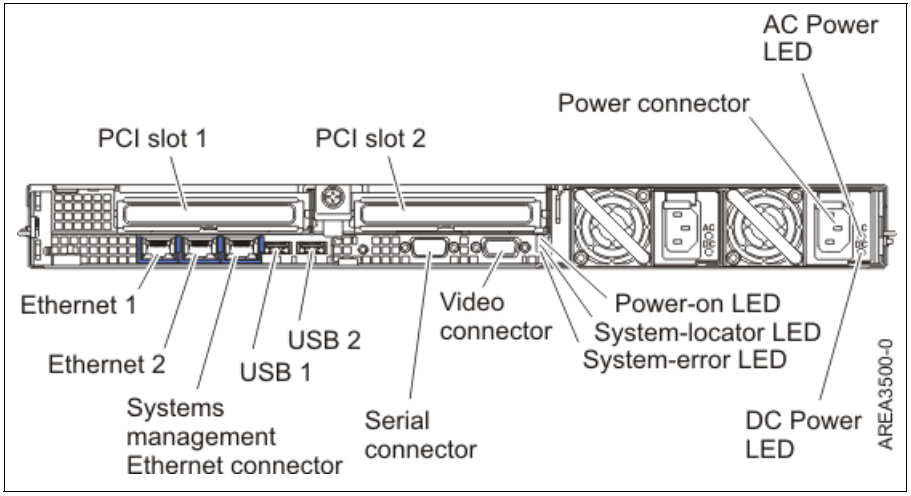


Figure 3-1 Back view of a rack-mounted HMC 7310-CR4

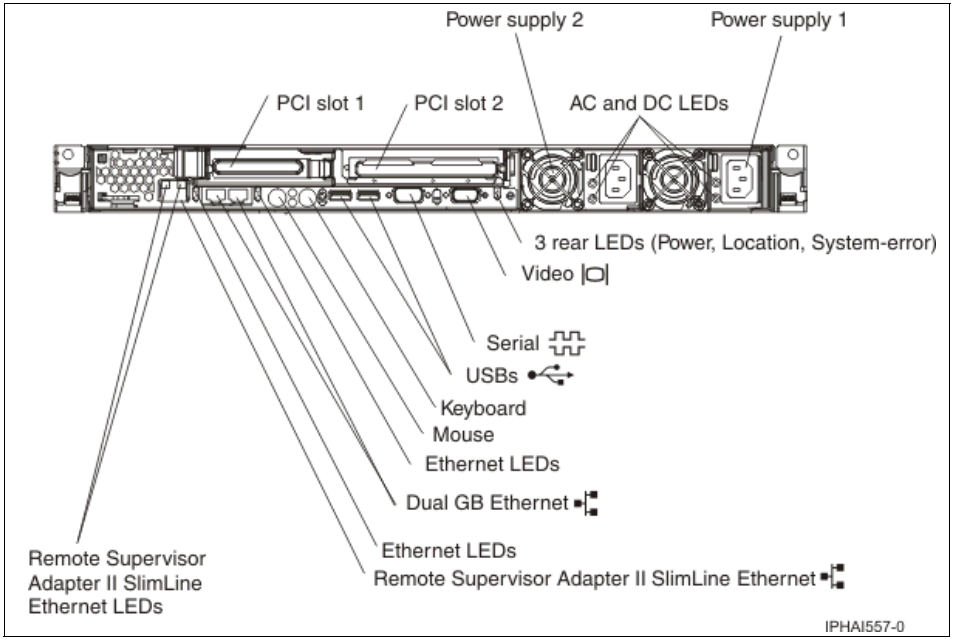


Figure 3-2 Back view of a rack-mounted HMC 7310-CR3

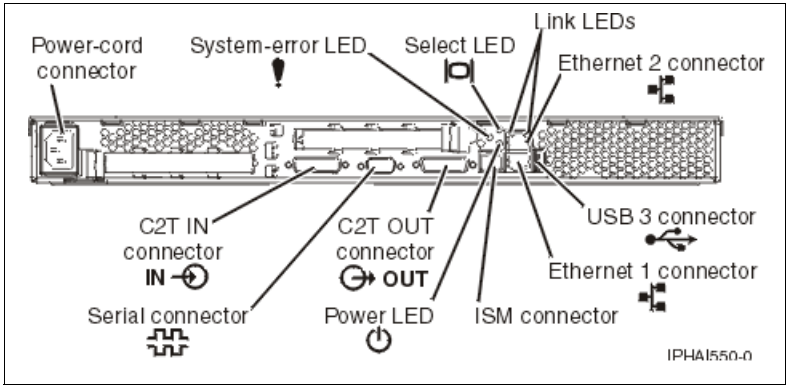


Figure 3-3 Back view of a rack-mounted HMC 7310-CR2

b. Next, install the HMC into a rack.

c. After the HMC is installed into a rack, connect the monitor, keyboard, and mouse.

   For connection to a HMC 7310-CR2, connect the keyboard and display to the C2T-to-KVM (keyboard, video, and mouse) adapter that you have attached previously to the HMC. The mouse is integrated with the keyboard. If your keyboard and mouse use USB connections, you can also connect them to the USB ports on the front panel of the HMC.

   For connection to a HMC 7310-CR3, connect the keyboard, display, and mouse using the USB conversion option cable.

After you complete these steps, then skip to step 4 on page 77.

3. If you are installing a stand-alone HMC:

   a. First, identify the location of the connectors:

      - A stand-alone HMC 7310-C06 (Figure 3-4 on page 73)
      - A stand-alone HMC 7310-C05 (Figure 3-5 on page 74)
      - A stand-alone HMC 7310-C04 (Figure 3-6 on page 75 and Table 3-1 on page 75)
      - A stand-alone HMC 7310-C03 (Figure 3-7 on page 76 and Table 3-2 on page 77)

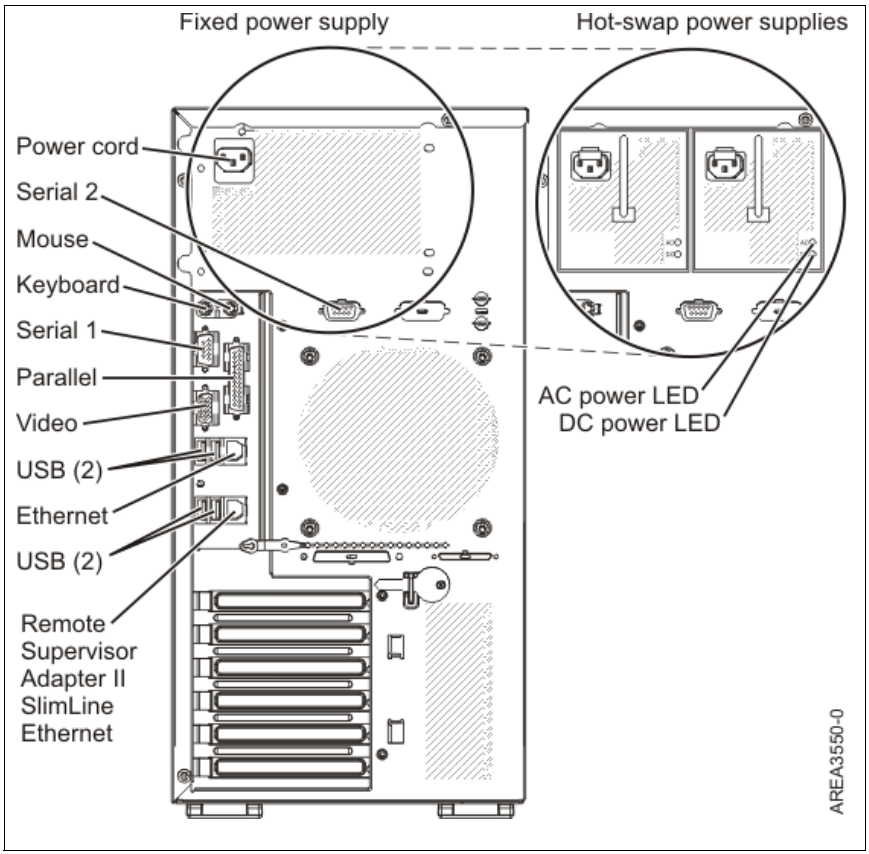


Figure 3-4 Back view of a stand-alone HMC 7310-C06

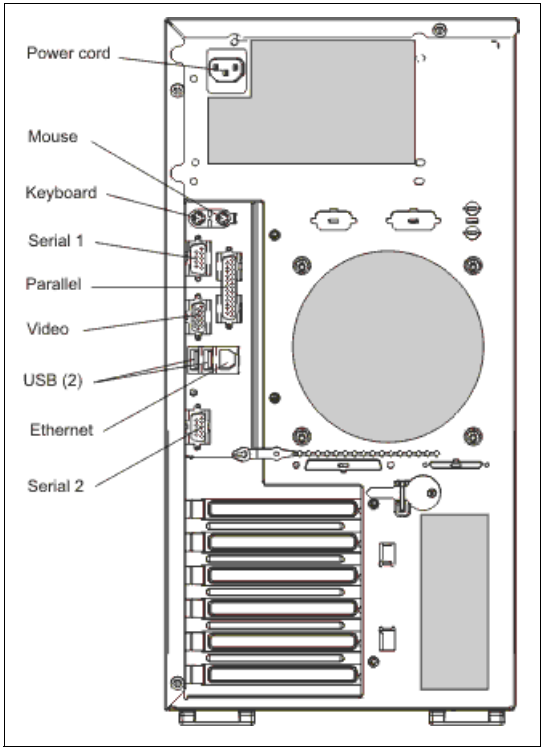


Figure 3-5 Back view of a stand-alone HMC 7310-C05

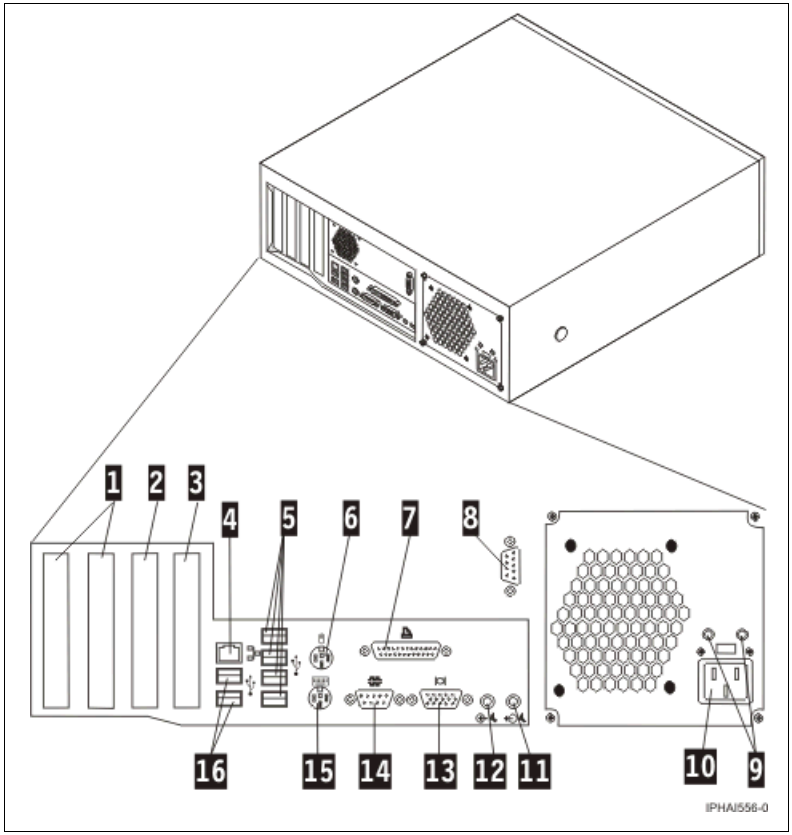


Figure 3-6 Back view of a stand-alone HMC 7310-C04

Table 3-1 describes the physical ports of this HMC hardware platform.

Table 3-1 Description of stand-alone HMC 7310-C04

No.	Description
1	PCI Connectors (slot 1 to left)
2	PCI Express (x1) connector
3	PCI Express (x16) graphic connector
4	Ethernet connector
5	USB connector
6	Mouse connector
7	Parallel connector

No.	Description
8	System connector
9	Diagnostic LEDs
10	Power connector
11	Audio line-out connector
12	Audio line-in connector
13	VGA monitor connector
14	System connector
15	Keyboard connector
16	USB connectors

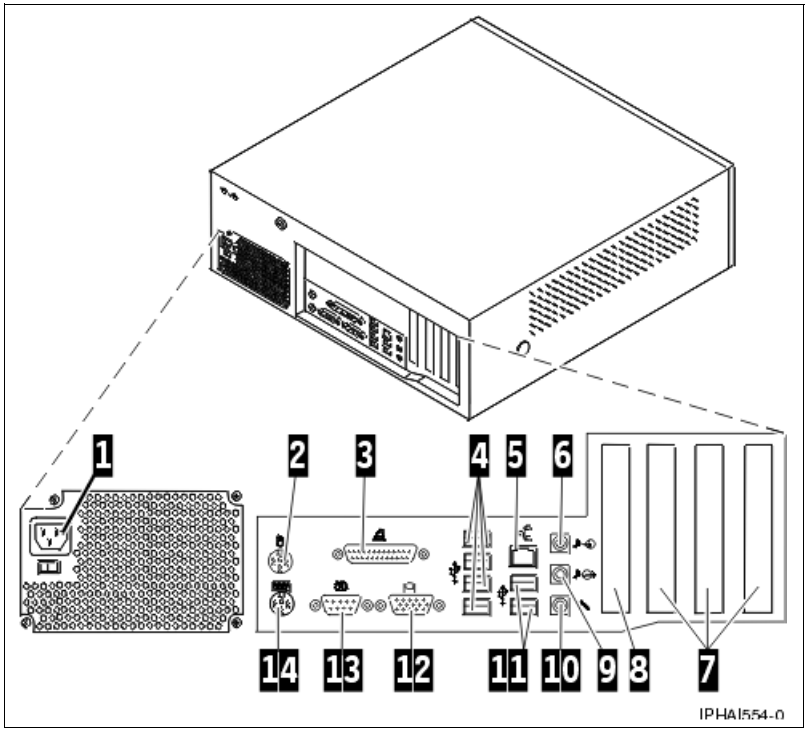


Figure 3-7 Back view of a stand-alone HMC 7310-C03

Table 3-2 describes the physical ports of this HMC hardware platform.

Table 3-2 Description of stand-alone HMC 7310-C03

No.	Description
1	Power connector
2	Mouse connector
3	Parallel connector
4	USB connectors
5	Ethernet connector
6	Audio line in connector
7	PCI slots (slot 1 to right)
8	AGP slot
9	Audio line-out connector
10	Microphone connector
11	USB connector
12	VGA monitor connector
13	System connector
14	Keyboard connector

b. Attach the monitor cable to the monitor connector and tighten the screws. Attach the power cord to the monitor. Ensure that the voltage selection switch on the HMC is set to the voltage that is used in your area. The voltage selection switch is red and is located near the power connector. Move the switch so that the voltage that is used in your area is displayed.

c. Plug the power cord into the HMC, and then connect the keyboard and mouse. For USB connections, connect the keyboard and mouse to USB ports on the HMC. You can connect the keyboard and mouse to the USB ports on the front or back panels. For PS/2 connections, connect the keyboard and mouse to their connector on the back panel of the HMC.

4. Connect the modem. During the installation and configuration of the HMC, the modem might dial out automatically as the HMC follows routine call-out procedures.

5. Connect the Ethernet (crossover) cable from the HMC to the managed server. Your HMC should be connected to the managed server in a private service DHCP network. Your Ethernet connection to the managed server

must be made using the Ethernet port that is defined as eth0 on your HMC. If you have not installed any additional Ethernet adapters in the PCI slots on your HMC, use the primary integrated Ethernet port. If you have installed additional Ethernet adapter in the PCI slots, see Table 3-3 to determine which Ethernet port you must use.

Table 3-3 HMC types and associated rules for Ethernet placement

HMC type	Rules for Ethernet placement
Rack-mounted	The HMC supports only one additional Ethernet adapter. If an additional Ethernet adapter is installed, that port is defined as eth0. In this case, the primary integrated Ethernet port is then defined as eth1, and the secondary integrated Ethernet port ID defined as eth2. If no adapters are installed, the primary integrated Ethernet port is defined as eth0.
Stand-alone model 7310-C04	The definitions depend on the type of Ethernet adapter you have installed: ► If only one Ethernet adapter is installed, whether it is a 1 Gigabit Ethernet adapter or 10/100 Mbps Ethernet adapter, that adapter is defined as eth0. ► If both a 10/100 Mbps adapter and a 1 Gigabit Ethernet adapter are installed, the 1 Gigabit Ethernet adapter is always defined as eth0. ► If two 10/100 Ethernet adapters are installed, the adapter in slot 1 is defined as eth0. ► If two 1 Gigabit Ethernet adapters are installed, the adapter in slot 1 is defined as eth0.
Stand-alone model 7310-C03	The definitions depend on the type of Ethernet adapter you have installed: ► The 1 Gigabit Ethernet adapter is generally defined as eth0. One exception is when it is placed in slot 1, however this placement is not recommended. ► If multiple 1 Gigabit Ethernet adapters are installed, the configuration is defined in the following order: slot 2 is eth0, slot 3 is eth1, and the integrated Ethernet port is eth2. ► If adapters other than the 1 Gigabit Ethernet adapters are installed, the integrated Ethernet port is always defined as eth0.

6. If you use an external modem, plug the modem power supply cord into the HMC modem.
7. Plug the power cords from the monitor, HMC, and HMC external modem into electrical outlets.

This completes the section for cabling of the HMC.

Attention: Do *not* connect the managed system to a power source at this time.

3.2 Configuring the HMC using the HMC Guided Setup wizard

The HMC Guided Setup wizard helps you to set up your system and the HMC. The wizard launches automatically the first time that you start the HMC. This wizard is the easiest way to configure the HMC.

Important: When installing a new Server p system, do not turn on the system before connecting it to an HMC. The service processor on a Server p system is a DHCP client and will search for a DHCP server (the HMC) to obtain its IP address. If no DHCP server can be found, the service processor will assign a default IP address and simple communication with the HMC will be prevented. If this occurs, you will have to change the IP setting of the service processor manually.

To configure the HMC successfully, you must understand related concepts, make decisions, and prepare information. The Guided Setup helps you to configure the following functions:

- Change HMC date and time
- Change HMC passwords
- Create additional HMC users
- Specify contact information
- Configure connectivity information
- Authorize users to use Electronic Service Agent™ and configure notification of problem events

After you complete this wizard, you can use the properties for an object to make changes.

3.2.1 The HMC Guided Setup wizard checklist

Use this checklist to make sure that you have collected the information that you need to complete the HMC Guided Setup wizard.

- ☐ Language and Locale
- ☐ Date and time zone
- ☐ HMC IDs and passwords
- ☐ HMC users and roles
- ☐ Contact information
- ☐ HMC network settings
- ☐ Media speed
- ☐ Private or open network
- ☐ HMC service and support
- ☐ Service Agent registration
- ☐ SMTP

3.2.2 Using the HMC Guided Setup wizard

This section provides a step-by-step guide to setting up the HMC using the HMC Guided Setup wizard. Make sure that you have completed the HMC Guided Setup wizard checklist before continuing with this section.

Set up language and locale

Before starting the HMC Guided Setup wizard, set up your language in one of the 42 supported languages or the default of US English. After you select a language, you can select a locale associated with that language. The language and locale settings determine the language, the character set, and other specific to the country or region such as the formats for date, time, numbers, and monetary units.

Figure 3-8 shows how to set up the language and locale. After you accept the new setting, you must log off the HMC and log on again. You can change the language at anytime, but you must log off the HMC then log on again.

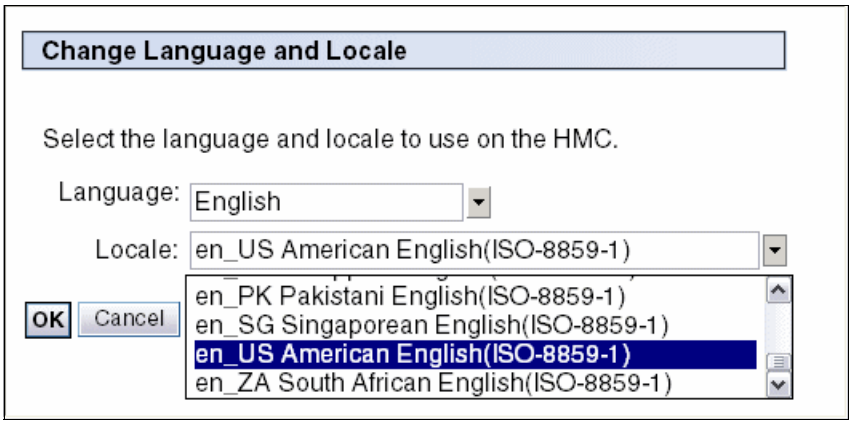


Figure 3-8 Change Language and Locale

Note: In some languages, not all words are translated.

Launching the HMC Guided Setup wizard

The HMC Guided Setup wizard launches automatically when you first start the HMC. You can also launch the wizard from the HMC desktop using the following steps:

1. Log on to the HMC with the default system administrator user ID *hscroot* with its default password *abc123*.

2. In the Work Pane, click **Guided Setup Wizard** (Figure 3-9).

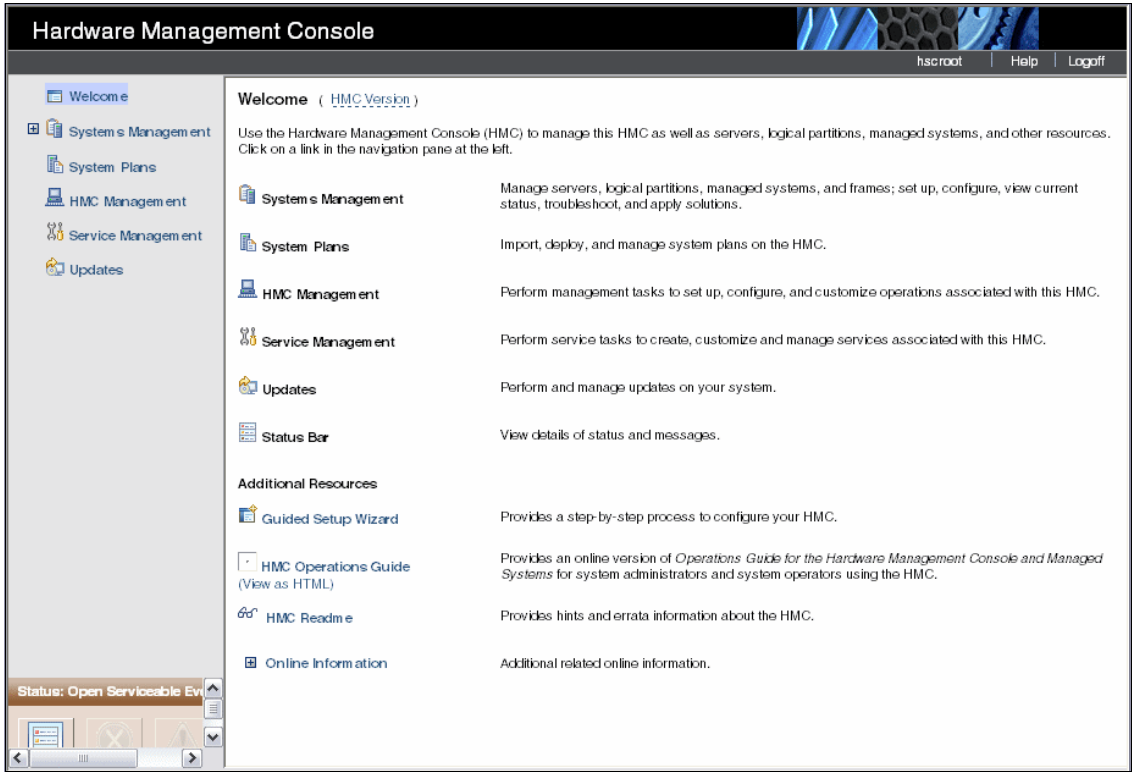


Figure 3-9 HMC Welcome screen

3. The Launch Guided Setup Wizard - Welcome page opens (Figure 3-10). Click **Next** to continue with the Guided Setup wizard.

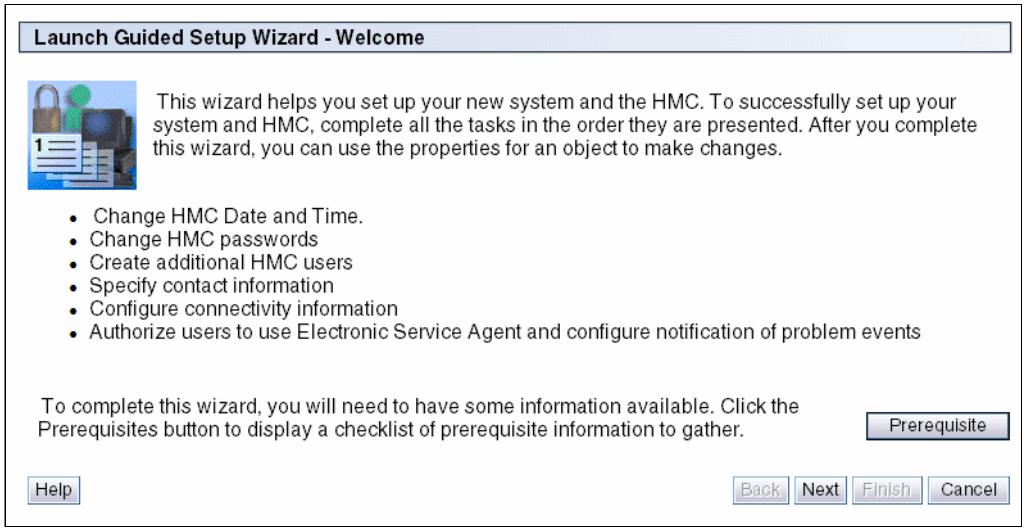


Figure 3-10 Launch Guided Setup Wizard - Welcome page

4. In the Launch Guided Setup Wizard - Change HMC Date and Time page, enter the correct date and time and time zone for your location (Figure 3-11). This information is typically the time zone for the server, assuming that the HMC is the local machine. For a remote machine, you should choose the correct time zone according your location. Click **Next** to continue with the Guided Setup wizard.

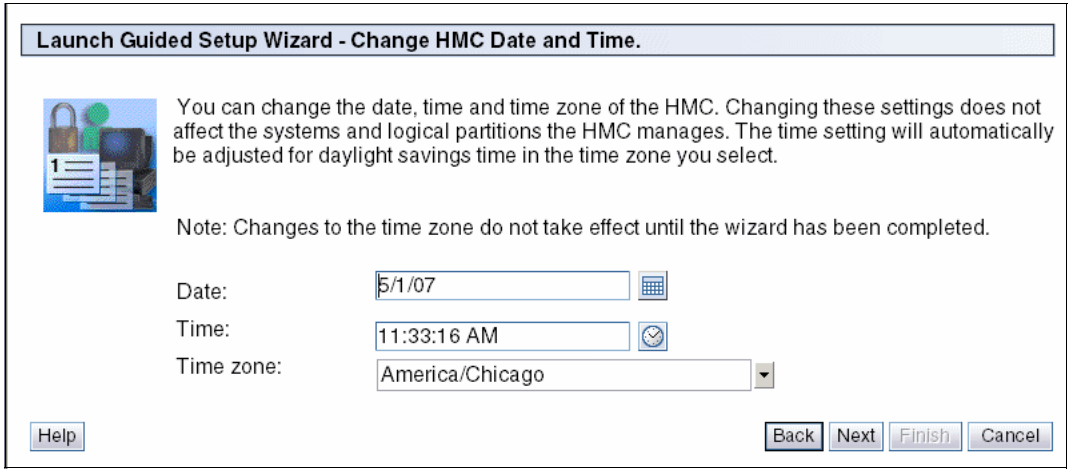


Figure 3-11 Launch Guided Setup Wizard - Change HMC Date and TIme

5. The Launch Guided Setup Wizard - Change *hscroot* Password window displays as shown in Figure 3-12. Enter the new *hscroot* password that you would like (normally the default password ID *abc123*). Use of the *hscroot* user ID to access the user interface and to manage the HMC.

   Use these following password rules:

   – The password must contain at least seven characters.

   – The characters should be standard 7-bit ASCII characters.

   – These characters include the characters A-Z, a-z, 0-9, and many special characters such as tilde (~), exclamation mark (!), at sign (@), number sign (#), dollar sign ($), percent sign (%), caret (^), ampersand (&), asterisk (*), left and right parentheses ( ), underscore (_), plus sign (+), hyphen (-), equals sign (=), left and right curly braces ({ }), left and right square brackets ([ ]), backslash (\), colon (:), quotation mark ("), semicolon (;), and apostrophe (').

   – Passwords can include special characters, but passwords must begin with an alphanumeric character.

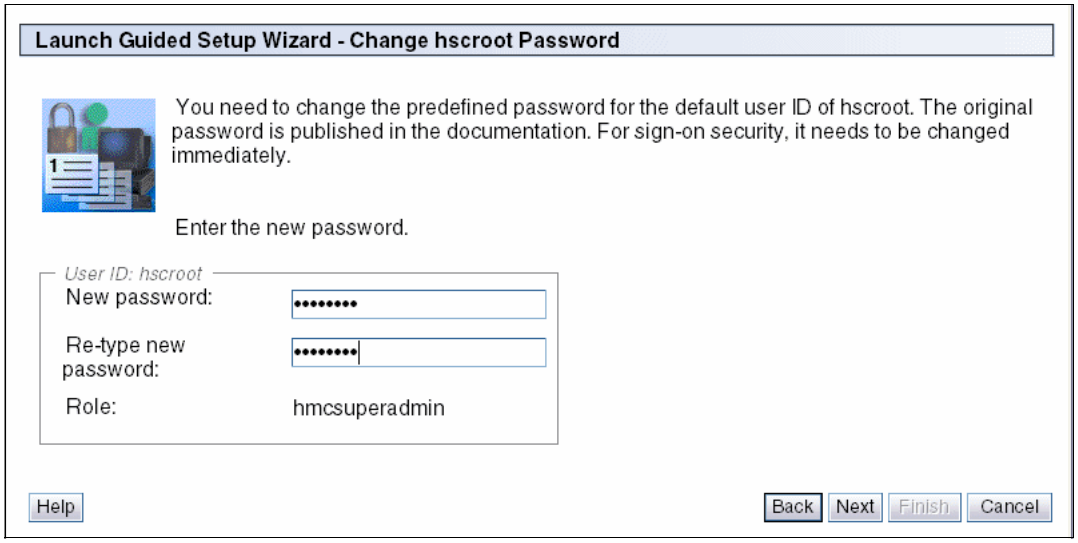


Figure 3-12 Launch Guided Setup Wizard - Change hscroot Password

You should change the *hscroot* default password as soon as possible as security issue.

Click **Next** to continue with the Guided Setup wizard.

6. The Launch Guided Setup Wizard - Change root password panel displays as shown in Figure 3-13. Enter the new *root* password that you would like (normally the default password ID *passw0rd* where *0* is the number zero). You should use *root* password rules same as *hscroot* password rules before. A service provider uses the *root* user ID to perform maintenance on the server.

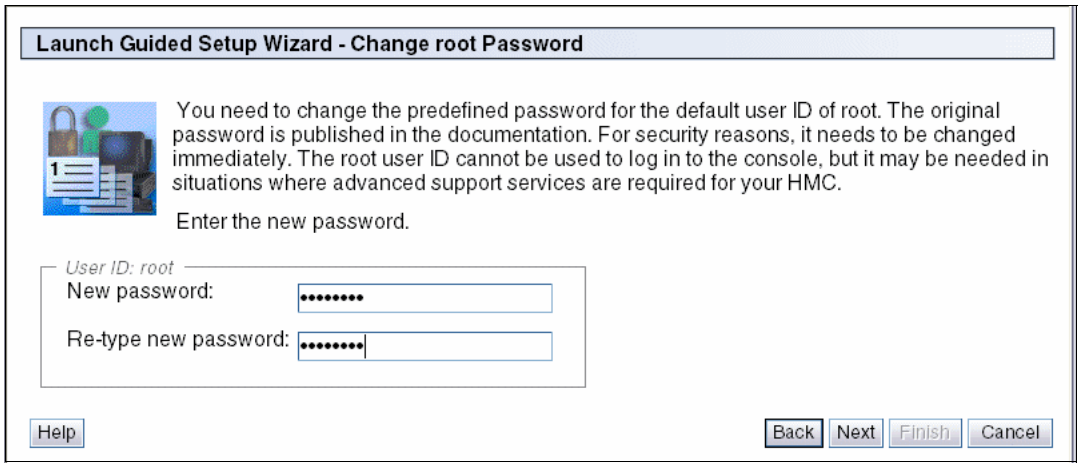


Figure 3-13 Launch Guided Setup Wizard - Change root Password

Click **Next** to continue with the Guided Setup wizard.

7. The Launch Guided Setup Wizard - Create Additional HMC Users panel displays as shown in Figure 3-14. You can optionally create new HMC users. In this example, we create a new hscoperator user ID with role as hmcoperator. Refer to 5.2, “HMC user management” on page 184 for further information about users and roles. You can also skip this step and create users manually later.

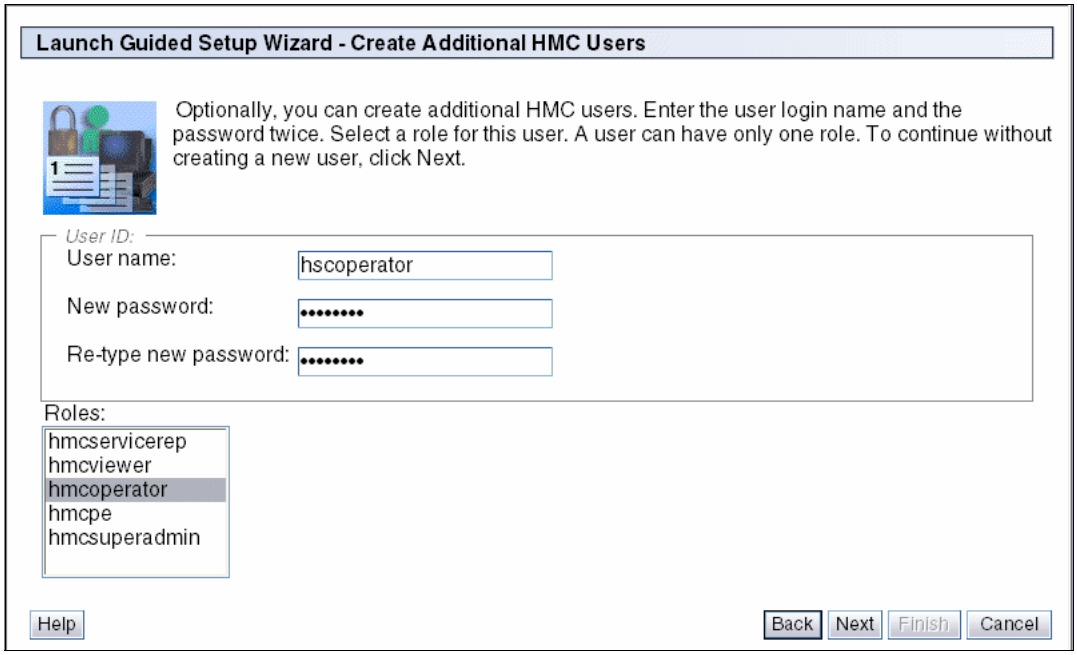


Figure 3-14 Launch Guided Setup Wizard - Create Additional HMC Users

Click **Next** to continue with the Guided Setup wizard.

8. The Launch Guided Setup Wizard - Create Additional HMC Users panel displays (see Figure 3-15). If you want to create more users, then select **Yes**, otherwise select **No** and click **Next** to continue with the Guided Setup Wizard.

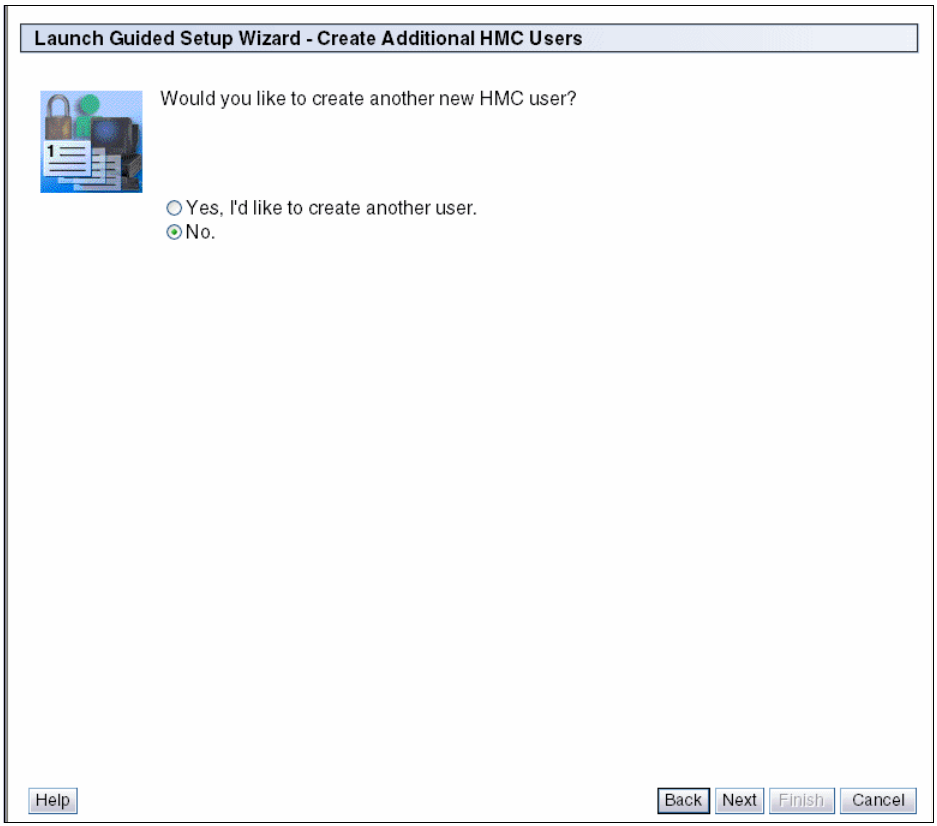


Figure 3-15 Launch Guided Setup Wizard - Create Additional HMC Users

9. This completes the first part of the Guide Setup Wizard. The Launch Guided Setup Wizard - The Next Steps panel displays as shown in Figure 3-16.

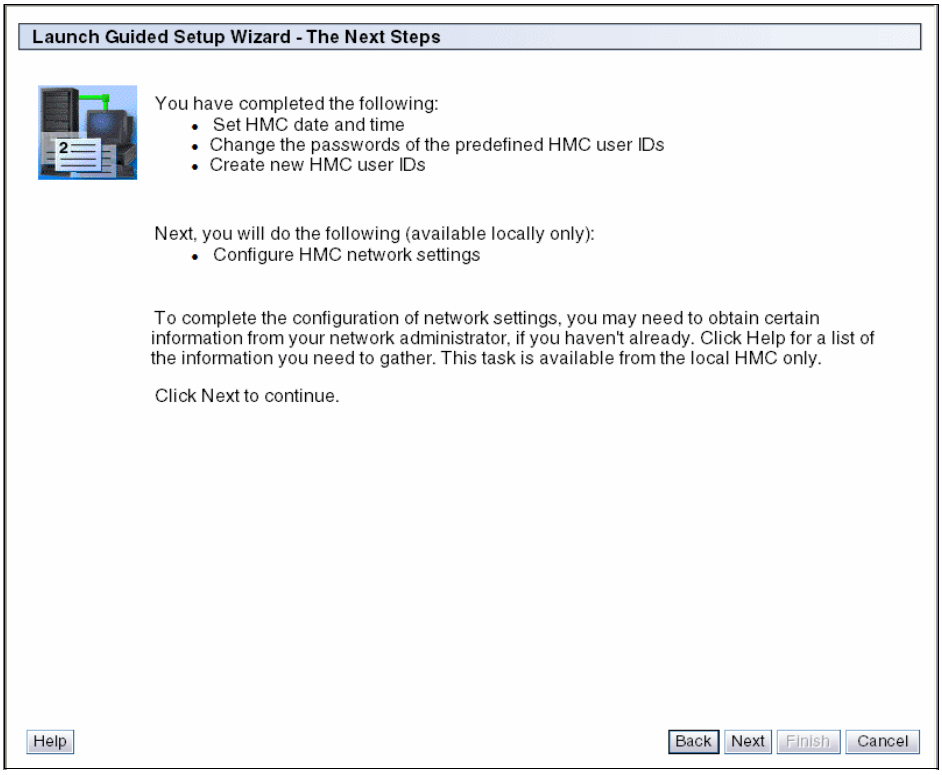


Figure 3-16 Launch Guided Setup Wizard - The Next Steps

The next step configures the HMC network settings. You might need to discuss this step with your network administrator for HMC environment.

Click **Next** to continue with the Guided Setup wizard.

10. The Launch Guided Setup Wizard - Configure HMC Network Settings panel displays as shown in Figure 3-17. In our example, we see two LAN adapters available (*eth0* and *eth1*), although you might only see one adapter in your HMC system.

    We show you how to configure the HMC for both a private network and an open network. We use the first Ethernet network card (eth0) for a private network, then return to this panel again to configure eth1 for an open network. We use the private network to connect the HMC with our managed systems and other HMCs. We use the second Ethernet card (eth1) for an open network.

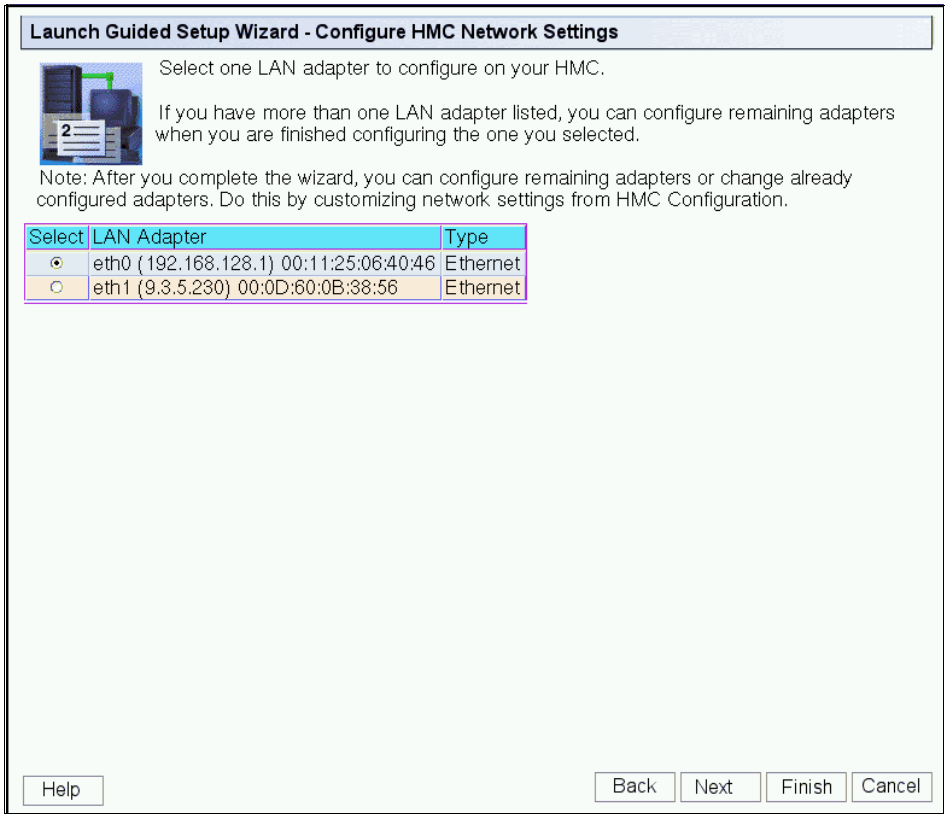


Figure 3-17 Launch Guided Setup Wizard - Configure HMC Network Settings

Select LAN adapter eth0 to be configured first, then click **Next** to continue with the Guided Setup wizard.

11. The Launch Guided Setup Wizard - Configure eth0 Media Speed panel displays (Figure 3-18). You can choose the LAN adapter speed at Autodetection for initial setup, or you can set the adapter speed if you know the information.

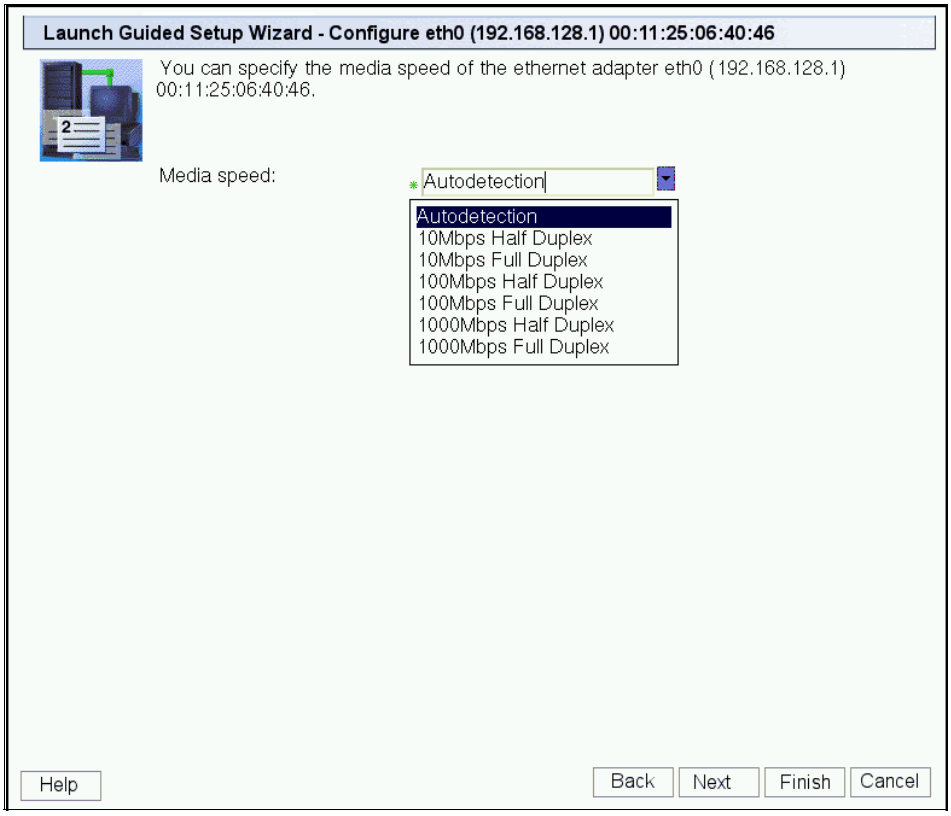


Figure 3-18 Launch Guided Setup Wizard - Configure eth0 Media Speed

For this example, we set Autodetection. Click **Next** to continue with the Guided Setup wizard.

12. The Launch Guided Setup Wizard - Configure eth0 Private Network panel displays as shown in Figure 3-19. As mentioned previously, we set the LAN adapter eth0 as a private network to connect to our managed systems.

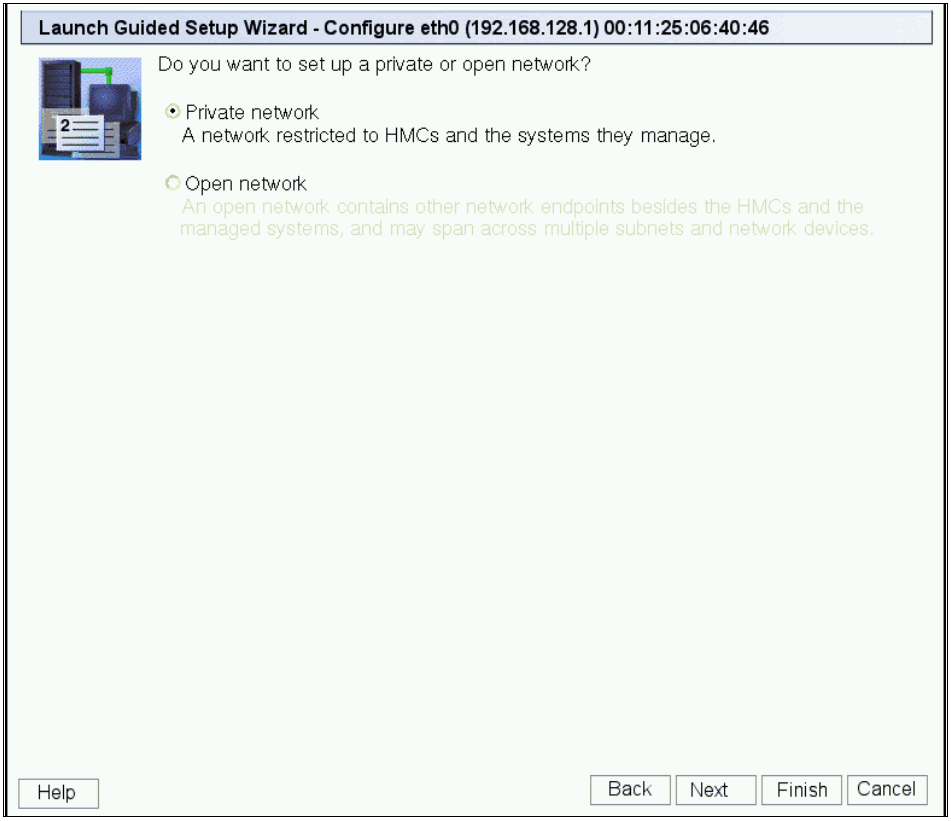


Figure 3-19 Launch Guided Setup Wizard - Configure eth0 Private Network

In this example, we select the Private Network. Then, click **Next** to continue.

13. The Launch Guided Setup Wizard - Configure eth0 DHCP panel displays (see Figure 3-20). We have to define the HMC as a DHCP server so our managed system is assigned an IP address by the DHCP server.

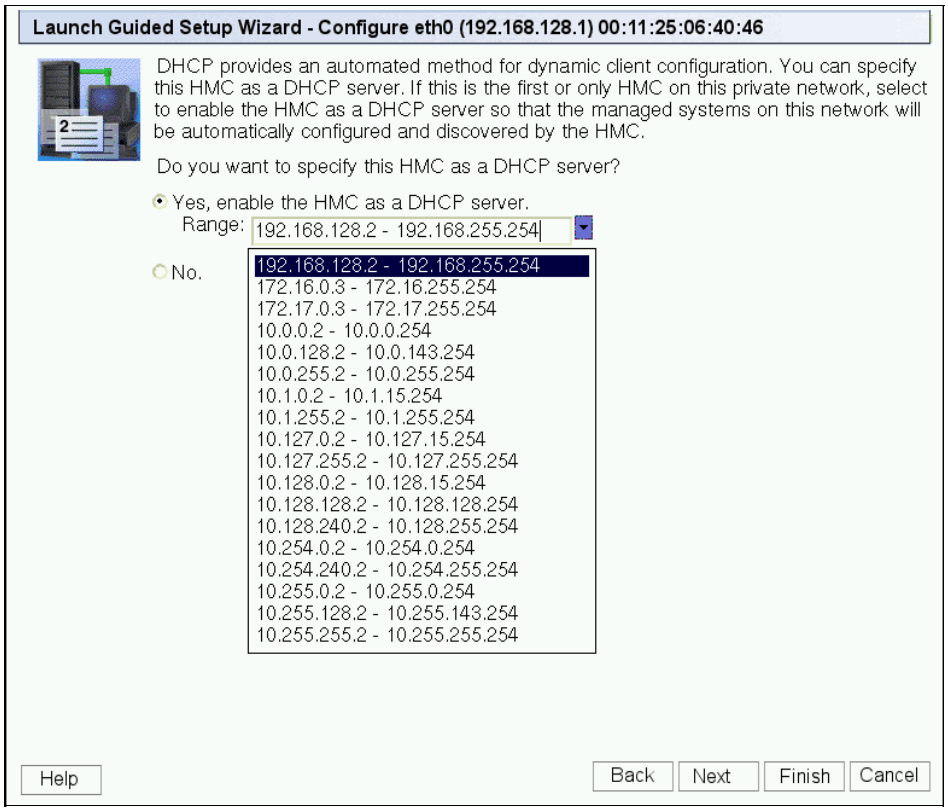


Figure 3-20 Launch Guided Setup Wizard - Configure eth0 DHCP

The HMC becomes DHCP server to all clients in a private network. These clients will be our managed systems and other HMCs. You can configure the HMC to select one of several different IP address ranges to use for this DHCP server, so that the addresses provided to the managed systems do not conflict with addresses used on other networks to which the HMC is connected.

We have some standard nonroutable IP address ranges that are assigned to its clients. The ranges that can be selected are:

- 192.168.128.2 - 192.168.255.254
- 172.16.0.3 - 172.16.255.254
- 172.17.0.3 - 172.17.255.254
- 10.0.0.2 - 10.0.0.254
- 10.0.128.2 - 10.0.143.254
- 10.0.255.2 - 10.0.255.254
- 10.1.0.2 - 10.1.15.254
- 10.1.255.2 - 10.1.255.254
- 10.127.0.2 - 10.127.15.254
- 10.127.255.2 - 10.127.255.254
- 10.128.0.2 - 10.128.15.254
- 10.128.128.2 - 10.128.128.254
- 10.128.240.2 - 10.128.255.254
- 10.254.0.2 - 10.254.0.254
- 10.254.240.2 - 10.254.255.254
- 10.255.0.2 - 10.255.0.254
- 10.255.128.2 - 10.255.143.254
- 10.255.255.2 - 10.255.255.254

The HMC LAN adapter eth0 will be assigned one before the first IP address out of the range selected. In our example, we select the 192.168.0.2 to 192.168.255.254 range, so our HMC is given an IP address 192.168.0.1. Any other client (HMC or managed system) is given an address from this range.

The DHCP server in the HMC uses automatic allocation, which means that each managed system will be reassigned exactly the same IP address each time it is started. The DHCP server uses each client's built in Media Access Control (MAC) address to ensure that it will reassign each client with same IP address as before. When a managed system starts, it will try to contact the DHCP server to obtain its IP address. If the managed system is unable to contact the HMC DHCP server then the managed system will use its last given IP address.

We set the IP address range 192.168.0.2 to 192.168.255.254 and click **Next** to continue.

14. The Launch Guided Setup Wizard - Configure HMC Network Settings panel displays (Figure 3-21). This completes the network configuration for LAN adapter eth0 as a private network. We can proceed with network configuration for LAN adapter eth1 as an open network.

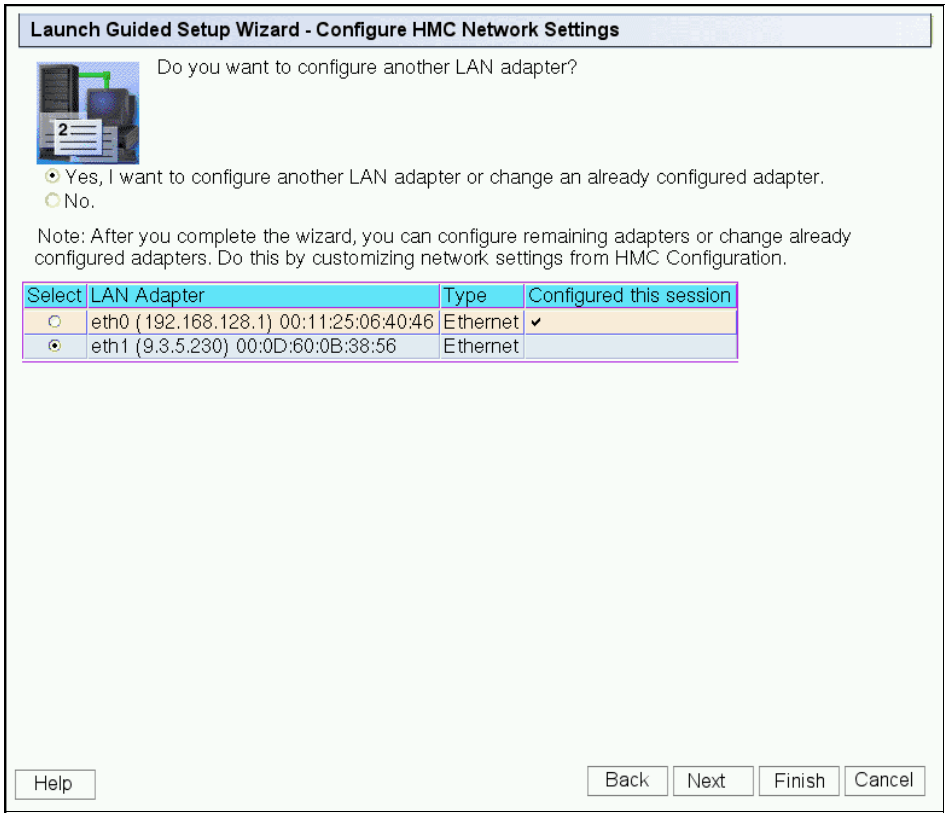


Figure 3-21 Launch Guided Setup Wizard - Configure HMC Network Settings

Select **Yes** option and LAN adapter eth1 should be selected. Click **Next** to continue with the Guided Setup wizard.

15. The Launch Guided Setup Wizard - Configure eth1 Media Speed panel is then displayed (Figure 3-22). As the eth0 configuration before, you can leave the LAN adapter speed at Autodetection for initial setup, or you can set the LAN adapter speed if you know the information.

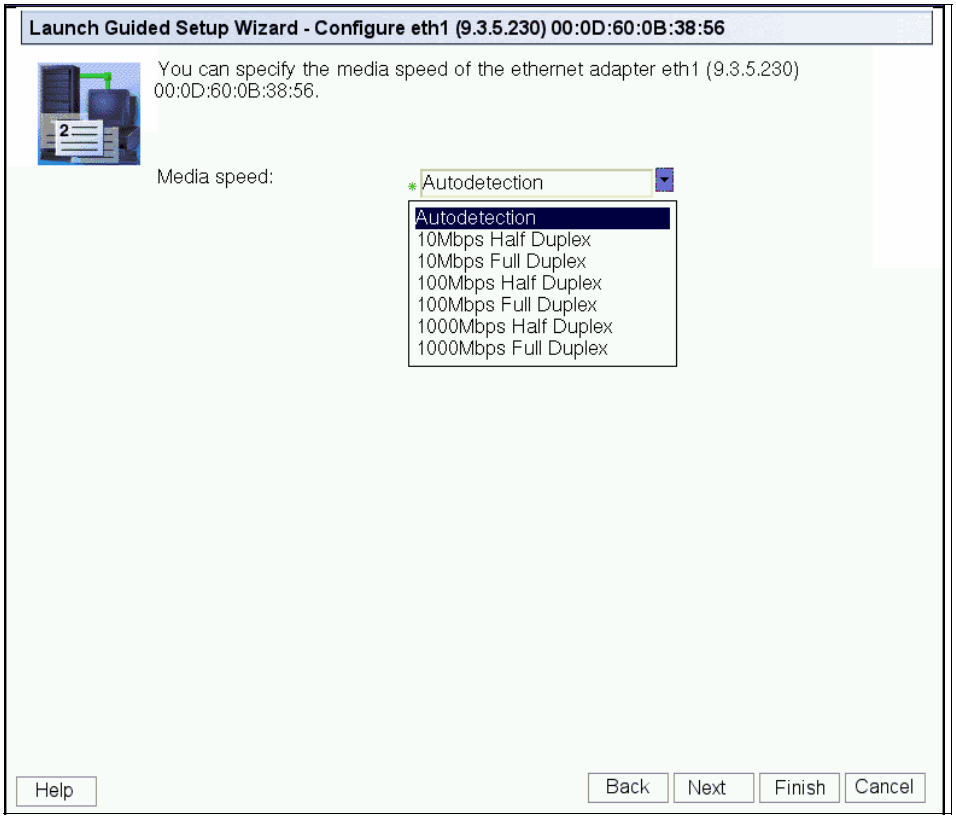


Figure 3-22 Launch Guided Setup Wizard - Configure eth1 Media Speed

Click **Next** to continue with the Guided Setup wizard.

16. The Launch Guided Setup Wizard - Configure eth1 Open Network display is now shown (Figure 3-23). As mentioned previously, we select Open network for eth1.

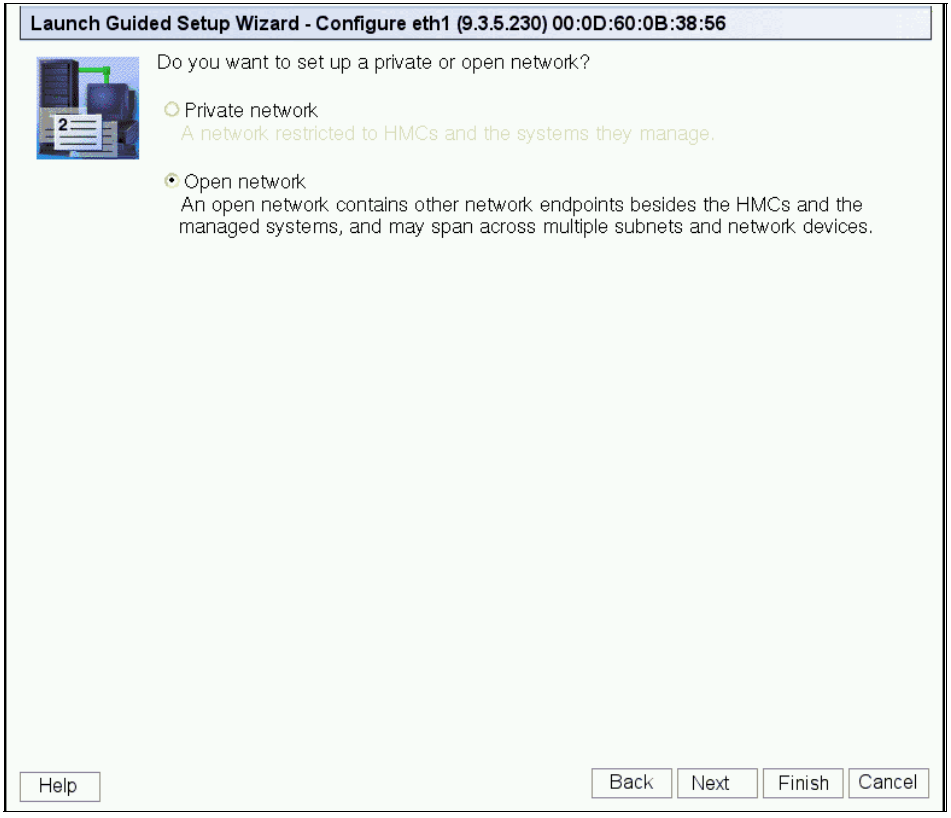


Figure 3-23 Launch Guided Setup Wizard - Configure eth1 Open Network

Click **Next** to continue with the Guided Setup wizard.

17. The Launch Guided Setup Wizard - Configure eth1 IP Assignment panel is shown in Figure 3-24. We can configure interface eth1 to obtain an IP automatically from your DHCP server or to use a fixed IP address.

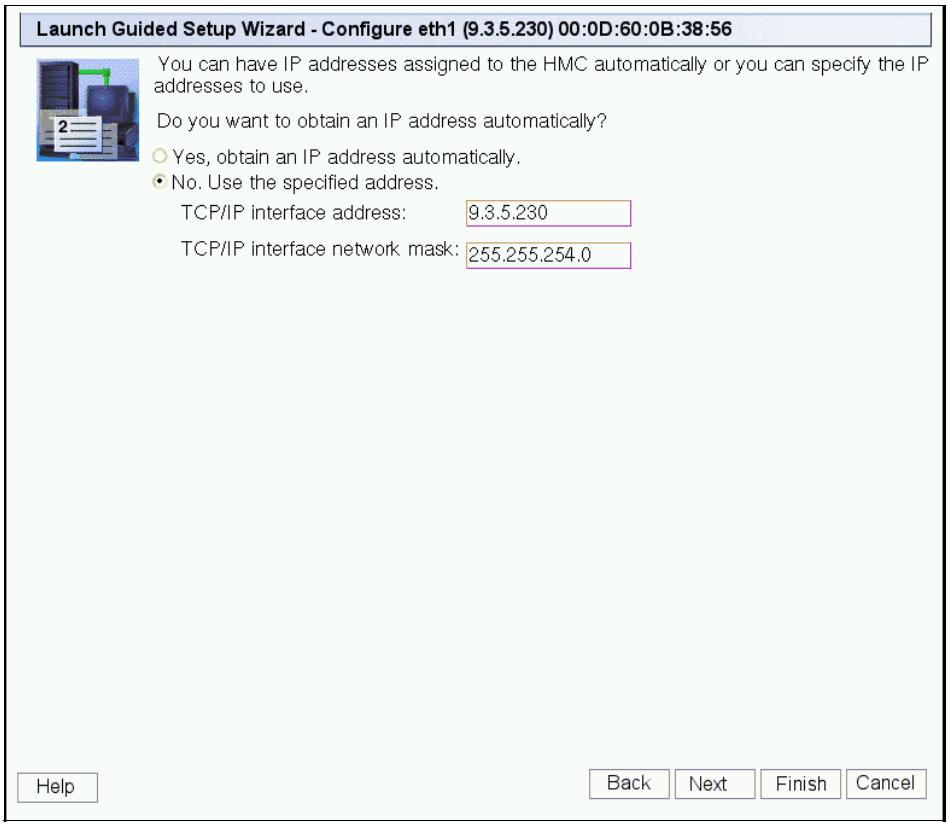


Figure 3-24 Launch Guided Setup Wizard - Configure eth1 IP Assignment

In our example, we configure the interface eth1 using fixed IP address, 9.3.5.20 with network mask 255.255.254.0. Click **Next** to continue with the Guided Setup wizard.

18. The Launch Guided Setup Wizard - Configure eth1 Firewall panel is now displayed as shown in Figure 3-25. Commonly, there is a firewall that controls access from outside to your network. Since the HMC is connected to an open network, we can also restrict outside access to the HMC by using built in firewall in HMC. There are some applications that running on the HMC, that can be secured from unauthorized outside access.

Figure 3-25 Launch Guided Setup Wizard - Configure eth1 Firewall

We select **Yes** to configure HMC firewall settings and click **Next** to continue with the Guided Setup wizard.

19. The Launch Guided Setup Wizard - Configure HMC Firewall for eth1 panel displays then (see Figure 3-26). In the top panel are listed all the available applications that are on the HMC, and in the bottom panels are listed all applications that available to open network through the HMC firewall.

    You can allow an application to pass through the firewall by selecting them from the top panel then clicking **Allow Incoming** or **Allow Incoming by IP address**. *Allow incoming* allows all remote clients access to the selected application, and *Allow Incoming by IP address* only allows specific remote clients' IP addresses to the selected application. You can select to remove an application completely from the firewall by selecting the application from the bottom panel then click **Remove**.

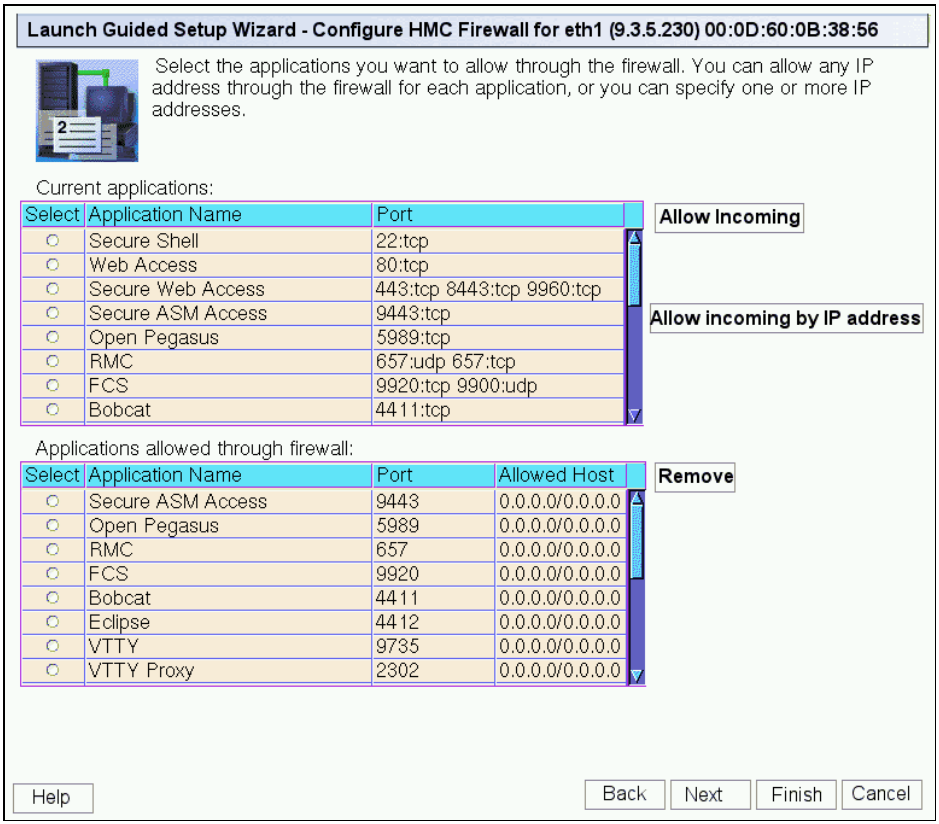


Figure 3-26 Launch Guided Setup Wizard - Configure HMC Firewall for eth1

Click **Next** to continue with the Guided Setup wizard.

20. The Launch Guided Setup Wizard - Configure HMC Network Settings panel is shown (see Figure 3-27). If you have more network adapters available, you can configure them now by selecting the adapters and the **Yes** radio button.

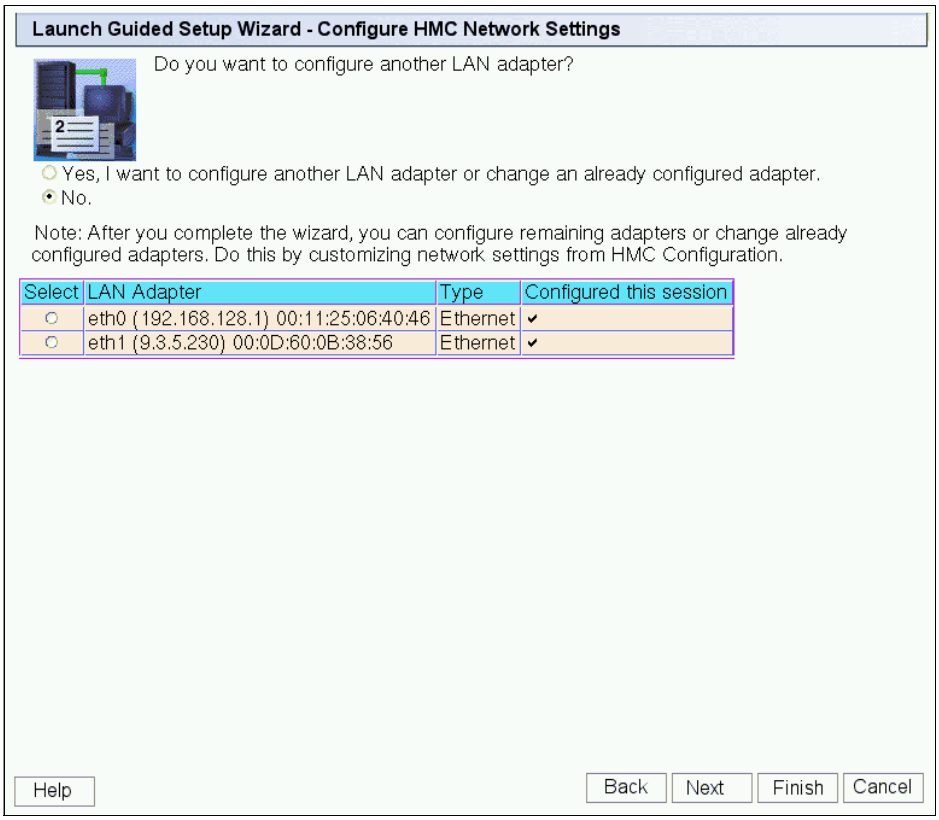


Figure 3-27 Launch Guided Setup Wizard - Configure HMC Network Settings

Because our both network adapters have been configured, we select **No**, then click **Next** to continue with the Guided Setup wizard.

21. The Launch Guided Setup Wizard - Configure HMC Host Name and Domain panel displays as shown in Figure 3-28. Enter your host name for the HMC, domain name and description for the HMC. In our example, we enter host name *localhost* and domain name *localdomain*.

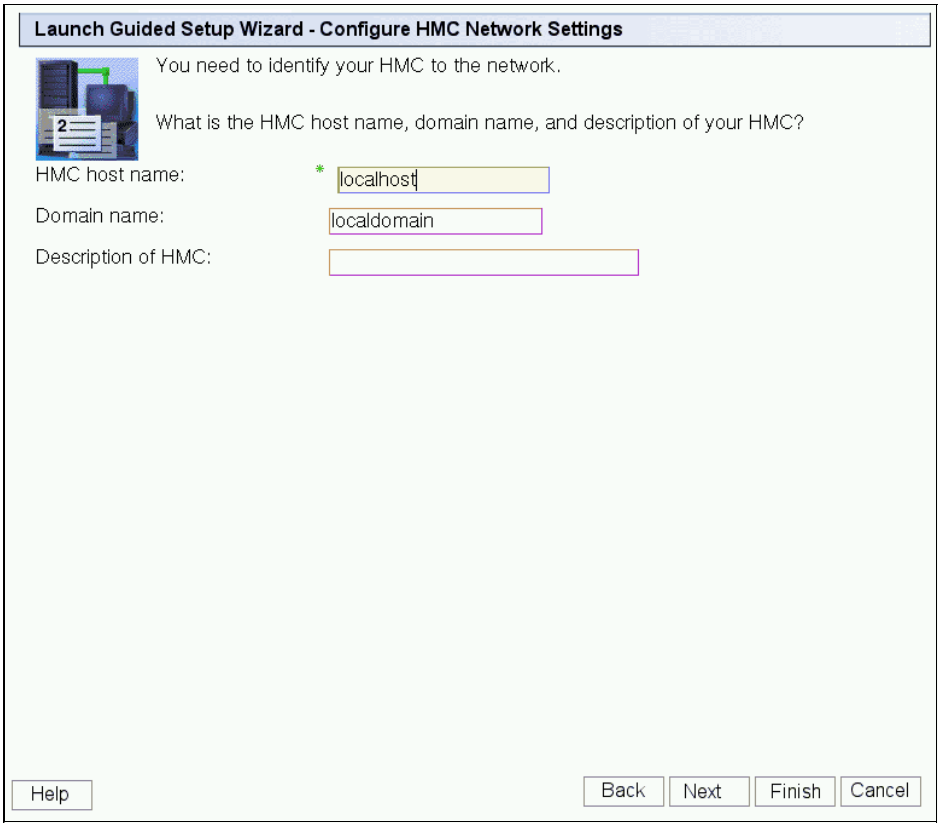


Figure 3-28 Launch Guided Setup Wizard - Configure HMC Host Name and Domain

Click **Next** to continue with the Guided Setup wizard.

22. The Launch Guided Setup Wizard - Configure HMC Gateway panel is shown (see Figure 3-29). If, required, we can specify one of our LAN adapters as a gateway device to an open network.

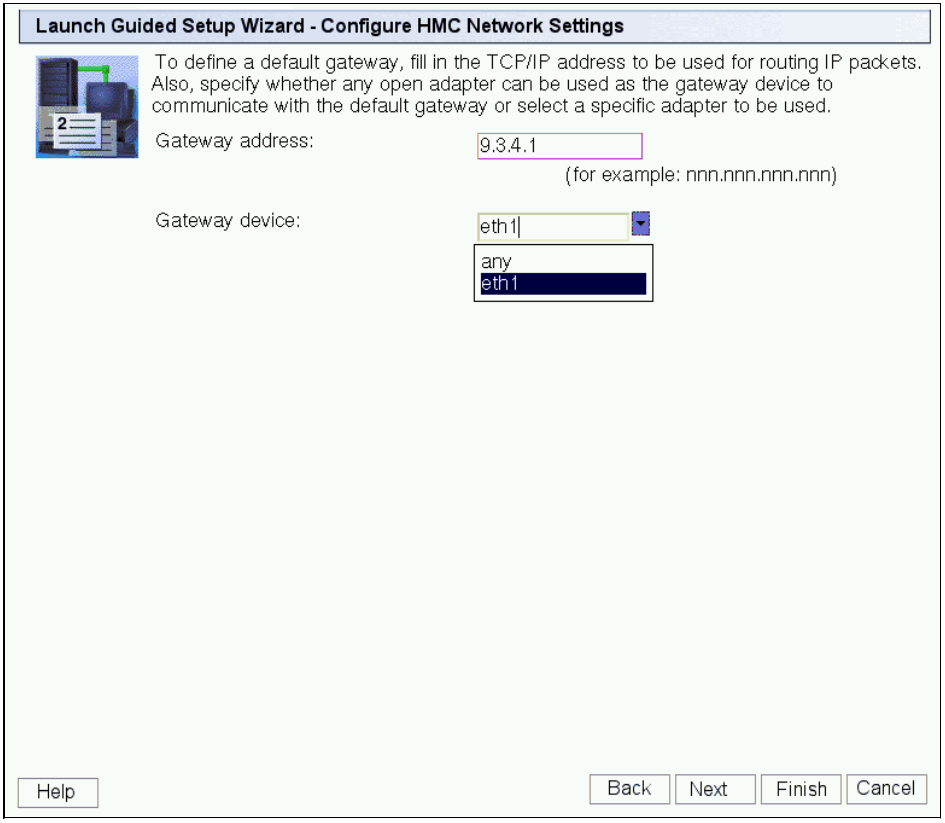


Figure 3-29 Launch Guided Setup Wizard - Configure HMC Gateway

In our example, eth1 is the gateway device to an open network. Click **Next** to continue with the Guided Setup wizard.

23. The Launch Guided Setup Wizard - Configure DNS panel displays now (Figure 3-30).

    A DNS server is a distributed database for managing host names and their IP addresses. By adding a DNS server, the HMC will allow us to find other hosts in our open network by their host name rather than by their IP addresses.

    Enter the IP address of your DNS server or servers in the DNS server address field and click **Add** to register the IP address. You can enter multiple DNS server addresses here, and the order that the addresses are entered will be the order in which they are searched when trying to resolve a host name.

    If you make a mistake when entering an address, you can remove it by selecting the entry and then clicking **Remove**.

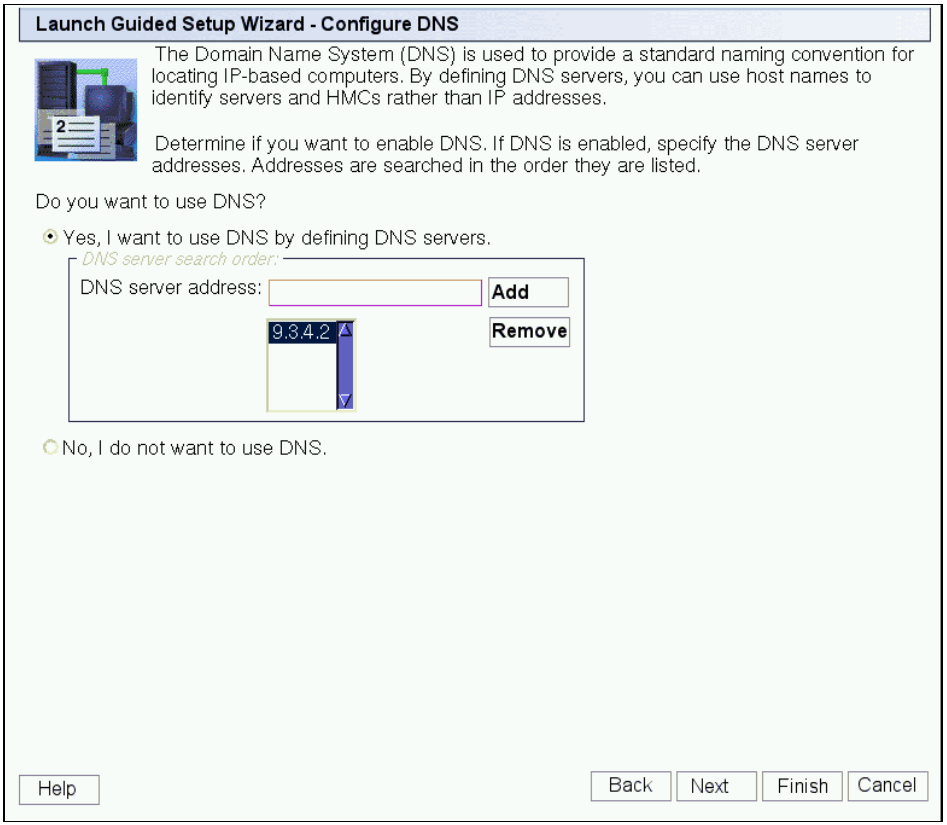


Figure 3-30 Launch Guided Setup Wizard - Configure DNS

Click **Next** to continue with the Guided Setup wizard.

24. The Launch Guided Setup Wizard - Configure Domain Suffix panel is shown in Figure 3-31.

    Enter a domain suffix in the Domain suffix field and click **Add** to register your entry. You can enter multiple domain suffixes for your organization if you have them. The order that the addresses are entered will be the order in which they are searched when trying to map the host name to a fully qualified host name.

    If you make a mistake when entering an address, you can remove it by selecting the entry and then clicking **Remove**.

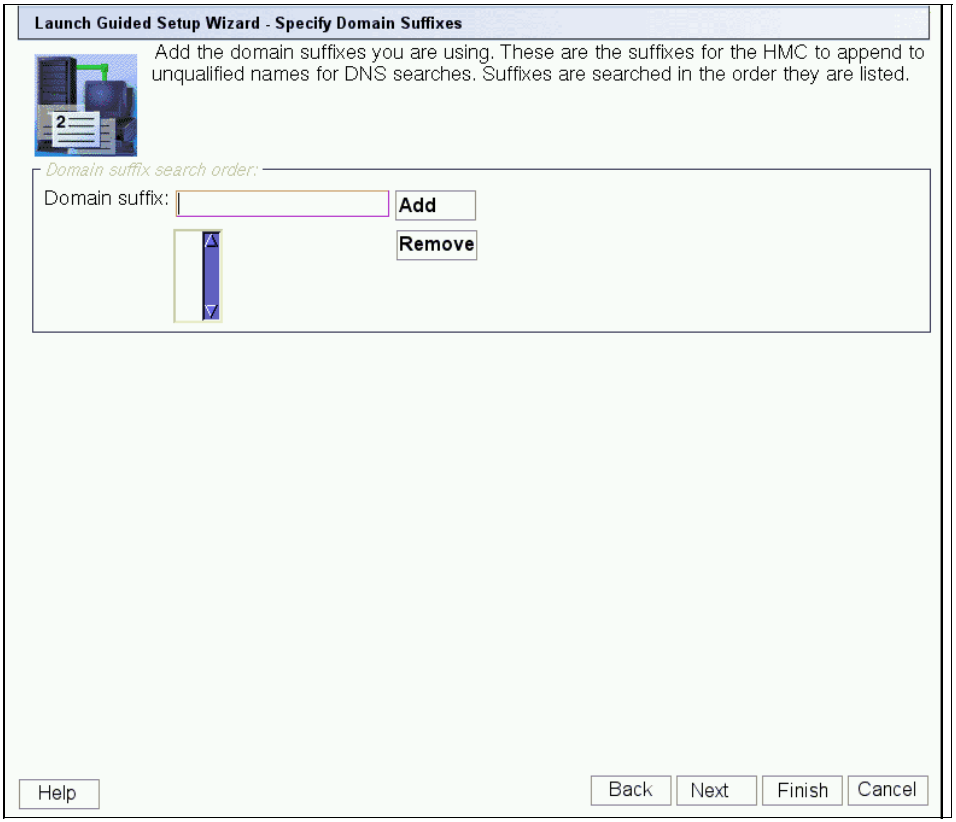


Figure 3-31 Launch Guided Setup Wizard - Configure Domain Suffix

Click **Next** to continue with the Guided Setup wizard.

25. The Launch Guided Setup Wizard - The Next Steps panel displays (see Figure 3-32). This completes the network configuration section of the Guided Setup wizard. We now continue with the next part of the wizard.

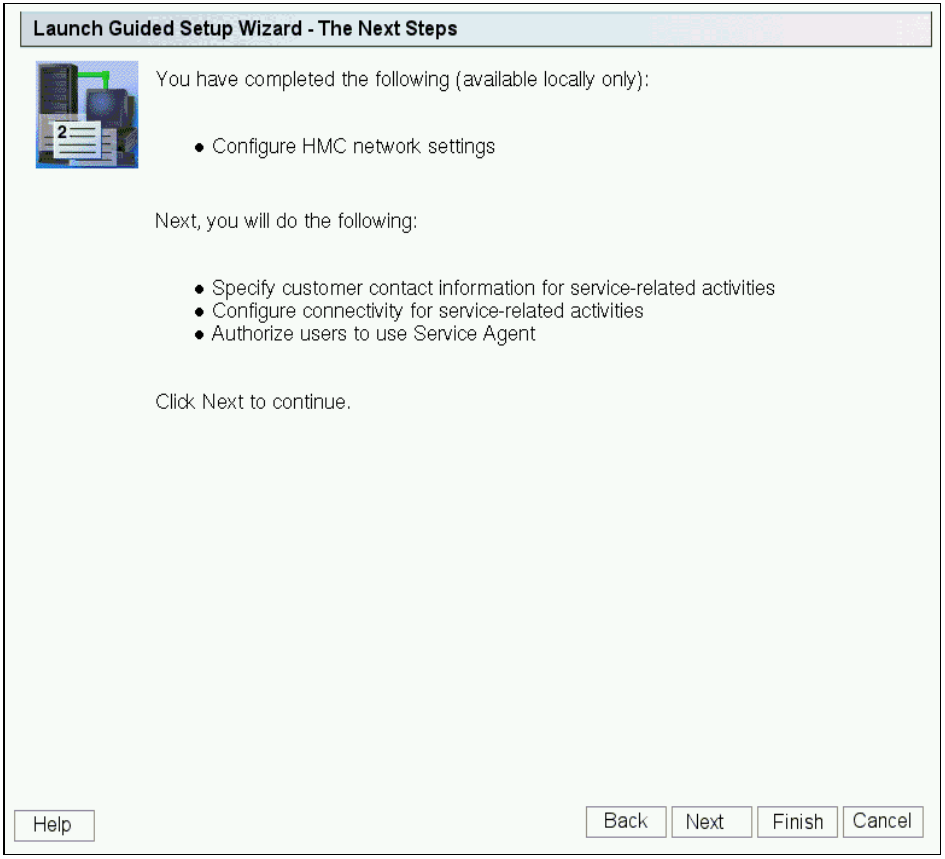


Figure 3-32 Launch Guided Setup Wizard - The Next Steps

Click **Next** to continue with the Guided Setup wizard.

26. The Launch Guided Setup Wizard - Specify Contact Information panel is shown (see Figure 3-33). This is the first of three panels which contains the contact details for your organization. The information entered here is used by IBM when dealing with problems electronically reported (calling home), as well as software updates. You should enter valid contact information for your own location. The fields marked with an asterisk (*) are mandatory and must be completed.

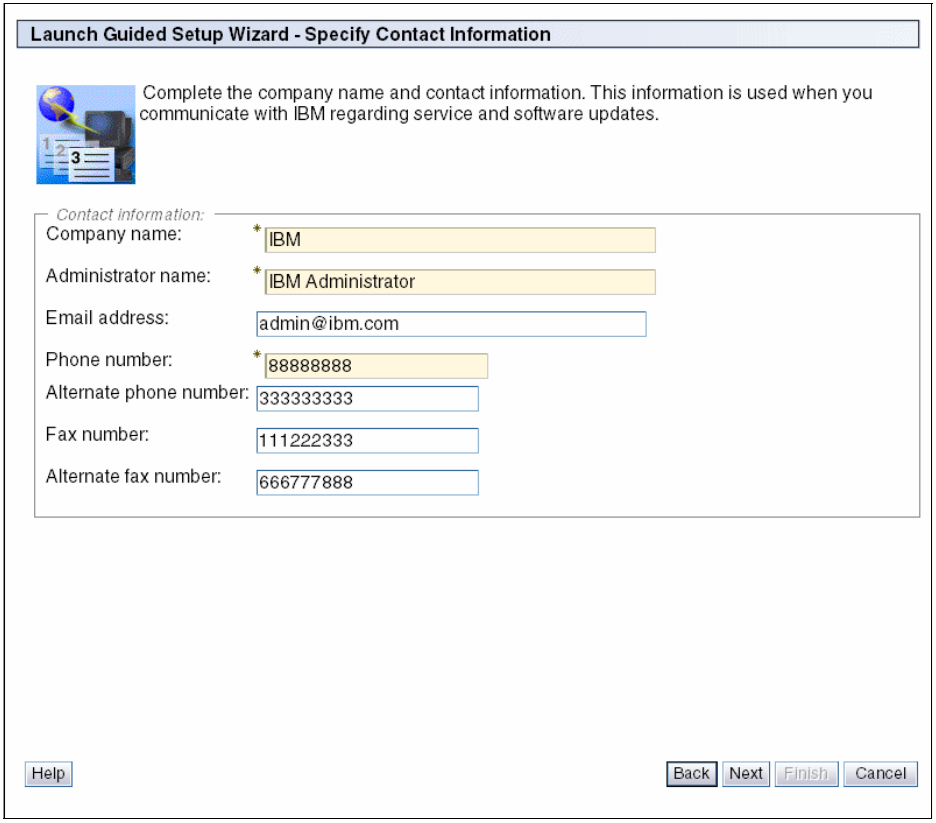


Figure 3-33 Launch Guided Setup Wizard - Specify Contact Information

Click **Next** to continue with the Guided Setup wizard.

27. The Launch Guided Setup Wizard - Specify Contact Address panel is displayed in Figure 3-34. It is the second Contact Information panel. You should enter your contact address information about this panel. Again, you must complete the mandatory fields (*). Use the drop-down menus to select your Country/Region and State/Province settings.

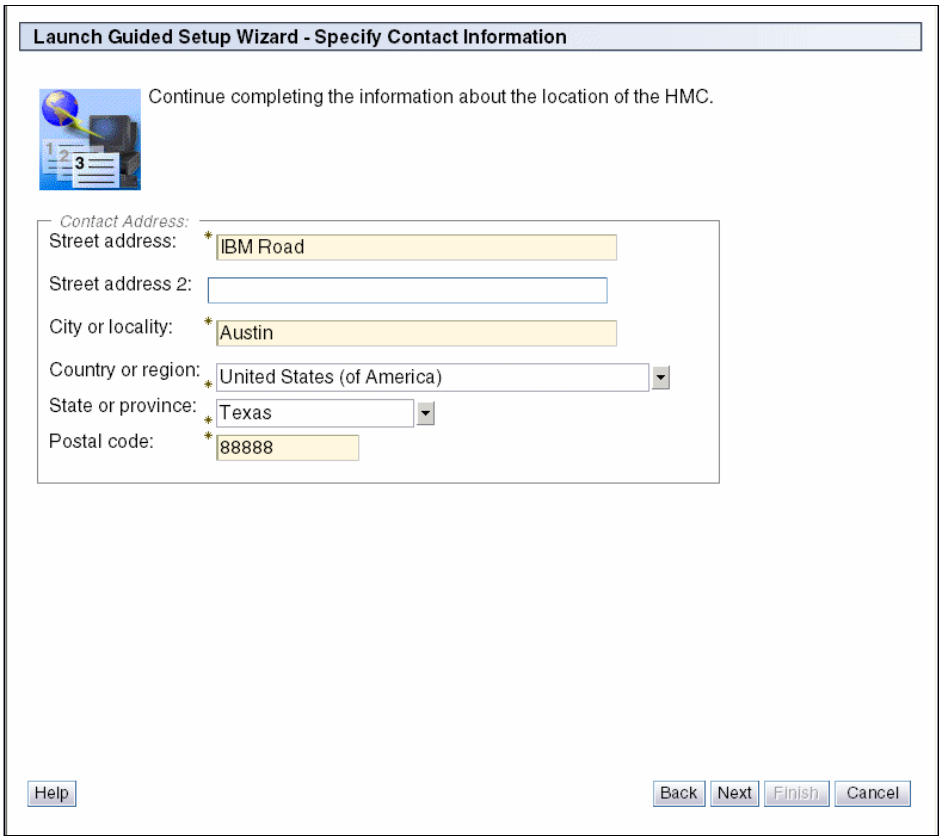


Figure 3-34 Launch Guided Setup Wizard - Specify Contact Address

Click **Next** to continue with the Guided Setup wizard.

28. The Launch Guided Setup Wizard - Location of the HMC panel is displayed (see Figure 3-35). It is the last panel for the Contact Information.You should enter the location details of this HMC here. If the location address is the same as the contact address used in the previous step, then click **Use the administrator mailing address**. Otherwise enter the correct HMC location address details.

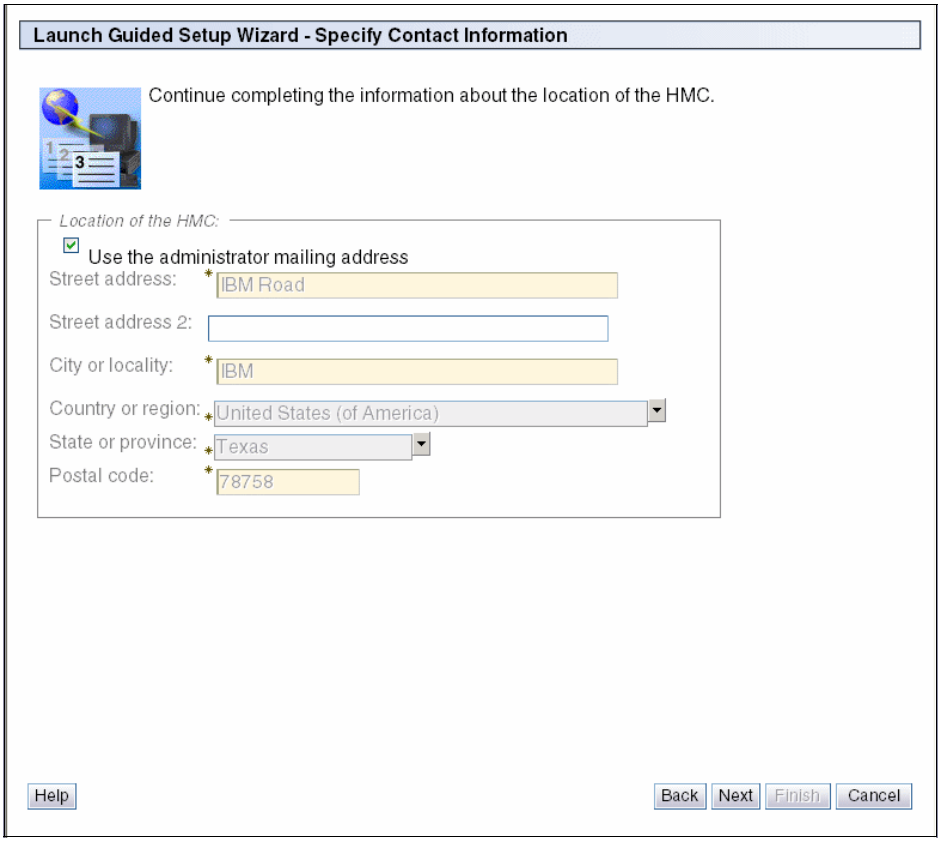


Figure 3-35 Launch Guided Setup Wizard - Location of the HMC

In our example, we use the same address for both contact and HMC, so we selected the Use the administrator mailing address. This completes the contact information part of the HMC Guided Setup wizard service and support. Click **Next** to continue with the Guided Setup wizard.

29. The Launch Guided Setup Wizard - Configure Connectivity to Your Service Provider panel is now shown in Figure 3-36.

    You can configure an outbound connection between the HMC and your service provider, such as your service provider's remote support facility. You can specify how the local HMC connects to your service provider from a local modem, an Internet Secure Sockets Layer (SSL), an Internet Virtual Private Network (VPN), or a remote pass-through system.

    – A local modem enables you to use the modem on your HMC to send problem information and system data to your service provider.
    – An Internet SSL enables you to use a high speed Internet connection on your HMC, the fastest option, to send problem information to your service provider.
    – An Internet VPN enables you to use a high speed Internet connection on your HMC to send problem information to your service provider.
    – A remote pass-through system enables you to use another HMC or a logical partition on your server to send problem information to your service provider.

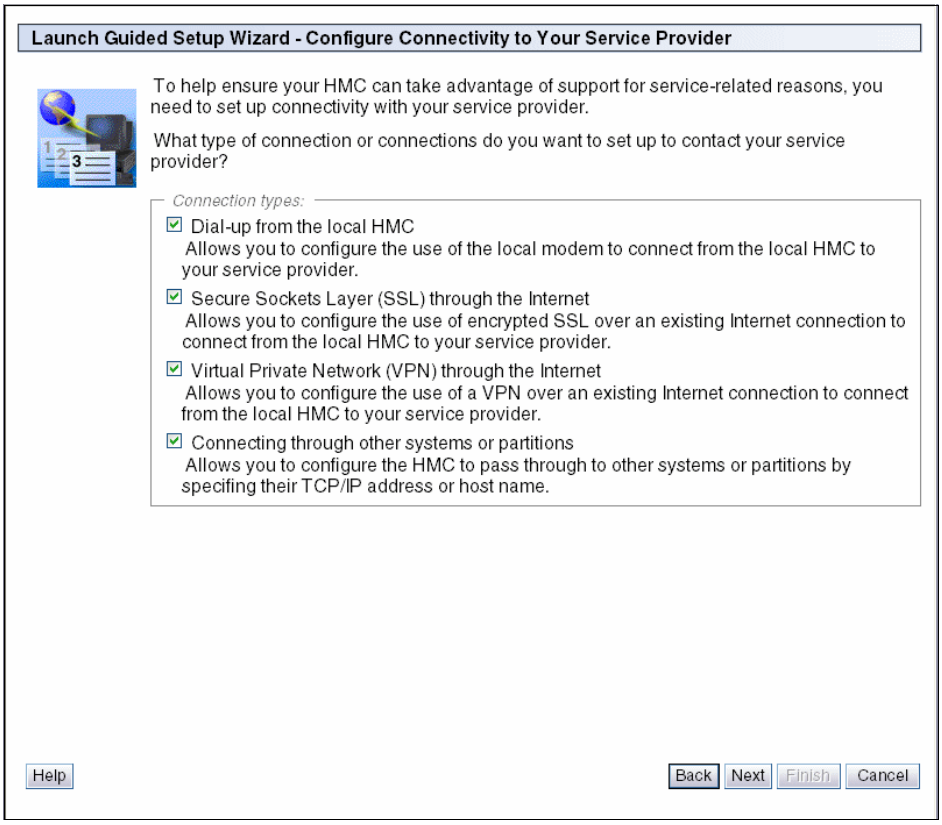


Figure 3-36 Launch Guided Setup Wizard - Configure Connectivity to Your Service Provider

You can select by the communications method to which you want to connect to IBM for service and support related functions. In our example, we select all four connectivity options for demonstration purposes only. Normally you would only select the options valid for your environment.

Click **Next** to continue with Guided Setup.

30. The Agreement for Service Programs panel is displayed (see Figure 3-37). You should read the agreement details carefully and click **Accept** or **Decline**

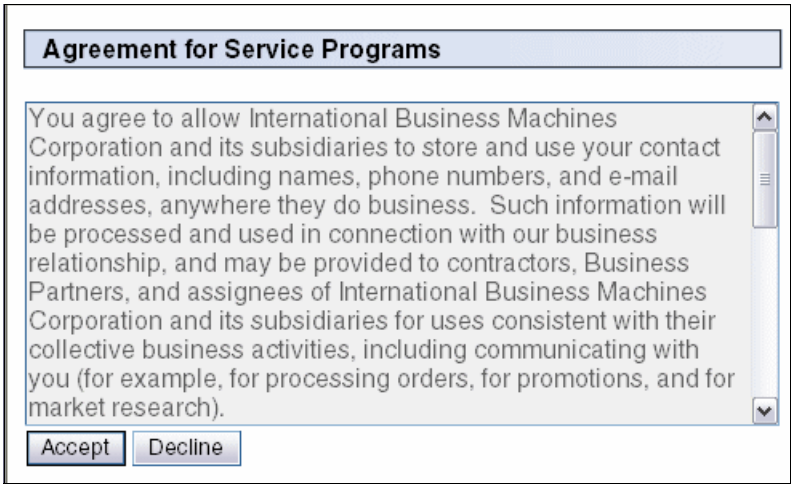


Figure 3-37 Agreement for Service Programs

In our example, we click **Accept** to accept the terms and conditions of the IBM Agreement for Service Programs which then opens the window shown in Figure 3-38.

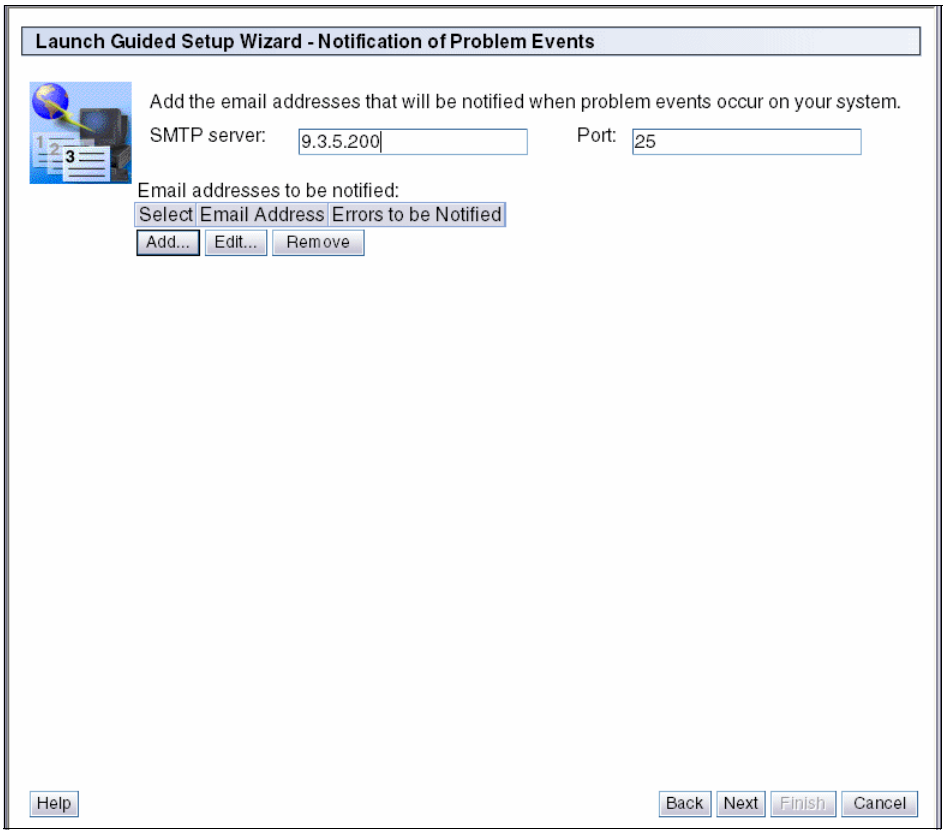


Figure 3-38 Launch Guided Setup Wizard - Notification of Problem Events

31. We enter our SMTP server information and also add the e-mail address for notifications. We then click **Next**, which opens the Launch Guided Setup Wizard - Configure Dial-up from the Local HMC panel shown in Figure 3-39.

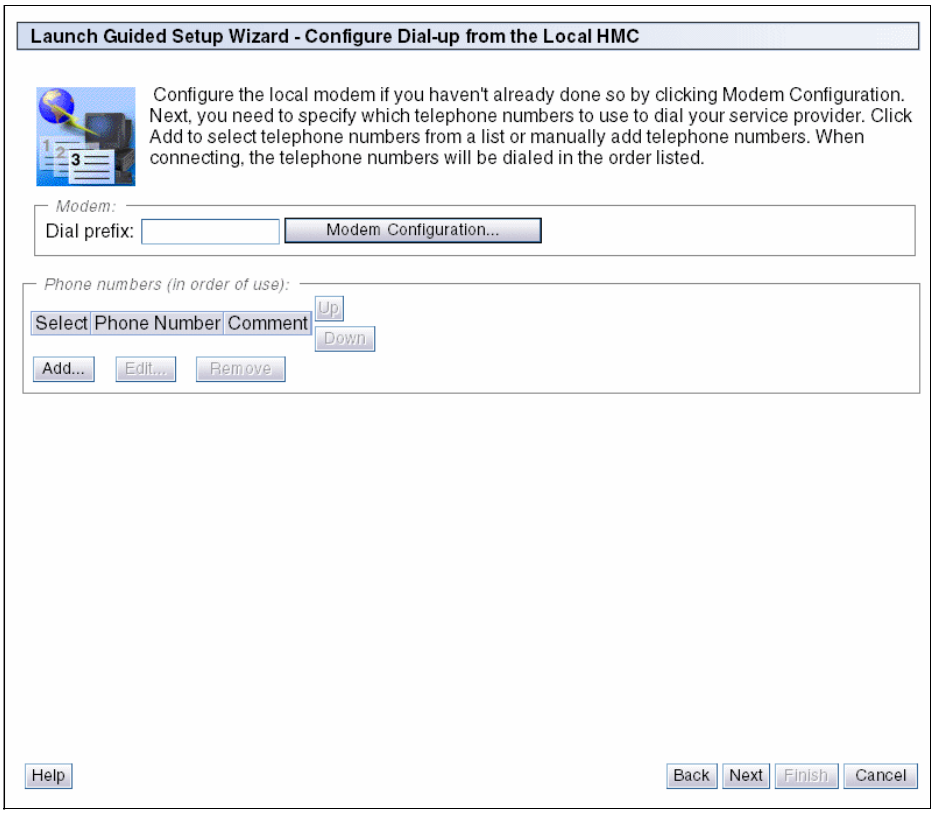


Figure 3-39 Launch Guided Setup Wizard - Configure Dial-up from the Local HMC

32. In the panel, click **Modem Configuration** to set the modem parameters. The Modem Configuration display opens (Figure 3-40). You can set the Dial Type (Tone/Pulse), Wait for dial tone, Enable speaker, and the Dial prefix value.

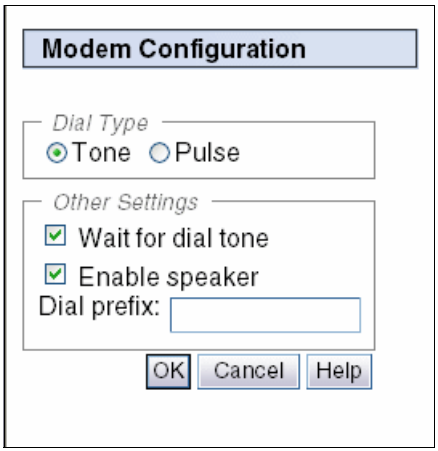


Figure 3-40 Modem Configuration

33. Click **OK** to continue with the Guided Setup wizard. Then click **Add** in the Phone numbers panel to add the IBM support service phone number. The Add Phone Number - Country or Region window display (Figure 3-41). Use the drop-down menus to select your country or region and then your state or province.

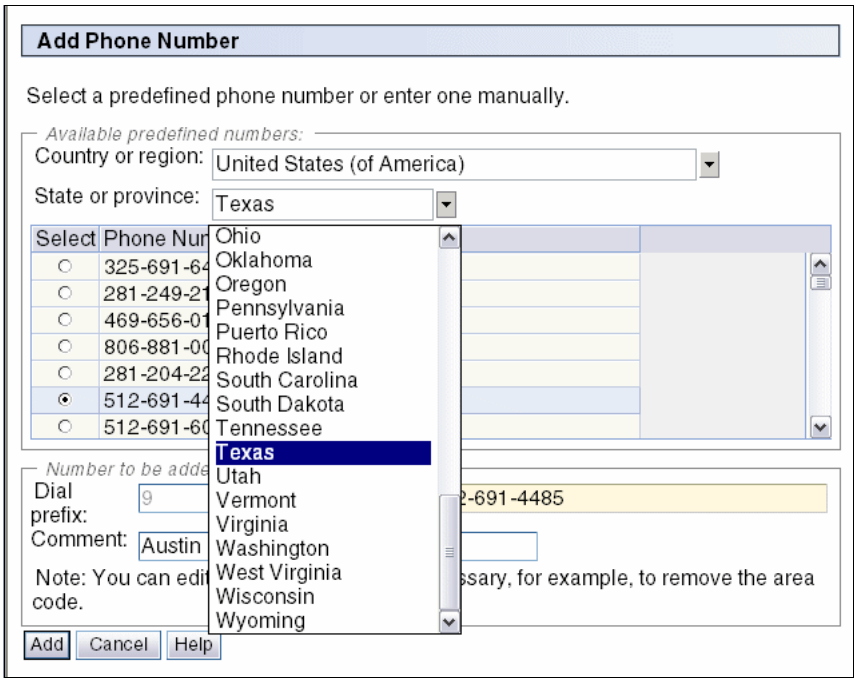


Figure 3-41 Add Phone Number - Country or Region

In our example we select **United States (of America)** for our Country/region and **Texas** for our State/province. You should select the relevant values for your location.

34. The Add Phone Number panel is shown in Figure 3-42. After you have selected your Country/region and State/province, a list of available IBM support service numbers are listed. You should select the phone number nearest to your location. The phone number will then be populated in the Phone number field at the bottom of the panel. You can also manually add phone numbers if you know your IBM support service number.

    Click **Add** to continue with the Guided Setup wizard.

    Click **Next** to continue with the Guided Setup wizard.

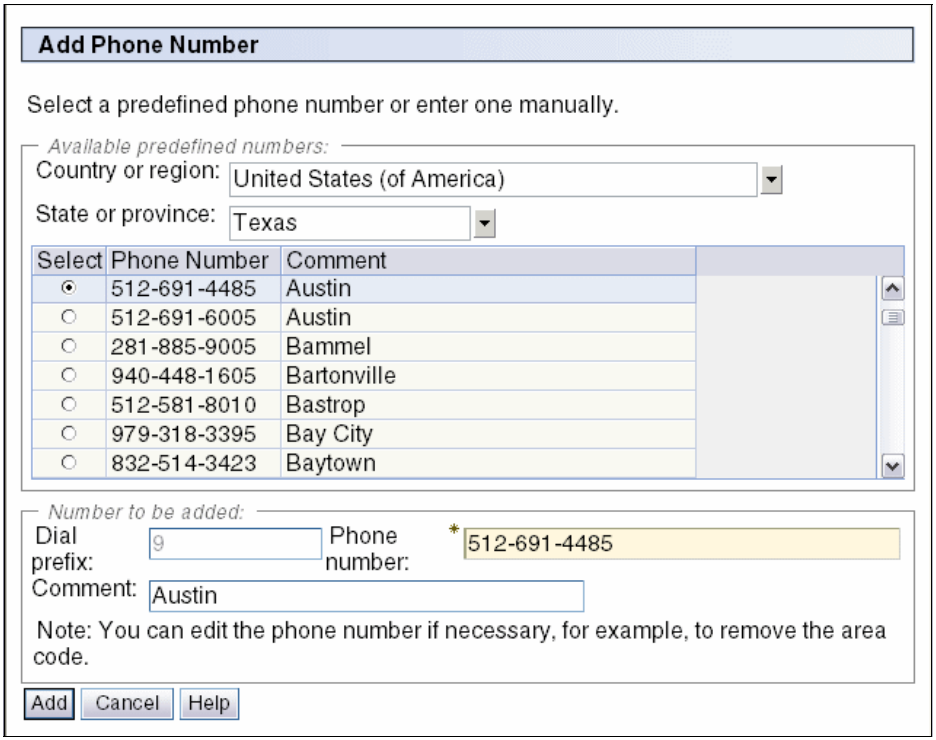


Figure 3-42 Add Phone Number

35. The Launch Guided Setup Wizard - List of Dial-up Number window is now displayed (Figure 3-43). You can add additional phone numbers by repeating the same procedure again and selecting a different number.

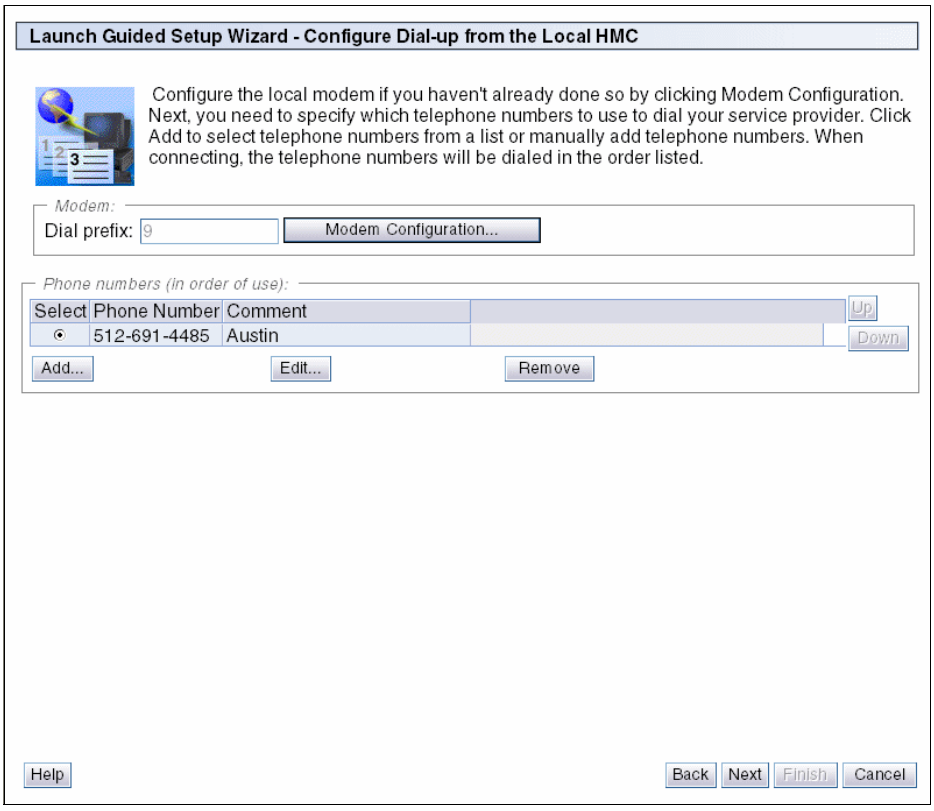


Figure 3-43 Launch Guided Setup Wizard - List of Dial-up Number

36. This finishes our configuration for the Dial-up connection for the HMC. Click **Next** to continue. The Launch Guided Setup Wizard - Configure SSL using an Existing Internet Connection panel as shown in Figure 3-44.

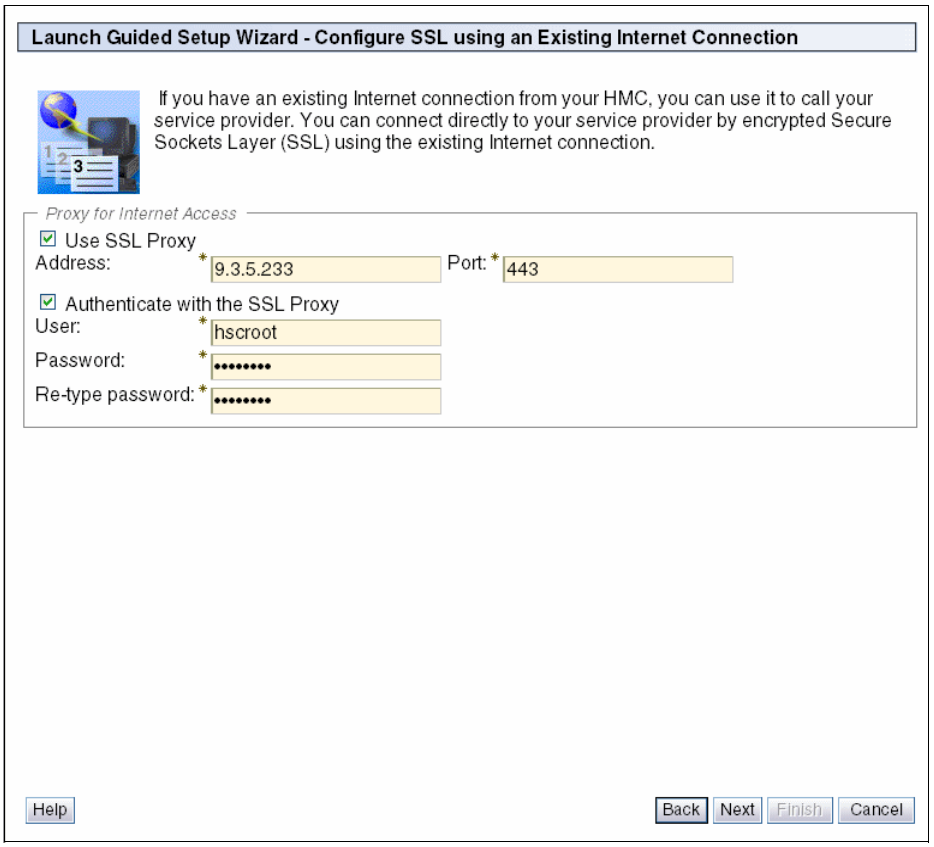


Figure 3-44 Launch Guided Setup Wizard - Configure SSL using an Existing Internet Connection

37. Select **Use SSL Proxy**, then enter SSL Proxy address and the port. You also can authenticate with the SSL Proxy by selecting **Authenticate with the SSL Proxy** then enter the user and password for the SSL Proxy. You should have the information from your network administrator. Click **Next** to continue with the Guided Setup wizard. The Launch Guided Setup Wizard - Use VPN using an Existing Internet Connection panel is now shown (Figure 3-45).

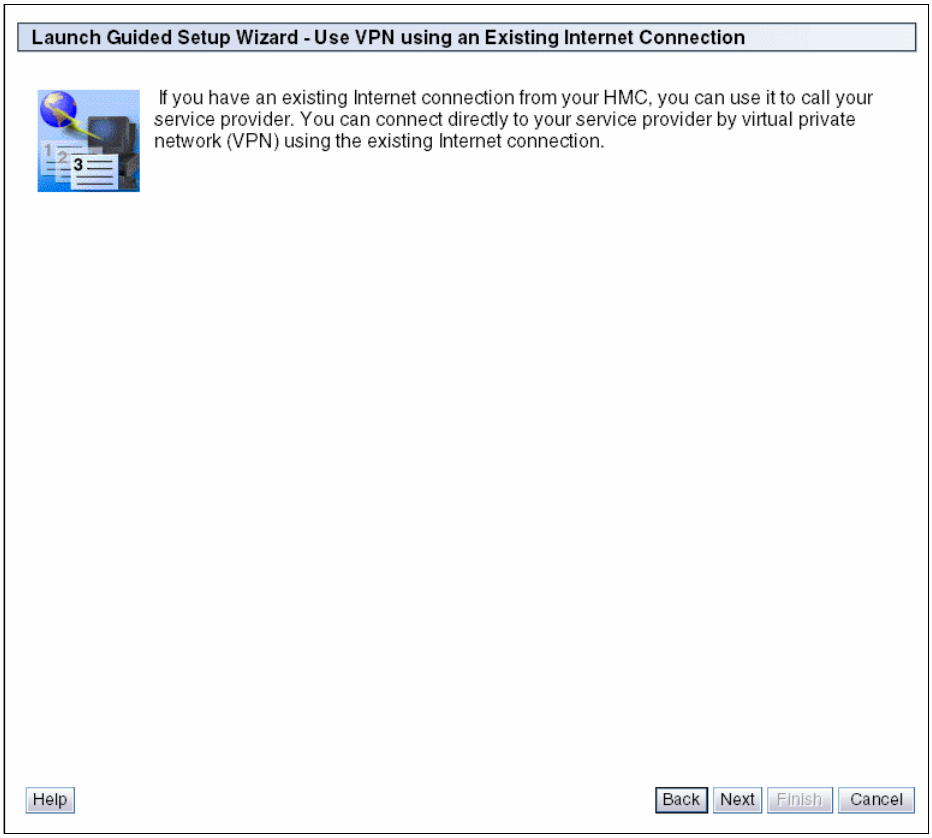


Figure 3-45 Launch Guided Setup Wizard - Use VPN using an Existing Internet Connection

38. We click **Next** to accept the VPN connection for our HMC support services and continue with the Guided Setup wizard. The Launch Guided Setup Wizard - Configure Connectivity using a Pass-Through System panel is shown in Figure 3-46. The HMC can use another system in your network which already has a VPN or dial-up connection to IBM service and support.

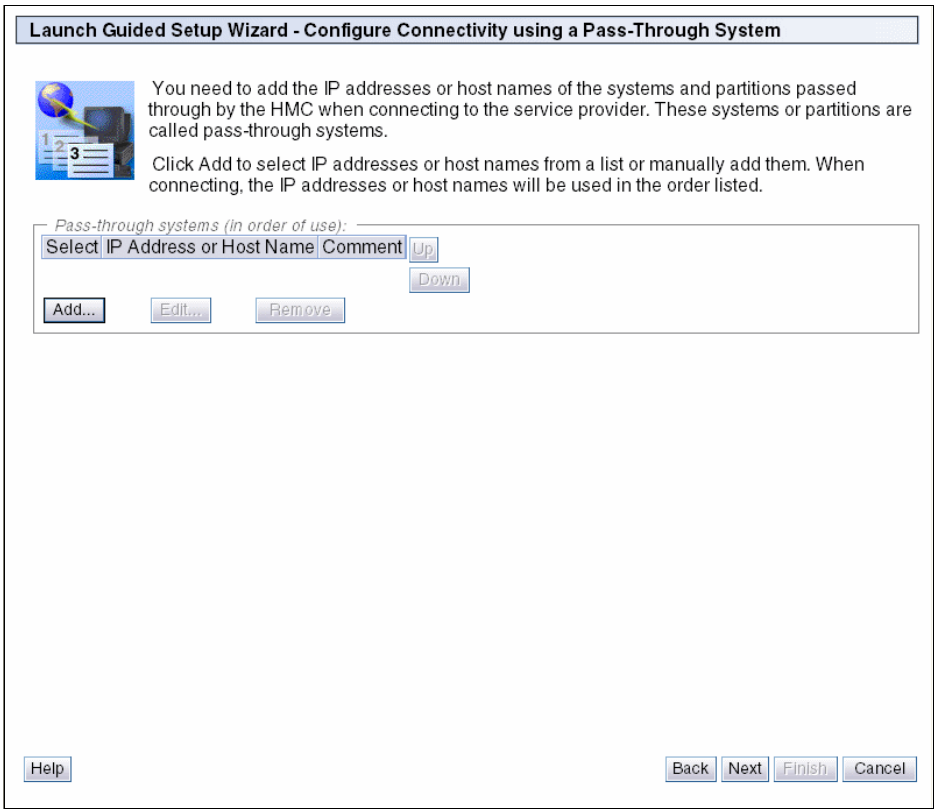


Figure 3-46 Launch Guided Setup Wizard - Configure Connectivity using a Pass-Through System

39. Click **Add** to continue with the Guided Setup wizard. The Add Pass-through System panel is shown in Figure 3-47.

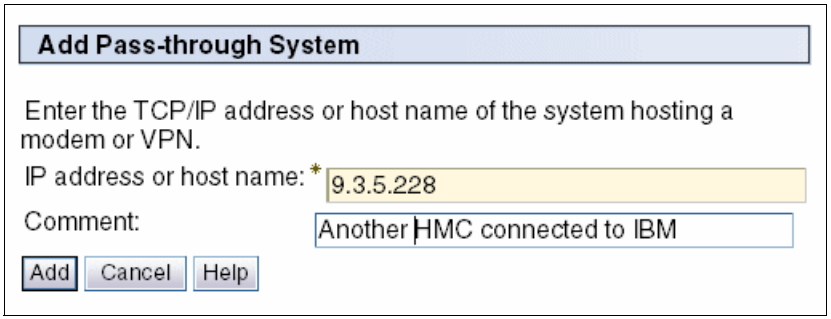


Figure 3-47 Add Pass-Through System

40. Enter the IP address or host name of your pass-through system. Type some comment text and click **Add** to accept the values entered. You can add multiple pass-through systems here. The order listed is the order in which the pass-through systems are used. The Launch Guided Setup Wizard - Pass-through System window displays (see Figure 3-48). It shows the list of the pass through systems.

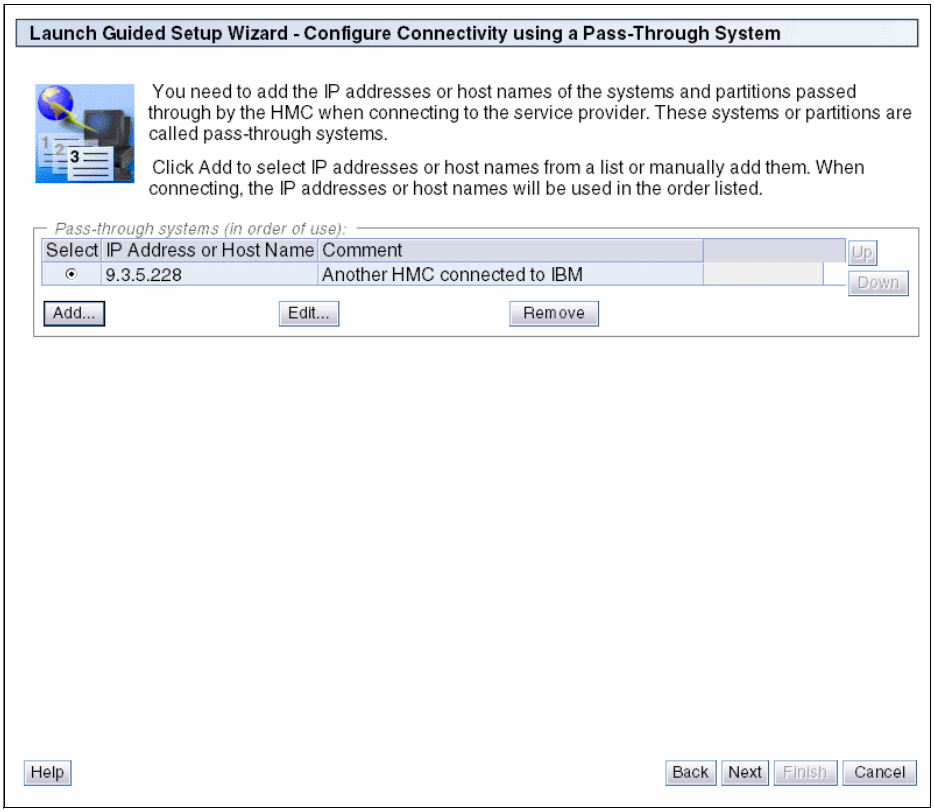


Figure 3-48 Launch Guided Setup Wizard - Pass-Through System

41. Click **Next** to continue with the Guided Setup wizard. The Launch Guided Setup Wizard - Authorize Users for Electronic Service Agent panel displays as shown in Figure 3-49.

    You can see the information that is collected and sent to IBM by the HMC on the IBM Electronic Service Agent Web site:

    `http://www.ibm.com/support/electronic`

    To access this data on the Web, you must have a registered IBM ID and authorized that ID through the HMC. You can register IBM IDs through the following Web site:

    `https://www.ibm.com/registration/selfreg`

    Enter a valid IBM ID and an optional second IBM ID if required, in the Web authorization panel. The Guided Setup only allows you to authorize two user IDs to access the data sent by the HMC to IBM.

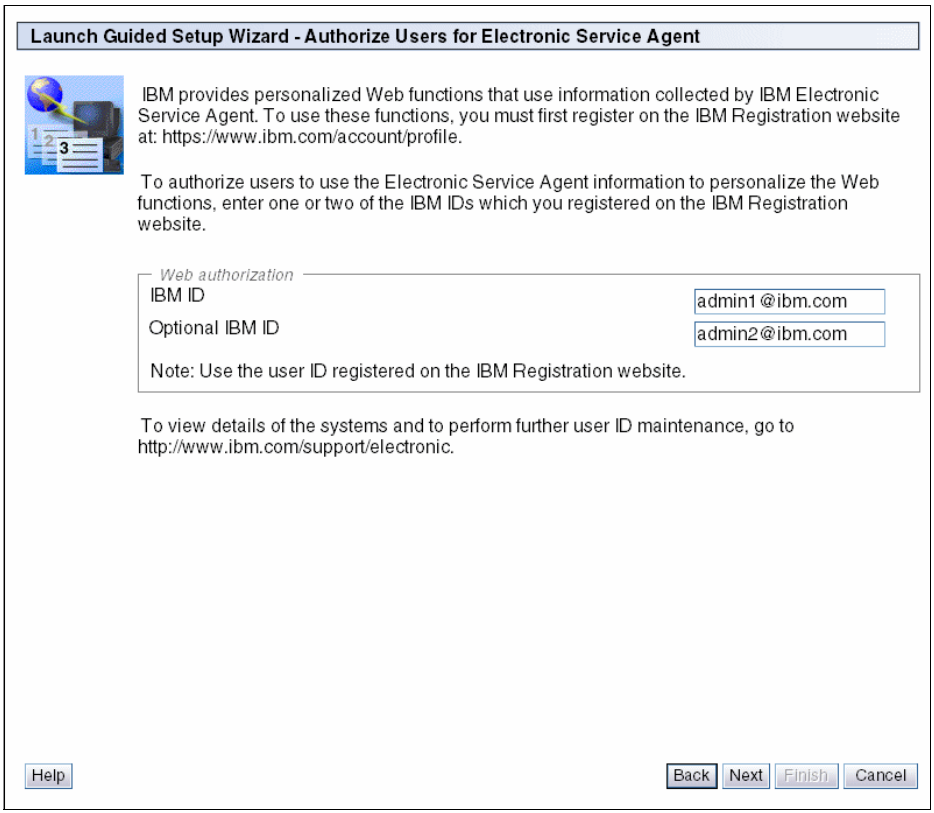


Figure 3-49 Launch Guided Setup Wizard - Authorize Users for Electronic Service Agent

42. Click **Next** to continue with the Guided Setup wizard. The Launch Guided Setup Wizard - Notification of Problem Events panel is displayed (Figure 3-50). The HMC can alert your administrator of problems with the HMC or its managed systems through e-mail.

    You can choose whether to notify your administrators of only problems reported to IBM (only call-home problem events) or of all problem events generated.

    Enter the IP address and port of your SMTP server. Then click **Add** continue.

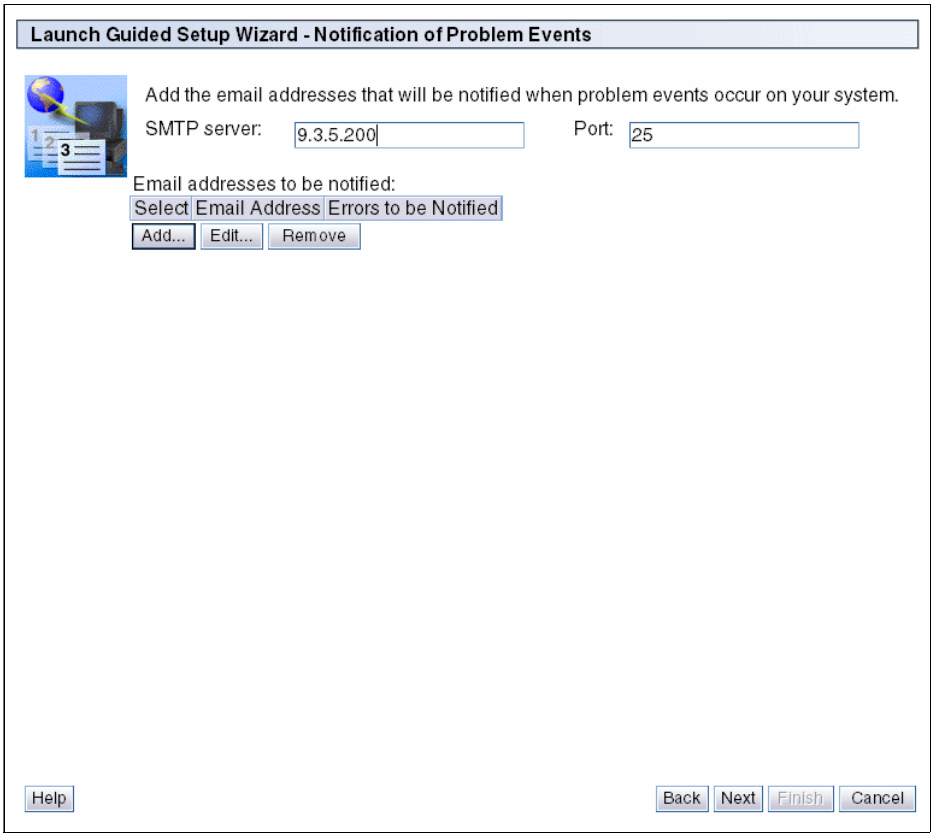


Figure 3-50 Launch Guided Setup Wizard - Notification of Problem Events

43. The Add Email Address panel displays, as shown in Figure 3-51. Enter your administrator's e-mail address and the notification type required.

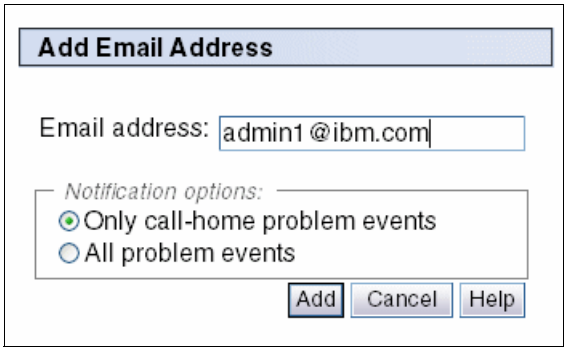


Figure 3-51 Add Email Address

Click **Add** to accept these values and return to the previous panel. You can enter multiple e-mail addresses by repeating this process.

44. The Launch Guided Setup Wizard - Notification of Problem Events window is displayed (Figure 3-52). It displays the e-mail address of administrator for notification of problem events.

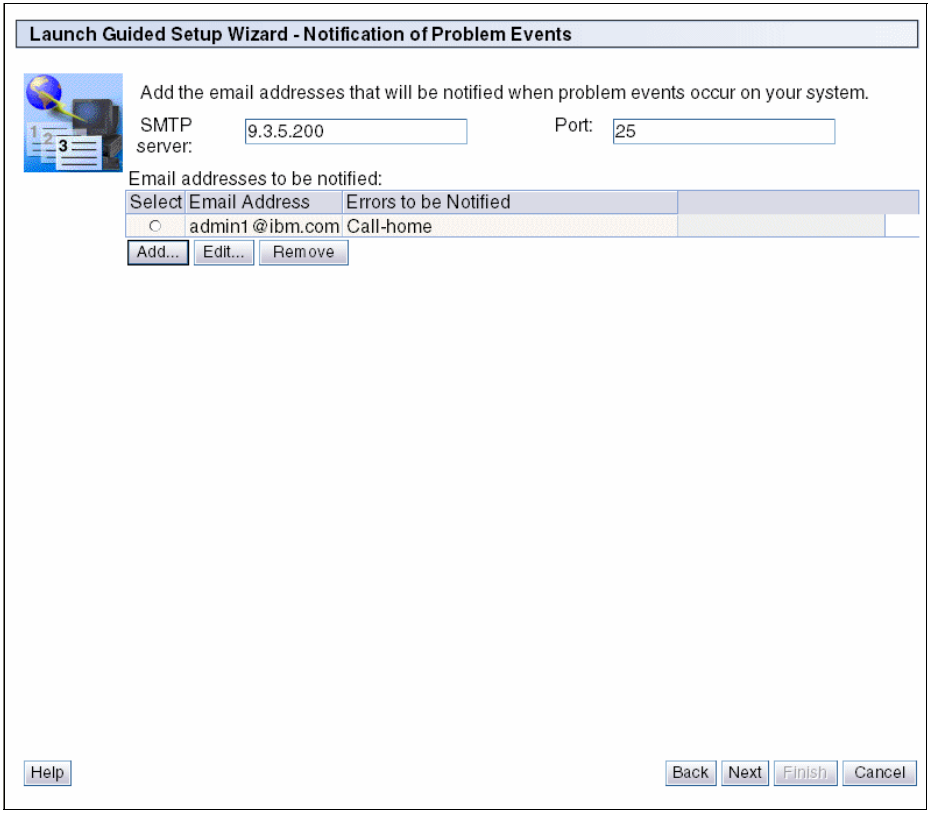


Figure 3-52 Launch Guided Setup Wizard - Notification of Problem Events

45. Click **Next** to continue with the Guided Setup wizard. The Launch Guided Setup Wizard - Summary window displays (Figure 3-53). You can see all the changes that the Guided Setup wizard configures later. At this stage, nothing has actually been changed on the HMC. You can cancel the changes by clicking **Cancel**.

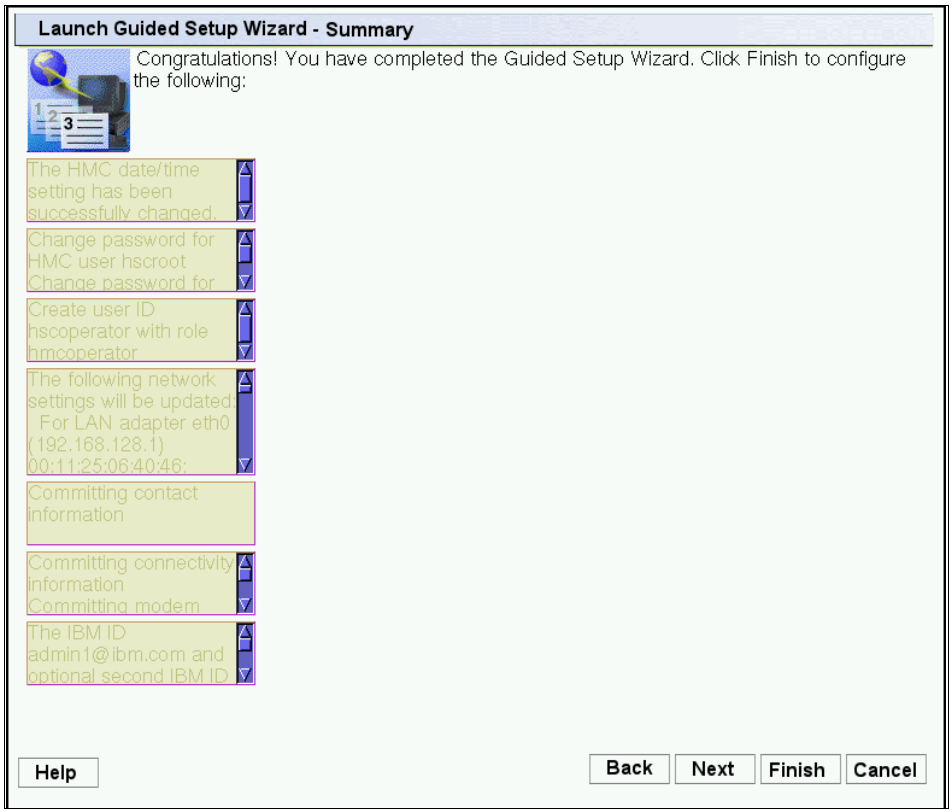


Figure 3-53 Launch Guided Setup Wizard - Summary

Click **Finish** to apply the changed configurations.

Note: At this step, nothing has changed on the HMC. If you click **Cancel**, all changes by Launch Guided Setup Wizard will be lost.

46. The Launch Guided Setup Wizard - Status panel displays (see Figure 3-54). If every task completes, its status is updated automatically.

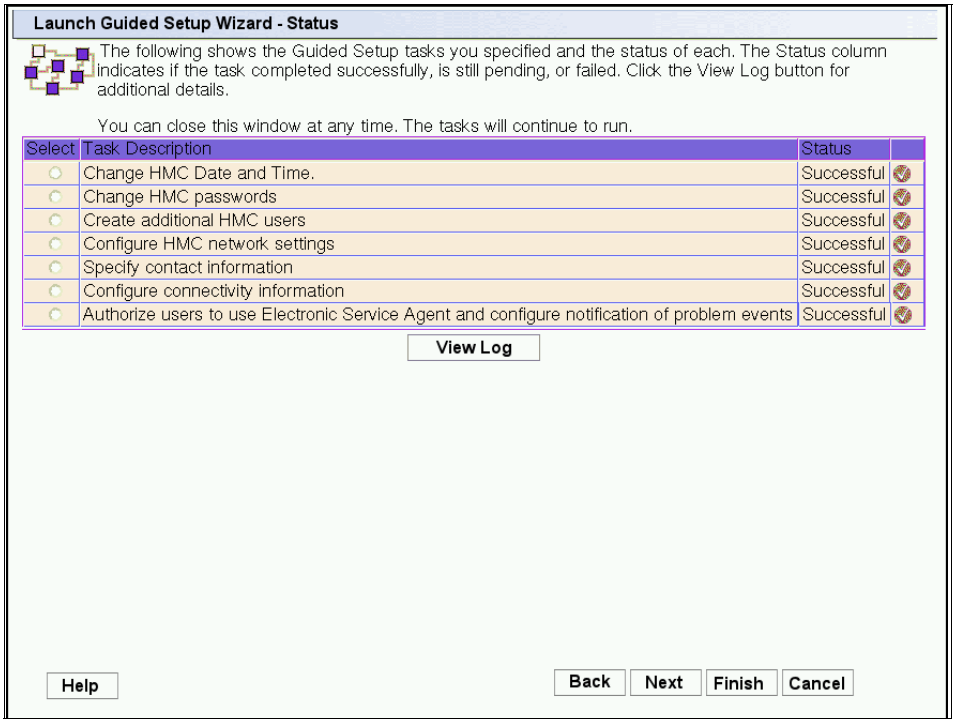


Figure 3-54 Launch Guided Setup Wizard - Status

47. You can review the log by clicking **View Log**. This log is useful if for any reason you have task that have a failed status. Figure 3-55 shows an example of the log file output.

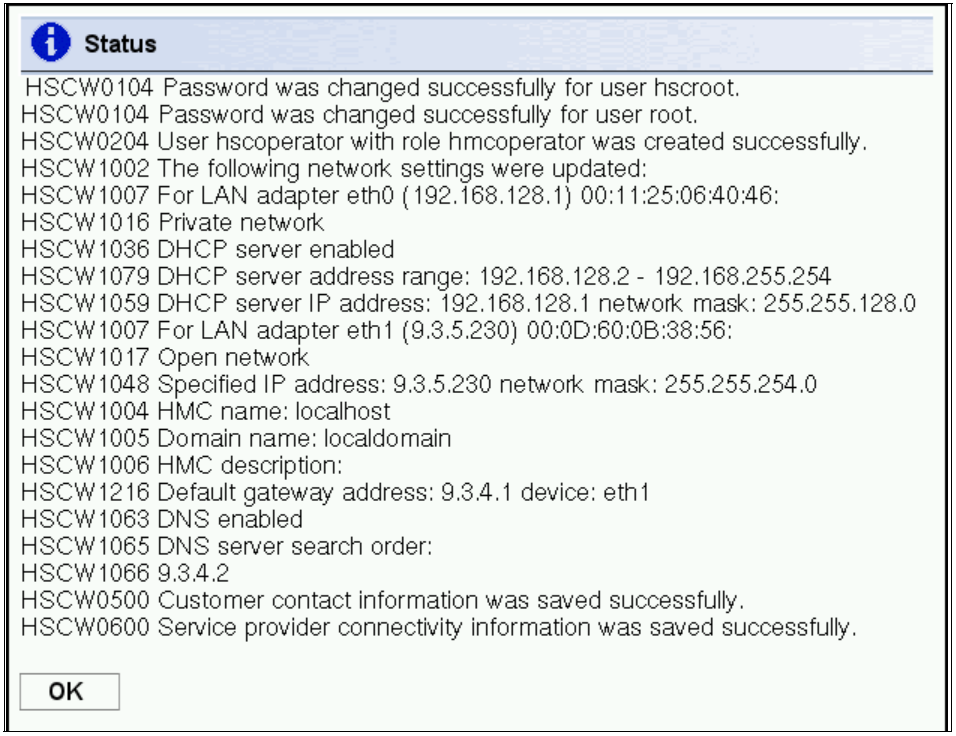


Figure 3-55 The launch Guided Setup Wizard - Status Log

48. Click **OK** to return to previous panel, then click **Close** to continue with the Guided Setup wizard.

    If you have configured the HMC network settings during the Guided Setup Wizard, then you will probably receive a message asking you to log off the HMC and log on again to apply some of changes as shown in Figure 3-56.

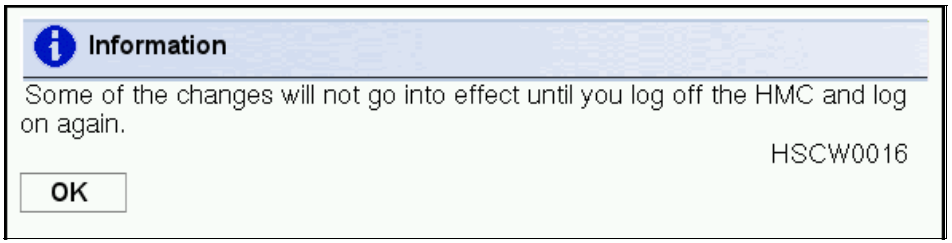


Figure 3-56 The Launch Guided Setup Wizard - Information

49. Click **OK** to log off from the HMC then log on back to apply some changes.

This completes the HMC Launch Guided Setup Wizard.

Post Guided Setup Tasks

If you were not able to set up all the information through the wizard, you can go back and use the standard HMC menu to complete tasks. If you are direct connected to the HMC, some tasks could be missed at first.

3.3 Connecting managed systems to the HMC

Attention: When installing a new System p system, do not turn on the system before connecting it to an HMC. The server processor (SP) on a System p system is a DHCP client and will search for a DHCP server to obtain its IP address. If no DHCP server can be found, then the SP assigns a default IP address. If this occurs, you have to use ASM to change the IP setting of the SP manually.

After you have completed the HMC Guided Setup Wizard, you can connect your managed systems to the HMC by using following steps:

1. Connect your HMC to the HMC port of the managed system with an Ethernet cable.
2. Connect the managed system to a power source. The managed system will then turn on its service processor. After the service processor is turned on, proceed to the next step. This process would take three to five minutes. You can see the following sequence of events signals that power has been applied to the service processor:
   a. Progress indicators, also referred as checkpoints, show on the control panel display while the system is being started. The display might appear blank for a few moments during this sequence.
   b. When the service processor has completed its power on sequence, the green power light blinks slowly and the output on the control panel is similar to the following:

      ```
      01 N V=F
      T
      ```
3. Click **Systems Management**, then **Servers** to view the status of your managed system. It can take a few minutes for the status to display.

4. If the status shows *Pending Authentication*, you need to set passwords for the managed system. The HMC prompts you to set passwords for the managed system. If you are not prompted by the HMC to set those passwords, click **Operations** then **Change Password**. The window for setting passwords opens as shown in Figure 3-57. Set the password for each as directed.

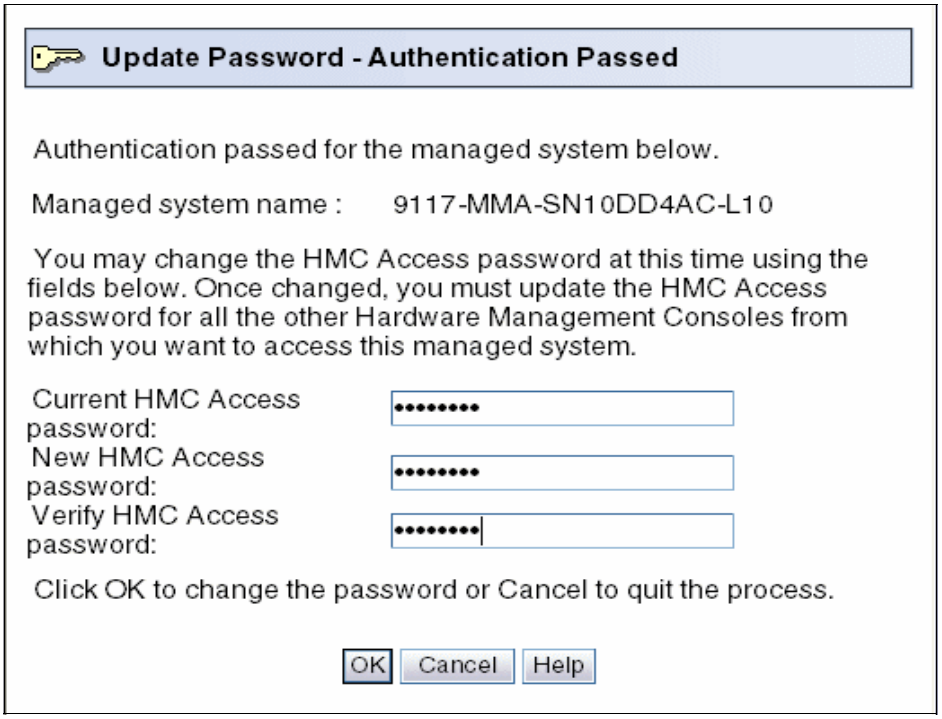


Figure 3-57 Update Password - Authentication Passed

Note: If you did not configure your HMC as a Dynamic Host Configuration Protocol (DHCP) server, the HMC will not detect the managed system automatically.

5. Access the ASMI to set the time of day on the system. Refer to 14.6.3, “Time of Day” on page 446 to set the time of day on the system.

6. Start the managed system by clicking **Systems Management** → **Servers**, select the managed system that you want to turn on, then click **Operation**, **Power On** as shown in Figure 3-58. There are three options for turning on the system:

   a. Partition standby allows you to create and activate logical partitions. When the partition standby power on is completed, the system is in standby mode.

   b. System profile turns on the system according to a predefined set of system profiles. Select the system profile that you want to use from the list.

   c. Partition auto start turns on the managed system to partition standby and then activate all partitions that are marked as auto start or those partitions that were running when the system shut down.

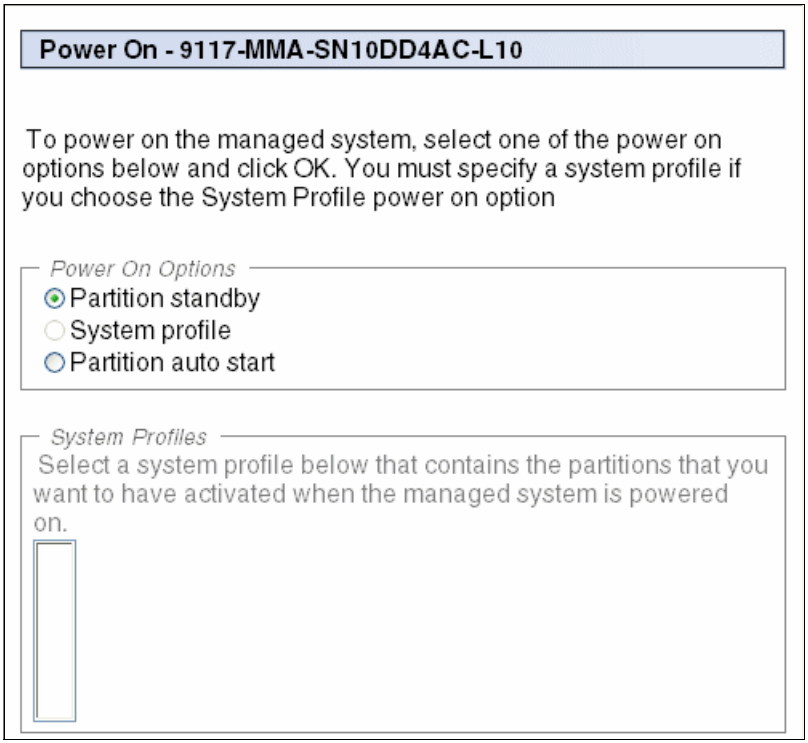


Figure 3-58 Power on the managed system

This completes the instructions for installing the HMC.

4

System plans and the HMC

This chapter introduces another important aspect of managing system plans. You can use the Hardware Management Console (HMC) to create import, export, view, create, remove, and deploy system plans. The HMC code level must be at Version 7 Release 3.1 or later, and it must include the latest service packs. The HMC provides a set of graphical user interfaces (GUIs) for these LPAR management functions.

Note: If you are connecting to the HMC from a PC workstation, there is no longer a requirement to install WebSM on the PC. You must access the HMC with Version 7.3 installed through a Web browser, not WebSM.

This chapter reviews the operations of each of these GUI interfaces for managing system plans, also referred to as *sysplans*. All of the utilities are available through the HMC graphical interface. Some functions are also available through the restricted shell, commonly referred to as the *command-level interface* (CLI). We do not document how to use the command-line functions that have not changed since they were documented in *LPAR Simplification Tools Handbook*, SG24-7231. You can find a list of these command-line functions and information about those command-line functions that have been added or changed in 4.3.3, “System plans management using restricted shell (CLI)” on page 171.

4.1 System plans

A system plan, also referred to as *sysplan* because of the .sysplan file extension, is a representation of the hardware and partition configuration currently on a system or the plan for deployment of hardware and configuration of partitions on a system, depending on how the sysplan file is generated:

- If the sysplan file is generated from an existing POWER5 or POWER6 system using the HMC, the file reflects the actual LPAR configuration of the server at that point in time if all the partitions are active. There is less detail if one or more partitions are not active.
- If the sysplan is generated by the System Planning Tool (SPT), the file reflects the intended LPAR configuration for a target server. The sysplan includes details on partition allocations of memory, processors, and the hardware required for each partition.

Hardware allocations can be defined as owned by the partition, and therefore required for the partition to activate. The only other choice is for the hardware to be defined as shared, in which case the hardware is optional for the partition, which can be activated without the hardware. Shared hardware can be switched between dynamically two or more partitions.

The sysplan also includes general information about the system, such as system type and model, total number of processors present and the number that are activated, and the total installed and activated memory. It has detailed information about the card slots in the processor enclosure and any I/O expansion towers or I/O drawers that will attach to the processor enclosure. The card slots are shown as empty, or occupied by IOP or IOA feature codes, and this level of detail is used for the hardware validation during the LPAR deployment process.

Note that at this time the sysplan file created by SPT includes device-level detail (for example, what type and number of disk units are attached to a storage controller IOA). In contrast, a sysplan created by the HMC does not, by default, include any detail of what is attached to and controlled by an IOA. For more information about this, refer to “Enabling hardware inventory collection from active partitions” on page 142.

A sysplan file is a composite object, which means that it could possibly include many files. The file’s description is imbedded in the file, as is the file level and last modifying application information. When a sysplan file is created on the HMC or imported using the HMC GUI, the file is stored on the HMC in a predefined directory. The directory path is /opt/hsc/data/sysplan.

4.2 Using the HMC graphical user interface

In the HMC workplace window, *System Plans* is where you can access the graphical interfaces that you use to manage system plans on the servers directly from the HMC or remotely using the Web browser based client connecting to the HMC (see Figure 4-1).

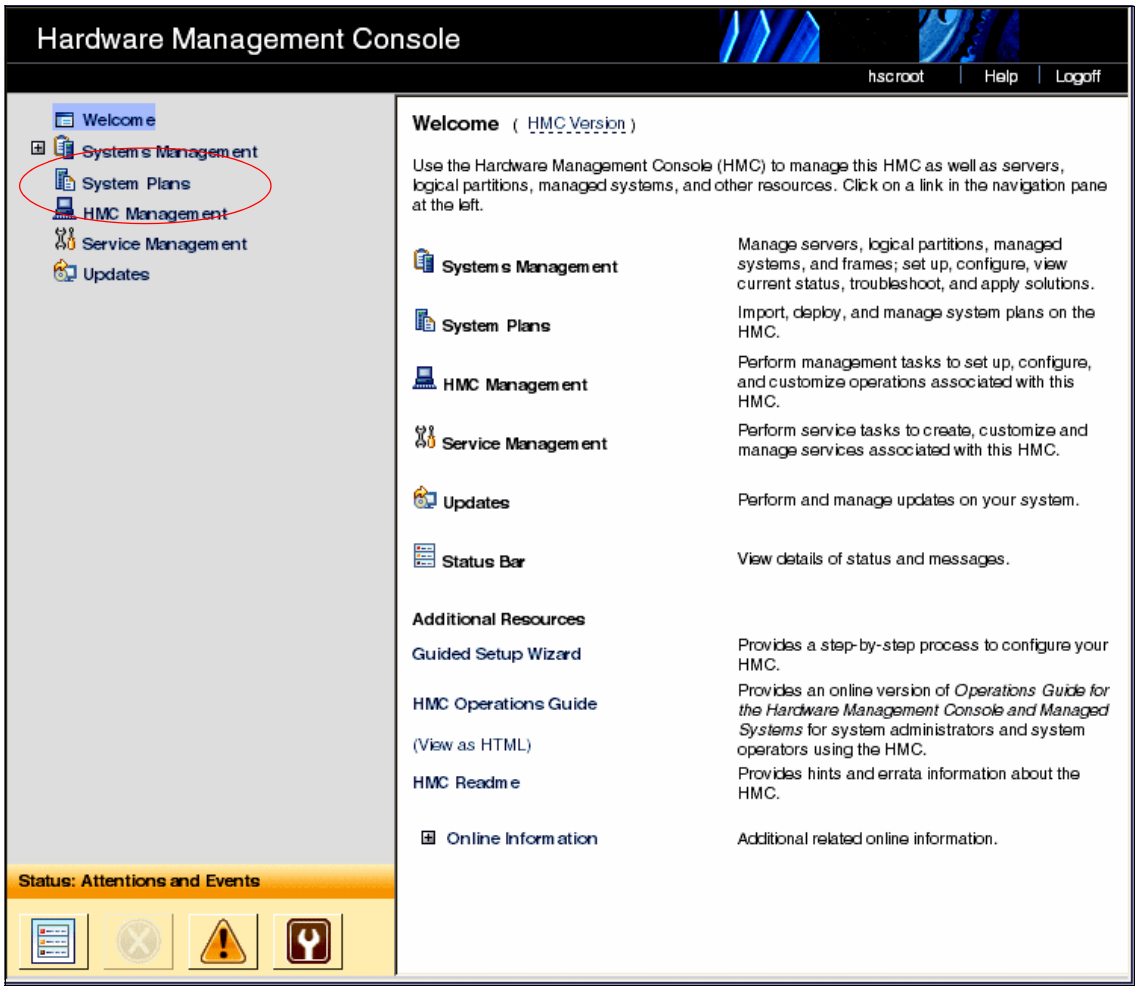


Figure 4-1 The HMC Welcome page

To display the system plans management tasks window, click **System Plans** (Figure 4-2). The upper section of this window lists all the system plans currently residing on the HMC. The buttons above the list lets you select and deselect, sort, filter, manage the columns of the display table, and perform tasks on selected system plans. The task options are repeated in the lower Tasks section of the main system plans management screen. Note that with no system plan selected, the only options are to import a system plan or to create a system plan.

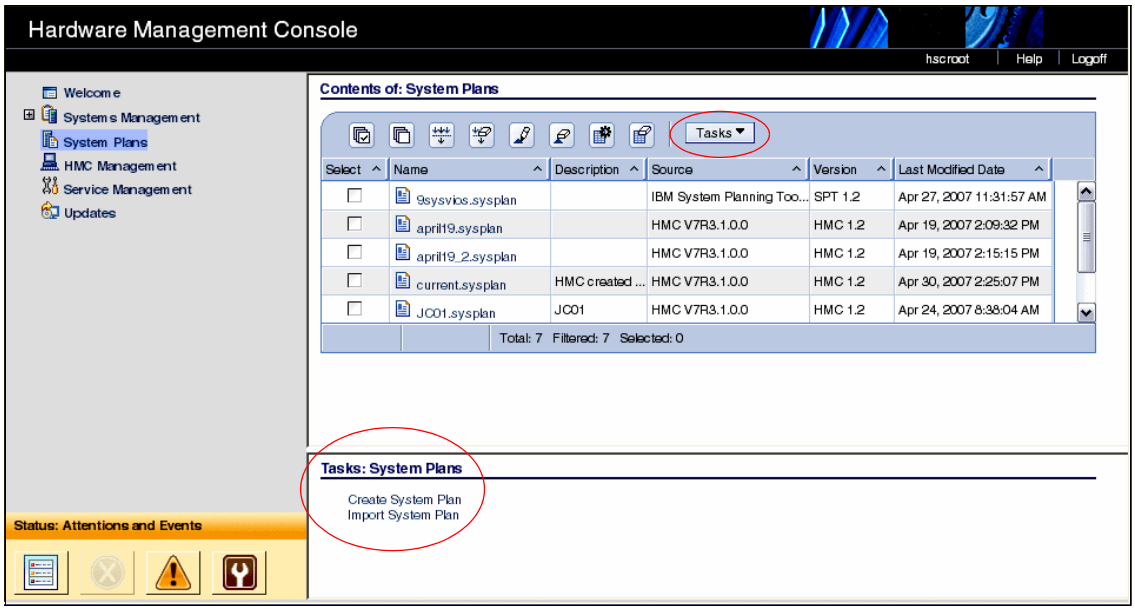


Figure 4-2 The main system plan management page

Using the HMC you can:

- Create a system plan
- View a system plan
- Deploy a system plan
- Export a system plan
- Import a system plan
- Remove a system plan

You can save a system plan created using the HMC interface as a record of the hardware and partition configuration of the managed system at a given time.

You can deploy an existing system plan to other systems that this HMC manages that have hardware that is identical to the hardware in the system plan.

You can export and system plan to another HMC (which imports the plan) and use it to deploy the system plan to other systems the target HMC manages that have hardware that is identical to the hardware in the system plan.

You have the option to view, create, deploy, export, import, or remove a system plan. Note that these tasks can be selected in either the Tasks drop-down menu or the Tasks links in the lower part of the right frame. The following sections provide more details for each option.

Figure 4-3 shows a common starting point for each example. In our first example we have selected a system plan named *9sysvios.sysplan*.

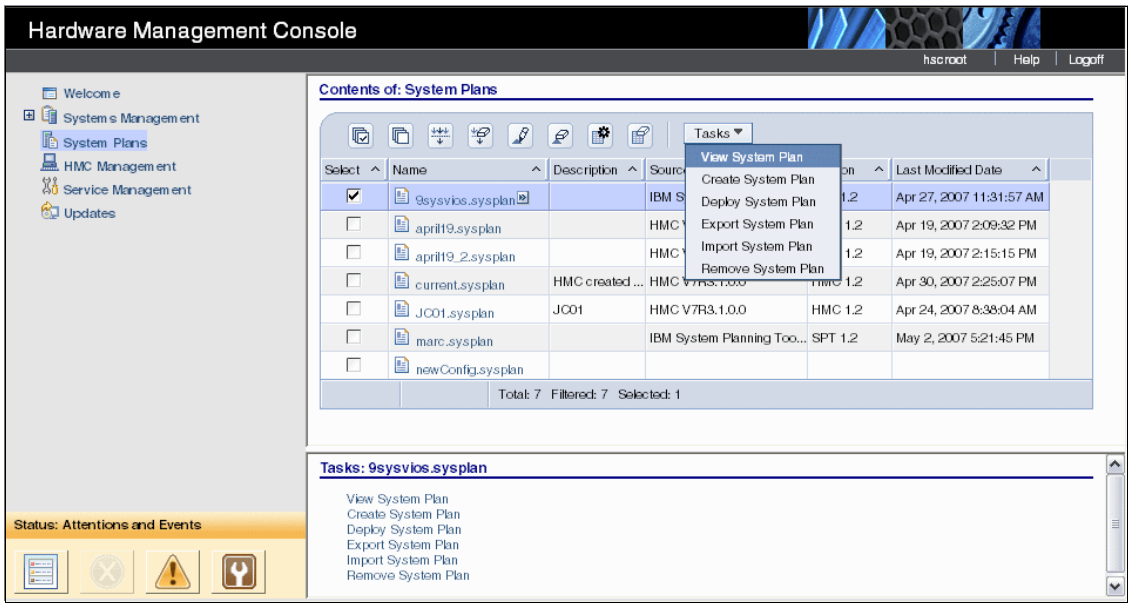


Figure 4-3 The system plan management page with a system plan selected

4.2.1 Importing a system plan to the HMC

You can load a system plan that was created using the SPT or created on another HMC using the import operation. You can import the system plan from one of the supported media types, such as CD, DVD, diskette, a USB device such as a memory card, a remote FTP site, or a PC connected to the HMC through a browser connection.

When you import a system plan, you first need to prepare the media, if needed. Then, you import the sysplan file.

From the System Plans task menu, select **Import System Plan**, which opens the Import System Plan prompt window. Identify the system plan file name and whether you are importing it from media, an FTP server, or, if you are accessing the HMC through a PC-based Web browser, the sysplan file can be on that PC. In our example (Figure 4-4), the system plan file is stored on a USB flash drive. The name of the file is newConfig.sysplan, and the file was initially created using SPT and saved to the flash drive. The directory path to access the file on the flash drive is /media/sysdata.

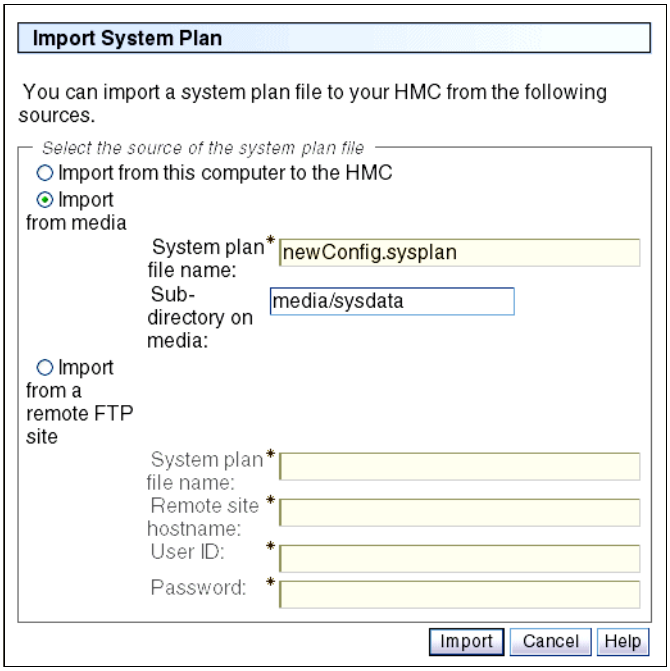


Figure 4-4 Import System Plan window

A successful import results in the conformation message shown in Figure 4-5.

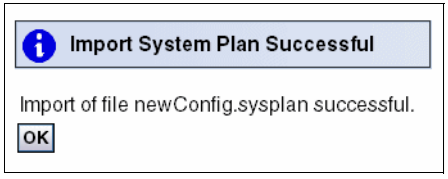


Figure 4-5 Importing a sysplan file success

4.2.2 Exporting a system plan from the HMC

You can export system plans that reside on the HMC to media, an FTP server, or, if you are using a PC to access the HMC through a browser, to a directory on the PC. The process is very much like the importing of a sysplan file. If you are exporting to media, you need to format that media for use with the HMC.

Preparing the media

To export to external media, that media must be in a format that is available to the HMC. The easiest method is using the Format Removable Media task:

1. Select **HMC Management** from the left navigation frame.
2. Select **Format Media** in the right window to open the media selection box as shown in Figure 4-6.

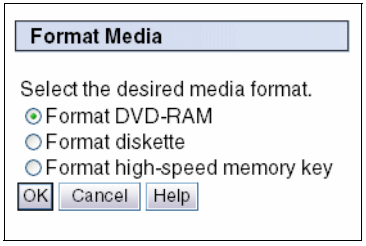


Figure 4-6 Format Media

If you have a USB memory key, insert it in a USB slot on the HMC.

If you have a diskette or CD that needs to be formatted, insert it into the disk or CD drive.

3. Select the correct device to format and click **OK**. The memory format process starts and completes.
4. Insert the media into the PC and load the system plan file using the save function in SPT or by browsing to the file and copying the sysplan file to the media.

Exporting the system plan

From the starting point shown in Figure 4-3 on page 137, follow these steps:

1. Select a system plan to export.
2. Click **Export System Plan** either from the Tasks drop-down menu or the content Tasks link in the lower portion of the window. A dialog box opens asking where you want to export the system plan (Figure 4-7). In our example, the name of the sysplan file is april19.sysplan and the target is media/USBstick directory.

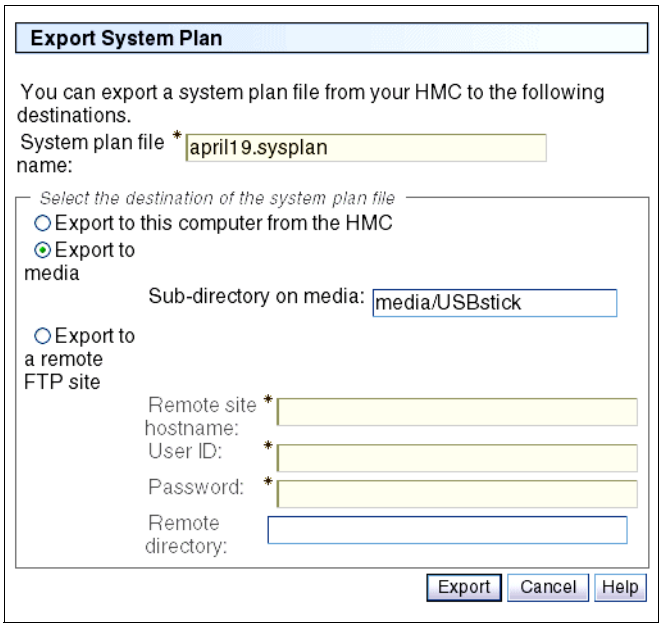


Figure 4-7 Export System Plan window

3. Click **Export** to initiate the export process. A results window with a success indication or an error message indicates the result of the export.

4.2.3 Creating a system plan on the HMC

You can create a system plan for a system that is controlled by the HMC. The system plan has information about the current partition definitions and hardware allocations. Processor, memory, and PCI cards are identified in the system plan, even if they are not owned by a partition.

Notes:

1. Hardware controlled through an IOA controller, such as disk units and external media devices, will not be represented in the system plan unless the owning partition is running. For more information, see “Enabling hardware inventory collection from active partitions” on page 142.
2. You cannot import the sysplan file that the HMC creates into the SPT to edit it. The sysplan file can only be deployed and viewed either on the HMC on which the file was created or an HMC to which the file has been moved.

From the starting point in Figure 4-3 on page 137, follow these steps:

1. Select **Create System Plan**.
2. The Create System Plan window prompts you for the system name, sysplan file name, a description, and a choice to view the system plan after creation, as shown in Figure 4-8.

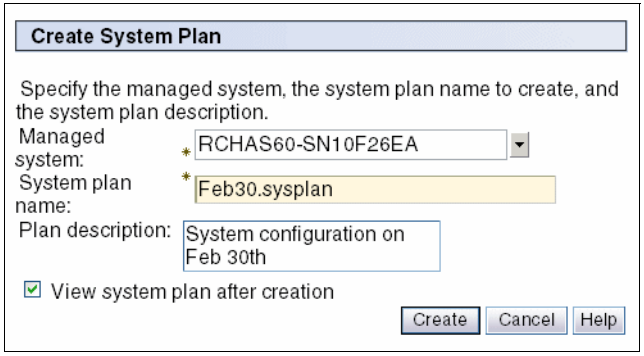


Figure 4-8 Create System Plan window

3. After you have entered the requested information, click **Create**.

4. Following the successful creation of a system plan, a message displays (Figure 4-9) and the system plan is now in the list of plans on the HMC. Click **OK**.

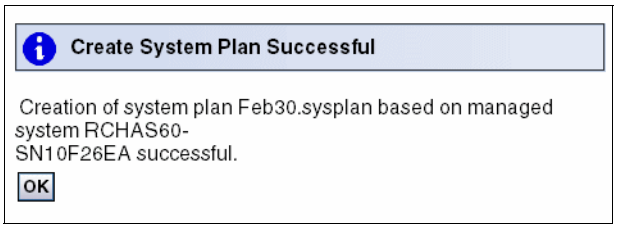


Figure 4-9 Success creating a system plan

Enabling hardware inventory collection from active partitions

When you use the HMC to create a system plan for a managed system, you can capture partition configuration information and a base set of associated hardware configuration information. If you have partitions already active, you can maximize the information that the HMC can obtain about the hardware.

To maximize the information that the HMC can obtain from the managed system, turn on the managed system and activate the logical partitions on the managed system, assuming that they already exist, before you create the new system plan.

Additionally, you need to set up Resource Monitoring and Control (RMC) on the HMC before you create a system plan to capture the most detailed information. Although using the RMC can take several more minutes to finish processing, by you can capture disk drive and tape drive configuration information for a managed system in the system plan. You can view this more detailed hardware information using the View System Plan task.

To enable the HMC's internal inventory collection tool (**`invscout`**) to be able to perform its most detailed hardware inventory retrieval operations, follow these steps:

1. In the HMC workplace window, select the HMC Management task.
2. Select **Change Network Settings**, and in the Customize Network Settings window, select the LAN Adapters tab, as shown in Figure 4-10.

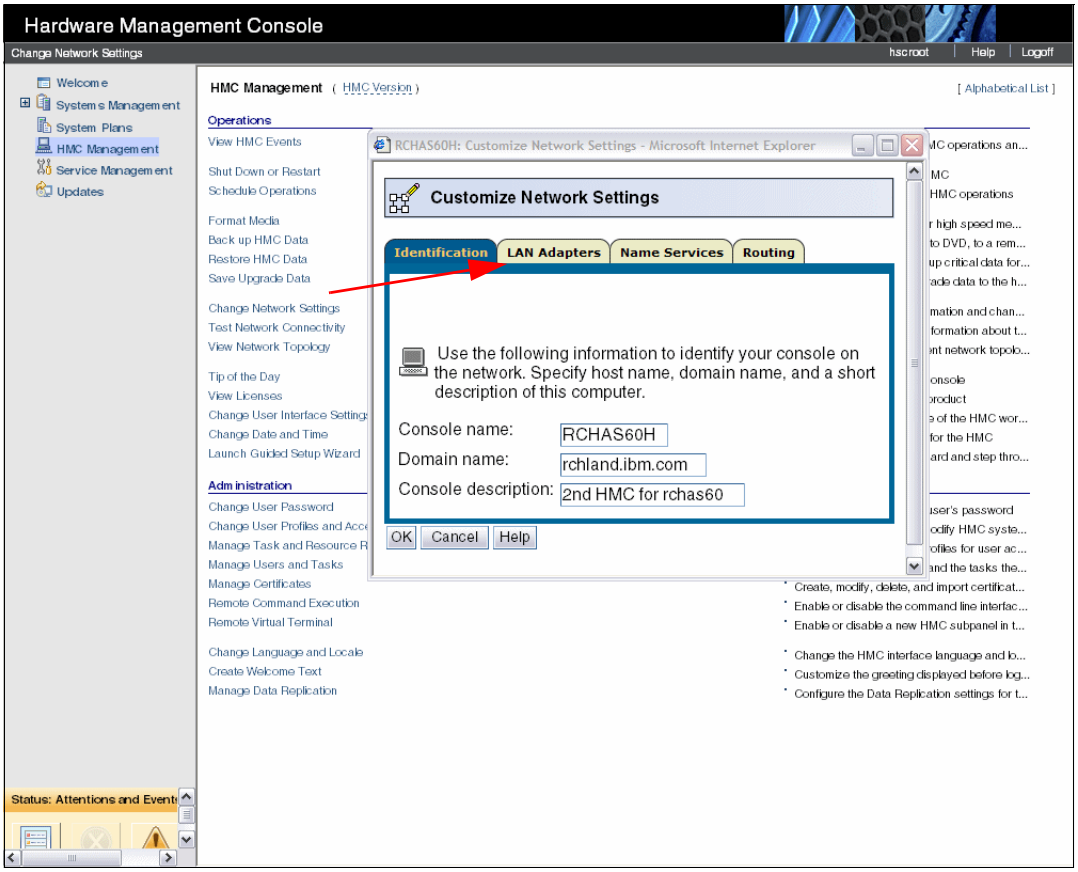


Figure 4-10 Customize Network Setting - LAN Adapters for enabling RMC

3. In the LAN Adapters window, select the **eth0** LAN Adapter and click **Details**.
4. In the LAN Adapter Details window (Figure 4-11) on the LAN Adapter tab, select **Open** within the Local Area Network information area to enable the check box for Partition Communication. Then, select **Partition communication**.

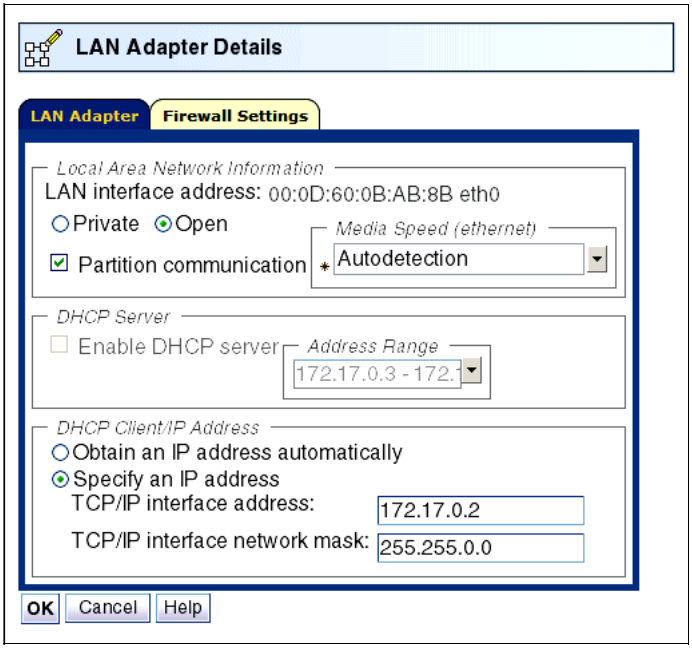


Figure 4-11 Customize Network Setting - LAN Adapters - partition communication

5. Click the Firewall Settings tab, scroll down the Available Applications area to see whether RMC is already specified as available. In this example, we assume that RMC has not yet been made available. Therefore, select **RMC** in the Allowed Hosts pane and click **Allow Incoming**, as shown in Figure 4-12.

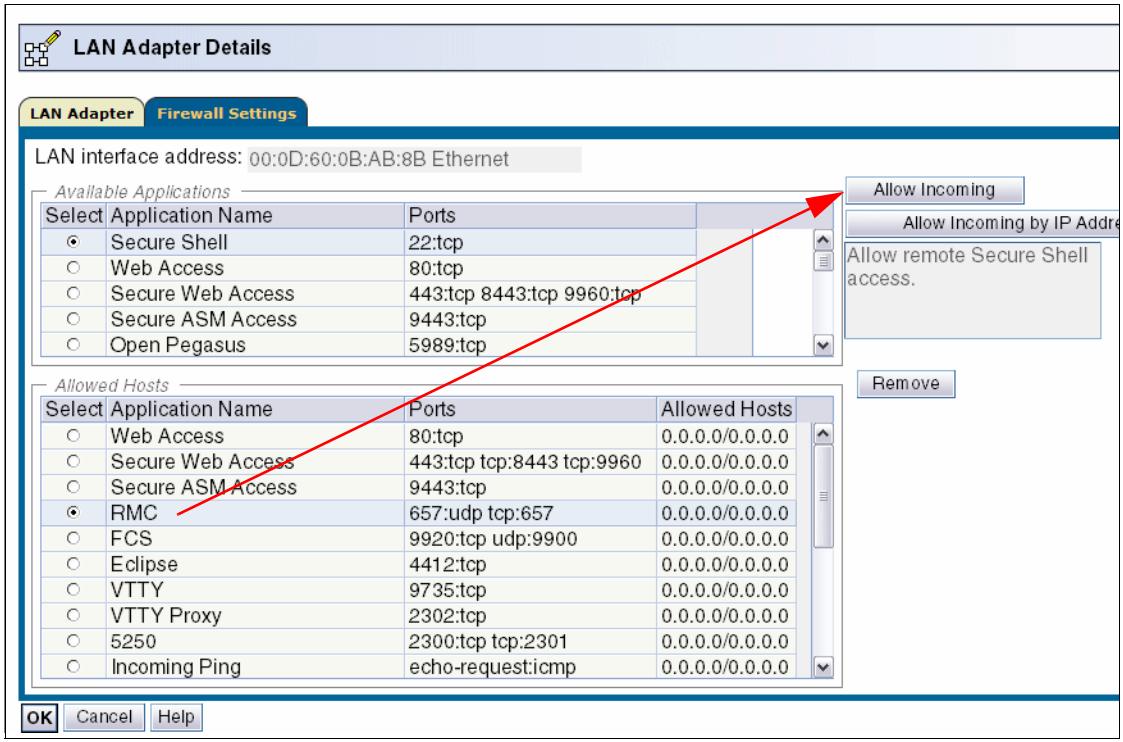


Figure 4-12 Customize Network Setting - LAN Adapters - enabling the RMC application

This action moves RMC into the Available Applications pane.

6. Click **OK** twice to open a window that states that the Network Settings Changes will be applied at the next HMC reboot.
7. Click **OK**. You are now back to the HMC workplace window with just the HMC Management pane on the right.

You can verify that you have enabled RMC successfully using the **lspartition** command on the HMC CLI. For more information about using the HMC CLI, refer to 4.3.3, “System plans management using restricted shell (CLI)” on page 171.

The list partition command is:

```
lspartition -c
```

For example:

```
hmc:> lspartition -c 9117_MTM-1OFZZD
```

In our example managed system, this command results in:

```
<#0> Partition:<4, partn1.business.com, 1.2.3.444>
   Active:<0>, OS<, >
```

If this command does not return any partitions, then the system might not be set up for RMC. Depending on whether the system is a System i or System p, the steps for RMC are different.

IBM Systems Hardware Information Center includes additional information about RMC. For background information about RMC, you can also refer to *A Practical Guide for Resource Monitoring and Control (RMC)*, SG24-6615. The content of this publication is based upon AIX 5L™, 5.1.

If the Create System plan from the GUI fails and if there is a need to create a system plan, use the underlying **mksysplan** CLI at the HMC command prompt, with the **noprobe** option. The **noprobe** option bypasses the default inventory collection of active partitions. So, the resulting sysplan might not have IOA/IOP controlled disk units or media enclosures.

For example:

```
hmc:> mksysplan -m machineName -f filename.sysplan -v -o noprobe
```

Note, when creating a sysplan, if there is a failure due to a Virtual I/O Server error, you can try the **noprobe** option from the CLI.

4.2.4 Viewing a system plan on the HMC

The HMC has a system plan viewer similar to the viewer in the System Planning Tool. The viewer offers a non-editable presentation of the system’s partitions and hardware. Using Figure 4-3 on page 137 as a starting point, select the desired plan in the main system plan management window. Click **View System Plan**.

When you are accessing the HMC remotely, you are presented with a View System Plan sign on window the first time that you launch the System Plan

Viewer. This additional log in protects unauthorized users from viewing the system's configuration. It also prevents launching the Viewer from bookmarks without providing an appropriate user name and password.

You get the login window shown in Figure 4-13. If you get a sign on window, use a valid user name and password and click **Login**.

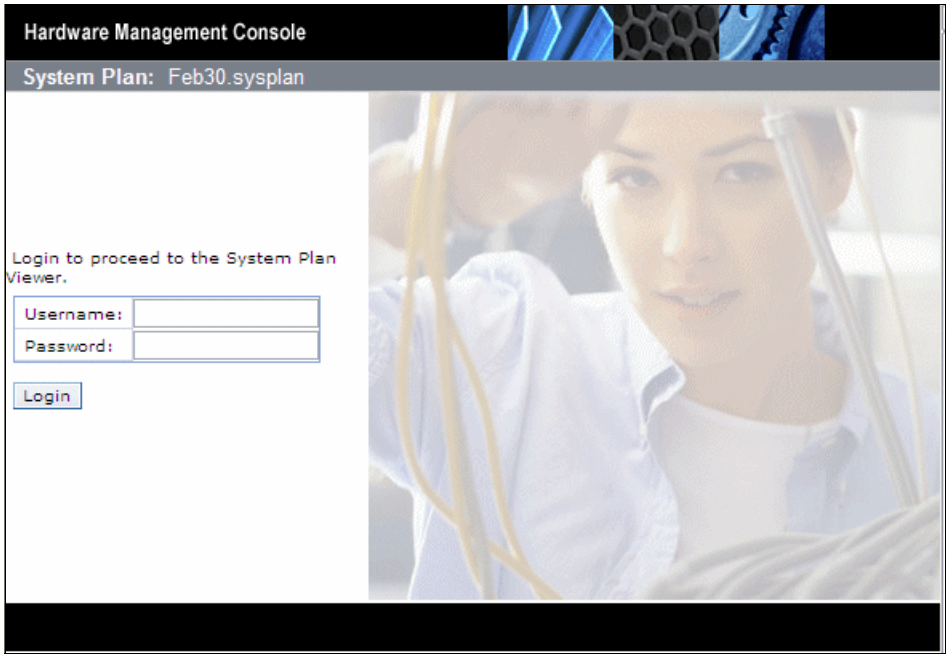


Figure 4-13 View System Plan sign on page

Figure 4-14 shows the system plan. The left navigation frame shows a single partition or the entire system. You can also choose just specific enclosures under the Hardware section. The file history is also viewable. The viewer also has a Print option and Show Comments / Hide Comments toggle, located at the bottom of the viewer window.

If you are accessing the HMC from a PC browser, the print function is through the PC's attached and network printers. If you are using the HMC terminal itself, the print function is through printers that are connected to the HMC or network printers to which the HMC has access.

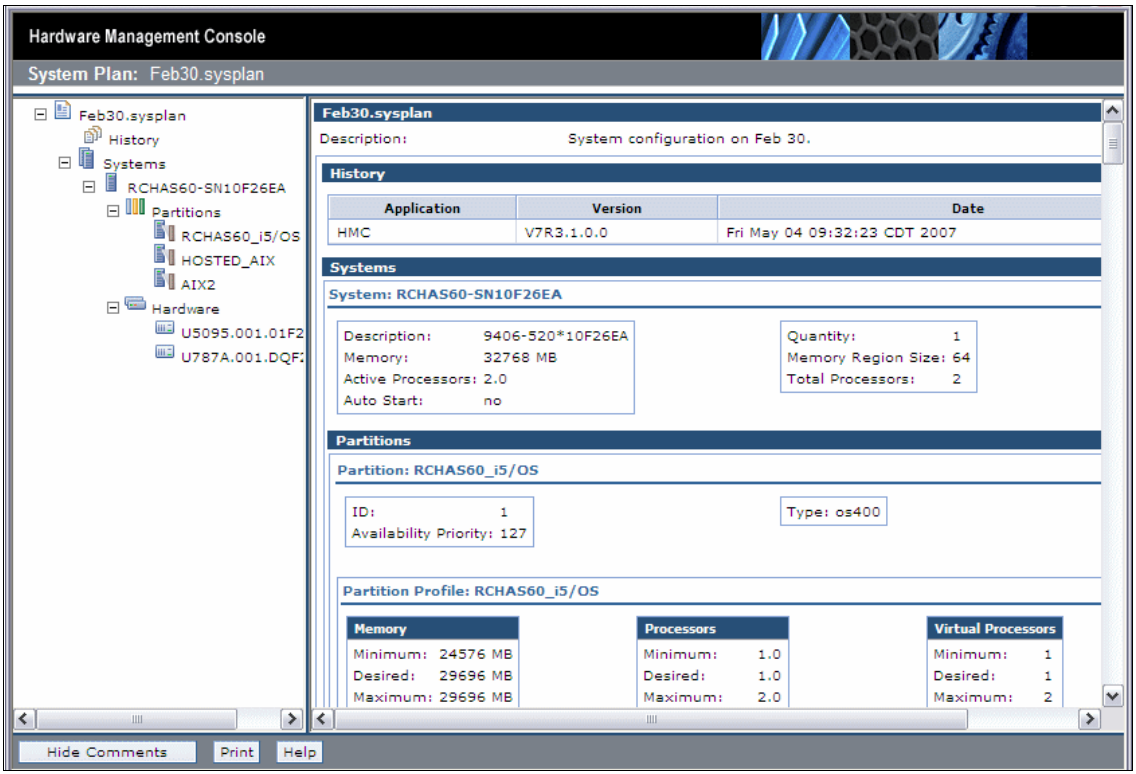


Figure 4-14 Viewing a system plan

The system plan section shown in Figure 4-15 shows the system's disk units. Note that the controller for the disk unit displays in the table. This detail is obtained only if the i5/OS operating system that is controlling the disk units is running. Linux and AIX operating systems do not display disk controller information or location information.

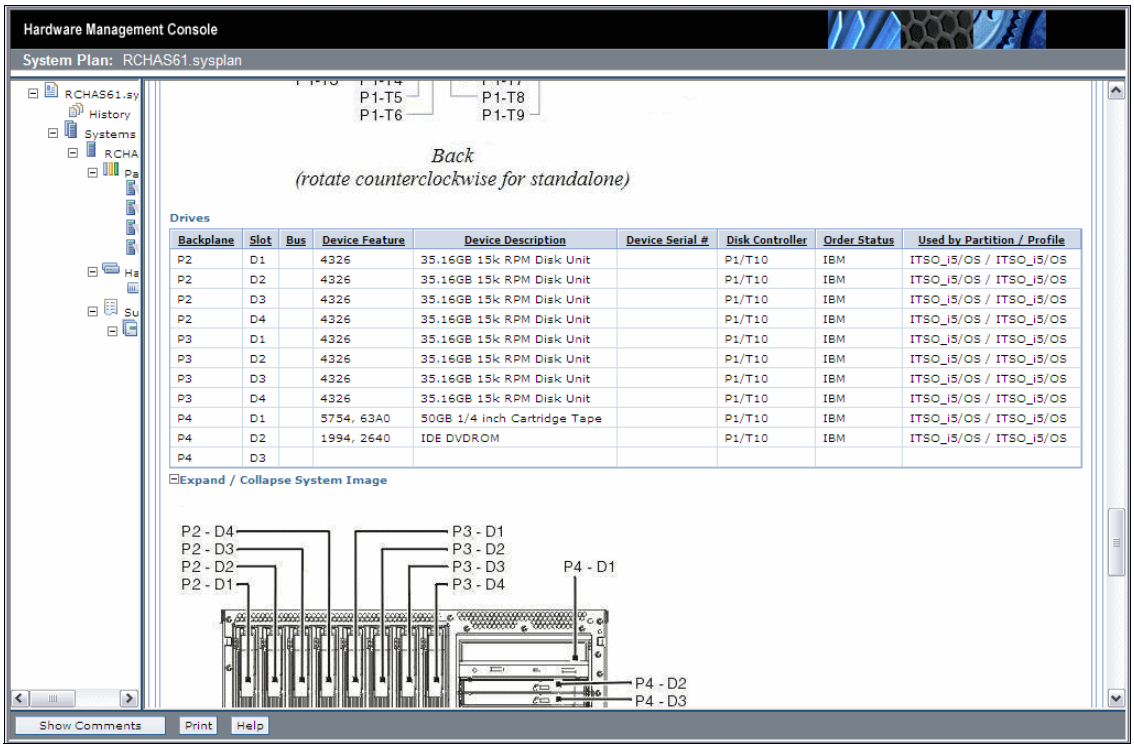


Figure 4-15 Viewing a system plan

4.2.5 Removing system plan on the HMC

When you no longer need a system plan, you can remove the sysplan file easily from the HMC. Using Figure 4-3 on page 137 as a starting point, follow these steps:

1. Select the desired plan in the main system plan management window.
2. Click **Remove System Plan** either from the Tasks drop-down menu or the content Tasks link in the lower portion of the window. A conformation message displays asking if you are sure you want to delete the file (Figure 4-16).

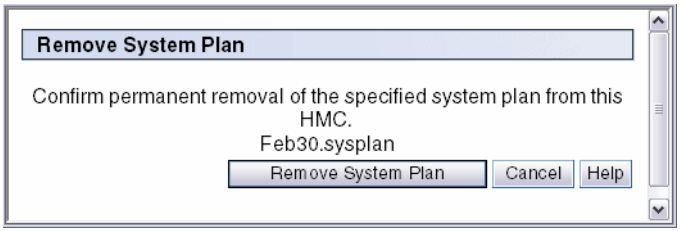


Figure 4-16 Confirm removal of system plan window

3. Click **Remove System Plan** to remove the selected sysplan file from the HMC.

4.3 System plans deployment

Since the publication of *LPAR Simplification Tools Handbook*, SG24-7231, from a general point of view, the deployment process has not changed a lot. Of course, due to the updates of System Planning Tool Version 2 and HMC software, the details are not the same. The major improvements of the process are related to Virtual I/O Server implementation.

In this section, we provide a summary of the deployment validation process. We cover the new deployment wizard using examples and provide details of the updates to the restricted shell CLI.

You can find specific deployment information about Virtual I/O Server in 9.1.2, “Virtual I/O Server” on page 261.

4.3.1 Deployment validation process

Before deploying any system plan, it must be validated. There are two steps in this validation process. First, the hardware is validated and then, if that validation is successful, the partition is validated.

This process is detailed in *LPAR Simplification Tools Handbook*, SG24-7231. You can refer to that book at any time. However, because it is fundamental to fully understand how the validation process works, we summarize the main concepts in this section.

Hardware validation

When running hardware validation, the HMC checks that any planned hardware exists on the managed server and that all the I/O processors and adapters are located physically in the planned slots. Hardware validation does not necessary mean that an exact match must occur between the planned and the existing hardware. For example, you can plan on using less processors or memory than physically installed, or you can plan on not using all the physically installed I/O units.

Important: The HMC is not aware of the devices that are connected to the IOA. Therefore, there is no validation at a lower level than the IOA. When using the System Plan Tool, you *must* specify devices such as disk drives, CD/DVD drives, and tape drives. The validation process *cannot* perform any validation about these devices.

The validation includes all the following items:

- Server type, model and processor feature: an exact match is required
- Number of processors: at least the planned number must exist
- Memory: at least the planned amount must exist
- Expansion units: all the expansion units in the plan must exist
- Slots: all the I/O processors and adapters in the plan must exist in a correct expansion or in the Central Electronic Complex (CEC) and must be at the same location
- Any serial number; an exact match is required

At this point, it is important to take actions to *avoid any ambiguity* about the expansion units or the processor enclosures CECs. You could have multiple CECs, for example on a 16-way model 570. In that case, you would have four CECs.

This ambiguity takes place when two or more installed expansion units or CECs have the same type and contain exactly the same I/O processors and adapters in the same slot. You might plan a partition to use specific expansion units due, for example, to their physical location in the racks or on the floor or to specific disks drives that the HMC cannot see. The validation process allows such a system plan, but there is no guarantee for the deployment to allocate the right expansion to the partition.

The best way to eliminate expansion units or CECs ambiguity is to specify, in the system plan, their serial number.

You must eliminate any hardware validation error, for the partition validation to start.

Partition validation

When running partition validation, the HMC checks that any *existing* partition on the server exactly matches with one of the planned partitions.

The validation includes all the following items:

- Partition name
- Partition ID
- Name of the default profile
- Processing resources in the system plan
- Memory resources in the system plan
- Physical hardware in the system plan
- Virtual adapters, including slot ids and maximum adapters, in the system plan

If any of these items fail, the partition validation is unsuccessful, and the deployment will fail. Some of the corrections to allow the deployment must be applied on the server. This is the case for the name of the default profile, which cannot be changed in the System Planning Tool and is the same as the partition name. This is also the case for some hardware features like the USB controller or the IDE CD controller that the HMC allows you to assign to an i5/OS partition (while it cannot use them) but the SPT does not.

4.3.2 Deploy a system plan using the graphical wizard

In this section, to show the new deployment wizard related to V7R3 HMC software, we run three deployment examples:

- The first example fails due to hardware errors.
- The second example fails due to partitions errors.
- The third example is successful.

You can initiate deployment when you are using any right pane of the HMC by clicking **System plans** on the left pane as shown in Figure 4-17.

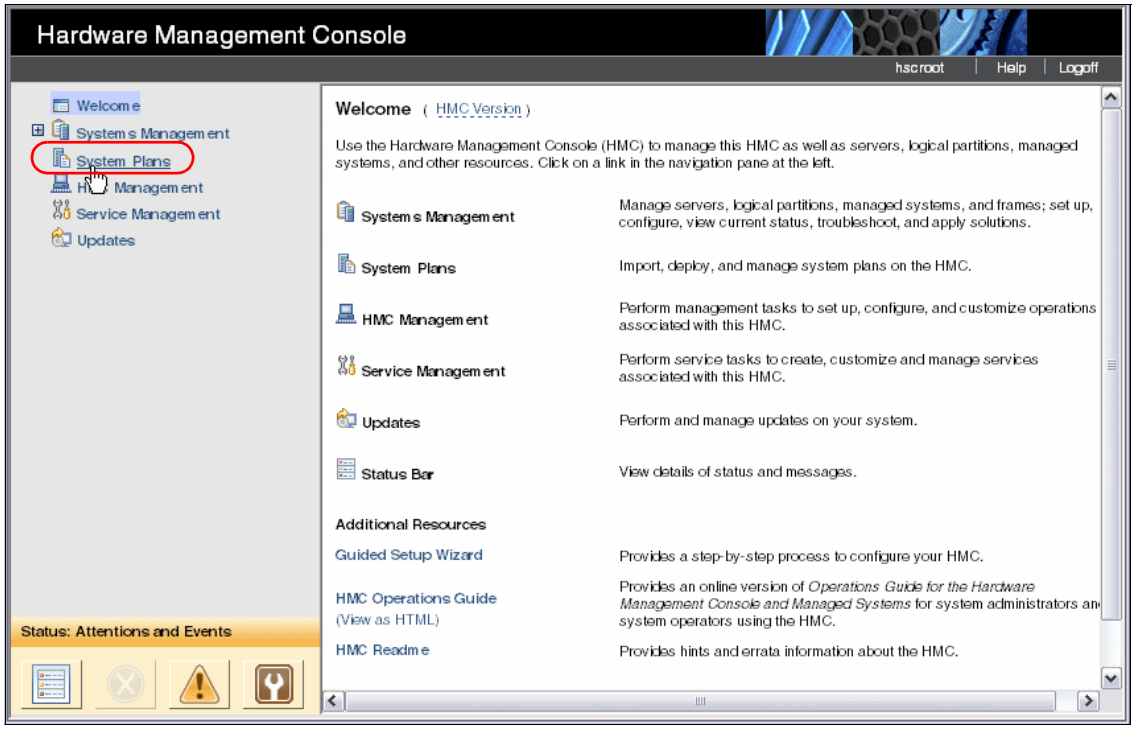


Figure 4-17 Launch deployment

To deploy a system, follow these steps:

1. On the list of the system plans, select the one that you want to deploy by clicking the check box to the left of the system plan, as shown in Figure 4-18. In our example, we select the **marc.sysplan** file.

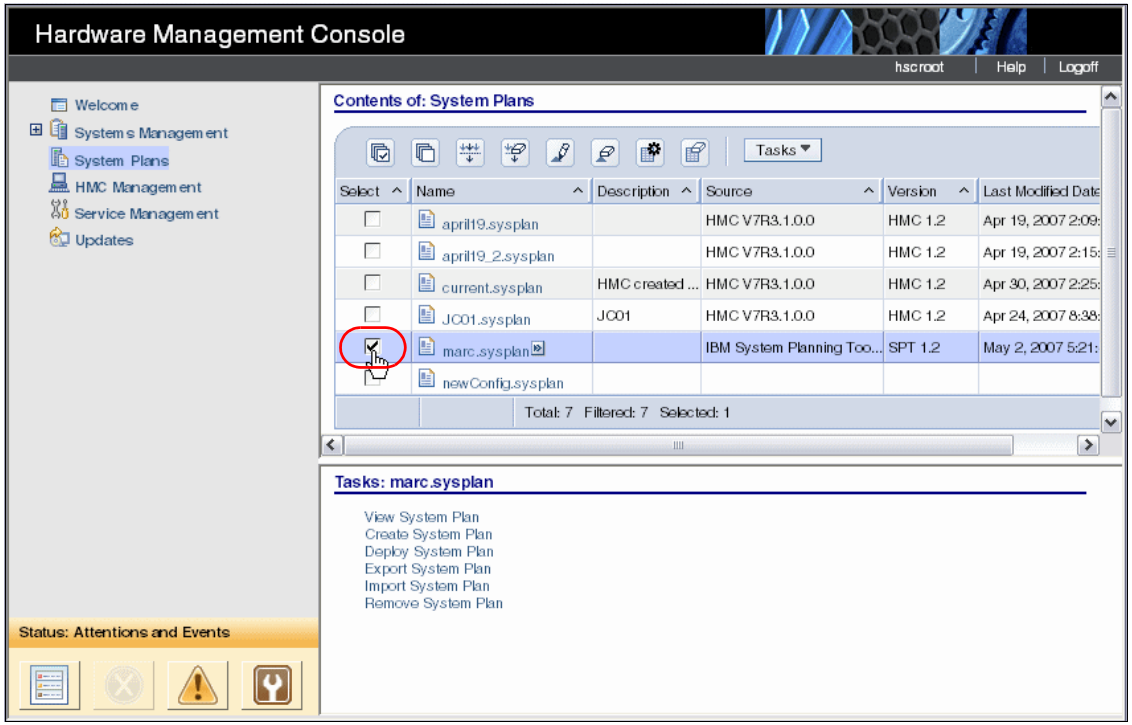


Figure 4-18 Select the system plan to deploy

There are three different ways to start the deployment of the selected system plan, as shown in Figure 4-19.

- Click the contextual menu immediately to the right of the system plan name and select **Deploy System Plan**.
- Click **Deploy System Plan** in the bottom Tasks panel.
- Click **Tasks** at the top of the System Plans list panel and select **Deploy System Plan**.

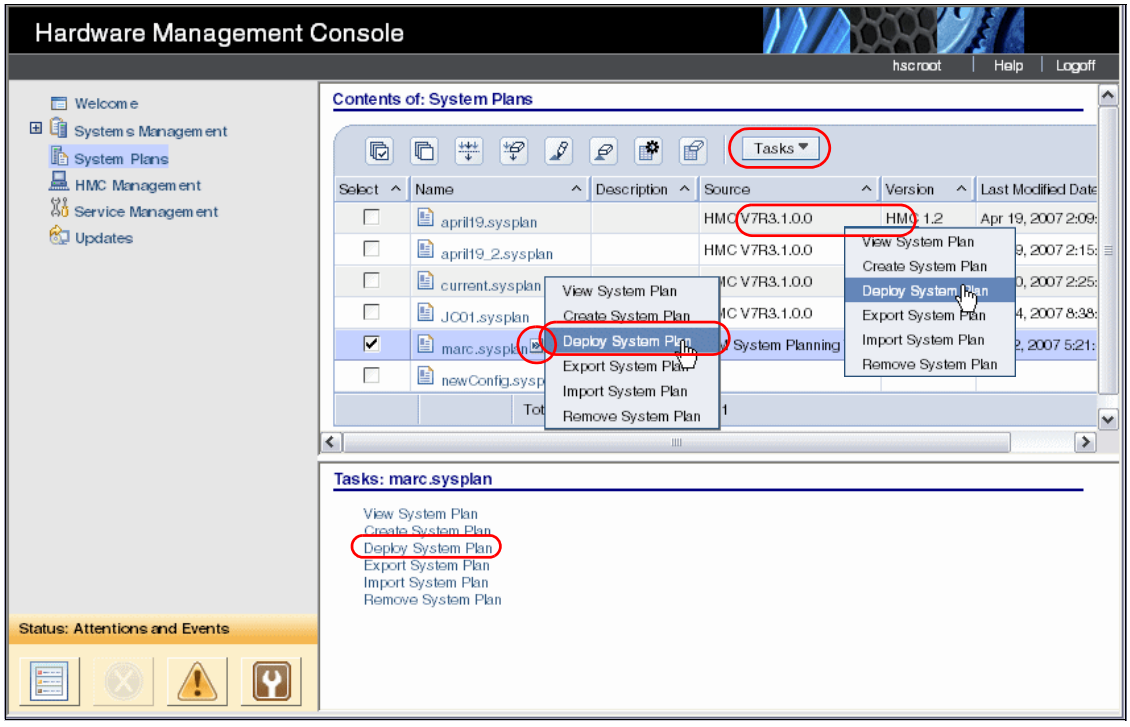


Figure 4-19 Launch the deployment

2. After the wizard is started, its Welcome page, shown in Figure 4-20, requests that you confirm the system plan to deploy and choose the managed server to be the target of the procedure. When your choices are done (in our example, we want to deploy the *marc.sysplan* file to the *RCHAS60-SN10F26EA* server), click **Next** to continue.

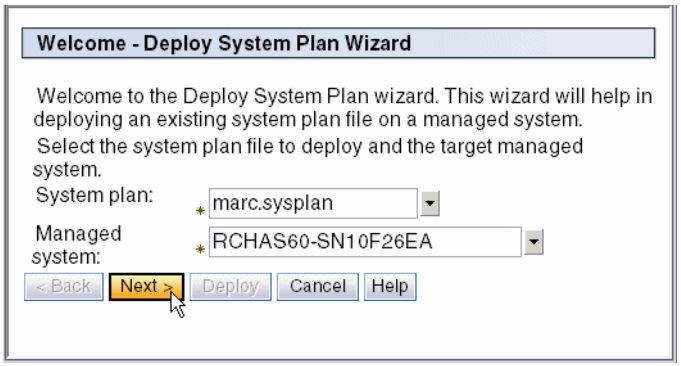


Figure 4-20 Confirm the deployment startup

3. Figure 4-21 shows you the validation progress. When this has completed, you can examine all the related messages, those messages that are successful as well as those messages that are unsuccessful. We provide information about the validation types in 4.3.1, “Deployment validation process” on page 151.

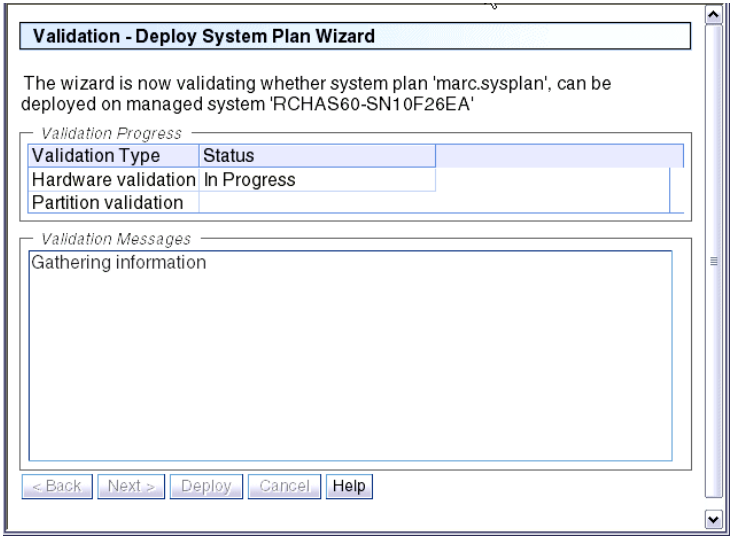


Figure 4-21 Deployment validation in progress

Here are three examples of validation result:

– The first example is related to a system plan that fails to deploy due to hardware errors. Figure 4-22 shows unsuccessful hardware validation.

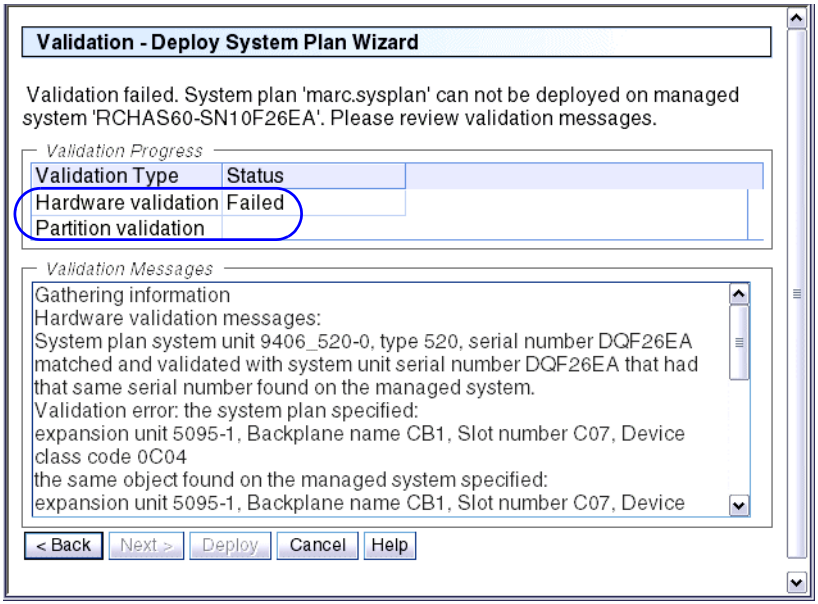


Figure 4-22 Deployment validation summary (hardware failed)

The Validation Messages panel shows the result of each particular validation step. You might need to scroll down or up to find the root cause of the failure and, in most cases, you can correct the system plan to get a successful validation.

Figure 4-23 shows the first hardware validation error message, which tells you that, in the expansion unit 5095, the slot C7 is occupied by a device which is not the same that the one specified in the system plan. The best way to correct this specific error is to update the system plan with SPT to match the hardware. Another option could be to install the right device physically according to the system plan and to adjust all the hardware to the system plan. This option might lead you to order such a device and move I/O cards from a slot to another.

After reading all the necessary messages, click **Cancel** to exit the window.

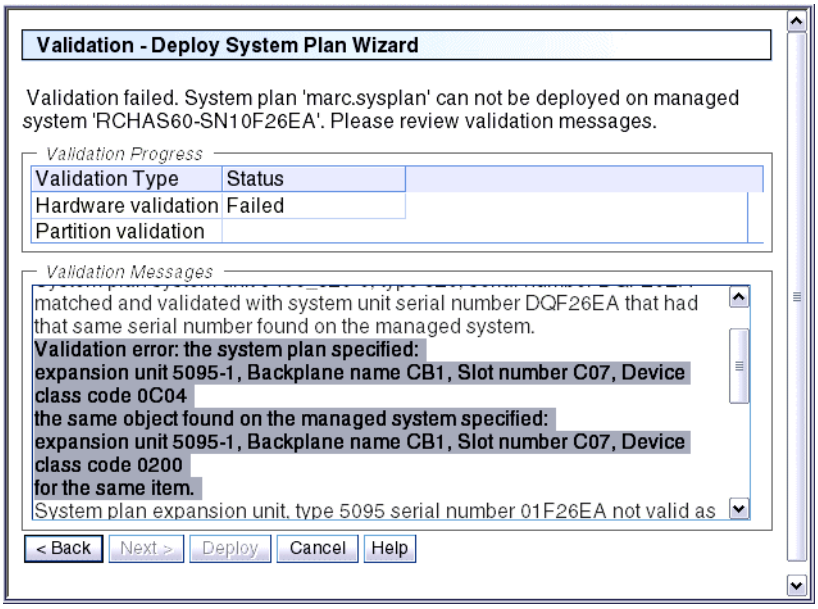


Figure 4-23 Example of hardware validation error

Note: The partition validation does not begin while there are errors on the hardware validation type.

– The second example is related to a system plan that fails to deploy due to partition errors. Figure 4-24 shows successful validation for the hardware part, and failed validation for the partition validation type.

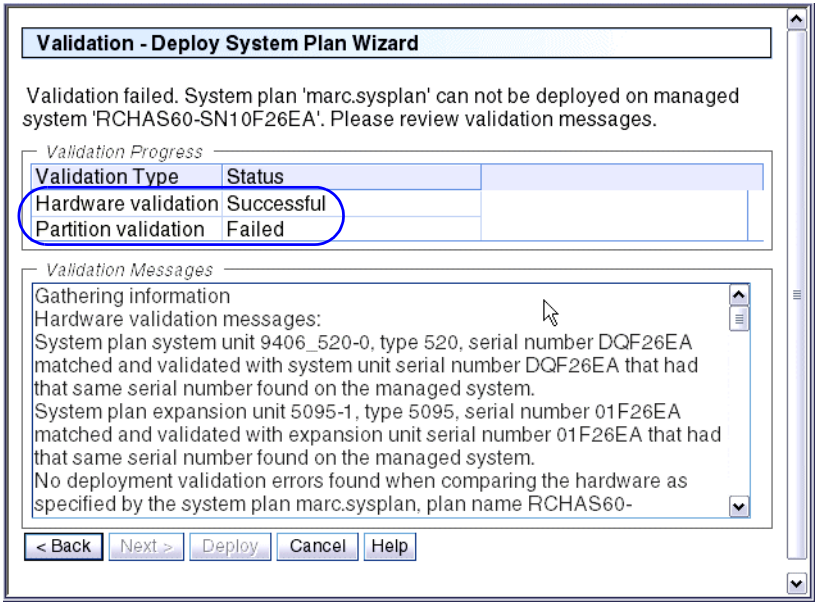


Figure 4-24 Deployment validation summary (partition failed)

The Validation Messages panel shows the result of each particular validation step. You might need to scroll down or up the list to find the root cause of the failure, and, in most cases, you can correct the system plan to get a successful validation.

Figure 4-25 shows the first partition validation error message, which tells you the partition 3 name of the system plan does not match with the existing partition 3 name. To fix this problem, you can either rename the partition in the system plan with SPT or rename the partition with the HMC.

After reading all the necessary messages, click **Cancel** to exit the window.

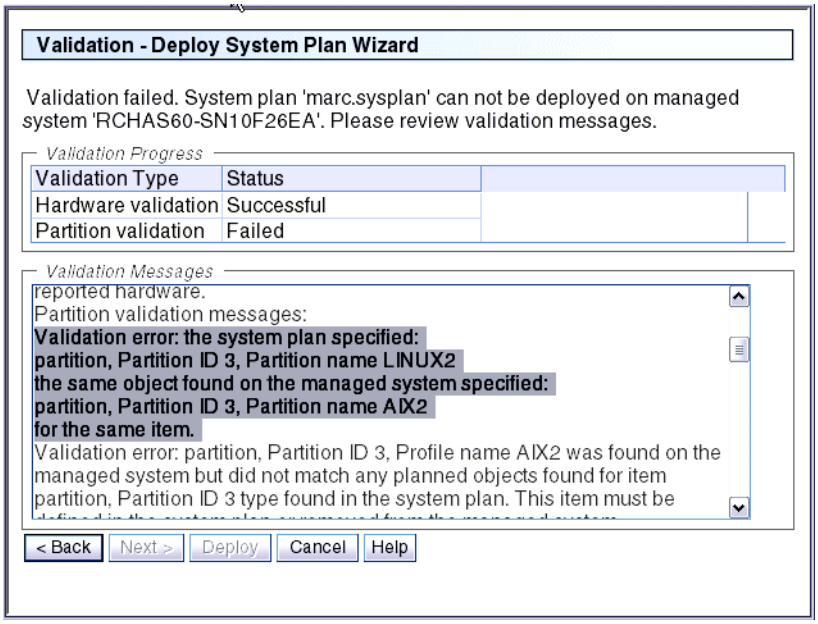


Figure 4-25 Example of partition validation error

– The third example is related to a system plan which gets successful validation. Figure 4-26 shows a successful validation for both hardware and partition steps. You can review all the messages in the Validation Messages panel, then click **Next** to continue.

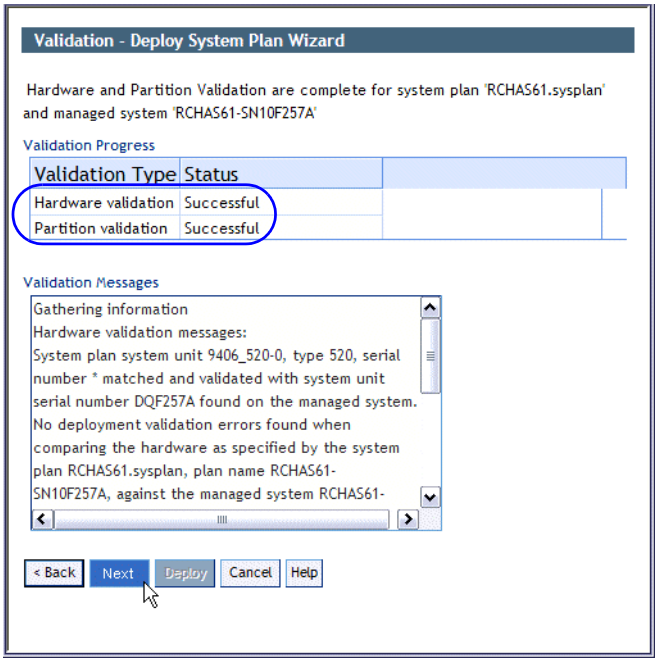


Figure 4-26 Example of successful validation

4. After the validation, the next panel is the starting point of the deployment. There are two portions in this panel:

   a. The first contains the list of all the actions that are planned (see Figure 4-27). In our example, the system plan is built with one i5/OS partition that hosts three Linux partitions.

      Notice the `Partially deployed` status of the i5/OS partition. This status means that some items of the partition exists on the server and does not need to be deployed. Specifically, here, the partition and the profile are created (and the LPAR is running at the time of the screen capture). These items will not be deployed again.

      Notice also the `Deploy` column. Each action of the plan can be deselected if you prefer run it at a later deployment. Notice that, even if there are deselected items, the dependency is checked before running the deployment. So, you cannot, for example, deploy an hosted partition while the hosting one does not exist.

      If you need to review the details of a specific action, you can select this one in the radio boxes of the `Select` column and click **Details**.

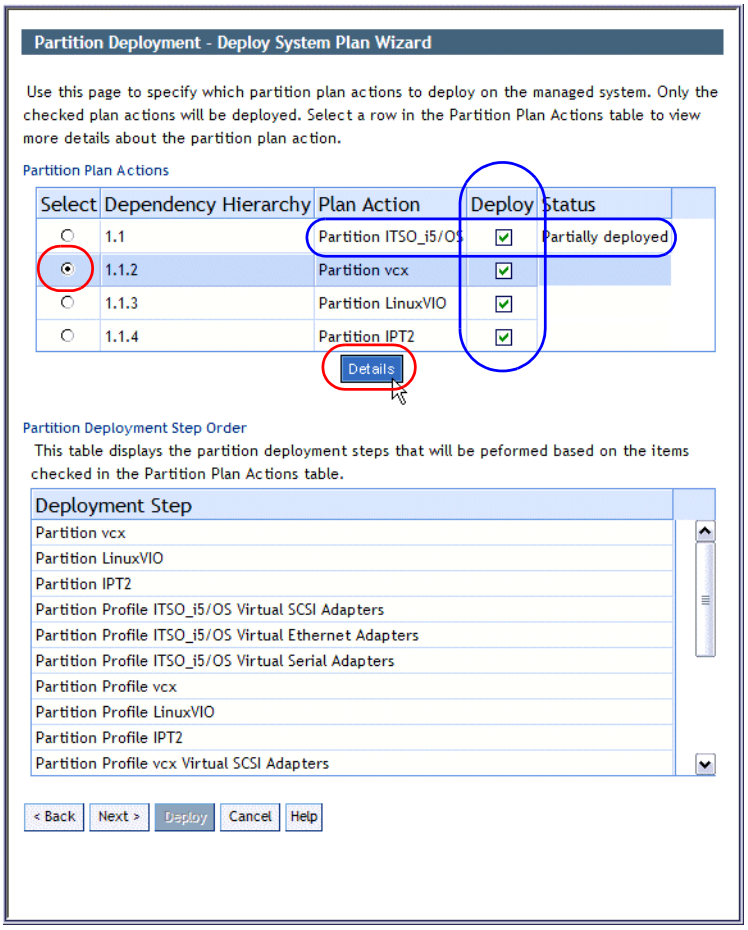


Figure 4-27 Request the details of a specific action

b. Click **Details**. The HMC links to the System Plan Viewer, restricted to the view associated with selected action. The System Plan Viewer *report* for the action is displayed in a separate window, as shown in Figure 4-28. In this example, we show the planned profile for the `vcx` partition. After the review is finished, just close this window.

> **Note:** You might need to authenticate again to the HMC when accessing this option.

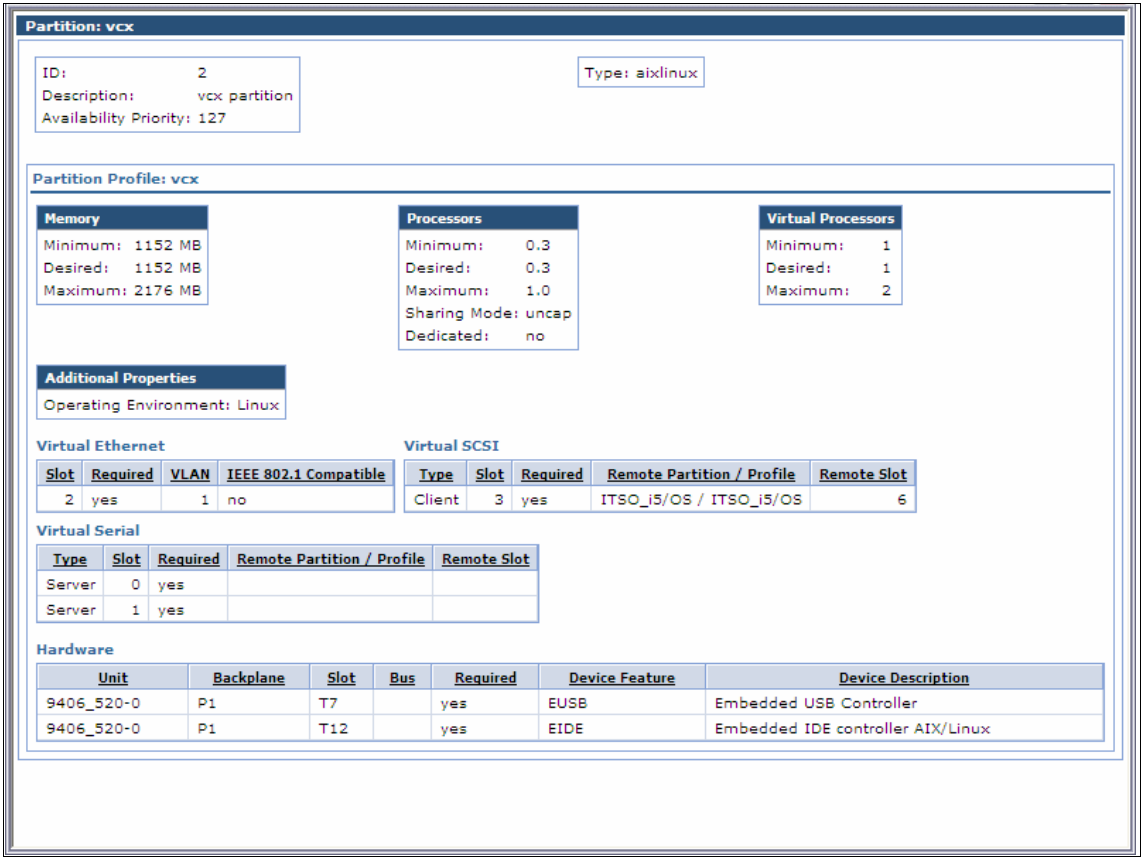


Figure 4-28 Details of an action, shown by a restricted view System Plan Viewer

c. The second portion contains the detailed list of all the steps that the HMC performs to deploy the plan as shown in Figure 4-29. You can scroll down and up to review all the steps.

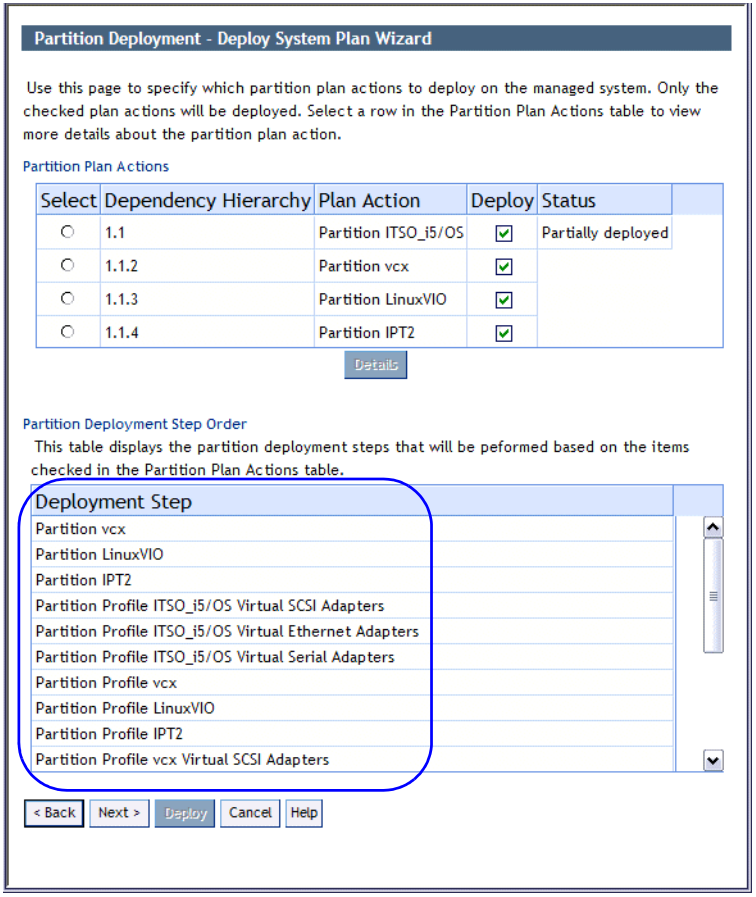


Figure 4-29 List of the deployment steps

d. When you are ready to deploy, after reviewing details of the actions, eventually deleting some of the actions, and reviewing the deployment steps, as shown in the Figure 4-30, click **Deploy** to start the deployment.

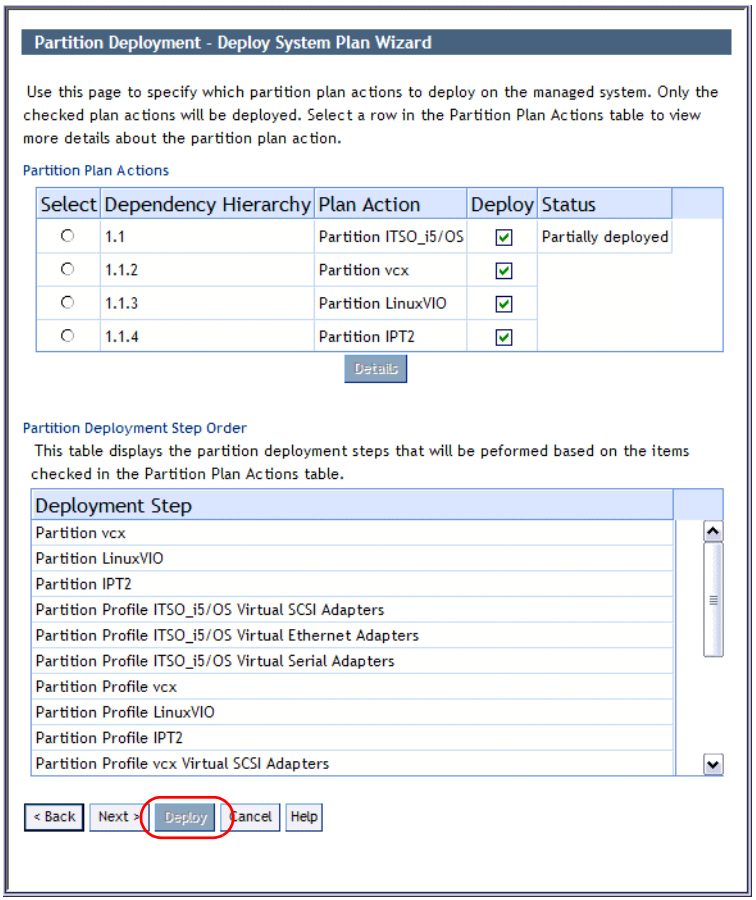


Figure 4-30 Partition Deployment - Deploy System Plan Wizard

5. Figure 4-31 shows the last panel before running the deployment. There is a summary of all the steps that the HMC performs. Click **Deploy** to start the operations.

   Notice the warning just above the buttons at the bottom of the window.

   The deploy process time, depending on the complexity and the number of partitions, generally ranges from 5 to 20 minutes, and might be longer for specific deployments, when using Virtual I/O Server partitions for example.

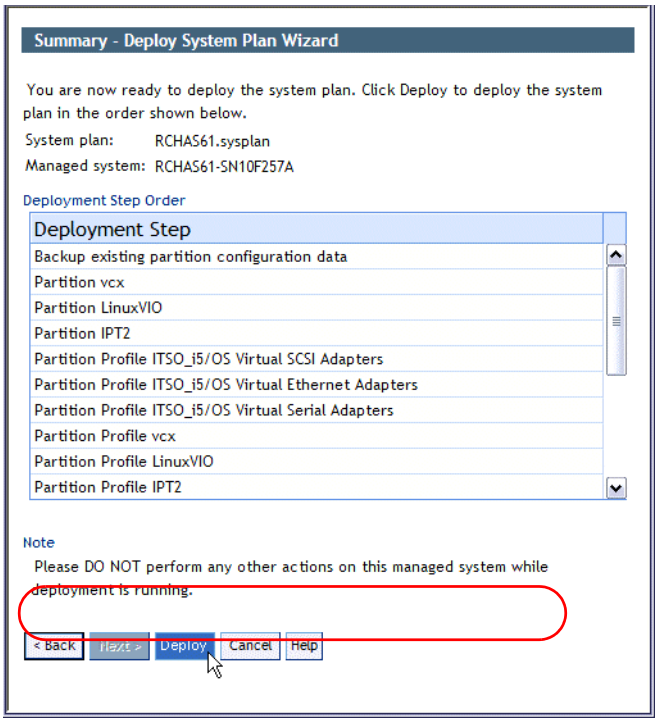


Figure 4-31 Ready to deploy

While the deployment is running, as shown on the Figure 4-32 on page 168 and Figure 4-33 on page 169, you can follow its progress. Each step is `In progress` then `Successful`, from the top to the bottom of the `Deploy progress` portion of the panel. Notice that you have to move the cursor of this list by yourself to see those steps that do not fit in the initial window.

Note: The first step that you cannot disable is always to perform a backup of the actual partitions configuration.

In the `Messages` portion of the panel, we see the detailed results of each step. In our example, when running the step "`Partition Profile ITSO_i5/OS Virtual Serial Adapters`", you can see that there is no result yet. However, when running the previous step, we can see that one of the results was the following message:

```
Virtual Ethernet Adapter deployed for slot 5 on profile ITSO_i5/OS of
partition 1 on managed system RCHAS61-SN10F257A.
```

Notice that the display sort, for this list, is the opposite of the steps sort. You see the latest event first and the first one last, and therefore, there is no need to scroll down or up this list during the deployment.

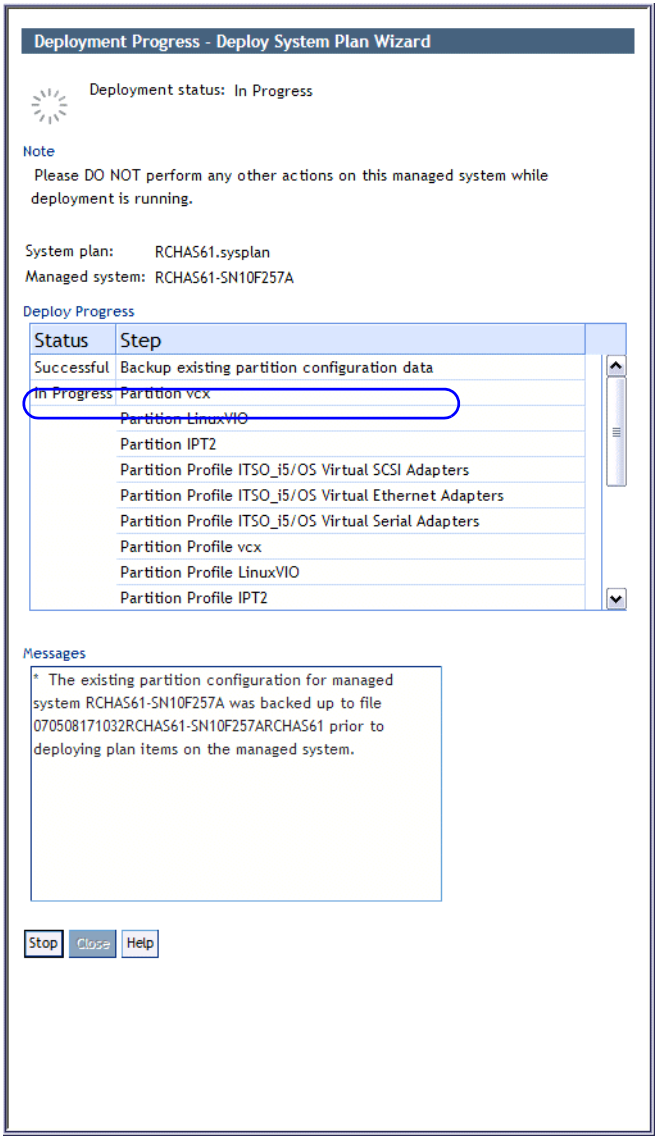


Figure 4-32 Deployment starting

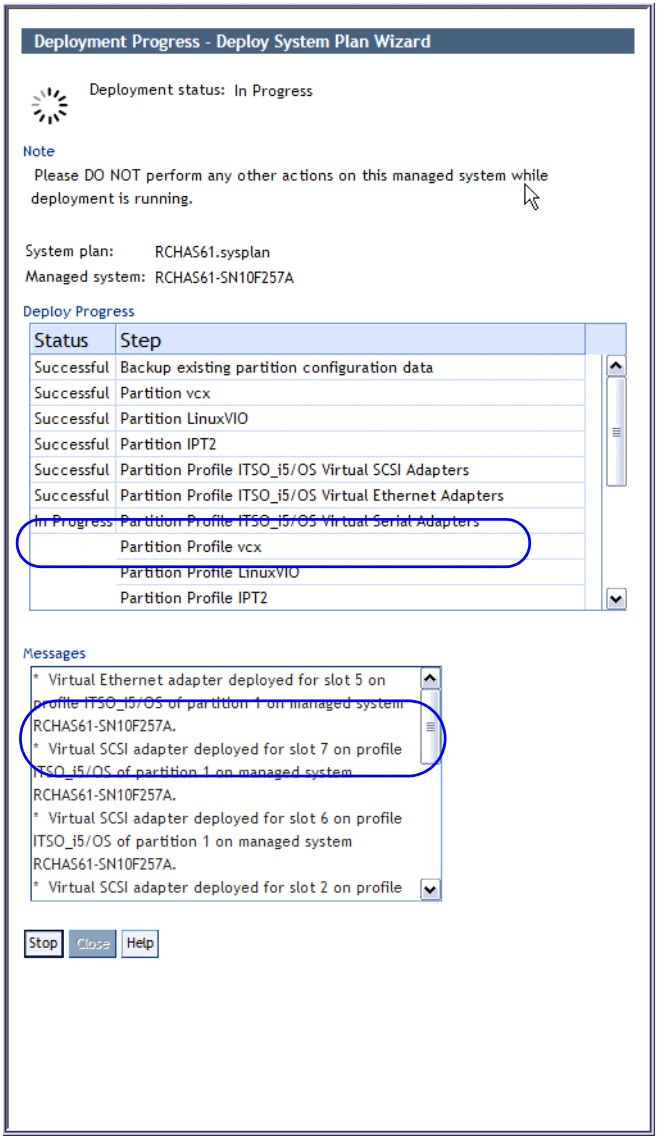


Figure 4-33 Deployment in progress

When the deployment is complete, as shown in Figure 4-34, review all the steps and messages to make sure that everything is OK. Then, click **Close** to finish the session.

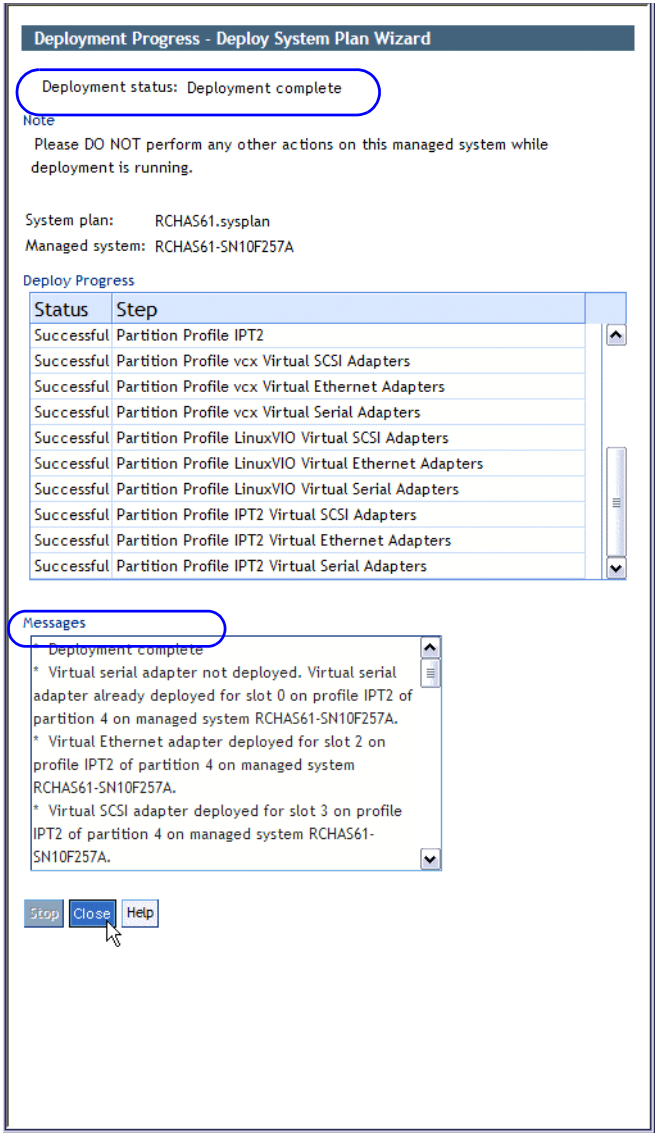


Figure 4-34 Deployment complete

4.3.3 System plans management using restricted shell (CLI)

This section focuses on the HMC CLI commands that are designed for managing tasks relating to system plans. Four of CLI command were introduced in HMC V5R2 code level and remain unchanged. Since System Planning Tool Version 1, their function and syntax did not change. We do not document existing parameters in HMC V5R2 code level here.

One of the CLI commands was introduced in HMC V5R2 and is updated in the HMC V7R3 code level. It has new parameters. We document only these new parameters here.

To get more information about the unchanged commands and parameters, or about the way to use the restricted shell, refer to *LPAR Simplification Tools Handbook*, SG24-7231.

Unchanged commands

The unchanged commands are the basic commands, which are:

- **`lssysplan`** used to display a list of the system plans.
- **`deploysysplan`** used to deploy a system plan on a managed server.
- **`rmsysplan`** used to delete a particular system plan.
- **`cpsysplan`** used to export (copy from the HMC) or import (copy into the HMC) a system plan. Because this command is unchanged, unlike the GUI there is no way to specify exporting or importing to or from the current PC.

Updated commands

The **`mksysplan`** command has two new optional parameters. This command is used to create a system plan that contains the actual LPAR configuration of a specific managed server. The two new optional parameters are:

- **`-o`** is used to specify an option for inventory collection

  By using this parameter with the **`noprobe`** value (the only allowed one), you can request not to scan the devices which are attached to IOA cards. This way, you do not retrieve in your system plan, any disk drives attached to the disks controllers, any tape drives which are unknown by the HMC, but are only known by the operating system of the partitions. Using this parameter allows the command to run much more faster, if you do not need the devices level details.

  If you do not specify the **`-o`** parameter, the HMC requests the operating system of each active partition to return the devices information for each IOP.

Important: To be able to receive devices information from the operating system, the corresponding partition *must be running*.

With or without using the option, the display output is the same as you can see in the Example 4-1. The first command does not specify **-o** parameter, and therefore gather all the devices information. The second one specifies **-o** parameter, and therefore does not request the operating system of the partitions to provide devices information.

Example 4-1 The mksysplan command with or without -o parameter

```
hscroot@RCHAS6OH:~> mksysplan -f marc.sysplan -m 9406-52O*1OF26EA
Started inventory gather process ...
System plan marc.sysplan created successfully for the system
9406-52O*1OF26EA.

hscroot@RCHAS6OH:~> mksysplan -f marc.sysplan -m 9406-52O*1OF26EA -o
noprobe
Started inventory gather process ...
System plan marc.sysplan created successfully for the system
9406-52O*1OF26EA.
hscroot@RCHAS6OH:~>
```

Both commands create the same system plan whose name is `marc.sysplan` but their contents are different.

Without specifying **-o noprobe**, like the first one, you get the devices information from the running partitions, as you can see in Figure 4-35 on page 173. You can see the disk drives details.

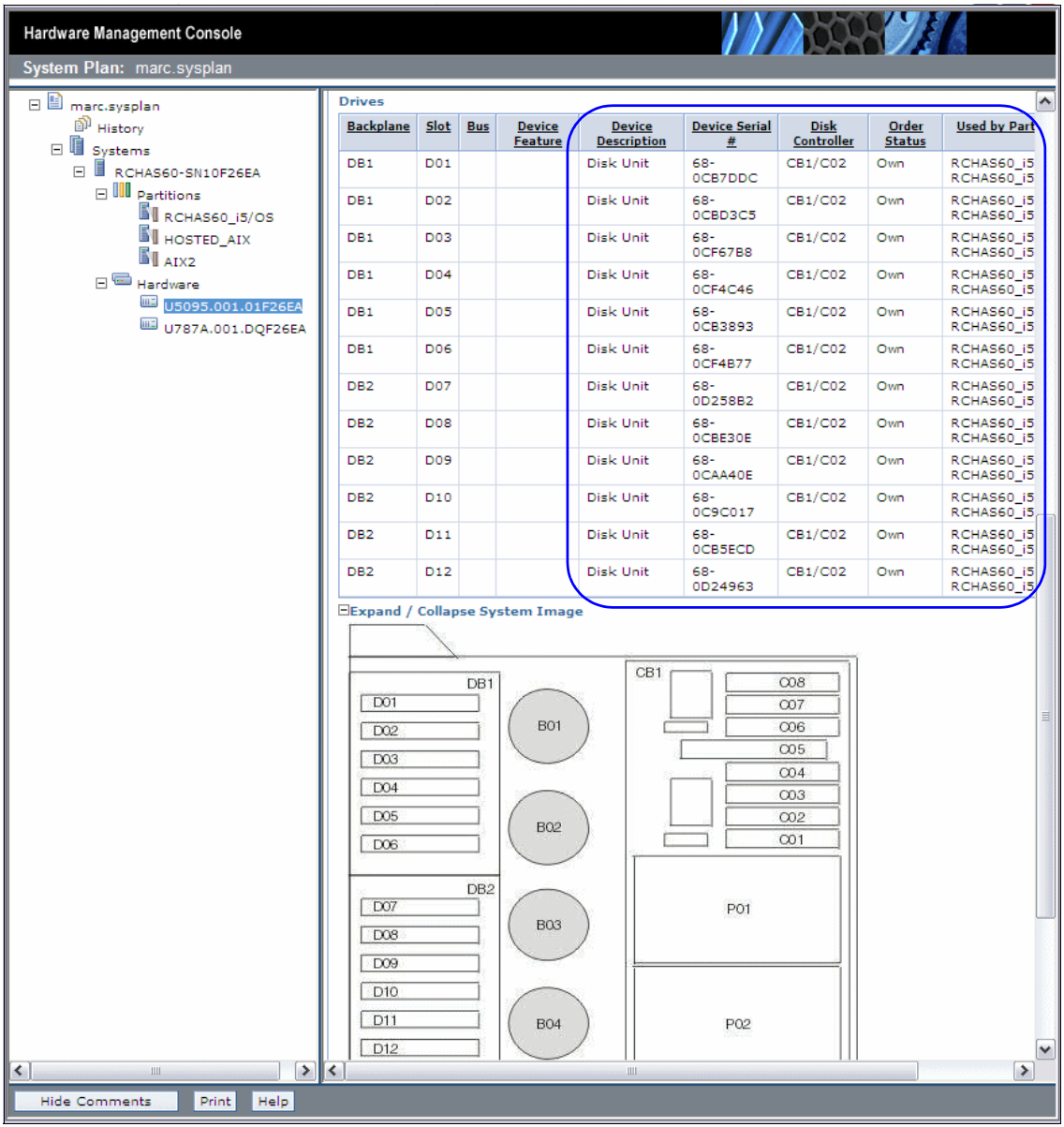


Figure 4-35 Disk information is gathered when not using -o noprobe on mksysplan

When specifying **-o noprobe**, the same query does not retrieve those devices information, as shown in Figure 4-36.

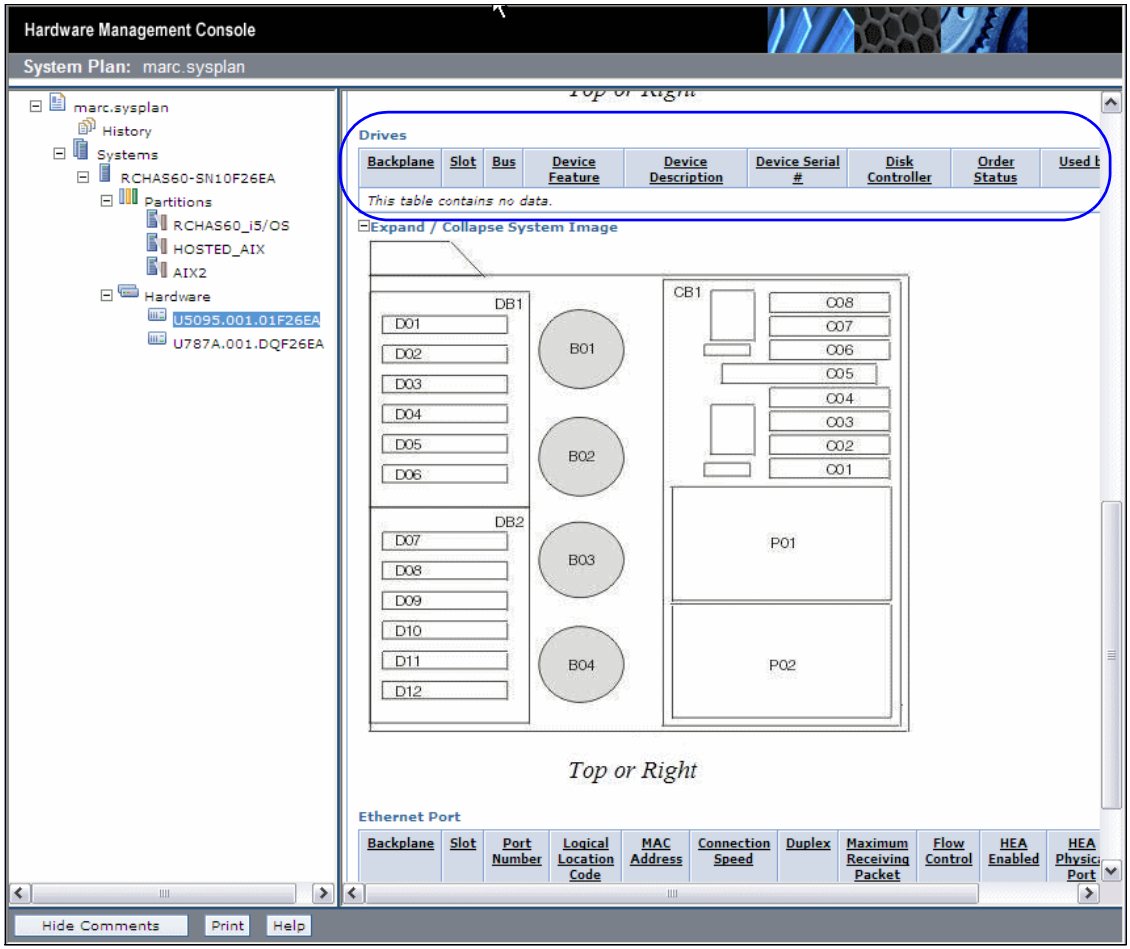


Figure 4-36 Disk information is not gathered when using -o noprobe on mksysplan

- **-v** is used to specify verbose display output

  This parameter does not have any value. You can specify it or not. When specified, the display output contains more information about the steps that the HMC performs. As shown in the Example 4-2, depending on the **-o** parameter usage, the display output are not exactly the same. Both commands specify **-v** parameter. The first gathers the devices information while the second does not.

Example 4-2 The mksysplan with -v parameter and with or without -o parameter

```
hscroot@RCHAS6OH:~> mksysplan -f marc.sysplan -m 9406-52O*1OF26EA -v
Started inventory gather process ...
Gathering slot level hardware and logical definitions ...
Creating new VPD files for the system ...
Adding inventory sensed from each active partition....If you dont need
a system plan to include realtime inventory, retry using the -o noprobe
option
Gathering VIOS identified hardware and logical definitions ...
Completed inventory gathering without errors ...
Writing system plan ...
System plan marc.sysplan created successfully for the system
9406-52O*1OF26EA.

hscroot@RCHAS6OH:~> mksysplan -f marc.sysplan -m 9406-52O*1OF26EA -v -o
noprobe
Started inventory gather process ...
Gathering slot level hardware and logical definitions ...
Gathering VIOS identified hardware and logical definitions ...
Completed inventory gathering without errors ...
Writing system plan ...
System plan marc.sysplan created successfully for the system
9406-52O*1OF26EA.
hscroot@RCHAS6OH:~>
```

Note: The equivalent GUI action that creates system plans makes use of the default of the **mksysplan** command. Therefore, it always gathers all the device information without any verbose output.

5

HMC security and user management

In this chapter, we discuss Certificate Management and User Administration within the Hardware Management Console (HMC) environment. We describe both certificate management and HMC user management.

5.1 Certificate management

HMC security management has changed from earlier versions of the HMC. Most options under System Manager Security are no longer needed in Version 7.3. Object Manager and Server Security are now gone. The new option for securing HMC remote connections is Manage Certificates under the Administration tab of HMC Management.

Security certificates ensure that the HMC can operate securely in the client-server mode. The managed machines are servers and the managed users are clients. Servers and clients communicate over the Secure Sockets Layer (SSL) protocol, which provides server authentication, data encryption, and data integrity.

When a user wants remote access the HMC user interface through a Web browser, the user requests the secure page by `https://hmc_hostname`. The HMC then presents its certificate to the remote client (Web browser) when establishing connection with the HMC. The browser verifies that the certificate was issued by a trusted party, check that the dates are still valid, as well as making sure that the certificate was created for that specific HMC.

Manage Certificates is located in the Administration section of HMC Management, as shown in Figure 5-1.

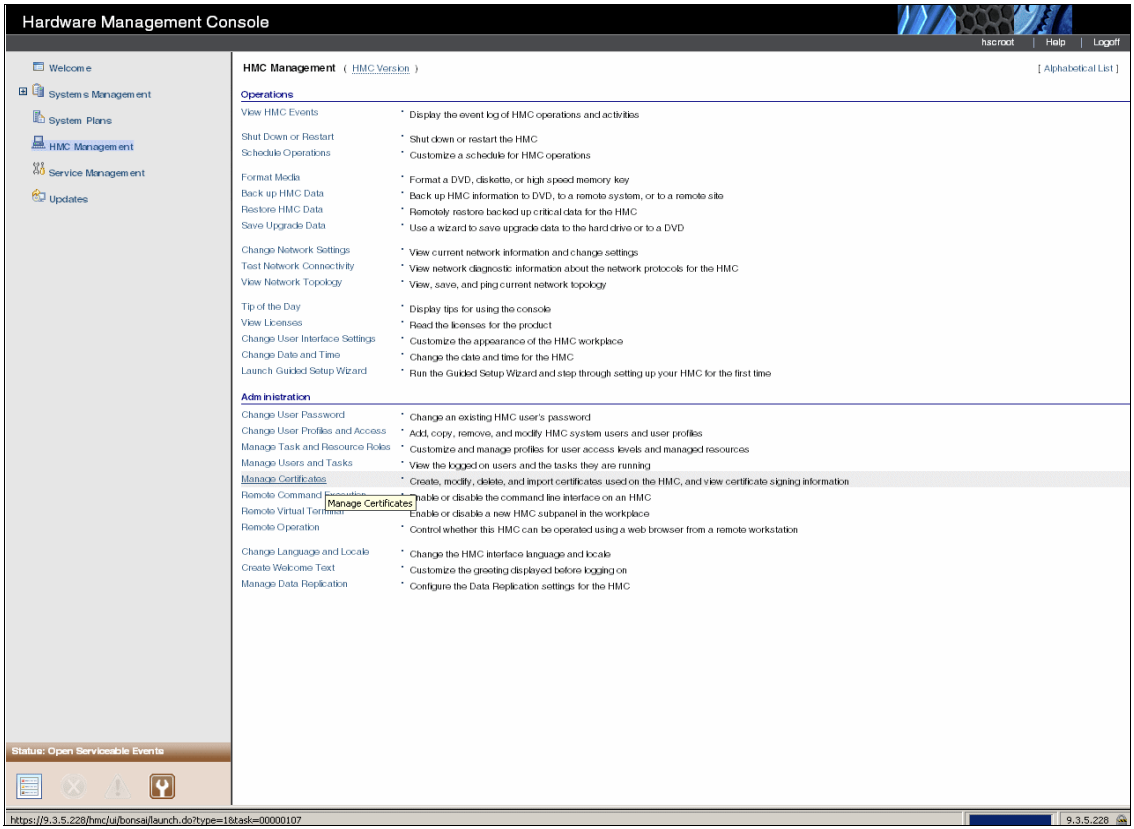


Figure 5-1 Manage Certificates

The available options in Manage Certificates allow you to create, modify, import, and remove certificates. There are a couple of notable changes from earlier HMC versions in HMC V7R3. Remote access is now available through a Web browser. Previous versions used WebSM remote client. Another notable change in certificate management is that HMC V7 does not allow a public or private key ring file to be created.

5.1.1 Creating a new certificate

You can create a new self-signed certificate or a certificate signed by a trusted third party. By default, the HMC comes with a self-signed certificate. To create a new certificates signed by a Certificate Authority:

1. Select **HMC Management** → **Manage Certificates** → **Create** → **New Certificate** as shown in Figure 5-2.

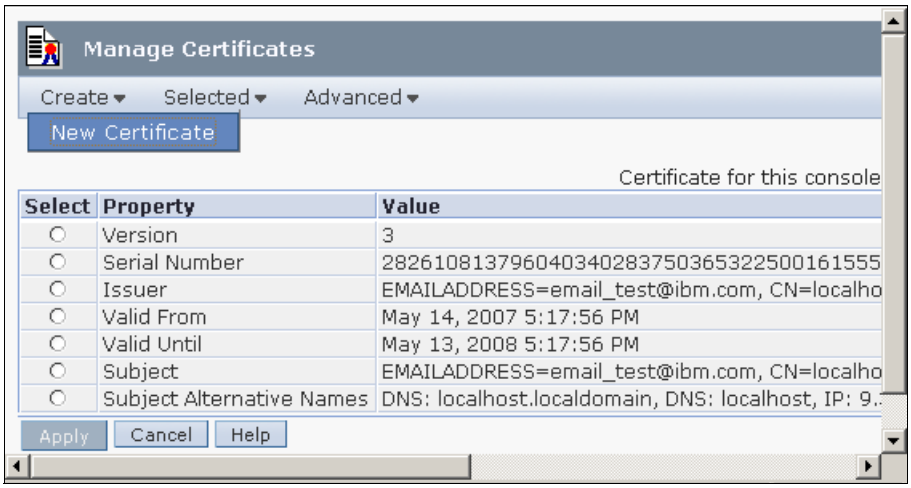


Figure 5-2 Create New Certificate

2. You are given the option of creating a self-signed certificate or a certificate signed by a Certificate Authority as shown in Figure 5-3. Select **Signed by a Certificate Authority**.

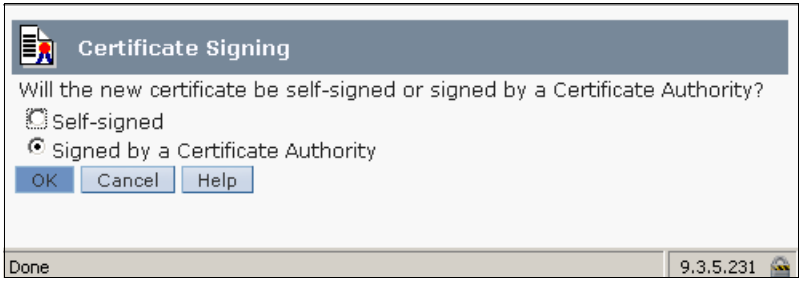


Figure 5-3 Certificate Signing

3. The HMC displays the **New Certificate** window as shown in Figure 5-4. Complete the New Certificate form and click **OK**.

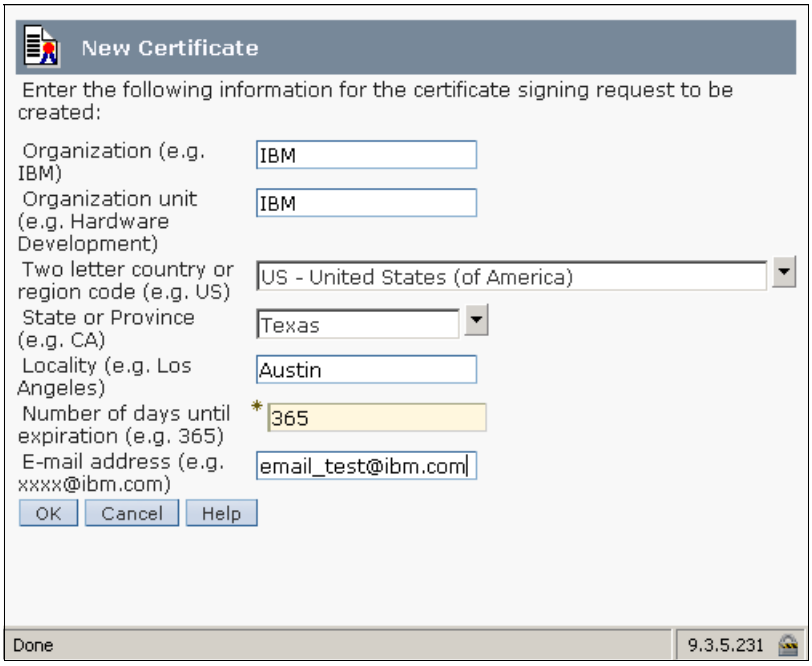


Figure 5-4 New Certificate

4. A window displays prompting you for the certificate to be stored as shown in Figure 5-5. You have the option of storing the certificate on Removable media on the console or on the file system on the system running the browser. Make your choice to continue.

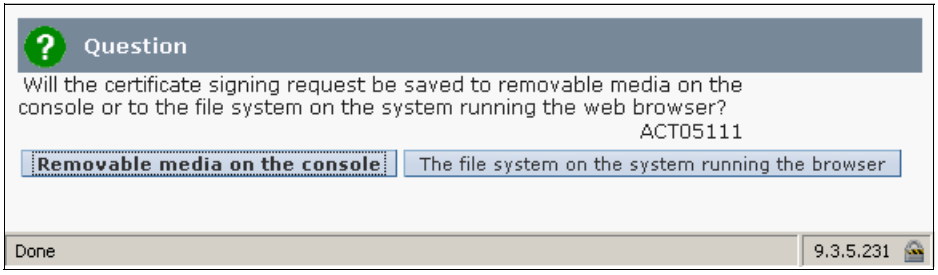


Figure 5-5 Certificate location

5. A message box displays asking for Save verification as shown in Figure 5-6. Click **OK** to save the Certificate Signing Request as a file. You are then prompted if you want to use a temporary self-signed certificate until your certificate is signed and returned.

   Clicking **Yes** creates a self-signed certificate.

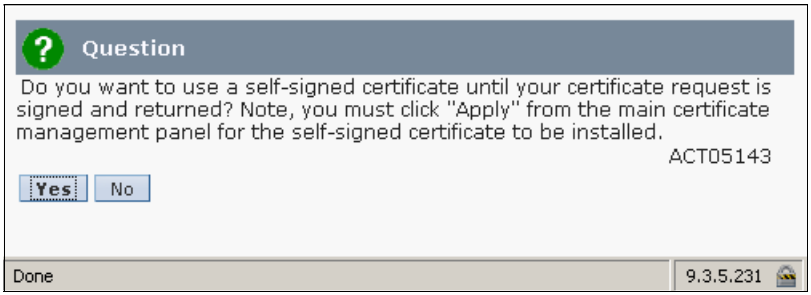


Figure 5-6 Creating a self-signed certificate while waiting on a signed certificate from a Certificate Authority

   You are returned to the **Manage Certificates** window shown in Figure 5-2 on page 180. Many of the values will be `Not available`.

6. Click **Apply** to apply the new self-signed certificate. *These values are updated after the certificate has been applied and the console has been restarted*. The next window asks for verification to replace the current certificate.
7. Click **Yes** to proceed. You are then presented with a message box asking if the certificate was replaced successfully or if any errors occurred.
8. Click **OK**. *Clicking OK at this point restarts the console.*
9. After your certificate request is signed and returned, you need to import the certificate and apply by clicking **HMC Management** → **Manage Certificates** → **Advanced** → **Import Certificate**. After the certificate has been imported, apply it and restart the console.

5.1.2 Modifying existing certificates

You can modify certain properties of an existing certificate. To modify a certificate, from the Manage Certificates window, select the radio button of the entry you want to modify, then click **Selected** → **Modify**. Modifiable properties are:

- Valid Until
- Subject
- Subject Alternative Names

For example, to modify the Valid Until property, select the radio button for that property and then select **Selected** → **Modify**. The window shown in Figure 5-7 displays.

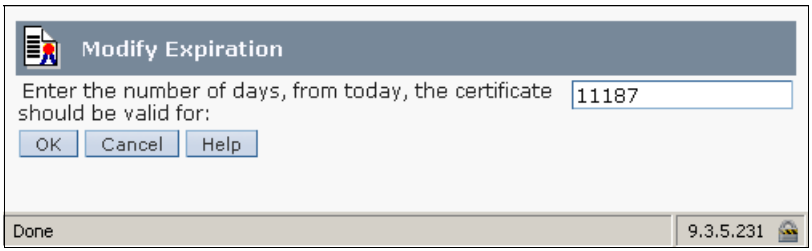


Figure 5-7 Modify Current Certificate

5.1.3 Advanced options for modifying existing certificates

There are several advanced options available for working with certificates under the Advanced tab. You can:

- Delete and Archive Certificate

  Allows you to remove the current certificate. After deleted, the certificate is actually archived on the HMC.

- Work with Certificate

  Allows you to view and restore archived certificates. Figure 5-8 shows the Archived Certificate window.

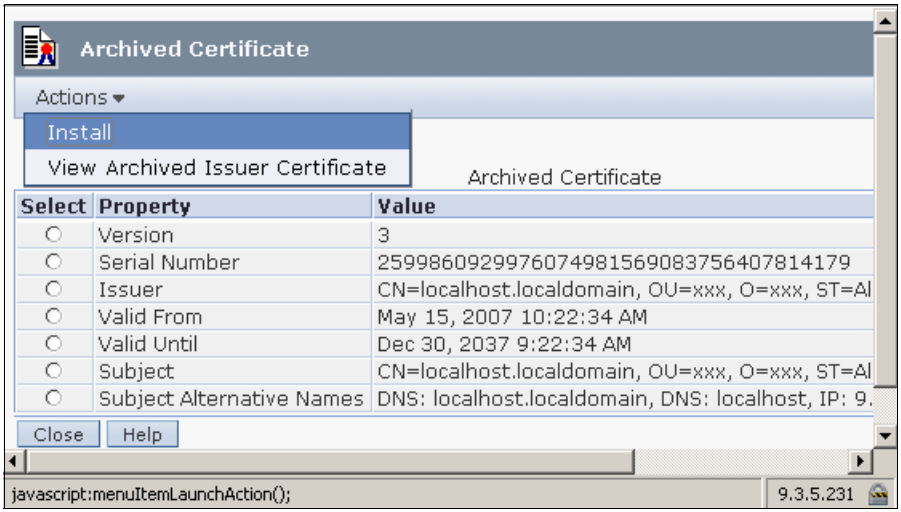


Figure 5-8 Restoring Archived Certificate

To restore an archived certificate, select **Actions** → **Install**. A window displays asking for verification for restoring the certificate. Click **Yes** to proceed. *This action restarts the console if the installation is successful.*

Figure 5-9 Restore Archived Certificate Verification

- Import certificate

  Allows you to import a certificate from media or a remote file system. Select the location of the certificate to import. When the certificate has been uploaded, you need to apply and restart the console.

- View Issuer certificate

  Displays available information about the issuer of the certificate.

5.2 HMC user management

In the Administration section of the HMC Management Task, there are four options for creating and managing users. Some of these tasks are handled in the Setup Wizard when the HMC is initially configured. The options in the HMC Management Administration section allow you to modify the initial user configuration.

5.2.1 Changing the user password

To use this function, select **HMC Management** → **Change User Password**.

This option allows you to change the password of the current user. The current password is needed for this option and the new password must be different than the current password. Figure 5-10 shows the Change User Password window.

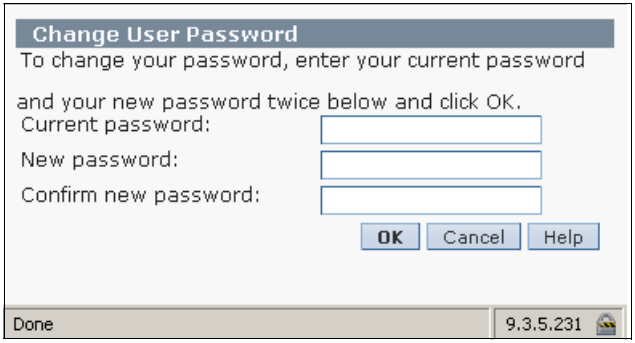


Figure 5-10 Change User Password window

5.2.2 Managing user profiles and access

To use this function, select **HMC Management** → **Manage User Profiles and Access**.

This option allows you to add, copy, remove, and modify HMC system users and user profiles. The administrative functions display in a drop-down menu from the User menu.

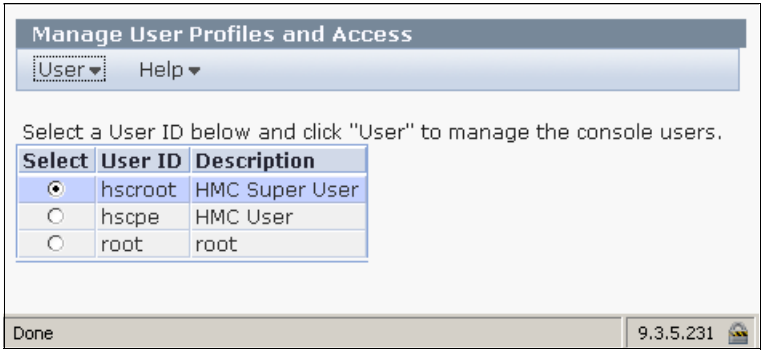


Figure 5-11 User Profiles window

Adding a new user with Super Administrator role

To add a new user with the Super Administrator role, follow these steps:

1. Select **User** → **Add** to add a new user. The HMC displays the Add User window as shown in Figure 5-12.

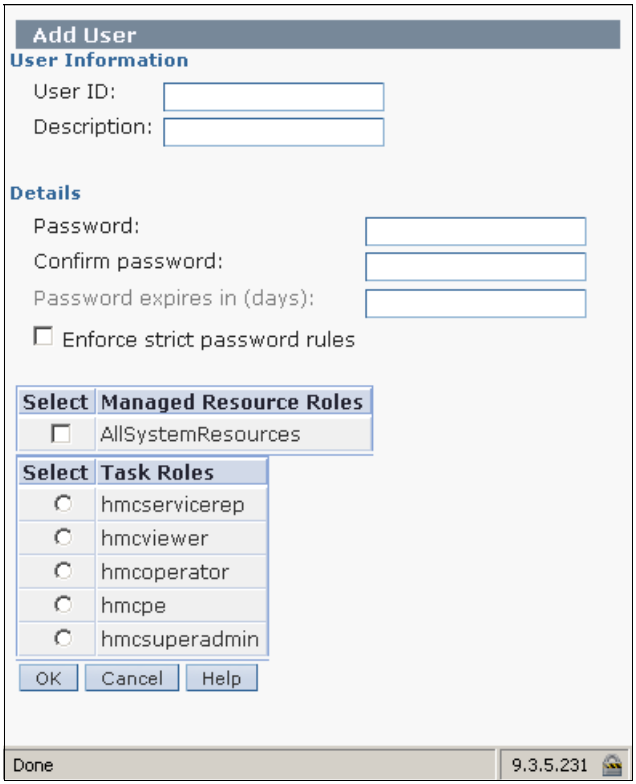


Figure 5-12 Add User window

2. Insert the new user ID, a description of the user ID, the password for the new user ID, and re-enter the new password. Select **hmcsuperadmin** from Task Roles to create a new user with the System Administrator role. You can select **Enforce strict password rules** to give the password expiration and type the number of the expiration day as shown in Figure 5-13. (This option sets the password to expire after the number of the days specified.)

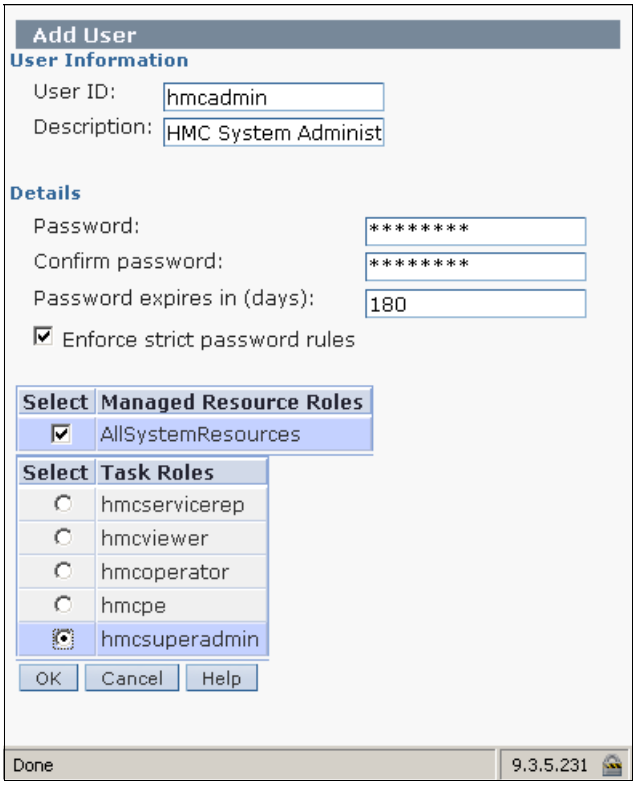


Figure 5-13 Add a new user with Super Administrator role using strict password rules

3. Click **OK** to create a new user. The new user ID is added in User profiles window as shown in Figure 5-14.

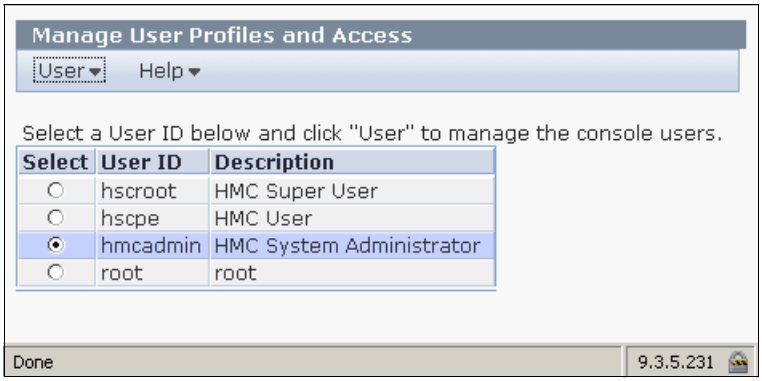


Figure 5-14 User Profiles user ID list updated

Adding a new user with Viewer role

To add a new user with the Viewer role, follow these steps:

1. Select **User** → **Add** to add a new user. The HMC displays the Add User window as shown in Figure 5-12 on page 186.
2. Insert the new user ID, a description of the user ID, the password for the new user ID, and re-enter the new password. Select **viewer** from Task Roles in order to create a new user with the Viewer role. You can select **Enforce strict password rules** to give the password expiration and type the number of the expiration day as shown in Figure 5-15. (This option sets the password to expire after the number of the days specified.)

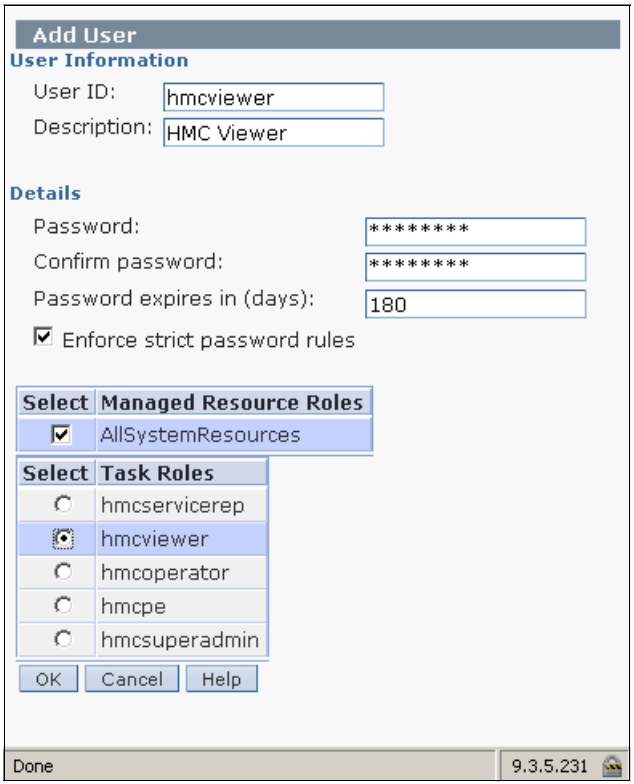


Figure 5-15 Add a new user with Viewer role using strict password rules

3. Click **OK** to create a new user. The new user ID is added in User profiles window as shown in Figure 5-16.

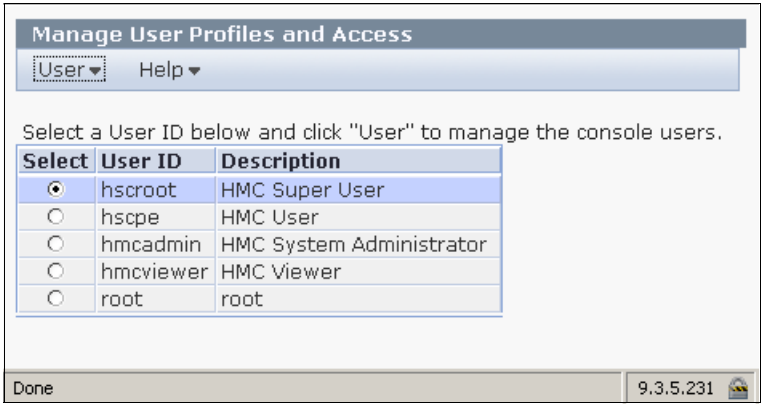


Figure 5-16 User Profiles user ID list updated

The HMC Viewer is given very limited access to functions in the HMC. Figure 5-17 shows the limited menu for the HMC Viewer.

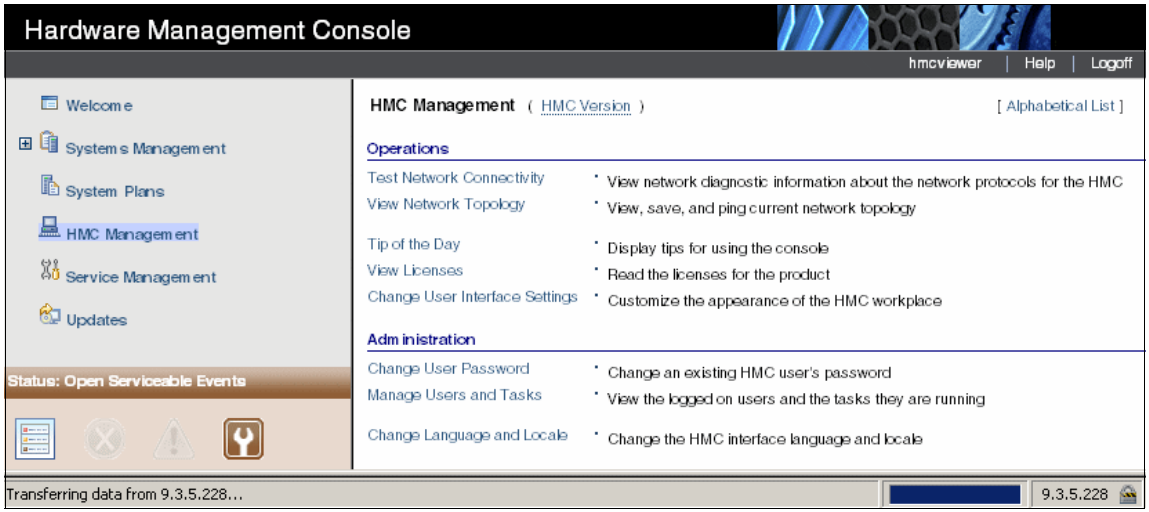


Figure 5-17 Very limited menu available for HMC Viewer user

5.2.3 Customizing user task roles and managed resource roles

You can customize HMC Task Roles and Managed Resource Roles through the HMC console. You can add new Task Roles and Managed Resource Roles based on existing roles in the HMC. System defined roles cannot be modified, but you can create a new role based on system defined role or existing role.

To manage access task and resource roles, select **HMC Management** → **Administration** → **Manage Access Task and Resource Roles**. The Customize User Controls window displays as shown in Figure 5-18.

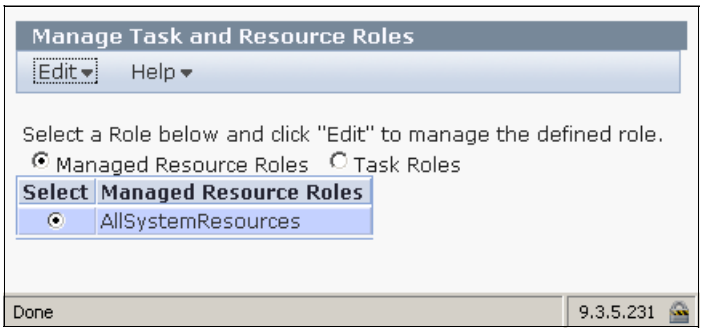


Figure 5-18 Customize User Controls window

Creating, copying, modifying, or deleting managed resource roles

A managed resource role assigns permissions for a managed object or group of objects, such as a managed system or a logical partition. In a managed resource role, you can define access to specific managed systems rather than all managed system controlled by the HMC.

You can create a new managed resource role, copy an existing managed resource role, modify existing managed resource roles, or delete an existing managed resource role from the Customize User Controls window. Select **Managed Resource Roles**, then select the desired operation from the Edit menu. By default, there is only one managed resource role: it is *AllSystemResources*.

To create a new managed resource role:

1. Click **Edit** → **Add**, and the Add Role window displays.
2. Enter the name for the new managed resource role, and choose the resource role from which the new managed resource role objects will be based.
3. Select which object is available for the new managed resource role, then click **Add** to add them to the new managed resource role current objects.
4. Click **OK** to create a new managed resource role.

Figure 5-19 shows an example of creating a new managed resource role.

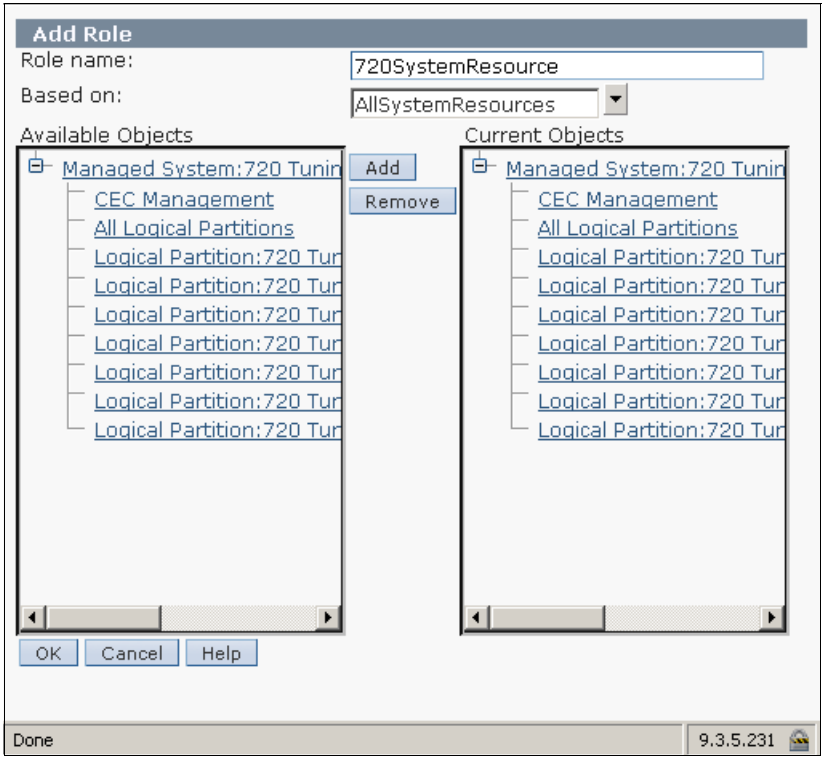


Figure 5-19 Add a new managed resource role

To copy a managed resource role, select the desired managed resource role and select **Edit** → **Copy**. You cannot copy a user defined managed system role created from the **Add** menu, but you can copy system defined managed resource roles, which is AllSystemRoles. From the Copy Role window, you can also customize the object configurations for a new copy of managed resource role.

To delete a managed resource role, select desired managed resource role and select **Edit** → **Remove**. A verification window displays as shown in Figure 5-20.

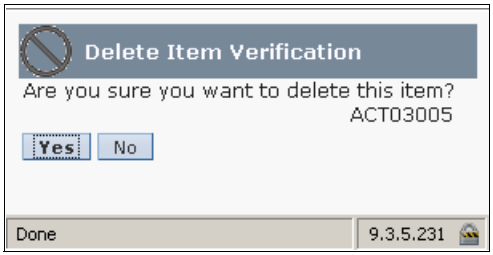


Figure 5-20 Delete managed resource or task role verification

To modify existing managed resource roles, select a managed resource role you want to change, and select **Edit** → **Modify**. You can change the objects' configuration, then click **OK** to save the changes.

Creating, copying, modifying, or deleting task roles

A task role defines the access level for a user to perform tasks on the managed object or group of objects, such as a managed system or logical partition. There are five system defined task roles:

- hmcservicerep
- hmcviewer
- hmcoperator
- hmcpe
- hmcsuperadmin

You can create a new task role, copy an existing task role, modify an existing task role, or delete an existing task role from the Customize User Controls window. You cannot modify or remove system defined task roles. Select **Task Roles**, then select the desired operation from the **Edit** menu.

To create a new user task role:

1. Click **Edit** → **Add**, and the Add Role window displays.
2. Enter the name for the new managed resource role, and choose the task role from which the new task role objects will be based.
3. Select which object will be available for the new task role, and then click **Add** to add them to new task role current objects.

4. Click **OK** to create a new task role. Figure 5-21 shows an example of creating a new task role.

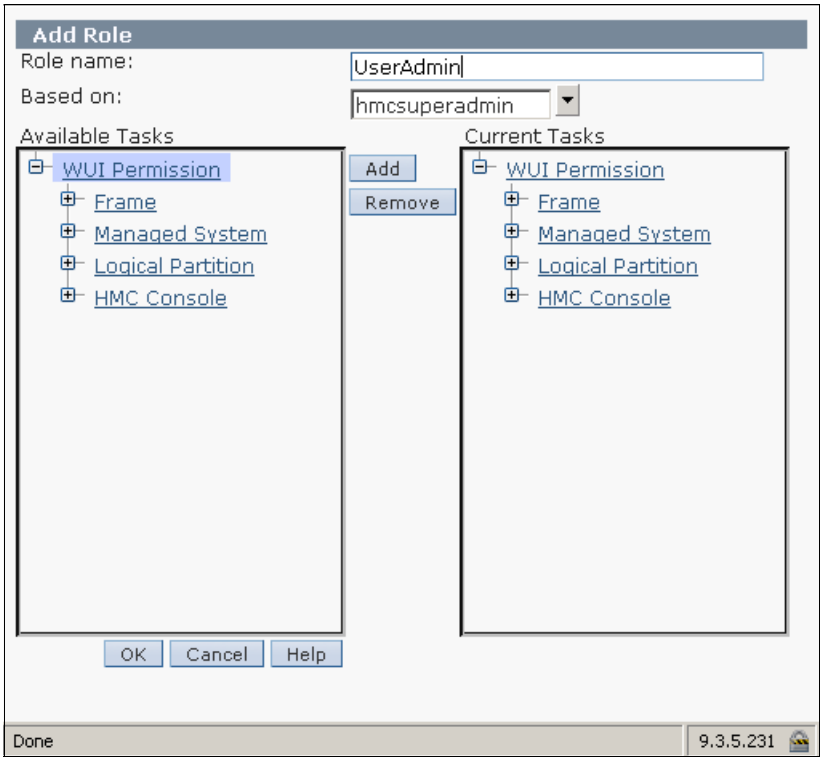


Figure 5-21 Add user role

To copy a task role, select the desired task role and select **Edit** → **Copy**. From the Copy Role window, you can also customize the object configurations for a copy of the task role.

To delete a task role, select the desire task role an select **Edit** → **Remove**. a verification window will be shown as in Figure 5-20 on page 193. System defined task roles cannot be removed.

To modify existing task roles, select a task role you want to change, and select **Edit** → **Modify**. You can change the objects' configuration, then click **OK** to save the changes. Only user defined task roles that are created by HMC users can be modified.

6

Network configuration and the HMC

This chapter provides a general overview of the types of network configurations for the Hardware Management Console (HMC) and explains how to configure HMC network settings. This chapter also describes how to use the HMC workplace to obtain network diagnostic information.

6.1 Types of HMC network configurations

The HMC supports several network communications:

- *HMC to managed system connection* performs most of the hardware management functions in which HMC issues control function requests through service processor of the managed system.
- *HMC to logical partition connection* collects platform related information, such as hardware error events or hardware inventory, from the operating system running in the logical partitions, as well as coordinates certain platform activities, such as DLPAR or concurrent maintenance with those operating systems.
- *HMC to remote users connection* provides remote users with access to HMC functionally. Remote users can access the HMC using:
  - The remote operation to access all the HMC GUI functions remotely.
  - SSH to access the HMC command line functions remotely.
  - A virtual terminal server for remote access to virtual logical partition consoles.
- *HMC to service and support connection* transmits data such as hardware error reports, inventory data, and microcode updates, to and from your service provider. You can use this communication path to make automatic service calls.

6.2 Configuring HMC network settings

This section describes network configuration for the HMC. To open the Change Network Setting window, select **Change Network Settings** from the main menu.

6.2.1 HMC Identification

HMC identification provides information that is needed to identify the HMC in the network. The Identification tab of the Change Network Settings window (Figure 6-1) includes the following information:

- Console name

  HMC name that identifies the console to other consoles in the network. This name is short host name.

- Domain name

  An alphabetic name that the Domain Name Services (DNS) can translate to the IP address.

- Console Description

  Short description for the HMC.

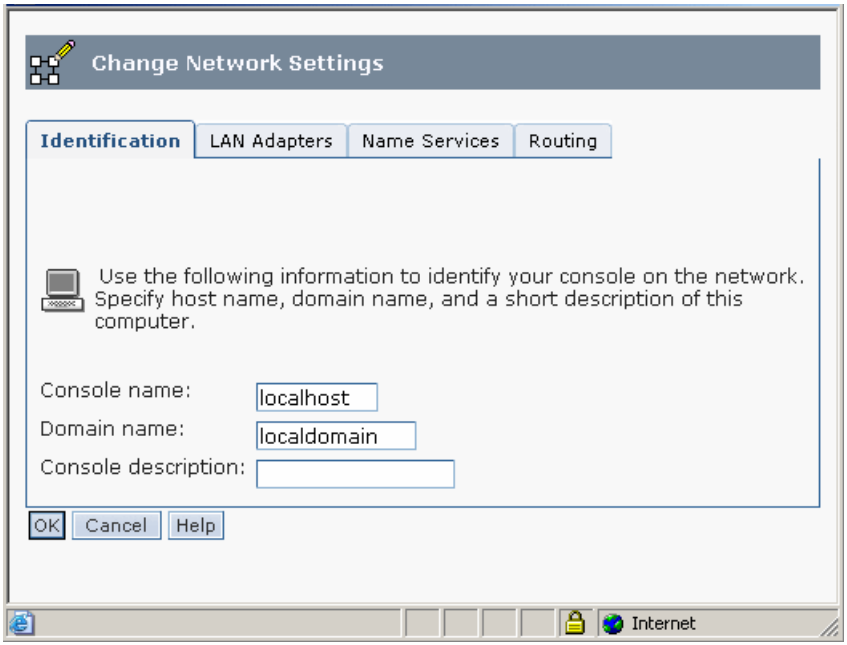


Figure 6-1 HMC Identification tab

6.2.2 LAN Adapters

The LAN Adapters tab (Figure 6-2) shows a summarized list of all Local Area Network (LAN) adapters that are installed on the HMC. You can view details of each LAN adapter by clicking **Details**, which launches a window that allows you to change LAN adapter configuration and firewall settings.

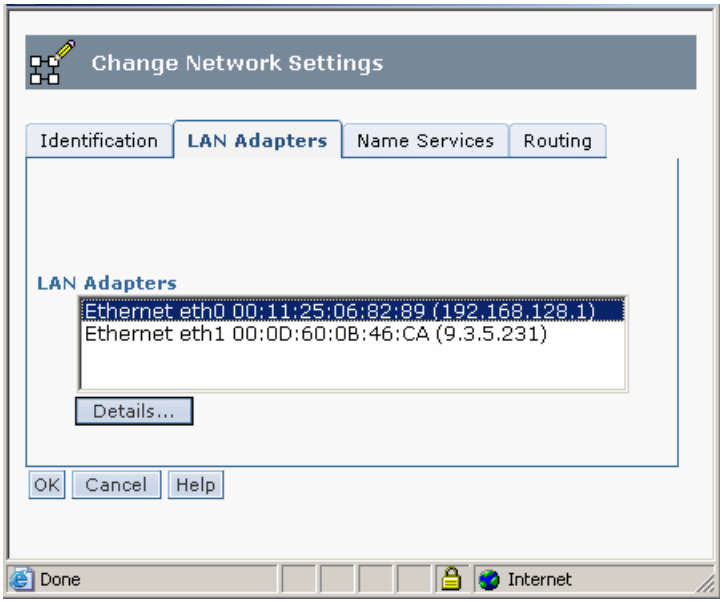


Figure 6-2 LAN Adapters tab

LAN Adapter configuration

The LAN Adapter Details window, shown in Figure 6-3, describes the LAN adapter configuration of Ethernet *eth0* on the LAN Adapter tab.

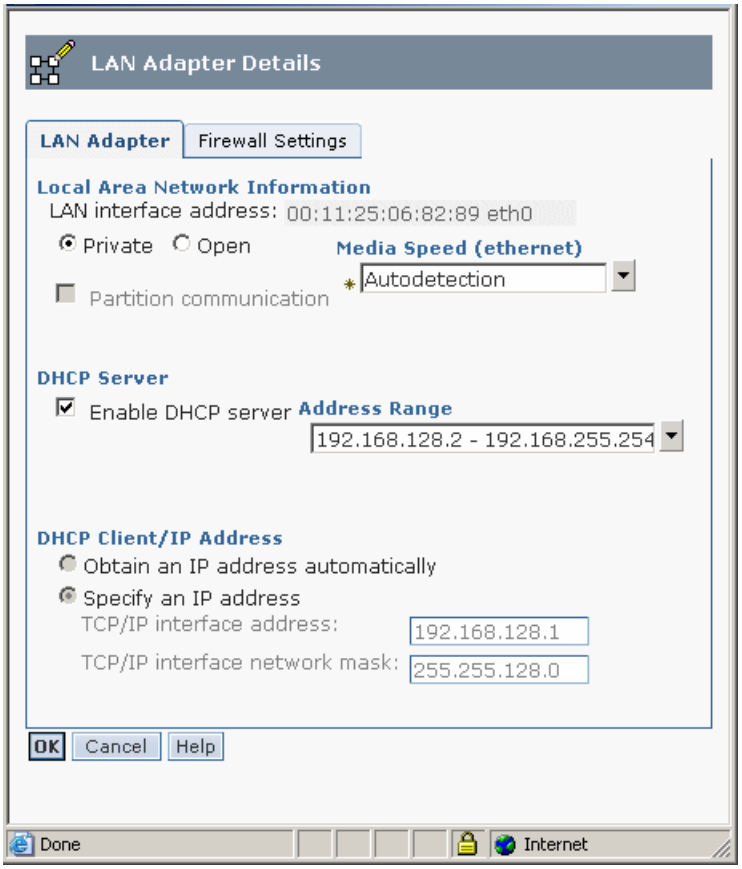


Figure 6-3 LAN Adapter configuration

The LAN Adapter tab of this window includes the following information:

- Local Area Network Information

  The LAN interface address shows Media Access Control (MAC) Address on the card and the adapter name. These values uniquely identify the LAN adapter and cannot be changed. A private network is used by the HMC to communicate by its managed system and an open network connect the HMC outside the managed system. Media speed specifies the speed in duplex mode of an Ethernet adapter. The options are Autodetection, 10 Mbps Half Duplex, 10 Mbps Full Duplex, 100 Mbps Half Duplex, 100 Mbps Full Duplex, or 1000 Mbps Full Duplex.

The connection between the HMC and its managed systems can be implemented either as a private or open network. The term open refers to any general, public network that contains elements other than HMCs and service processors that is not isolated behind an HMC. The other network connections on the HMC are considered open, which means that they are configured in a way that you would expect when attaching any standard network device to an open network.

In a private service network, however, the only elements on the physical network are the HMC and the service processors of the managed systems. In addition, the HMC provides Dynamic Host Configuration Protocol (DHCP) services on that network, which allow it to automatically discover and assign IP configuration parameters to those service processors. You can configure the HMC to select one of several different address ranges to use for this DHCP service, so that the addresses provided to the service processors do not conflict with addresses used on the other networks to which the HMC is connected. The DHCP services allow the elements on the private service network to be automatically configured and detected by the HMC, while at the same time preventing address conflicts in the network.

On a private network, therefore, all of the elements are controlled and managed by the HMC. The HMC also acts as a functional firewall, isolating that private network from any of the open networks to which the HMC is also attached. The HMC does not allow any IP forwarding; clients on one network interface of the HMC cannot directly access elements on any other network interface.

To take advantage of the additional security and ease of setup, implement service network communications through a private network. However, in some environments, this is not feasible because of physical wiring, floor planning, or control center considerations. In this case, the service network communications can be implemented through an open network. The same functionality is available on both types of networks, although the initial setup and configuration on an open network require more manual steps.

- DHCP Server

  Choose **Enable DHCP Server** only if this adapter is defined as private network, then choose one range of addresses for the DHCP Server to distribute. If the adapter is defined as open, this setting is not available.

  If you want to configure the first network interface as a private network, you can select from a range of IP addresses for the DHCP server to assign to its clients. The selectable address ranges include segments from the standard nonroutable IP address ranges.

  In addition to these standard ranges, a special range of IP addresses is reserved for IP addresses. This special range can be used to avoid conflicts in cases where the HMC-attached open networks are using one of the

nonroutable address ranges. Based on the range selected, the HMC network interface on the private network will be automatically assigned the first IP address of that range, and the service processors will then be assigned addresses from the rest of the range.

The DHCP server in the HMC uses automatic allocation, which means that each unique service processor Ethernet interface will be reassigned exactly the same IP address each time it is started. Each Ethernet interface has a unique identifier based upon a built-in MAC address, which allows the DHCP server to reassign the same IP parameters.

- DHCP Client/IP address

  There are two options:

  - *Obtain an IP address automatically* allows the HMC to obtain an available IP address automatically.
  - *Specify an IP address* specifies an IP address to be used, providing TCP/IP interface address and TCP/IP interface network mask.

Firewall Settings

You use the Firewall Settings tab of the LAN Adapter Details window to view and change current firewall adapter settings for the specified LAN interface address. Select **Allow Incoming** to allow access to incoming network traffic from this address, or select **Allow Incoming by IP Address** to allow access by incoming network traffic from hosts specified by an IP address and network mask, as shown in Figure 6-4.

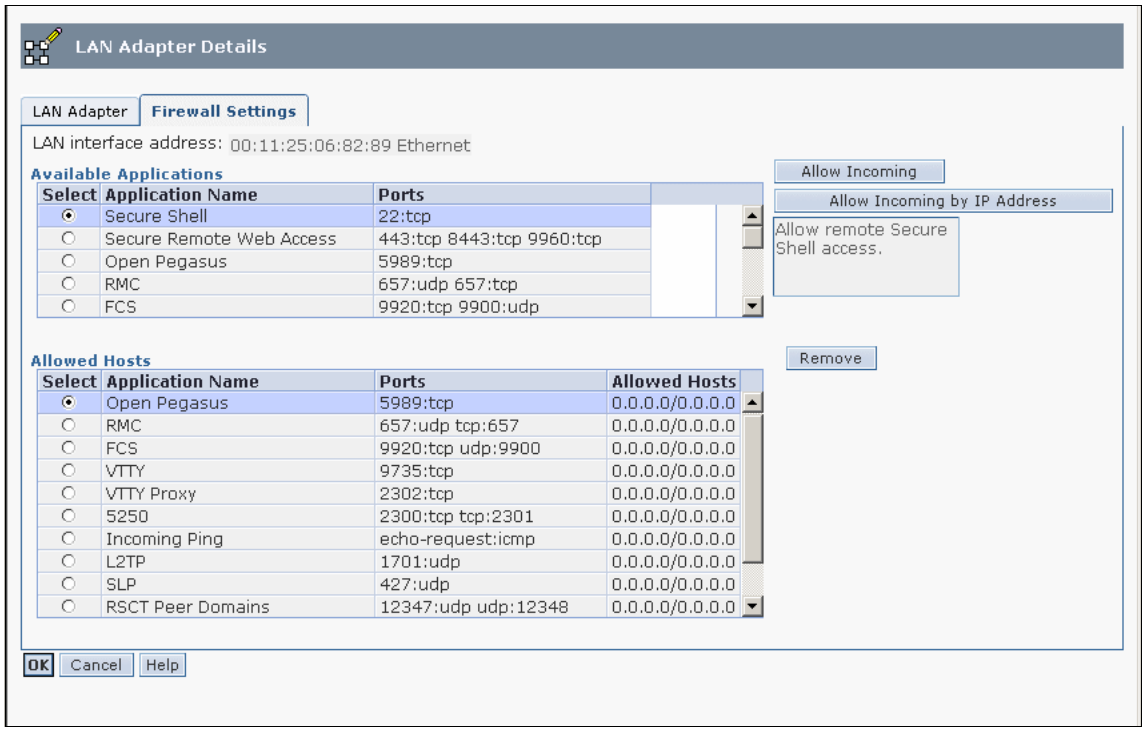


Figure 6-4 Firewall Settings tab

6.2.3 Name Services

You use the Name Services tab to specify Domain Name Services (DNS) for configuring the console network settings (Figure 6-5). DNS is a distributed database system for managing host names and their associated Internet Protocol (IP) addresses. With DNS, people can use names to locate a host, rather than using the IP address.

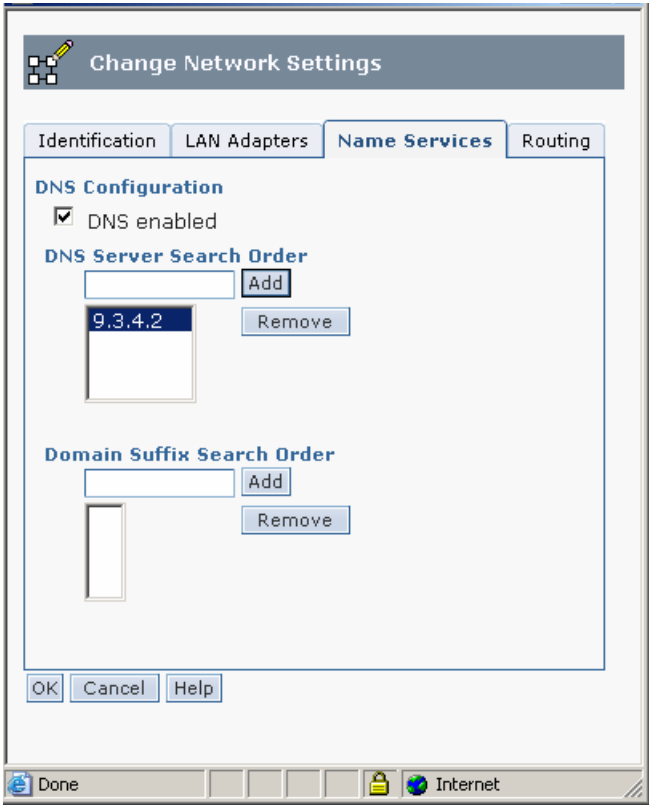


Figure 6-5 Name Services tab

6.2.4 Routing

On the Routing tab, you specify routing information for configuring the console network settings, such as add, delete, or change routing entries and specify routing options for the HMC as shown in Figure 6-6.

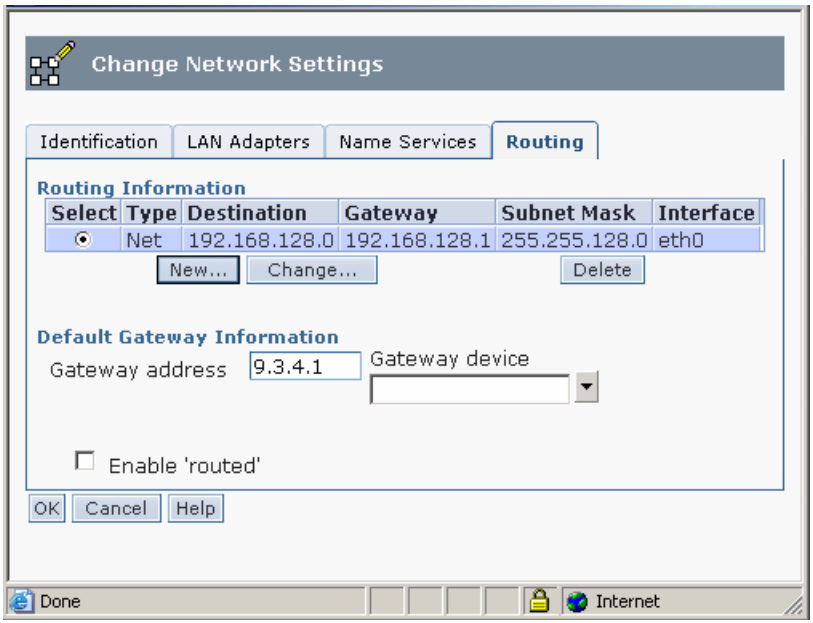


Figure 6-6 Routing configuration

Routing Information

The routing information displays the following information:

- *Type* displays the specific route, which can be on of three choices:
  - Net

    Specifies a network-specific route. The destination address is the TCP/IP address of a particular network. All TCP/IP communications destined for that network are using the TCP/IP address of the router, unless a host route also applies for the communication to the destination host address.

    Note: When a conflict occurs between a host and net route, the host route is used.

- Host

  Specifies a host-specific destination. The destination address is the TCP/IP address of a particular host. All TCP/IP communications destined for that host are routed through the router using the router address as the TCP/IP address.

- Default

  Specifies all destinations not defined with another routing table entry. With a default route, the destination address is all zeros. If no host or net routes apply when communicating with a destination host address, the communication is routed through the default router using the TCP/IP address given by the router address.

- *Destination* displays the TCP/IP address of the destination host, network, or subnet.
- *Gateway* displays the TCP/IP address of the next hop in the path to the destination.
- *Subnet Mask* displays the subnet mask used by network interface to add routes
- *Interface* displays the name of the network interface that is associated with the table entry.

Default Gateway Information

The Default Gateway Information provides:

- *Gateway address*

  The default gateway is the route to all networks. It informs each personal computer or other network device where to send data if the target station does not reside on the same subnet as the source

- *Gateway device*

  Network interface that is used as gateway device.

The Enable “routed” option

You use the *Enable “routed”* option to enable or disable the network routing daemon, *routed*. If disabled, it stops the daemon from running and prevents any routing information from being exported from this HMC.

6.3 Testing network connectivity

You can use the HMC workplace to obtain network diagnostic information about the HMC's network protocols. You can use the Test Network Connectivity window to access any of the following functions:

- Ping
- Interfaces
- Address
- Routes
- ARP (Address Resolution Protocol)
- Sockets
- TCP (Transmission Control Protocol)
- UDP (User Datagram Protocol)
- IP (Internet Protocol)

This section explains each of these functions. To open the Test Network Connectivity window, select **Test Network Connectivity** on the main window.

6.3.1 Ping

Use the Ping function to send an echo request (ping) to a remote host to see whether the host is accessible and to receive information about that TCP/IP address or name. Specify any TCP/IP address or name in the TCP/IP Address or Name to Ping field, then click **Ping** as shown in Figure 6-7.

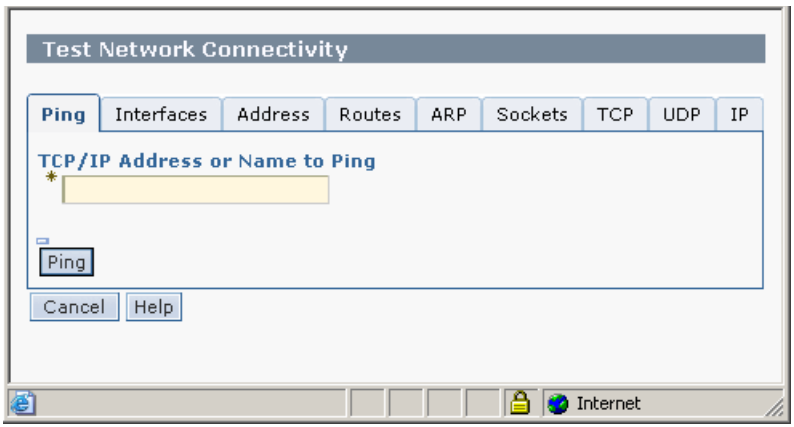


Figure 6-7 Network Diagnostic Information - Ping

The result for that TCP/IP address or name displays as shown in Figure 6-8.

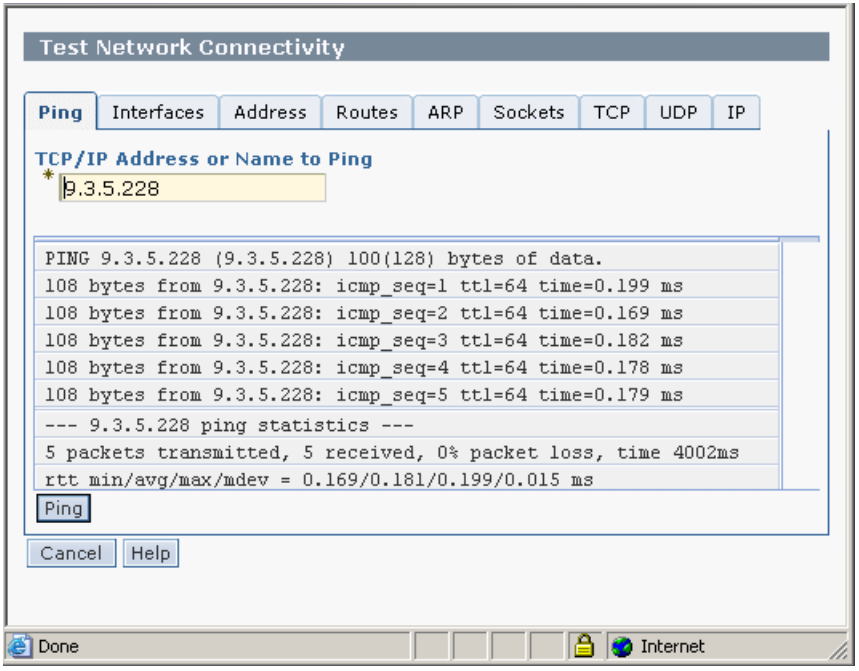


Figure 6-8 Network Diagnostic Information - Ping result

6.3.2 Interfaces

The Interfaces tab displays the statistics for the network interfaces that are configured currently as shown in Figure 6-9. To update the information that is displayed with the most recent information, n click **Refresh**.

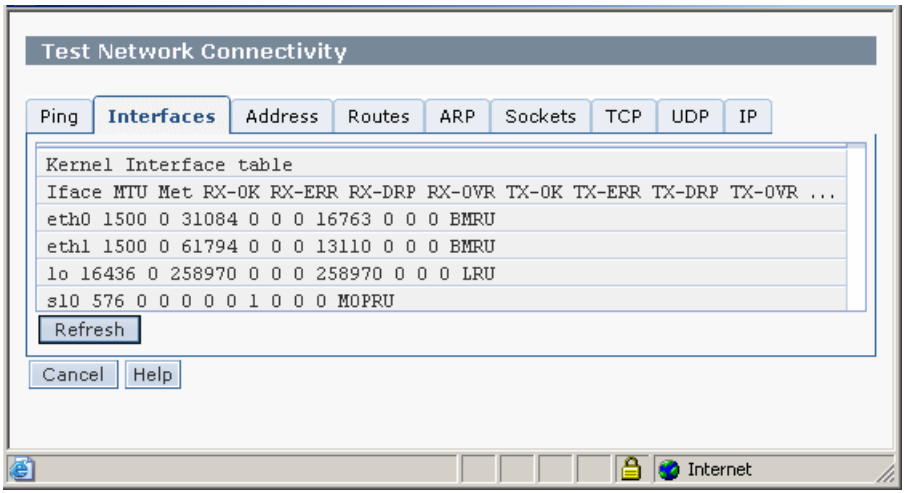


Figure 6-9 Network Diagnostic Information - Interfaces

6.3.3 Address

The Address tab displays TCP/IP addresses for the configured network interfaces. To update the information that is displayed with the most recent information, click **Refresh** as shown in Figure 6-10.

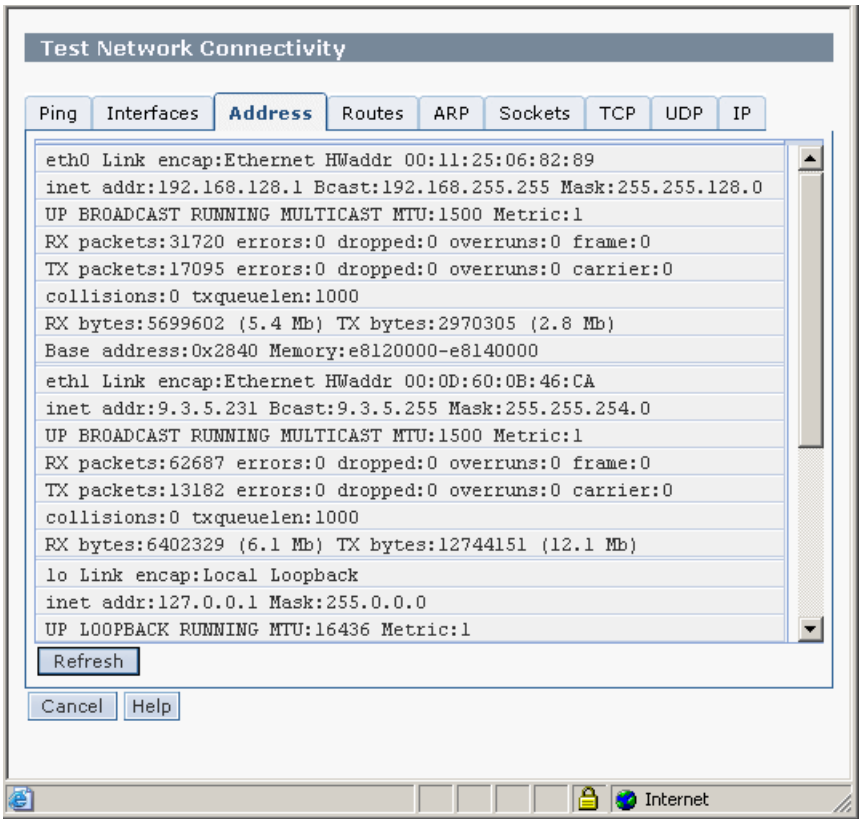


Figure 6-10 Network Diagnostic Information - Address

6.3.4 Routes

The Routes tab displays the Kernel routing table and corresponding network interfaces. You can click **Refresh** to update the information that is displayed with the most recent information as shown in Figure 6-11.

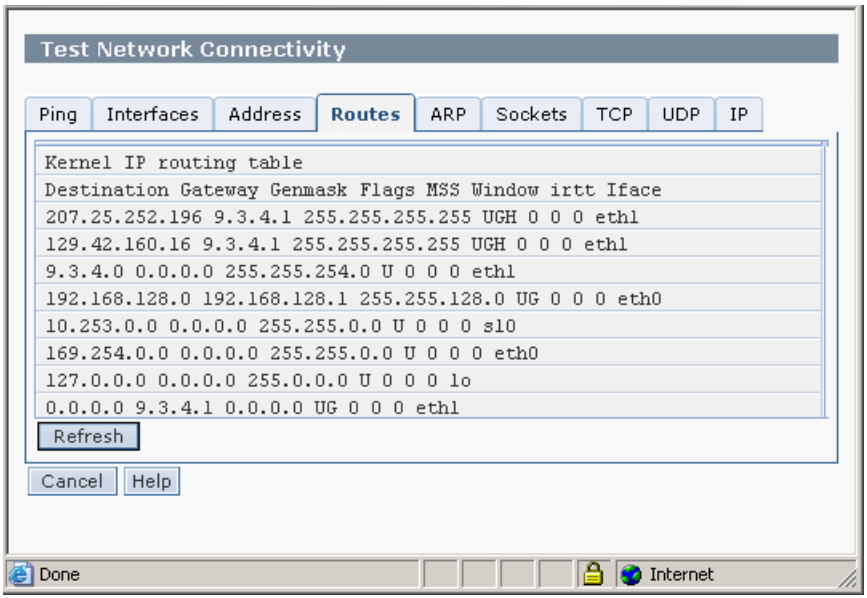


Figure 6-11 Network Diagnostic Information - Routes

6.3.5 ARP

The ARP tab displays the Address Resolution Protocol (ARP) connections. ARP is used to find the host's hardware address if only the network layer address is known and is usually used to translate an IP address to a MAC address. To update the information that is displayed with the most recent information, you can click **Refresh** as shown in Figure 6-12.

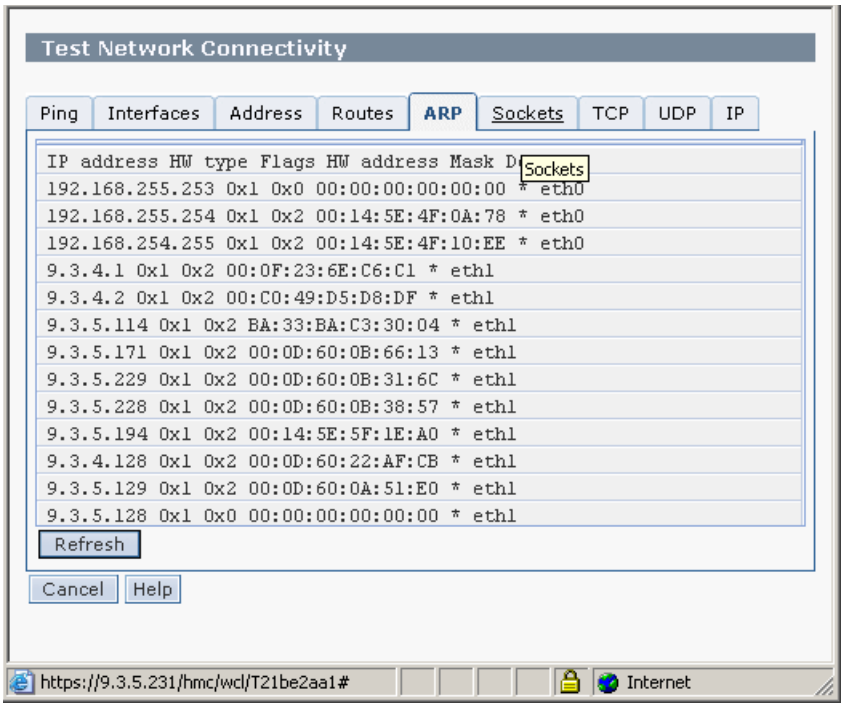


Figure 6-12 Network Diagnostic Information - ARP

6.3.6 Sockets

Use the Sockets tab to display information about TCP/IP sockets. Socket is a communication endpoint on the IP network. To update the information that is displayed with the most recent information, click **Refresh** as shown in Figure 6-13.

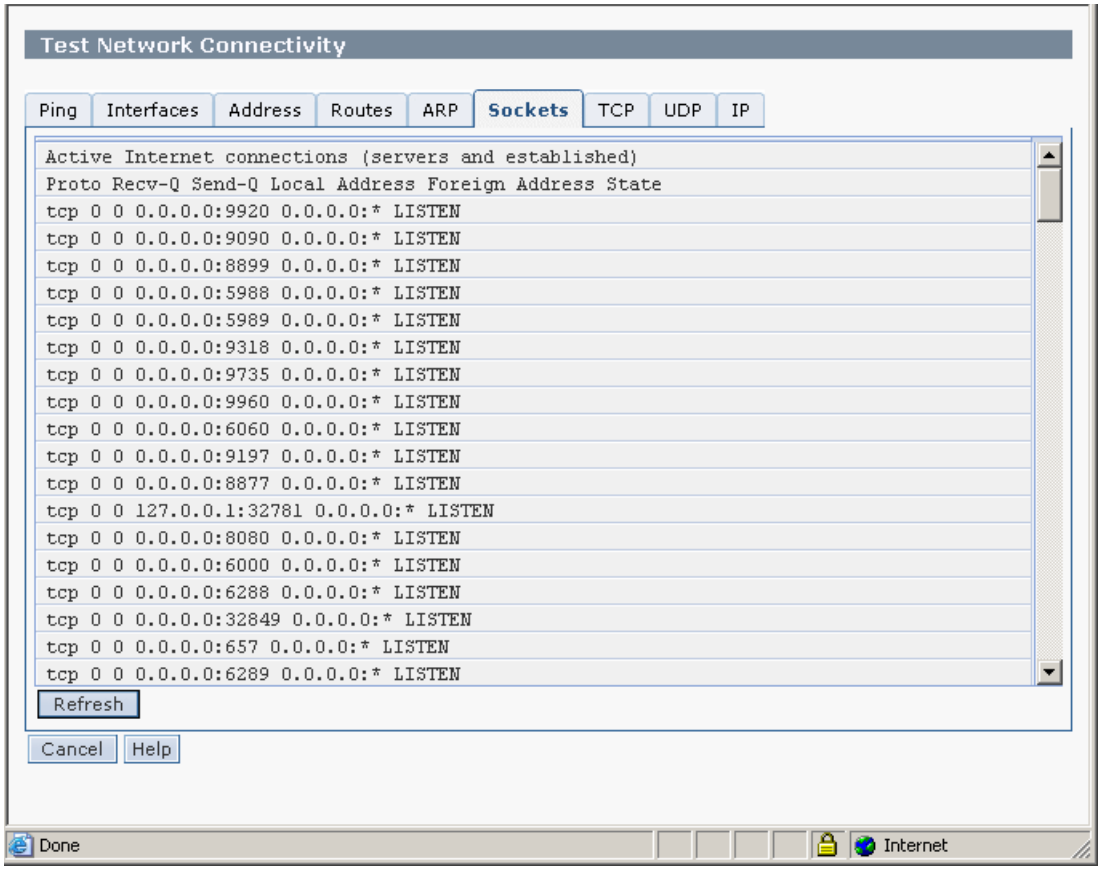


Figure 6-13 Network Diagnostic Information - Sockets

6.3.7 TCP

The TCP tab displays information about Transmission Control Protocol (TCP) connections. To update the information that is displayed with the most recent information, click **Refresh** as shown in Figure 6-14.

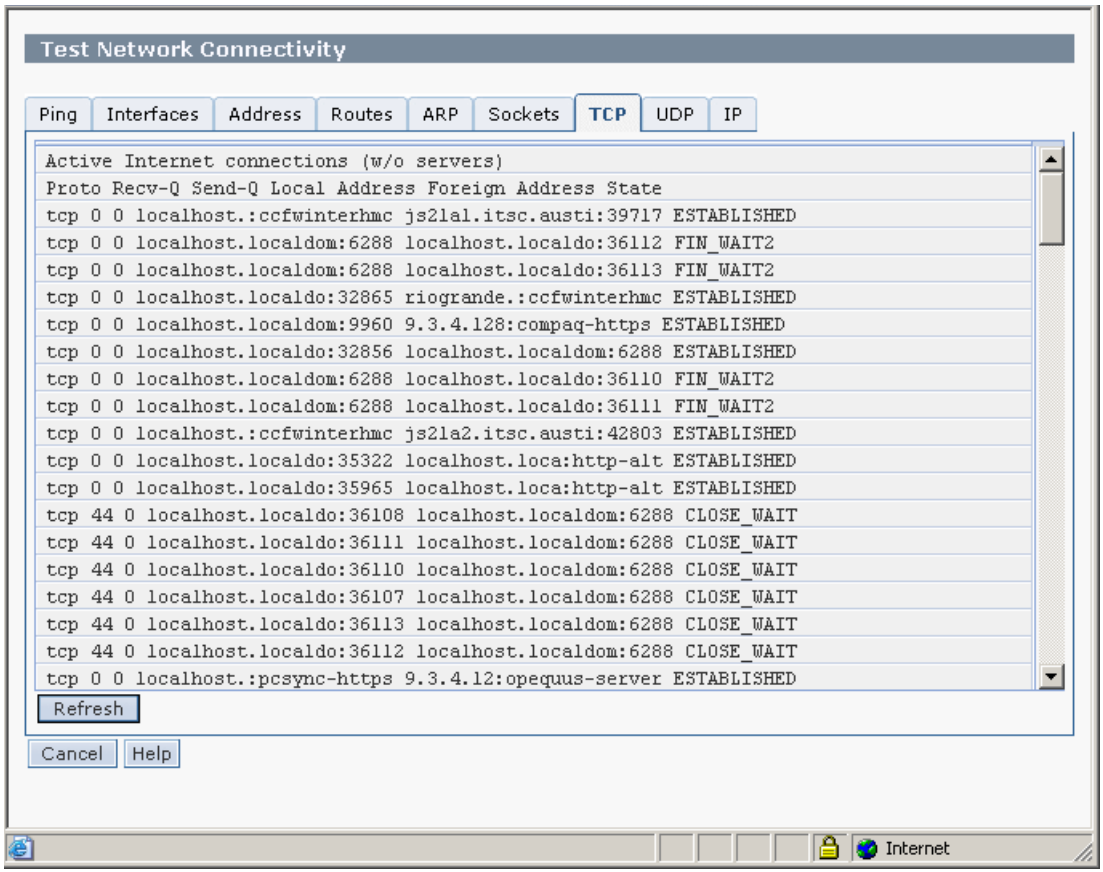


Figure 6-14 Network Diagnostic Information - TCP

6.3.8 UDP

Use the UDP tab to display information about User Datagram Protocol (UDP) statistics as shown in Figure 6-15. To update the information that is displayed with the most recent information, click **Refresh**.

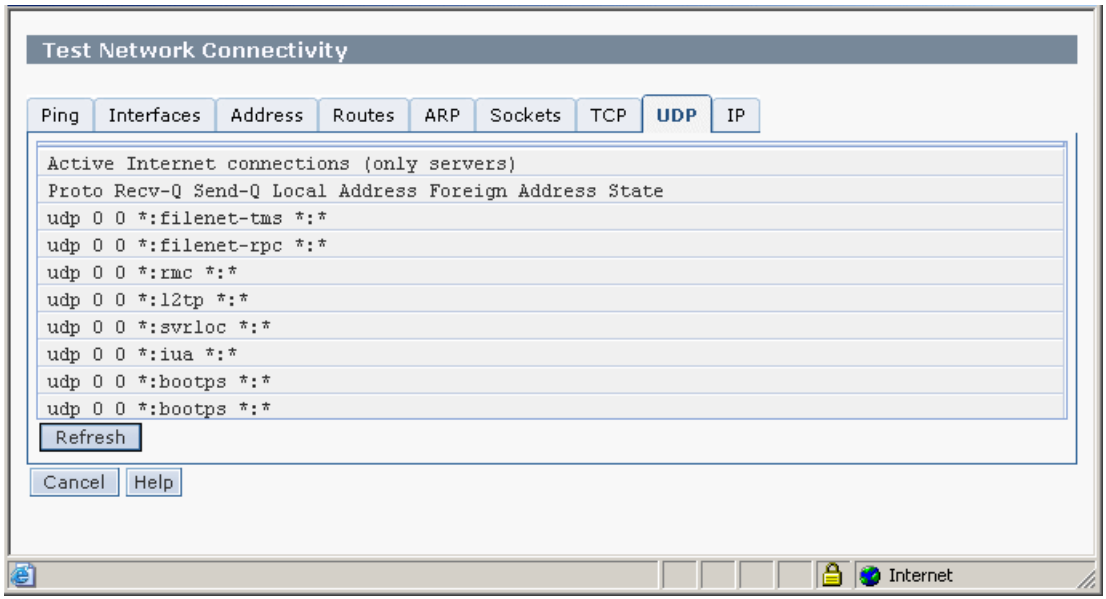


Figure 6-15 Network Diagnostic Information - UDP

6.3.9 IP

The IP tab displays the IP and corresponding network interfaces. You can click **Refresh** to update the information that is displayed with the most recent information as shown in Figure 6-16.

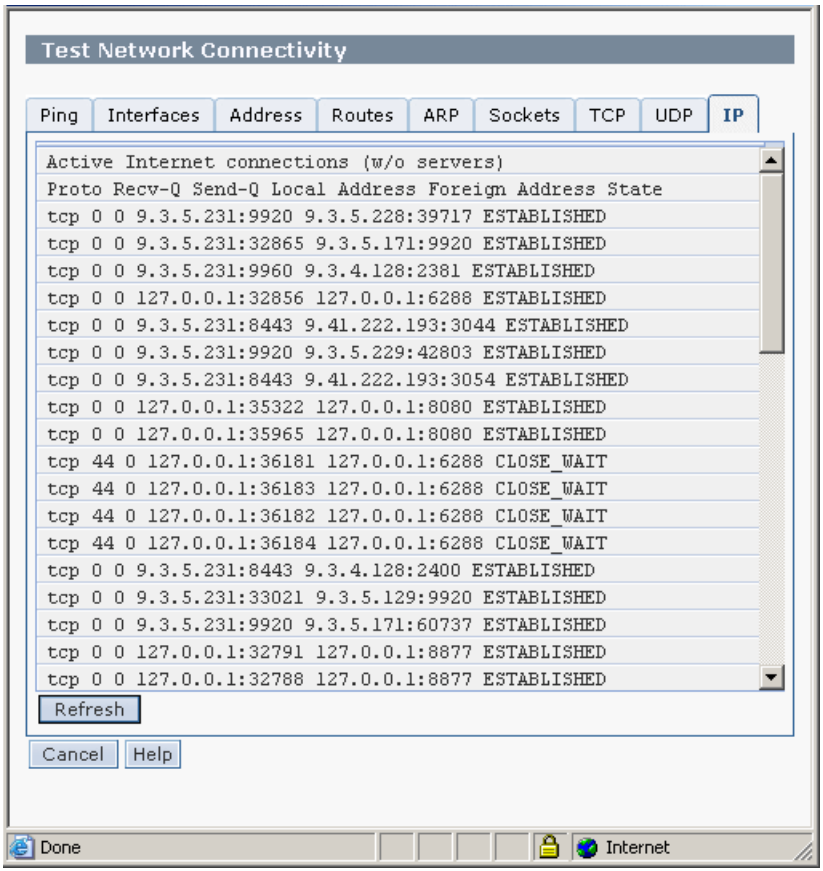


Figure 6-16 Network Diagnostic Information - IP

6.4 Viewing network topology

Use the Network Topology window to see a tree view of the network nodes known to this HMC (Figure 6-17). Examples of such nodes are managed systems, logical partitions, storage, and other HMCs. You can view attributes of a node by selecting the node in the tree view that is shown in the left pane under Current Topology. Attributes vary according to the type of node. Some examples are IP address, host name, location code, and status. Click **Refresh** to rediscover the topology and to query the nodes again for status and other attributes.

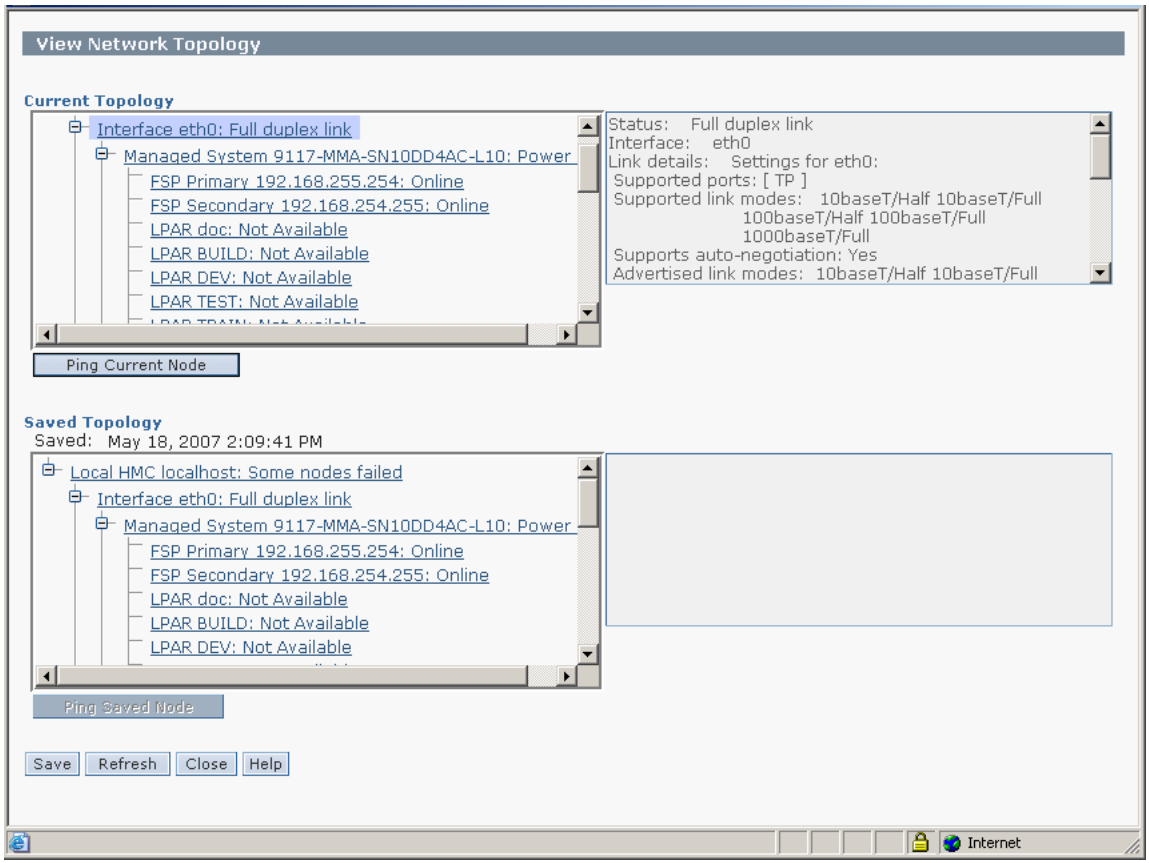


Figure 6-17 Network Topology

Table 6-1 shows the possible status for each node.

Table 6-1 Possible status for each node

Node	Possible Status
Local HMC	All nodes OK, Some nodes failed, All nodes failed
Remote HMC	Online, Offline
Interface	No link, Half duplex link, Full duplex link
Storage Facility	Status not reported
Managed system	Managed system status reported by the **lssyscfg** command (Operating, Running)
FSP	Online, Offline
LPAR	LPAR status reported by the **lsstscfg** command. LPARs can also carry a connection status to report their current network status as Active, On, Off, Offline
BPA	BPA status reported by the **lssyscfg** command
BPC	Online, Offline

Each status has its meaning which is evaluated when determining cumulative status for the Local HMC node, as shown in Table 6-2.

Table 6-2 Meaning of node status

Status	Evaluation for cumulative status (OK/Fail)	Meaning
All nodes OK	OK	Child node statuses are OK
Some nodes failed	Fail	One or more child node statuses failed
All nodes failed	Fail	All child nodes statuses failed
No link	Fail	No link detected on interface
Half duplex link	OK	Half duplex link detected on interface
Full duplex link	OK	Full duplex link detected on interface
Active	OK	LPAR is pingable and known to RMC
On	Fail	LPAR is pingable but not known to RMC
Off	Fail	LPAR is not pingable nor known to RMC

Status	Evaluation for cumulative status (OK/Fail)	Meaning
Offline	Fail	For LPARs: LPARs is not pingable but is known to RMC For Remote HMCs: Remote HMC is not pingable but is known to this HMC For FSPs, BCPs: FSP or BPC are not pingable
Online	OK	Remote HMC is pingable FSP is pingable BPC is pingable
Unknown	Fail	Status window be determined
Operating, Running, or any other text from `lssyscfg`	N/A	Not evaluated when determining the cumulative status

This task also allows you to save a snapshot of the current topology and to view that saved reference topology. You can view attributes of a node in this saved topology by selecting the node in the tree view that is shown in the left pane under Saved Topology.

To test network connectivity to a node, you can select the node in either the current or the saved topology and click Ping Current Node or Ping Saved Node, available only for nodes that include an IP address or a host name.

7

Partitioning

This chapter discusses the various ways to create partitions on POWER5 and POWER6 systems using the Hardware Management Console (HMC).

Note: The System Planning Tool and system plans are closely tied to this topic. For more information on the System Planning Tool, see *IBM System i and System p*, SG24-7487.

You can use the HMC graphical user interface or the command line interface to create the LPARs. Each LPAR will have one or more profiles that includes the settings that are used when the LPAR is turned on. Multiple profiles allow you to save multiple configurations for a single LPAR, giving you the ability to configure an LPAR to handle different workloads and to save that information to make it easily repeatable and scheduled.

7.1 Partitioning concepts

HMC Version 7 includes three significant changes in how resources are handled with managed server partitions. The changes for POWER6 managed servers include:

- Host Ethernet adapter

  The configuration of the host Ethernet adapter for your POWER6 server has a separate configuration area on the HMC. See 7.1.1, “Host Ethernet Adapter” on page 221 for information.

- Shared pool usage of dedicated capacity

  On POWER6 servers, you can configure dedicated partitions to become processor donors for idle processors they own. See 7.1.2, “Shared pool usage of dedicated capacity” on page 223 for information.

- Partition availability priority

  This function allows you to configure a partition hierarchy of availability for when a processor fails. See 7.1.3, “Partition availability priority” on page 225 for information.

7.1.1 Host Ethernet Adapter

On POWER6 servers only, the configuration of the integrated Host Ethernet Adapter for partitions is handled in a different area. To get to the Host Ethernet Adapter area:

1. In the HMC workplace window, select **Systems Management** → **Servers** then select the name of the server. Select **Hardware** → **Adapters** → **Host Ethernet** to open the window shown in Figure 7-1.

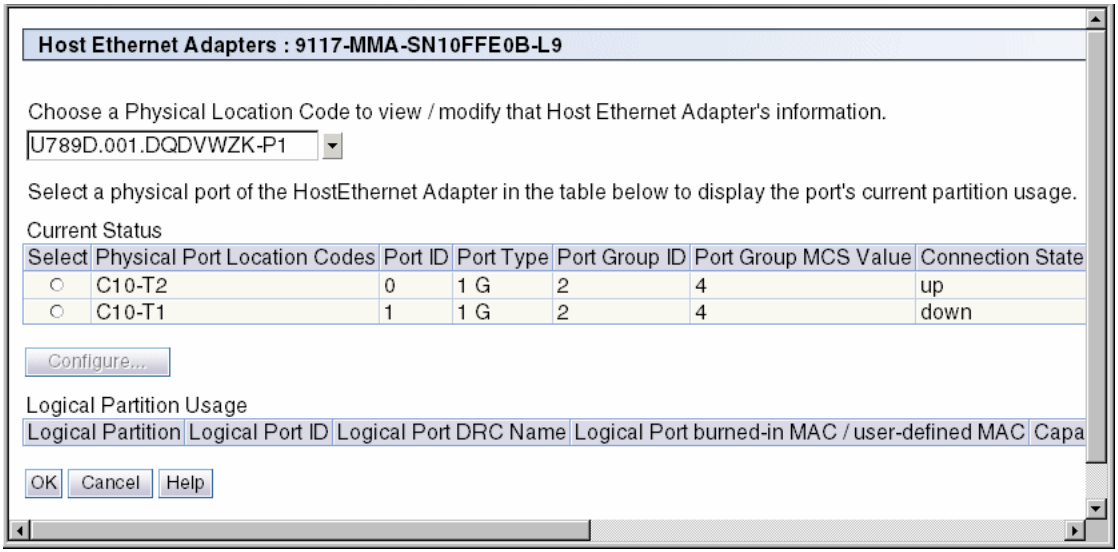


Figure 7-1 Host Ethernet Adapter configuration

2. Select the Ethernet adapter that you want to configure, and then select **Configure** to open the window shown in Figure 7-2. Here you can set the network adapter speed, duplex mode, packet size, and default partition control for the integrated controller. These numbers depends on the type of network switch to which you are connecting the server.

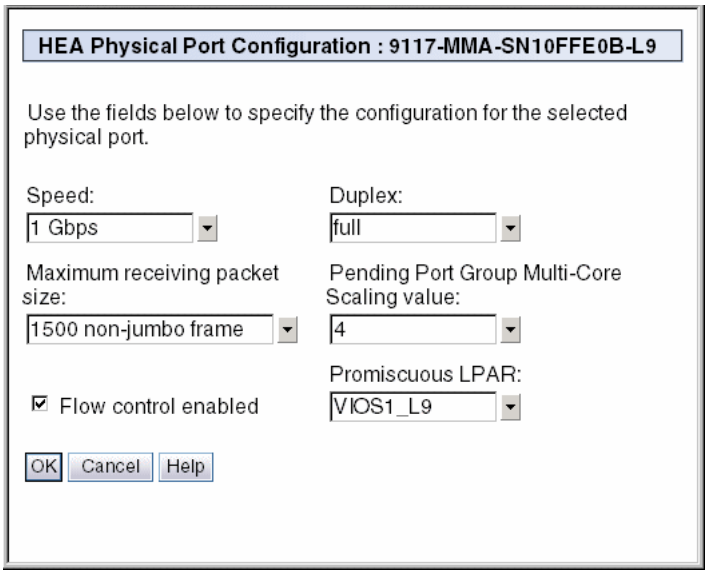


Figure 7-2 Configure Host Ethernet Adapter

3. When you have finished, select **OK** and your selections are saved.

7.1.2 Shared pool usage of dedicated capacity

Beginning with POWER6, HMC V7 R3 allows for the shared use of dedicated processing resources. The option to donate resources is turned off by default when partitions are created as *Dedicated* and can be configured through the partition property window. (To read about how to create a dedicated partition, see “Configuring a dedicated processor partition” on page 236.)

To verify that your system is capable of sharing dedicated capacity:

1. In the HMC workplace window, select **Systems Management** → **Servers** then select the name of the server. Select **Tasks** → **Properties** to open the window shown in Figure 7-3.

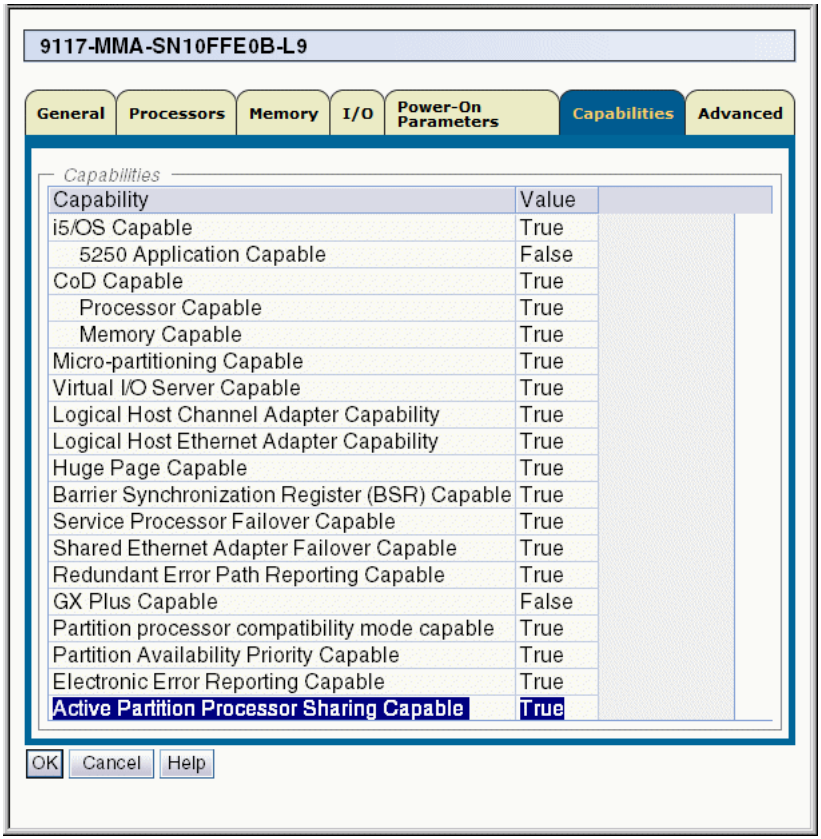


Figure 7-3 Active partition processor sharing

2. Select the Capabilities tab. At the bottom of the window, the status for processor sharing on the managed server is listed.
3. To configure the managed server as a processor donor and open the window as shown in Figure 7-4, select **Systems Management** then select the name of the server. Select the name of the partition to view the partition properties.

   Go to the Hardware tab to view the settings for processors, memory, and I/O.
4. On the Processors tab, you can select the radio buttons for when you want to allow processor sharing for this particular partition. In this window, *inactive* and *active* refer only to the partition's activation state. Before POWER6, dedicated processors were not shared with other partitions, even if the processors were idle. With POWER6 systems you can now share idle processing power from dedicated processors.

   When the LPAR with dedicated processors is inactive the processors are always idle. With this version of the HMC and POWER6 systems you can also share the idle processor cycles to the shared processor pool when the partition is active. This gives you the performance benefit of configuring dedicated processors to a partition while at the same time providing the server utilization benefit of sharing idle resources with other partitions.

   – Allow when partition is inactive

     When this option is selected, the dedicated resources for this partition are allocated to other active partitions for their shared processor usage.

   – Allow when partition is active

     When this option is selected, as processors become idle on this partition, the idle processors are allocated to other active partitions for their shared processor usage.

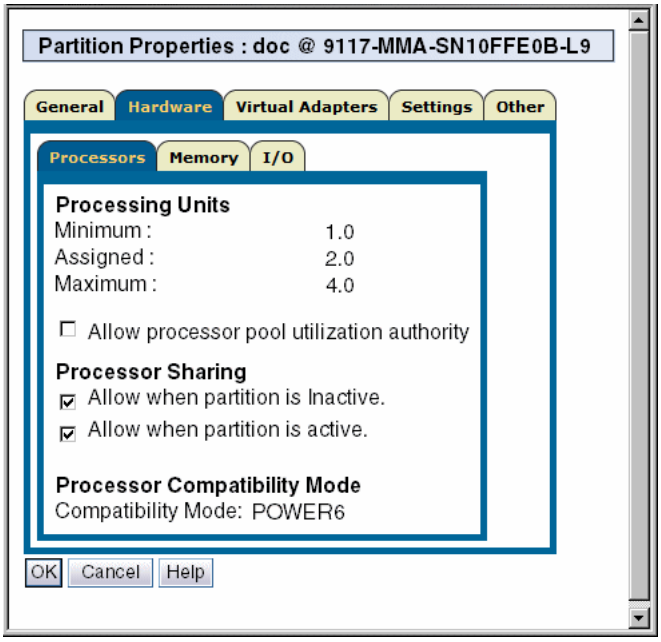


Figure 7-4 Processor sharing

7.1.3 Partition availability priority

New for POWER6 servers with the HMC V7 is the concept of *Partition Availability Priority*. This configuration option allows you to set up a hierarchy of partitions to cover for the event of a processor failure and ensures that high priority partitions have a higher guarantee of processor access than other partitions when a processor fails.

Note: The Partition Availability Priority option under System Plans displays only for POWER6 servers. If you are managing a POWER5 server, this option is not available.

To access the window shown in Figure 7-5, select **Systems Management** → **Servers** then select the name of the server. Select **Configuration** → **System Plans** → **Partition Availability Priority**.

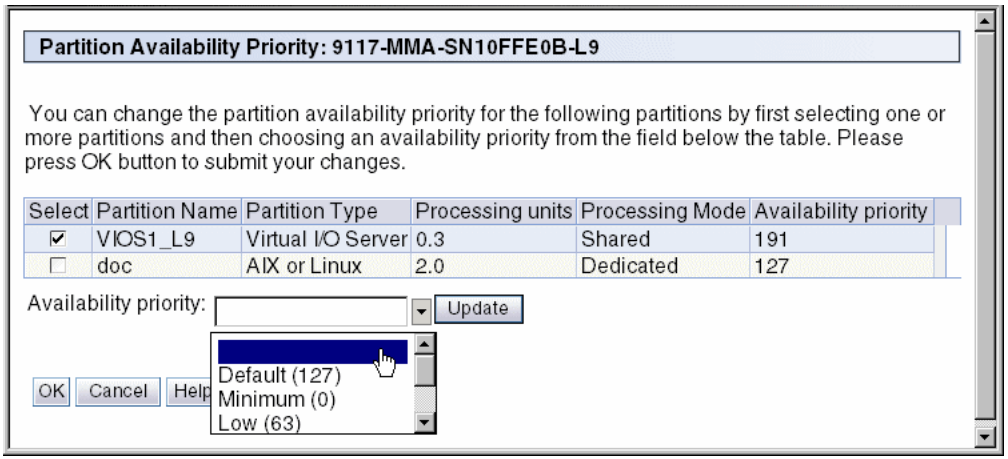


Figure 7-5 Setting partition availability priority

The managed system uses partition-availability priorities in the case of processor failure. If a processor fails on a logical partition and if there are no unassigned processors available on the managed system, the logical partition can acquire a replacement processor from logical partitions with a lower partition-availability priority. This allows the logical partition with the higher partition-availability priority to continue running after a processor failure.

When a processor fails on a high-priority logical partition, the managed system follows these steps to acquire a replacement processor for the high-priority logical partition:

1. If there are unassigned processors on the managed system, the managed system replaces the failed processor with an unassigned processor.
2. If there are no unassigned processors on the managed system, the managed system checks the logical partitions with lower partition-availability priorities, starting with the lowest partition-availability priority.
3. If a lower-priority logical partition uses dedicated processors, the managed system shuts down the logical partition and replaces the failed processor with one of the processors from the dedicated-processor partition.
4. If a lower-priority logical partition uses shared processors, and removing a whole processor from the logical partition would not cause the logical partition to go below its minimum value, the managed system removes a whole processor from the shared-processor partition using Dynamic Logical

Partitioning and replaces the failed processor with the processor that the managed system removed from the shared-processor partition.

5. If a lower-priority logical partition uses shared processors, but removing a whole processor from the logical partition would cause the logical partition to go below its minimum value, the managed system skips that logical partition and continues to the logical partition with the next higher partition availability.
6. If the managed system still cannot find a replacement processor, the managed system shuts down as many of the shared-processor partitions as it needs to acquire the replacement processor. The managed system shuts down the shared-processor partitions in partition-availability priority order, starting with the lowest partition-availability priority.

A logical partition can take processors only from logical partitions with lower partition-availability priorities. If all of the logical partitions on your managed system have the same partition-availability priority, then a logical partition can replace a failed processor only if the managed system has unassigned processors.

By default, the partition availability priority of Virtual I/O Server logical partitions and i5/OS logical partitions with virtual SCSI adapters is set to 191. The partition-availability priority of all other logical partitions is set to 127, by default, as shown in Figure 7-5.

Note: Do not set the priority of Virtual I/O Server logical partitions to be lower than the priority of the logical partitions that use the resources on the Virtual I/O Server logical partition.

Do not set the priority of i5/OS logical partitions with virtual SCSI adapters to be lower than the priority of the logical partitions that use the resources on the i5/OS logical partition.

7.2 Creating logical partitions

To create a logical partition, begin in the HMC workplace window. Select **Systems Management** → **Servers** and then select the name of the server. This action takes you to the view shown in Figure 7-6.

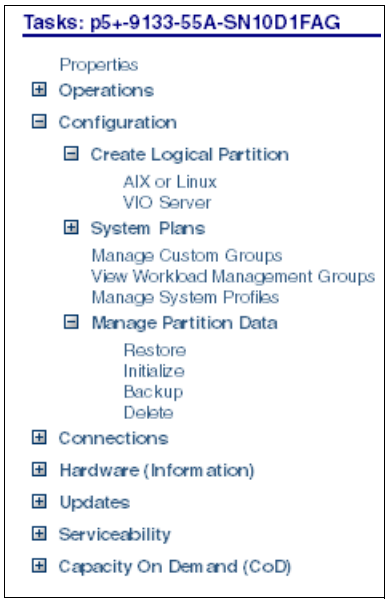


Figure 7-6 System partitioning view

Expand **Configuration** and then expand **Create Logical Partition** to open the area to create an AIX, Linux, or Virtual I/O Server partition.

7.2.1 Creating an AIX or a Linux partition

Note: The options and window views for creating a Virtual I/O Server (*VIO Server*) partition are the same as those that we present in this section. Thus, we do not document the steps for the VIO Server.

To create an AIX or a Linux partition, follow these steps:

1. Select **Configuration** → **Create Logical Partition** → **AIX or Linux** to open the window shown in Figure 7-7. Here you can set the partition ID and specify the partition's name. Then, select **Next**.

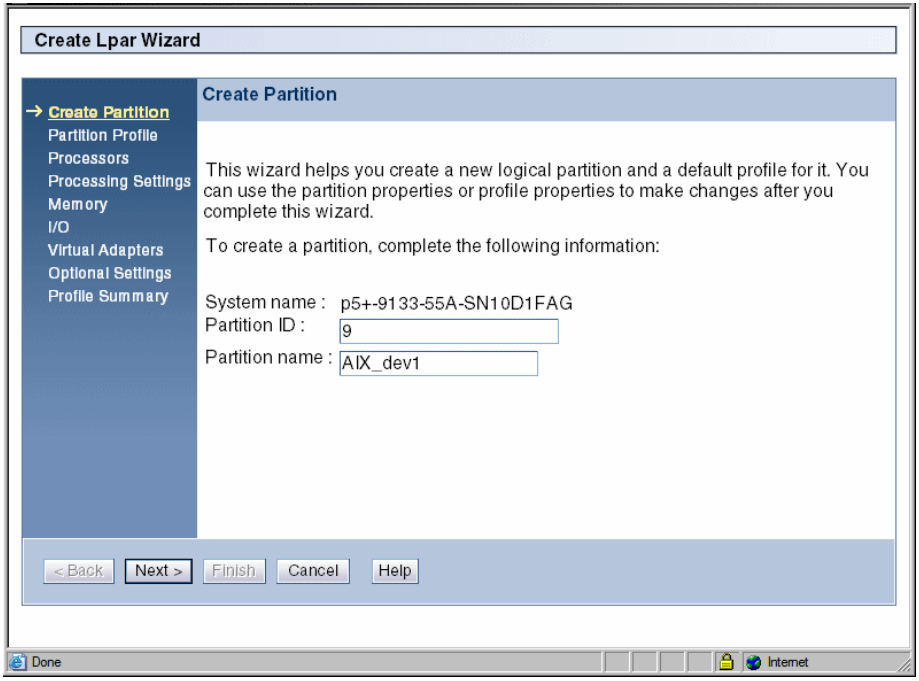


Figure 7-7 Create an AIX partition

2. Enter a profile name for this partition and click **Next** (Figure 7-8). You can then create a partition with either *shared* or *dedicated* processors on your server.

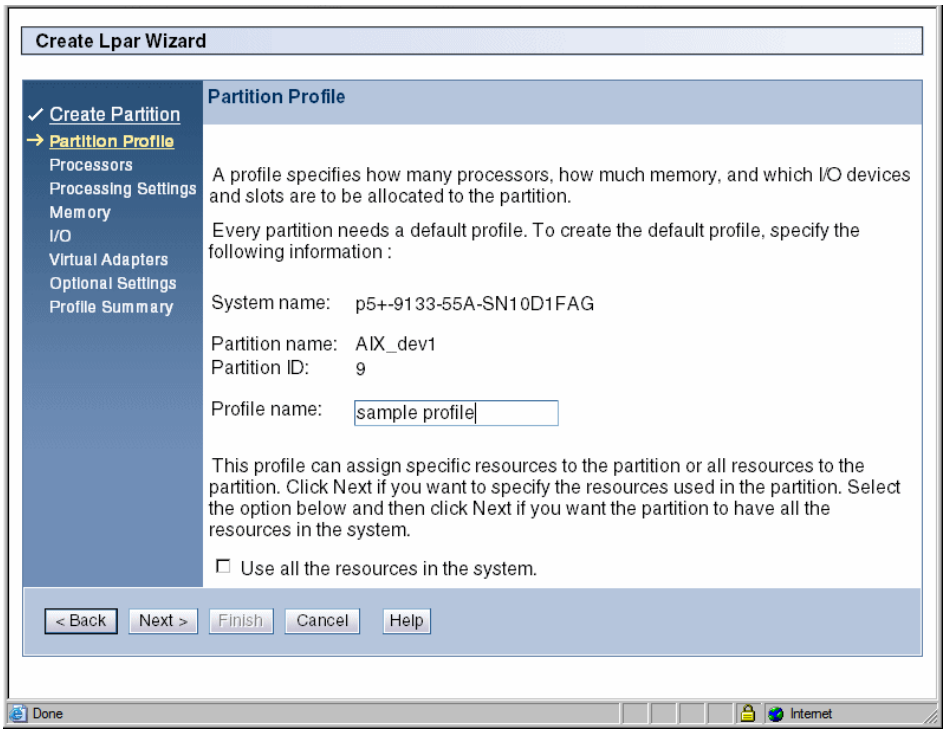


Figure 7-8 Create an AIX partition

Configuring a shared processor partition

This section describes how to create a partition with a *shared* processor. If you want to create a partition with a *dedicated* processor, refer to “Configuring a dedicated processor partition” on page 236.

To configure a shared processor partition:

1. Select **Shared** and then select **Next**, as shown in Figure 7-9.

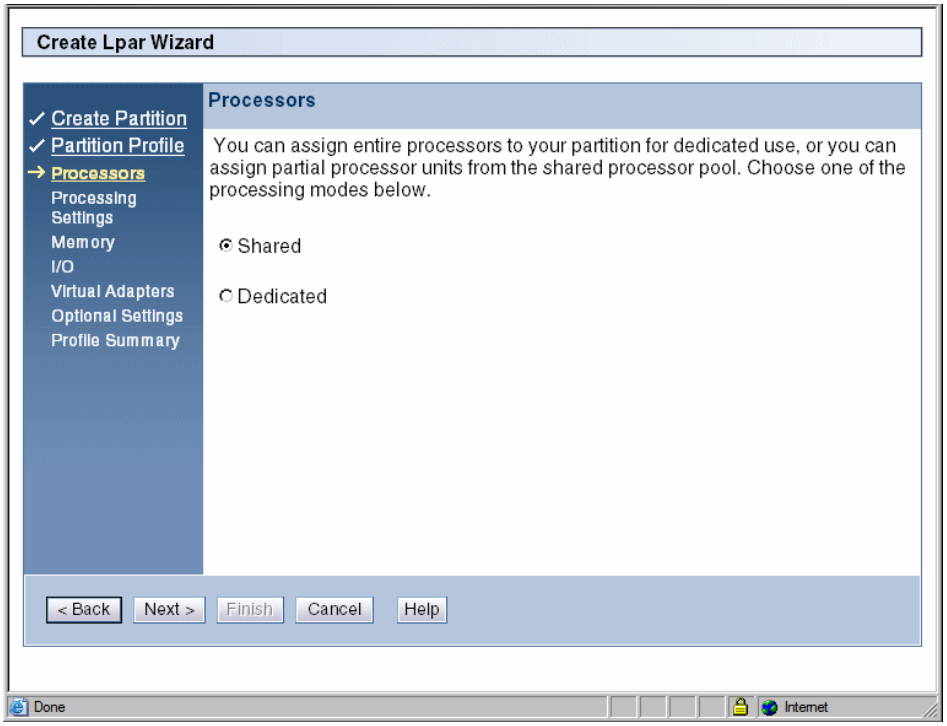


Figure 7-9 Create a shared processor partition

2. Specify the processing units for the partition as well as any settings for virtual processors, as shown in Figure 7-10. The sections that immediately follow this figure discuss the settings in this figure in detail.
3. After you have entered data in each of the fields (or accepted the defaults) select **Next** and then proceed to “Setting partition memory” on page 238.

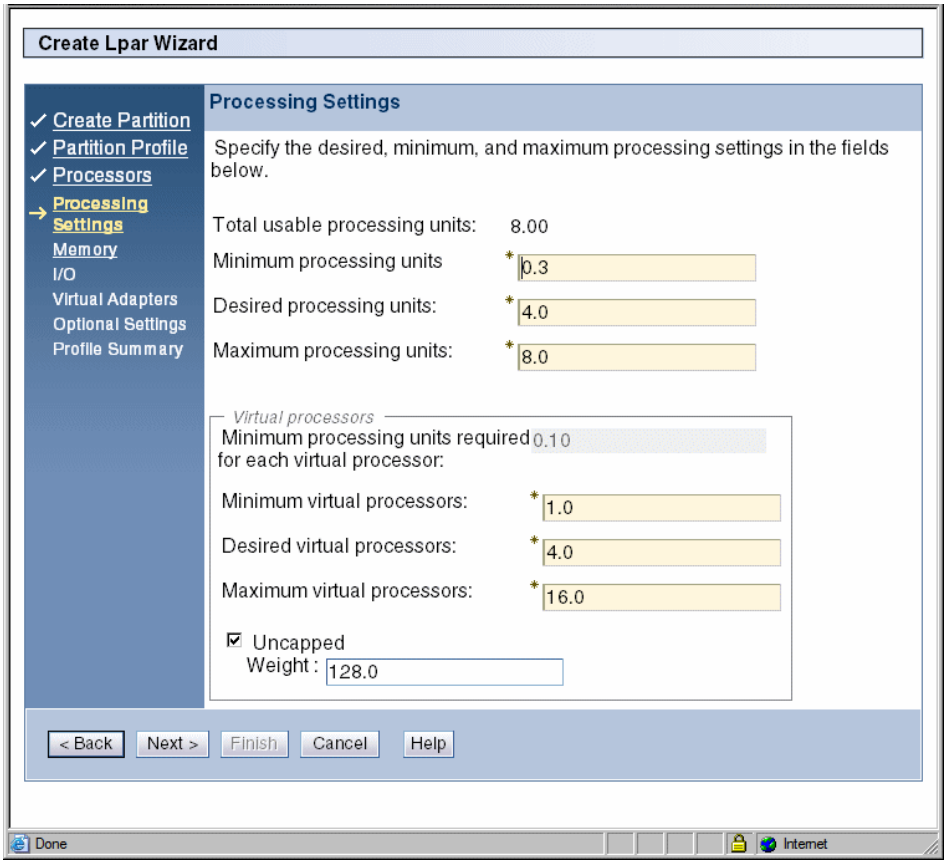


Figure 7-10 Shared partition settings

Processing Settings area

In the Processing Settings area, you must specify the minimum number of processors that you want the shared processor partition to acquire, the desired amount, and the maximum upper limit allowed for the partition.

The values in each field can range anywhere between .1 and the total number of processors in the managed server and can be any increment in between in tenths of a processor.

Each field defines the following information:

- **Minimum processing units**

  The absolute minimum number of processing units required from the shared processing pool for this partition to become active. If the number in this field is not available from the shared processing pool, this partition cannot be activated.

  This value has a direct bearing on dynamic logical partitioning (DLPAR), as the minimum processing units value represents the smallest value of processors the partition can have as the result of a DLPAR deallocation.

- **Desired processing units**

  This number has to be greater than or equal to the amount set in *Minimum processing units*, and represents an amount of processors asked for above the minimum amount. If the minimum is set to 2.3 and the desired set to 4.1, then the partition could become active with any number of processors between 4.1 and 2.3, whatever number is greater and available from the shared resource pool.

  When a partition is activated, it queries for processing units starting at the desired value and goes down in .1 of a processor until it reaches the minimum value. If the minimum is not met, the partition does not become active.

  Desired processing units only governs the possible number of processing units a partition can become active with. If the partition is made *upcapped*, then the hypervisor can let the partition exceed its desired value depending on how great the peak need is and what is available from the shared processing pool.

- **Maximum processing units**

  This setting represents the absolute maximum number of processors this partition can own at any given time, and must be equal to or greater than the *Desired processing units*.

  This value has a direct bearing on dynamic logical partitioning (DLPAR), as the maximum processing units value represents the largest value of processors the partition can have as the result of a DLPAR allocation.

  Furthermore, while this value affects DLPAR allocation, it does not affect the processor allocation handled by the hypervisor for idle processor allocation during processing peaks.

Note: Whether your partition is *capped* or *uncapped*, the minimum value for *Maximum processing units* is equal to the value specified for *Desired processing units*.

Uncapped option

The Uncapped option represents whether you want the HMC to consider the partition capped or uncapped. Whether a partition is *capped* or *uncapped*, when it is activated it takes on a processor value equal to a number somewhere between the minimum and desired processing units, depending on what is available from the shared resource pool. However, if a partition is capped, it can gain processing power only through a DLPAR allocation and otherwise stays at the value given to it at time of activation.

If the partition is *uncapped*, it can exceed the value set in *Desired virtual processors* and it can take the number of processing units from the shared processor pool that it needs. This is not seen from the HMC view of the partition, but you can check the value of processors owned by the partition from the operating system level with the appropriate commands.

The *weight* field defaults to 128 and can range from 0 to 256. Setting this number below 128 decreases a partition's priority for processor allocation, and increasing it above 128, up to 256, increases a partition's priority for processor allocation.

If all partitions are set to 128 (or another equivalent number), then all partitions have equal access to the shared processor pool. If a partition's *uncapped weight* is set to 0, then that partition is considered *capped*, and it never owns a number of processors greater than that specified in *Desired processing units*.

Virtual processors area

The values that are set in the Virtual processors are of this window govern how many processors to present to the operating system of the partition. You must show a minimum of one virtual processor per actual processor, and you can have as many as 10 virtual processors per physical processing unit.

As a general recommendation, a partition requires at least as many virtual processors as you have actual processors, and a partition should be configured with no more than twice the number of virtual processors as you have actual processors.

Each field defines the following information:

- **Minimum virtual processors**

  Your partition must have at least one virtual processor for every part of a physical processor assigned to the partition. For example, if you have assigned 2.5 processing units to the partition, the minimum number of virtual processors is three.

  Furthermore, this value represents the lowest number of virtual processors that can be owned by this partition as the result of a DLPAR operation.

- **Desired virtual processors**

  The desired virtual processors value has to be greater than or equal to the value set in *Minimum virtual processors*, and as a general guideline about twice the amount set in *Desired processing units*. Performance with virtual processing can vary depending on the application, and you might need to experiment with the desired virtual processors value before you find the perfect value for this field and your implementation.

  Note: The desired virtual processors value, along with the resources available in the shared resource pool, is the only value that can set an effective limit on the amount of resources that can be utilized by an uncapped partition.

- **Maximum virtual processors**

  You can only have 10 virtual processors per processing unit. Therefore, you cannot assign a value greater than 10 times the *Maximum processing units* value as set in “Processing Settings area” on page 232. It is recommended, though not required, to set this number to twice the value entered in *Maximum processing units*.

  Note: Regardless of the number of processors in the server or the processing units owned by the partition, there is an absolute upper limit of 64 virtual processors per partition with the HMC V7 software.

  Finally, this value represents the maximum number of virtual processors that this partition can have as the result of a DLPAR operation.

Configuring a dedicated processor partition

This section describes how to create a partition with a *dedicated* processor. If you want to create a partition with a *shared* processor, refer to “Configuring a shared processor partition” on page 231.

To configure a dedicated processor partition:

1. Select **Dedicated** and then select **Next**, as shown in Figure 7-11.

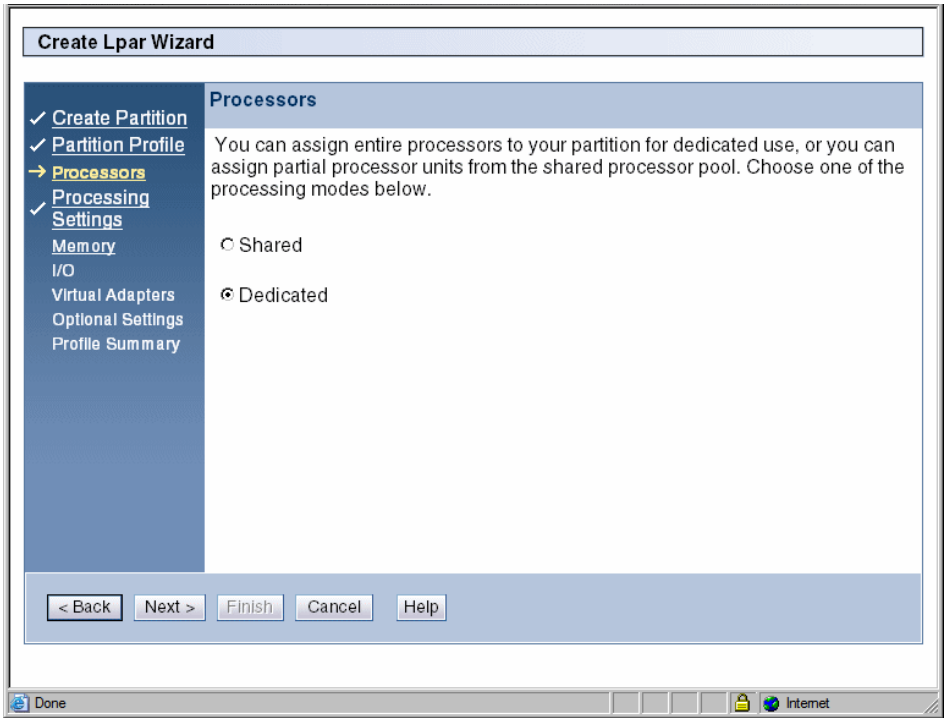


Figure 7-11 Create dedicated processor partition

2. Specify the number of minimum, desired, and maximum processors for the partition, as shown in Figure 7-12. For a description on what each field represents, refer to “Processing Settings area” on page 232.

> **Note:** If you are creating a partition on a POWER6 server, you can still configure the partition to donate idle processors to the shared processing pool. For more information, refer to 7.1.2, “Shared pool usage of dedicated capacity” on page 223.

3. After you have entered the values for the fields, select **Next**.

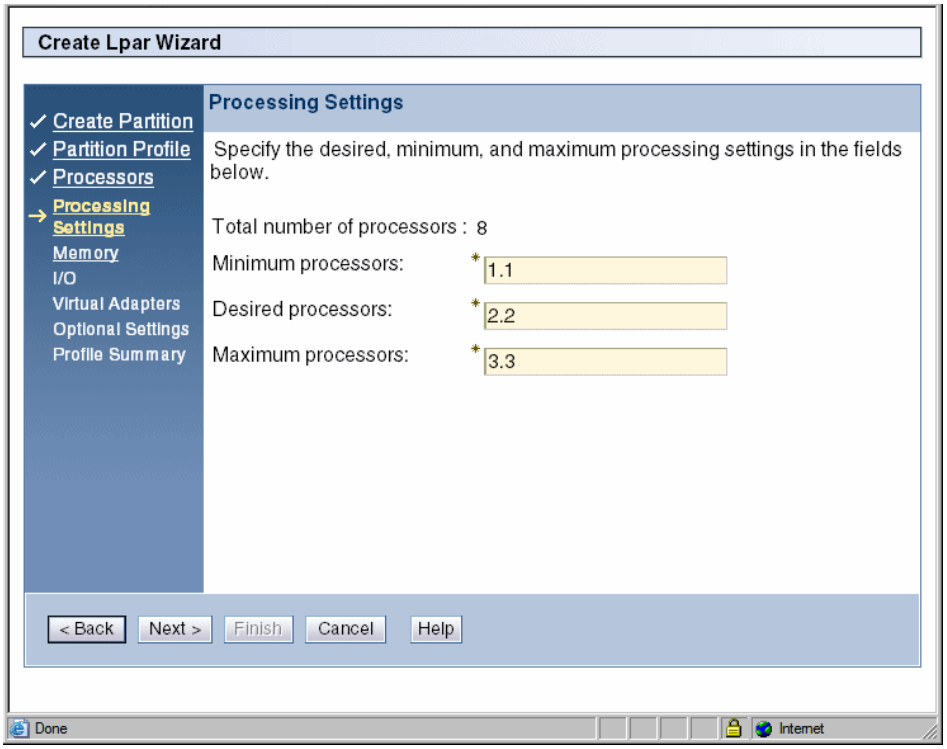


Figure 7-12 Processor settings with dedicated processors

Setting partition memory

Now, you need to set the partition memory, as shown in Figure 7-13.

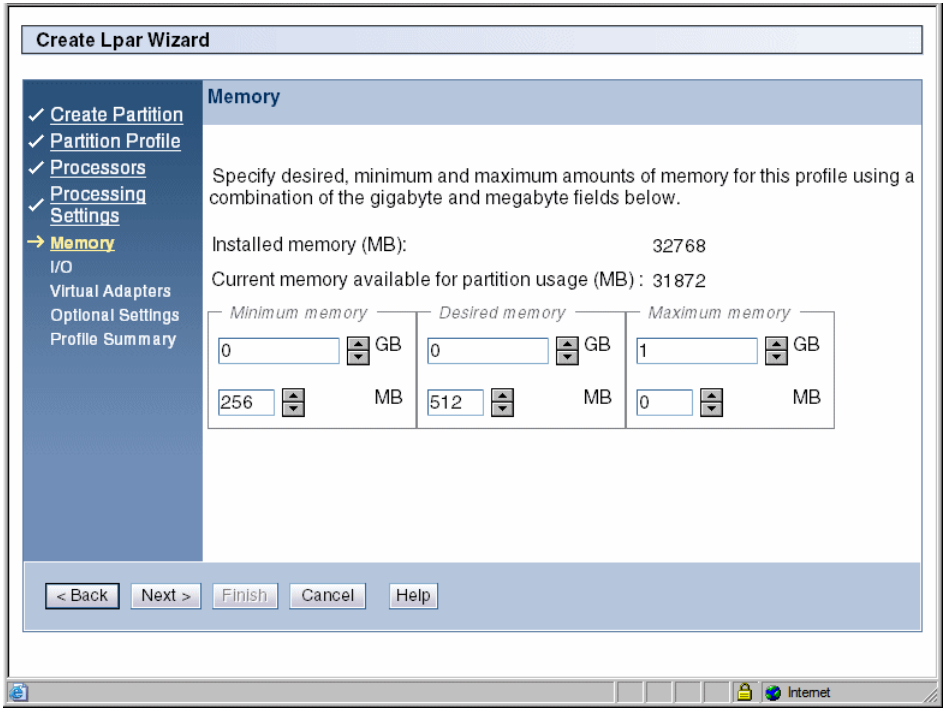


Figure 7-13 Set partition memory

The *minimum*, *desired*, and *maximum* settings are similar to their processor counterparts:

- **Minimum memory**

  Represents the absolute memory required to make the partition active. If the amount of memory specified under minimum is not available on the managed server then the partition cannot become active.

- **Desired memory**

  Specifies the amount of memory beyond the minimum that can be allocated to the partition. If the minimum is set at 256 MB and the desired is set at 4 GB, then the partition in question can become active with anywhere between 256 MB and 4 GB.

- **Maximum memory**

  Represents the absolute maximum amount of memory for this partition, and it can be a value greater than or equal to the number specified in *Desired*

memory. If set at the same amount as desired, then the partition is considered *capped*, and if this number is equal to the total amount of memory in the server then this partition is considered *uncapped*.

After you have made your memory selections, select **Next**.

Configuring physical I/O

On the I/O window, as shown in Figure 7-14, you can select I/O resources for the partition to own. If you want the partition to own virtual resources, refer to “Configuring virtual resources” on page 240. After you have made your selections in this window, select **Next**.

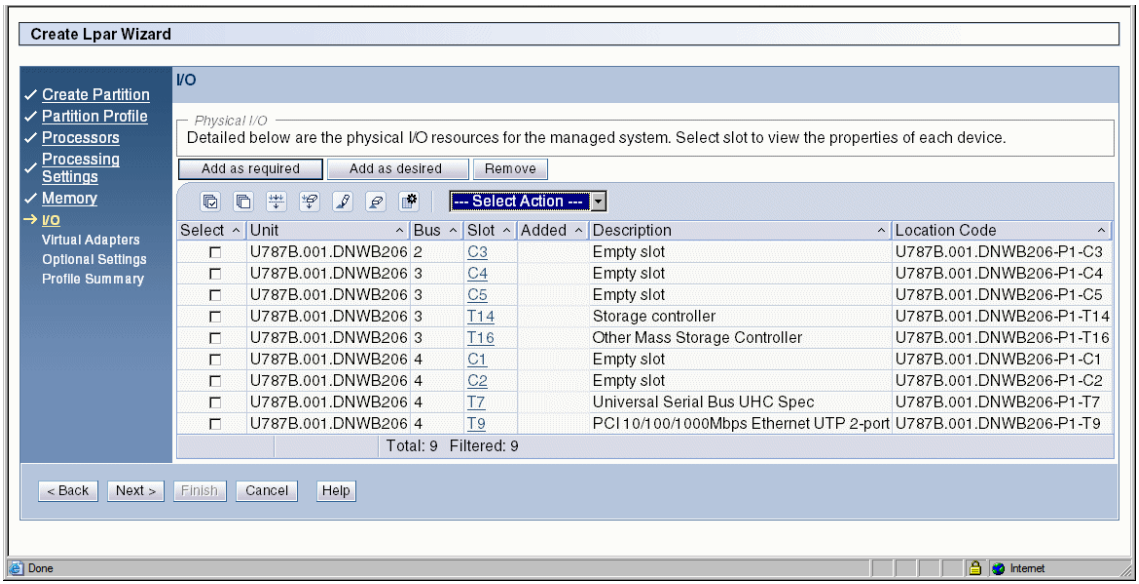


Figure 7-14 Configure physical I/O

Configuring virtual resources

If you have adapters assigned to the virtual I/O server (as explained in Chapter 9, “Virtual I/O” on page 259), you can create a virtual adapter share for your partition. Follow these steps:

1. Select **Actions** → **Create** → **SCSI Adapter** to create a virtual SCSI share.

   Alternatively, select **Actions** → **Create** → **Ethernet Adapter** to create a shared Ethernet share.

   See Figure 7-15.

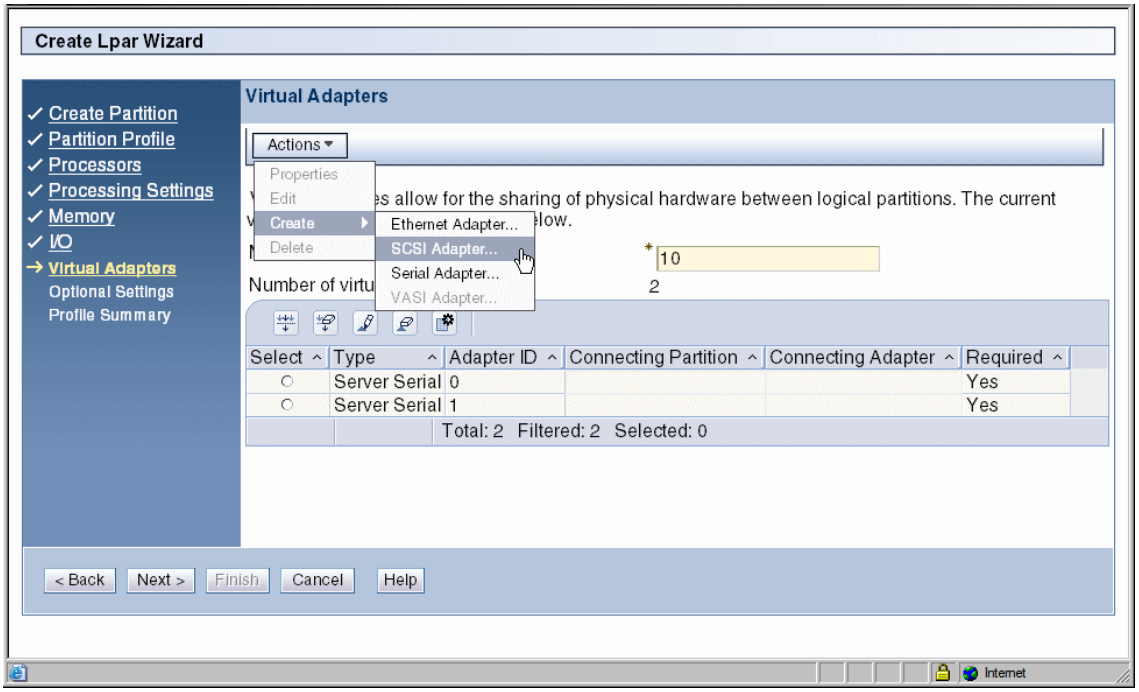


Figure 7-15 Configure virtual resources

2. You can specify your server partition, get System VIOS info, and specify a tag for adapter identification, as shown in Figure 7-16. When you have entered all of the data, select **OK**.

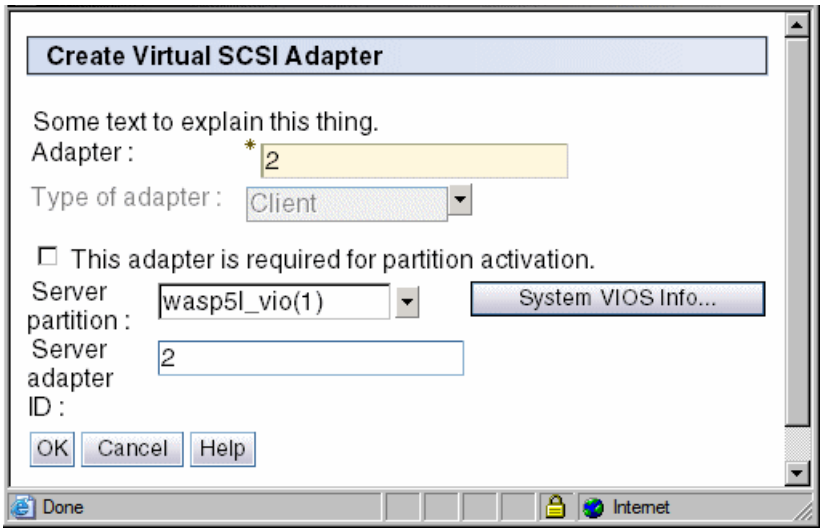


Figure 7-16 Create virtual SCSI adapter

You are returned to the virtual adapters window as shown in Figure 7-17. When you are done creating all the virtual resources, select **Next**.

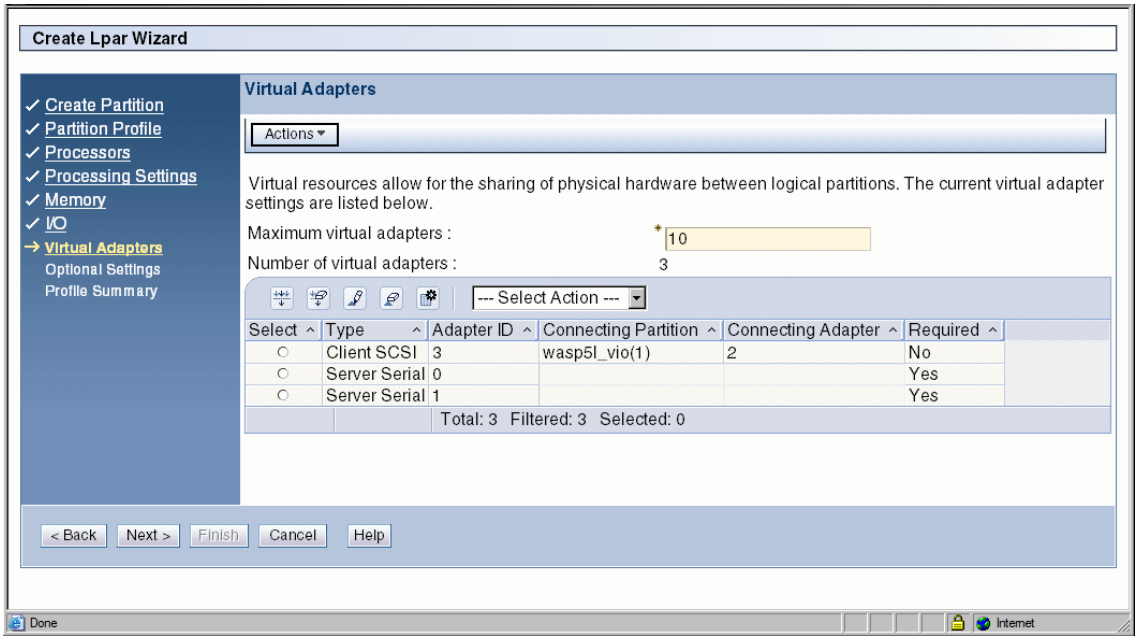


Figure 7-17 Virtual adapters

Optional Settings window

On the Optional Settings window shown in Figure 7-18 you can:

- Enable connection monitoring
- Start the partition with the managed system automatically
- Enable redundant error path reporting

You can also specify one of the various boot modes that are available.

After you have made your selections in this window, click **Next** to continue.

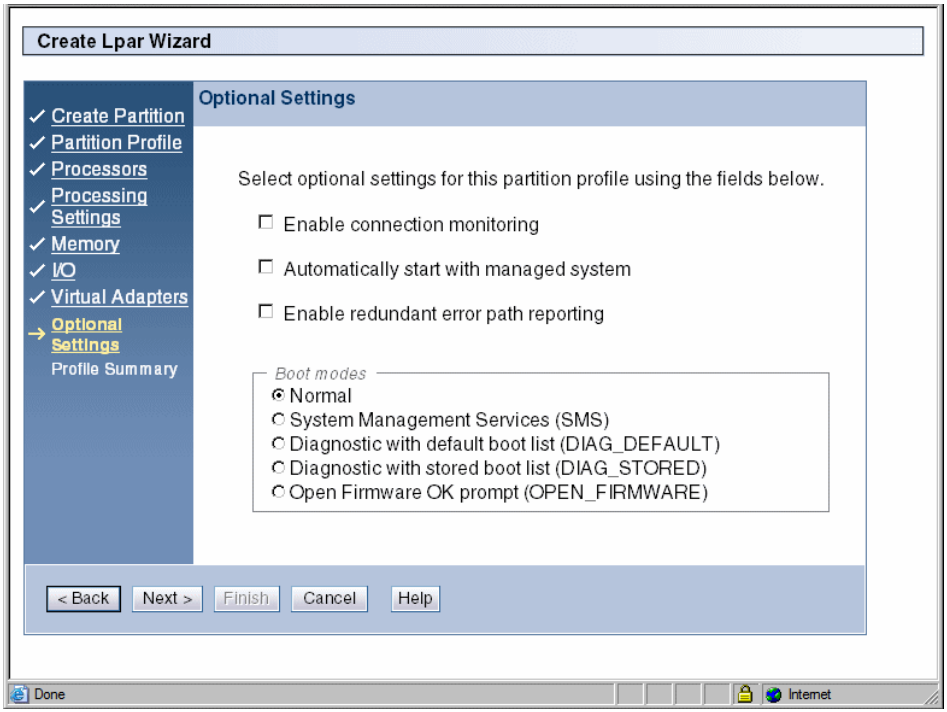


Figure 7-18 Optional settings

Enabling connection monitoring

Select this option to enable connection monitoring between the HMC and the logical partition that is associated with this partition profile. When connection monitoring is enabled, the Service Focal Point (SFP) application periodically tests the communications channel between this logical partition and the HMC. If the channel does not work, the SFP application generates a serviceable event in the SFP log. This ensures that the communications channel can carry service requests from the logical partition to the HMC when needed.

If this option is not selected, the SFP application still collects service request information when there are issues on the managed system. This option only controls whether the SFP application automatically tests the connection and generates a serviceable event if the channel does not work.

Clear this option if you do not want the SFP application to monitor the communications channel between the HMC and the logical partition associated with this partition profile.

Starting with managed system automatically

This option shows whether this partition profile sets the managed system to activate the logical partition that is associated with this partition profile automatically when you power on the managed system.

When you power on a managed system, the managed system is set to activate certain logical partitions automatically. After these logical partitions are activated, you must activate any remaining logical partitions manually. When you activate this partition profile, the partition profile overwrites the current setting for this logical partition with this setting.

If this option is selected, the partition profile sets the managed system to activate this logical partition automatically the next time the managed system is powered on.

If this option is not selected, the partition profile sets the managed system so that you must activate this logical partition manually the next time the managed system is powered on.

Enabling redundant error path reporting

Select this option to enable the reporting of server common hardware errors from this logical partition to the HMC. The service processor is the primary path for reporting server common hardware errors to the HMC. Selecting this option allows you to set up redundant error reporting paths in addition to the error reporting path provided by the service processor.

Server common hardware errors include errors in processors, memory, power subsystems, the service processor, the system unit vital product data (VPD), non-volatile random access memory (NVRAM), I/O unit bus transport (RIO and PCI), clustering hardware, and switch hardware. Server common hardware errors do not include errors in I/O processors (IOPs), I/O adapters (IOAs), or I/O device hardware.

If this option is selected, this logical partition reports server common hardware errors and partition hardware errors to the HMC. If this option is not selected, this logical partition reports only partition hardware errors to the HMC.

This option is available only if the server firmware allows you to enable redundant error path reporting (the Redundant Error Path Reporting Capable option on the Capabilities tab in Managed System Properties is True.

Boot modes

Select the default boot mode that is associated with this partition profile. When you activate this partition profile, the system uses this boot mode to start the operating system on the logical partition unless you specify otherwise when activating the partition profile. (The boot mode applies only to AIX, Linux, and virtual I/O server logical partitions. This area is unavailable for i5/OS logical partitions.) Valid boot modes are as follows:

- **Normal**

  The logical partition starts up as normal. (This is the mode that you use to perform most everyday tasks.)

- **System Management Services (SMS)**

  The logical partition boots to the System Management Services (SMS) menu.

- **Diagnostic with default boot list (DIAG_DEFAULT)**

  The logical partition boots using the default boot list that is stored in the system firmware. This mode is normally used to boot customer diagnostics from the CD-ROM drive. Use this boot mode to run standalone diagnostics.

- **Diagnostic with stored boot list (DIAG_STORED)**

  The logical partition performs a service mode boot using the service mode boot list saved in NVRAM. Use this boot mode to run online diagnostics.

- **Open Firmware OK prompt (OPEN_FIRMWARE)**

  The logical partition boots to the open firmware prompt. This option is used by service personnel to obtain additional debug information.

Profile summary

When you arrive at the profile summary as shown in Figure 7-19, you can review your partition profile selections. If you see anything that you want to change, select **Back** to get to the appropriate window and to make changes.

If you are satisfied with the data represented in the Profile Summary, select **Finish** to create your partition.

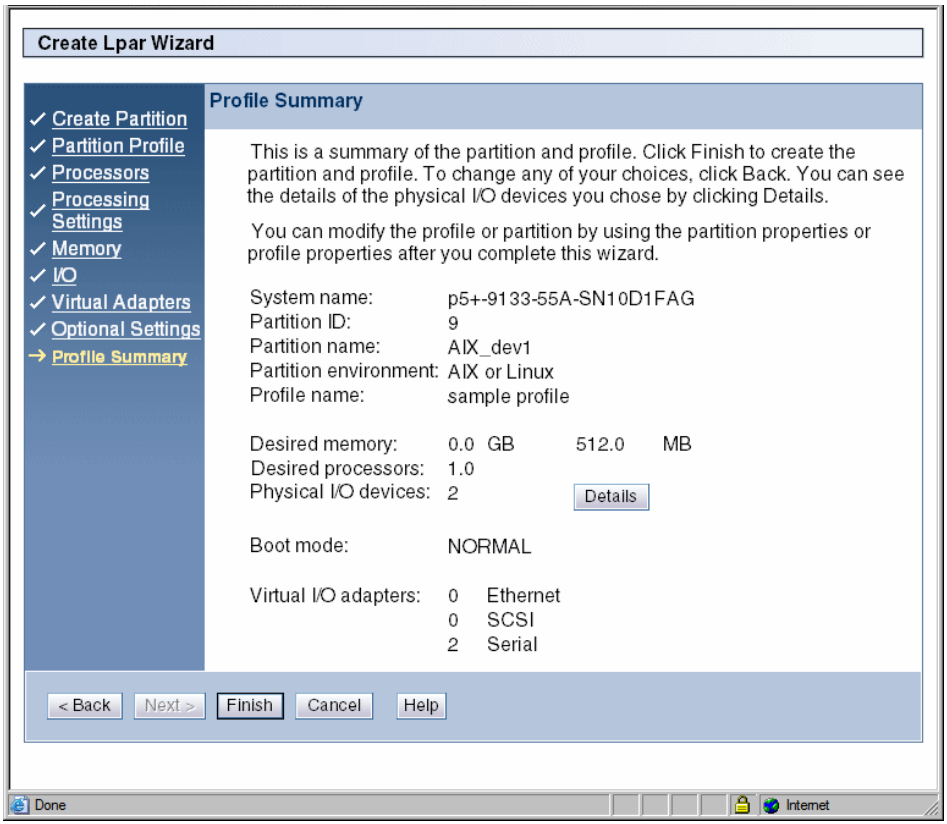


Figure 7-19 Profile summary

After you select **Finish**, for a few minutes the window shown in Figure 7-20 displays. When this window goes away, go back to your main HMC view, and the partition that you created is listed under the existing partitions on your managed server.

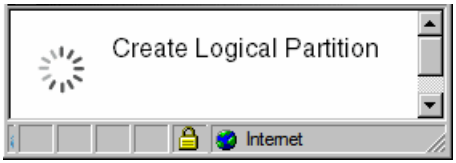


Figure 7-20 Partition creation status window

7.3 Managing partition data

This section discusses how to manipulate partition profile data on the HMC. It includes information about:

- **Restore**: Load profile data locally from the HMC or from removable media
- **Initialize**: Initialize all profile images

> **Note:** Initialize removes *all* profile data saved to the HMC. Do not perform this action if you want to preserve *any* of the profile data saved on the HMC.

- **Backup**: Save profile data to the HMC
- **Delete**: Remove profile data

7.3.1 Restore

The *restore* option allows you to restore profile data from a local backup stored on the HMC. To restore profile data, select **Configuration** → **Manage Partition Data** → **Restore**. Select the backup image that you would like to restore, and then select **OK**, as shown in Figure 7-21. The restore can take approximately a minute and a half or longer to complete.

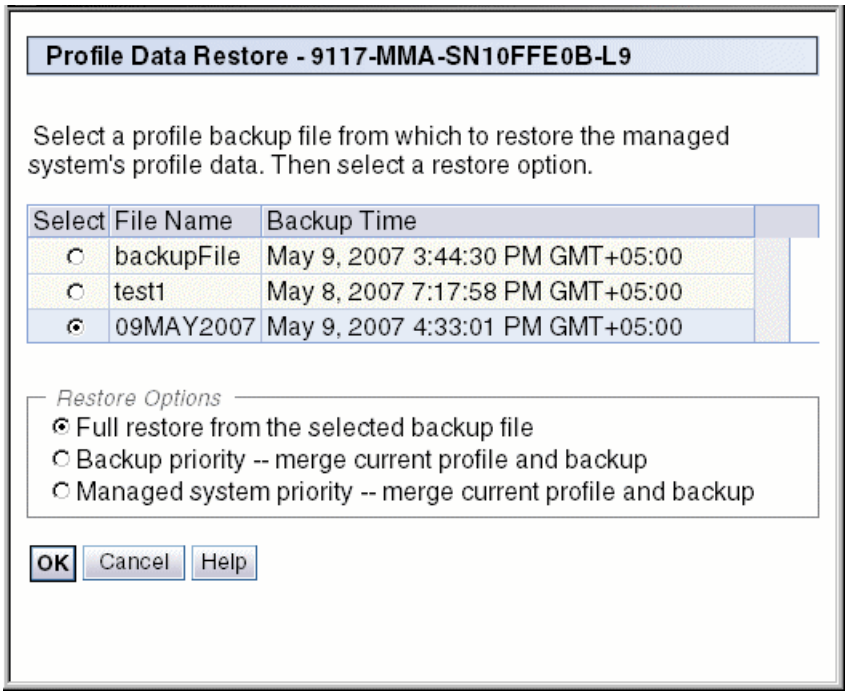


Figure 7-21 Restore profile data

You have the following options for restore:

- **Full restore**

  A full restore ignores all current partition profile data and restores the system using only the backup file. If you want to preserve any of the existing partition profile data that resides on the managed server during the restore process, you consider using *Backup priority* or *Managed system priority* instead of a full restore.

- **Backup priority**

  This option merges the backup file with the current partitions on the system. This option is useful when you want to do a restore and have the backup file restore existing partitions to a previous state.

An example of when this option would be useful is if you have a a partition where you have changed the memory, processors, or adapters, but the previous configuration of the partition performed better. By using this option, you can restore the partition to its previous state from a backup. Keep in mind this holds true for all partitions included in the backup data.

This option ultimately overwrites existing profile data with the profile data contained in the backup you are selecting.

- **Managed system priority**

  This option merges the backup file with the current partitions on the system, but if the backup file contains data for any of the current partitions their current state takes precedence over their backup state. This option is useful to restore deleted partitions without affecting the other partitions on the system.

  This option ultimately preserves existing partition profile data while restoring data for partitions not currently on the system.

7.3.2 Initialize

The *initialize* option clears all current profile data on the managed server and effectively removes all partitions from the hypervisor and system image on the HMC. (This option does not remove profile backups. To do that, see 7.3.4, “Delete” on page 251.)

To use this option, select **Configuration** → **Manage Partition Data** → **Initialize**. If you are certain that you want to remove all the partitions on the managed server, select **Yes** as shown in Figure 7-22.

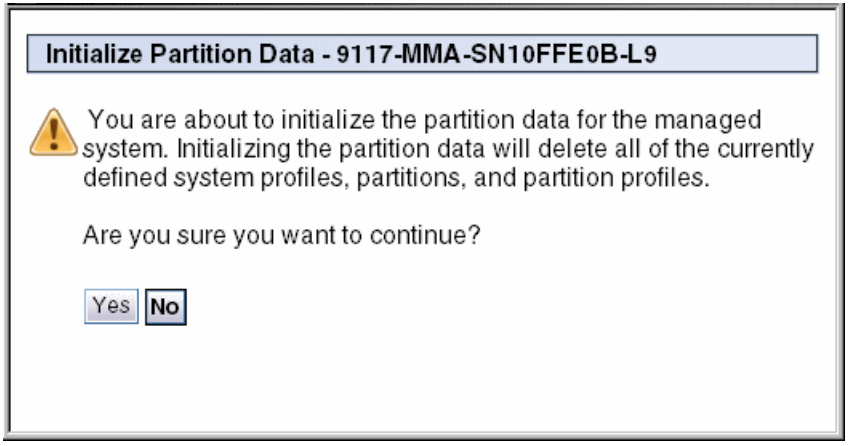


Figure 7-22 Initialize profile data

Note: You cannot initialize profile data if any partition on the managed system is in the *Standby* or *Operating* state. All partitions on the managed system must be in the *Not Activated* state to initialize profile data.

Times vary on how long it takes to initialize profile data. To initialize data can take as long as two minutes or longer.

When complete, your managed server will be clear of any profile data. From this point, you can create new partitions on the server or restore partition profile data from a previous backup. Read 7.3.1, “Restore” on page 248 on how to restore profile data.

7.3.3 Backup

The *backup* option allows for the backup of profile data for all partitions on a managed server to be saved locally on the HMC. To use this option, select **Configuration** → **Manage Partition Data** → **Backup**. Enter a name for the backup, and then select **OK** to continue, as shown in Figure 7-23.

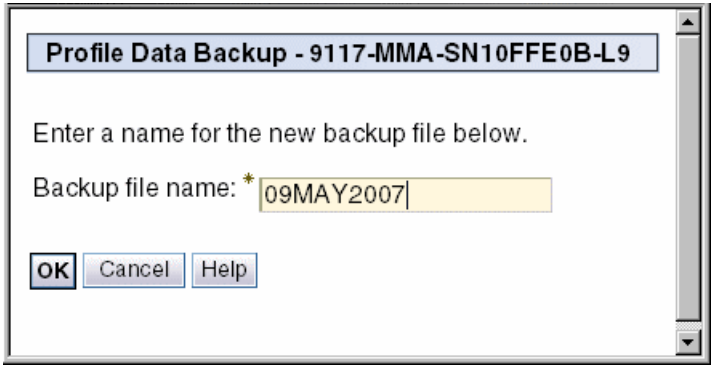


Figure 7-23 Backup profile data

The backup can take a minute or longer, depending upon how many partitions are on the system.

When the backup is complete, a message displays (Figure 7-24).

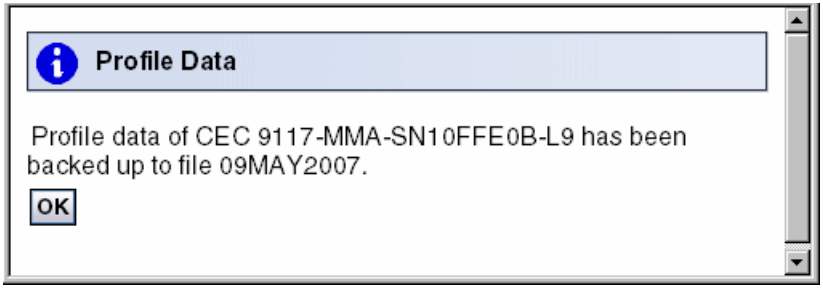


Figure 7-24 Backup profile data results

7.3.4 Delete

The *delete* option allows you to delete a single backup image of the managed server partition profile data. To use this option, select **Configuration** → **Manage Partition Data** → **Delete**. Select the partition profile image that you want to remove and select **OK**, as shown in Figure 7-25.

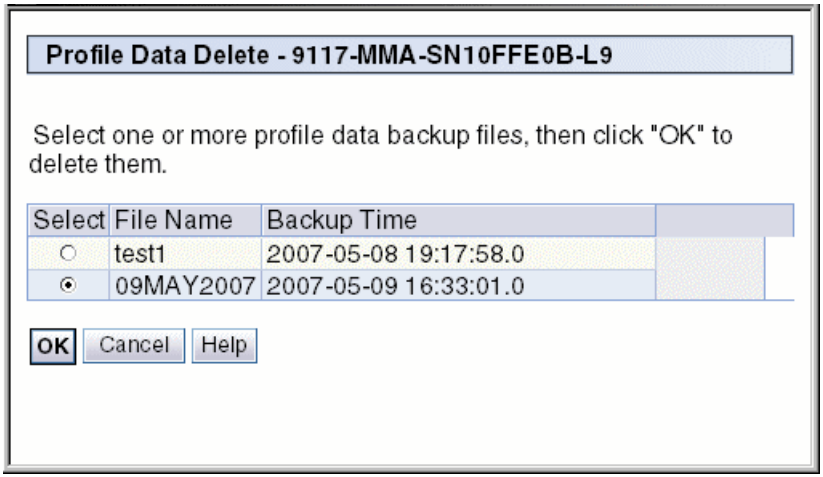


Figure 7-25 Delete profile data

A status window opens after you select **OK**. The HMC simply returns you to the main partition view when the deletion is complete.

8

Dual HMC and redundancy

A *dual HMC* is a redundant Hardware Management Console (HMC) management system that provides flexibility and high availability. When two HMCs manage one system, they are *peers*, and each can be used to control the managed system. One HMC can manage multiple managed systems, and each managed system can have two HMCs. If both HMCs are connected to the server using private networks, each HMC must be a DHCP server set up to provide IP addresses on two unique, nonroutable IP range.

This chapter discusses redundant HMC configurations and considerations.

8.1 Redundant HMC configurations

You can configure a redundant HMC in a configuration in which dual HMC servers are connected to the service processors.

Using a redundant HMC configuration with your service processor setup requires a specific port configuration, as shown in Figure 8-1. In this configuration, each service processor connects to a network hub that is connected to each HMC. The network hubs that are connected to the service processors must remain in the *power-on* state. Any 10/100BASE-T Ethernet switch or hub can be used to connect the server and HMC.

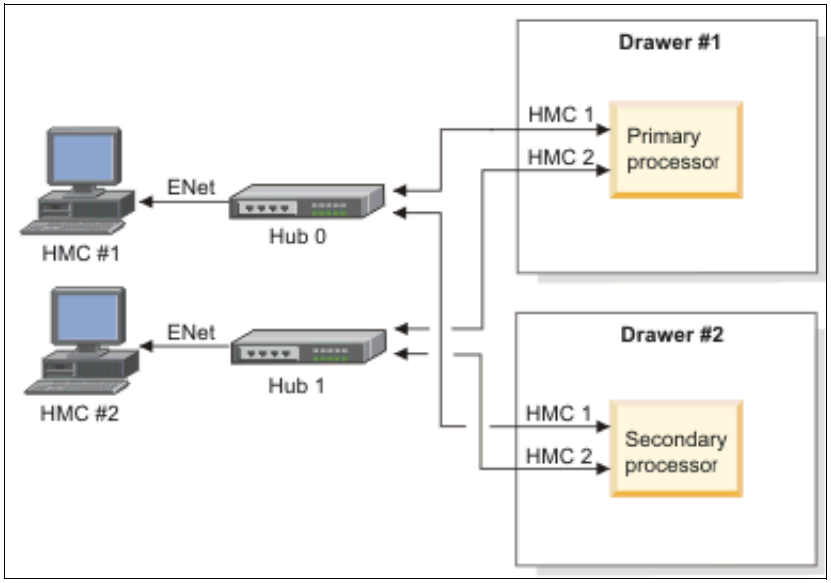


Figure 8-1 Dual HMC configuration on a private network

The HMC's first Ethernet port, eth0, should be configured to be a DHCP server over a private network. By default, the FSP uses a DHCP client to request an IP address. This occurs when power is applied to the server or FSP is reset.The FSP has two default IP addresses: 192.168.2.147 on HMC1 port and 192.168.3.147 on HMC2 port. Always turn on the HMC first, then the server, during setup, so that an IP address is available for the FSP, by which the HMC will also discover the servers on its private service network. See Figure 8-2.

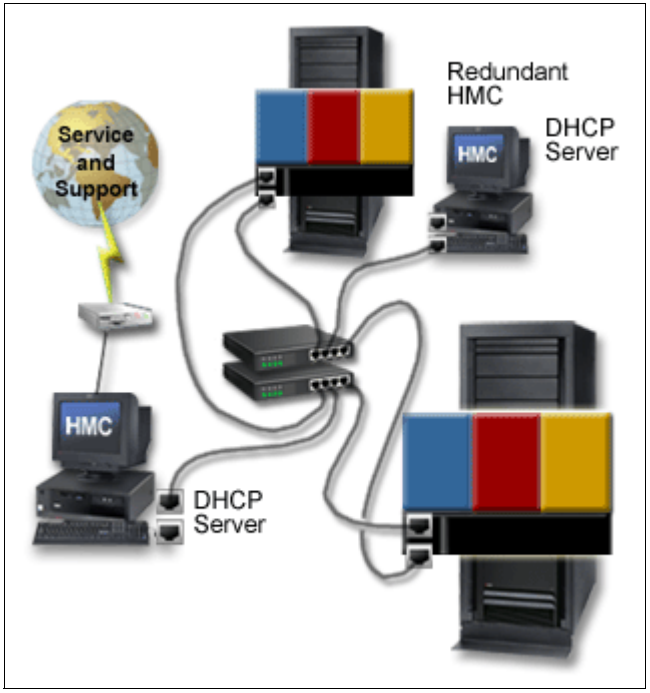


Figure 8-2 Dual HMC physical connections

For information about how to configure an HMC, refer to Chapter 3, "Installing the HMC" on page 69.

8.2 Redundant remote HMC

A redundant remote HMC configuration is very common. When customers have multiple sites or a disaster recovery site, they can use their second HMC in the configuration remotely over a switched network, as illustrated in Figure 8-3. The second HMC can be local, or it can reside at a remote location. Each HMC must use a different IP subnet.

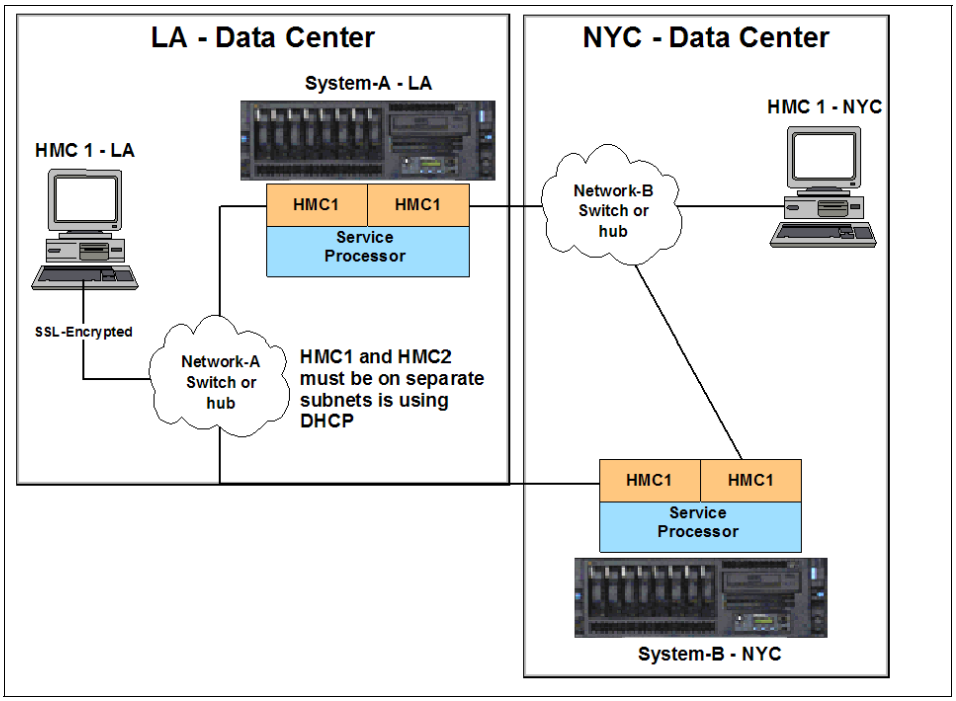


Figure 8-3 Example of redundant remote HMC

8.3 Redundant HMC configuration considerations

In a redundant HMC configuration, both HMCs are fully active and accessible at all times, enabling you to perform management tasks from either HMC at any time. There is no primary or backup designation.

You need to consider the following points:

- Because authorized users can be defined independently for each HMC, determine whether the users of one HMC should be authorized on the other. If so, the user authorization must be set up separately on each HMC.

- Because both HMCs provide Service Focal Point and Service Agent functions, connect a modem and phone line to only one of the HMCs and enable its Service Agent. To prevent redundant service calls, do not enable the Service Agent on both HMCs.
- Perform software maintenance separately on each HMC, at separate times, so that there is no interruption in accessing HMC function. This allows one HMC to run at the new fix level, while the other HMC can continue to run at the previous fix level. However, the best practice is to upgrade both HMCs to the same fix level as soon as possible.

The basic design of HMC eliminates the possible operation conflicts issued from two HMCs in the redundant HMC configuration. A locking mechanism provided by the service processor allows interoperation in a parallel environment. This allows an HMC to temporarily take exclusive control of the interface, effectively locking out the other HMC. Usually, this locking is held only for the short duration of time it takes to complete an operation, after which the interface is available for further commands.

Both HMCs are automatically notified of any changes that occur in the managed systems, so the results of commands issued by one HMC are visible in the other. For example, if you choose to activate a partition from one HMC, you will observe the partition going to the Starting and Running states on both HMCs.

The locking between HMCs does not prevent users from running commands that might seem to be in conflict with each other. For example, if the user on one HMC activates a partition, and a short time later a user on the other HMC selects to power the system off, the system will turn off. Effectively, any sequence of commands that you can do from a single HMC is also permitted when it comes from redundant HMCs.

For this reason, it is important to consider carefully how to use this redundant capability to avoid such conflicts. You might choose to use them in a primary and backup role, even though the HMCs are not restricted in that way. The interface locking between two HMCs is automatic, usually of short duration, and most console operations wait for the lock to release without requiring user intervention.

However, if one HMC experiences a problem while in the middle of an operation, it might be necessary to release the lock manually. HMC 2 can be used to disconnect HMC 1. When an HMC is disconnected, all locks owned by the HMC are reset. To due this, any *hmcsuperadmin* user can run the Disconnect Another HMC GUI task on HMC 2 against HMC1. This task can only be done from the graphical interface. There is no corresponding command line version of this task.

When running two HMCs to the same server, you should also be careful with long running functions, as they might be impacted if they have not completed before an additional function is run on the second HMC.

With the previous considerations in mind, there a number of good reasons to utilize the redundant HMC configuration. This list is not exhaustive:

- Redundancy of critical configuration information.
- Ability to apply maintenance to an HMC while the other is available for production management functions.
- Reduced risk of no HMC available.
- Knowing that a long running command is running against one system, being able to use the second HMC to perform functions on another system without waiting.

9

Virtual I/O

Virtual I/O provides the capability for a single physical I/O adapter and disk to be used by multiple logical partitions of the same server, allowing consolidation of I/O resources and minimizing the number of I/O adapters that are required.

In this chapter, we introduce the basic concept of a virtual I/O on an HMC V7 and discuss the main topics of Virtual SCSI, Virtual Ethernet, and Shared Ethernet Adapter.

We do not discuss how to install or configure the Virtual I/O Server in this chapter. If you information more about virtualization, refer to:

- *Advanced POWER Virtualization on IBM System p5: Introduction and Configuration*, SG24-7940
- *IBM System p Advanced POWER Virtualization Best Practices*, REDP-4194.
- Hardware Information Center

  http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp

9.1 Understanding virtual I/O

Virtual I/O describes the ability to share physical I/O resources between partitions in the form of *virtual adapter cards* that are located in the managed system. Each logical partition typically requires one I/O slot for disk attachment and another I/O slot for network attachment. In the past, these I/O slot requirements would have been physical requirements. To overcome these physical limitations, I/O resources are shared with virtual I/O. In the case of *Virtual Ethernet*, the physical Ethernet adapter is not required to communicate between LPARS. *Virtual SCSI* provides the means to share I/O resources for SCSI storage devices.

9.1.1 POWER Hypervisor for virtual I/O

The POWER Hypervisor™ provides the interconnection for the partitions. To use the functionalities of virtual I/O, a partition uses a virtual adapter as shown in Figure 9-1. The POWER Hypervisor provides the partition with a view of an adapter that has the appearance of an I/O adapter, which might or might not correspond to a physical I/O adapter.

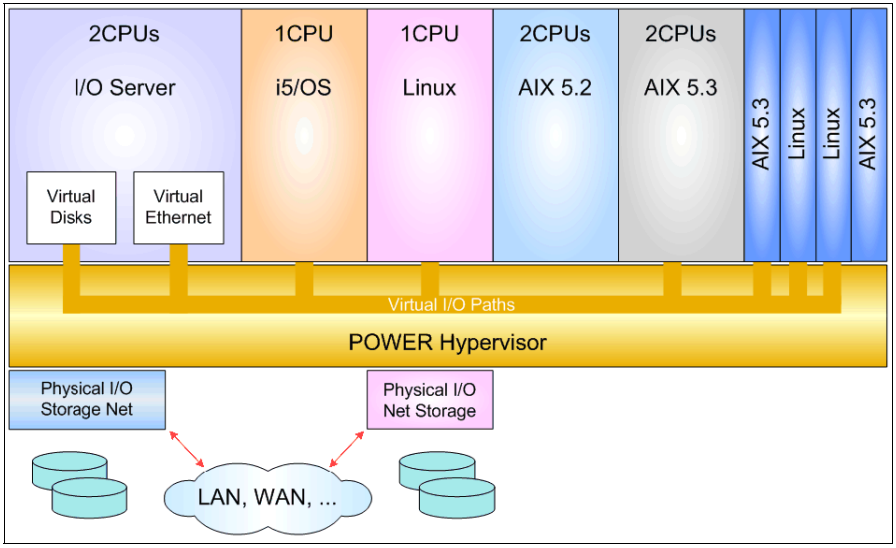


Figure 9-1 Role of POWER Hypervisor for virtual I/O

9.1.2 Virtual I/O Server

The Virtual I/O Server can link the physical resources to the virtual resources. By this linking, it provides virtual storage and Shared Ethernet Adapter capability to client logical partitions on the system. It allows physical adapters with attached disks on the Virtual I/O Server to be shared by one or more client partitions.

Virtual I/O Server mainly provides two functions:

- Serves virtual SCSI devices to clients, which is described in 9.2, “Virtual SCSI” on page 262.
- Provides a Shared Ethernet Adapter for virtual Ethernet, which is described in 9.4, “Shared Ethernet Adapter” on page 267.

Virtual I/O Server partitions are not intended to run applications or for general user logins. The Virtual I/O Server is installed in its own partition. The Virtual I/O Server partition is a special type of partition which is marked as such on the first window of the Create Logical Partitioning Wizard program.

Currently the Virtual I/O Server is implemented as a customized AIX partition, however the interface to the system is abstracted using a secure shell-based command line interface (CLI). When a partition is created as this type of partition, only the Virtual I/O Server software boot image will boot successfully when the partition is activated.

This Virtual I/O Server should be properly configured with enough resources. The most important resource is the processor resources. If a Virtual I/O Server has to host a lot of resources to other partitions, you must ensure that enough processor power is available.

9.2 Virtual SCSI

Virtual SCSI is based on a client/server relationship. A Virtual I/O Server partition owns the physical resources, and logical client partitions access the virtual SCSI resources provided by the Virtual I/O Server partition. The Virtual I/O Server partition has physically attached I/O devices and exports one or more of these devices to other partitions as shown in Figure 9-2.

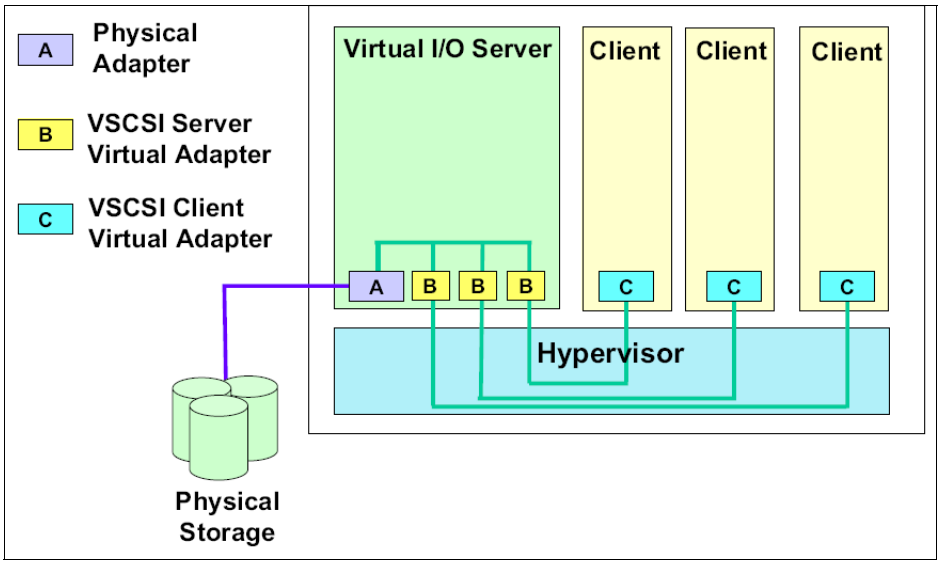


Figure 9-2 Virtual SCSI overview

The client partition is a partition that has a virtual client adapter node defined in its device tree and relies on the Virtual I/O Server partition to provide access to one or more block interface devices. Virtual SCSI requires POWER5 or POWER6 hardware with the Advanced POWER Virtualization feature activated.

9.2.1 Client/server communications

In the Figure 9-2, the virtual SCSI adapters on the server and the client are connected through the hypervisor. The virtual SCSI adapter drivers (server and client) communicate control data through the hypervisor.

When data is transferred from the backing storage to the client partition, it is transferred to and from the client's data buffer by the DMA controller on the physical adapter card using redirected SCSI Remote Direct Memory Access (RDMA) Protocol. This facility enables the Virtual I/O Server to securely target memory pages on the client to support virtual SCSI.

9.2.2 Adding a virtual SCSI server adapter

You can create the virtual adapters in two periods. One is to create those during installing the Virtual I/O Server. The other is to add those in already existing Virtual I/O Server. In this chapter, we suppose that we already created the Virtual I/O Server.

Before activating a server, you can add the virtual adapter using the Manage Profiles task. For an activated server, you can only do that through dynamic LPAR operation if you want to use virtual adapters immediately. This procedure requires that the network is configured with connection to the HMC to allow for dynamic LPAR.

Now, you can add the adapter through dynamic LPAR. To add the adapter:

1. Select the activated Virtual I/O Server partition in HMC. Then click **Virtual Adapters** in the Dynamic Logical Partitioning section in the Task pane. The Virtual Adapters window opens.
2. Click **Actions** → **Create** → **SCSI Adapter**, as shown in Figure 9-3.

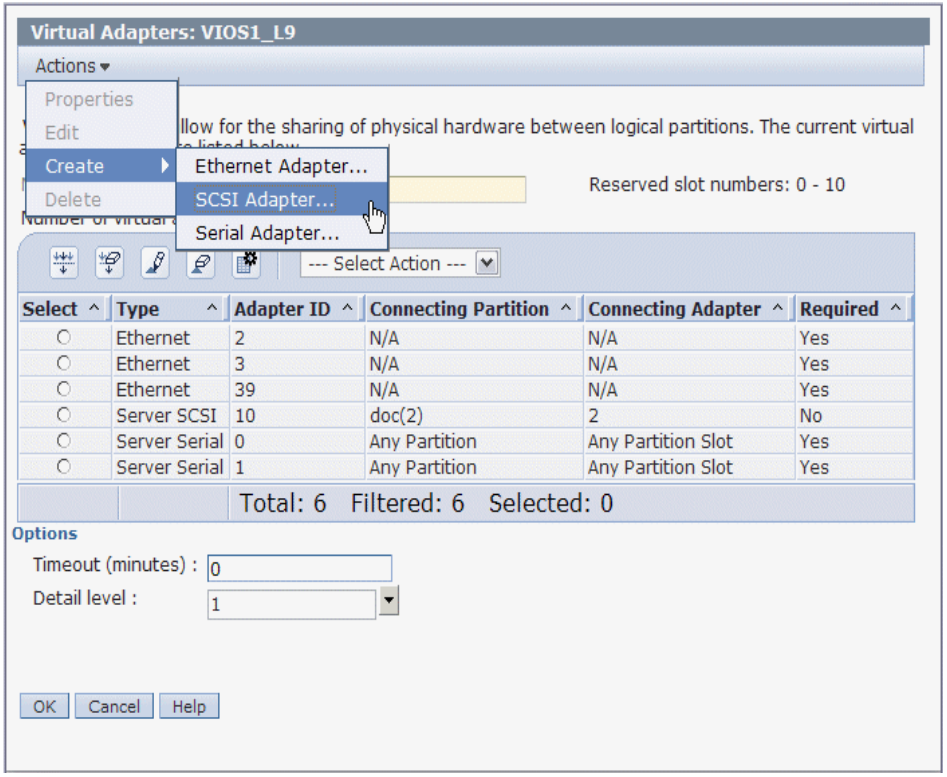


Figure 9-3 Create SCSI Adapter

3. In the next window, you create the new virtual SCSI adapter, as shown in Figure 9-4. If the clients are not known to the HMC, select **Any client can connect**. If you select this option, you have to change the client partition options to the proper name of the client after you create the clients.

   If you know which client partition is connected, select **Only selected client partition can connect**. Then, choose the client adapter ID number.

   Click **OK**.

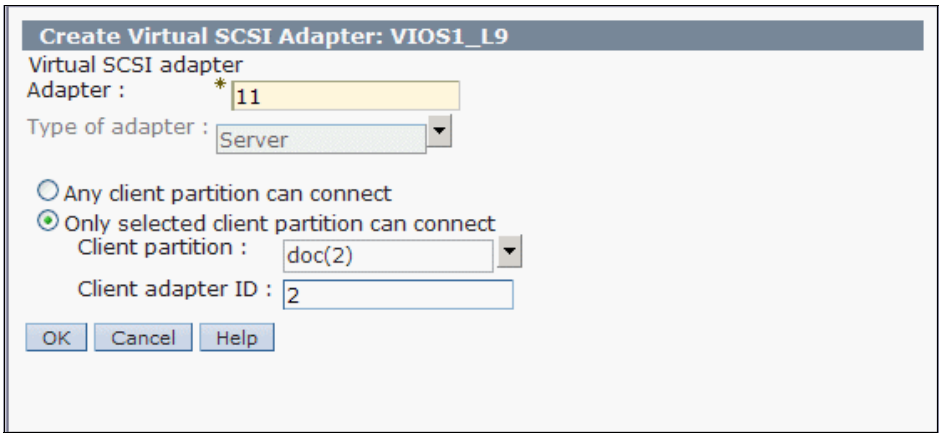


Figure 9-4 Create Virtual SCSI Adapter

4. Now, you can see the new virtual SCSI adapter in the Virtual Adapters window as shown in Figure 9-5. In our example, we set up the adapter to connect to the *doc* partition with *Adapter ID 11*.

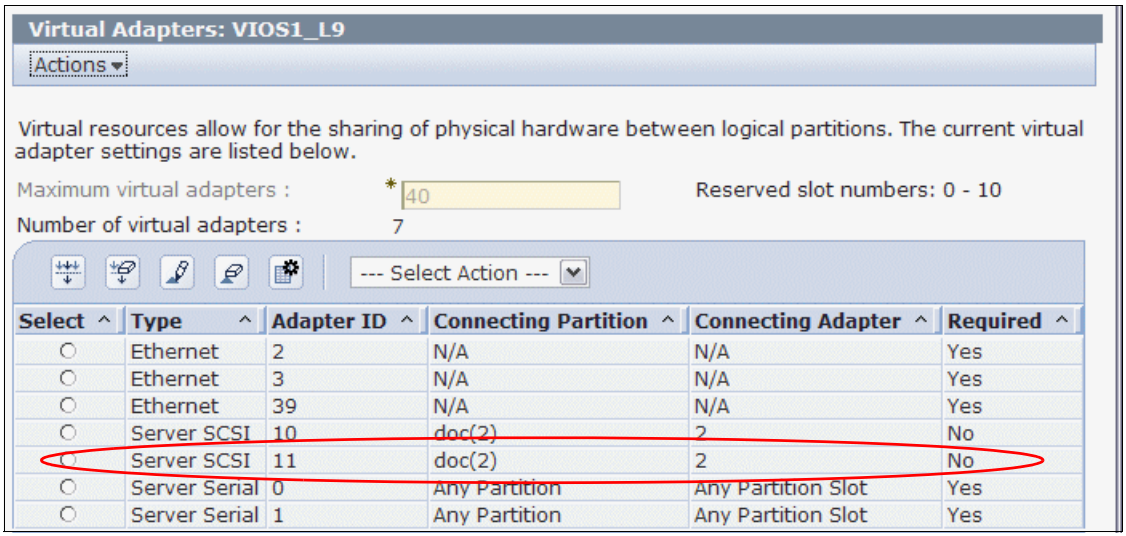


Figure 9-5 Display new virtual SCSI adapter

Note: We found that it is good to have a server slot number that is consistent with the client slot number. You can save time figuring out the slot mappings later.

9.3 Virtual Ethernet

Virtual Ethernet enables inter-partition communication without having physical network adapters assigned to each partition. It can be used in both shared and dedicated POWER5 and POWER6 processor partitions, provided that the partition is running AIX 5L V5.3 or Linux with the 2.6 kernel or a kernel that supports virtualization. This technology enables IP-based communication between logical partitions on the same system using a Virtual LAN capable software switch (POWER Hypervisor).

Due to the number of partitions possible on many systems being greater than the number of I/O slots, virtual Ethernet is a convenient and cost saving option to enable partitions within a single system to communicate with one another through a virtual Ethernet LAN. These connections exhibit characteristics similar

to physical high-bandwidth Ethernet connections and support multiple protocols (IPv4, IPv6, and ICMP).

Virtual Ethernet does not require the purchase of any additional features or software, such as the Advanced POWER Virtualization feature. Virtual Ethernet is different from Shared Ethernet adapter in that, there is no connection to a physical Ethernet adapter which connects to a physical Ethernet network. To use virtual Ethernet to connect to a physical Ethernet adapter which connects to a physical Ethernet network, you must implement Shared Ethernet adapter.

9.3.1 Virtual LAN overview

Virtual LAN (VLAN) is a technology used for establishing virtual network segments on top of physical switch devices. Multiple VLAN logical devices can be configured on a single system as shown in Figure 9-6. Each VLAN logical device constitutes an additional Ethernet adapter instance. These logical devices can be used to configure the same types of Ethernet IP interfaces as are used with physical Ethernet adapters.

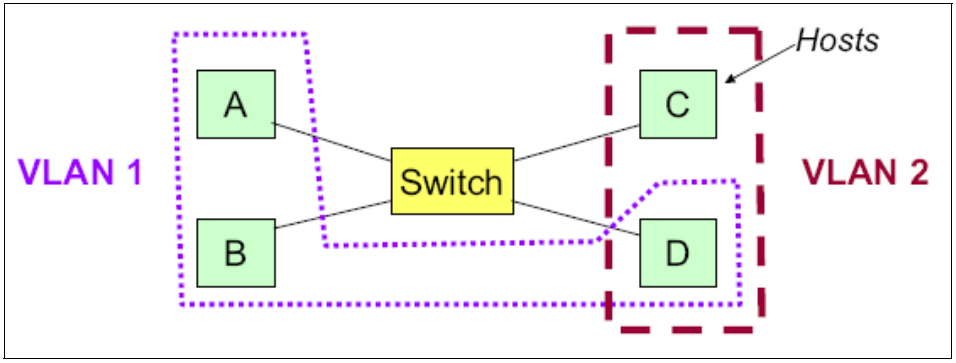


Figure 9-6 VLAN example: Two VLANs

9.3.2 Virtual Ethernet connection

Virtual Ethernet connections supported in POWER5 and POWER6 processor based systems use VLAN technology to ensure that the partitions can access only data that is directed to them. The POWER Hypervisor provides a virtual Ethernet switch function based on the IEEE 802.1Q VLAN standard that enables

partition communication within the same server as shown in Figure 9-7. The connections are based on an implementation internal to the Hypervisor that moves data between partitions.

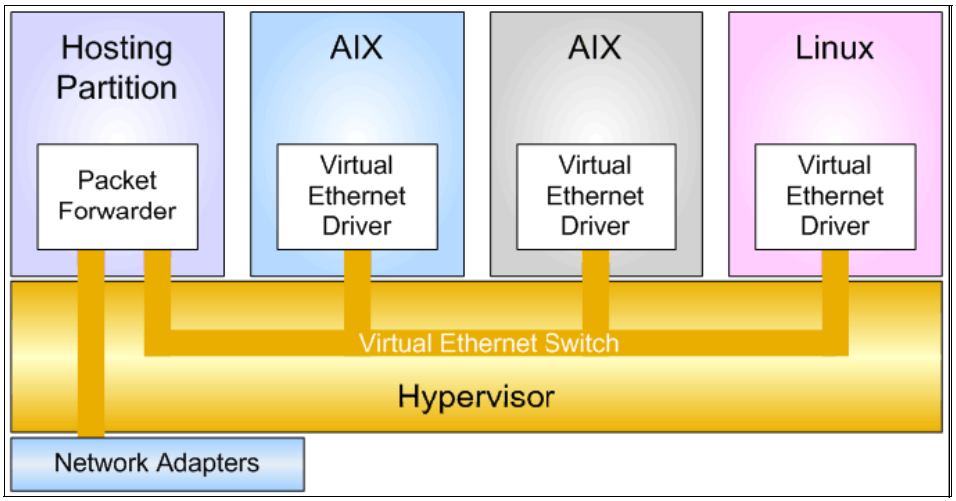


Figure 9-7 Virtual Ethernet connection

9.3.3 Adding virtual Ethernet

You can create virtual Ethernet adapters in the same manor as creating a virtual SCSI adapter as described in 9.2.2, “Adding a virtual SCSI server adapter” on page 263.

9.4 Shared Ethernet Adapter

A Virtual I/O Server partition is not required for implementing a VLAN. Virtual Ethernet adapters can communicate with each other through the POWER Hypervisor without the functionality of the Virtual I/O Server. Shared Ethernet adapter bridges external networks to internal VLANs. The Shared Ethernet Adapter hosted in the Virtual I/O Server partition acts as an OSI Layer 2 switch between the internal and external network.

Figure 9-8 shows the Shared Ethernet Adapter used as a bridge between the virtual Ethernet and physical Ethernet.

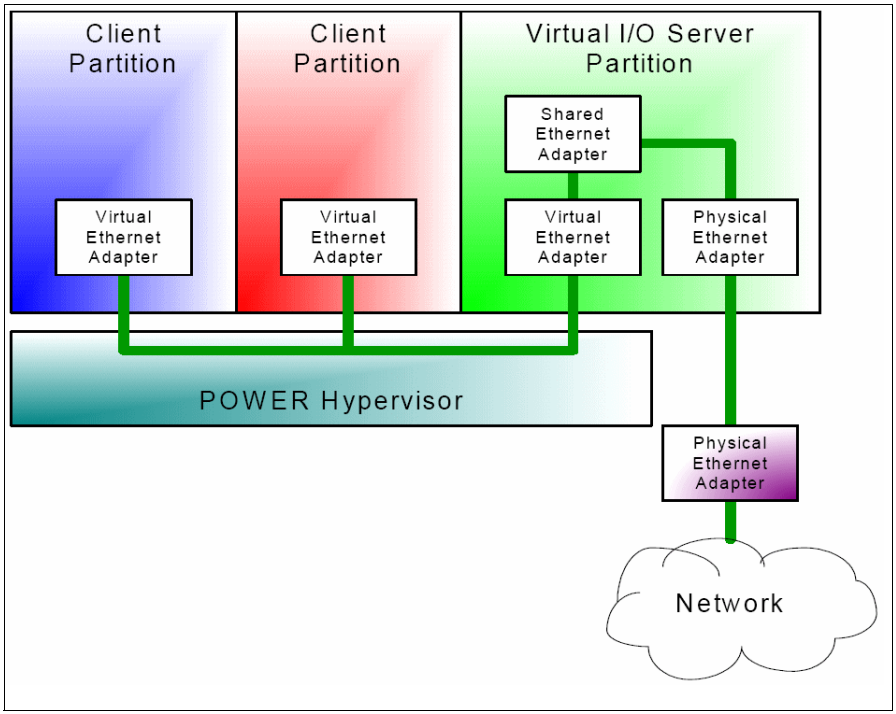


Figure 9-8 Shared Ethernet Adapter configuration

The bridge interconnects the logical and physical LAN segments at the network interface layer level and forwards frames between them. The bridge performs the function of a MAC relay (OSI Layer 2) and is independent of any higher layer protocol. Figure 9-9 is a close-up view of the Virtual I/O Server partition.

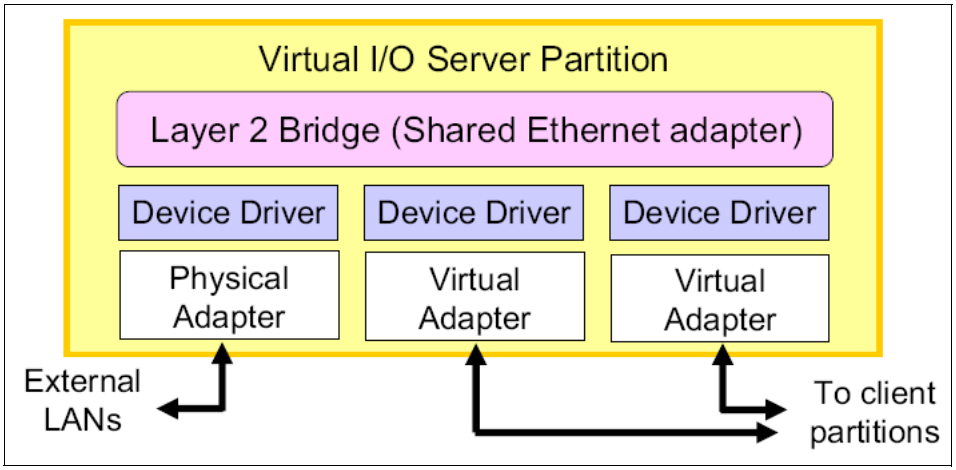


Figure 9-9 Shared Ethernet Adapter OSI layer

The bridge is transparent to the Internet Protocol (IP) layer. For example, when an IP host sends an IP datagram to another host on a network connected by a bridge, it sends the datagram directly to the host. The datagram crosses the bridge without the sending IP host being aware of it.

The Virtual I/O Server partition offers broadcast and multicast support. Address Resolution Protocol (ARP) and Neighbor Discovery Protocol (NDP) also work across the Shared Ethernet Adapter.

The Virtual I/O server does not reserve bandwidth on the physical adapter for any of the VLAN clients that send data to the external network. Therefore, if one client partition of the Virtual I/O Server sends data, it can take advantage of the full bandwidth of the adapter, assuming that the other client partitions do not send or receive data over the network adapter at the same time.

10

Command line interface

This chapter discusses added enhancements to the command line interface (CLI) . It also provides information about the most common command line options and usage.

On the Hardware Management Console (HMC), you can find a man page for every command. You can also access a PDF that includes all the man pages at:

http://www14.software.ibm.com/webapp/set2/sas/f/hmc/power6/related/hmc_man_7310.pdf

In addition, you can find the current command line specification at:

http://www.ibm.com

From the IBM main site, follow these steps:

1. Select **Support & downloads** → **Support by product** → **Systems and servers**. Then, select **System p**.
2. Under Popular Links, select **HMC Updates**. Select the most current release of HMC on this page.
3. On the Recovery Media tab, select **Related documentation** and select the command line specification.

10.1 CLI enhancements

Many changes have been made to the CLI for HMC V7 R3 to take advantage of the new features that are available in AIX and the POWER6 hardware.

This chapter provides information about changes made to the CLI for the following new features:

- Host Ethernet Adapter (HEA)
- Partition Availability Priority (PAP)
- Shared Pool Usage of Dedicated Processor Capacity for active partitions
- Partitioning Support for Barrier Synchronization Register (BSR)
- System Planning enhancements
- Managed System Dump enhancements
- Partition Processor Compatibility Modes
- Utility Capacity on Demand (CoD)
- i5/OS only enhancements
- Other changes in CLI not related to specific features

10.1.1 Host Ethernet Adapter

The commands that we list in this section have been enhanced to support Host Ethernet Adapter (HEA), which is a feature of POWER6 servers only.

For more information about Host Ethernet Adapter, see 7.1.1, “Host Ethernet Adapter” on page 221.

lshwres

The HEA added hardware resources to the system. The **lshwres** command adds parameter options that lists the new resources. To list HEA resources (POWER6 servers only), use this command:

```
lshwres -r hea -m managed-system
--rsubtype {logical | phys}
--level {port | port_group | sys}
[-R] [--stat]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

For the parameters in this command:

- `--rsubtype logical`

  Lists the valid HEA resource subtypes for *logical* HEA resources.

- `--rsubtype phys`

  Lists the valid HEA resource subtypes for *physical* HEA resources.

  The `--rsubtype` parameter is required when listing HEA resources.

- `--stat`

  When specified, the port counter statistics for HEA physical ports are listed.

- `--level “port” | “port_group” | “sys”`

  When specified with the `-- stat` parameter, this parameter provides information for a particular `port`, `port_group`, or the entire adapter.

- `--filter “adapter_ids”`

  This parameter has been enhanced to support HEA.

- `--filter “port_groups”`

  This parameter has been added to specify HEA port groups.

Valid filters for **`lshwres -r hea`** include:

- `--rsubtype logical --level sys:`

  `adapter_ids, lpar_ids | lpar_names`

- `-- rsubtype logical --level port:`

  `adapter_ids, lpar_ids | lpar_names, port_groups`

- `--rsubtype phys --level sys:`

  `adapter_ids`

- `--rsubtype phys --level port:`

  `adapter_ids, port_groups`

- `--rsubtype phys --level port_group:`

  `adapter_ids, port_groups`

chhwres

The **chhwres** command changes the hardware resource configuration of the managed system. This command is used to perform dynamic logical partitioning (DLPAR) operations and was updated so that HEA logical ports could be added, removed, or moved or so that the configuration could be updated.

To add, remove, or move an HEA logical port (POWER6 servers only), use this command:

```
chhwres -r hea -m managed-system -o {a | r | m}
{-p partition-name | --id partition-ID}
[{-t target-partition-name | --tid target-partition-ID}]
-l HEA-adapter-ID
[--physport physical-port-ID]
-g port-group --logport logical-port-ID
[-a "attributes"]
[-w wait-time] [-d detail-level] [--force]
```

To set HEA attributes (POWER6 servers only), use this command:

```
chhwres -r hea -m managed-system -o s
-l HEA-adapter-ID
[--physport physical-port-ID]
-g port-group -a "attributes"
```

For the parameters in this command:

- **-l** HEA-adapter-ID
  - The ID of the HEA to add, remove, or move
  - The DRC index of the slot
- **--physport** physical-port-ID
  - The ID of the HEA physical port
  - A required option when adding an HEA logical port to a partition
- **-g** port-group
  - The port group that includes the HEA logical port to add, remove, or move
  - The **-g** option is required for all (and only) HEA operations
  - This option is required when --logport is specified
- **--logport** logical-port-ID
  - The ID of the HEA logical port to add, remove, or move
- **-a** lhea_capabilities
  - Comma separated list of LHEA capabilities
  - Valid formats are *capability* or 5/ieq/nieq/qp/cq/mr

chsyscfg

The **chsyscfg** command changes the attributes of partitions, partition profiles, or system profiles for the managed system. It can also change the attributes of the managed system as well as the attributes of the managed-frame. This command supports the += and -= syntax.

To use this command, use this syntax:

```
chsyscfg -r {lpar | prof | sys | sysprof | frame}
{-m managed-system | -e managed-frame}
{-f configuration-file | -i "configuration-data"}
[--help]
```

These are the attributes that you can change for partition profiles (**-r prof**):

- lhea_logical_ports
  - POWER6 servers only.
  - Comma separated list of LHEA logical ports, with each logical port having the format:

    adapter-ID/port-group/physical-port-ID/logical-port-ID/allowed-VLAN-IDs

    All four slash (/) characters must be present, but optional values can be omitted. Optional values are allowed-VLAN-IDs.
- lhea_capabilities
  - POWER6 servers only.
  - Comma separated list of LHEA capabilities, with each capability having one of the following formats:

    adapter-ID/capability or adapter-ID/5/ieq/nieq/qp/cq/mr

rsthwres

The **rsthwres** command restores the hardware resource configuration of partitions in the managed system. This operation might need to be performed after a DLPAR operation fails. This command was updated to handle the new LHEA resources.

For this command, use the following syntax:

```
rsthwres -r hea -m managed-system
[{-p partition-name | --id partition-ID}]
[-l HEA-adapter-ID]
[-g port-group --logport logical-port-ID]
```

When restoring HEA resources, specify the adapter ID of the HEA to restore. If this option is omitted and a partition is specified with the **-p** or **--id** option, then

all HEA resources, including LHEA and logical ports that are assigned to the specified partition are restored. If this option is omitted and a partition is not specified, then all HEA resources in the managed system are restored. This option is required when the **-g** and **--logport** options are specified to restore a specific logical port.

mksyscfg

The **mksyscfg** command creates partitions, partition profiles, or system profiles for the managed system. It can also be used to save the current configuration of a partition to a new partition profile and was updated to accept new parameters in the configuration file to configure HEA resources.

To use this command, use the following syntax:

```
mksyscfg -r {lpar | prof | sysprof} -m managed-system
[{-f configuration-file | -i "configuration-data"}]
[-o save {-p partition-name | --id partition-ID}
-n profile-name]
[--help]
```

The new attributes for this command are:

- `lhea_logical_ports`
  - POWER6 servers only.
  - Comma separated list of LHEA logical ports, with each logical port having the following format:

    adapter-ID/port-group/physical-port-ID/logical-port-ID/allowed-VLAN-IDs

    All four slash (/) characters must be present, but optional values can be omitted. Optional values are allowed-VLAN-IDs.
- `lhea_capabilities`
  - POWER6 servers only.
  - Comma separated list of LHEA capabilities, with each capability having one of the following formats:

    adapter-ID/capability or adapter-ID/5/ieq/nieq/qp/cq/mr
  - Valid values are 0 (base minimum - default), 1 (low), 2 (medium), 3 (high), 4 (dedicated), and 5 (custom).

lssyscfg

The **lssyscfg** command lists the attributes of partitions, partition profiles, or system profiles for the managed system. It can also list the attributes of the managed system, and of all of the systems managed by this HMC. This command was updated to handle the attributes associated with LHEA resource attributes.

To use this command, use the following syntax:

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

In this command:

- **-F** lhea_capable
  - The **-F** option is an added option to show if the managed system is LHEA capable.
  - The managed system is LHEA capable only if the hypervisor supports HEA and physical HEA exists.

Examples of HEA commands

Here are some examples of common HEA commands:

- List all physical HEAs on the managed system:

  ```
  lshwres -r hea -m mySys --rsubtype phys --level sys
  ```

- List all port groups for all HEAs on the managed system:

  ```
  lshwres -r hea -m mySys --rsubtype phys --level port_group
  ```

- List all physical ports belonging to port group 2 for the HEA with adapter ID 23000010:

  ```
  lshwres -r hea -m 9117-MMA*1234ABC --rsubtype phys --level port
  --filter "adapter_ids=23000010,port_groups=2"
  ```

- List all Logical Host Ethernet adapters (LHEA) on the managed system:

  ```
  lshwres -r hea -m mySys --rsubtype logical --level sys
  ```

- List all HEA logical ports assigned to partition p1:

  ```
  lshwres -r hea -m mySys --rsubtype logical --level port --filter
  "lpar_names=p1"
  ```

- Restore all HEA resources in the managed system:

  ```
  rsthwres -r hea -m mySystem
  ```

- Restore all HEA resources for partition p1:

  ```
  rsthwres -r hea -m mySystem -p p1
  ```

- Restore the logical port with ID 3 in port group 2 of the HEA with an adapter ID of 23000010:

  ```
  rsthwres -r hea -m 9117-MMA*1112223 --logport 3 -g 2 -l 23000010
  ```

- Add logical port 4 for physical port 0 belonging to port group 2 of the HEA with an adapter ID of 23000020 to partition p1. Also set the LHEA capability level to low:

  ```
  chhwres -r hea -m mySystem -o a -p p1 -l 23000020 --physport 0 -g 2
  --logport 4 -a "lhea_capabilities=1"
  ```

- Remove logical port 1 belonging to port group 2 of the HEA with an adapter ID of 23000020 from the partition with ID 8:

  ```
  chhwres -r hea -m 9117-MMA*123432C -o r --id 8 -l 23000020 -g 2
  --logport 1
  ```

- Set physical port attributes for port group 2 of physical port 1 of the HEA with an adapter ID of 23000020:

  ```
  chhwres -r hea -m mySystem -o s -l 23000020 -g 2 --physport 1 -a
  "conn_speed=auto,duplex=auto,flow_control=1"
  ```

- Set port group attributes for port group 1 of the HEA with an adapter ID of 23000030:

  ```
  chhwres -r hea -m sys1 -o s -l 23000030 -g 1 -a
  "pend_port_group_mcs_value=4"
  ```

10.1.2 Partition Availability Priority

The commands that we list in this section have been enhanced to support Partition Availability Priority (POWER6 servers only).

For more information about Partition Availability Priority, see 7.1.3, “Partition availability priority” on page 225.

lssyscfg

The **lssyscfg** command lists the attributes of partitions, partition profiles, or system profiles for the managed system. It can also list the attributes of the managed system, and of all of the systems managed by this HMC and was updated to handle the attributes associated with Partition Availability Priority attributes.

To use this command, use the following syntax:

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

The parameters in this command:

- `-F lpar_avail_priority_capable`
  - Shows if a managed system supports Partition Availability Priority.
  - Valid values are 0, 1.
- `-F lpar_avail_priority`
  - Displays the current Partition Availability Priority setting.
  - Valid values are 0 through 255.

mksyscfg

The **mksyscfg** command creates partitions, partition profiles, or system profiles for the managed system. It can also be used to save the current configuration of a partition to a new partition profile and was updated to accept new parameters in the configuration file to configure Partition Availability Priority attributes.

To use this command, use the following syntax:

```
mksyscfg -r {lpar | prof | sysprof} -m managed-system
[{-f configuration-file | -i "configuration-data"}]
[-o save {-p partition-name | --id partition-ID}
-n profile-name]
[--help]
```

The new attribute is:

- `lpar_avail_priority`
  - Partitions created with a default value of 127.
  - Valid values are:
    - Minimum (0) - the lowest priority. This partition is most likely to be affected by recovery events.
    - Low (63) - indicates low priority.
    - Default (127) - the default setting for most newly created partitions.
    - High (191) - the default setting for newly created special partitions types such as Virtual I/O Server partition.
    - Maximum (255) - the highest priority setting.
    - Custom (0 - 255) - allows users to enter their custom priority setting.

chsyscfg

The **chsyscfg** command changes the attributes of partitions, partition profiles, or system profiles for the managed system. It can also change the attributes of the managed system as well as the attributes of the managed-frame and was updated to handle the new Partition Availability Priority configuration attributes.

To use this command, use the following syntax:

```
chsyscfg -r {lpar | prof | sys | sysprof | frame}
{-m managed-system | -e managed-frame}
{-f configuration-file | -i "configuration-data"}
[--help]
```

The new attribute is:

- `lpar_avail_priority`
  - Partitions created with a default value of 127.
  - Valid values are:
    - Minimum (0) - this is the lowest priority. This partition is most likely to be affected by recovery events.
    - Low (63) - indicates low priority.
    - Default (127) - this is the default setting for most newly created partitions.
    - High (191) - this is the default setting for newly created special partitions types such as Virtual I/O Server partition.
    - Maximum (255) - This is the highest priority setting.
    - Custom (0 - 255) - allows users to enter their custom priority setting.

Examples of Partition Availability Priority commands

Here are some examples of common Partition Availability Priority commands:

- Show if a managed system supports Partition Availability Priority:

  ```
  lssyscfg -r sys -m system1 -F lpar_avail_priority_capable
  ```

- Create a partition with Partition Availability Priority set to default value:

  ```
  mksyscfg -m system1 -r lpar -i
  name=part1,profile_name=test,lpar_env=aixlinux,min_mem=512,desired_m
  em=512,max_mem=512
  ```

- Display the Partition Availability Priority setting of a partition:

  ```
  lssyscfg -r lpar -m system1 -F lpar_avail_priority
  ```

- Set/change Partition Availability Priority of a partition:

  ```
  chsyscfg -r lpar -m system1 -i name=part1,lpar_avail_priority=45
  ```

10.1.3 Shared pool usage of dedicated

This feature allows an active dedicated processor partition to share its unused processors. The commands that we list in this section have been enhanced to support shared pool usage.

You can find more information in 7.1.2, “Shared pool usage of dedicated capacity” on page 223.

lssyscfg

The **lssyscfg** command lists the attributes of partitions, partition profiles, or system profiles for the managed system. It can also list the attributes of the managed system and of all of the systems managed by this HMC. The **lssyscfg** command was updated to handle the attributes associated with Dedicated Processor Shared Pool Usage attributes.

To use this command, use the following syntax:

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

The parameters for this command are:

- `-F active_lpar_share_idle_procs_capable`

  Displays if the system supports Shared Dedicated Processors.

- `-F sharing_mode`

  Valid modes include `share_idle_procs_always` and `keep_idle_procs`.

- `-F state`

  Valid mode includes `Running`.

mksyscfg

The **mksyscfg** command creates partitions, partition profiles, or system profiles for the managed system. It can also be used to save the current configuration of a partition to a new partition profile and was updated to accept new parameters in the configuration file to configure Dedicated Processor Shared Pool Usage attributes.

To use this command, use the following syntax:

```
mksyscfg -r {lpar | prof | sysprof} -m managed-system
[{-f configuration-file | -i "configuration-data"}]
[-o save {-p partition-name | --id partition-ID}
-n profile-name]
[--help]
```

The new attributes are:

- `sharing_mode`

  Valid values for partitions using dedicated processors include:

  - `keep_idle_procs`

    Never share processors.

  - `share_idle_procs_always`

    Always share processors (POWER6 servers only).

  - `share_idle_procs`

    Share processors only when partition is inactive.

  - `share_idle_procs_active`

    Share processors only when partition is active (POWER6 servers only).

chsyscfg

The **chsyscfg** command changes the attributes of partitions, partition profiles, or system profiles for the managed system. It can also change the attributes of the managed system as well as the attributes of the managed-frame and was updated to handle the new Dedicated Processor Shared Pool Usage configuration attributes.

To use this command, use the following syntax:

```
chsyscfg -r {lpar | prof | sys | sysprof | frame}
{-m managed-system | -e managed-frame}
{-f configuration-file | -i "configuration-data"}
[--help]
```

The new attribute is:

- `sharing_mode`

  Valid values for partitions using dedicated processors are:

  - `keep_idle_procs`

    Never share processors.

  - `share_idle_procs_always`

    Always share processors (POWER6 servers only).

  - `share_idle_procs`

    Share processors only when partition is inactive.

  - `share_idle_procs_active`

    Share processors only when partition is active (POWER6 servers only).

chhwres

The **chhwres** command changes the hardware resource configuration of the managed-system. It is used to perform dynamic logical partitioning (DLPAR) operations and was updated to handle the new Dedicated Processor Shared Pool Usage configuration attributes.

To use this command, use the following syntax:

```
chhwres -r proc -m managed-system -o s
{-p partition-name | --id partition-ID}
-a "attributes"
```

The new attribute is:

- `sharing_mode`

  Valid values for partitions using dedicated processors are:

  - `keep_idle_procs`

    Never share processors.

  - `share_idle_procs_always`

    Always share processors (POWER6 servers only).

  - `share_idle_procs`

    Share processors only when partition is inactive.

  - `share_idle_procs_active`

    Share processors only when partition is active (POWER6 servers only).

  - Can be changed when the partition is in running condition.

lshwres

The **lshwres** command lists the hardware resources of the managed system, including physical I/O, virtual I/O, memory, processing, Host Channel Adapter (HCA), HEA, and Switch Network Interface (SNI) adapter resources. New filters were added for the new Dedicated Processor Shared Pool Usage feature.

To use this command, use the following syntax:

```
lshwres -r proc -m managed-system
--level {lpar | pool | sys} [-R]
[--procunits quantity]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

The new attributes are:

- **-F** pend_sharing_mode
  - Describes the pending capping mode,
  - Valid modes are capped and uncapped.
- **-F** sharing_mode
  - share_idle_procs_active

    Specifies Donor mode.
  - share_idle_procs

    Specifies Sharing mode.

lslparutil

The **lslparutil** command lists utilization data that is collected for a managed system. This command also lists the HMC settings for utilization data collection.

To use this command, use the following syntax:

```
lslparutil -r {hmc | lpar | pool | sys | all}
-m managed-system
[-d number-of-days] [-h number-of-hours]
[--startyear year] [--startmonth month]
[--startday day] [--starthour hour]
[--endyear year] [--endmonth month]
[--endday day] [--endhour hour]
[-n number-of-events] [-s sample-rate]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

A new attribute was added to the shared_cycles_while_active filter that shows the total cycles donated by this LPAR since PHYP IPL.

Examples of shared pool usage commands

Here are some examples of shared pool usage commands:

- Display if a managed system is capable of donating idle processor cycles when the partition is in active state:

```
lssyscfg -r sys -m system1 -F active_lpar_share_idle_procs_capable
```

- Modify the Sharing/Donor attribute while creating the profile:

```
mksyscfg -r prof -m system1 -i
“name=prof2,lpar_name=part1,min_mem=256,desired_mem=1024,max_mem=102
4,proc_mode=ded,min_procs=1,desired_procs=1,max_procs=1,sharing_mode
=keep_idle_procs”
```

- Display current value of sharing attribute:

```
lssysfcg -r prof -m system1 --filter “lpar_names=part1” -F
sharing_mode
```

- Change the Sharing/Donor attribute of a profile:

```
chsyscfg -r prof -m system1 -i
“name=prof1,lpar_name=part1,sharing_mode=share_idle_procs_always”
```

- Change the Sharing/Donor attribute of a partition:

```
chhwres -m system1 -r proc -o s -a
“sharing_mode=share_idle_procs_active” -p part1”
```

- Display the current state of the partition:

```
lssyscfg -r lpar -m system1 -F name,state --filter lpar_names=part1
```

10.1.4 Partitioning support for barrier synchronization register

The commands that we list in this section have been enhanced to support barrier synchronization register (POWER6 technology only).

For more information about barrier synchronization register, see 1.4.10, “Barrier Synchronization Register” on page 13.

lssyscfg

The **lssyscfg** command lists the attributes of partitions, partition profiles, or system profiles for the managed system. It can also list the attributes of the managed system and of all of the systems managed by this HMC. The **lssyscfg** command was updated to handle the attributes associated with barrier synchronization register attributes.

To use this command, use the following syntax:

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

The filter attribute was added:

- `-F bsr_capable`

  Valid values are 0 and 1.

mksyscfg

The **mksyscfg** command creates partitions, partition profiles, or system profiles for the managed system. It can also be used to save the current configuration of a partition to a new partition profile and was updated to accept new parameters in the configuration file to configure barrier synchronization register attributes.

To use this command, use the following syntax:

```
mksyscfg -r {lpar | prof | sysprof} -m managed-system
[{-f configuration-file | -i "configuration-data"}]
[-o save {-p partition-name | --id partition-ID}
-n profile-name]
[--help]
```

The new attribute is `bsr_arrays`, which accepts an integer value.

chsyscfg

The **chsyscfg** command changes the attributes of partitions, partition profiles, or system profiles for the managed system. It can also change the attributes of the managed system as well as the attributes the managed-frame and was updated to accept new parameters in the configuration file to configure barrier synchronization register attributes.

To use this command, use the following syntax:

```
chsyscfg -r {lpar | prof | sys | sysprof | frame}
{-m managed-system | -e managed-frame}
{-f configuration-file | -i "configuration-data"}
[--help]
```

The new attribute is `bsr_arrays`, which accepts an integer value and supports the `+=` and `-+` syntax.

lshwres

The **lshwres** command lists the hardware resources of the managed system, including physical I/O, virtual I/O, memory, processing, HCA, HEA, and SNI adapter resources. New filters were added for the new barrier synchronization register feature.

To use this command, use the following syntax:

```
lshwres -r proc -m managed-system
--level {lpar | pool | sys} [-R]
[--procunits quantity]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

New attributes for this command include:

- New filters
  - `-F total_sys_bsr_arrays`

    The number of BSR arrays that can be assigned to partitions.
  - `-F bsr_array_size`

    The number of bytes in each assignable array.
  - `-F curr_avail_sys_bsr_arrays`

    The number of arrays that are not currently assigned to any partition.
- `lshwres-r mem --level lpar`
  - `-F curr_bsr_array`

    The number of BSR arrays that are allocated to a partition.

Examples of barrier synchronization register commands

Here are some examples of barrier synchronization register commands:

- Show if a managed system is BSR-capable if the hypervisor supports BSR partitioning and a BSR exists:

  ```
  lssyscfg -r sys -m system1 -F bsr_capable
  ```
- Display the number of BSR arrays that can be assigned, the size of each assignable BSR array, and the number of BSR arrays that are currently available for assignment:

  ```
  lshwres -r mem --level sys -m system1 -F
  total_sys_bsr_arrays,bsr_array_size,curr_avail_sys_bsr_arrays
  ```

- Display the number of BSR arrays that are currently allocated to a partition:

```
lshwres -r mem --level lpar -m system1 --filter lpar_ids=1 -F
curr_bsr_arrays
```

10.1.5 System planning

The commands that we in this section have been added to support new system planning features.

defsysplanres

The **defsysplanres** command defines a system plan resource for use by system plans deployed from the HMC:

```
defsysplanres -r osinstall -n resource-name
-v "resource-value" [-d "resource-description"] [--help]
```

lssysplanres

The **lssysplanres** command lists the system plan resources that are defined on this HMC. These resources can be used when deploying system plans from this HMC.

```
lssysplanres -r osinstall
[-F [attribute-names][--header]] [--help]
```

rmsysplan

The **rmsysplan** command removes a system plan file from the system plan file directory on the HMC:

```
rmsysplan -f file-name [--help]
```

10.1.6 HMC dump commands

The HMC allows users to show and configure the dump policy values. The commands that we list in this section have been enhanced to support the features added to the dump functions.

lsdump

The **lsdump** command lists the dumps that are available on the managed system or the managed-frame. It can list the managed system dumps and the managed frame dumps that are available on the HMC and also lists the system dump parameters for the managed system. This command is only supported for POWER6 servers.

The syntax for this command is:

```
lsdump -m managed-system -r parm
[-F [attribute-names] [--header]]
```

The attribute for this command is `-r parm`, which is enhanced to display dump offload parameters.

dump

The **dump** command sets the system dump parameters for the managed system. This operation is only supported for POWER6 servers.

The syntax for this command is:

```
dump -m managed-system -t sys -o set -a "attributes" [--help]
```

The attributes for this command are:

- This is a new command added in HMC 7.3.
- The command sets the system dump parameters for a managed system (POWER6 servers only).

10.1.7 Partition processor compatibility modes

The commands that we list in this section have been enhanced to support partition processor compatibility mode. Changing modes is supported using command line only.

For more information about partition processor compatibility modes, see 1.4.6, “Processor compatibility” on page 11.

lssyscfg

The **lssyscfg** command lists the attributes of partitions, partition profiles, or system profiles for the managed system. It can list the attributes of the managed system, and of all of the systems managed by this HMC and can also list the attributes of cages in the managed-frame, the attributes of the managed-frame, or the attributes of all of the frames managed by this HMC.

To use this command, use the following syntax:

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

The attributes for this command are:

- `lssyscfg -r sys` displays two new attributes:
  - `lpar_proc_compat_mode_capable`

    Displays 0 (not capable), or 1 (capable).
  - `lpar_proc_compat_modes`

    Displays only if `lpar_proc_compat_mode_capable` value is 1.

    Displays value of `default` or `enhanced` (POWER6 servers only).
- `lssyscfg -r lpar` displays two new attributes:
  - `desired_lpar_proc_compat_mode`
  - Displays `default` or `enhanced`.
- `curr_lpar_proc_compat_mode`
  - Displays `default`, `POWER6`, or `enhanced`.
- `lssyscfg -r prof` displays one new attribute
  - `lpar_proc_compat_mode`
  - Displays `default` or `enhanced` (only if `plar_proc_mode_capable` value is 1).

mksyscfg

The **`mksyscfg`** command creates partitions, partition profiles, or system profiles for the managed system. It can also be used to save the current configuration of a partition to a new partition profile.

To use this command, use the following syntax:

```
mksyscfg -r {lpar | prof | sysprof} -m managed-system
[{-f configuration-file | -i "configuration-data"}]
[-o save {-p partition-name | --id partition-ID}
-n profile-name]
[--help]
```

The new attributes are:

- `-r {prof | lpar}|`
  - Accepts the new partition attribute `lpar_proc_compat_mode`.
  - Valid values are `default` or `enhanced`.
  - Valid only if the managed system supports partition processor compatibility modes.
  - Can be set for full system partitions.

chsyscfg

The **chsyscfg** command changes the attributes of partitions, partition profiles, or system profiles for the managed system. It can also change the attributes of the managed system as well as the attributes the managed-frame.

To use this command, use the following syntax:

```
chsyscfg -r {lpar | prof | sys | sysprof | frame}
{-m managed-system | -e managed-frame}
{-f configuration-file | -i "configuration-data"}
[--help]
```

The new attribute is:

- `-r prof`

  `lpar_proc_compat_mode`

  - Valid values are `default` or `enhanced`.
  - Valid only if the managed system supports partition processor compatibility modes.
  - Can be set for full system partitions.

Examples of partition processor compatibility mode commands

Here are some examples of partition processor compatibility mode commands:

- Show if the managed system is processor compatibility capable:

  ```
  lssyscfg -m system1 -r sys -F lpar_proc_compat_mode_capable
  ```

- Display all supported partition processor compatibility modes for the managed system:

  ```
  lssyscfg -m system1 -r sys -F lpar_proc_compat_modes
  ```

- Change the processor compatibility mode of the managed system to default:

  ```
  chsyscfg -m system1 -r prof -i
  "name=profile-name,lpar_name=partition-name,lpar_proc_compat_mode=de
  fault"
  ```

10.1.8 Utility Capacity on Demand

The commands that we list in this section have been enhanced to support Utility Capacity on Demand (CoD).

For more information about Utility CoD, see 13.3.4, “Utility CoD” on page 383.

chcod

The **chcod** command performs CoD operations on the managed system. It is used to enter a CoD code for the managed system. This command is used to activate On/Off CoD, Reserve CoD, or Utility CoD resources or to deactivate On/Off CoD, Reserve CoD, Trial CoD, or Utility CoD resources. CoD resources are either memory or processors.

The **chcod** command is also used to set or disable a Utility CoD processor minute usage limit. Reserve CoD is only supported on POWER5 servers. Utility CoD is only supported on POWER6 servers.

To activate or change the number of Reserve CoD or Utility CoD processors, use this syntax:

```
chcod -o a -m managed-system -c {reserve | utility}
-r proc -q quantity-of-processors
```

To deactivate all On/Off CoD, all Reserve CoD, all Trial CoD, or all Utility CoD resources, use this syntax:

```
chcod -o d -m managed-system
-c {onoff | reserve | trial | utility}
-r {mem | proc}
```

To set or disable a Utility CoD processor minute usage limit, use this syntax:

```
chcod -o s -m managed-system -c utility -r proc
-l number-of-processor-minutes
```

lscod

The **lscod** command lists CoD information for the managed system. Reserve CoD is only supported on POWER5 servers. Utility CoD is only supported on POWER6 servers.

To use this command, use the following syntax:

```
lscod -t {bill | cap | code | hist | util}
-m managed-system
[-c {cuod | mobile | onoff | reserve | trial | trialexc |
trialstd | utility | utilityen}]
[-r {mem | proc}]
[-F [attribute-names] [--header]] [--help]
```

The following options and attribute-names were added to valid CoD types:

- **-c** {utility | utilityen}
  - Utility CoD reporting codes | Utility CoD enablement codes
- **-t cap -c utility -r proc -F** attribute-names

  -F utility_state
  -F activated_utility_procs
  -F avail_procs_for_utility
  -F utility_days_left
  -F proc_min_usage
  -F proc_min_left
  -F this_month_proc_min
  -F last_month_proc_min
  -F total_proc_min
  -F unreported_proc_min
  -F reporting_threshold
  -F reporting_limit
  -F time_last_reported
  -F proc_min_last_reported
- **-t util -c utility -r proc**

  -F non_utility_procs
  -F utility_procs
  -F non_utility_procs_util
  -F utility_procs_util
  -F sample_sys_date
  -F sample_sys_time
  -F sample_rate

- **-t code -c utility -r proc**

  -F anchor_card_ccin
  -F anchor_card_serial_num
  -F anchor_card_unique_id
  -F sys_type
  -F sys_serial_num
  -F resource_id
  -F activated_resources
  -F sequence_num
  -F entry_check

- **-t code -c utilityen -r proc**

  -F **anchor_card_ccin**
  -F **anchor_card_serial_num**
  -F **anchor_card_unique_id**
  -F **unreported_processor_minutes**
  -F **sys_type**
  -F **sys_serial_num**
  -F resource_id
  -F activated_resources
  -F sequence_num
  -F entry_check

lslparutil

The **lslparutil** command lists utilization data that is collected for a managed-system. This command also lists the HMC settings for utilization data collection.

The HMC collects the following types of utilization data: sampling events, state change events, configuration change events, and Utility CoD processor usage events.

To use this command, use the following syntax:

lslparutil -r {**hmc** | **lpar** | **pool** | **sys** | **all**}
-m *managed-system*
[**-d** *number-of-days*] [**-h** *number-of-hours*]
[**--startyear** *year*] [**--startmonth** *month]*
[**--startday** *day*] [**--starthou**r *hour*]
[**--endyear** *year*] [**--endmonth** *month*]
[**--endday** *day*] **[--endhour** *hour]*
[**-n** *number-of-events*] [**-s** *sample-rate*]
[**--filter** *"filter-data"*]
[**-F** [*attribute-names*] [**--header**]] [**--help**]

The attribute that was added for Utility CoD is:

- `shared_cycles_while_active`

  This attribute returns the number of dedicated processing cycles shared by this partition while it has been active since the managed system was started.

Examples of Utility CoD commands

Here are some examples of Utility CoD commands:

- Add Utility CoD processors to the shared processor pool or change the number of Utility CoD processors:

  ```
  chcod -o a -m system1 -c utility -r proc -q quantity-of-processors
  ```

- Remove all Utility CoD processors from the shared processor pool:

  ```
  chcod -o d -m system1 -c utility -r proc
  ```

- Display Utility CoD enablement code generation information:

  ```
  lscod -t code -m system1 -c utilityen -r proc -F "" --header
  ```

- Display Utility CoD shared processor utilization:

  ```
  lscod -t util -m system1 -c utility -r proc -F "" --header
  ```

10.1.9 i5/OS only enhancements

This section includes CLI enhancements that pertain to i5/OS only. The commands that we list here have been enhanced to support various features on HMC 7.3.

lssyscfg

The **lssyscfg** command lists the attributes of partitions, partition profiles, or system profiles for the managed system. It can list the attributes of the managed system and of all of the systems managed by this HMC and can also list the attributes of cages in the managed-frame, the attributes of the managed-frame, or the attributes of all of the frames managed by this HMC.

To use this command, use the following syntax:

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

The following attribute was added for POWER6 servers running i5/OS:

- `lssyscfg -F “electronic_err_reporting_capable”`

mksyscfg

The **mksyscfg** command creates partitions, partition profiles, or system profiles for the managed system. It can also be used to save the current configuration of a partition to a new partition profile.

To use this command, use the following syntax:

```
mksyscfg -r {lpar | prof | sysprof} -m managed-system
[{-f configuration-file | -i "configuration-data"}]
[-o save {-p partition-name | --id partition-ID}
-n profile-name]
[--help]
```

The following attribute was added:

- `mksyscfg -i “electronic_err_reporting={0 | 1}`

  Enables or disables Electronic Error Reporting.

The `load_source_slot` attribute is no longer required to be specified when creating an i5/OS partition or partition profile on a POWER6 server.

chsyscfg

The **chsyscfg** command changes the attributes of partitions, partition profiles, or system profiles for the managed system. It can also change the attributes of the managed system as well as the attributes the managed-frame.

To use this command, use the following syntax:

```
chsyscfg -r {lpar | prof | sys | sysprof | frame}
{-m managed-system | -e managed-frame}
{-f configuration-file | -i "configuration-data"}
[--help]
```

The following attribute was added:

- `chsyscfg -i electronic_err_reporting={0 | 1}`

  Changes the Electronic Error Reporting value.

chsysstate

The **chsysstate** command changes the state of a partition, the managed system, or the managed-frame. It was updated to enable console service functions on an i5/OS partition.

To perform an operator panel service function on a partition:

```
chsysstate -m managed-system -r lpar
-o {dston | remotedstoff | remotedston |
consoleservice | iopreset | iopdump}
{-n partition-name | --id partition-ID}
```

The option that was added is `consoleservice`, which enables console service functions for the partition (operator panel function 65 followed by 21).

10.1.10 Other changes in CLI that are not related to specific features

The section lists command line options that are not necessarily related to any of the new features that we have listed previously in this chapter.

New options have been added to the **chhmc** command to set the date, time, time zone, and clock on the HMC.

```
chhmc -c date
-s modify
[--datetime date-time]
[--clock {local | utc}]
[--timezone {time-zone | none}]
[--help]
```

Option requirements changed for the **lssyscfg** command:

- `lssyscfg -r prof -m managed system` now lists all partition profiles for all partitions in the managed system. The `--filter` option is no longer required.

```
lssyscfg -r {lpar | prof | sys | sysprof | cage | frame}
[-m managed-system | -e managed-frame]
[--filter "filter-data"]
[-F [attribute-names] [--header]] [--help]
```

A new option has been added to the **chsvcevent** command to close one or all serviceable events on the HMC. The options added were `close` and `closeall`.

```
chsvcevent -o {close | closeall}
[-p problem-number -h analyzing-HMC] [--help]
```

A new option has been added to the **mksysplan** command to limit the inventory gathered to just the PCI slot devices. The new option is `noprobe`. A new option has been added to the **mksysplan** command to display verbose output during command processing in addition to the default message, the new option is **-v**.

```
mksysplan -f file-name -m managed-system
[--check] [-d "description"] [-o noprobe] [-v] [--help]
```

The **lslic** command has been enhanced to display automatic code download status. The new options are `-t power` and `-t syspower`.

```
lslic {-m managed-system | -e managed-frame | -w}
[-t {sys | power | syspower | powerfru}]
[-r {ibmretain | ibmwebsite | ftp | dvd | disk | mountpoint}
[-h host-name] [-u user-ID] [--passwd password] [-d directory]
[-F [attribute-names] [--header]] [--help]
```

- `lslic -t power | syspower`

The **dlslic** command has been removed. The information that was displayed by the **dlslic** command is now displayed by the **lslic** command.

The **lsusrtca** command has been deprecated.

10.2 Most common command line options and usage

In this section, we list some of the most commonly used command line options.

Display information about systems, partitions, and profiles

- **lssysconn**

  Definition: List system connections

  Example:

  – List connection information for all systems and frames managed by this HMC:

    ```
    lssysconn -r all
    ```

- **lssyscfg**

  Definition: List system configuration

  Examples:

  – List all configuration information for systems managed by this HMC:

    ```
    lssyscfg -r sys
    ```

  – List all partitions in the managed system and only display attribute values for each partition, following a header of attribute names:

    ```
    lssyscfg -r lpar -m system1 -F --header
    ```

- **lshwres**

  Definition: Lists hardware resources

  Examples:

  - List all system level memory informations:

    ```
    lshwres -r mem -m system1 --level sys
    ```

  - List all virtual slots for partition part1:

    ```
    lshwres -r virtualio --rsubtype slot -m system1 --level slot
    --filter “lpar_names=lpar1”
    ```

Modifying resources

- **chsyscfg**

  Definition: Modifying system resources

  Examples:

  - Change a partition profile’s memory amounts (reduce the profile’s current memory amounts each by 256 MB) and number of desired processors:

    ```
    chsyscfg -r prof -m system1 -i
    “name=profile1,lpar_name=part1,min_mem=256,desired_mem=256,max_me
    m=256,desired_procs=2”
    ```

  - Change a partition profile’s memory amounts (reduce the profile’s current memory amounts each by 256 MB) and number of desired processors:

    ```
    chsyscfg -r prof -m system1 -i
    “name=profile1,lpar_name=part1,min_mem=256,desired_mem=256,max_me
    m=256,desired_procs=2”
    ```

  - Change a system profile (add two new partition profiles):

    ```
    chsyscfg -r sysprof -m system1 -i
    "name=sysprof1,"lpar_names+=part3,part4","profile_names+=3_prof1,
    4_defaultProf""
    ```

- **chhwres**

  Definition: Modifying hardware resources

  Examples:

  - Add a virtual Ethernet adapter to the partition with ID 3:

    ```
    chhwres -r virtualio -m system1 -o a --id 3 --rsubtype eth -a
    "ieee_virtual_eth=1,port_vlan_id=4,"addl_vlan_ids=5,6",is_trunk=1
    ,trunk_priority=1"
    ```

Creating resources

- **mksyscfg**

  Definition: Create system resources

  Example:

  – Create an AIX or Linux partition:

```
mksyscfg -r lpar -m system1 -i
"name=aix_lpar2,profile_name=prof1,lpar_env=aixlinux,min_mem=256,
desired_mem=1024,max_mem=1024,proc_mode=ded,min_procs=1,desired_p
rocs=1,max_procs=2,sharing_mode=share_idle_procs,auto_start=1,boo
t_mode=norm,lpar_io_pool_ids=3,"io_slots=21010003/3/1,21030003//0
""
```

Removing / restoring resources

- **rmsyscfg**

  Definition: Remove a system resource

  Example:

  – Remove the partition profile test_profile for partition lpar3:

```
rmsyscfg -r prof -m system1 -n test_profile -p lpar3
```

- **rmsysconn**

  Definition: Remove system connection

  Example:

  – Disconnect from the managed system sytem1 and remove it from the HMC:

```
rmsysconn -o remove -m system1
```

- **rsthwres**

  Definition: Restore hardware resources

  Example:

  – Restore memory resources for partition p1:

```
rsthwres -r mem -m system1 -p p1
```

Partition communication

- **mkvterm**

  Definition: Opens a virtual terminal session to a partition

  Example:

  – Open a virtual terminal session for partition p1:

  ```
  mkvterm -m system1 -p p1
  ```

Problem determination of the HMC or managed systems

- **lshmc**

  Definition: Lists HMC configuration information

  Example:

  – List the BIOS level of the HMC

  ```
  lshmc -b
  ```

  – List the network settings for the HMC

  ```
  lshmc -n
  ```

  – List the VPD information for the HMC

  ```
  lshmc -v
  ```

  – List the version information for the HMC

  ```
  lshmc -V
  ```

- **lspartition**

  Definition: Lists partition and their states.

  Example:

  – List the status of DLPAR enabled partitions

  ```
  lspartition -dlpar
  ```

- **pesh**

  Definition: Provides PE Shell access

- **pedbg**

  Definition: Product Engineering debug tools

  Example:

  – Collect various logs and javacore. This option can copy the data collected onto DVD or leave a compressed file in the /dump directory.

  ```
  pedbg -c
  ```

- **`lssysconn`**

  Example:

  – List connection information for all systems and frames managed by this HMC:

  ```
  lssysconn -r all
  ```

- **`lshmcusr`**

  Definition: Lists all users on the HMC

  Example:

  – List all users defined on this HMC:

  ```
  lshmcusr
  ```

- **`lssvcevents`**

  Definition: List console or serviceable events

  Example:

  – List the console events that occurred within the past three days:

  ```
  lssvcevents -t console -d 3
  ```

  – List all of the open serviceable events for the system system1:

  ```
  lssvcevents -t hardware -m system1 --filter "status=open"
  ```

11

Firmware maintenance

This chapter describes the various options that are available for maintaining both Hardware Management Console (HMC) and managed system firmware levels. We show you, through examples, the main firmware update options.

We discuss the different methods of updating the HMC to a new software level as well as installing individual fix packs. We also cover the temporary and permanent side of the firmware on a POWER6. Finally, we show the various options available to POWER6 system's firmware, either through the HMC or through an AIX service partition.

11.1 Critical Console Data backup

Before you begin any firmware upgrade, it is important that you maintain a current Critical Console Data (CCD) backup. This back up can be useful in recovering the HMC in the event of the loss of a disk drive.

When you move to a new version level of HMC or use a Recovery CD to update the HMC, you need to create a new CCD backup immediately following the installation. If you update HMC code between releases using the Corrective Service files downloadable from the Web and then create new CCD backups after the update, you can use those CCD backups and the last-used Recovery CD to rebuild the HMC to the level in use when the disk drive was lost.

Another example where a CCD would be useful is when replacing an FSP or BPC on a POWER6 server. You need to make a fresh CCD backup *before* starting the replacement to preserve the DHCP lease file on the HMC that lists the starting FSP and BPC IP addresses. If for some reason things do not work after you replace the FSP or BPC, you can use the backup to restore the original information. If the replacement is successful, a new IP address is assigned to the new component, and the lease file is updated. At this point, a new CCD backup is created that captures the freshly updated DHCP lease file.

With the HMC, you can back up the following important data:

- User-preference files
- User information
- HMC platform-configuration files
- HMC log files
- HMC updates through Install Corrective Service

Use the archived data only in conjunction with a reinstallation of the HMC from the product CDs.

Note: You cannot restore the Critical Console Data backup on different versions of HMC software.

11.1.1 Manual back up of Critical Console Data

To back up the HMC, you must be a member of one of the following roles:

- Super administrator
- Operator
- Service representative

You must format the DVD in the DVD-RAM format before you can save data to the DVD. To format a DVD, select **HMC Management** → **Format Media** from the HMC workplace window (Figure 11-1).

To back up CCD, click **HMC Management** → **Backup HMC Data**.

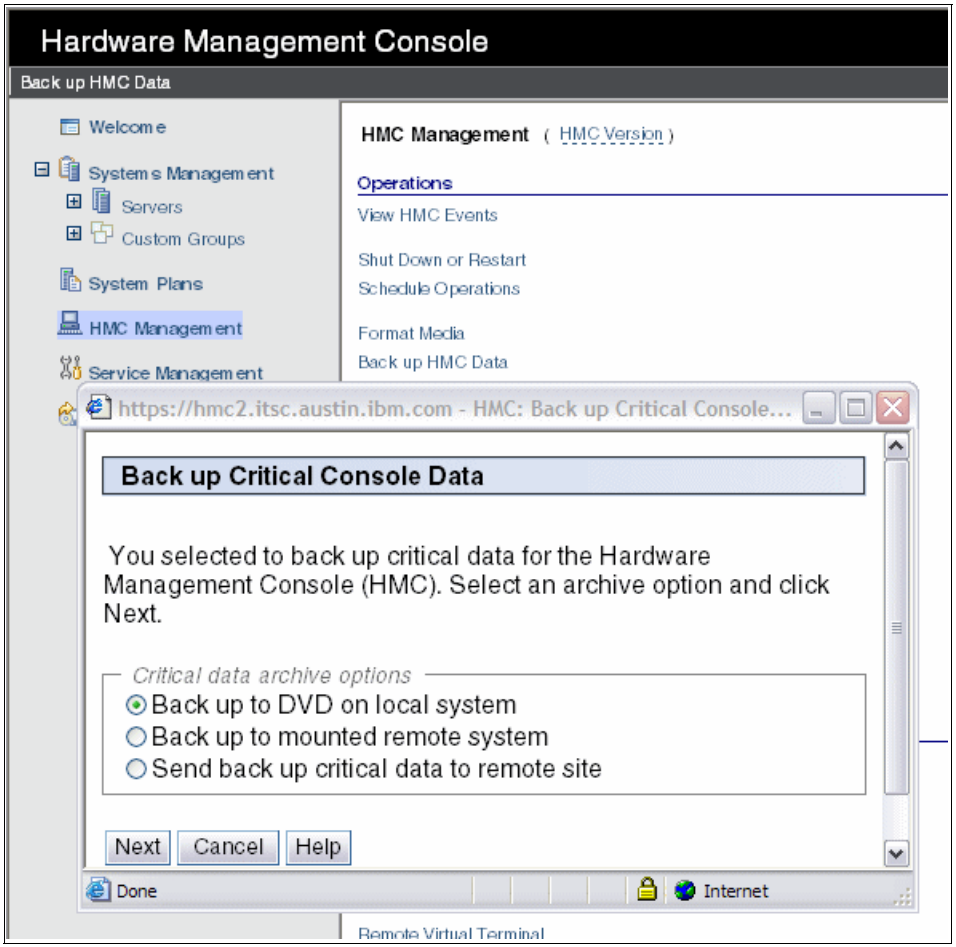


Figure 11-1 Back up Critical Console Data

Then, select an archive option. You can back up to a DVD on the HMC, back up to a remote system mounted to the HMC file system, or a remote site through FTP. After you select an option, click **Next**.

Follow the instructions to back up the data. Figure 11-2 shows an example to back up Critical Data to DVD.

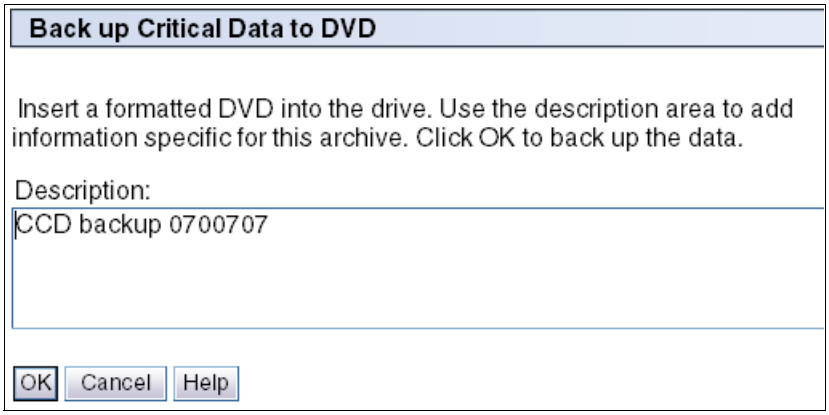


Figure 11-2 CCD back up to DVD

You can add specific information related to the Critical Console Data backup.

11.1.2 Scheduled Critical Console Data backup

You need to back up the CCD up at least once a week. You should also keep two copies of the CCD backup—one copy from the upgrade or any changes to the HMC and one backup CCD to store in a safe place. For information on how to make a backup, see 11.1, “Critical Console Data backup” on page 304.

To schedule a CCD backup, select **HMC Management** → **Schedule Operations** from the HMC workplace window. Then, follow these steps:

1. In the Customize Scheduled Operations window, select **Options** → **New** (Figure 11-3).

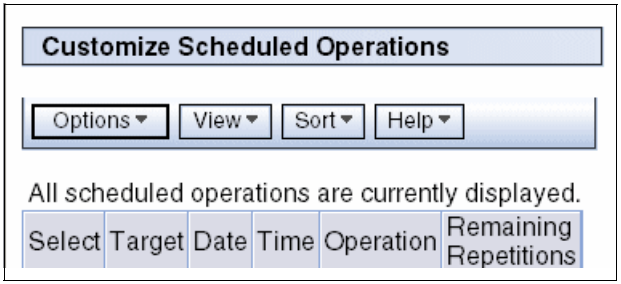


Figure 11-3 Customize Scheduled Operations

2. In the Add a Scheduled Operation window, select **OK**.
3. On the Date and Time tab, select the date and time, and time window for the first backup, as shown in Figure 11-4. The scheduled operation will start at that time window.

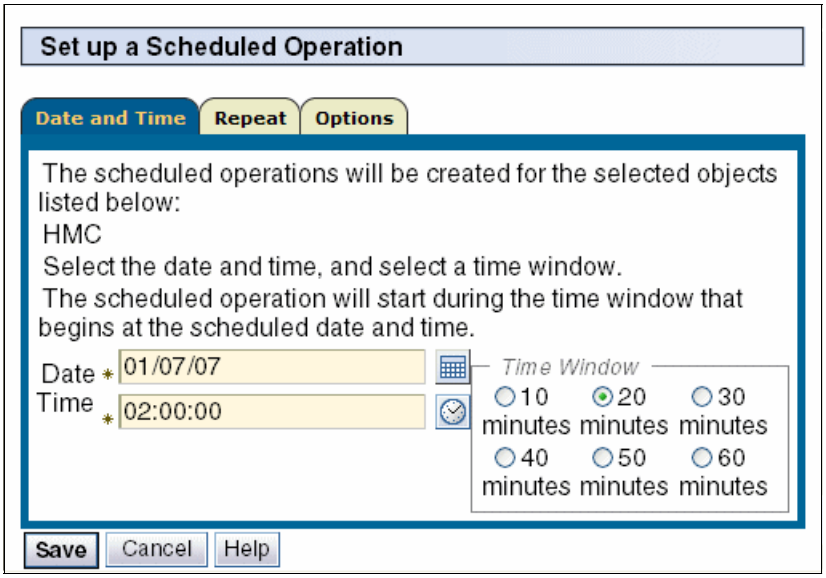


Figure 11-4 Set up a Scheduled Operation

4. On the Repeat tab, select the repeat options for the backup (Figure 11-5).

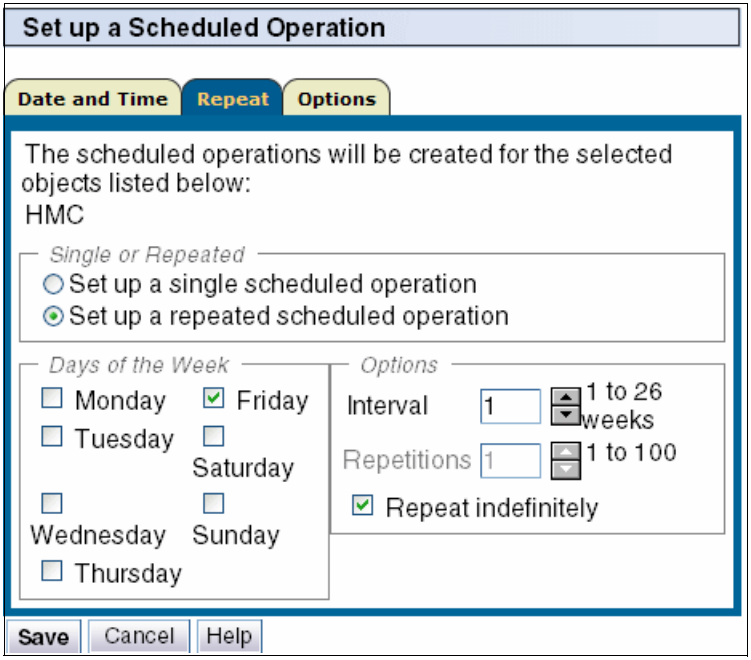


Figure 11-5 Scheduled CCD Repeat Option

5. On the Options tab, select the options available to backup media (Figure 11-6). The most common option is Local DVD Media.

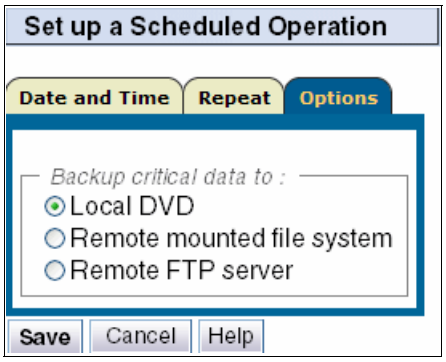


Figure 11-6 Scheduled CCD Options

6. After setting all the options, select **Save**. Then, select **OK**.
7. After you have saved the scheduled operations, you can view the operations by selecting **HMC management** → **Schedule Operations**. Select the CCD scheduled operation and then select **View**.

11.2 Restoring Critical Console Data

There are different ways of restoring CCD, depending on the option that you use to back up the data. This section describes these options.

11.2.1 Restoring data from DVD

You restore Critical Console Data from the menu displayed at the end of the HMC reinstallation. To restore from DVD, you need to insert the DVD that contains the archived console data. On the first boot of the newly installed HMC, the data is restored automatically.

11.2.2 Restoring data that was archived to a remote FTP or NFS server

If the critical console data was archived remotely either on a FTP server or remote file system, you need to:

1. Manually reconfigure network settings to enable access to the remote server after the HMC is installed. For information about configuring network settings, refer to Chapter 6, “Network configuration and the HMC” on page 195.
2. In the HMC workplace window, select **HMC Management** → **Restore HMC Data**. Then, select the type of restoration and click **Next**.
3. Follow the directions to restore the CCD. The data restores automatically from the remote server when the system reboots.

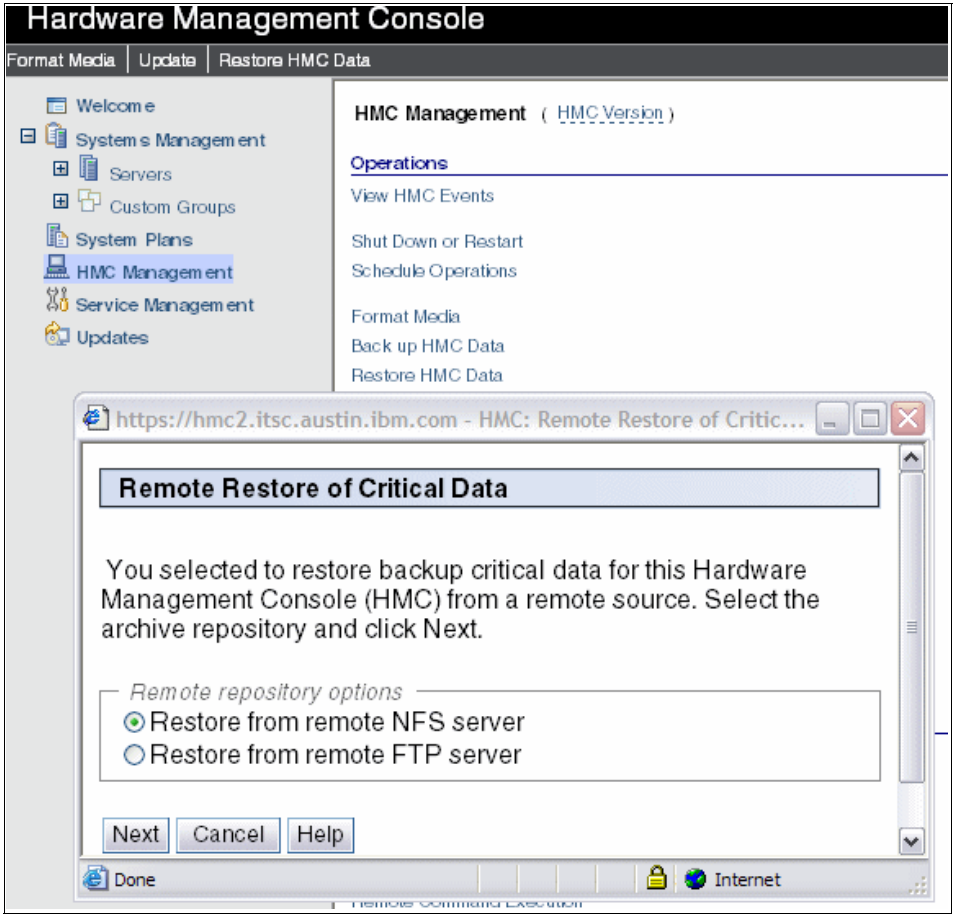


Figure 11-7 Remote restore

11.3 HMC firmware maintenance

The HMC is completely independent from the server. The server and all partitions can remain active while maintenance is performed on the HMC, allowing you to easily keep your HMC at the latest maintenance level.

The HMC software level has to be maintained same as managed system firmware. HMC firmware is packaged as a full Recovery CD set or as a Corrective Service pack/fix image. The HMC recovery CDs are bootable images and can be used to perform a complete recovery of the HMC (scratch install) or an update to an existing HMC version.

A corrective fix updates the minor version level of code on the HMC. The HMC update packages are available on CDs or as downloadable, compressed files. The downloadable, compressed files have different naming formats depending on whether they are individual fixes or complete update packages:

- MH*xxxxx*.zip - individual HMC fixes

  Where *xxxxx* is the HMC fix number

- HMC_Update_V*x*R*y*M*z*_*n*.zip - HMC update packages

  Where *x* is the version number, *y* is the release number, *z* is the modification number, and *n* is the image number (if there are multiple images)

11.3.1 How to determine the HMC software version

The level of machine code on the HMC determines the available features, including concurrent server firmware maintenance and enhancements to upgrading to a new release.

To determine the HMC software version, click **Updates** in the HMC workplace window. In the Work area, view and record the information that displays under the HMC Code Level heading, including the HMC version, release, maintenance level, build level, and base versions. See Figure 11-8.

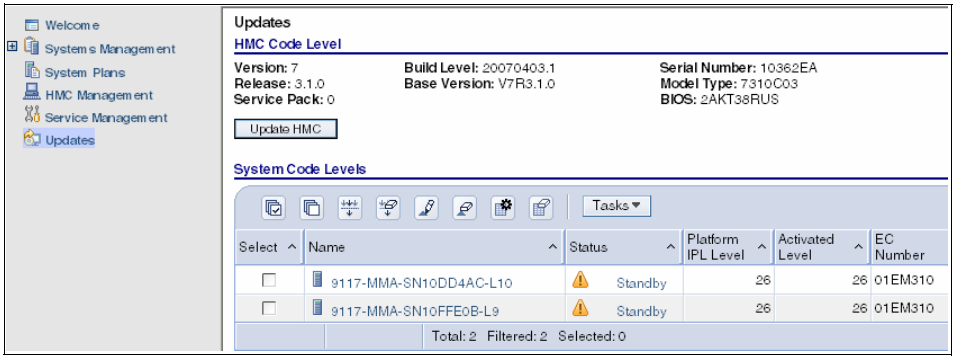


Figure 11-8 Shows the Version number of HMC and Managed Systems

11.3.2 Which firmware or fix level is correct for your system

One of the most important tasks is to determine the correct level of firmware or fix level for your system. IBM has an online tool called the *Fix Level Recommendation Tool*. The Fix Level Recommendation Tool assists system administrators in formulating a maintenance plan for IBM System p servers.

For each hardware model that you select, the tool displays fix level information in a report for the following components:

- HMC
- System Firmware (SF)
- AIX 5L
- Virtual I/O server (VIOS)
- High Availability Cluster Multi-processing (HACMP)
- General Parallel File System™ (GPFS)
- Cluster Systems Management (CSM)
- CSM Highly Available Management Server (CSM-HA)

To connect to the Fix Level Recommendation Tool, go to the following URL:

`https://www14.software.ibm.com/webapp/set2/flrt/home`

Figure 11-9 shows the Fix Level Recommendation Tool Web site main page.

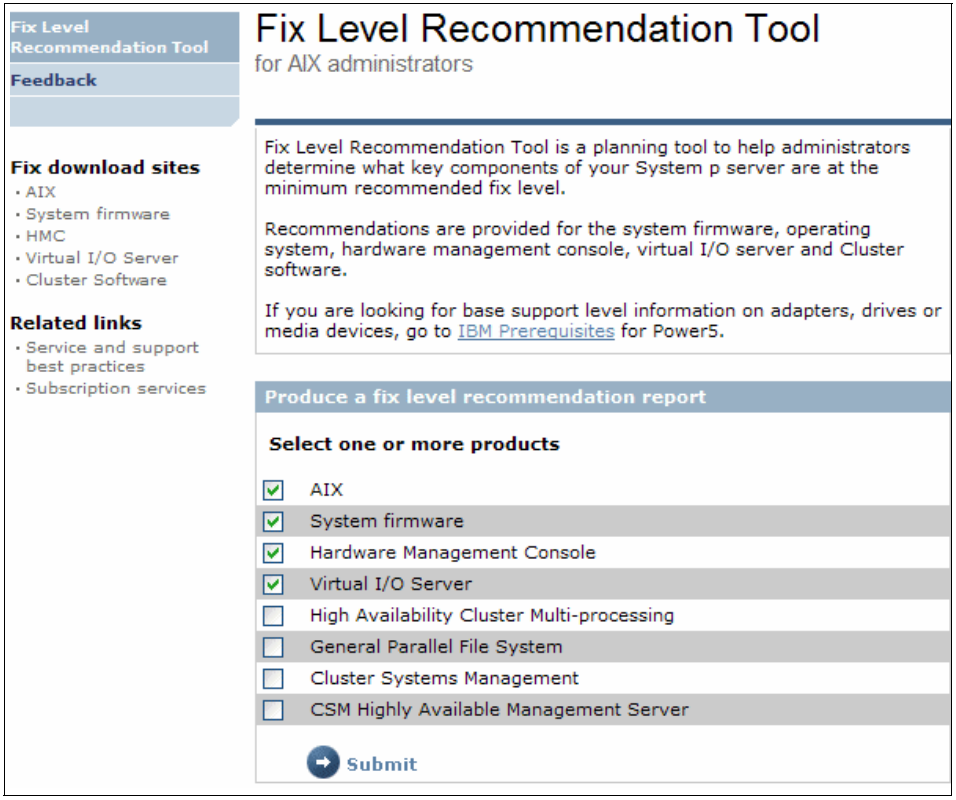


Figure 11-9 Fix Level Recommendation Tool Web site

Only the products that you select on the Fix Level Recommendation Tool entry page are listed on the *inventory page*. The Fix Level Recommendation Tool is most useful for querying the combination of two or more products to ensure that they are at the recommended level and that any interdependencies are met. For example, specific system firmware levels are required for some HMC releases, and VIOS only virtualizes a system with AIX 5L Version 5.3 and higher.

The report that the Fix Level Recommendation Tool produces includes two sections:

- Your selected level
- The recommended minimum fix level

To run a report:

1. On the Fix Level Recommendation Tool main page, select the products for which you want to check recommended levels and click **Submit**. The Fix Level Recommendation Tool displays the information shown in Figure 11-10.

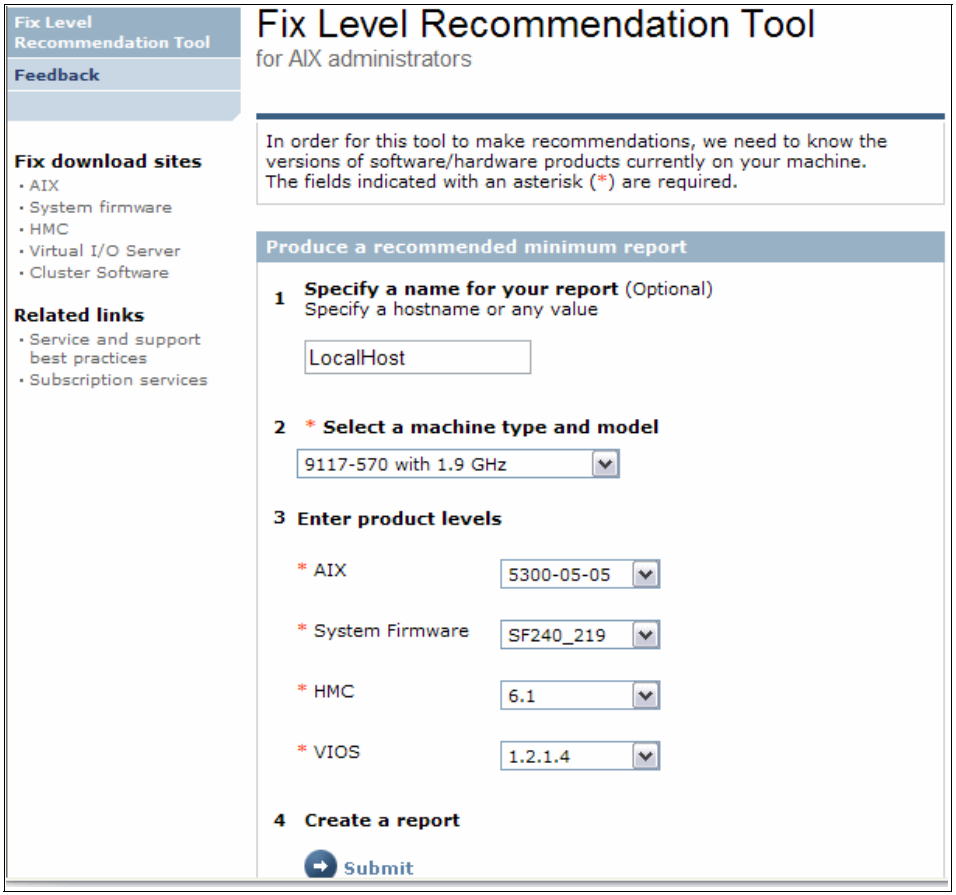


Figure 11-10 Fix Level Recommendation Tool product options window

2. Enter the current details from your system. To find the current fix level of HMC and managed system, refer to 11.3.1, “How to determine the HMC software version” on page 311. Select **Submit**.

The Fix Level Recommendation Tool displays the report, as shown in Figure 11-11.

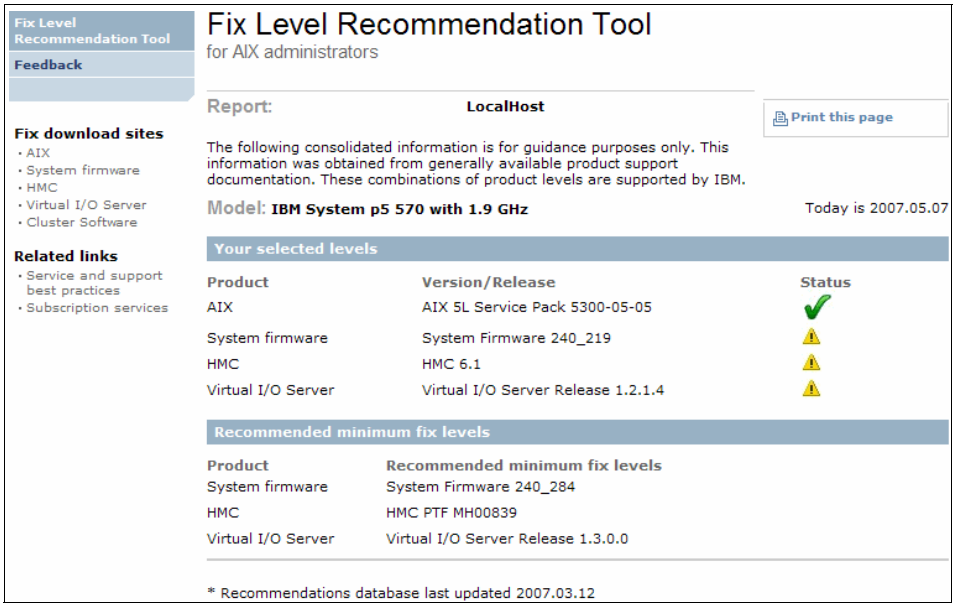


Figure 11-11 Fix Level Recommendation Tool recommendation window

Your selected levels

The report includes information on *Your selected levels*. This information includes the current levels that you entered on the inventory page. This section of the report lists the current levels and displays a check mark if your current level is already at a recommended level. A warning icon displays if the Fix Level Recommendation Tool finds a recommendation for a specific product.

Recommended minimum fix levels

The report also includes information on *Recommended minimum fix levels*. This information includes the levels that include the latest updates. When you decide what upgrade path to take, links on left side of the page take you to the download location for that firmware or software package.

Look for the check marks in the report. The check marks indicate that the fix level is at the current level under your selected levels. The warning icon indicates that the installed fix level is at a lower level than recommended level. Then, look at the recommended minimum fix levels on the window for the latest fix level available.

To download and apply the fixes, refer to Chapter 11, “Firmware maintenance” on page 303.

11.3.3 Obtaining HMC updates and recovery software

You can order Recovery CDs or download packages that contain the files that you need to burn your own Recovery CD. The files that you use to create CDs have a .iso file extension. The CDs created from these packages are bootable. You can download updates to HMC code as well as emergency fixes, and you can order CDs containing the updates and fixes. The CDs containing updates and fixes are *not* bootable.

Important: If you are not sure what code level is correct for your machine, then read 11.3.2, “Which firmware or fix level is correct for your system” on page 312.

Use the following URL to download the latest HMC software (Figure 11-12):

`http://www14.software.ibm.com/webapp/set2/sas/f/hmc/home.html`

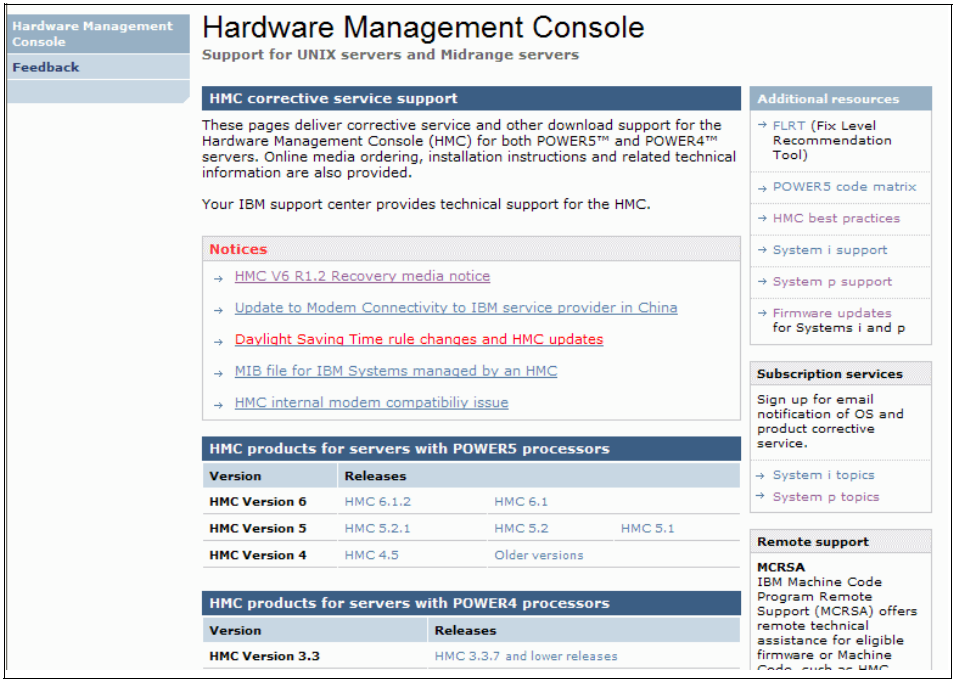
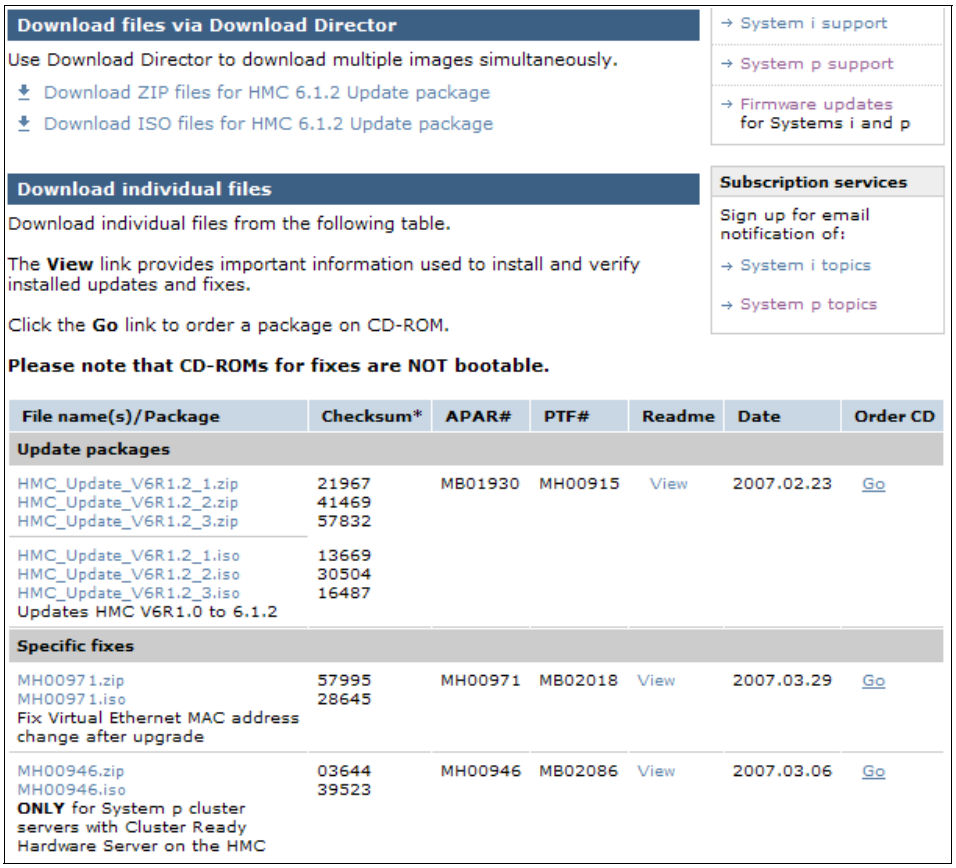


Figure 11-12 Displays the HMC software that is available on the Web site

Select the version of the software that you want to download (Figure 11-13).



Download files via Download Director

Use Download Director to download multiple images simultaneously.

Download ZIP files for HMC 6.1.2 Update package

Download ISO files for HMC 6.1.2 Update package

→ System i support

→ System p support

→ Firmware updates for Systems i and p

Download individual files

Download individual files from the following table.

The **View** link provides important information used to install and verify installed updates and fixes.

Click the **Go** link to order a package on CD-ROM.

Please note that CD-ROMs for fixes are NOT bootable.

Subscription services

Sign up for email notification of:

→ System i topics

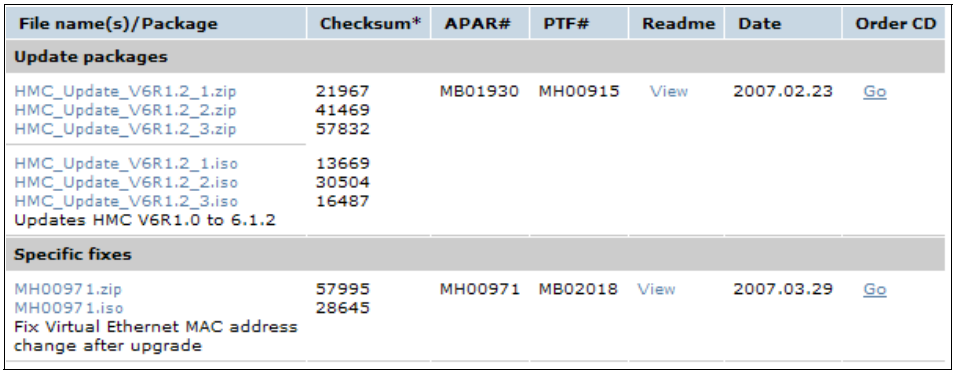
→ System p topics

File name(s)/Package	Checksum*	APAR#	PTF#	Readme	Date	Order CD
Update packages						
HMC_Update_V6R1.2_1.zip HMC_Update_V6R1.2_2.zip HMC_Update_V6R1.2_3.zip	21967 41469 57832	MB01930	MH00915	View	2007.02.23	Go
HMC_Update_V6R1.2_1.iso HMC_Update_V6R1.2_2.iso HMC_Update_V6R1.2_3.iso Updates HMC V6R1.0 to 6.1.2	13669 30504 16487					
Specific fixes						
MH00971.zip MH00971.iso Fix Virtual Ethernet MAC address change after upgrade	57995 28645	MH00971	MB02018	View	2007.03.29	Go
MH00946.zip MH00946.iso **ONLY** for System p cluster servers with Cluster Ready Hardware Server on the HMC	03644 39523	MH00946	MB02086	View	2007.03.06	Go

Figure 11-13 HMC software and update files available on IBM Web site

Save the file on your computer and burn it on a DVD or order a CD from IBM as shown in Figure 11-14.

Note: To order a DVD, you will need an IBM ID. Select **IBM ID** and follow the instruction to register. After you have registered, log in to the Web site and complete the necessary information.



File name(s)/Package	Checksum*	APAR#	PTF#	Readme	Date	Order CD
Update packages						
HMC_Update_V6R1.2_1.zip HMC_Update_V6R1.2_2.zip HMC_Update_V6R1.2_3.zip	21967 41469 57832	MB01930	MH00915	View	2007.02.23	Go
HMC_Update_V6R1.2_1.iso HMC_Update_V6R1.2_2.iso HMC_Update_V6R1.2_3.iso Updates HMC V6R1.0 to 6.1.2	13669 30504 16487					
Specific fixes						
MH00971.zip MH00971.iso Fix Virtual Ethernet MAC address change after upgrade	57995 28645	MH00971	MB02018	View	2007.03.29	Go

Figure 11-14 Ordering HMC code CD

11.3.4 Obtaining and applying HMC code from an FTP server

If your HMC has a VPN connection to the Internet, you might choose to perform the HMC update directly from the IBM support FTP server.

Important: Some of the HMC update packages are large (over 2 GB) and can take time to download.

To perform the HMC update directly from an FTP server:

1. First, back up Critical Console Data as described in 11.1, “Critical Console Data backup” on page 304.

2. Then, in the HMC workplace window, click **Updates** → **Update HMC**. The Install Corrective Service window opens (Figure 11-15).

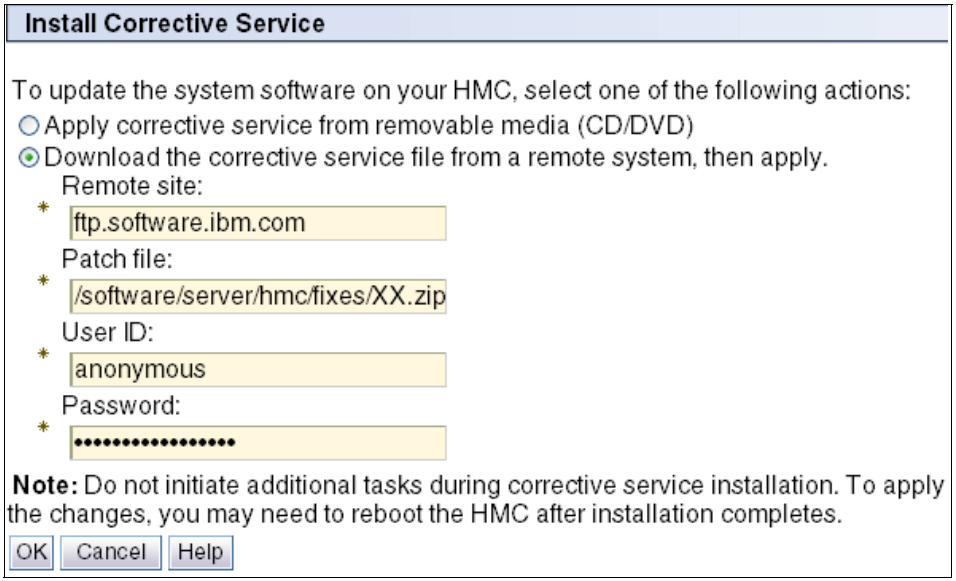


Figure 11-15 Install Corrective Service window

3. Select **Download the corrective service file from a remote system, and then apply**, and enter the following information:
   - **Remote site:** `ftp.software.ibm.com`
   - **Patch file:** `/software/server/hmc/fixes/filename.zip`

     Note: The name of the patch file changes with each new update. Refer to 11.3.2, “Which firmware or fix level is correct for your system” on page 312.

   - **User ID:** `anonymous`
   - **Password:** Your e-mail address
4. Click **OK**.
5. Follow the instructions to install the update.
6. Shut down and restart the HMC for the update to take effect.

11.3.5 Applying HMC code from CD or DVD

To apply HMC code from a CD or DVD, follow these steps:

1. You can either order a DVD with HMC updates from IBM or download .iso or a compressed file from the IBM software support site. For more information, see to11.3.3, “Obtaining HMC updates and recovery software” on page 316.
2. Insert the CD or DVD in the HMC.
3. In the HMC workplace window, click **Updates** → **Update HMC**. The Install Corrective Service window opens (Figure 11-15 on page 319).
4. Select **Apply corrective service from removable media (CD\DVD)** and click **OK**.
5. Follow the instructions to install the update. If you have more than one CD or DVD, then follow the procedure from step 2 for the second CD or DVD.
6. Shut down and restart the HMC for the update to take effect.
7. To verify that the HMC machine code update installed successfully, refer to 11.3.1, “How to determine the HMC software version” on page 311.
8. If the level of code displayed is not the level that you installed, perform the following steps:
   a. Retry the machine code update. If you created a CD or DVD for this procedure, use a new media.
   b. If the problem persists, contact your next level of support.

11.3.6 Upgrading the HMC machine code

Note: You cannot use this procedure to upgrade from a POWER4 HMC to a POWER5 HMC. You must do a full installation. To upgrade from Version 6 to Version 7, refer to 11.3.7, “Upgrading HMC from Version 6 to Version 7” on page 324.

To upgrade the HMC machine code, follow these steps:

1. Determine the HMC machine code level that is required for your system. Refer to 11.3.2, “Which firmware or fix level is correct for your system” on page 312.
2. Obtain the recovery CD or DVD. See 11.3.3, “Obtaining HMC updates and recovery software” on page 316.

3. Back up the managed system's profile data. In the HMC workplace window, select **System Management** → **Servers**. Then, select the server and ensure the state is *Operating* or *Standby*.

   Under Tasks, select **Configuration** → **Manage Partition Data** → **Backup**. Enter a backup file name and record this information. Then, click **OK**.

   Repeat these steps for each managed system.

4. Backup critical console data as described in 11.1, "Critical Console Data backup" on page 304.

   It is absolutely necessary to backup the CCD.

5. Before you upgrade to a new version of HMC software, as a precautionary measure, record HMC configuration information as follows:

   a. In the HMC workplace window, select **HMC Management**. Then, in the tasks list, select **Schedule Operations**. The Scheduled Operations window displays with a list of all managed systems.

   b. Select the HMC that you plan to upgrade and click **OK**. All scheduled operations for the HMC display.

      Note: If you do not have any scheduled operations skip to step 6.

   c. Select **Sort** → **By Object**. Select each object and record the following details:

      - Object Name
      - scheduled date
      - Operation Time (displayed in 24-hour format)
      - Repetitive

        If Yes, select **View** → **Schedule Details**. Then, record the interval information and close the scheduled operations window. Repeat for each scheduled operation.

   d. Close the Customize Scheduled Operations window.

6. Record remote command status:

   a. In the navigation area, select **HMC Management**. Then, in the tasks list, click **Remote Command Execution**.

   b. Record whether the Enable remote command execution using the **ssh** facility check box is selected.

   c. Click **Cancel**.

Saving upgrade data

You can save the current HMC configuration in a designated disk partition on the HMC. Only save upgrade data immediately prior to upgrading your HMC software to a new release. This action allows you to restore HMC configuration settings after upgrading.

Note: Only one level of backup data is allowed. Each time you save upgrade data, the previous level is overwritten.

HMC Version 7 also gives a option to save upgrade data on DVD media. It is strongly suggested to save a copy on a DVD too. See Figure 11-16.

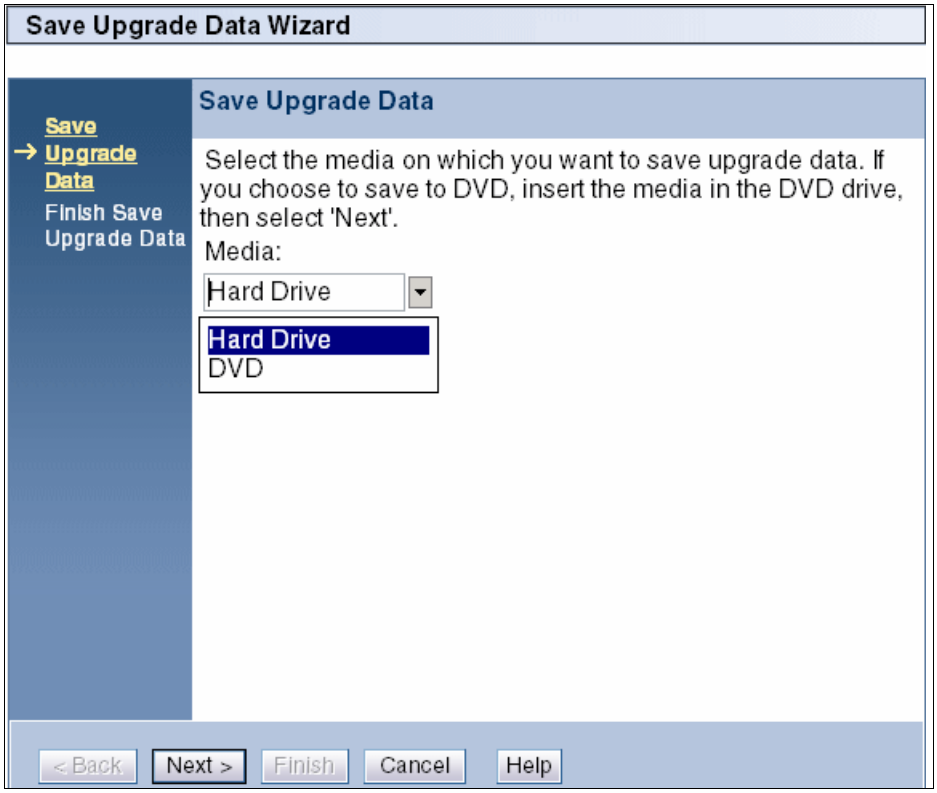


Figure 11-16 Save Upgrade Data wizard

To save upgrade data:

1. In the HMC workplace window, select **HMC Management**. Then, in the tasks list, select **Save Upgrade Data**. Select **Hard Drive** and click **Next**.
2. Click **Finish**.

3. Wait for the task to complete. If the Save Upgrade Data task fails, contact your next level of support before proceeding.

   Important: If the save upgrade data task fails, do not continue the upgrade process.

4. Click **OK**. Then, click **Close**.

To upgrade the HMC software:

1. Restart the system with Recovery DVD-RAM in the DVD-RAM drive by inserting the HMC RecoveryDVD-RAM into the DVD-RAM drive.
2. In the navigation area, select **HMC Management** → **Shutdown or Restart**.Then, select **Restart the HMC** and click **OK**.
3. The HMC restarts and boots from the bootable recovery DVD. The window shows the following option:
   - Install
   - Upgrade

   Select **Upgrade** and click **Next**.
4. When the warning displays, choose from the following options:
   - If you have saved upgrade data during the previous task, continue with the next step.
   - If you did not save upgrade data previously in this procedure, you must save the upgrade data now before you continue.
5. Select **Upgrade** from media and click **Next**. Confirm the settings and click **Finish**.
6. Follow the prompts as they display.

   Note: If the window goes blank, press the space bar to view the information.The first DVD can take approximately 20 minutes to install.

7. Select option **1. Install additional software from media** and press Enter. Press any key to confirm the installation. The HMC displays status messages as it installs the packages.
8. When the second media installation is complete, remove the media from the drive and close the media drawer.
9. Select option **2. Finish the installation** and press Enter. The HMC completes the booting process.
10. At the login prompt, log in using your user ID and password.

11. Accept the License Agreement for Machine Code twice. The HMC code installation is complete.
12. Verify that the HMC machine code upgrade installed successfully. Refer to 11.3.1, “How to determine the HMC software version” on page 311.

You have completed upgrading the HMC machine code procedure.

11.3.7 Upgrading HMC from Version 6 to Version 7

This section shows you how to upgrade your HMC Version 6 to HMC Version 7 while maintaining your configuration data.

Important: You must be at a minimum of Version 6 to upgrade to the POWER6 HMC machine code level which is Version 7 Release 4.

To upgrade from Version 6 to Version 7, follow these steps:

1. Determine the HMC machine code level that is required for your system. Refer to 11.3.2, “Which firmware or fix level is correct for your system” on page 312.
2. Obtain the recovery CD or DVD as described in 11.3.3, “Obtaining HMC updates and recovery software” on page 316.
3. Back up the managed system’s profile data. In the HMC workplace window, select **System Management** → **Servers**. Select the server and ensure the state is *Operating* or *Standby*.

   Under Tasks, select **Configuration** → **Manage Partition Data** → **Backup**. Enter a backup file name and record this information. Then, click **OK**.

   Repeat these steps for each managed system.
4. Backup Critical Console Data as described in 11.1, “Critical Console Data backup” on page 304.

   It is absolutely necessary to backup the CCD.
5. Before you upgrade to a new version of HMC software, as a precautionary measure, record HMC configuration information as follows:
   a. In the Navigation area, select **HMC Management**. Then, in the tasks list, select **Schedule Operations**. The Scheduled Operations window displays with a list of all managed systems.
   b. Select the HMC that you plan to upgrade and click **OK**. All scheduled operations for the HMC display.

Note: If you do not have any scheduled operations skip to step 6.

c. Select **Sort** → **By Object**.

d. Select each object and record the following details:

- Object Name
- scheduled date
- Operation Time (displayed in 24-hour format)
- Repetitive

  If Yes, select **View** → **Schedule Details**. Then, record the interval information. Close the scheduled operations window. Repeat for each scheduled operation.

e. Close the Customize Scheduled Operations window.

6. Record remote command status:

a. In the navigation area, select **HMC Management**. Then, in the tasks list click **Remote Command Execution.**

b. Record whether the Enable remote command execution using the **ssh** facility check box is selected.

c. Click **Cancel**.

7. Save the upgrade data as described in “Saving upgrade data” on page 322.

Important: If this step is not followed properly, you will lose all your partition information.

8. Upgrade the HMC Software from Version 6 to Version 7.

Note: You can only upgrade your HMC from Version 6 to Version 7. If you have an HMC Version 6, you need to upgrade it to Version 6 first. You need a to have a recovery DVD from step 2 in this procedure.

a. Insert the Version 7 recovery DVD in the DVD drive.

b. In the navigation area, select **HMC Management** → **Shutdown or Restart**. Then, select **Restart the HMC** and click **OK**.

c. The HMC restarts and boots from the bootable recovery DVD. The window shows the following options:

- Install
- Upgrade

d. Select **Upgrade** and click **Next**.

e. When the warning displays, choose from the following options:

- If you have saved upgrade data during the previous task, continue with the next step.
- If you did not save upgrade data previously in this procedure, you must save the upgrade data now before you continue. Refer to previous step.

f. Select **Upgrade** from media and click **Next**. Confirm the settings and click **Finish**. Follow the prompts as they display.

> **Note:** If the window goes blank, press the space bar to view the information.The first DVD can take approximately 20 minutes to install.

g. Select option **1. Install additional software from media** and press Enter. Press any key to confirm the installation. The HMC displays status messages as it installs the packages. When the second media installation is complete, remove the media from the drive and close the media drawer.

h. Select Option **2. Finish the installation** and press Enter. The HMC completes the booting process.

i. At the login prompt, log in using your user ID and password.

j. Accept the License Agreement for Machine Code twice. The HMC code installation is complete.

k. Verify that the HMC machine code upgrade installed successfully. Refer to 11.3.1, “How to determine the HMC software version” on page 311.

11.4 Managed system firmware updates

In this section, we discuss different options that are available to install system firmware. The system firmware is also referred to as *licensed internal code*. It resides on the service processor.

> **Important:** The HMC machine code needs to be equal to or greater than the managed system firmware level. Also, if an HMC manages multiple servers at different firmware release levels, the HMC machine code level must be equal to or higher than the system firmware level on the server that is at the latest release level.

11.4.1 Firmware overview

Depending on your system model and service environment, you can download, install, and manage your server firmware updates using different methods. The default firmware update policy for a partitioned system is through the HMC. If you do not have HMC attached to your system, refer to your operating system documentation to upload the code using the operating system.

System firmware is delivered as a *Release Level* or a *Service Pack*. Release Levels support the general availability (GA) of new function or features and new machine types or models. Upgrading to a higher Release Level can be disruptive to customer operations. Thus, IBM intends to introduce no more than two new Release Levels per year. These Release Levels are supported by Service Packs. Service Packs are intended to contain only firmware fixes and are not intended to introduce new functionalitiy. A Service Pack is an update to an existing Release Level.

Note: Installing a Release Level is also referred to as *upgrading* your firmware. Installing a Service Pack is referred to as *updating* your firmware

The file naming convention for System Firmware is as follows:

- POWER5

  01SF*xxx_yyy_zzz*

  where

  - *xxx* is the release level
  - *yyy* is the service pack level
  - *zzz* is the last disruptive service pack level

So, for example, System Firmware 01SF240_320, as displayed on the Firmware Download page, is Release Level 240, Service Pack 320.

- POWER6

  EM*xxx_yyy_zzz*

  where

  - *xxx* is the release level
  - *yyy* is the service pack level
  - *zzz* is the last disruptive service pack level

So, for example, System Firmware 01EM310_026, as displayed on the Firmware Download page, is Release Level 310, Service Pack 026.

The Service Pack maintains two copies of the server firmware. One copy is held in the t-side repository (temporary) and the other copy is held in the p-side repository (permanent):

- **Temporary side**: New firmware updates should be applied to the t-side first and should be tested before they are permanently applied. When you install server firmware updates on the t-side, the existing contents of the t-side should be permanently installed on the p-side first.

  We recommend that under normal operations the managed system run on the t-side version of the system firmware.

- **Permanent side**: The permanent side holds the last firmware release that was running on the temporary side. You know that this firmware has been running for a while on the temporary side and is stable. This is also a good way to hold a back up firmware on the system. If for any reason your temporary firmware gets corrupted, you can boot from the permanent side and recover your system.

Before you update your system firmware, move current firmware that is on the temporary side to the permanent side.

We recommend that under normal operations the managed system runs on the t-side version of the system firmware.

When you install changes to your firmware, you have three options:

- **Concurrent install and activate:** Fixes can be applied without interrupting running partitions and restarting managed system.
- **Concurrent install with deferred disruptive activate:** Fixes can be applied as delayed and activated the next time the managed system is restarted.
- **Disruptive install with activate:** Fixes can only be applied by turning off the managed system.

You want to choose the option that fits the status of the server that you are updating. For example, you do not want to use a disruptive installation option on a production server. However, on a test server, this option might not be an issue.

11.4.2 Obtaining system firmware

This section describes how to view or to download the firmware fix. Download the fix to your computer with an Internet connection and then create a fix CD that you apply on the server. If necessary, contact service and support to order the fix on CD.

You can download fixes from the following URL (Figure 11-17):

http://www14.software.ibm.com/webapp/set2/firmware/gjsn

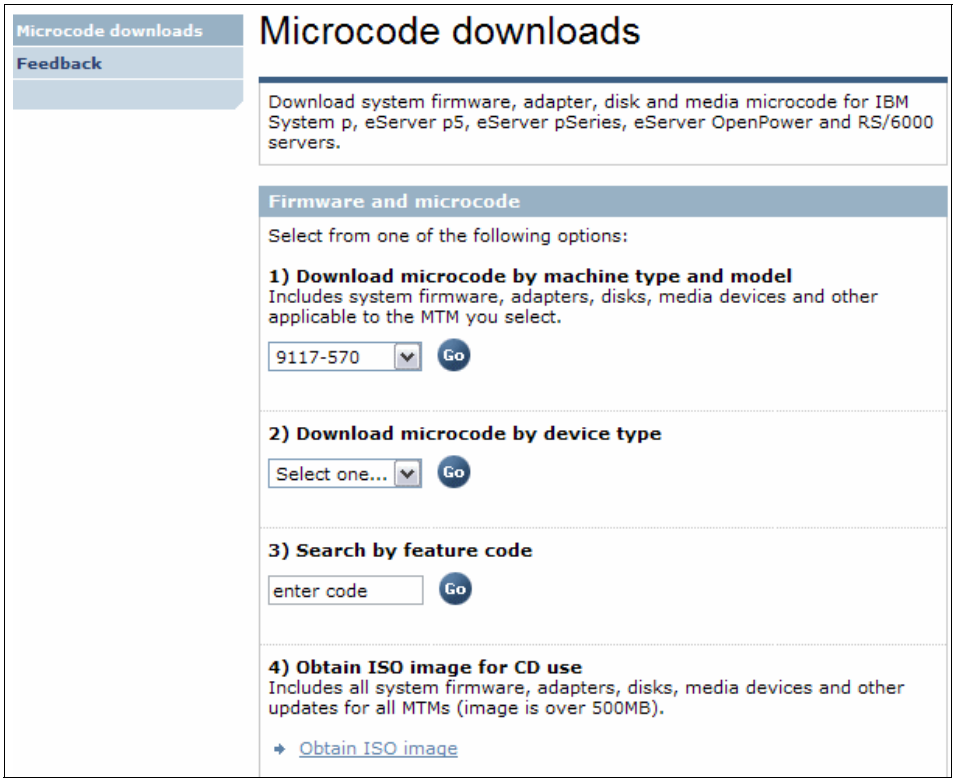


Figure 11-17 Server firmware download site

Decide what version of the firmware is correct for system as described in 11.3.2, “Which firmware or fix level is correct for your system” on page 312. Use the Fix Level Recommendation Tool to decide the level of firmware that you require for your system.

Then, select your machine type and select **Go**.

Select the version of the system firmware that is applicable to your system and click **Continue** at the bottom of the window (Figure 11-18).

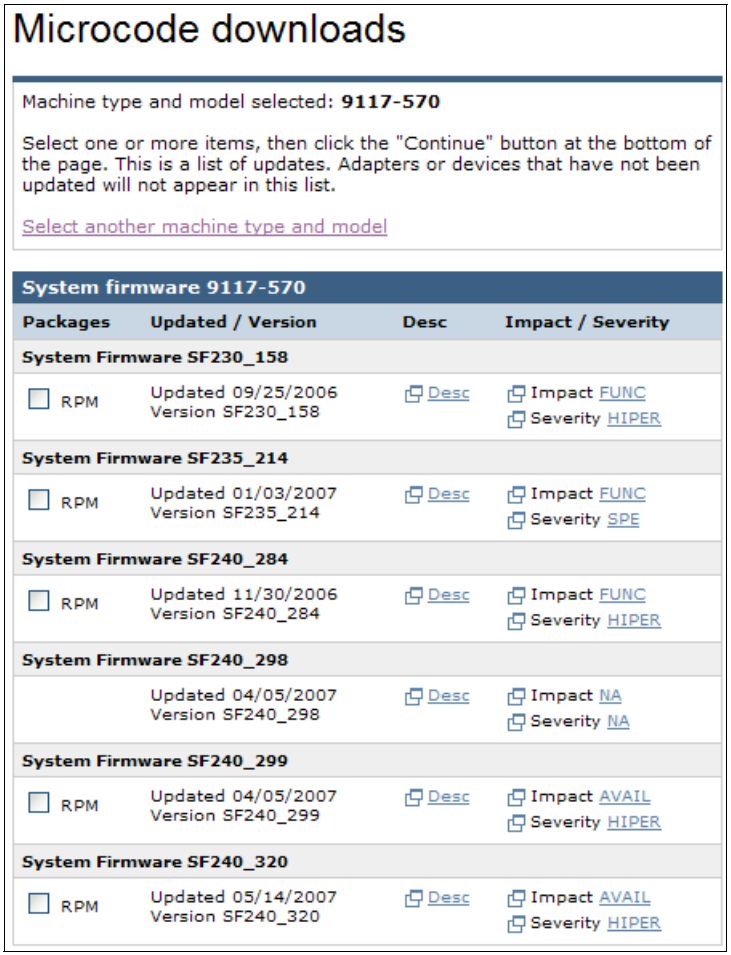


Figure 11-18 System firmware selection window

12

Service Management

This chapter describes the Service Management functions on the Hardware Management Console (HMC).

12.1 Service Management area of the HMC

The main view of the Service Management area is divided into two sections, as shown in Figure 12-1.

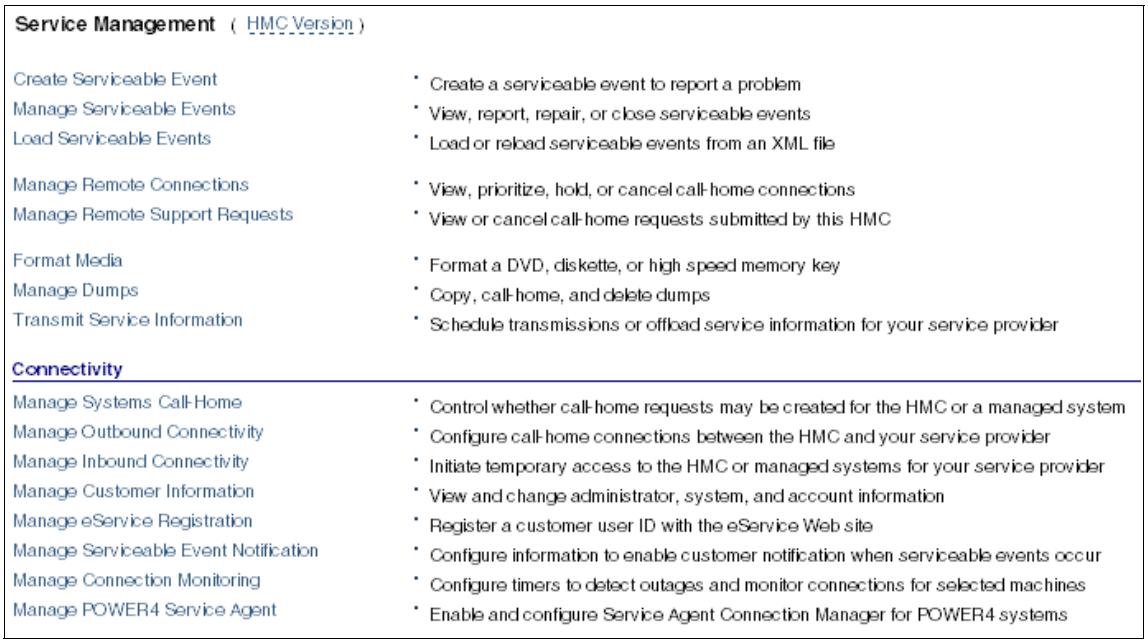


Figure 12-1 Service Management, main view

The first Service Management section describes the *management tasks* that can be performed on the HMC. These tasks include:

- Handling service events
- Managing remote connections
- Formatting removable media
- Managing service dumps
- Transmitting service data

The second Service Management section covers *connectivity* with the HMC. These tasks include:

- Managing call home (also known as Service Agent)
- Handling outbound connectivity
- Permitting inbound connectivity
- Specifying customer information
- Registering eService
- Setting contact information for serviceable events

- Manage connection monitoring
- Handle previous Service Agent connectivity

12.2 Management tasks

The options that can be performed in the top half of the service management area mostly pertain to service events, formatting and using removable media, and sending in service reports to IBM. There are also troubleshooting tools available in this area of the HMC that pertain to troubleshooting not only with managed servers but also with the HMC itself.

12.2.1 Service events

There are three options for service events on the HMC:

- Create event
- Manage events
- Load events

Create event

Select **Create Serviceable Event** to manually report a hardware failure on a managed server or on the HMC itself (as shown in Figure 12-2).

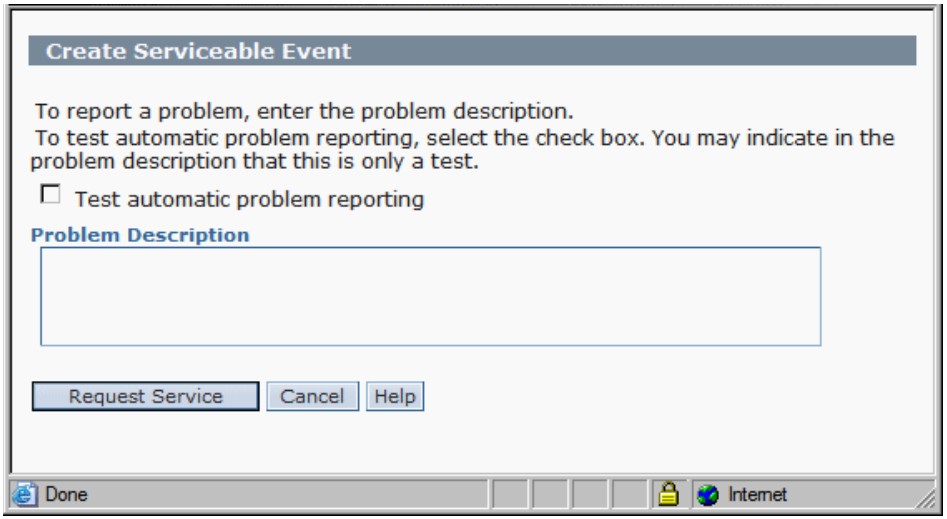


Figure 12-2 Service Management, creating a serviceable event

Under Problem Description, provide as much information as possible about the problem that you encountered, including the hardware involved and references to any error logs or reports associated with the event.

When completed, select **Request Service**. If your connectivity to IBM is set up as properly as described in 12.3.2, “Manage Outbound Connectivity” on page 353, the error report is sent to IBM.

Manage events

Select **Manage Serviceable Events** to open the window shown in Figure 12-3.

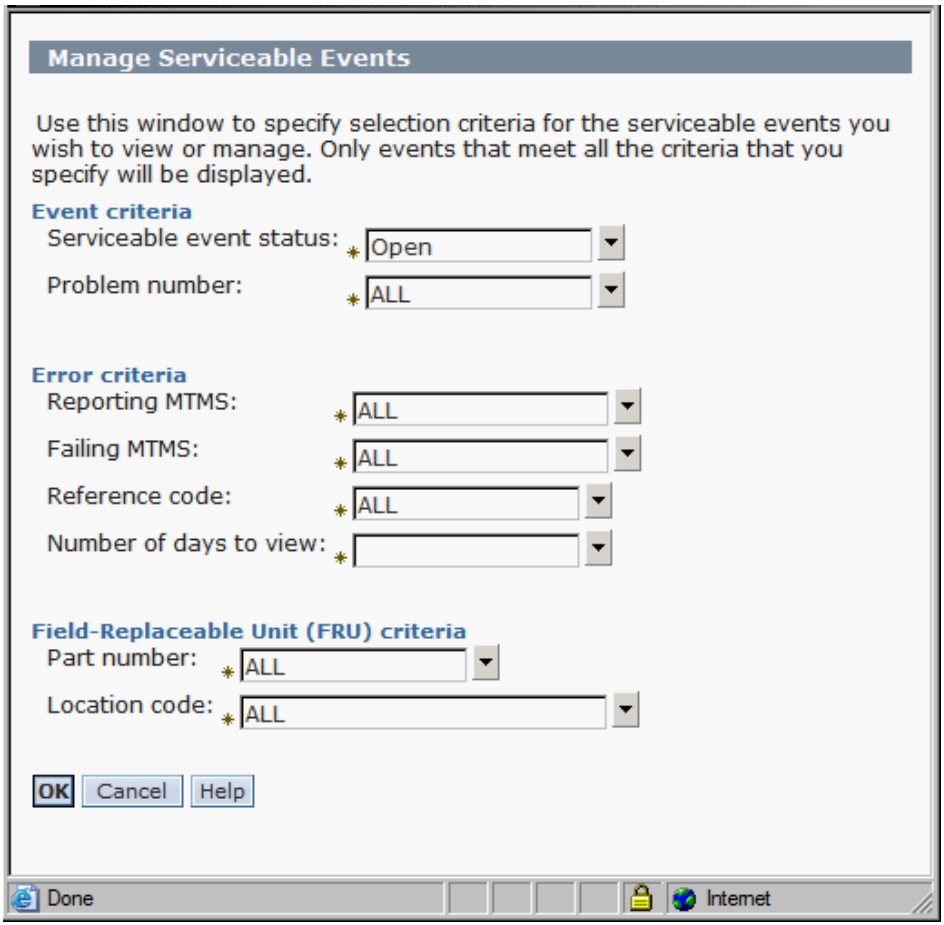


Figure 12-3 Service Management, manage serviceable events

Use the pull-down menus to alter the filters to display the current service events recorded on the HMC. When your selections are complete, select **OK**. Then you have a results window similar to Figure 12-4.

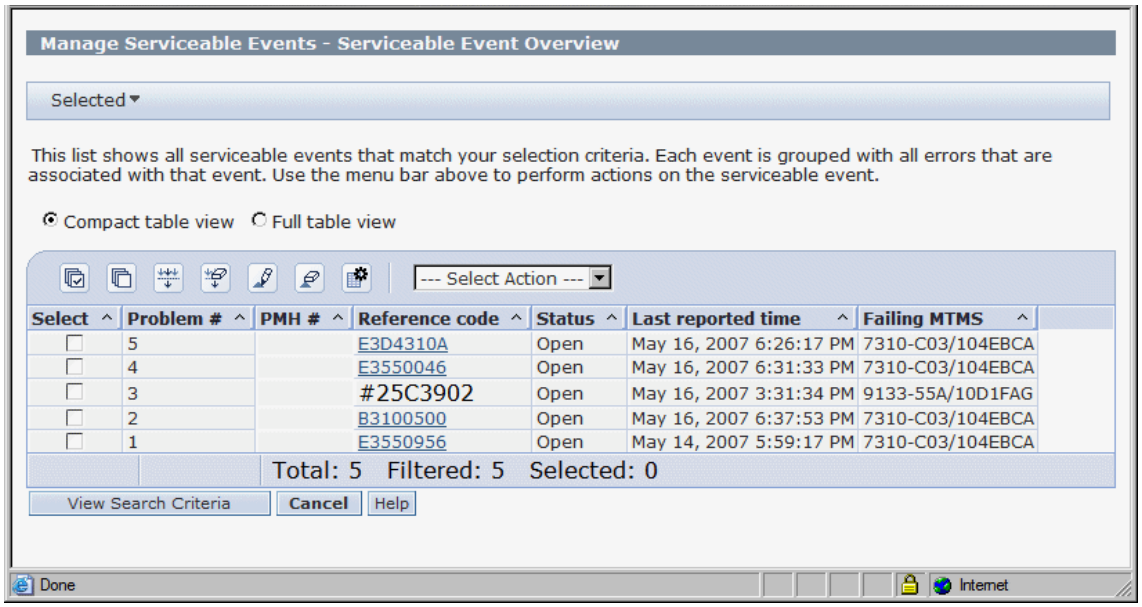


Figure 12-4 Service Management, serviceable event overview

The codes contained in the *Reference code* column are live links. You can select these codes to get further information pertaining to the service event in question. As shown in figure Figure 12-5, by selecting the reference code *E3D4310A*, a window displays that shows additional information about this service event.

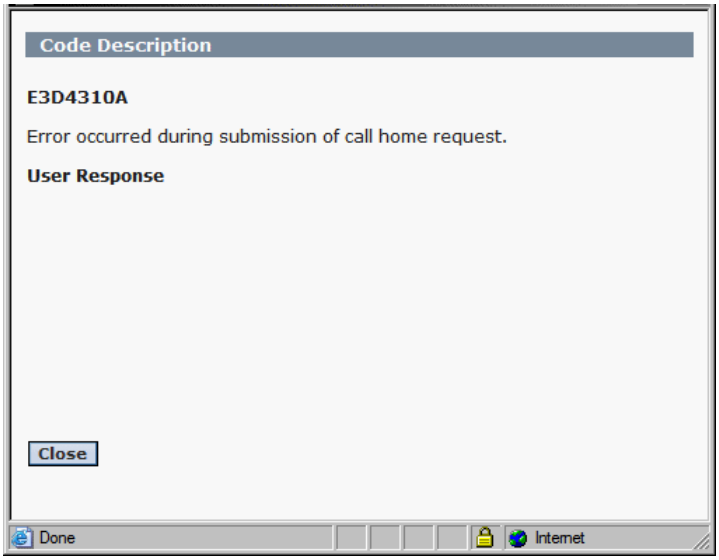


Figure 12-5 Service Management, event description

Similarly, as shown in Figure 12-6, you can select a service event, and then click **Selected** to choose one of the following menu options:

- **View Details**: Get reference details on service event
- **Repair**: Connect to ResourceLink to attempt to fix the problem associate with the service event
- **Call Home**: Manually report the service event to IBM
- **Manage Problem Data**: Send specific files associated with a service event to IBM or offload data to removable storage
- **Close Event**: Remove the service event from the list

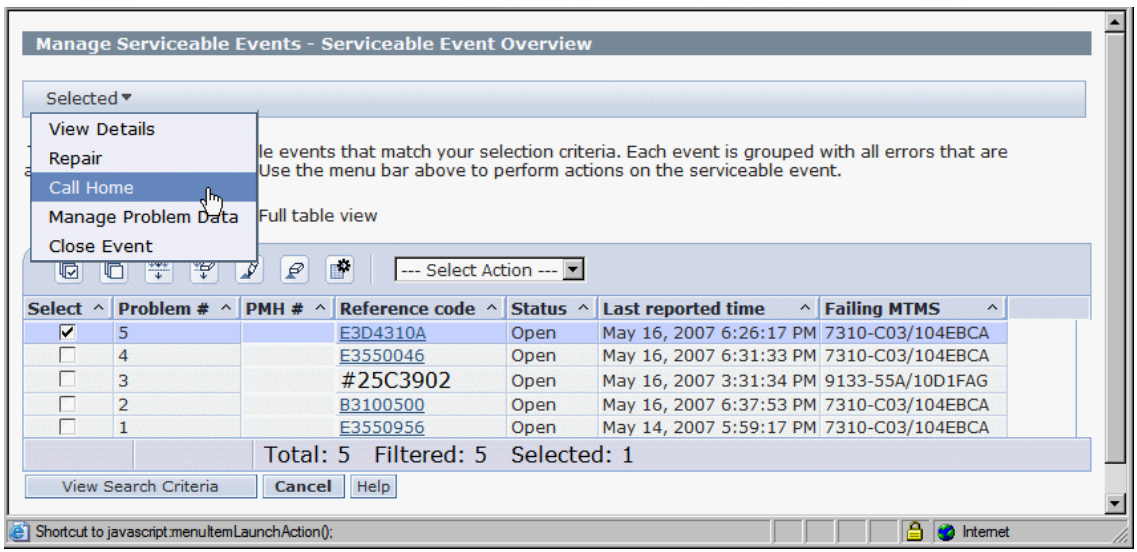


Figure 12-6 Service Management, reporting options

By having a service event selected and clicking **View Details**, a window opens as shown in Figure 12-7.

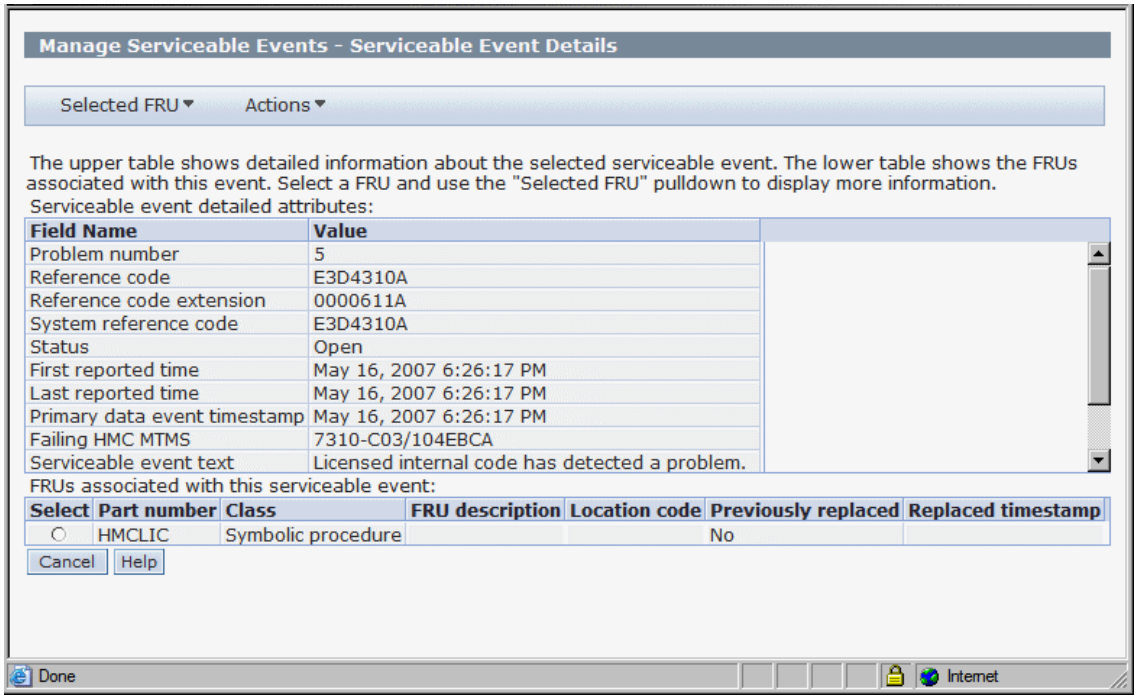


Figure 12-7 Service Management, view details on service event

In this view, you can see the SRC extensions that are associated with the service event that you selected, as well as take actions associated with the hardware by clicking **Selected FRU** or **Actions**.

You can return to the Serviceable Event Overview window by closing the window.

You can select a service event and then select **Repair** to begin repair actions associated with the service event, as shown in Figure 12-8.

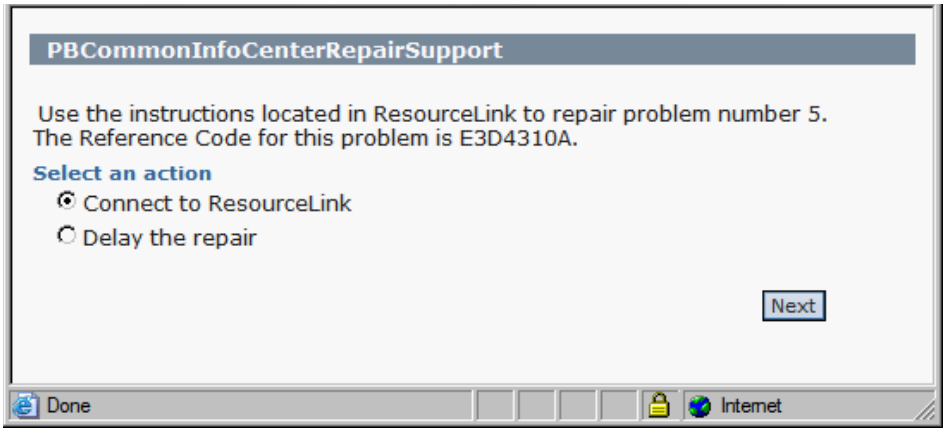


Figure 12-8 Service Management, repair action on service event

If you select **Connect to ResourceLink**, you can get help in resolving the service event or you can delay the repair. If you select **Delay the repair**, you are returned to the Serviceable Event Overview window, as shown in Figure 12-4 on page 335.

When you select a service event and clicking **Manage Problem Data**, the window shown in Figure 12-9 opens.

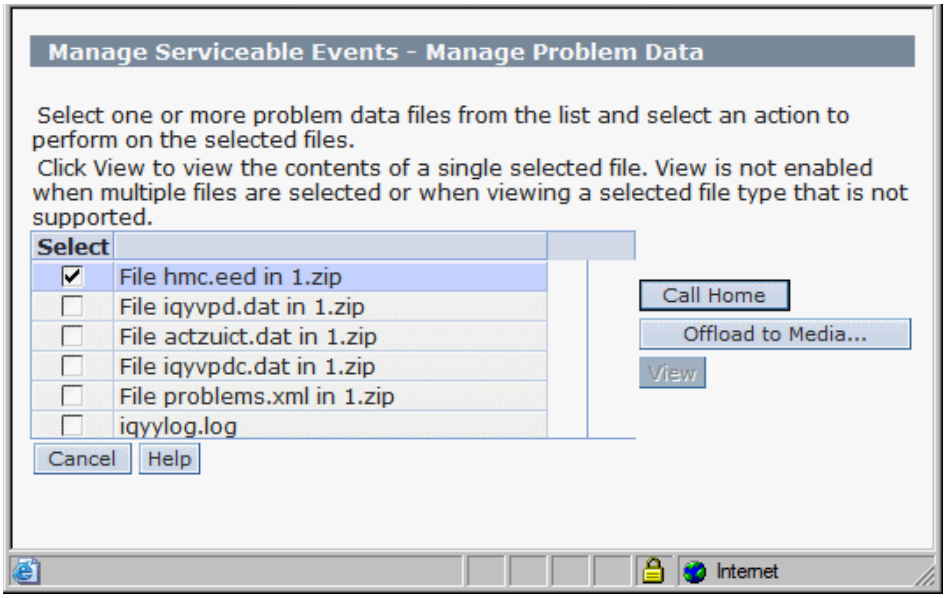


Figure 12-9 Service Management, manage problem data

You can select specific files that are associated with the service event with the following possible actions:

- Send the file to IBM using the Call Home button.
- Save the associated files to removable media through the Offload to Media button.
- Examine the contents of the associated file with the View button.

Finally, if you select a service event and click **Close Event** a window opens as shown in Figure 12-10.

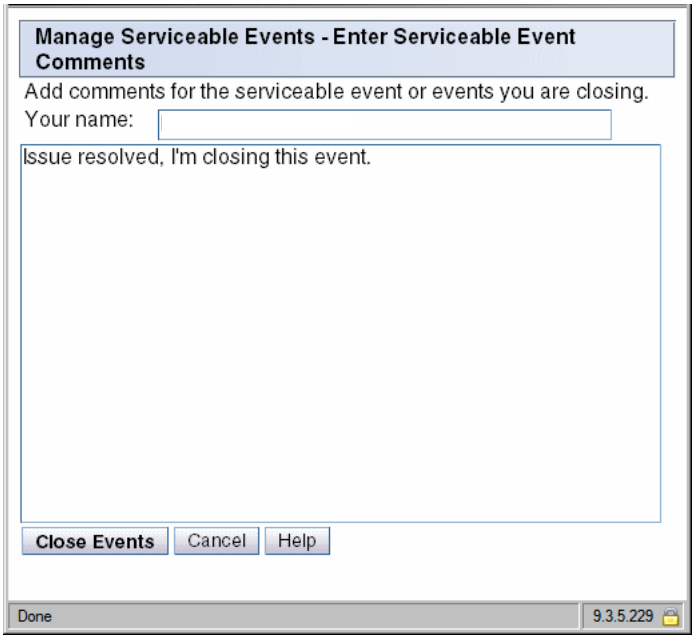


Figure 12-10 Service Management, close a service event

Here, you provide your name and the reason for closing the associated service event.

Note: After you perform the Close Event task, all other options except Manage Problem Data are greyed out for the service event in question on the Serviceable Event Overview window.

12.2.2 Remote access

The remote access options of the Service Management area of the HMC allow you to:

- Manage remote connections by manually configuring the serviceable event queue for transmission to IBM.
- Manage remote support requests by managing the local queue of serviceable events on your HMC.

Figure 12-11 shows the remote access options of the Service Management area.

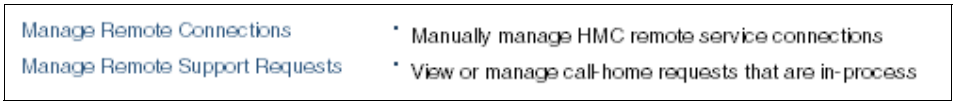


Figure 12-11 Service management, remote access options

Manage Remote Connections

If the HMC's call-home server service is enabled, use the Manage Remote Connections option to manage the console's remote connections manually.

The console manages its remote connections automatically. It puts requests on a queue and processes them in the order in which they are received. However, you can use the Manage Remote Connections option to manage the queue manually.

Figure 12-12 shows the Manage Remote Connections window.

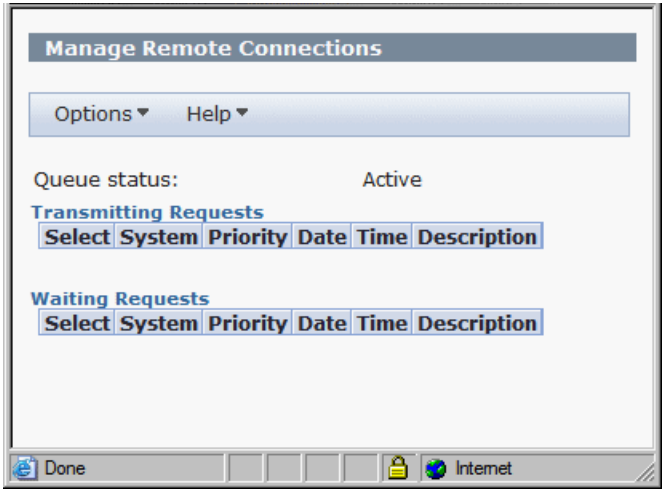


Figure 12-12 Manage Remote Connections

Use the Options menu to in this window to:

- Stop transmissions
- Move priority requests ahead of others
- Delete requests

Manage Remote Support Requests

You can use the Manage Remote Support Requests option to view or manage Call-Home requests that are submitted by the HMC that are either being processed or that are waiting to be processed.

Figure 12-13 shows the Manage Remote Support Requests window.

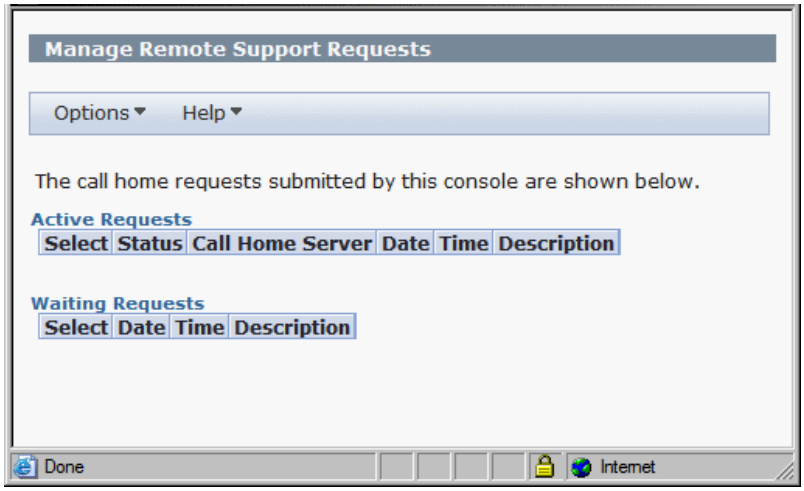


Figure 12-13 Manage Remote Support Requests

Use the Options menu in this window to:

- View All Call-Home Servers
- Cancel Selected Requests
- Cancel All Active Requests
- Cancel All Waiting Requests

12.2.3 Managing HMC service data

The HMC service data area of the HMC allows you to:

- Format media for use with various HMC functions
- Manipulate managed server dump information
- Schedule transmittal of VPD, CoD, and serviceable event information about the HMC

Figure 12-14 the HMC data options area of the Service Management area.

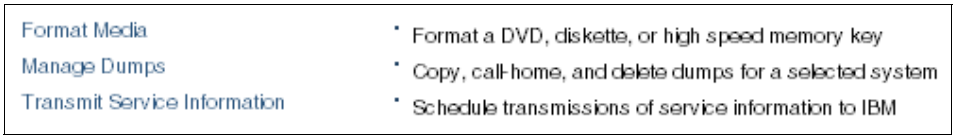


Figure 12-14 Service Management, HMC data options

Format Media

To format media:

1. Select **Format Media**. The window shown in Figure 12-15 opens.

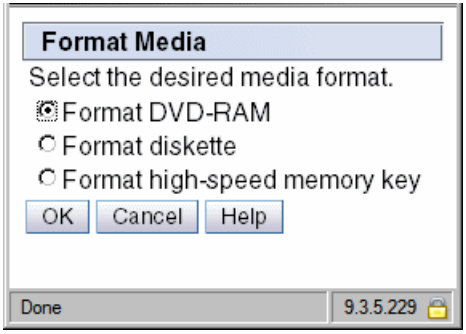


Figure 12-15 Service Management, Format Media

2. Select the media device that you want to format, and select **OK**.
3. Then, either insert or attach the appropriate media device to be formatted.

Manage Dumps

Before you can use the Manage Dumps option, you need create a dump from the server view:

1. Select **Systems Management** → **Servers and then select the name of the** *server.* Select **Serviceability** → **Hardware** → **Manage Dumps**.

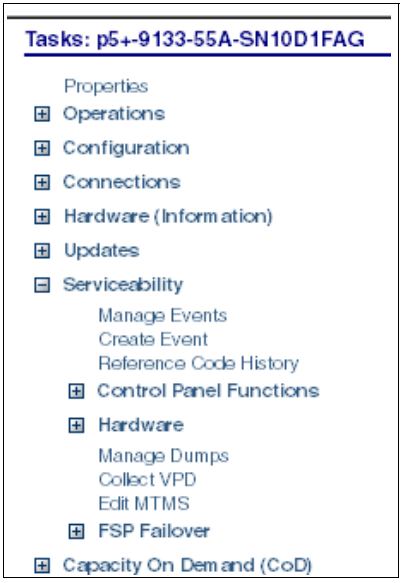


Figure 12-16 Service Management, initiate dump from server

2. In the Manage Dumps window, select **Action** → **Initiate System Dump**, as shown in Figure 12-17.

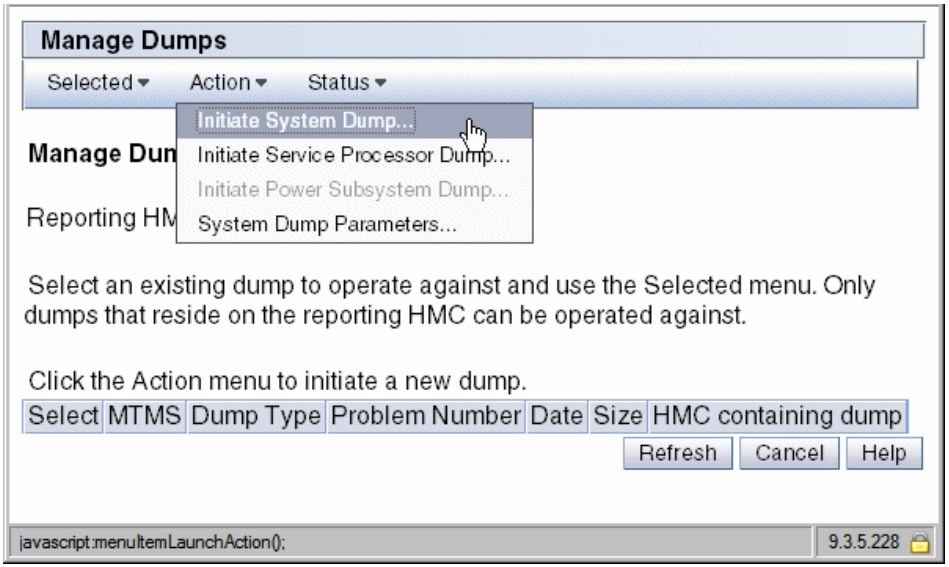


Figure 12-17 Service Management, initiate system dump

3. Specify the system where you want to initiate the dump (Figure 12-18). Verify the selected server, and then select **OK**.

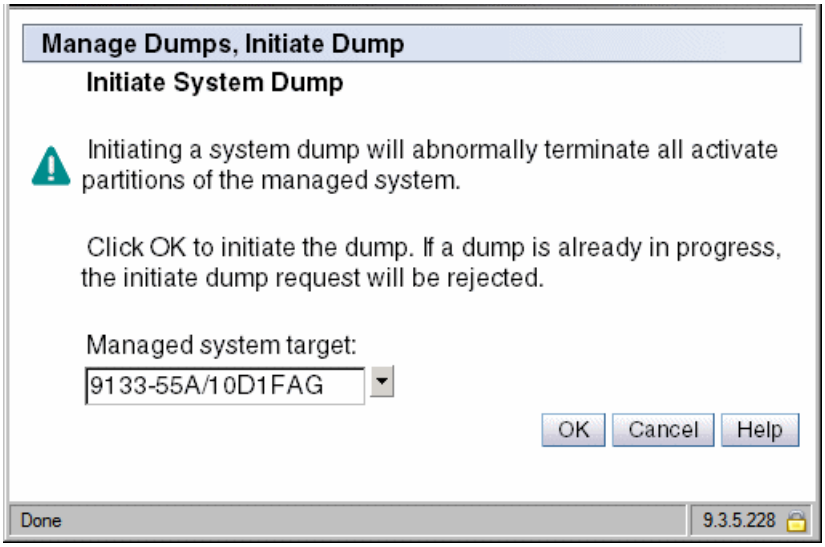


Figure 12-18 Service Management, initiate system dump

4. If there are no errors associated with the system dump, you get a status message as shown in Figure 12-19. Click **OK**.

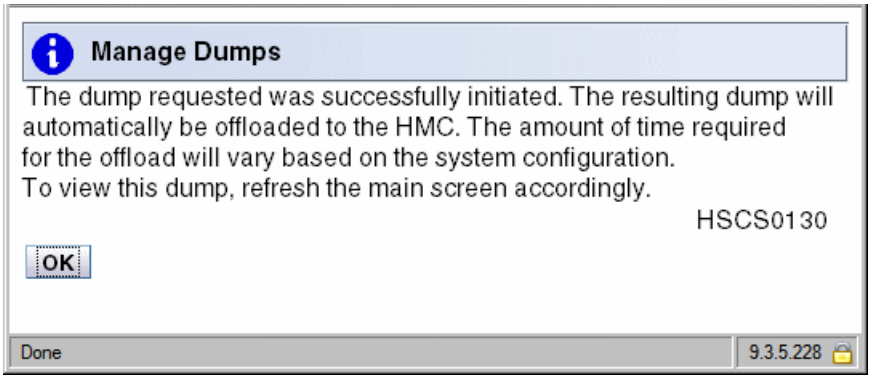


Figure 12-19 Service Management, system dump complete

5. Now that there is a dump available for manipulation in Service Management, select **Service Management** → **Manage Dumps**. The system dump displays in the results window as shown in Figure 12-20.
6. Select the dump that you would like to manipulate. Then click **Selected**. From this menu, you can:
   - **Copy Dump to Media**: Allows you to move dump information from the HMC to removable media such as a DVD.
   - **Copy Dump to Remote System**: Allows you to specify a remote FTP server, ID, and password to which to transmit your system dump.
   - **Call Home Dump**: Sends your system dump data to IBM.
   - **Delete Dump**: Removes dump data from the HMC.

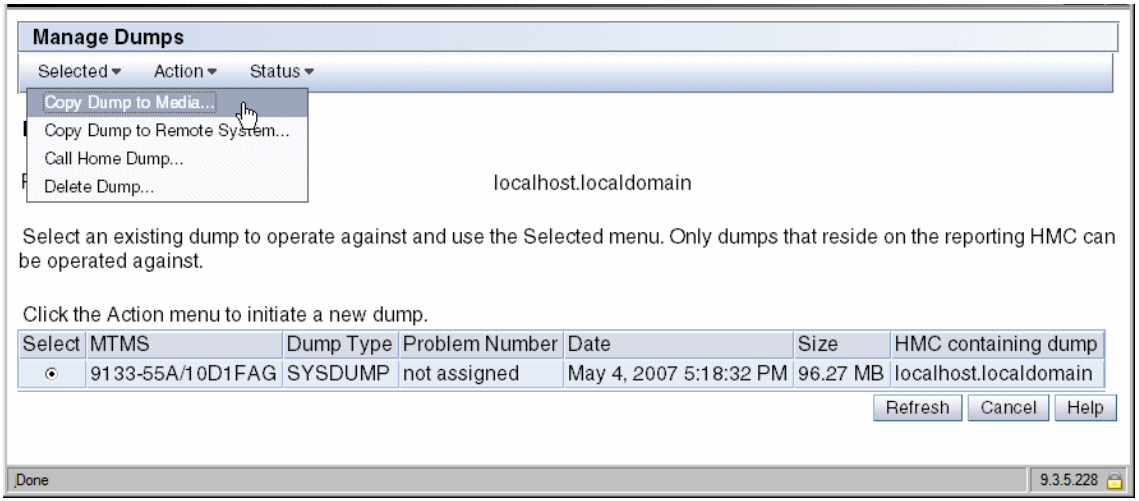


Figure 12-20 Service Management, dump results

Transmit Service Information

This area of Service Management is used to transfer service event information from the HMC to IBM. As shown in Figure 12-21, there are three tabs associated with service data transmission.

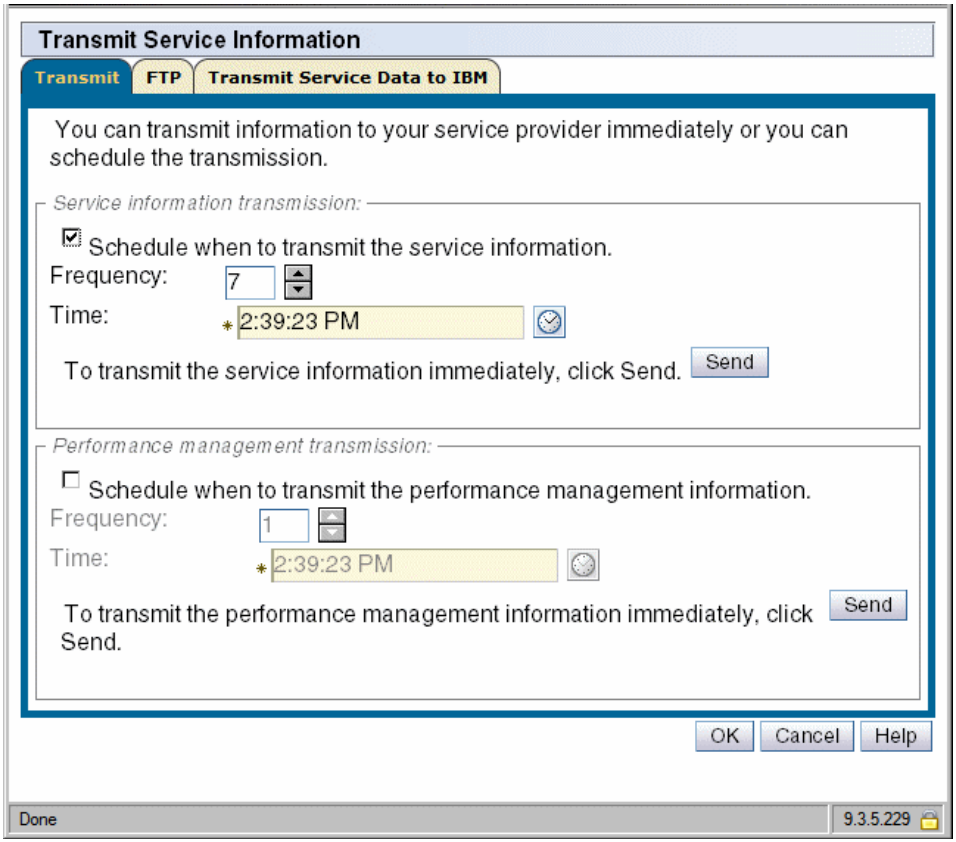


Figure 12-21 Service Management, transmit

In the Transmit tab, you can:

- Control the frequency of data transmissions to IBM
- Send service data immediately
- Separate schedules for service information and performance management data transmission

Note: Schedules of service information and performance management data be different, and you can also send one to IBM without having to send the other.

When you have made your selections for how often the data is to be sent or when you have made an immediate transfer, select **OK**.

The FTP tab allows for control of where to FTP data when it is sent (Figure 12-22). If the HMC is behind a firewall, the FTP tab allows you to specify the proper settings to transmit service data beyond the firewall.

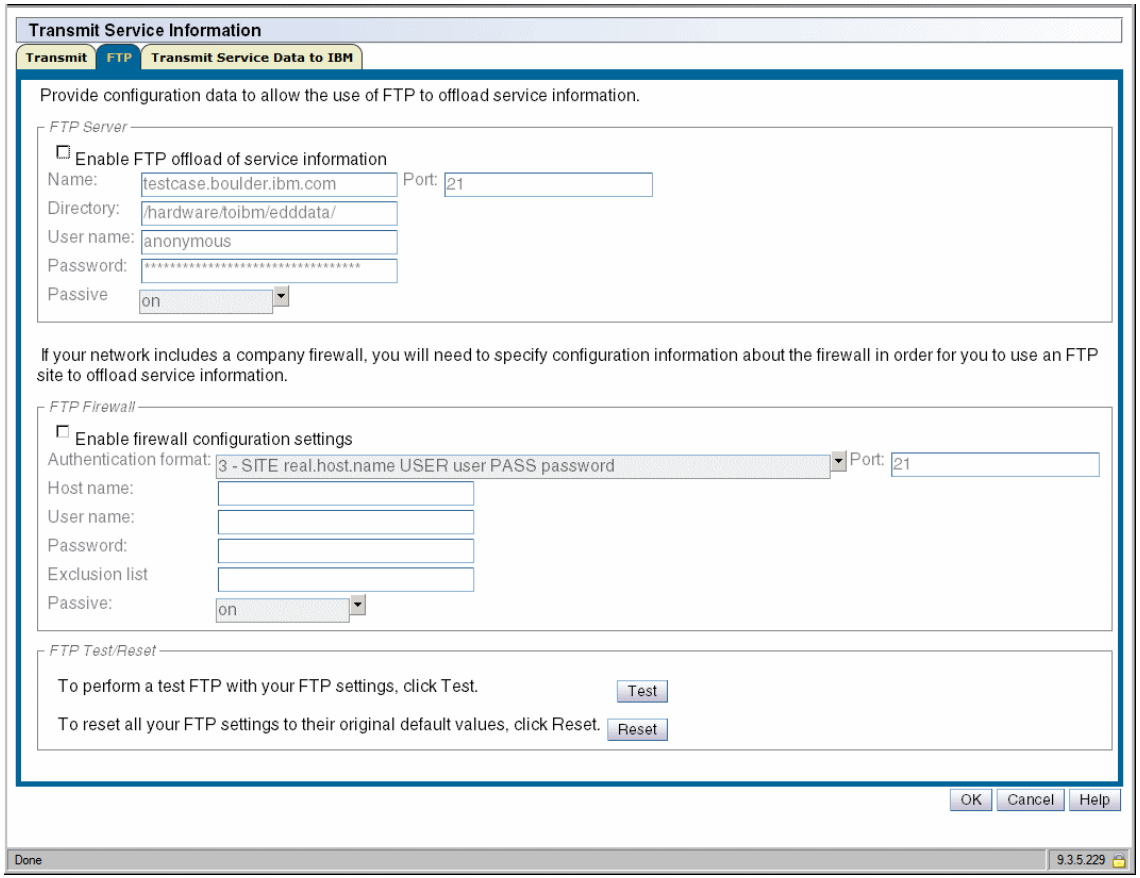


Figure 12-22 Service Management, FTP settings

At the bottom of the FTP tab are the options to test the FTP connection and to reset all of the FTP settings to their original defaults.

Note: If your system is enabled for a type of CoD that requires monthly reporting, such as that discussed in 13.3.2, “On/Off CoD” on page 378, it is highly recommended that you test your FTP and firewall settings after set up to ensure that your data is in fact getting to IBM.

The Transmit Service Data to IBM tab allows you to choose which specific sets of data to transmit to IBM (Figure 12-23). You can transmit:

- Hardware management console log: The full log of serviceable event data on the HMC.
- Problem determination data: Information that is specific to serviceable events logged by the HMC.
- Managed systems VPD data collection: The full system inventory of managed servers attached to the HMC.

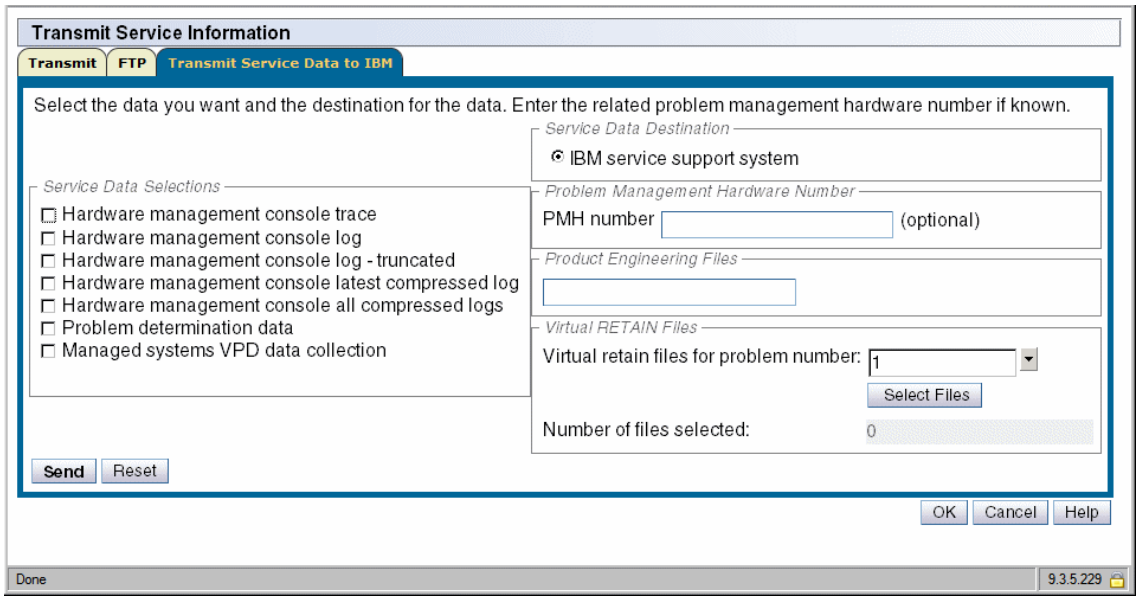


Figure 12-23 Service Management, specify data to send

12.3 Connectivity

To get to the connectivity options, select **Service Management** in the HMC workplace window. The following options are available:

- **Systems Call-Home**: Formerly called *Service Agent*, Call-Home allows the HMC to dial in to the IBM network through a modem or the Internet to report:
  - Serviceable events
  - CoD usage (On/Off, Reserve Capacity, and Utility Capacity)
  - Hardware failures
- **Outbound Connectivity**: This window allows for configuration of the HMC modem or for configuration of Ethernet connectivity to the outside Ethernet.

- **Inbound Connectivity**: Allow your service provider temporary access to your HMC or partitions of a managed system.
- **Customer Information**: Specify administrator, system, and account information.
- **eService Registration**: Register a customer user ID with the eService Web site.
- **Serviceable Event Notification**: Define information to enable customer notification when service events occur.
- **Connection Monitoring**: Configure timers to detect outages and monitor connections for selected computers.
- **POWER4 Service Agent**: Activate Service Agent Connection Manager for POWER4 systems.

12.3.1 Manage Systems Call-Home

To activate regular system status reporting through Call-Home, select **Service Management** → **Manage Systems Call-Home**. Select any systems on which you want to affect Call-Home, and then select either **Enable** or **Disable** (Figure 12-24). Click **OK** to save your selections or click **Cancel** to negate your selections.

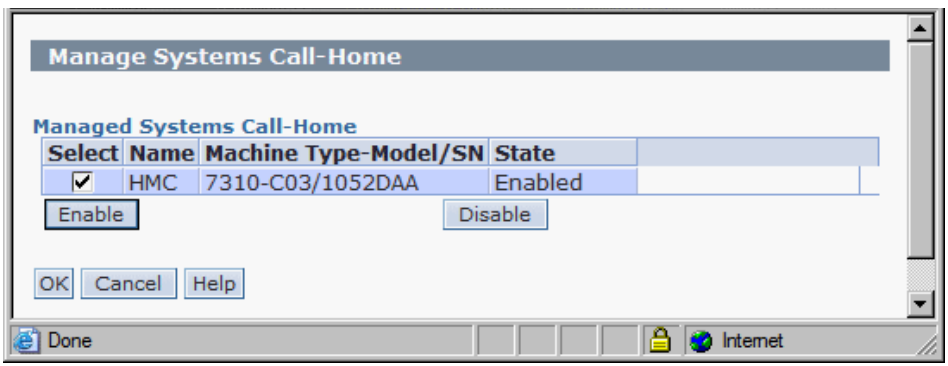


Figure 12-24 Service Management, enable Call-Home

Along with enabling your HMC or managed servers for Call-Home, you will want to configure and test your outbound connectivity to make sure that your reports can get to IBM. Refer to 12.3.2, “Manage Outbound Connectivity” on page 353 for more information.

12.3.2 Manage Outbound Connectivity

You can achieve outbound connectivity either through a modem on the HMC or through Internet connectivity. First, select **Service Management** → **Manage Outbound Connectivity**.

Modem configuration

To set your modem configuration:

1. On the Local Modem tab, **Allow local modem dialing for service**, and then select **Modem Configuration** (Figure 12-25).

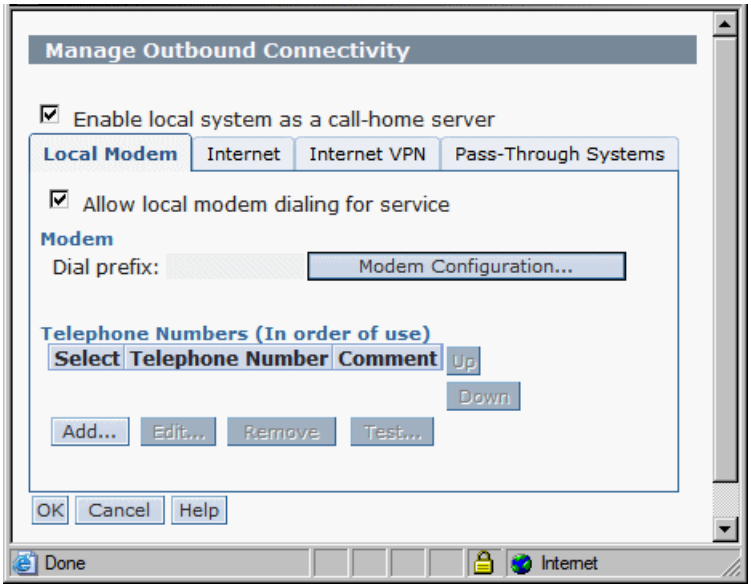


Figure 12-25 Manage Outbound Connectivity, Local Modem

2. Set the modem to tone or pulse dialing and set a dial prefix, if required, as shown in Figure 12-26. Then, select **OK**.

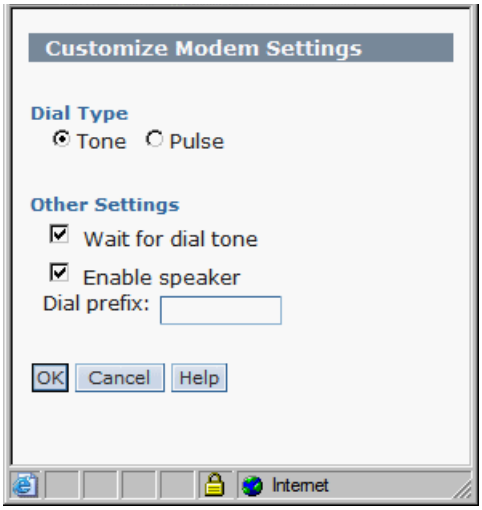


Figure 12-26 Modem configuration

Internet configuration

To configure your HMC for internet configuration:

1. Select the Internet tab as shown in Figure 12-27.
2. Select **Allow an existing Internet connection for service**. If your HMC is behind a firewall, you need to select **Use SSL proxy** and provide the address and port for your proxy in the address and port fields.
3. When e complete, you can test the configuration by clicking **Test**. If the test completes successfully, select **OK** to save your settings.

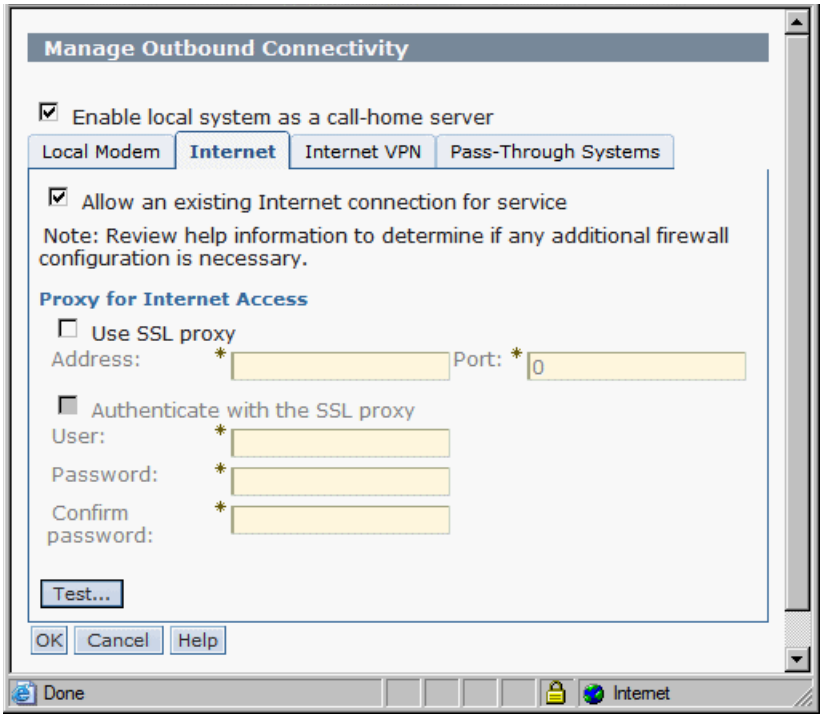


Figure 12-27 Manage Outbound Connectivity, Internet access

Internet VPN

Use the Internet VPN tab, shown in Figure 12-28, to allow the HMC to use a Virtual Private Network (VPN) over an existing internet connection for service. This option is highly recommended if it is available within your IT infrastructure. By using a VPN for remote connectivity you are encrypting the information as it is transmitted from your HMC to IBM. This helps ensure your systems data is kept private and helps keep your HMC secure.

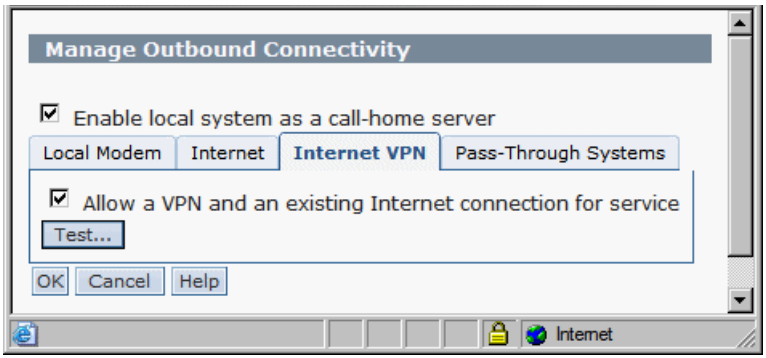


Figure 12-28 Manage Outbound Connectivity, Internet VPN

Pass-Through Systems

Use the Pass-Through Systems tab to allow other managed servers, systems, and other devices on the same network as the HMC to use it as an access point to the external Internet. This is useful if you have set up a VPN connection as described in “Internet VPN” and want to allow all devices that receive a DHCP lease from the HMC to use the HMC as a point of access to the Internet.

It is recommended, though not required, to have separate network adapters on the HMC for a private (the HMC and all managed servers) and open (the HMC, servers, systems, and the external internet) network. By having separate networks for HMC management and internet connectivity you are helping secure the data transferred between the HMC and managed servers. For information about how to set up open and private networks on the HMC, read 6.2.2, “LAN Adapters” on page 198.

Using the Pass-Through Systems option allows for a single network that is both private and open. It is highly recommended that if you allow the HMC as a pass-through point that you also configure a VPN connection on the HMC as shown in “Internet VPN”. By having the pass-through point through a VPN, you are encrypting the data and helping keep it secure.

To use the HMC as a pass-through point:

1. Select **Allow pass-through systems for service** (Figure 12-29). Until you select this option, you will not be able to allow systems for pass-through nor will you be able to use the Edit, Remove, and Test options until you have added a server.
2. To add servers for pass-through service, select **Add**.

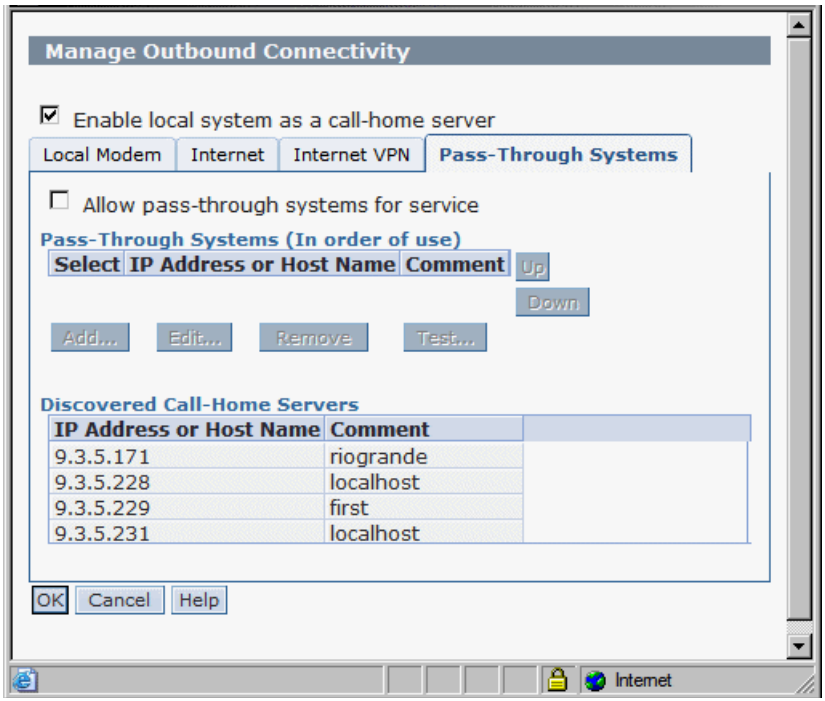


Figure 12-29 Manage Outbound Connectivity, Pass-Through Systems

3. In the “IP address or host name” field, enter either the IP address or the fully qualified host name for the server that you want to add, as well as a comment for the server, then select Add, as shown in Figure 12-30.

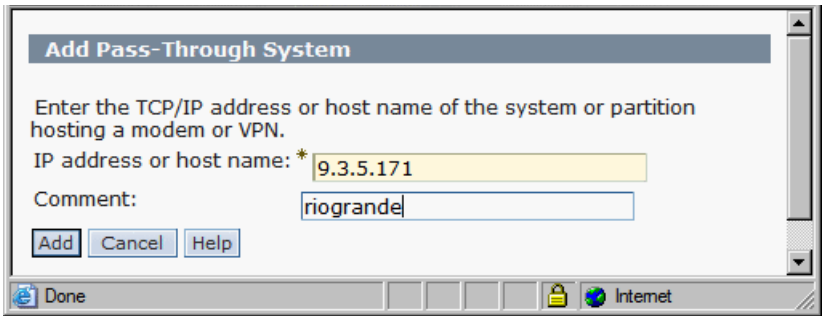


Figure 12-30 Add servers for pass-through access

4. If your selection is successful, you receive a results window similar to that shown in Figure 12-31. The system that you entered is listed in the area labeled Pass-Through Systems.

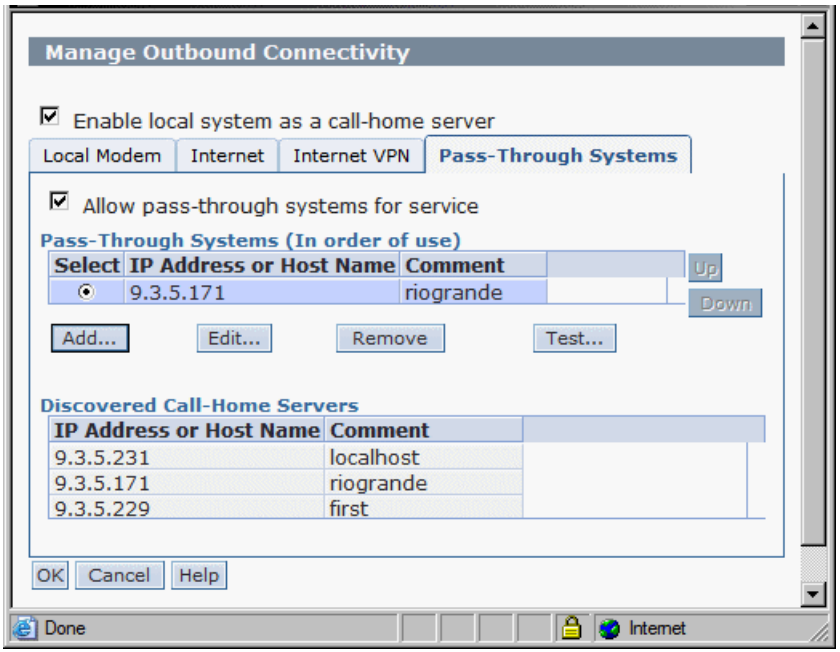


Figure 12-31 Add servers for pass-through access, results

5. Now with a server or servers entered for pass-through, you can use the Edit, Remove, and Test options available on this window.

12.3.3 Manage Inbound Connectivity

The Manage Inbound Connectivity task allows the HMC to receive a connection from an outside source through the Internet or over modem. First, select **Service Management** → **Manage Inbound Connectivity**.

In the Manage Inbound Connectivity window, you use the Remote Service tab to allow an Internet connection through PPP or VPN (Figure 12-32). Under Connection Type are the access types. You can allow local console and managed server partition access. To save your settings on this tab, select **OK**.

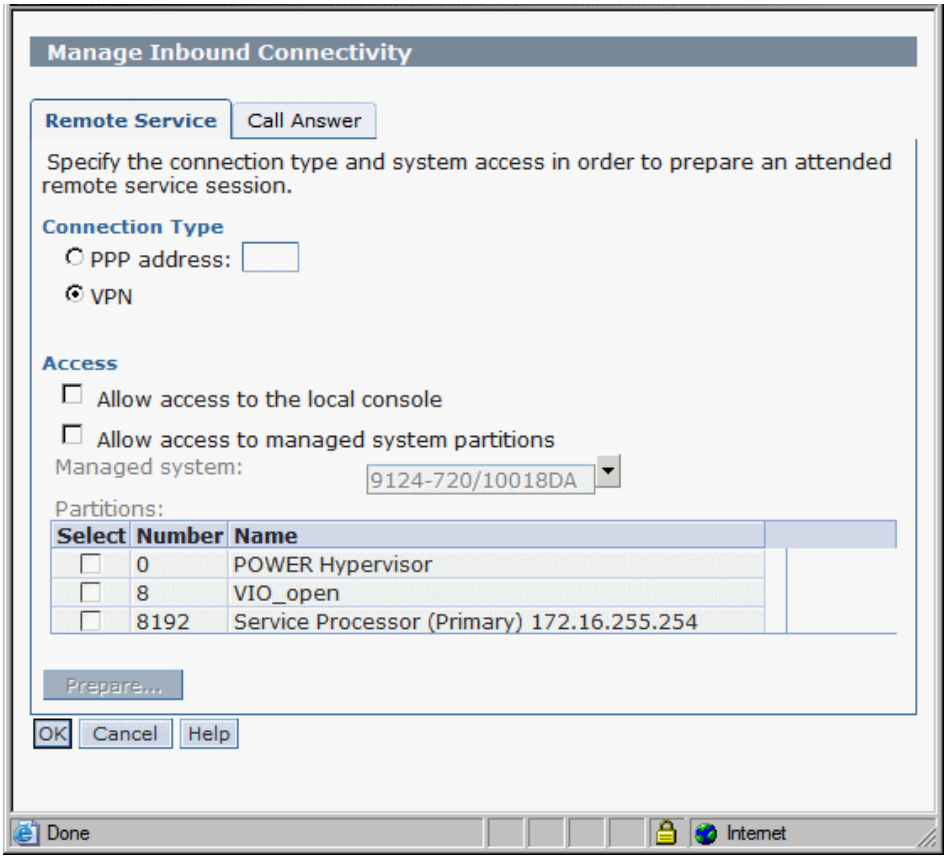


Figure 12-32 Manage Inbound Connectivity, Remote Service

You use the Call Answer tab to allow a modem that is inside or connected to the HMC to answer incoming calls on the phone line to which it is connected. If you select **Allow local modem call answering** and then select **OK**, then the HMC will answer automatically on the phone line to which it is connected and will negotiate a connection with the other end if it is a modem. See Figure 12-33.

Note: As a general security guideline, you should turn off this option.

You should refrain from activating this setting unless you have approval from your local IT infrastructure's management and administrators. Many IT departments have rules and restrictions governing the use of modems over phone lines in their environment, and allowing the modem on your HMC to answer phone calls might be a security violation in your environment.

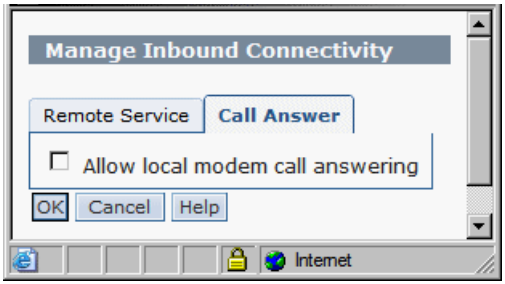


Figure 12-33 Manage Inbound Connectivity, Call Answer

12.3.4 Manage Customer Information

The Manage Customer Information tasks allows you to enter contact information that pertains to the HMC ownership. On the Administrator tab, you can enter a primary and secondary phone number as well as the owning e-mail address and fax number (Figure 12-34).

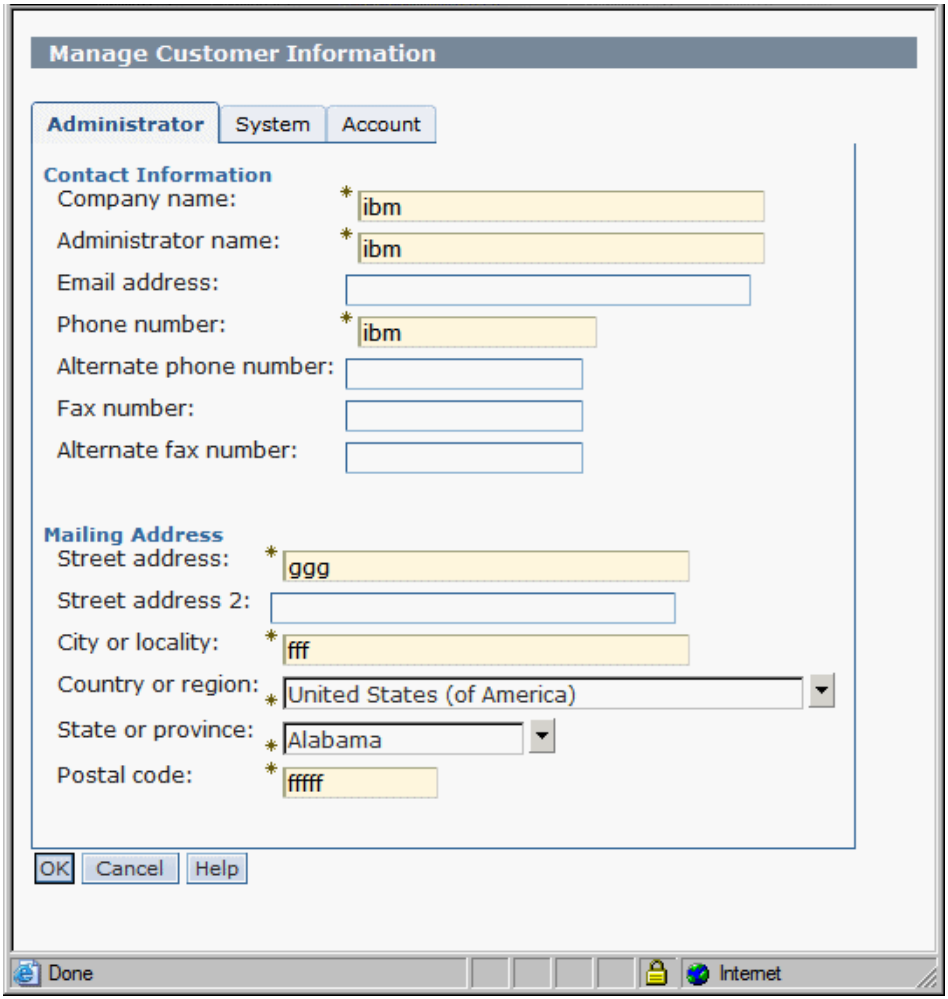


Figure 12-34 Manage Customer Information

On the System tab, you can enter the postal address at the HMC location (Figure 12-35). This information can be used to send you fixes and patches through mail and also can provide an address for service technicians for when the HMC needs to be serviced.

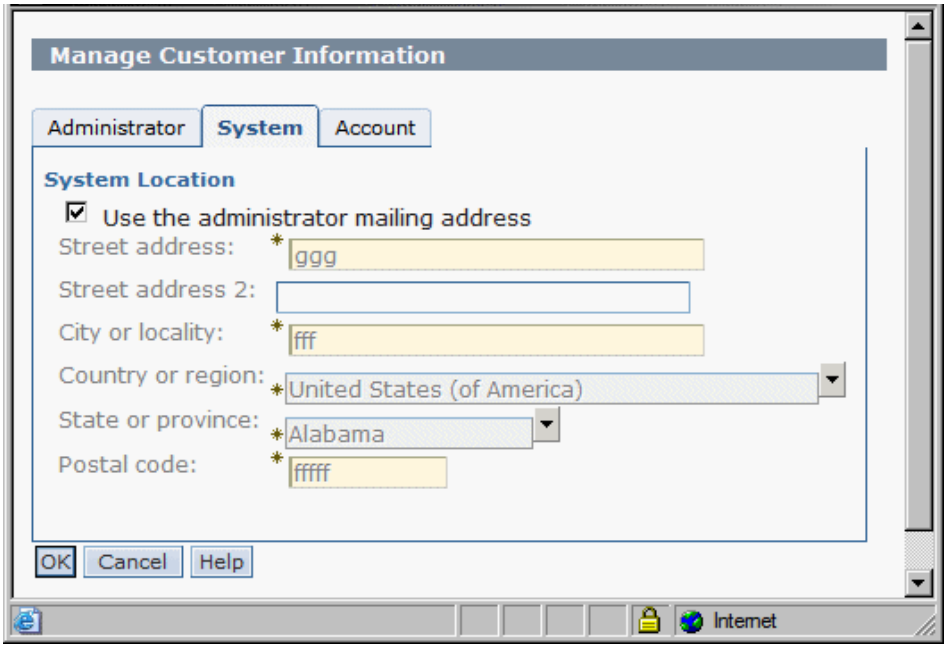


Figure 12-35 Manage Customer Information, System

Finally, on the Account tab, you enter the fields for the account that owns the HMC (Figure 12-36). If you do not know your customer number, enterprise number, and so forth, contact your sales representative who can provide this information to you.

The information about this window can be useful for IBM representatives to gather inventory and account data associated with your HMC and your enterprise.

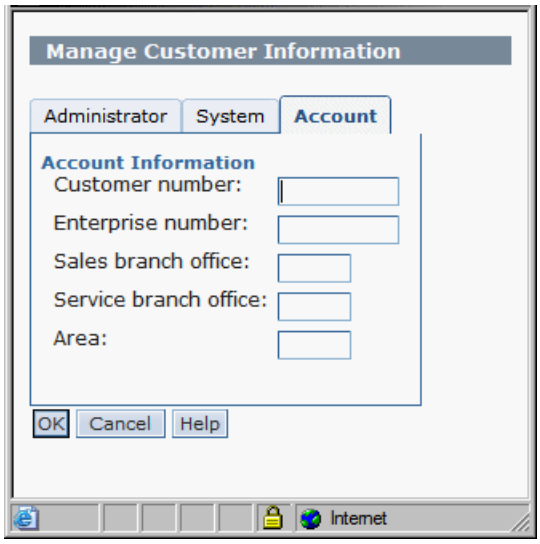


Figure 12-36 Manage Customer Information, Account

12.3.5 Manage eService Registration

The Manage eService Registration task allows you to add the HMC and managed servers to your IBM Electronic Services profile. By enabling eService registration you can:

- View the latest IBM Electronic Services news
- Customize the Web page with links that apply to your systems
- View reports that are created from the Electronic Service Agent information that your system sent to IBM
- Submit a service request for hardware and software
- Search for information to solve your system problems
- Find services available in your country

Before proceeding with registering your HMC, you first need to visit the following Web site:

`http://www.ibm.com/support/electronic`

On this Web site, select **Register** as shown in Figure 12-37.

Note: If you already have an ID, then skip to “Registering eService from the HMC” on page 366.

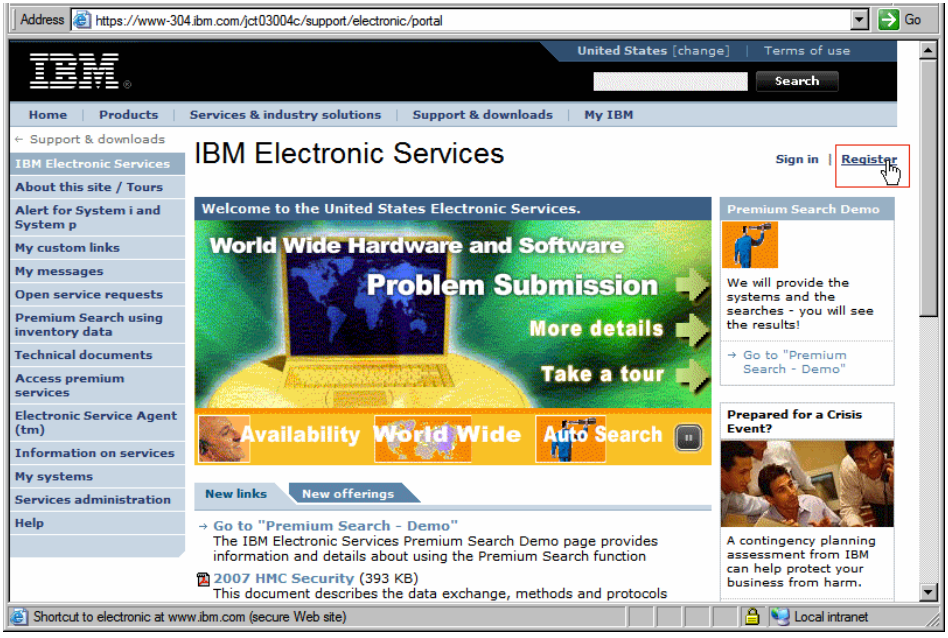


Figure 12-37 Electronic services Web site

Create an IBM ID as shown in Figure 12-38. When you have completed all the fields on this window, select **Continue**.

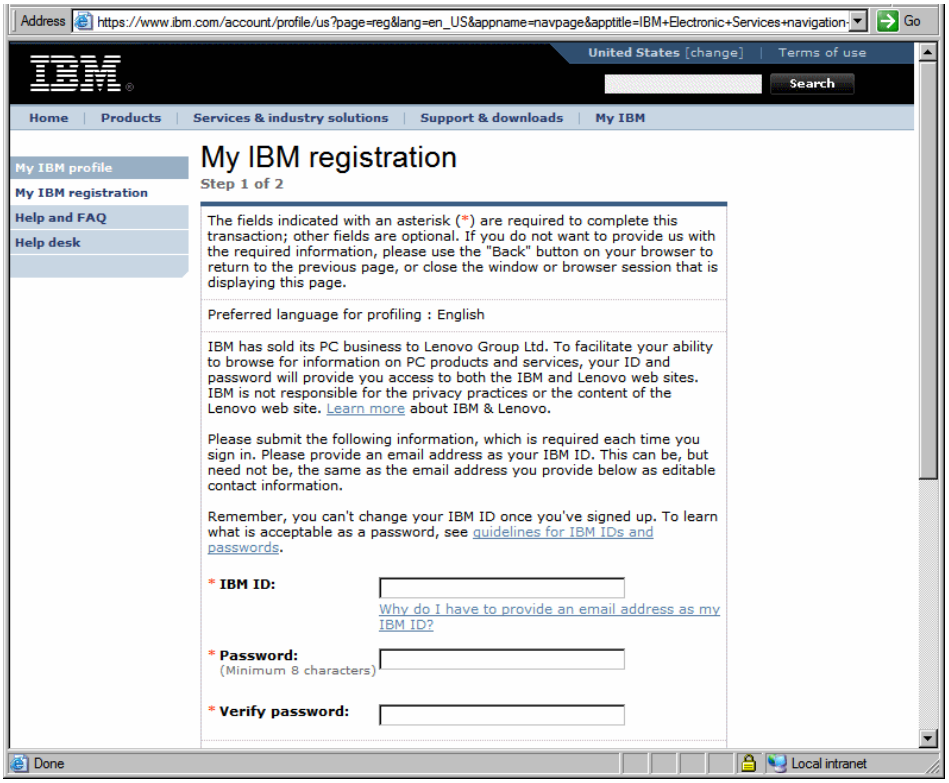


Figure 12-38 Electronic services, registration

Registering eService from the HMC

When you have an IBM ID, select **Service Management** → **Manage eService Registration**. Then, follow these steps:

1. Enter the e-mail address that you used to create your IBM ID and then select **OK** (Figure 12-39).

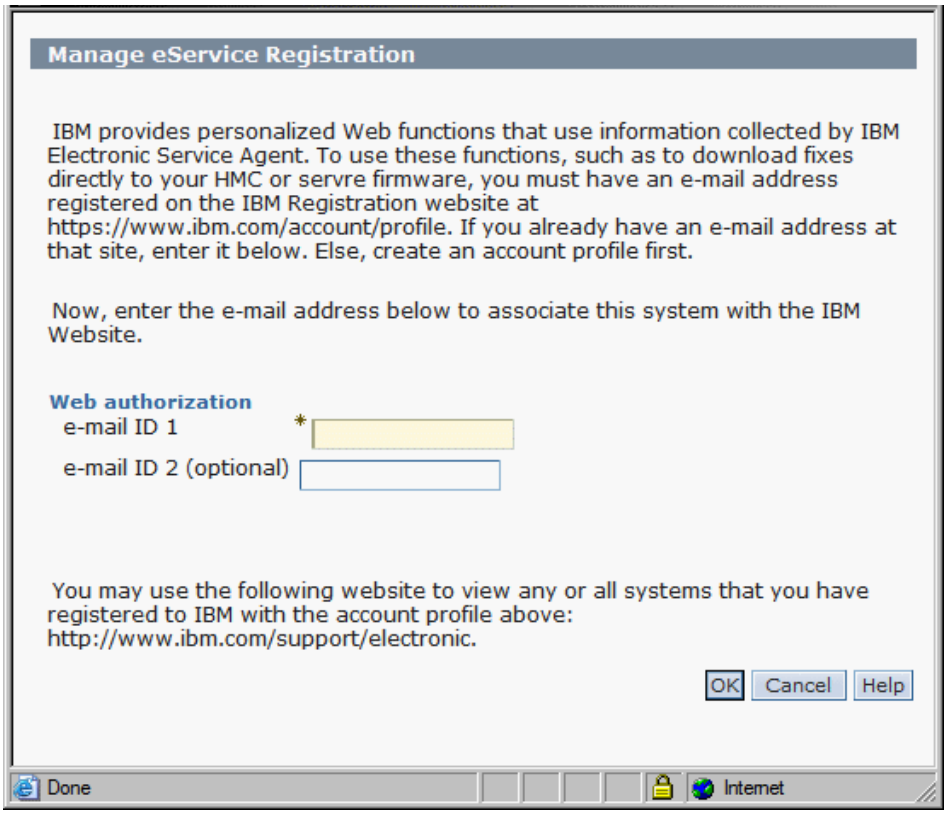


Figure 12-39 Enter e-mail addresses to associate HMC with eService

2. When you have registered your HMC successfully, revisit the Web site:

   `http://www.ibm.com/support/electronic`

3. Then select **My Systems** as shown in Figure 12-40 to view the servers that are associated with your IBM ID on the Electronic Services Web site.

Figure 12-40 Electronic services registration

12.3.6 Manage Serviceable Event Notification

This option allows you to set up e-mail addresses to be contacted for hardware notices or all serviceable events.

To set up e-mail addresses to be contacted for serviceable events, select **Service Management → Manage Serviceable Event Notification**. On the Email tab, click Add to enter an e-mail address (Figure 12-41).

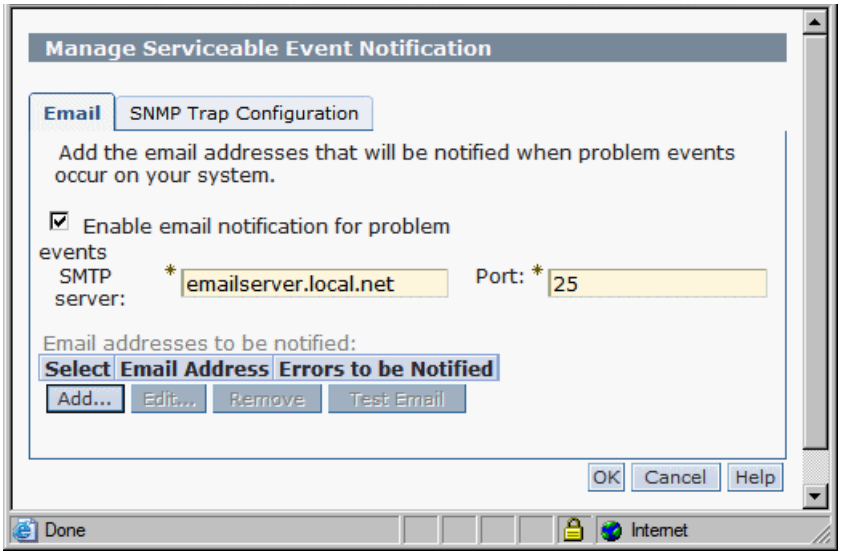


Figure 12-41 Manage Serviceable Event Notification

You can enter an e-mail address to be contacted and then select to choose to have this e-mail address contacted for either all problem events or just Call-Home hardware events (Figure 12-42). You can enter multiple e-mail addresses one at a time and select **Add**. When you have added all the e-mail addresses that you want contacted for serviceable events, select **Cancel** to close this window and to return to the main HMC view.

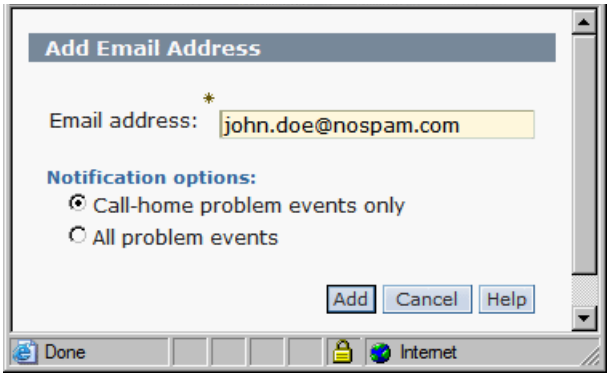


Figure 12-42 Add Email Address for notification

12.3.7 Manage Connection Monitoring

Connection monitoring generates serviceable events when communication problems are detected between the HMC and managed systems. If you disable connection monitoring, no serviceable events are generated for networking problems between the selected machine and this HMC.

To enable connection monitoring with a managed server, select **Service Management** → **Manage Connection Monitoring**. The Manage Connection Monitoring window opens as shown in Figure 12-43.

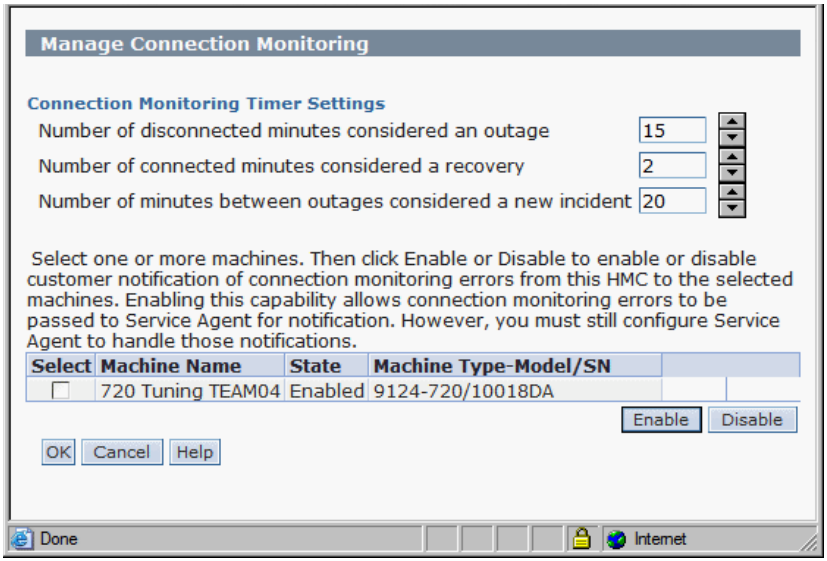


Figure 12-43 Manage cOnnection Monitoring

Here, you can manipulate:

- **Number of disconnected minutes considered an outage**: Set the number of minutes of disconnect that are considered an outage. If connectivity is restored before this threshold is met, the managed server is considered recovered and no serviceable event is reported.
- **Number of connected minutes considered a recovery**: Specify the number of minutes of required connectivity required to put a managed server in a recovered state. This is directly associated with the disconnected minutes threshold, in that this value is monitored when the outage threshold is met.
- **Number of minutes between outages considered a new incident**: Specify the amount of time required between outages required to report a new outage report

Select the managed server that you want and then select either **Enable** or **Disable** to manipulate connection monitoring. To save your settings, select **OK**.

12.3.8 Manage POWER4 Service Agent

If your IT environment has POWER4 servers attached to an HMC, you can use the Manage POWER4 Service Agent option to have your V7 HMC act as a focal point for Service Agent reporting.

To use this option, select **Service Management** → **Manage POWER4 Service Agent**. Then, in the window that opens, select **Enable Service Agent Connection Manager** as shown in Figure 12-44.

Next, you can manipulate settings for:

- Secure Mode: If cleared, data transmission is unencrypted. If selected, then data between the HMC and the POWER4 HMC is encrypted through the HTTPS protocol.
- URL for configuration download
- Password for configuration updates: It is highly recommended that you change the password from its default value for security purposes.

When you have finished with your selections, select **OK**.

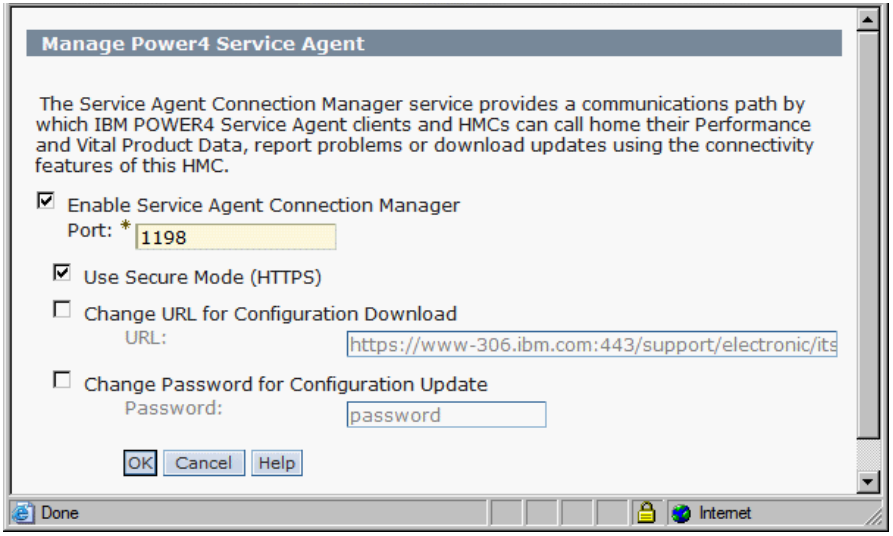


Figure 12-44 Manage POWER4 Service Agent

13

Capacity on Demand

This chapter discusses the various types of Capacity on Demand (CoD), how to acquire enablement and activation codes, and finally how to enter these enablement and activation codes on your HMC to gain the benefits of the various CoD types.

13.1 Advantages of CoD

CoD provides several advantages to IBM customers:

- Customers can plan for later expansion.

  An IBM customer can order a POWER5 or POWER6 16-way system now with 8-way active and then can scale their system performance granularity to a 16-way without CE intervention or additional hardware installation.

  Similarly, customers can order a 590 or 595 with 256 GB of system memory and 128 GB active, and then can bring up their memory capacity without additional hardware installation.

- Customers can work around budget constraints by taking advantage of CoD.

  A customer might want a 16-way 570 now but can only afford an 8-way within the current budget. In this scenario, the customer could buy the 16-way with 8-way active, and then when the budget allows, the customer can activate the additional processors without having to order additional hardware, schedule a CE, and so forth.

- Customers can plan for emergencies and system outages.

  CoD resources can be turned on or off on the fly to cover for system outages or emergency business needs.The Capacity BackUp (along with HACMP/XD) offering can be set up to have a full system in reserve in the event of an outage.

- Customers can plan for scaled usage or billing of POWER5 and POWER6 servers.

  Customers can use On/Off CoD, Reserve Capacity, or Utility Capacity to have resources in reserve and can save money on servers by paying just for what they use.

  Note: Reserve Capacity is available on POWER5 systems that support CoD functions. Utility Capacity is available on POWER6 systems that support CoD.

- Customers can take advantage of increased RAS (reliability, availability, serviceability).

  By delivering resources for later activation, customers can activate additional system horsepower without any system downtime or interruption. Processor sparing allows for inactive processors to be activated on the fly in the event of a processor failure. Processor sparing incurs no activation charge to the customer.

In addition to these advantage, the latest version of the HMC code introduces a new type of CoD which we discuss in detail in 13.3.4, “Utility CoD” on page 383.

Furthermore, there have been some enhancements and changes to the CoD Web site, as well as changes to the HMC interface in how to activate and enable the various CoD types.

13.2 Permanent types of CoD

Permanent types of CoD are permanent activations of inactive resources. On some models, all system resources are turned on by default, but on some larger scale POWER systems, resources (processors and sometimes memory) can be delivered inactive. For these inactive resources, permanent activations can be purchased either on initial order or through an upgrade. The types of permanent activation for these resources are:

- Capacity Upgrade on Demand (CUoD)
- Mobile CoD

13.2.1 Capacity Upgrade on Demand

CUoD references acquiring full processor or memory activations for inactive CoD resources. CUoD allows for customers to plan for later expansion with their POWER servers, and allows for flexibility with system pricing. By purchasing systems with inactive resources customers can get around budget constraints, or have resources in reserve for increased demand later in their server ownership.

13.2.2 Mobile CoD

Mobile CoD is the ability to move, at no charge, resource (processor *and* memory) activations between systems with the same system type, and it is currently handled by the CoD Project Office at pcod@us.ibm.com.

Guidelines for Mobile CoD

Movement of activations can only be done between the same system types. For example, you can move activations from one 9117-570 to another 9117-570, but not from a 9117-570 to a 9119-590 since the 570 and 590 systems are not only different models but different system types. Not only do the system types have to match between the source and target server, but the processor speed activations also have to match.

Another requirement for Mobile CoD is that the final configuration of both the source and the target server must be a valid configuration. For example, a 9119-595 server with 32 processors and 16 activations could not be a source server to move activations to another 595, because a 595 server might not have fewer than 50% of its processors activated. Furthermore, *both* the source and target servers must be in the same country in the same enterprise to be eligible for Mobile CoD.

Requesting a Mobile CoD transfer

Getting an activation moved from one system to another requires co-operation with both the sales team involved with the customer and the CoD Project Office.

The following are the necessary steps to request a transfer:

1. The customer must provide the system type and serial numbers for both the source and target servers to their sales representative.
2. RPO MES configurations must be done within eConfig by your sales representative on both the source and target servers representing which resources and how much of each are being deallocated and reallocated.
3. These RPO MES configuration files are then sent to the System p CoD Project Office at pcod@us.ibm.com.
4. When the RPO MES order files have been approved by the CoD Project Office you will receive resource de-activation codes. For documentation on entering deactivation/activation codes on your HMC see 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395.

   Note: The source server must be at firmware level SF235-160 or higher in order to implement step 4.

5. Collect VPD at the source server for the appropriate resources using the following commands using the HMC CLI interface as shown in Figure 13-1 on page 377:
   - processors: `lscod -m` *system_name* `-t code -r proc -c cuod`
   - memory: `lscod -m` *system_name* `-t code -r mem -c cuod`

   Note: The **`lscod`** command can only be executed if the managed system is in either *Standby* or *Operating* state.

   After you collect VPD, send the output to pcod@us.ibm.com.

Figure 13-1 Capacity on Demand, example of lscod command

6. When the CoD Project Office has received the VPD for the appropriate resource deactivation from the source server, they will then send you the appropriate activation codes for activation on the target server. You can enter these codes on your HMC using the steps outlined in 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395.

13.3 Temporary types of CoD

On some system types some resources (processors, and sometimes memory) can be temporarily activated for brief or extended periods of time. This allows for greater resource allocation flexibility, as well as provide more choices to customers in how to pay for resource usage by allowing them to pay for just what they use.

The types of temporary CoD are:

- Trial CoD
- On/Off CoD
- Reserve Capacity
- Utility CoD (formerly Reserve Capacity)
- Capacity BackUp (CBU)

13.3.1 Trial CoD

Any system purchased with inactive system resources (processors or memory) can have resources temporarily activated using Trial Capacity on Demand. This allows for customers to test various processor or memory configurations before purchasing permanent or temporary resource activations. Similarly, customers can request full or partial trials for their resources to meet emergency performance needs. By doing this they can bridge the time gap between immediate performance needs and activation code delivery.

There are two types of Trial CoD:

- Standard Trial
- Exception Trial

Standard Trial

A Standard Trial allows for up to two processors and also four gigabytes of system memory to be temporarily activated for up to thirty days. If after thirty days the customer decides to fully activate those resources, additional trials for their other inactive resources become available to them.

Exception Trial

An Exception Trial allows for up to 100% of processors or memory to be temporarily activated for up to thirty days. Unlike the Standard Trial, an Exception Trial is one time only, and after the Exception Trial expires after thirty days no more Exception Trials can be requested.

To learn how to receive activation codes for either a standard or exception trial, see 13.4.2, “Requesting trial activation” on page 390.

13.3.2 On/Off CoD

On/Off Capacity On Demand is used to activate resources temporarily to cover for the demands of business peaks. As long as on On/Off resource (1 processor or 1 GB of memory) is active, at the end of every twenty four hours a resource day is charged against the customer. On/Off CoD is post-paid only, and allows for system administrators to anticipate peak business demands by activating resources appropriately.

Contract requirements

There are both contract and reporting requirements for On/Off CoD. The contract requirements for On/Off CoD can be found at:

http://www-912.ibm.com/supporthome.nsf/document/28640809

As shown in Figure 13-2, there are links for both the sales channel and customers to review the contract requirements associated with On/Off CoD.

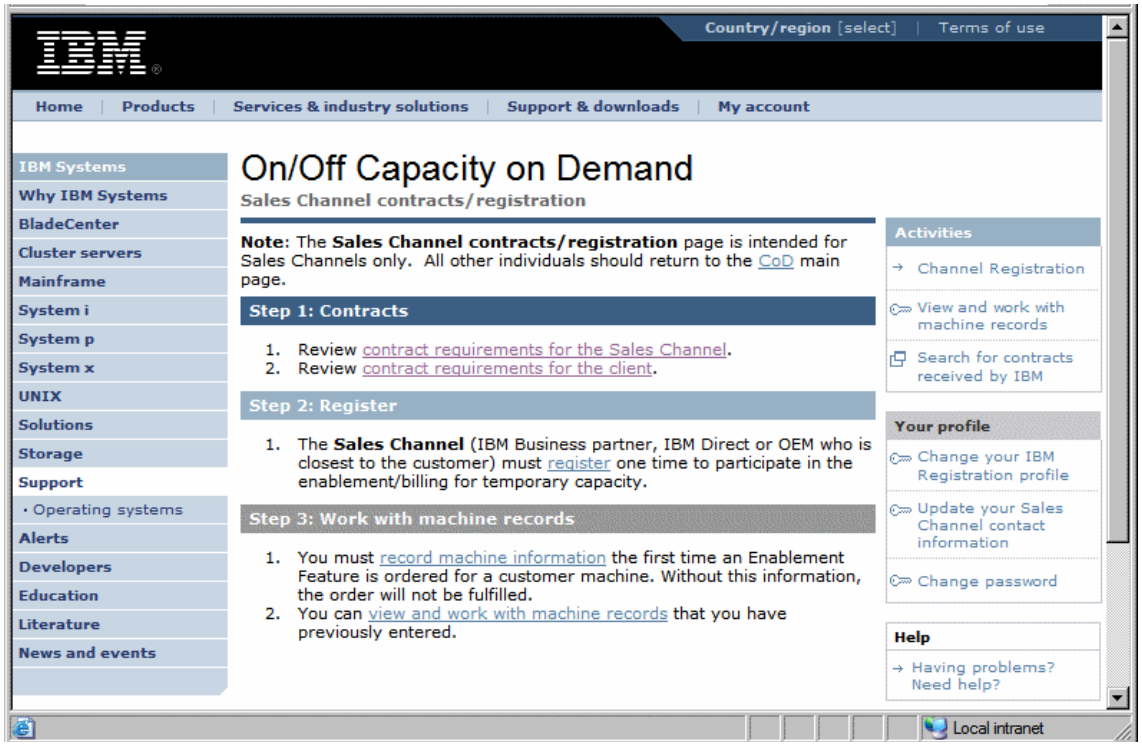


Figure 13-2 Capacity on Demand, On/Off CoD contract requirements

To obtain contract requirements for the sales channel, you must select your country and relationship with IBM as shown in Figure 13-3.

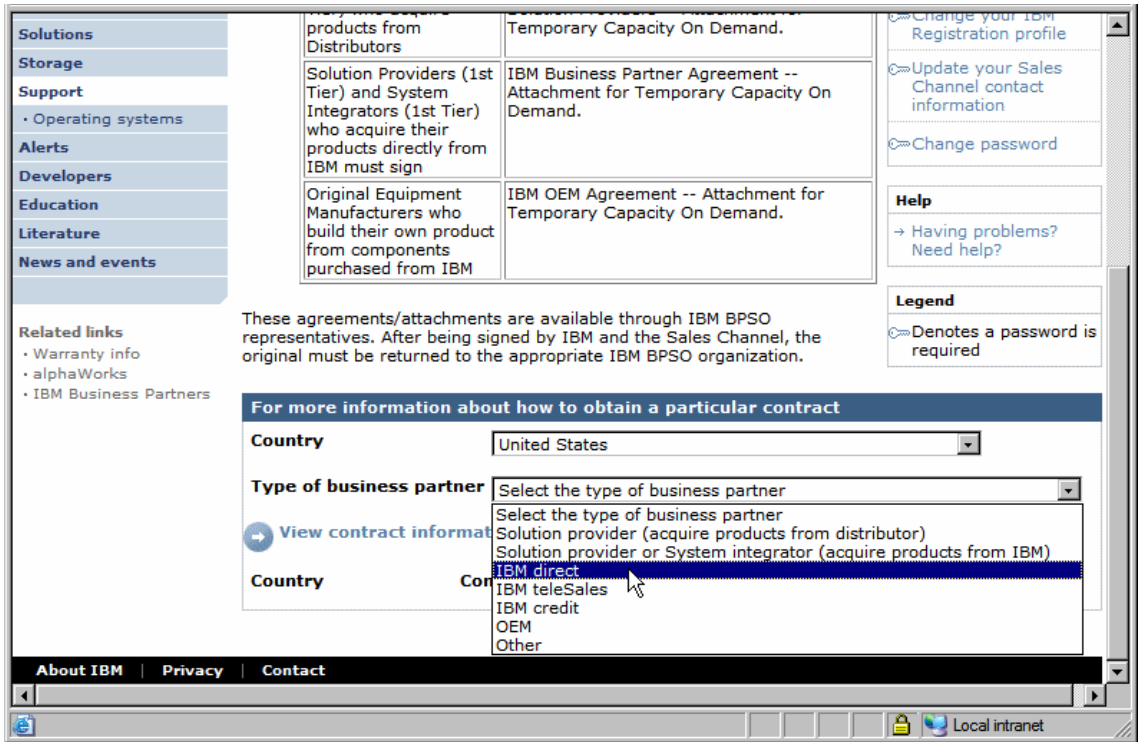


Figure 13-3 Capacity on Demand, On/Off CoD contract requirements for the sales channel

To obtain contract requirements for customers, you must select your country, as shown in Figure 13-4.

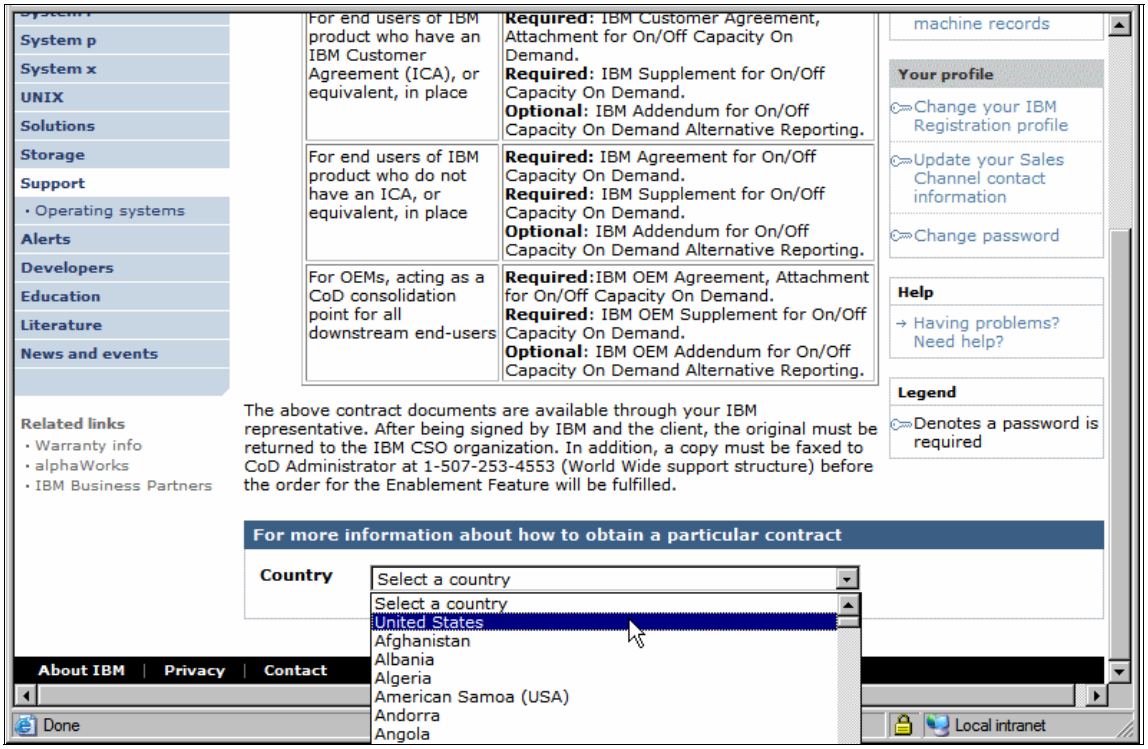


Figure 13-4 Capacity on Demand, On/Off CoD contract requirements for customers

Finally, as shown in Figure 13-29 on page 409 there is a click-through agreement when the customer activates On/Off CoD on their managed server.

Reporting requirements

IBM customers have three options for reporting their On/Off CoD usage:

- Fax
- E-mail
- Service Agent (call home)

For fax reporting, send your usage reports to:

Capacity on Demand Administrator
Fax number: 507-253-4553
Location: Rochester, Minnesota USA

For e-mail reports, send your usage reports to pcod@us.ibm.com.

The usage reports for both e-mail and fax must contain the following data:

- Customer company name
- Customer contact name
- Customer address
- Customer phone number
- Customer fax number
- Processor days used
- Memory days used

Furthermore, usage reporting can be done by activating Service Agent in the Service Management windows on your HMC. For instructions on enabling Call Home (also known as Service Agent) on your HMC, see 12.3.1, “Manage Systems Call-Home” on page 352.

Failure to report the billing data results in an estimated bill for 90 processor or memory days of temporary capacity.

Acquiring enablement codes

Before using On/Off capacity on your server, you must *enable* your server. To do this, engage your sales channel for an enablement feature (available as an upgrade feature only) and sign the required contracts.

IBM generates an enablement code, mails it to you, and posts it on the Web for you to retrieve and enter on your server.

To read about how you can access your enablement codes on the Web see 13.4, “CoD Web site navigation” on page 385, and to read about how to enter your enablement codes on the HMC see “Entering enablement and activation codes on the HMC” on page 395.

A On/Off processor enablement code lets you activate up to 360 processor days (360 days x 1 processor) of temporary capacity. If you have reached the limit of 360 processor days, place an order for another processor enablement code to reset the number of processor days you can request to 360.

A On/Off memory enablement code (if the customer opts for On/Off memory) lets you activate up to 999 memory days (999 days x 1 GB of memory) of temporary capacity. If you have reached the limit of 999 memory days, place an order for another memory enablement code to reset the number of memory days you can request to 999.

13.3.3 Reserve Capacity

Reserve Capacity is used to manage short workload peaks by temporarily activating inactive processors. This offering is only for POWER5 servers, and requires an HMC to enter the enablement code or to turn this feature on or off.

Reserve Capacity is pre-paid only, and it is purchased in 30 day blocks of processor days. A processor day can be used by any processor, and 30 processor days could mean:

- One processor for thirty days
- Two processors for fifteen days
- Three processors for ten days, and so forth

The shared processor pool will contain both non-reserve and reserve processor capacity. The reserve processor capacity will only be utilized if the non-reserve capacity is fully utilized from the shared processor pool.

A processor that is enabled through a Reserve Capacity enablement code is added to the shared processor pool. This additional processor capacity will be utilized in a partition when an uncapped partition requests additional processor resources from a 100% utilized shared processor pool.

A Reserve CoD processor day is consumed when the non-reserve processors become 100% utilized (all active non-Reserve processors available to the pool are being fully utilized), and 10% of a Reserve CoD processor is put into use for more than 30 consecutive seconds. When a Reserve CoD processor day is consumed within a 24 hour period against a specific Reserve CoD processor, no additional Reserve CoD processor days will be charged against that Reserve CoD processor within the same 24 hour period.

Reserve Capacity also requires the system to be licensed for Advance POWER Virtualization. This is because Reserve Capacity can only be used with uncapped partitions, which are then monitored for utilization. When the shared pool of processors reaches 100% utilization only then are reserve processors activated and processor days removed from the reserve capacity.

13.3.4 Utility CoD

The shared processor pool will contain both non-reserve and Utility CoD capacity. The Utility CoD capacity will only be utilized if the non-reserve capacity is fully utilized from the shared processor pool.

A processor that is enabled through a Utility CoD enablement code is added to the shared processor pool. This additional processor capacity will be utilized in a

partition when an uncapped partition requests additional processor resources from a 100% utilized shared processor pool.

Utility CoD allows for processors to be held in reserve and activated when system utilization hits a pre-determined peak performance threshold. In the event of a system peak where all the fully active processors reach 100% utilization, inactive processors can be activated on the fly by the HMC to add additional processing horsepower to cover for the increased performance need. When the business peak has ended, these processors are then returned to the shared resource pool until they are required again.

Utility CoD replaces Reserve Capacity on POWER6 servers, and it offers more flexibility and granularity than its predecessor. The major points of difference from Reserve Capacity are:

- Capacity is measured on a per processor minute, not processor day, basis
- Capacity can be paid for either before *or* after usage
- Resource usage reporting is *required*

Much like Reserve Capacity (which is still offered on POWER5 servers with the HMC), Utility CoD only works with uncapped partitions, and also requires the use of an HMC for both enablement and for managing the number of Utility CoD processors that are available for use in the shared processor pool monitoring of utilization.

There are no contract requirements for Utility CoD, but there is a pop-up window where the customer has to agree on the reporting requirements associated with Utility CoD.

13.3.5 Capacity BackUp (CBU)

Capacity BackUp (CBU) is available for System p enterprise class servers to provide a production system backup capability at an attractive price.

With IBM HACMP V5 and HACMP/XD software (5765-F62) installed, Capacity BackUp processors can be automatically activated to provide round-the-clock business continuity and disaster recovery with no loss of data. HACMP can be configured to recognize a failing server and activate Capacity BackUp resources upon failover.

CBU systems are configured and shipped with a full compliment of processors installed with four active processors and the remaining processors inactive CoD. With the p5-590 and p5-595 systems CoD memory can also be purchased and activated when needed.

Each processor book ships with 450 On/Off days, and when these expire the customer must move to the On/Off CoD model as detailed in 13.3.2, “On/Off CoD” on page 378. As such, CBU has the exact same contract and reporting requirements as On/Off CoD.

Finally, beyond the initial four processor activations, the other processors on a CBU system can never be permanently activated.

Software licensing

There are no AIX, HACMP, or GPFS licensing fees associated with disaster recovery, however there are associated software licensing fees with activating CBU processors for testing purposes and production emergencies. Software licensing is done on a per processor day basis, and you should contact your sales representative to licence your system appropriately for such usage.There might be additional fees associated with your Linux distribution. Check with your Linux vendor to see if there are any licensing fees that are associated with your distribution and CBU usage.

13.4 CoD Web site navigation

The System p CoD Web site is available at:

`http://www-03.ibm.com/systems/p/cod/`

On this Web site, shown in Figure 13-5 on page 386, you can find:

- Documentation on the various types of CoD
- Activation codes for CoD offerings you are eligible for
- Hardware specific documentation for CoD

The three tabs in the center of the window as shown in Figure 13-5 on page 386 provide information about CoD, documentation on the different types of CoD, and an area where you can get activations for both CoD and Advanced POWER Virtualization (APV).

Under the Learn More section you can find hardware specific documents that discuss how CoD is handled and delivered on the various releases of the POWER hardware set.

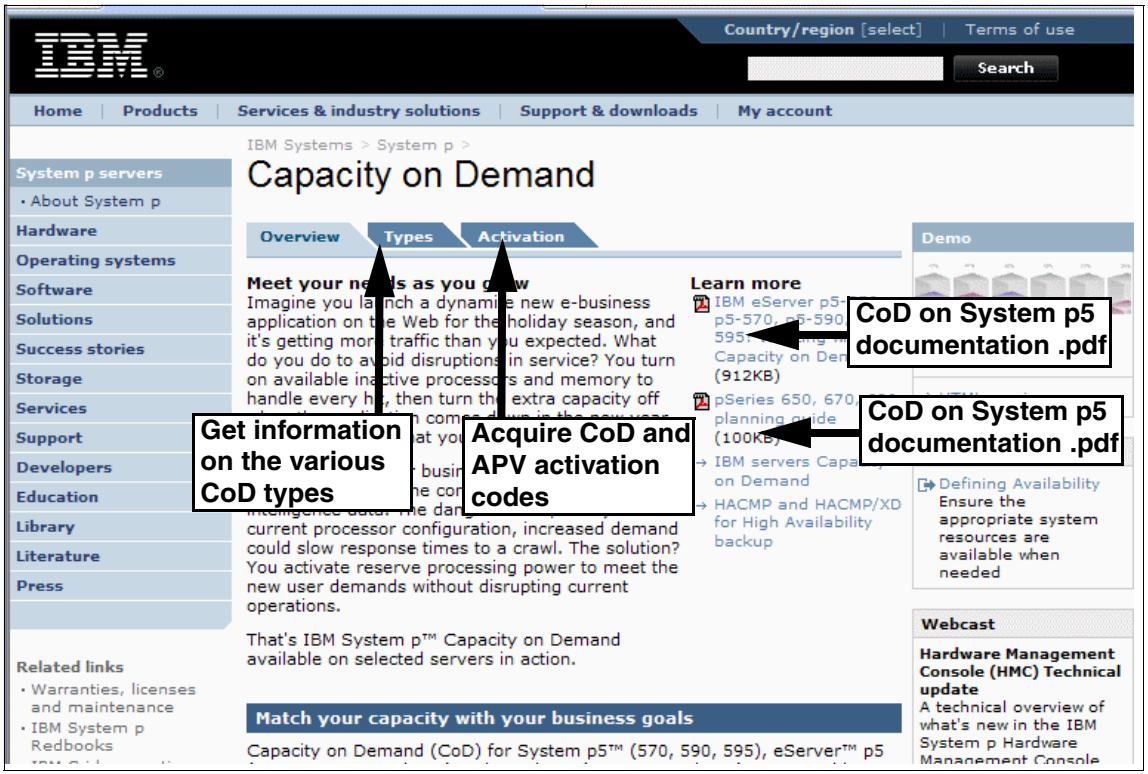


Figure 13-5 Capacity on Demand, main Web site

13.4.1 Acquiring activation codes

To acquire your CoD activation codes online, visit the URL:

http://www-03.ibm.com/systems/p/cod/activation.html

Select **Activation codes by machine serial number**, as shown in Figure 13-6.

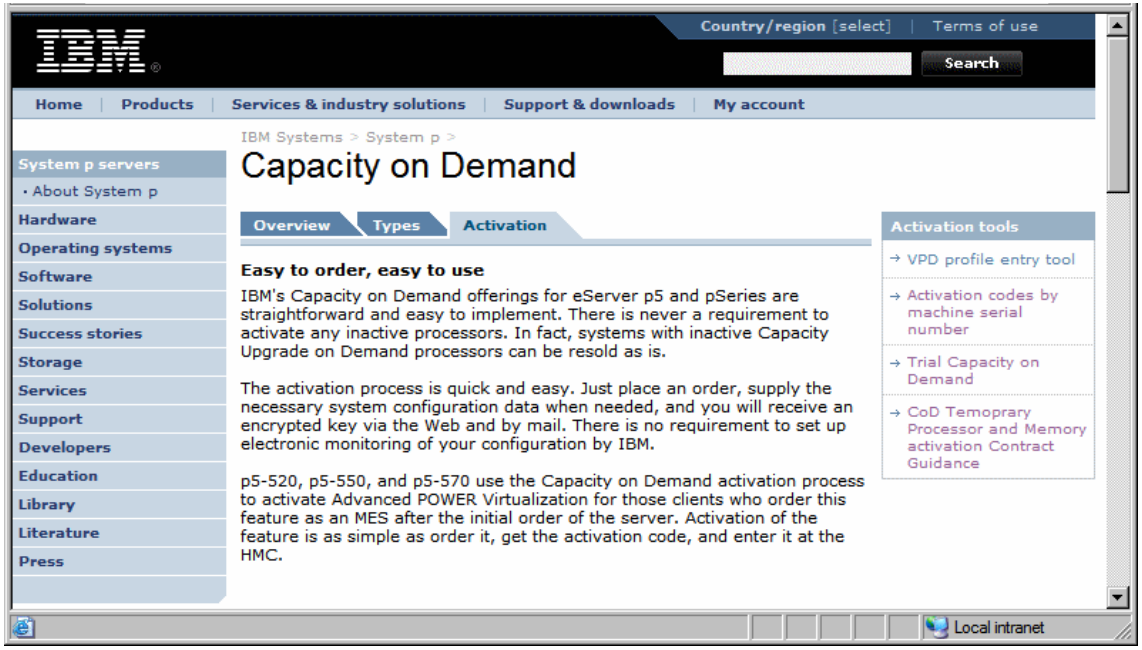


Figure 13-6 Capacity on Demand, activation codes

Then, enter the four digit system type, two digit factory code, and five digit serial number in the fields provided, and select **Submit** (Figure 13-7).

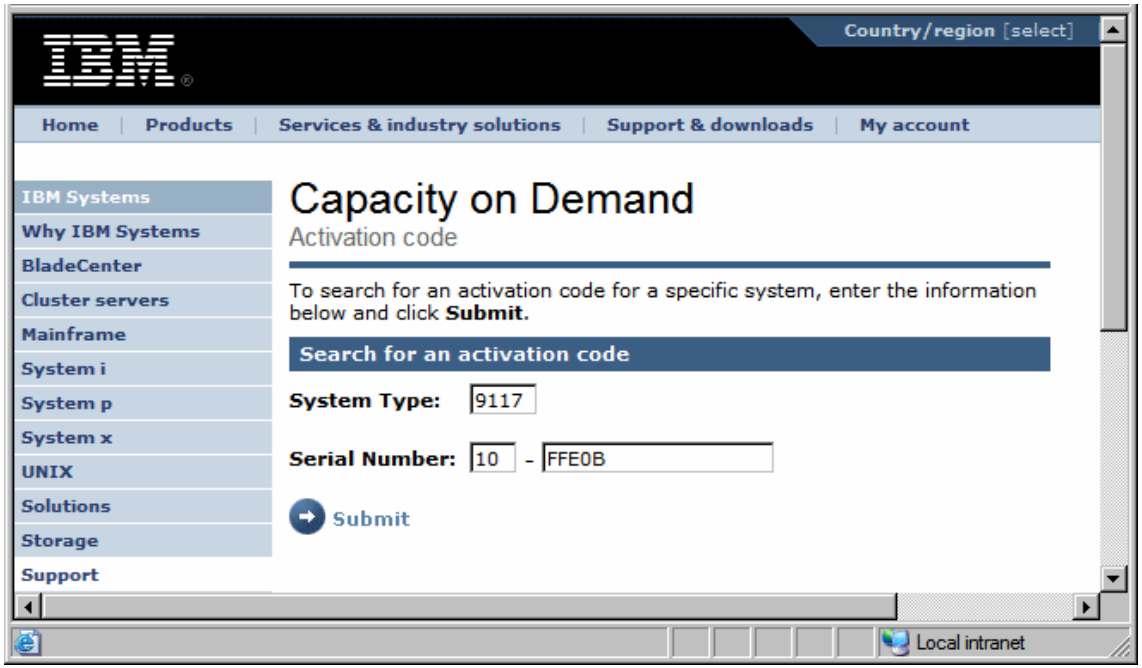


Figure 13-7 Capacity on Demand, entering system type and serial number

If all the data that you entered is valid, a results window opens, as shown in Figure 13-8. The top half are the codes that are already available for the system type and serial number you provided, as well as the dates the codes were made available. Below is a key for the acronyms of the various types of CoD offered.

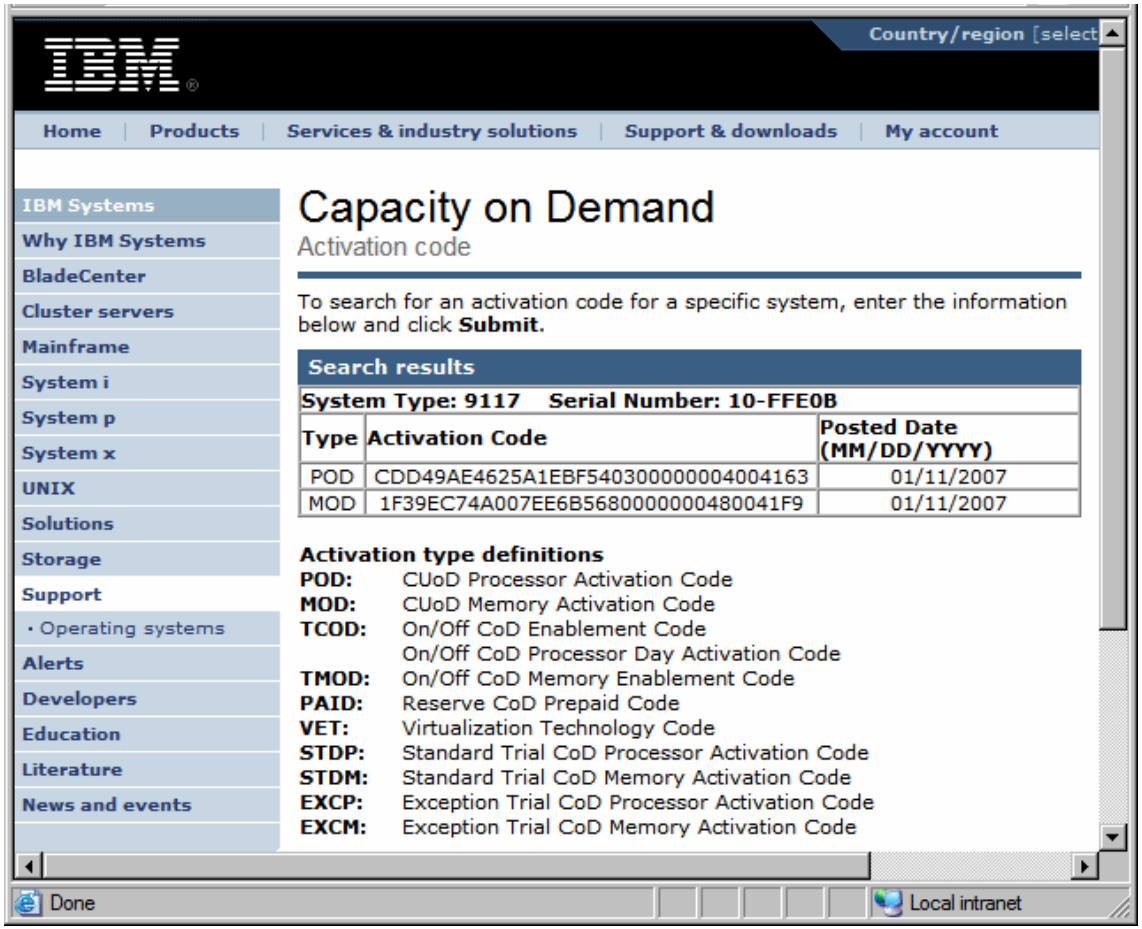


Figure 13-8 Capacity on Demand, activation codes results window

13.4.2 Requesting trial activation

To make either a *standard request* (described in “Standard Trial” on page 378) or *exception request* (described in “Exception Trial” on page 378), visit the URL:

`https://www-912.ibm.com/tcod_reg.nsf/TrialCod?OpenForm`

Select the appropriate trial request. See Figure 13-9.

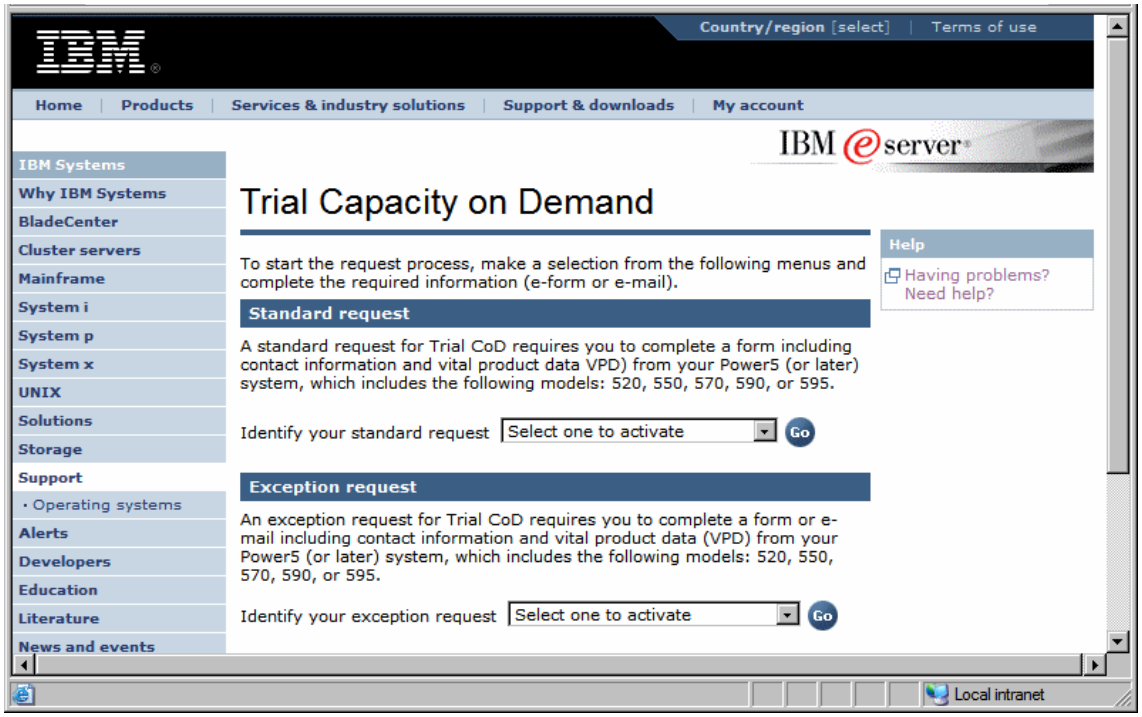


Figure 13-9 Capacity on Demand, request types

For the next step, you need to gather information from the HMC or in the Advanced System Management interface windows. To gather the trial code information off the HMC, proceed to “Gathering trial information off the HMC” on page 392. Otherwise, continue with the next section.

Gathering trial information off of Advanced System Management interface

Select **Systems Management** and select the name of the server. Then, select **Operations** → **Advanced System Management**. On the Advanced System Management interface window, select **On Demand Utilities** → **CoD Processor Information** to see the information displayed in Figure 13-10.

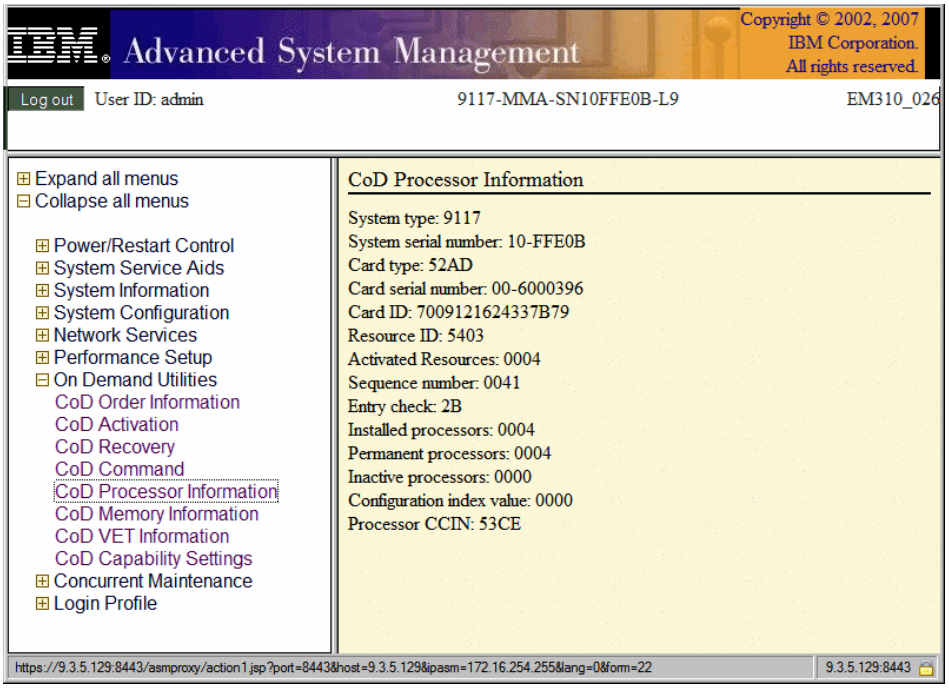


Figure 13-10 Capacity on Demand, gathering information to request a trial

Gathering trial information off the HMC

To gather the required data off your HMC, select **Capacity on Demand** → **Processor** → **Trial CoD** → **View Code Information** to open the window as shown in Figure 13-11.

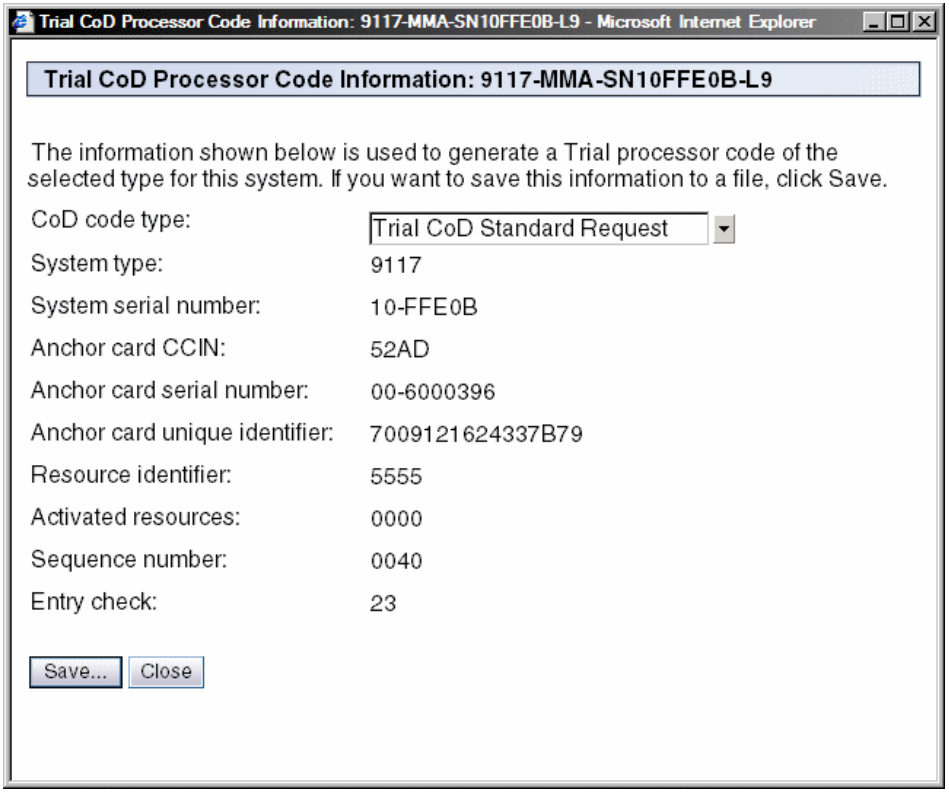


Figure 13-11 View code settings for trial CoD

Note: The data for Resource identifier changes depending on whether you are requesting an *exception* or *standard* request.

Now with this information available, you can enter the data in the form for the trial page as shown in Figure 13-12.

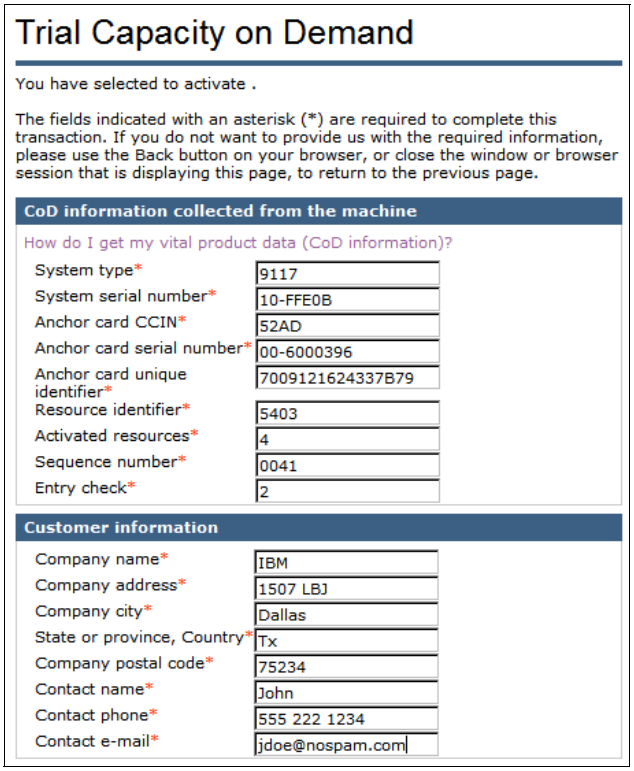


Figure 13-12 Capacity on Demand, requesting a trial

When you have completed the form, review the terms and conditions for trial capacity as shown in Figure 13-13, confirm that you have reviewed and agree with them, and then select **Submit**.

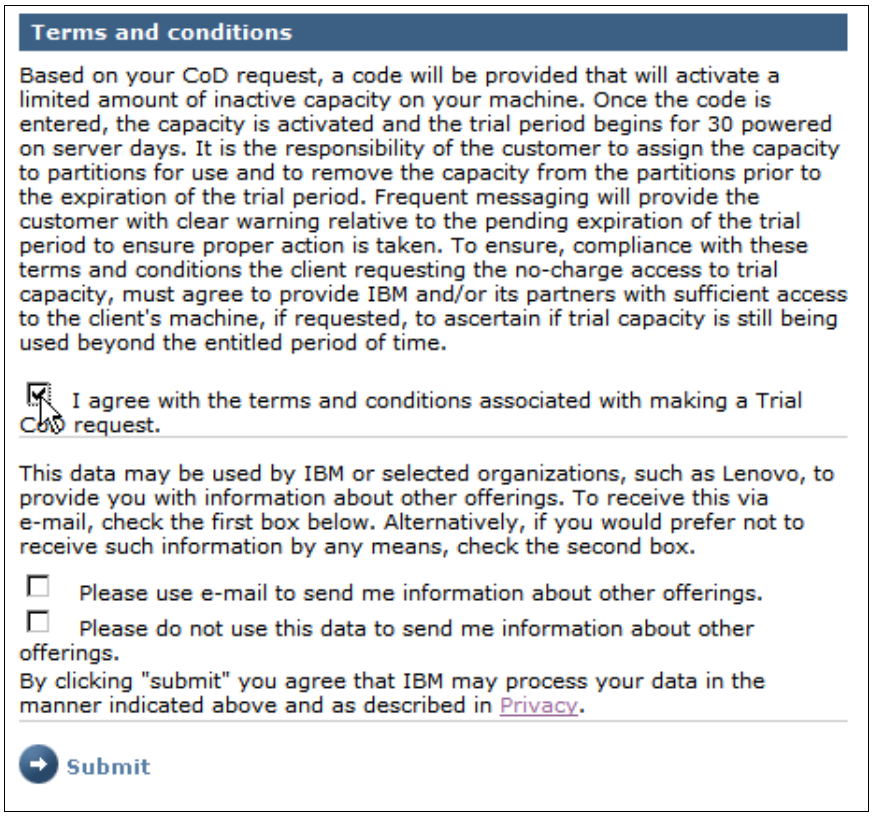


Figure 13-13 Capacity on Demand, agree to terms and conditions

You then get a confirmation page, and your activation codes display on the Web as described in 13.4.1, “Acquiring activation codes” on page 387.

13.5 Entering enablement and activation codes on the HMC

In this section, we discuss entering enablement codes, deactivation, and activation codes on your HMC. To read about how to acquire these codes, see 13.4.1, “Acquiring activation codes” on page 387.

13.5.1 Entering an activation, enablement, or deactivation code

On the HMC workplace window, select **Systems Management** → **Servers** and the name of the server. Then, select **Capacity on Demand** → **Enter CoD Code** to open the window shown in Figure 13-14.

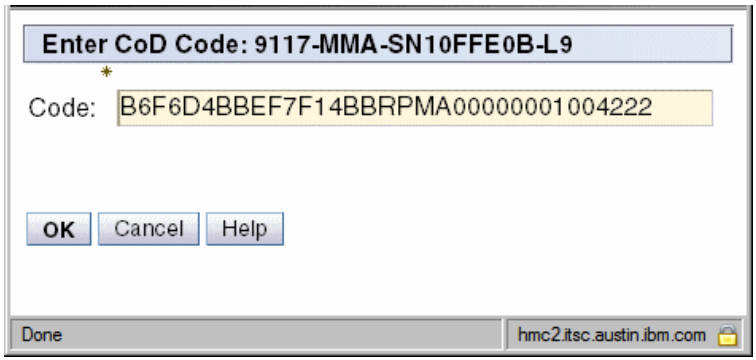


Figure 13-14 Capacity on Demand, entering activation/deactivation codes

Deactivation codes can only be acquired from the CoD project office and can be obtained by contacting pcod@us.ibm.com.

Activation and enablement codes are purchased through your sales channel. You can obtain them on the Web as described in 13.4.1, “Acquiring activation codes” on page 387, and they are mailed to you after they are purchased.

Note: Enablement, activation, and deactivation codes only work once. If you require additional code, you have to work with the System p CoD project office at pcod@us.ibm.com.

When your code is entered, select **OK**. If your code is valid, you receive a confirmation window as shown in Figure 13-15.

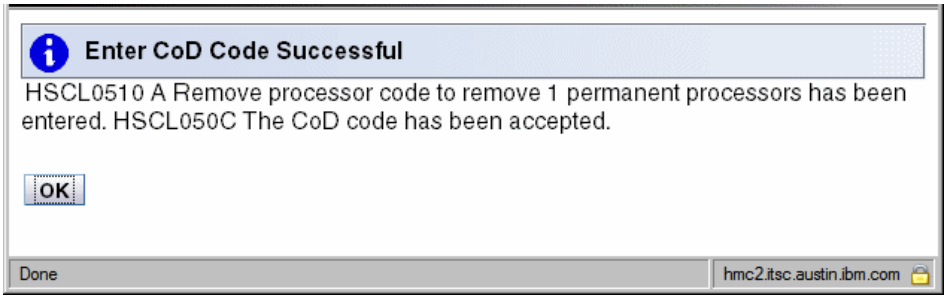


Figure 13-15 Capacity on Demand, deactivation successful

After this point the resources that you either activated or deactivated are changed on the managed server. If you entered an enablement code, the code that is associated with your CoD type allows you to manipulate the CoD offering on your managed server.

13.5.2 Activating and managing Utility CoD

You can acquire your Utility CoD activation code online as described in 13.4.1, “Acquiring activation codes” on page 387 and enter the activation code for Utility CoD as described in 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395.

When you enter your activation code, a results window displays as shown in Figure 13-16.

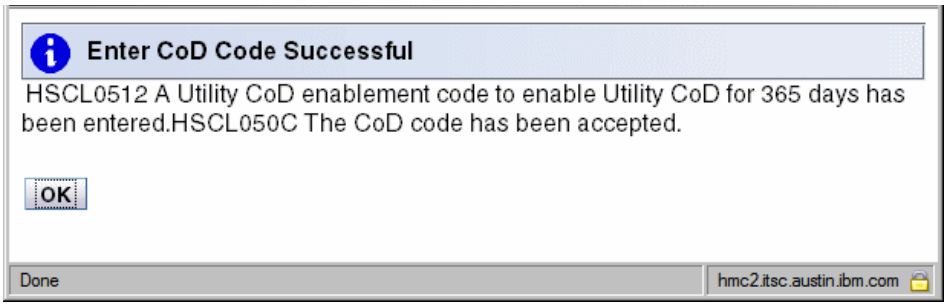


Figure 13-16 Capacity on Demand, activation Utility CoD

When activated, you can now manage your system’s **Utility** CoD usage from the Systems Management area. Select **Systems Management** → **Servers** and the

name of the server. Then, expand **Capacity on Demand (Cod)** → **Processor** → **Utitlity CoD** to see the view shown in Figure 13-17.

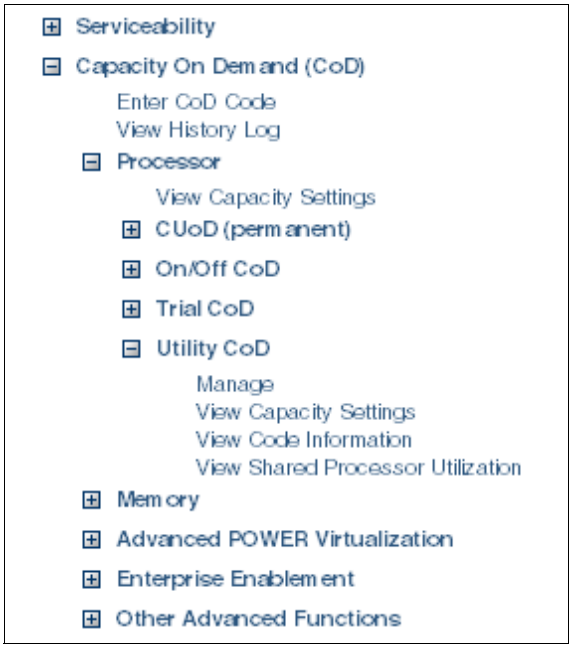


Figure 13-17 Capacity on Demand, Utility CoD view

From this view, you can:

- **Manage**: Set the number of processors eligible for Utility usage as well as set a processor minute limit.
- **View Capacity Settings**:
  - View the number of processors currently eligible for utility usage.
  - See the current minute usage limit.
  - View processor minutes that have been used by the server.
  - Examine how many processor minutes have been reported back to IBM.
- **View Code Information**: View system information associated with Utility CoD registration and activation.
- **View Shared Processor Utilization**: View utilization numbers for the shared processor pool, both Utility CoD and Non-Utility CoD processors.

Manage

Under the **System Management** view for a specific managed server, select **Capacity on Demand (CoD)** → **Processor** → **Utility CoD** → **Manage** to open the window as shown in Figure 13-18. On this window, you can add inactive processors to be used with Utility CoD and set an upper limit of processor minutes to be used. Confirm your selections and select **OK**.

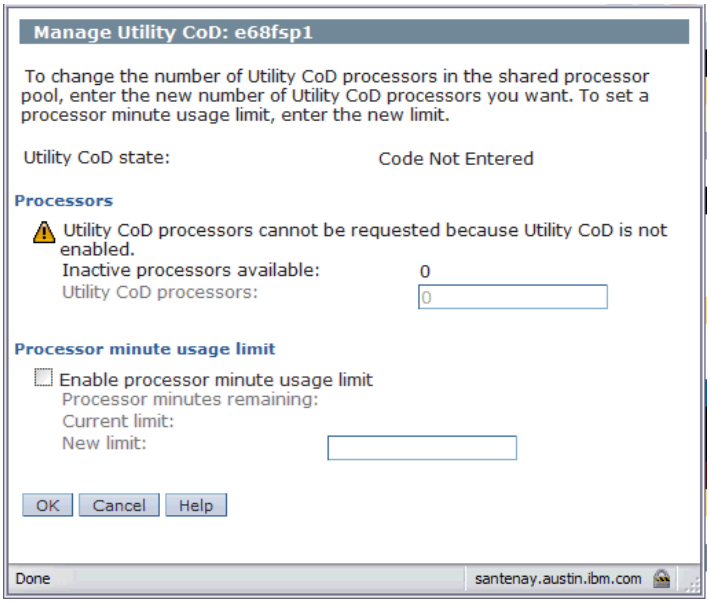


Figure 13-18 Capacity on Demand, manage utility capacity

View capacity settings

Under the **System Management** view for a specific managed server select **Capacity on Demand (CoD)** → **Processor** → **Utility CoD** → **View Capacity Settings** to open the window as shown in Figure 13-19. Here you can see the number of Utility CoD processors and are configured for Utility processor minute usage, as well as:

- The upper limit of processor minutes set
- The remaining processor minutes unused
- The stats for the previous month, the current month, and total minutes used to date
- The total number of processor minutes that have been reported to IBM

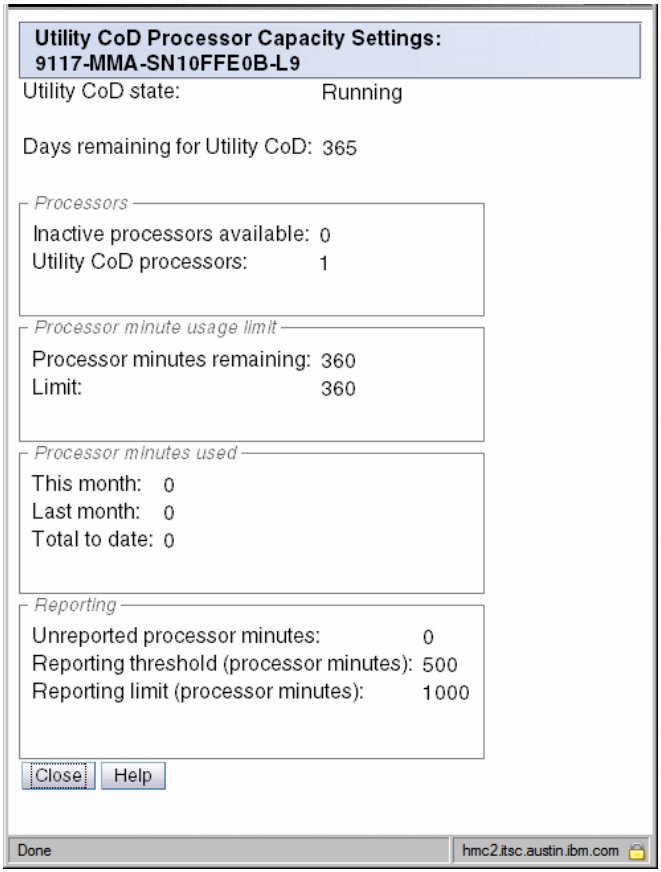


Figure 13-19 Capacity on Demand, view capacity settings

View code information

Under the **System Management** view for a specific managed server, select **Capacity on Demand (CoD)** → **Processor** → **Utility CoD** → **View code information**. You can view the registration and serial codes associated with your Utility CoD activation as shown in Figure 13-20. You can also select your view for either the reporting or enablement codes associated with Utility CoD and your managed server.

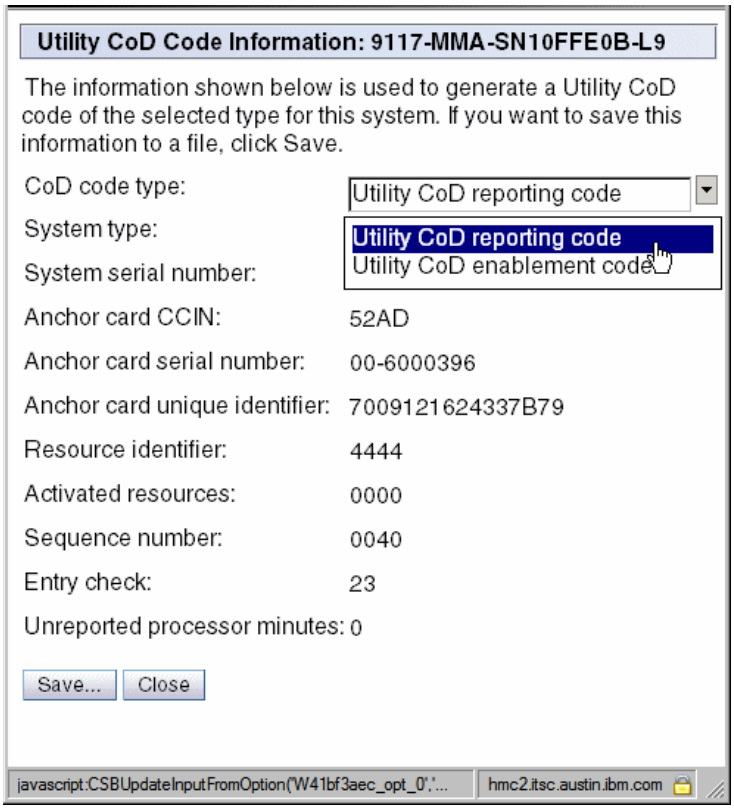


Figure 13-20 Capacity on Demand, view code information

View shared processor utilization

Under the **System Management** view for a specific managed server select **Capacity on Demand (CoD)** → **Processor** → **Utility CoD** → **View Shared Processor Utilization**. You can see the number of processors and their utilization both in and outside Utility CoD, as shown in Figure 13-21.

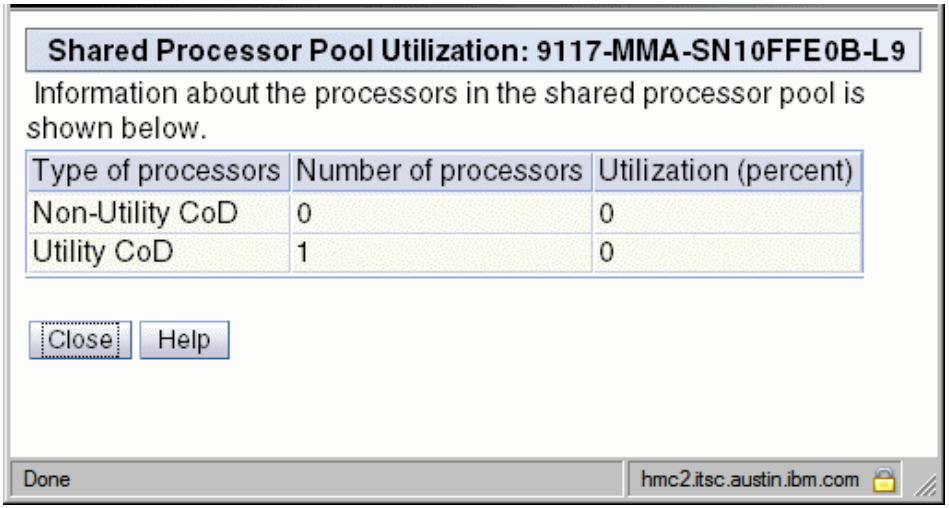


Figure 13-21 Capacity on Demand, view shared processor utilization

Viewing Utility CoD usage

On the HMC V7 you can view the logs to examine how many Utility CoD minutes have been used by your managed server. Select **Server Management** → **Servers** and the name of the server. Then, select **Capacity on Demand** → **View History Log**. See Figure 13-22.

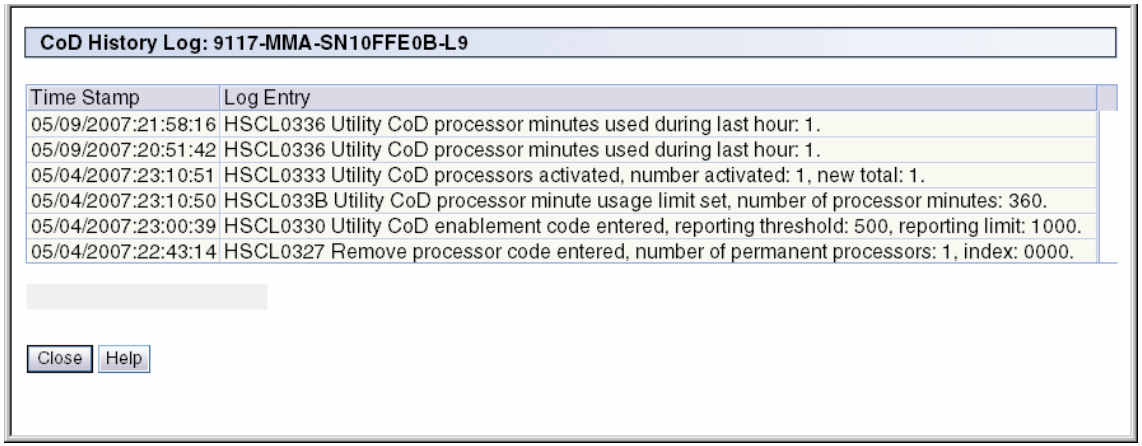


Figure 13-22 Capacity on Demand, view Utility CoD usage log

13.5.3 Activating and managing Reserve CoD

Before you can use the management options for reserve CoD, you have to enter an enablement code on the HMC. To acquire your Reserve CoD enablement code online, refer to 13.4.1, “Acquiring activation codes” on page 387 and enter the enablement code for Reserve CoD by following the directions in 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395.

Reserve CoD is only available on POWER5 servers and can be accessed by clicking **Server Management** → **Servers** and the name of the server. Then, select **Capacity on Demand** → **Processor** → **Reserve CoD** to see the view shown in Figure 13-23.

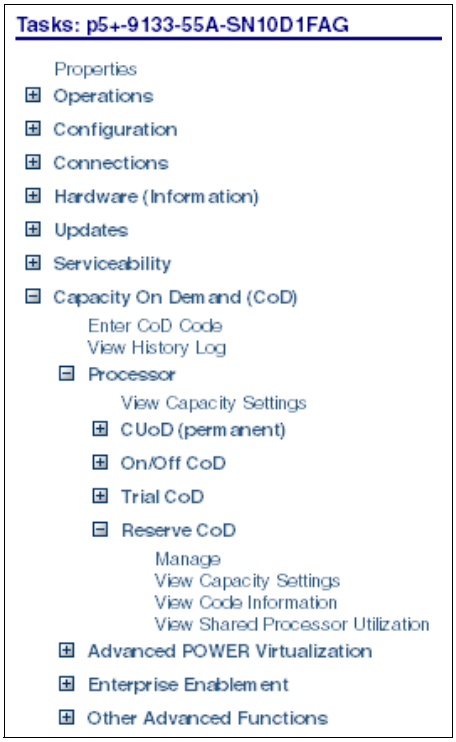


Figure 13-23 Capacity on Demand, Reserve Capacity

Here you can:

- Manage reserve capacity settings: Add processors to the resource pool
- View capacity settings: View the values you have set through the management windows
- View code settings: View codes
- View shared processor utilization

View capacity settings

Select **Capacity on Demand** → **View Capacity Settings**. Here you can view the processors that can be used for Reserve Capacity, as well as the prepaid processor days that remain for usage, as shown in Figure 13-24.

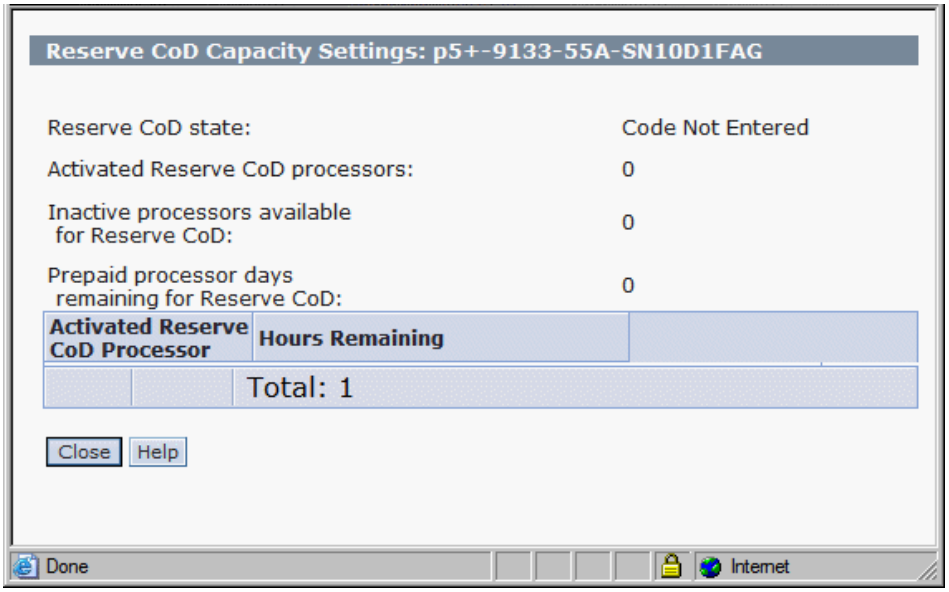


Figure 13-24 Reserve capacity, view capacity settings

View code settings

Select **Capacity on Demand** → **View Code Settings**. Here you can view the codes that are associated with your Reserve Capacity enablement. You can offload this information to remote system or removable media by using the **Save** function. See Figure 13-25.

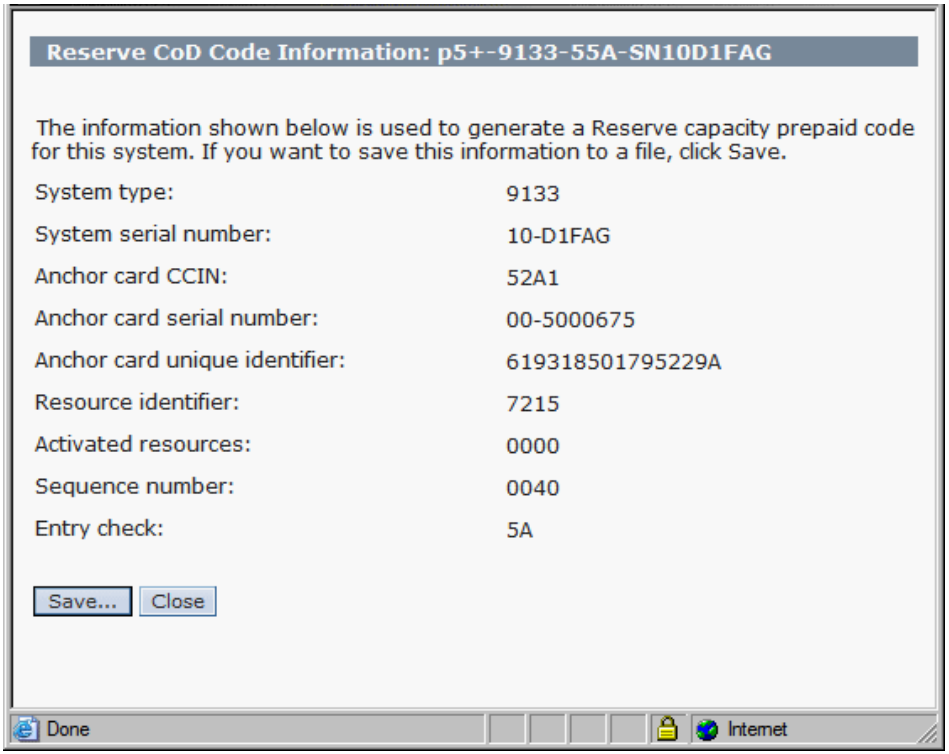


Figure 13-25 Reserve capacity, view code information

View shared processor utilization

Select **Capacity on Demand → View Shared Processor Utilization**. Here you can check the state of reserve and non-reserve processors, as shown in Figure 13-26. If your system has hit a peak performance threshold as outlined in 13.3.3, “Reserve Capacity” on page 383, you can view the inactive processors that have become activated and made available for Reserve Capacity usage.

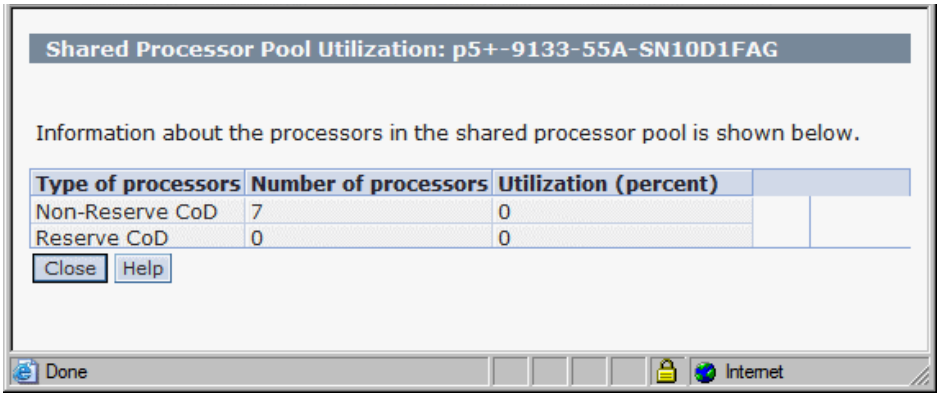


Figure 13-26 Reserve capacity, view shared processor utilization

13.5.4 Activating and managing On/Off CoD

Before you can use the management options for On/Off CoD, you have to enter an enablement code on the HMC. To acquire your On/Off CoD enablement code online refer to 13.4.1, “Acquiring activation codes” on page 387 and enter the enablement code for Reserve CoD as described in 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395.

On/Off CoD is available on POWER5 and POWER6 servers, and can be accessed by clicking **Server Management** → **Servers** and the name of the server. Then, select **Capacity on Demand** → **Processor** → **On/Off CoD** to see the view shown in Figure 13-23.

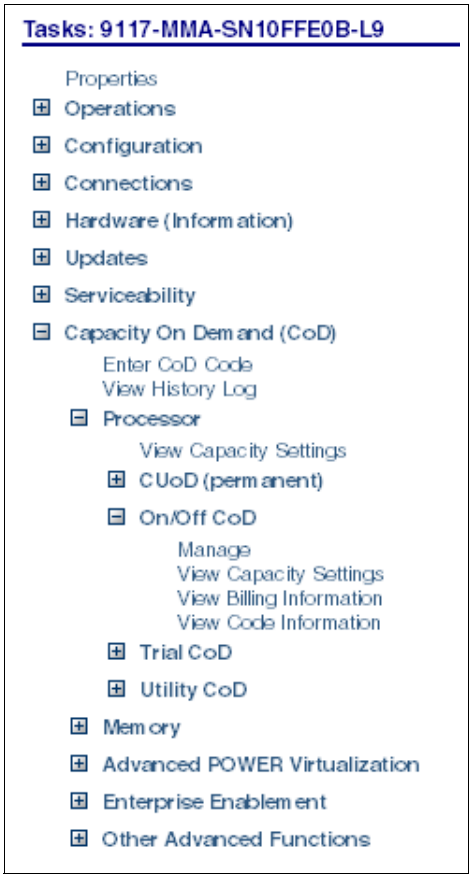


Figure 13-27 Capacity on Demand, managing On/Off CoD

Manage on/off CoD

Select **Manage** under **On/Off CoD** to open the window shown in Figure 13-28. Here you can specify

- How many inactive processors you want to activate for On/Off CoD
- The number of days you want these processors active for use by partitions

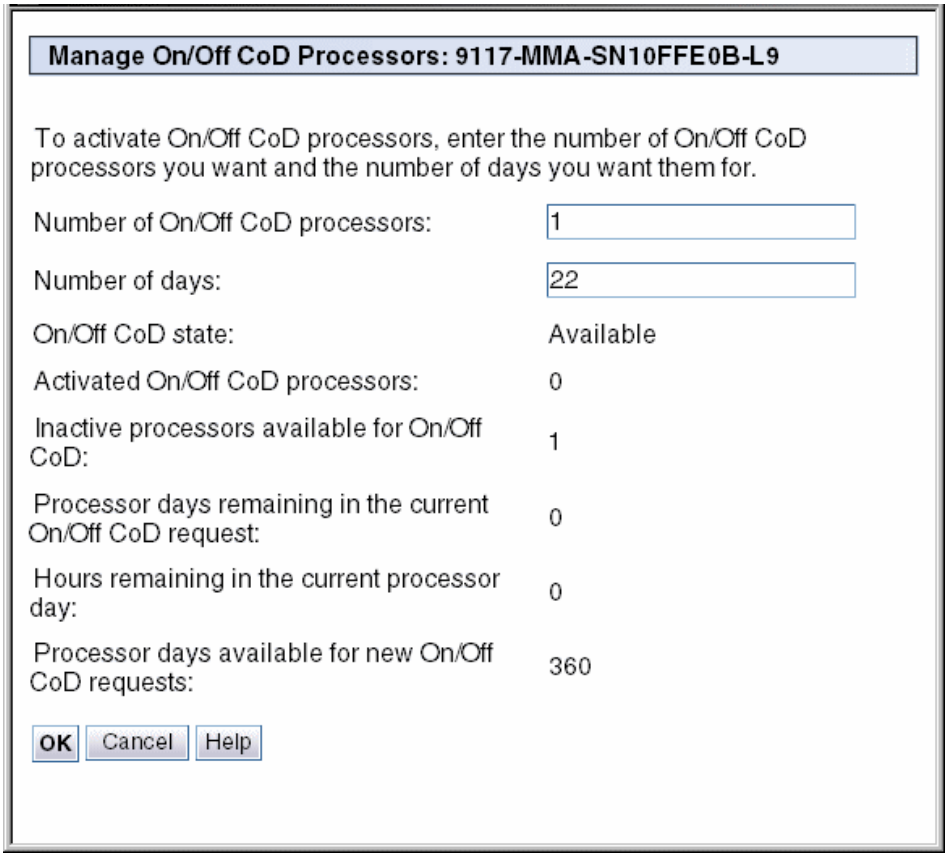


Figure 13-28 Manage on/off settings

After you have entered your selections, select **OK**. The window shown in Figure 13-29 opens. Verify your entries and agree to the terms and conditions for On/Off processor usage. If your entries are correct, and you agree with the terms and conditions, select **OK**.

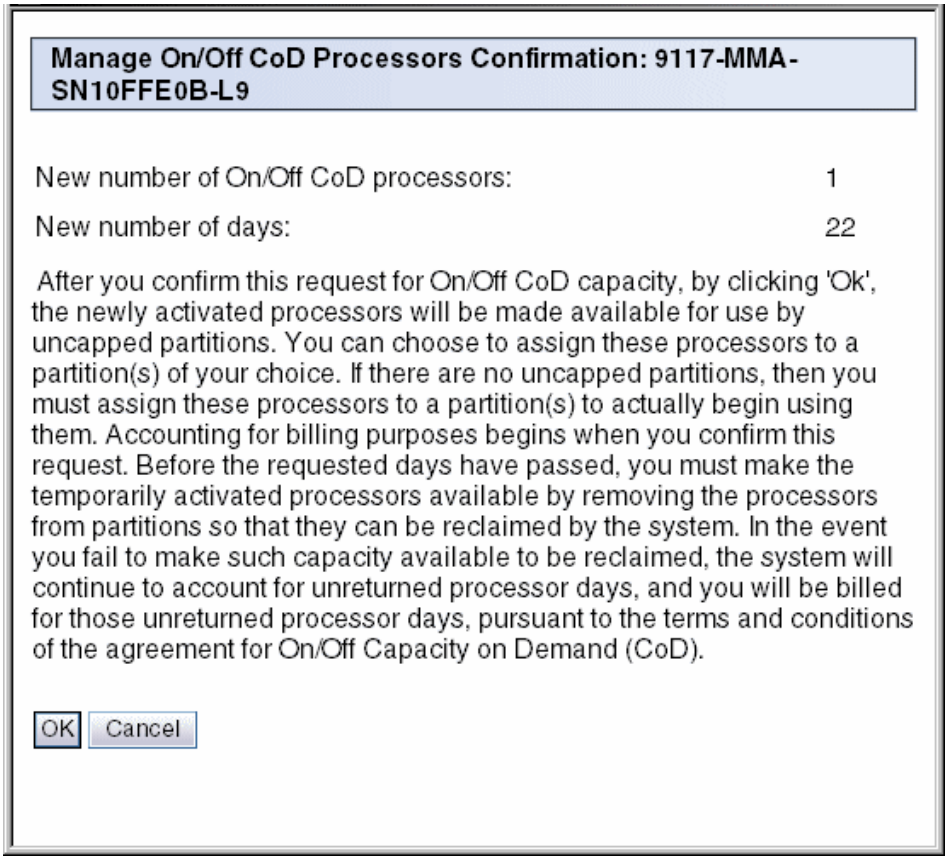


Figure 13-29 On/off confirmation and agreement

In the confirmation window, select **OK** (Figure 13-30).

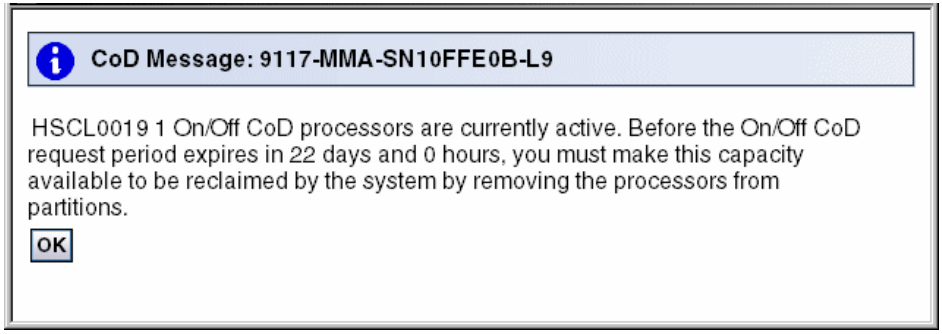


Figure 13-30 On/off CoD results window

View capacity settings

The View Capacity Settings option allows you to review your managed server's On/Off CoD usage, as well as view how many processors are exercising On/Off processor days. Select **View Capacity Settings** under **On/Off CoD** to open the window shown in Figure 13-31. To return to the main HMC view, select **Close**.

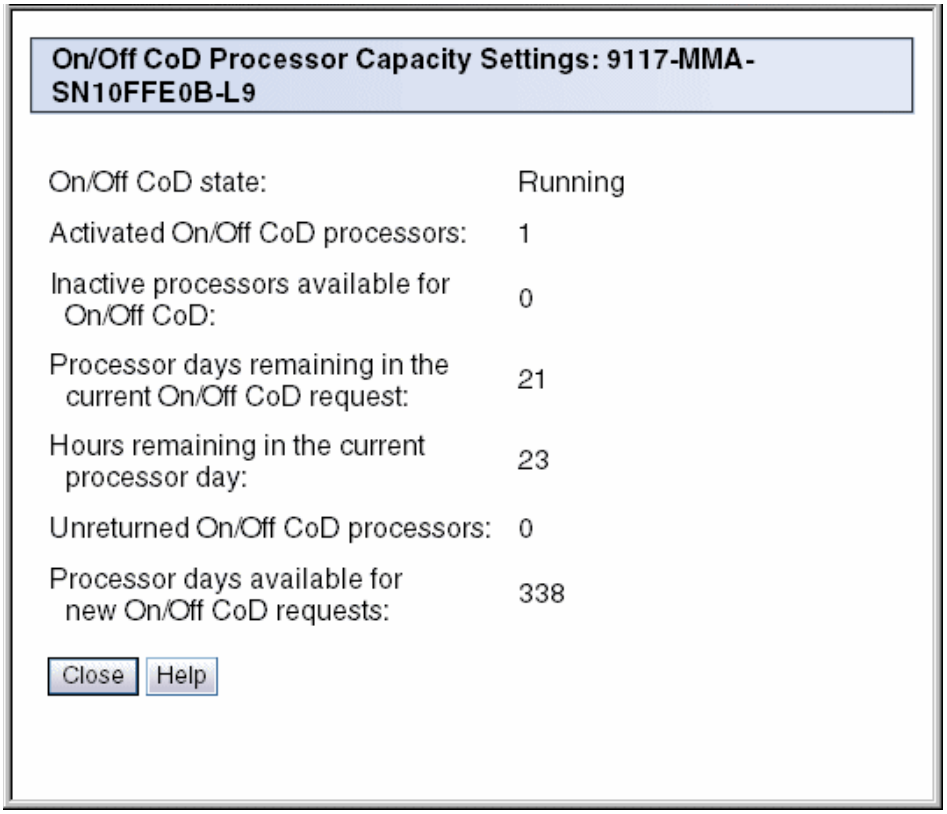


Figure 13-31 On/off CoD, view capacity settings

View billing information

The view billing area on the HMC under On/Off CoD allows you to review all of the billing information for On/Off CoD associated with your managed server. Select **View Billing Information** under **On/Off CoD** to open the window shown in Figure 13-32. You have the option to offload billing data to an FTP server or removable media. To do so, select **Save**. Otherwise, select **Cancel** to return to the main HMC view.

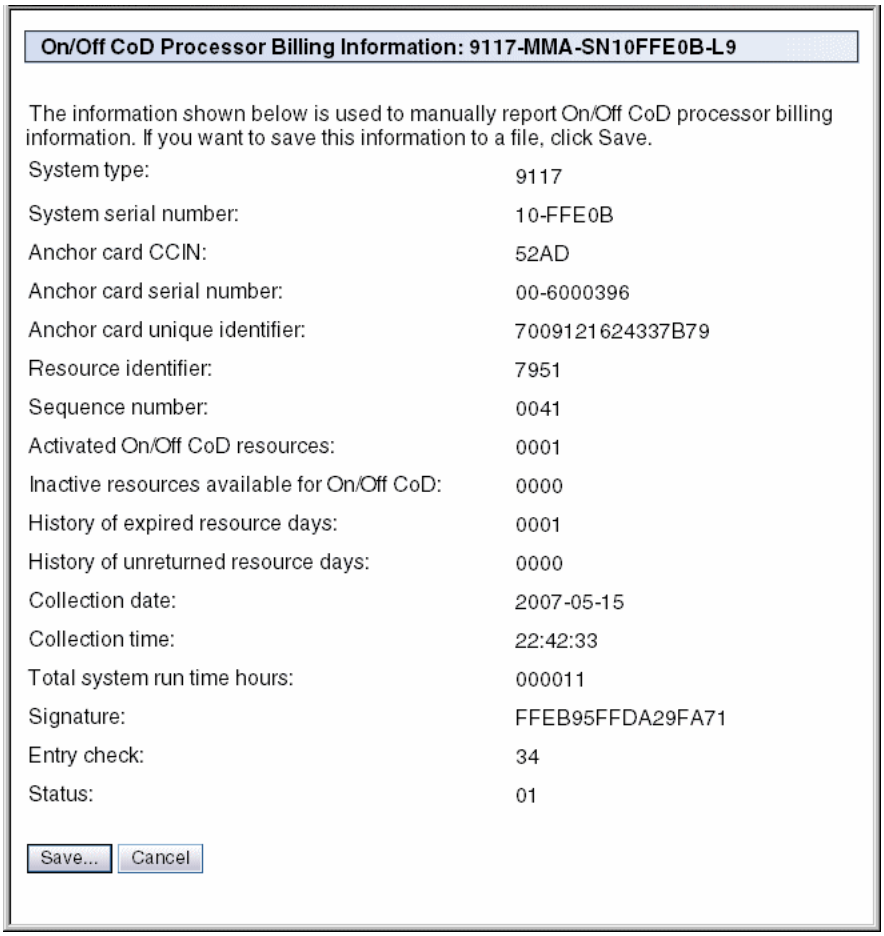


Figure 13-32 On/off CoD, view billing information

View code information

The view code area under On/Off CoD allows you to view all of the code information tied to the On/Off enablement on your managed server. Select **View Code Information** under **On/Off CoD** to open the window shown in Figure 13-33. You have the option to offload the code information to removable media or an FTP server. To do so, select **Save** and specify a location. Otherwise, select **Close** to return to the main HMC view.

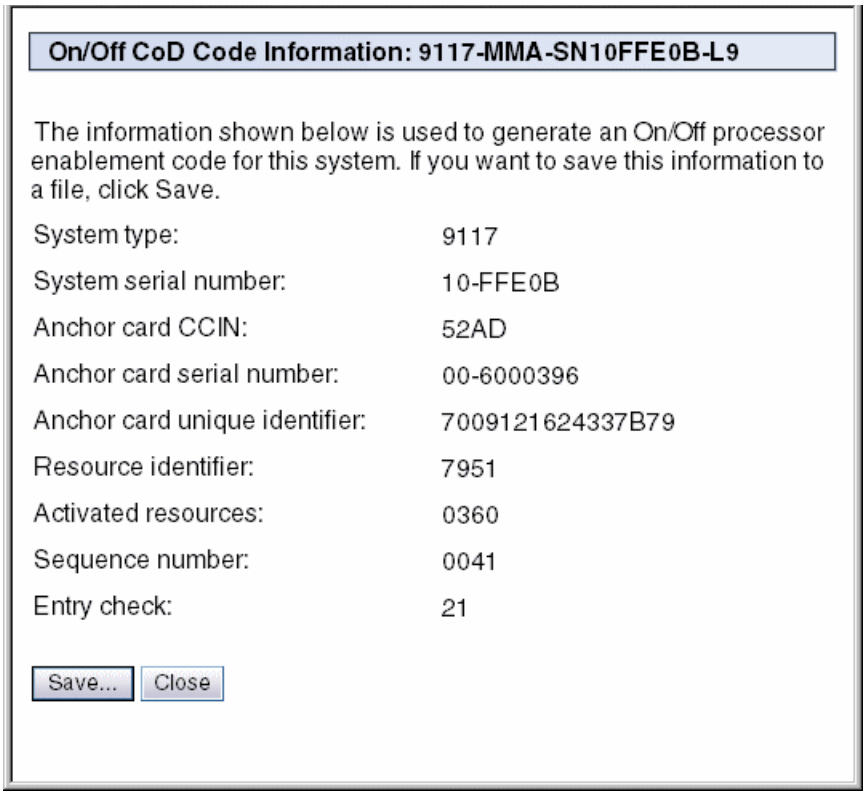


Figure 13-33 On/off CoD, view code information

13.5.5 Activating and managing Trial CoD

Before you can use the management options for Trial CoD, you have to enter an enablement code on the HMC. To acquire your Trial CoD enablement code online refer to 13.4.1, “Acquiring activation codes” on page 387 and enter the enablement code for Trial CoD as described in 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395.

Trial CoD is available on POWER5 and POWER6 servers and can be accessed by clicking **Server Management** → **Servers** and the name of the server. Then, select **Capacity on Demand** → **Processor** → **Trial CoD** to see the view shown in Figure 13-34.

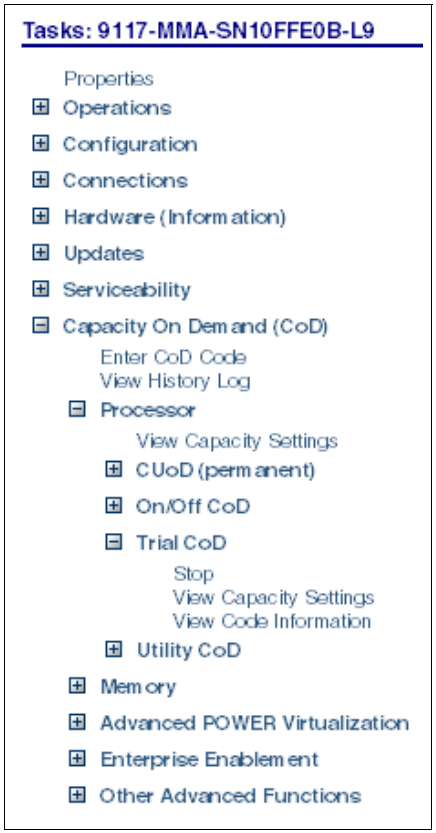


Figure 13-34 Capacity on Demand, managing Trial CoD

You can view the current Trial CoD capacity settings by clicking **Capacity on Demand → Processor → Trial CoD → View Capacity Settings**. Then the window displays as shown in Figure 13-35.

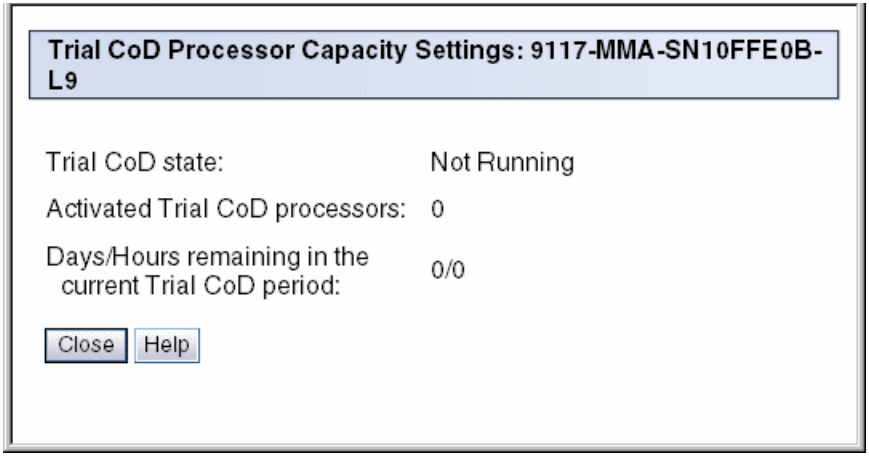


Figure 13-35 Capacity on Demand, view trial capacity settings

This window shows you the current state of your trial, how many processors are active, and how many days are left on the current trial period.

Select **Capacity on Demand → Processor → Trial CoD → View Code Information** to open a window that presents all the information that is associated with logging your trial usage (Figure 13-36).

Figure 13-36 Capacity on Demand, view trial code information

If you want to take the information contained on this window and save it to removable media or a remote system, select **Save** to open the window shown in Figure 13-37. Click **OK**.

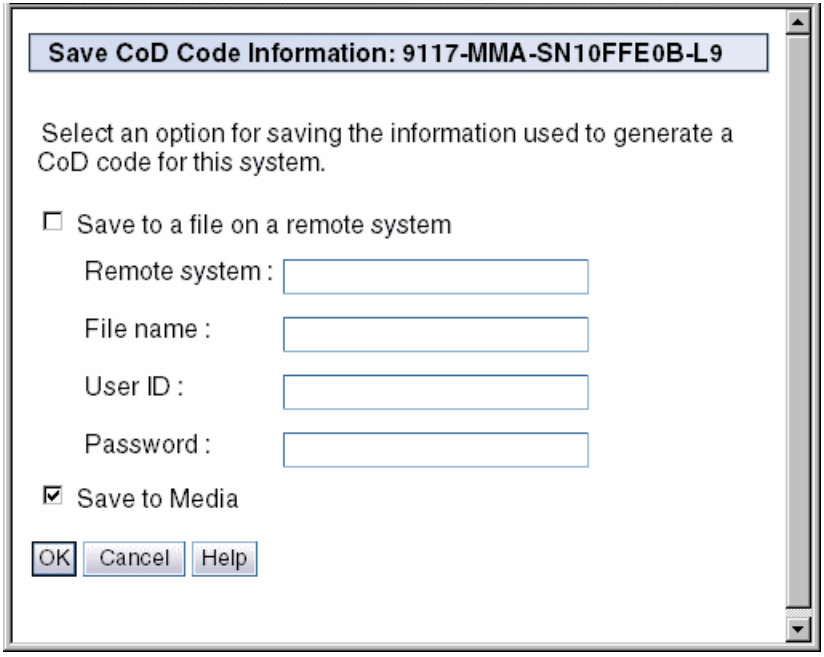


Figure 13-37 Capacity on Demand, saving trial code information

If you select **Save to Media**, the window shown in Figure 13-38 opens. Select the destination of the save, and then select **OK**.

Note: The Save function only works on formatted media. To read about how to format your removable media on your HMC, refer to “Format Media” on page 344.

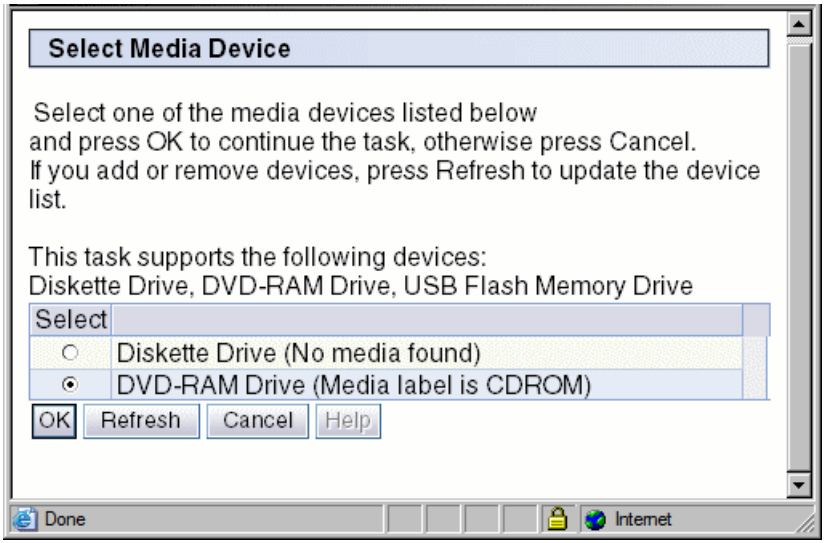


Figure 13-38 Capacity on Demand, save code information

13.5.6 Advanced System Management CoD interface

Select **Systems Management** and the name of the server. Then, select **Operations** → **Advanced System Management**. From the Advanced System Management interface window that opens (Figure 13-39), you can:

- Get order information
- Enter an activation code for a CoD offering
- Put your managed server into CoD recovery mode
- Enter a CoD command
- Gather processor related CoD code information
- Gather memory related CoD code information
- Get VET information
- View CoD capacity settings

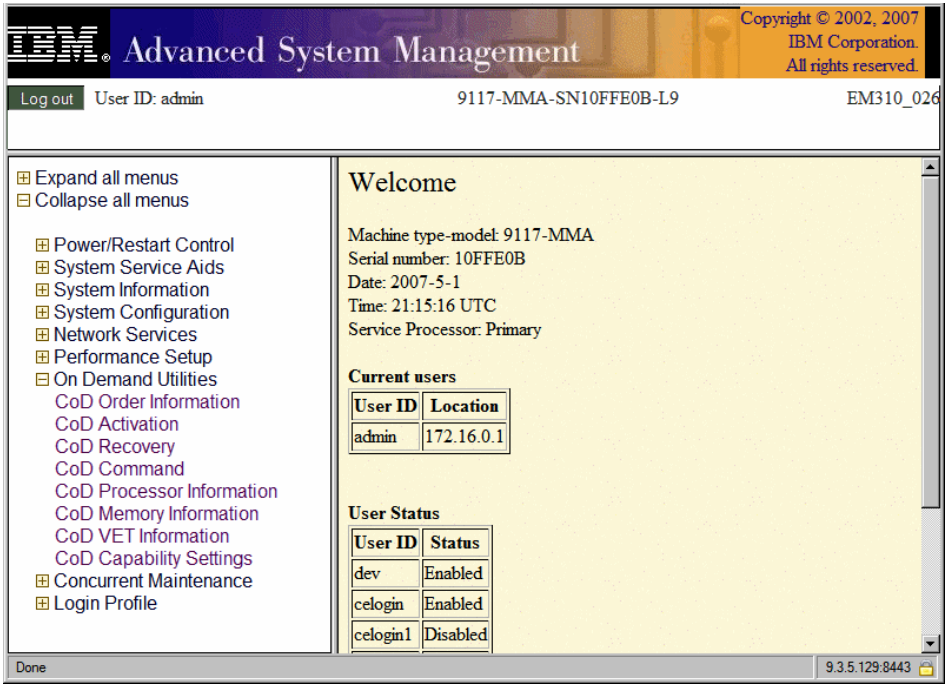


Figure 13-39 Capacity on Demand, ASMI windows

Gathering processor code information through the Advanced System Management interface

For various types of CoD requests you need to provide the processor code information of your system to IBM to complete the request.

To get the information, select **CoD Processor Information** under **On Demand Utilities**, as shown in Figure 13-40.

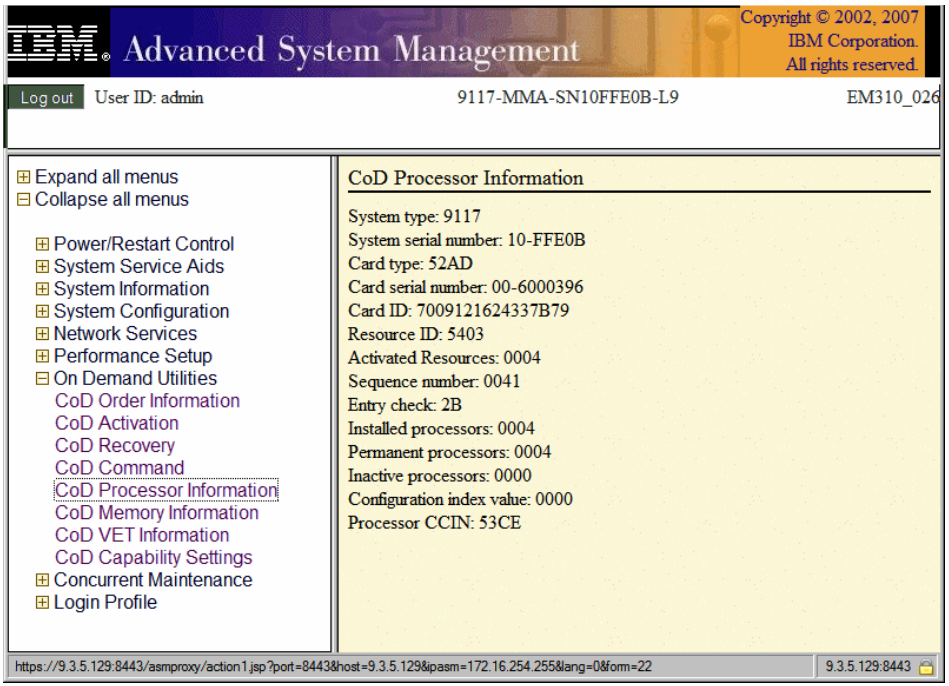


Figure 13-40 Gather processor code information

Gathering memory code information through the Advanced System Management interface

For various types of CoD requests you need to provide the memory code information of your system to IBM to complete the request. To get the information, select **CoD Memory Information** under **On Demand Utilities**, as shown in Figure 13-41.

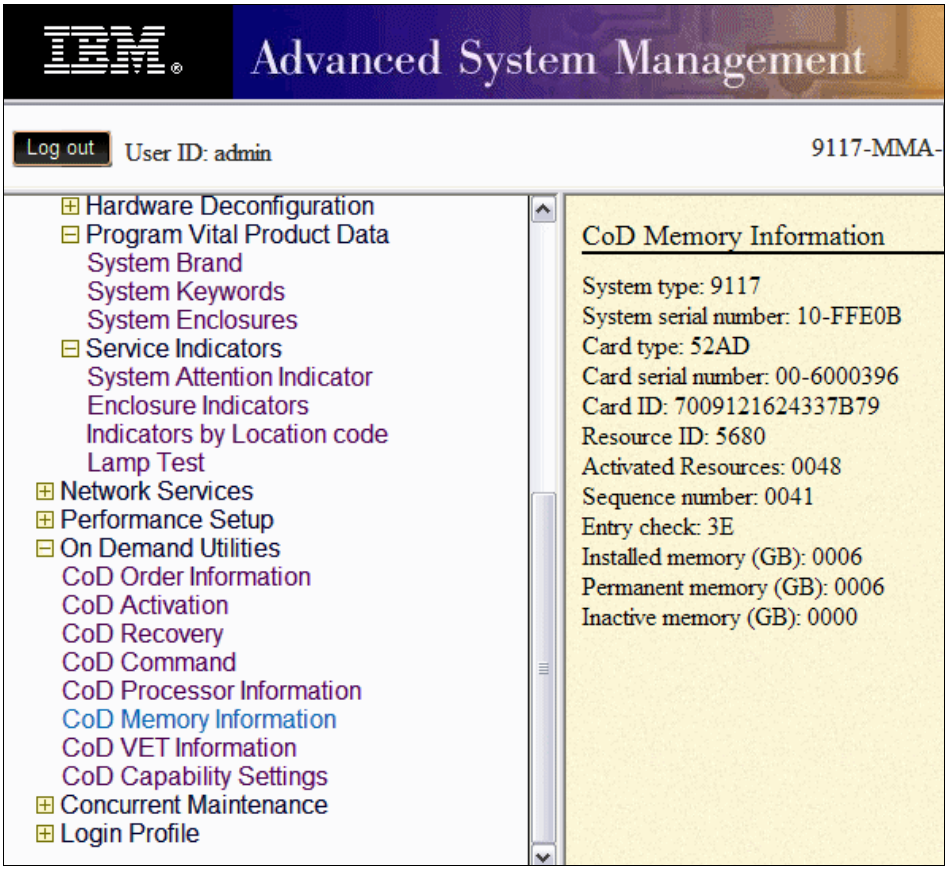


Figure 13-41 Gather memory code information

Advanced System Management interface use of activation, deactivation, and enablement codes

You can enter your activation codes using the HMC windows as discussed in 13.5.1, “Entering an activation, enablement, or deactivation code” on page 395, or you can use the Advanced System Management interface to enter your codes.

To use the Advanced System Management interface to enter your codes, select **CoD Activation** under **On Demand Utilities**, as shown in Figure 13-42.

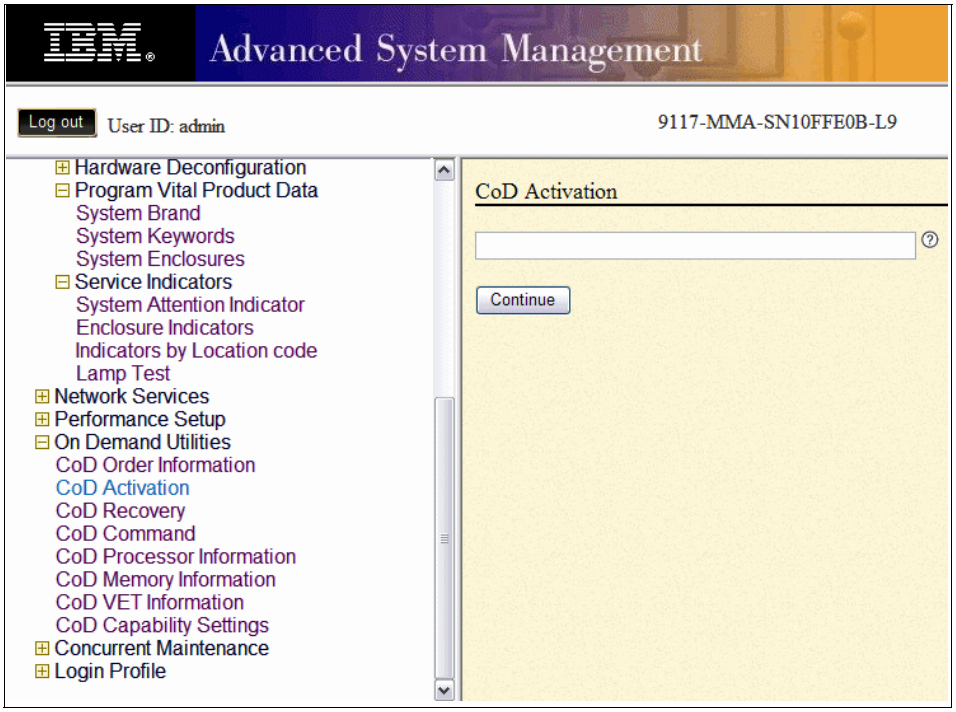


Figure 13-42 Enter CoD activation, deactivation, or enablement code

14

Advanced System Management Interface

In this chapter, we describe how to set up and use the Advanced System Management Interface (ASMI). The ASMI provides a terminal interface through a standard Web browser to the service processor that allows you to perform general and administrator level service tasks. The ASMI allows you to perform service functions and various system management functions.

14.1 Connecting to ASMI

There are three different methods to gain access to the ASMI:

- Access through the Hardware Management Console (HMC)
- Access through a Web browser
- Access through ASCII terminal

14.1.1 Connection to ASMI using the HMC

If you have an HMC attached to your managed system, connecting the ASMI using the HMC is the simplest way to connect. If this is a new system, refer to 3.3, “Connecting managed systems to the HMC” on page 130 for information about how to connect your managed system to the HMC.

To connect to ASMI using the HMC:

1. In the HMC workplace window, select **System Management** → **Servers**.
2. In the contents area select the server to which you want to connect ASMI (Figure 14-1).
3. Select **Operations** → **Advanced System Management (ASM)**.

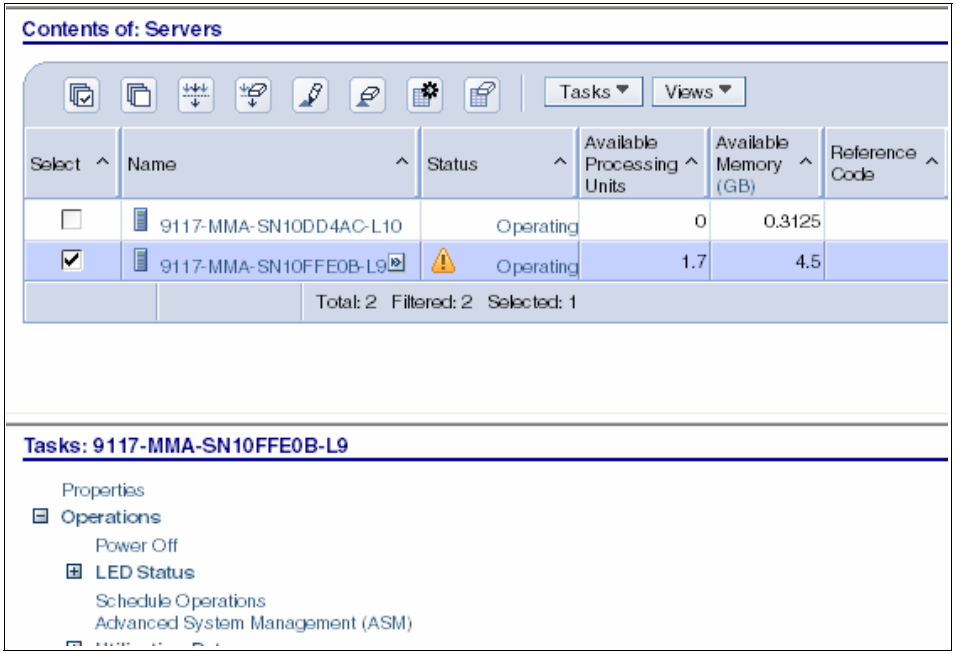


Figure 14-1 Connection to ASMI using HMC

14.1.2 Connecting to ASMI through a Web browser

The Web interface to the ASMI is accessible through Microsoft® Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 and Mozilla Firefox 1.0.7 running on a PC or mobile computer that is connected to the service processor. The Web interface is available during all phases of system operation, including the initial program load (IPL) and run time. However, some of the menu options in the Web interface are unavailable during IPL or run time to prevent usage or ownership conflicts if the system resources are in use during that phase.

To set up the Web browser for direct or remote access to the ASMI, complete the following tasks:

1. Connect the power cord from the server to a power source, and wait for the control panel to display *01*.
2. Select a PC or a mobile computer that has Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 and Mozilla Firefox 1.0.7 to connect to your server. You can use this PC or mobile computer temporarily or permanently to access ASMI.
3. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1 on the back of the managed system. If HMC1 is occupied, connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC2 on the back of the managed system. You can use cross over cable or standard Ethernet cable, both are supported.
4. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server so that your PC or mobile computer can communicate with the server. Use Table 14-1 to help you determine these values.

Table 14-1 Default IP address for server connectors HMC1 and HMC2

Sever Connector	Subnet Mask	IP address
HMC1	255.255.255.0	169.254.2.147
HMC2	255.255.255.0	169.254.3.147

   If you are not sure how to configure your PCs IP settings, then consult your network administrator.
5. Use Table 14-1 to determine the IP address of the Ethernet port to which your PC or mobile computer is connected, and enter the IP address in the Address field of your PC's or mobile computer's Web browser.

   For example, if you connected your PC or mobile computer to HMC1, enter `https://169.254.2.147` in your PC's or mobile computer's Web browser.

14.1.3 Accessing the ASMI using an ASCII terminal

The ASCII interface to the ASMI provides a subset of the Web interface functions. The ASCII terminal is available only when the system is in the platform standby state. It is not available during the IPL or run time. The ASMI on an ASCII terminal is not available during the other phases of system operation, including the IPL and run time.

To set up the ASCII terminal for direct or remote access to the ASMI, complete the following tasks:

1. Use a null modem cable to connect the ASCII terminal to system connector S1 on the back of the server or to system port S1 on the control panel using an RJ-45 connector.

   Note: *Both system port 1 connections are not available simultaneously; when one is connected, the other is deactivated.*

2. Connect the power cord from the server to a power source.
3. Wait for the control panel to display *0*1.
4. Ensure that your ASCII terminal is set to the following general attributes. These attributes are the default settings for the diagnostic programs:

   ```
   Line Speed-19200,word length-8,parity- none,stop bit-1
   ```

5. Press a key on the ASCII terminal to allow the service processor to confirm the presence of the ASCII terminal.

   You should get the ASMI login window.

14.2 Log in to ASMI

To connect successfully to the ASMI, the ASMI requires password authentication.

- The ASMI provides a Secure Sockets Layer (SSL) Web connection to the service processor. To establish an SSL connection, open your browser using https://.
- The browser-based ASMI is available during all phases of the system operation, including IPL and run time. Some menu options are not available during the system IPL or run time to prevent usage or ownership conflicts if corresponding resources are in use during that phase.

- The ASMI that is accessed on a terminal is available only if the system is at platform standby.

After you have connected to the ASMI as described in 14.1, “Connecting to ASMI” on page 424, the login display opens. Enter one of the default user ID and passwords, as shown in Table 14-2.

Table 14-2 Default login user ID and password

User ID	Default Password	Authority Level
general	general	general user
admin	admin	administrator
celogin	contact ibm for password	Authorised service provider

As soon as you login to ASMI, you are asked to change the default password. You will not be allowed to proceed unless you change the password.

14.2.1 ASMI login restrictions

The following restrictions apply to ASMI users:

- Only three users can login at any one time.
- If you are logged in and inactive for 15 minutes, your session expires and you have to login again.
- If you make five invalid login attempts, your user ID is locked out for five minutes.

The ASMI window shown in Figure 14-2 opens after a successful login.

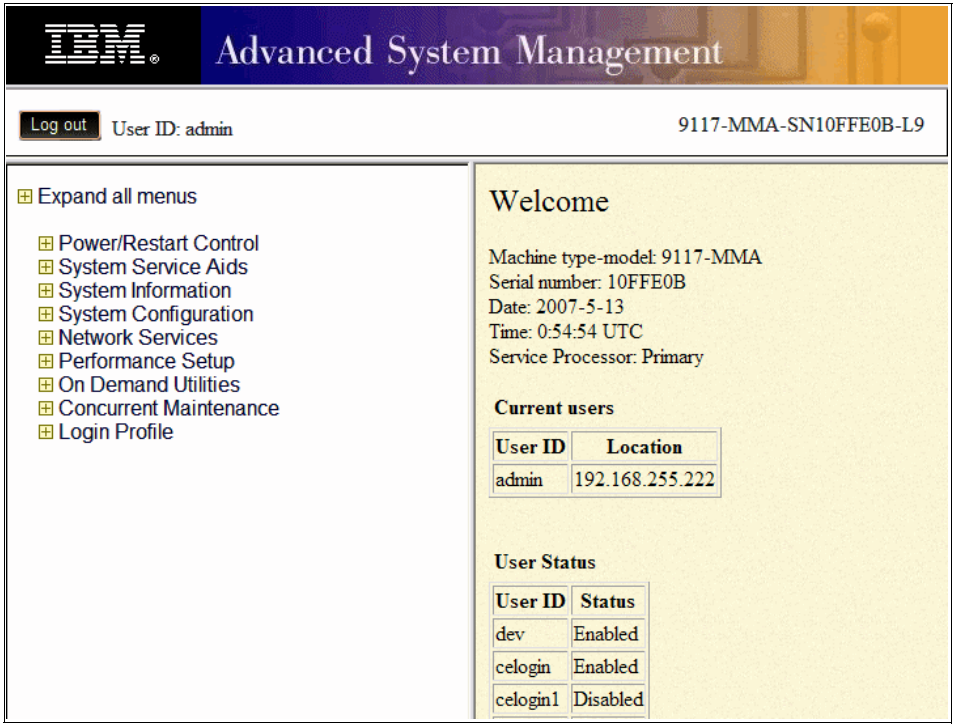


Figure 14-2 Advanced System Management menus

14.3 Power and restart control

You can use the power and restart control feature to control the system power manually and automatically. In this section, we also discuss different options that are available to turn on the system. See Figure 14-3.

We describe the following options in detail:

- Fast and slow boot
- Temporary and Permanent boot side
- Normal and permanent operating mode

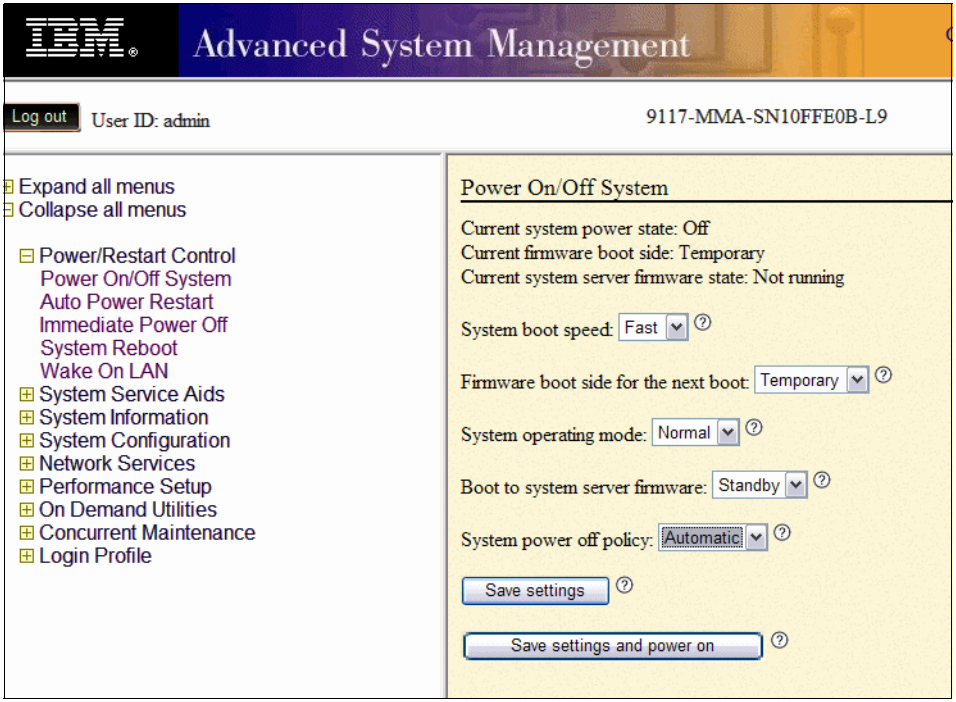


Figure 14-3 System power on and off options

14.3.1 Power On/Off System

When you select this option, on the right hand side of the menu gives you the current system power state, Current firmware boot side, and system server firmware state. You can select the following boot options:

- **System boot speed**: Select the speed for the next boot (*Fast* or *Slow*). Fast boot results in some diagnostic tests being skipped, and shorter memory tests being run during the boot. Slow boot will go through all diagnostic tests

and memory test. Normally you take this option if you are experiencing some system errors or when you have made some system changes for example CPU and Memory upgrades.

- **Firmware boot side**: Select the side from which the firmware will boot: permanent or temporary. When you upgrade your system firmware, typically, firmware updates are tested on the temporary side before being applied to the permanent side. So the temporary side should always have the latest firmware. The permanent side has the previous revision.
- **System operating mode**: Select the operating mode (*Manual* or *Normal*). Manual mode overrides various automatic power-on functions, such as auto-power restart, and enables the power button which allows you to select power options from the control panel. You can also set this option from the control panel.
- **Boot to system server firmware**: Select the state for the server firmware: Standby or Running. When the server is in the server firmware standby state, partitions can be set up and activated. The running option restarts your partitions automatically.
- **System power off policy**: Select the system power off policy. The system power off policy is a system parameter that controls the system's behavior when the last partition (or the only partition in the case of a system that is not managed by an HMC) is powered off. The choices are:
  - Power off: When the last partition is powered down, the system turns off.
  - Stay on: When the last system is powered down, the system stays on.
  - Automatic: Is the default setting, if the system is not partitioned, the system is turned off. If the system is partitioned, it stays on.

Make your selections and select **Save settings and power on**.

14.3.2 Auto Power Restart

You can set your system to restart automatically. This function is useful when power is restored after an unexpected power line disturbance causes the system to shut down unexpectedly. Select either **Enable** or **Disable**. By default, the auto power restart value is set to *Disable*. In many cases, you might not want the system to restart automatically, unless you are reasonably certain that the power problem has been resolved.

14.3.3 Immediate Power Off

You can power off the system quickly using the Immediate Power Off function. Typically this option is used when an emergency power off is needed. The operating system is not notified before the system is powered off.

Attention: To avoid experiencing data loss and a longer IPL the next time the system or logical partitions are booted, shut down the operating system prior to performing an immediate power off

14.3.4 System Reboot

You can reboot the system quickly using the reboot function. The operating system is not notified before the system is rebooted.

Attention: Rebooting the system shuts down all partitions immediately. To avoid experiencing data loss and a longer IPL the next time the system or logical partitions are booted, shut down the operating system prior to performing a reboot.

14.4 System Service Aids

Figure 14-4 shows the System Service Aids menu. From this menu, you can:

- Display system error, event logs.
- Initiate a system dump.
- Initiate a service processor dump.
- Reset the service processor.
- Reset your system to the factory-shipped configuration settings.

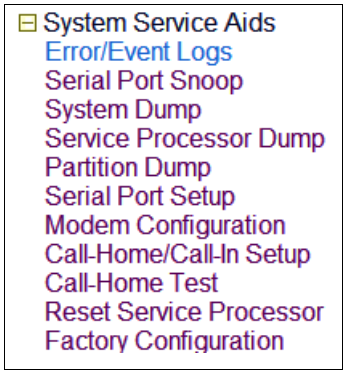


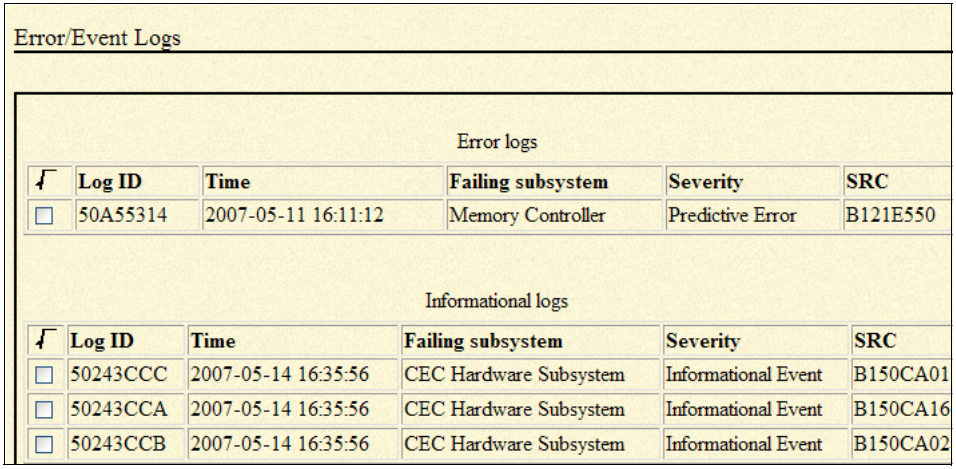
Figure 14-4 System Service Aids menu

The following features are not available when your system is connected to the HMC. These features are part of the Service Management on the HMC:

- Serial port snoop
- Partition dump
- Serial port set up
- Modem configuration
- Call home/call in setup
- Call home test

14.4.1 Error/Event Logs

From the System Service Aids menu, select **Error/Event Logs**. You can view error and event logs that are generated by various service processor firmware components. The content of these logs can be useful in solving hardware or server firmware issues. You see a selection panel as shown in Figure 14-5.


Error/Event Logs

Error logs

	Log ID	Time	Failing subsystem	Severity	SRC
☐	50A55314	2007-05-11 16:11:12	Memory Controller	Predictive Error	B121E550

Informational logs

	Log ID	Time	Failing subsystem	Severity	SRC
☐	50243CCC	2007-05-14 16:35:56	CEC Hardware Subsystem	Informational Event	B150CA01
☐	50243CCA	2007-05-14 16:35:56	CEC Hardware Subsystem	Informational Event	B150CA16
☐	50243CCB	2007-05-14 16:35:56	CEC Hardware Subsystem	Informational Event	B150CA02

Figure 14-5 Error and event logs

Select the event log that you wish to view and scroll to the bottom of window to select **show details**. The details provide the description of the system reference code (`src`).

14.4.2 System Dump

Use the System Dump procedure only under the direction of your service provider. You can initiate a system dump to capture overall system information, system processor state, hardware scan rings, caches, and other information. This information can be used to resolve a hardware or server firmware issue. A system dump can also be initiated automatically after a system malfunction, such as a checkstop or hang.

Select **System Dump** to open the window shown in Figure 14-6.

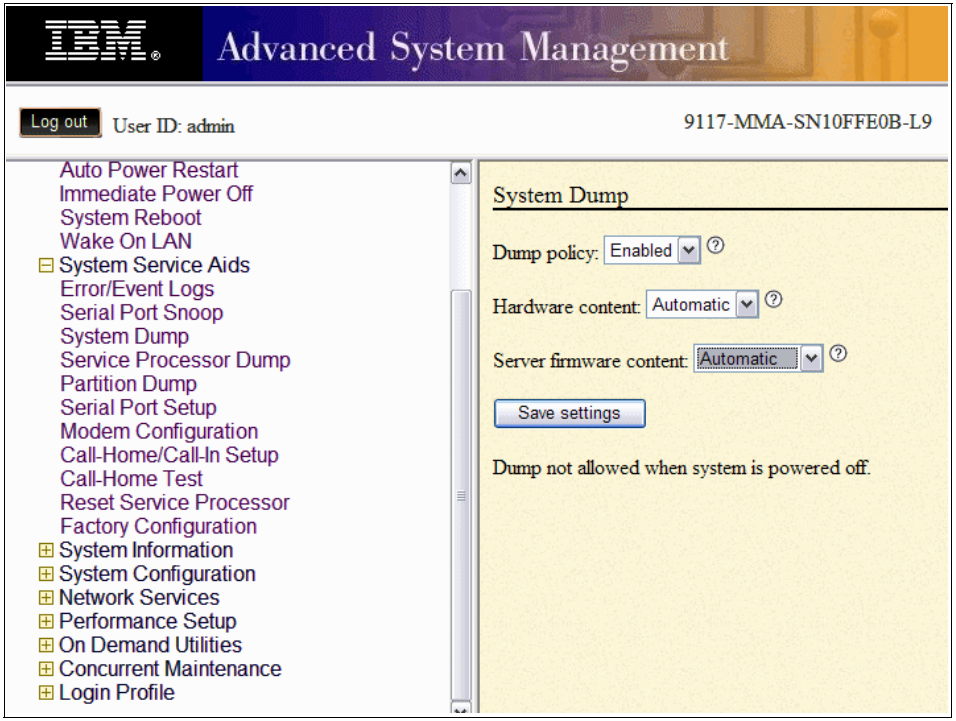


Figure 14-6 Capturing overall system information with System Dump

From this window, you set the following information:

- **Dump policy**: Select the policy to determine when system dump data is collected. If you select **Enable**, the service processor (SP) collects system dump data only when the SP determines it is necessary, typically only when a specific failure has not been identified.

  If you select **Disable**, the SP never collects any dump data, unless explicitly requested by the user.

  The default is *Enabled*.

- **Hardware content**: Select the policy to determine how much hardware data is collected for a system dump. If you select **Automatic** (default), the SP collects the hardware data that it determines is necessary, depending on the particular failure.

  If you select **Maximum**, the SP collects the maximum amount of hardware data. Note that if you choose this selection, the collection of hardware data can be quite time consuming, especially for systems with a large number of processors.

- **Server firmware content**: Select the policy to determine how much server firmware data is collected for a system dump. If you select **Automatic**, the SP collects the minimum amount of data necessary to debug server firmware failures. Automatic is the default policy. In some cases, your support engineer might want you to override the default policy.

  If you select **Physical I/O**, the SP collects the minimum firmware data plus the firmware data associated with physical I/O operations.

  If you select **Virtual I/O**, the SP collects the minimum firmware data plus the firmware data that is associated with I/O operations that do not involve physical I/O devices.

  If you select **High performance switch HPS Cluster**, the SP collects the minimum firmware data plus the firmware data that is associated with high performance switch operations between this server and other servers in the cluster.

  If you select **HCA I/O**, the SP collects the minimum firmware data plus the firmware data associated with the host channel adapter I/O operations.

  If you select **Maximum**, the SP collects the maximum amount of server firmware data.

Make your selections and click **Save settings**.

14.4.3 Service Processor Dump

You use the Service Process Dump option to enable or disable the service processor dump function. The default value is *Enabled*. A service processor dump captures error data after a service processor failure, or upon user request. User request for service processor dump is not available when this policy is set to disabled

The save settings and initiate dump button is visible only when an SP dump is allowed (that is, when SP dumps are enabled and the previous SP dump data has been retrieved). Press this button to initiate an SP dump.

14.4.4 Reset Service Processor

Typically, rebooting of the SP is done only when instructed by IBM service personnel (Figure 14-7).

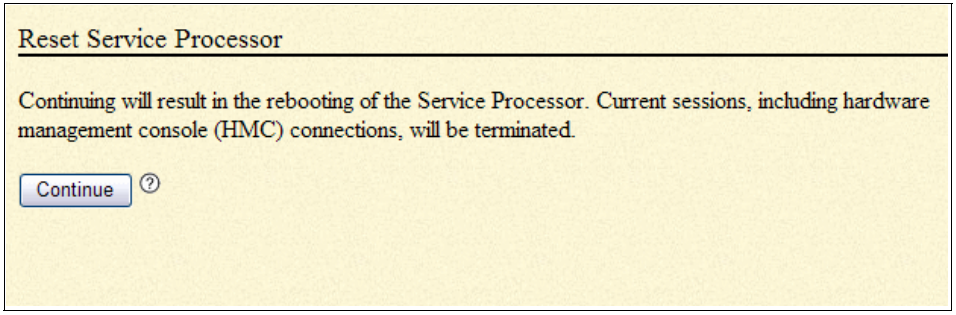


Figure 14-7 Reset service processor

This function is not available if your system is turn on. Clicking **Continue** causes the service processor to reboot. Because the service processor reboots, your ASMI session is dropped, and you have to reconnect your session to continue.

14.4.5 Factory Configuration

Use this procedure only under the direction of your IBM service personnel (Figure 14-8 on page 437).

In critical systems situations, you can restore your system to the factory default settings. Doing so results in the loss of all system settings (such as the HMC access and ASMI passwords, time of day, network configuration, and hardware deconfiguration policies) that you have to set again through the service processor interfaces. Also, you lose the system error logs and partition-related information.

Important: Before continuing with this operation, make sure you have manually recorded all settings that need to be preserved.

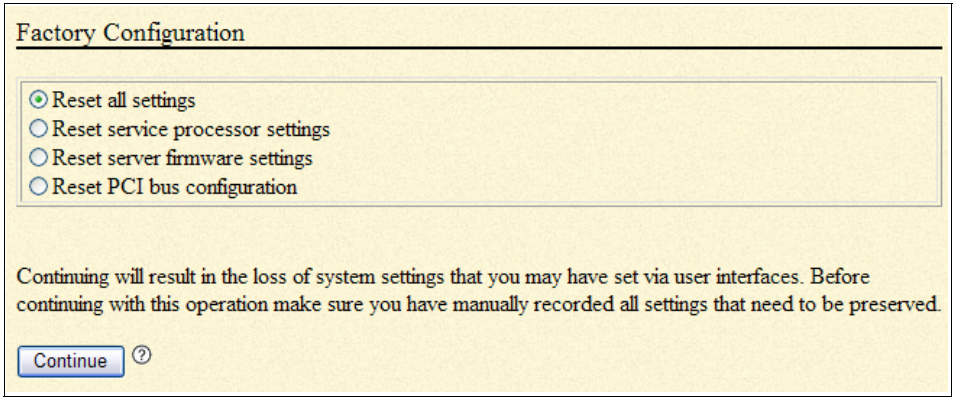


Figure 14-8 Factory configuration reset

In this window, you have the following options:

- **Reset all settings**: Resets everything. It is a combination of all the others. To complete this operation, the system will be powered on and then off, and the service processor will be reset.
- **Reset service processor settings**: Resets the settings of the service processor that include passwords, network addresses, time of day, hardware configuration policies, and so forth. Any sessions currently active in the network interfaces will be disconnected, and the service processor will be reset.
- **Reset server firmware settings**: Resets the firmware settings only. Partition data will be lost.
- **Reset PCI bus configuration**: Resets the PCI bus and the firmware settings. To complete this operation, the system is turned on and then off.

Make the appropriate selection and then select **Continue**.

14.5 System Information

The System Information menu gives you the following options (Figure 14-9):

- Display vital product data.
- Perform an SPCN power control network trace and display the results.
- Display the previous boot indicator.
- Display the progress indicator history.
- Display the Real-time Progress Indicator

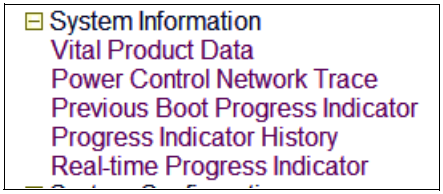


Figure 14-9 System Information menu

14.5.1 Vital Product Data

Select **Vital Product Data** to view manufacturer's vital product data (VPD) that is stored from the system boot prior to the one in progress now (Figure 14-10).

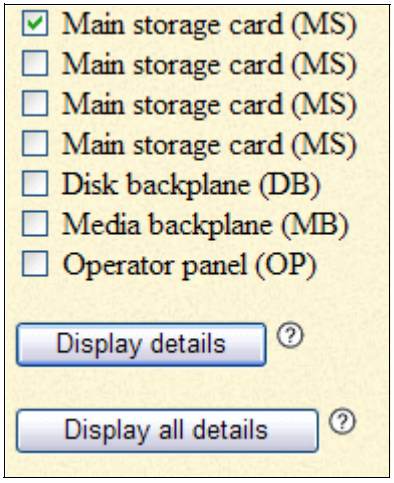


Figure 14-10 Display details of VPD

If you want to view only selected manufacturer's VPD, such as serial numbers and part numbers, select the feature that you want to vies and select **Display details**.

To view details of all the features, select **Display all details** to open the display shown in Figure 14-11.

Vital Product Data

Build name: fips310/b0313a_0711.310

System brand: P0

System serial number: 10FFE0B

Machine type-model: 9117-MMA

FRU ID	Part number	Serial number	FRU number	CCIN	RID	Location code
EV	42R7352	YL3126355GF3	42R7352	293B	0x1e00	U789D.001.DQDVWZK
EI	42R7352	YL3126355GF3	42R7352	293B	0xa200	U789D.001.DQDVWZK
BP	42R7352	YL3126355GF3	42R7352	293B	0x800	U789D.001.DQDVWZK-P1
CU	42R7352	YL3126355GF3	42R7352	293B	0x2900	U789D.001.DQDVWZK-P1-T1
CU	42R7352	YL3126355GF3	42R7352	293B	0x2901	U789D.001.DQDVWZK-P1-T2
P2	42R7352	YL3126355GF3	42R7352	293B	0x4300	U789D.001.DQDVWZK-P1
P5	42R7352	YL3126355GF3	42R7352	293B	0x3700	U789D.001.DQDVWZK-P1
PI	42R7352	YL3126355GF3	42R7352	293B	0x3600	U789D.001.DQDVWZK-P1

Figure 14-11 Display all VPD detail

14.5.2 Power Control Network Trace

You can perform a system power control network (SPCN) trace and display the results. This information is gathered to provide additional debug information when working with your hardware service provider.

Note: Producing a trace can take an extended amount of time based upon your system type and configuration. This is a normal delay due to the amount of time the system requires to query the data.

14.5.3 Previous Boot Progress Indicator

You can display the previous boot progress indicator that was displayed in the control panel during the previous failed boot by selecting this option. During a successful boot, the previous progress indicator is cleared. If this option is selected after a successful boot, nothing is displayed.

The progress indicator information is stored in nonvolatile memory. If the system is powered off using the power-on button on the control panel, this information is retained. If the ac power is disconnected from the system, this information is lost.

14.5.4 Progress Indicator History

With this option, you can review the progress of codes that displays in the control panel during the previous boot. The codes display in reverse chronological order, as shown in Figure 14-12. (The first entry seen is the most recent entry.) This information is gathered to provide additional debug information when working with your hardware service provider.

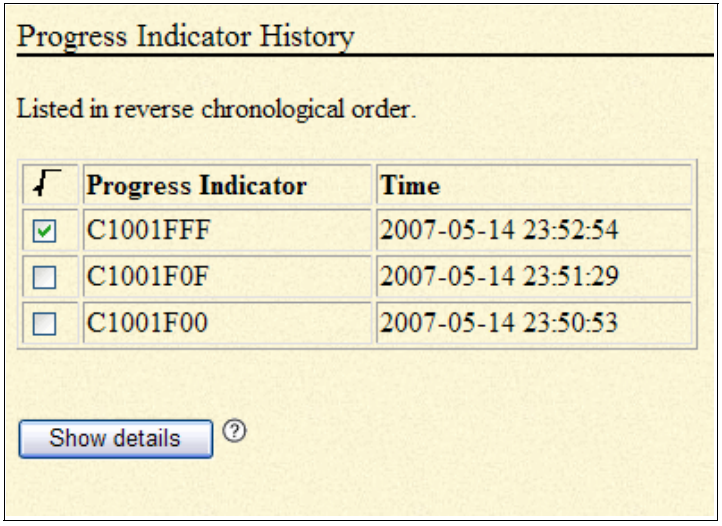
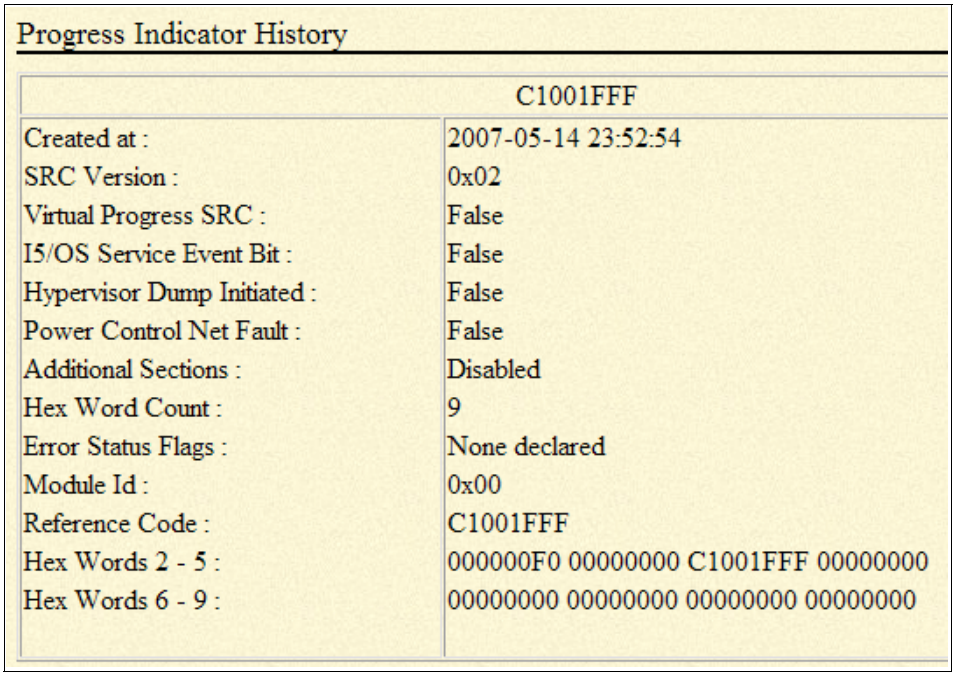


Figure 14-12 Progress Indicator History

Select the code that you want to display and select show details. Figure 14-13 shows the details of the code.


Progress Indicator History

	C1001FFF
Created at :	2007-05-14 23:52:54
SRC Version :	0x02
Virtual Progress SRC :	False
I5/OS Service Event Bit :	False
Hypervisor Dump Initiated :	False
Power Control Net Fault :	False
Additional Sections :	Disabled
Hex Word Count :	9
Error Status Flags :	None declared
Module Id :	0x00
Reference Code :	C1001FFF
Hex Words 2 - 5 :	000000F0 00000000 C1001FFF 00000000
Hex Words 6 - 9 :	00000000 00000000 00000000 00000000

Figure 14-13 Details of the Progress Indicator History code

14.5.5 Real-time Progress Indicator

You can view the progress and error codes that currently display on the control panel. Viewing progress and error codes is useful when diagnosing boot-related issues. To perform this operation, your authority level must be one of the following possibilities:

- General
- Administrator
- Authorized service provider

Select this option to open the window shown in Figure 14-14. This window shows the real-time progress of the system and displays what you have on the systems display.

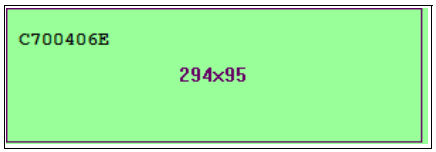


Figure 14-14 Real-time Progress Indicator

14.6 System Configuration

Figure 14-15 shows the expanded System Configuration menu. Using this menu, you can:

- Change the system name.
- Configure I/O Enclosure.
- Change the time of day.
- Establish the firmware update policy.
- Establish the Detailed PCI error injection policies.
- Change the Interposer Plug Count.
- Enable I/O Adapter Enlarged Capacity.
- View Hardware management Consoles connection.
- Change floating point unit commutation test values.

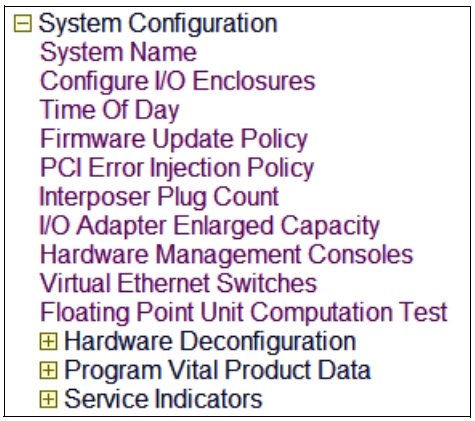


Figure 14-15 System Configuration menu

14.6.1 System Name

From the System Configuration menu, you can select the system name option to display the current system name and change the system name if you choose to do so. The system name is a value used to identify the system or server. The system name might not be blank and might not be longer than 31 characters. To change the system name, enter a new value and click **Save settings**.

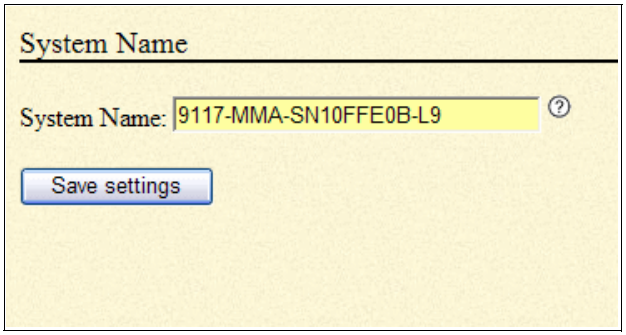


Figure 14-16 System Name

This example shows changes the system name. The valid characters are [a-Z], [0-9], hyphen (-), underscore (_), and period (.).

The system is shipped with the default system name initialized to a 31 character value as follows (Server-*tttt*-*mmm*-SN0000000). In this default system name:

- *tttt* = Machine type
- *mmm* = Model number
- 0000000 = Serial number

14.6.2 Configure I/O Enclosures

This function normally is used by your hardware service provider. After the server firmware has reached the *standby* state, you can configure I/O enclosure attributes as follows:

- Display the status, location code, rack address, unit address, power control network identifier, and the machine type and model of each enclosure in the system.
- Change the identification indicator state on each enclosure to *on* (identify) or *off*.
- Update the power control network identifier, enclosure serial number, and the machine type and model of each enclosure.

- Change the identification indicator state of the SPCN firmware in an enclosure to *enable* or *disable*.
- Remove rack and unit addresses for all inactive enclosures in the system.

When you select this option, the window shown in Figure 14-17 opens.

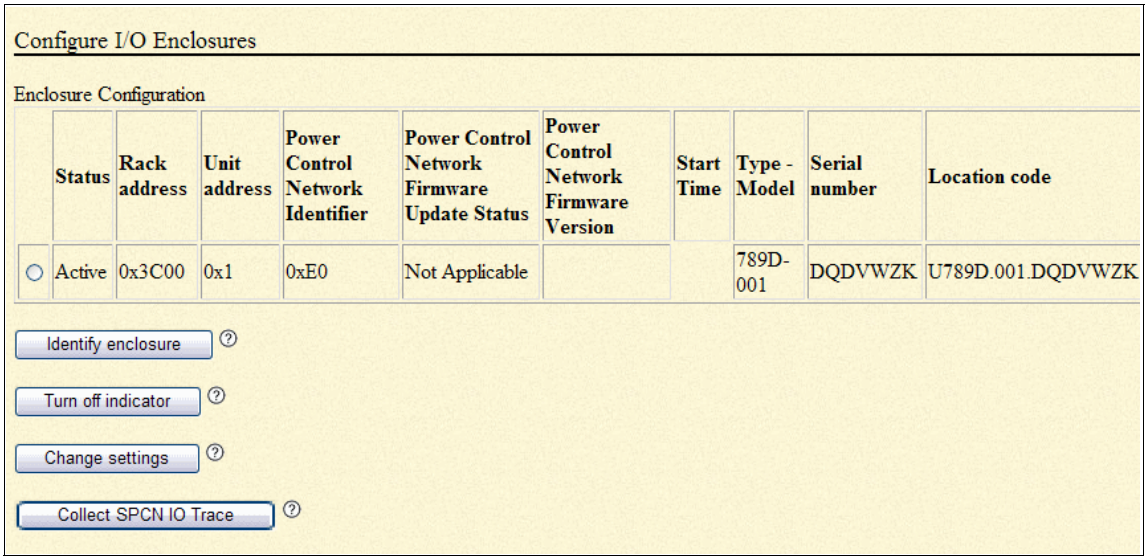


Figure 14-17 Configure I/O Enclosures

In this window, you have the following options:

- **Identify enclosure**: Turns on the indicator on the selected enclosure. Led flashes to identify the enclosure.
- **Turn off indicator**: Turns off the indicator on the selected enclosure.
- **Change settings**: Changes the settings for the selected enclosure. The next page displays options for changing configuration ID, machine type-model, and serial number.
  - **Power Control Network Identifier**: Enter a hexadecimal number for the power control network identifier.

> **Note:** The system server firmware must be in *standby* state or the expansion unit must be turned off when this operation is performed.

- **Type - Model**: Enter the enclosure machine type and model in the form *TTTT-MMM*:

  TTTT : The four characters of the enclosure machine type.

  MMM : The three characters of the enclosure model.

  The enclosure machine type cannot be 0000. All alphanumeric characters are valid.

- **Serial number**: Enter seven characters for the enclosure serial number. All alphanumeric characters except o, i, and q are valid. All lowercase letters are converted to uppercase letters.

- **Collect SPCN I/O Trace**: Displays SPCN I/O trace for selected enclosure.

Note: The remaining options described here do not display in Figure 14-17 because that screen capture is a partial screen capture of the Configure I/O Enclosure panel.

- **Clear inactive enclosures**: Clears the rack and unit addresses of all inactive enclosures.
- **Start SPCN Firmware Update** : Starts pending SPCN firmware downloads if allowed by the SPCN firmware update policy. SPCN firmware downloads cannot all be attempted at the same time, some downloads can remain in a pending state before starting while others complete. Starting SPCN downloads is done asynchronously and can be monitored using the table above showing the power control network firmware update status.
- **Stop SPCN Firmware Update**: Stops SPCN firmware downloads that are currently in progress. SPCN firmware downloads that are stopped will move to a pending state. These SPCN firmware downloads can be restarted from the beginning either automatically by the system or by using Start SPCN Firmware Update, if allowed by the SPCN firmware update policy.

  Stopping the SPCN downloads is done asynchronously and can be monitored showing the power control network firmware update status.

- **SPCN Firmware Update Policy**: If *Disabled*, no SPCN firmware downloads will be allowed to start. Changing the SPCN firmware update policy to disabled will not impact SPCN firmware downloads currently in progress.

  If *Enabled*, SPCN firmware downloads will only be allowed over the high speed link (HSL) interface. Changing the SPCN firmware update policy to enabled will not impact SPCN firmware downloads over the serial interface that are currently in progress.

Changing the SPCN firmware update policy setting to *Enabled* from *Disabled* will not automatically cause SPCN Firmware downloads over the HSL interface to begin immediately.

If *Expanded*, SPCN firmware downloads are allowed over both the HSL and serial interfaces. Changing to the SPCN firmware update policy to *expanded* will not cause SPCN firmware downloads to begin immediately.

14.6.3 Time of Day

You can display and change the system's current date and time. This function is available if your system is turn on or off. When you select this option, the window shown in Figure 14-18 opens.

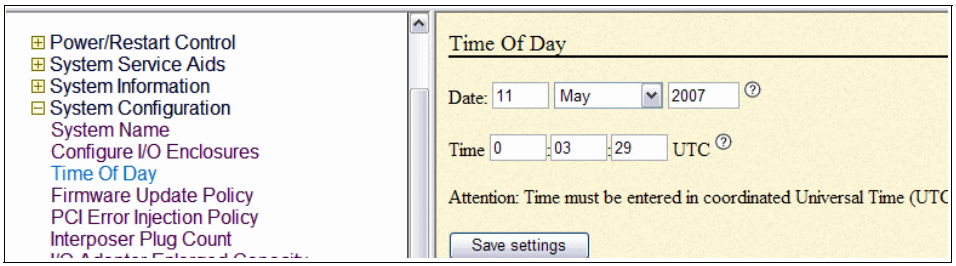


Figure 14-18 Time of Day

From this window, you have the following options:

- **Date**: Enter the current date. Any change to the current date or time is applied to the service processor only, and is independent of any partition.
- **Time**: Enter the current time in Coordinated Universal Time (UTC) format. UTC is the current term for what was commonly referred to as Greenwich Meridian Time (GMT). Zero (0) hours UTC is midnight in Greenwich, England, which lies on the zero longitudinal (or prime) meridian.

Universal time is based on a 24 hour clock. Local time is expressed as a positive or negative offset from UTC, depending on whether the local time zone is east or west of the prime meridian.

To convert local time to UTC, use 24 hour notation, then algebraically add the time zone offset to the local time. For instance, a user in the Central Daylight-savings Time zone (CDT) would add 5 hours (UTC offset -5 hours) to the local time to obtain the time in UTC. Example: 07:00 PM CDT equals 00:00 UTC.

Enter the date and time and select **Save settings**.

14.6.4 Firmware Update Policy

This policy defines whether firmware updates are allowed from an operating system when the system is managed by a HMC. The default setting of this policy is to not allow firmware updates through the operating system. Note that this policy only takes effect when a system is HMC managed. When a system is not HMC-managed, firmware updates can only be made through the operating system, so this policy setting is ignored.

When this policy is set to allow firmware updates from the operating system, firmware updates from an HMC are not allowed, unless the system is turned off.

When a system is turned off, firmware updates can be performed from an HMC, regardless of the setting of this policy. However, care should be taken when updating firmware from both an HMC and the operating system.

When you select this option, the window shown in Figure 14-19 opens.

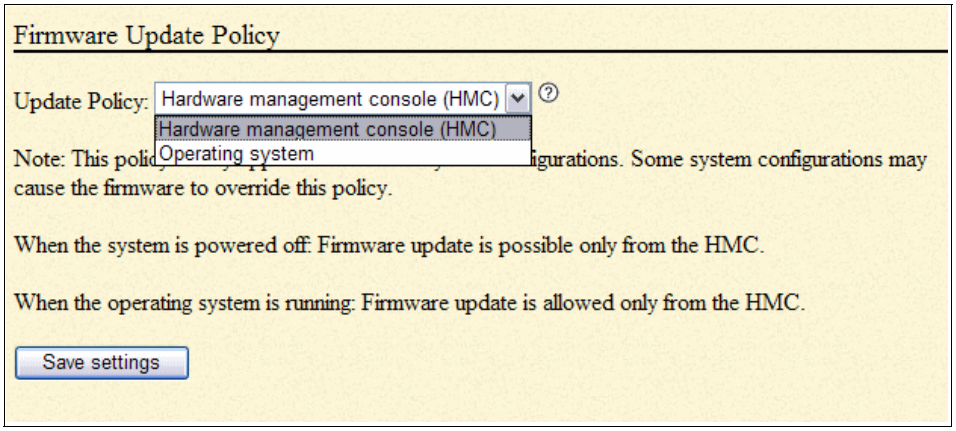


Figure 14-19 Firmware Update Policy

14.6.5 PCI Error Injection Policy

This option controls the PCI error injection policy. If enabled, utilities on the host operating system can inject PCI errors.

14.6.6 I/O Adapter Enlarged Capacity

This option controls the size of PCI memory space allocated to each PCI slot. When enabled, selected PCI slots, including those in external I/O subsystems, receive the larger DMA and memory mapped address space. Some PCI

adapters might require this additional DMA or memory space, per the adapter specification. This option increases system mainstore allocation to these selected PCI slots.

Enabling this option might result in some PCI host bridges and slots not being configured because the installed mainstore is insufficient to configure all installed PCI slots.

14.6.7 Hardware Management Consoles

You can use this option to disconnect the HMC from your server. When you select this option, the window shown in Figure 14-20 opens.

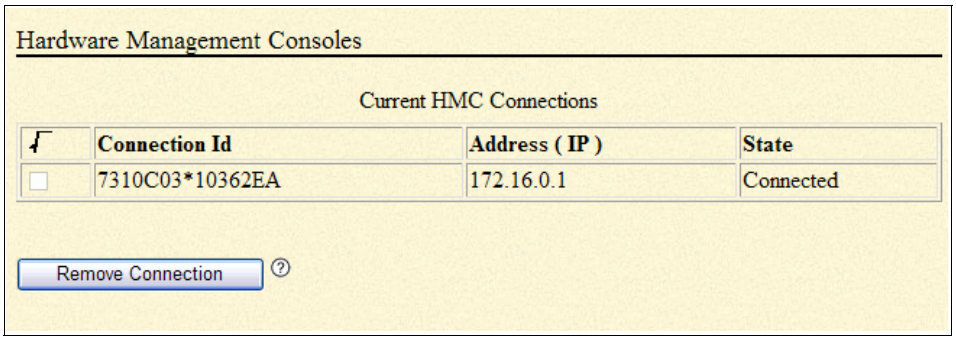


Figure 14-20 Hardware Management Consoles

Select the **Remove Connection** button.

14.6.8 Virtual Ethernet Switches

To use this option, enter a number between 0 to 16 for Virtual Ethernet switches. This value controls the number of virtual Ethernet switches allocated by system server firmware. Most users leave this value set to its default of 0. A value of 0 enables the HMC to control the number of virtual Ethernet switches allocated by system server firmware.

For advanced configuration, this number can be set higher to cause system server firmware to create that many virtual Ethernet switches during platform power on, and disables the ability of the HMC to configure the number of virtual Ethernet switches.

If this is done, when a virtual Ethernet adapter is created using the HMC, the adapter will be connected to a particular virtual switch depending on the virtual slot number chosen during creation.

The adapter's virtual slot number will be divided by the number of virtual Ethernet switches, and the remainder of this division operation will be used to determine with which switch the adapter will be associated.

Each virtual Ethernet adapter will only be able to communicate with other virtual Ethernet adapters on the same virtual switch. For example, if the number of virtual Ethernet switches is set to 3, virtual Ethernet adapters in virtual slot 3, 6 and 9 are assigned to the same switch. A virtual Ethernet adapter in virtual slot 4 would be assigned to a different switch, and would not be able to communicate with the adapters in slots 3, 6, and 9.

14.6.9 Floating Point Unit Computation Test

This option allows you to set the floating point unit test policy or to run the test immediately. You can set one of the following:

- **Disabled**: Test never runs except when choosing to run the test immediately.
- **Staggered**: Test is run once on every processor in the platform over a 24 hour period. This is the default setting.
- **Periodic**: Test runs at specified time, sequentially through all processors in the system.

When choosing to run the test immediately, the current policy setting is overridden but not changed, and the test is executed sequentially on all the processors in the system. This feature is only available when the system is turned on.

14.6.10 Hardware Deconfiguration

You can set various policies to deconfigure processors and memory in certain situations (Figure 14-21). *Deconfiguration* means that the resource is taken from a state of being available to the system, to a state of being unavailable to the system.

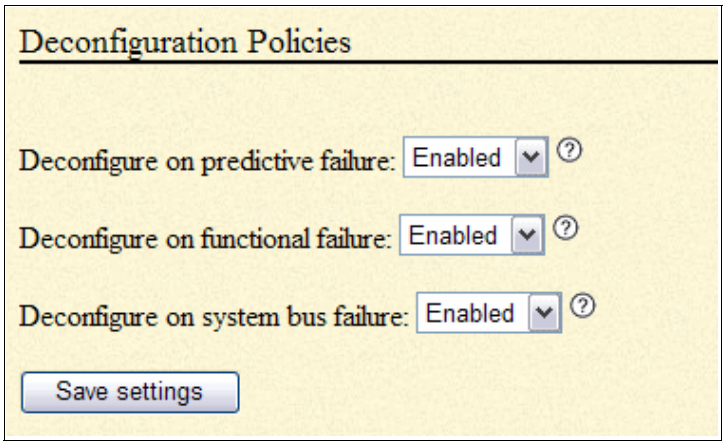


Figure 14-21 Deconfiguration Policies

From this window, you have the following options:

- **Deconfigure on predictive failure:** Select the policy for deconfigure on predictive failures. This applies to run time or persistent boot time deconfiguration of processing unit resources or functions with predictive failures, such as correctable errors over the threshold.

  If enabled, the particular resource or function affected by the failure is deconfigured.

- **Deconfigure on functional failure**: Select the policy for deconfigure on functional failures. This applies to run time or persistent boot time deconfiguration of processing unit resources or functions with functional failures, such as checkstop errors or uncorrectable errors.

  If enabled, the particular resource or function affected by the failure is deconfigured.

- **Deconfigure on system bus failure**: Select the policy for deconfigure on system bus failures. Applies to run time or persistent boot time deconfiguration of processing unit resources or functions with system bus failures, such as check stop errors or uncorrectable errors.

This policy is not applicable for systems with one processing unit node. If enabled, the particular resource or function affected by the failure is deconfigured.

This applies to resource types such as processor, L2 cache, L3 cache, and memory.

Processor deconfiguration

In the event of a single processor failure, it might be possible to continue operating, with degraded performance, on fewer processors. You can use the panel shown in Figure 14-22 on page 452 to start the process of removing processors that might have failed or are beginning to generate errors. You can also see processors that might have become deconfigured due to some error condition that the system was able to detect and isolate.

All processor failures that stop the system, even if intermittent, are reported to the authorized service provider as a diagnostic dial-out for a service repair action. To prevent the recurrence of intermittent problems and improve the availability of the system until a scheduled maintenance window can be found, processors with a failure history are marked *deconfigured* to prevent them from being configured on subsequent boots. Processors marked as deconfigured remain offline and will be omitted from the system configuration.

A processor is marked *deconfigured* under the following circumstances:

- If a processor fails built-in self-test or power-on self-test testing during boot (as determined by the service processor).
- If a processor causes a machine check or check stop during run time, and the failure can be isolated specifically to that processor (as determined by the processor run-time diagnostics in the service processor firmware).
- If a processor reaches a threshold of recovered failures that results in a predictive call to the service provider (as determined by the processor run-time diagnostics in the service processor firmware).

The deconfiguration policy also provides the user with the option to manually deconfigure a processor or re-enable a previous manually deconfigured processor.

To begin the process, use a panel similar to the one shown in Figure 14-22. Select the processing unit with which you want to work (one or more processing units can be shown) and click **Continue**.

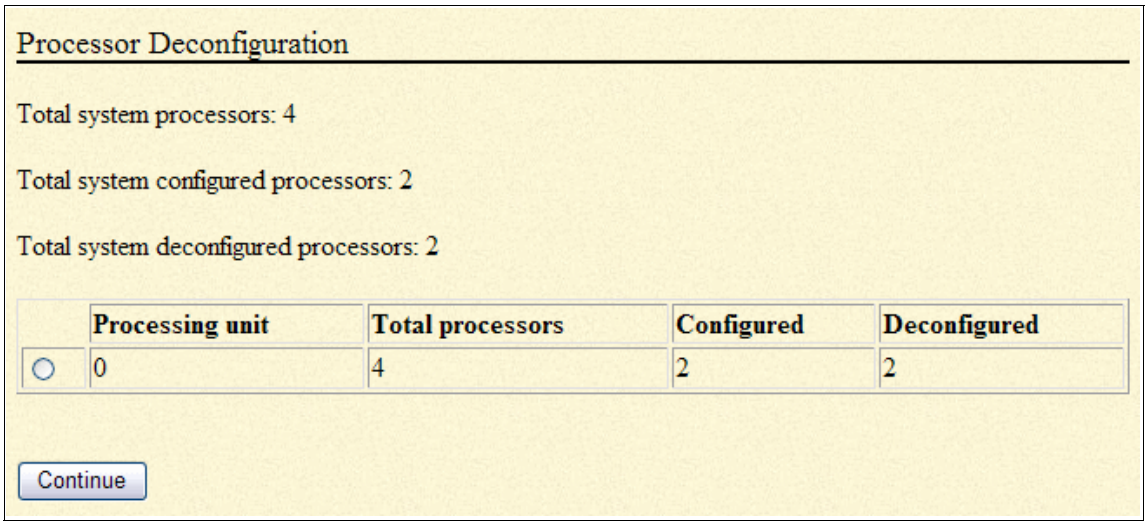
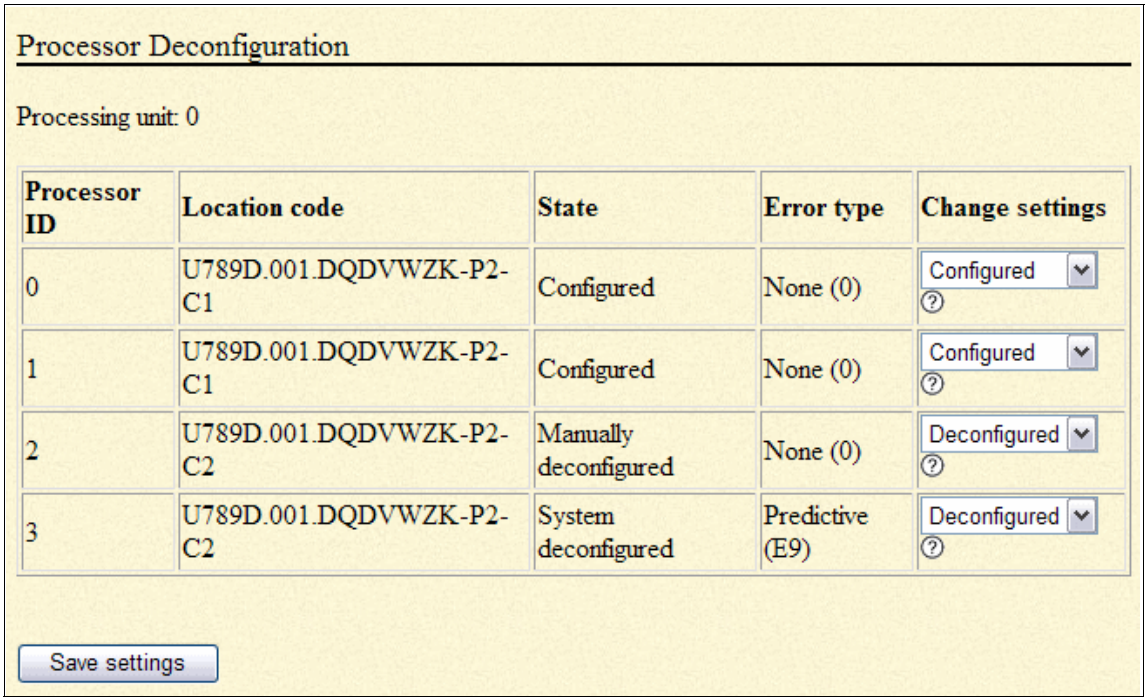


Figure 14-22 Processor Deconfiguration

Select the setting to configure or deconfigure for the processors and select **Save settings**.


Processor Deconfiguration

Processing unit: 0

Processor ID	Location code	State	Error type	Change settings
0	U789D.001.DQDVWZK-P2-C1	Configured	None (0)	Configured
1	U789D.001.DQDVWZK-P2-C1	Configured	None (0)	Configured
2	U789D.001.DQDVWZK-P2-C2	Manually deconfigured	None (0)	Deconfigured
3	U789D.001.DQDVWZK-P2-C2	System deconfigured	Predictive (E9)	Deconfigured

Save settings

Figure 14-23 Processor Deconfiguration window

Memory deconfiguration

Most System POWER6 systems will have several gigabytes (GB) of memory. Each memory bank contains two DIMMs (dual inline memory module). If the firmware detects a failure, or predictive failure, of a DIMM, it deconfigures the DIMM with the failure, as well as the other one. All memory failures that stop the system, even if intermittent, are reported to the authorized service provider as a diagnostic dial-out for a service repair action.

To prevent the recurrence of intermittent problems and improve the availability of the system until a scheduled maintenance window can be found, memory banks with a failure history are marked *deconfigured* to prevent them from being configured on subsequent boots. Memory banks marked as deconfigured remain offline and will be omitted from the system configuration.

A memory bank is marked *deconfigured* under the following circumstances:

- If a memory bank fails built-in self-test or power-on self-test testing during boot (as determined by the service processor).
- If a memory bank causes a machine check or check stop during run time, and the failure can be isolated specifically to that memory bank (as determined by the processor run-time diagnostics in the service processor firmware).
- If a memory bank reaches a threshold of recovered failures that results in a predictive call to the service provider (as determined by the processor run-time diagnostics in the service processor firmware).

The deconfiguration policy also provides the user with the option to manually deconfigure a memory bank or re-enable a previous manually deconfigured memory bank.

If you select **Memory Deconfiguration** from the **Hardware Configuration** menu, you see a panel similar to the one shown in Figure 14-24 which allows you to view the total memory installed on your system. From this panel, you can select the Processing Unit (one or more processing units can be shown). The reason you see processing unit is because the memory is installed on CPU board. Click **Continue** to advance to the next panel.

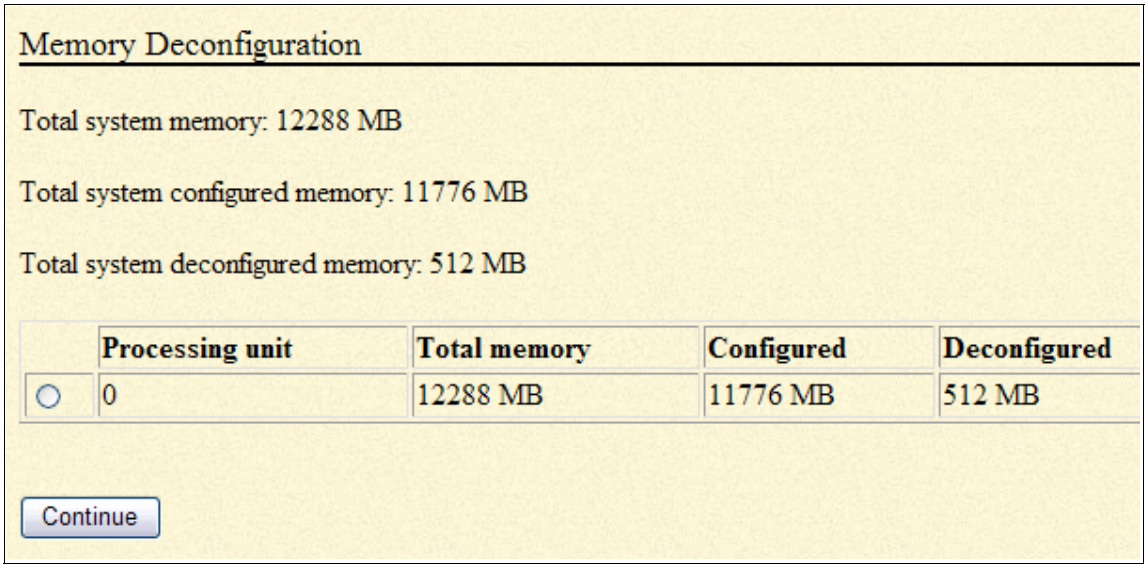


Figure 14-24 Memory Deconfiguration

A new panel similar to the one shown in Figure 14-25 displays. You can then see any Memory Banks that might have become deconfigured due to some error

condition that the system was able to detect and isolate. You can select either configured or deconfigured for each memory bank and select **Save settings**.

Memory Deconfiguration

Processing unit: 0

Memory dimm	Location code	Size	State	Error type	Change settings
0	U789D.001.DQDVWZK-P2-C1-C6	512 MB	Configured	None (0)	Configured
1	U789D.001.DQDVWZK-P2-C1-C3	512 MB	Manually deconfigured	None (0)	Deconfigured
2	U789D.001.DQDVWZK-P2-C1-C9	512 MB	Configured	None (0)	Configured
3	U789D.001.DQDVWZK-P2-C1-C12	512 MB	Configured	None (0)	Configured

Figure 14-25 Memory deconfiguration memory bank selection

14.6.11 Program Vital Product Data

The ASMI allows you to program the system (VPD such as system brand, system identifiers, and system enclosure type (Figure 14-26). To access any of the VPD-related panels, your authority level must be administrator or authorized service provider.

Note: You cannot boot the system until valid values are entered for the system brand, system identifiers, and system enclosure type.

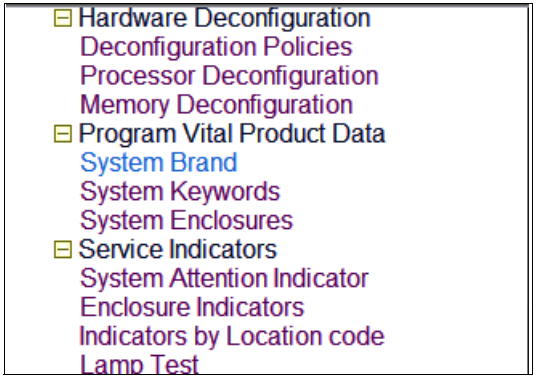


Figure 14-26 Program Vital Product Data

System Brand

Enter a two-character brand type. The first character must be one of the following:

D IBM Storage
I IBM System i
N OEM IBM System i only
O OEM IBM System p only
P IBM System p

The second character is reserved. A value of zero means that there is no specific information associated with it. This entry is write once only, except in the case where it is all blanks, or when changing from a System p system to an IBM Storage system. Any other changes are disallowed. A valid value is required for the machine to boot. Additionally, for IBM Storage, each of the systems that constitutes the storage facility must have the first character set to D for storage to be accessible online.

System Keyword

You can set the system-unique ID, serial number, machine type, and machine model (Figure 14-27). If you do not know the system-unique ID, contact your next level of support.

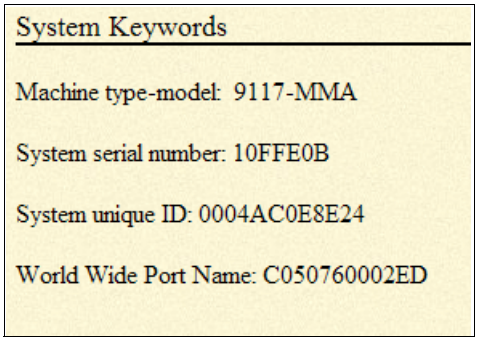


Figure 14-27 System Keyword

Machine type-model

Enter a machine type and model in the form *TTTT-MMM*, where *TTTT* is the 4-character machine type and *MMM* is the 3-character model. A valid value is required for the machine to boot. Additionally, for storage to be accessible online, this value must match exactly both systems that constitute the storage facility. This entry is write once only.

System serial number

Enter a system serial number in the form *XXYYYYY*, where XX is the code for the plant of manufacture and *YYYYY* is the unit sequence number. Valid characters are 0 to 9 and A to Z. A valid value is required for the machine to boot. This entry is write once only.

System unique ID

Enter a system-unique serial number as 12 hexadecimal digits. The value should be unique to a given system anywhere in the world. A valid value is required for the machine to boot.

World wide port name

Enter a 16-digit hexadecimal number for the worldwide node name. This value is an IEEE-assigned 64-bit identifier for the storage facility. A valid value is required for the machine to boot. This entry is write once only.

System enclosure

When setting the system enclosure type, ensure that the enclosure serial number field matches the original value, which can be found on a label affixed to

the unit. Updating the enclosure serial field keeps the configuration and error information synchronized, and this information is used by the system when creating the location codes. This task must be done using the ASMI, not with the control panel. However, if you do not have access to the ASMI, the system will still operate without updating this information. See Figure 14-28.

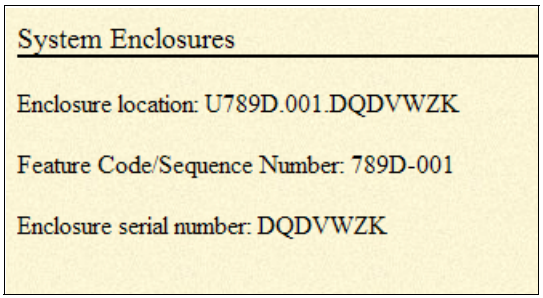


Figure 14-28 System Enclosures

Feature code/sequence number

Enter a feature code and sequence number in the form *FFFF-SSS*, where *FFFF* is the 4-character feature and *SSS* is the 3-character sequence number. The Feature Code/Sequence Number is used to uniquely identify the type of the enclosure attached to the system. A valid value is required for the machine to boot. When this value is changed, the service processor reboots so that the location codes can be updated accordingly.

Enclosure serial number

Enter an enclosure serial number in the form *XXYYYYY*, where *XX* is the code for the plant of manufacture and *YYYYY* is the unit sequence number. Valid characters are 0 to 9 and A to Z. This serial number must be different from the serial number on the machine. A valid value is required for the machine to boot. When this value is changed, the service processor will reboot so that the location codes can be updated accordingly.

Service Indicators

From this menu you can turn off system attention indicator, enable enclosure indicators, change indicators by location code, and perform an LED test on the control panel.

The service indicators alert you that the system requires attention or service. It also provides a method for identifying a field-replaceable unit (FRU) or a specific enclosure within the system. A hierarchical relationship exists between FRU indicators and enclosure indicators. If any FRU indicator is in an identify state, then the corresponding enclosure indicator will change to an identify state

automatically. You cannot turn off the enclosure indicator until all FRU indicators within that enclosure are in an off state.

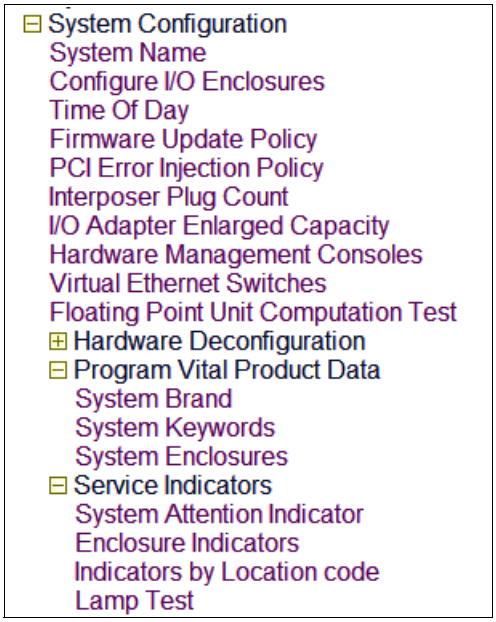


Figure 14-29 Service Indicators menu

System attention indicator

Click this button to turn off the system attention indicator. If the indicator is off, you cannot use this option to turn the system attention indicator on again. See Figure 14-30.

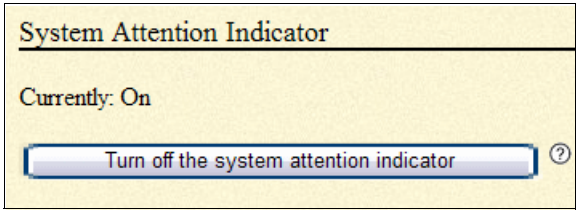


Figure 14-30 System Attention Indicator

Enclosure indicators

You can turn on or off the identify indicators in each enclosure. An enclosure is a group of indicators. For example, a processing unit enclosure represents all of the indicators within the processing unit and an I/O enclosure represents all of the indicators within that I/O enclosure. Enclosures are listed by their location code. See Figure 14-31. Select the check box and select **Continue**.

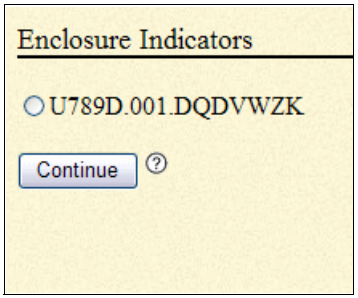


Figure 14-31 Enclosure Indicators

Select to off or identify as appropriate and select **Save settings**. Alternatively, select **Turn off all indicators** to reset the leds.

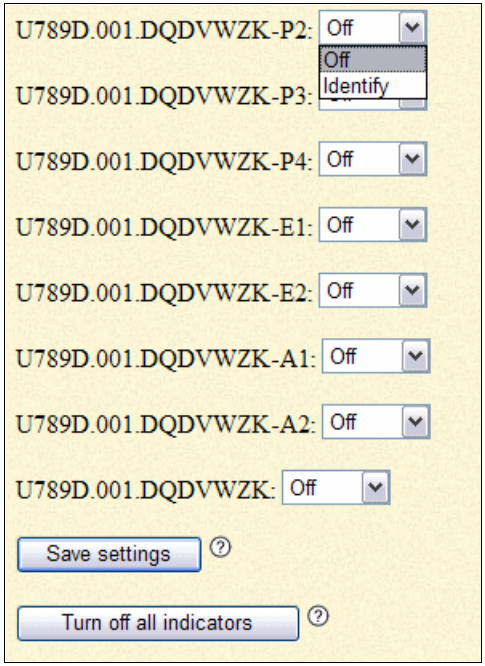


Figure 14-32 Enclosure Identify window

Indicators by location code

You can specify the location code of any indicator to view or modify its current state. If you provide the wrong location code, the advanced system manager attempts to go to the next higher level of the location code. The next level is the base-level location code for that FRU. For example, a user types the location code for the FRU located on the second I/O slot of the third enclosure in the system. If the location code for the second I/O slot is incorrect (the FRU does not exist at this location), an attempt to set the indicator for the third enclosure is initiated. This process continues until a FRU is located or no other level is available.

Lamp test

You can perform an LED test on the control panel to determine if one of the LEDs is not functioning properly. Select **Lamp Test**. Click **Continue** to perform the lamp test. The test changes all indicators to the identify state for a short time (approximately 4 minutes).

14.7 Network Services

Use this menu option to configure the number and type of network interfaces according to the needs of your system (Figure 14-33). You can configure network interfaces on the system. The number and type of interfaces vary according to the specific needs of your system.

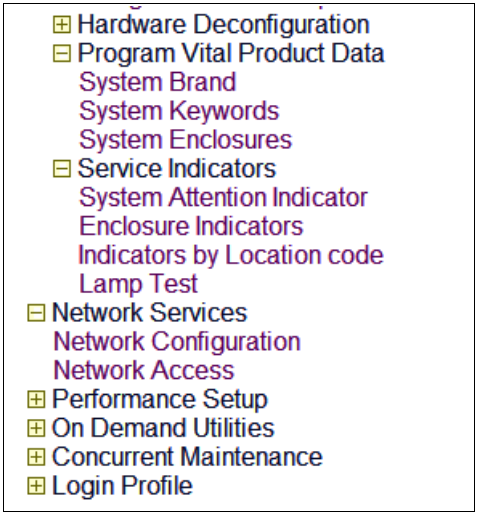


Figure 14-33 Network Services menu

14.7.1 Network Configuration

This operation can be performed when the system is turned on and off. Because network configuration changes occur immediately, existing network sessions, such as HMC connections, are stopped. If a firmware update is in progress, do not perform this operation. The new settings must be used to re-establish any network connections. Additional errors can also be logged if the system is turned on. See Figure 14-34.

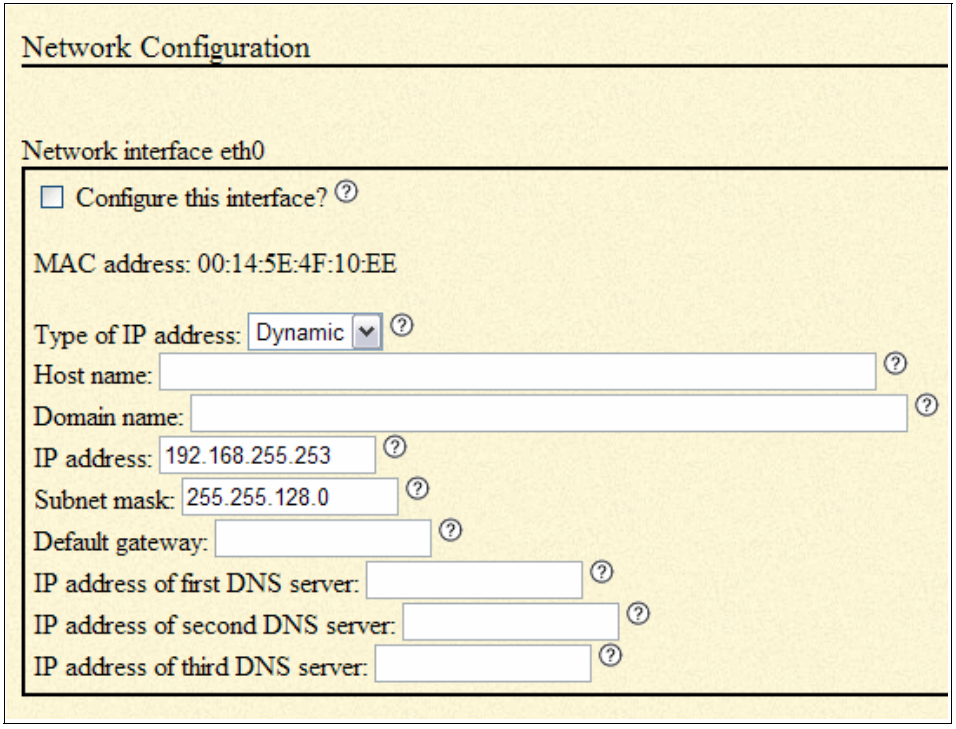


Figure 14-34 HMC Ethernet port configuration

From this window, you have the following options:

- **Configure this interface**: Configures this interface. If not selected, then the corresponding fields will be ignored.
- **Type of IP address**: Select the IP address type for this interface. If dynamic is selected, then network configuration data is obtained from the DHCP server. Typically your HMC is your DHCP server connected to FSP Ethernet port1.

- **Host name**: Enter a new value for the host name.

  The valid characters are: hyphen (-) and period (.) , uppercase and lowercase alphabetics (A to Z and a to z), and numeric (0 to 9).

  The first character must be alphabetic or numeric and the last character must not be a hyphen or a period.However, if the host name contains a period, then the preceding characters must have an alphabetic character. This input is required for the static type of IP address.
- **Domain name**: Enter a new value for the domain name. All alphanumeric characters and the symbols hyphen (-), underscore (_), and period (.) are valid.
- **IP address**: Enter a new value for the IP address. This input is required for the static IP address type.
- **Subnet mask**: Enter a new value for the subnet mask. This input is required for the static IP address type.
- **Default gateway**: Enter a new value for the default gateway.
- **IP address of first DNS server**: Enter a new value for the first DNS server.
- **IP address of second DNS server**: Enter a new value for the second DNS server.
- **IP address of third DNS server**: Enter a new value for the third DNS server.
- **Reset Network Configuration**: Resets the Network Configuration settings to their default factory settings.
- **Network Configuration**: Select service processor to be configured. The default is the current service processor

Selecting **Save Settings** causes the network configuration changes to be made and the service processor to be rebooted. As the service processor reboots, your ASMI session drops and you have to reconnect your session to continue. When you reconnect, you are then using the new settings.

14.7.2 Network Access

When you configure network access, you specify which IP addresses can access the service processor. You can specify a list of allowed IP addresses and a list of denied IP addresses. See Figure 14-35.

Note: The allowed list takes priority over the denied list, and an empty denied list is ignored. *ALL* is not allowed in the denied list if the allowed list is empty

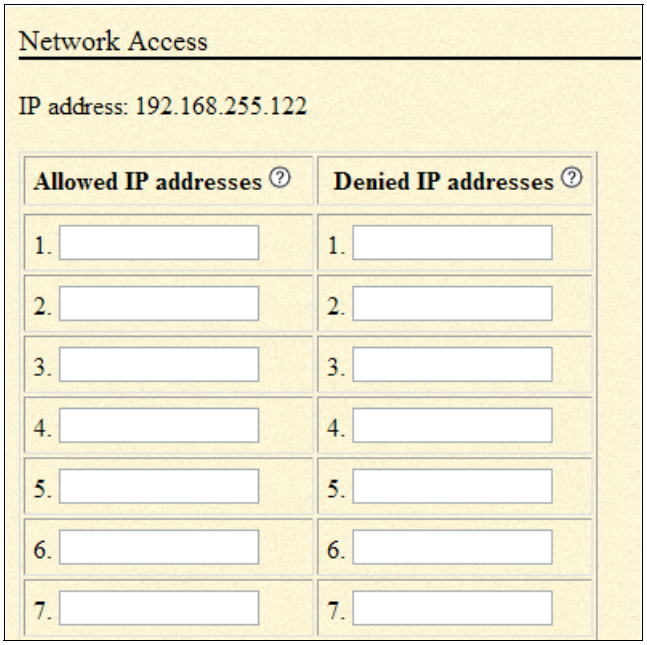


Figure 14-35 Network Access

In this window, you have the following options:

- **Allowed IP addresses**: Enter up to 16 complete or partial IP addresses. A complete IP address contains all four octets.

  A partial IP address has only 1, 2, or 3 octets, and must end in a period. If a login is received from an IP address which matches a complete or partial IP address in the allowed list, access to the service processor is granted.

  To allow access to the service processor from any IP address, enter `ALL` in the allowed list. An empty allowed list is ignored and access is granted from any IP address.

- **Denied IP addresses**: Enter up to 16 complete or partial IP addresses to be denied. Access to the service processor is not allowed if a login is received from an IP address listed in this list.

  To deny access from any IP address, enter `ALL` in the list. If an incorrect IP address is entered in the allowed list and the denied list contains ALL, access to the service processor can be permanently denied. In this case, reset the network parameters by using the network reset parameters switch on the service processor card. Note that an empty denied list is ignored and the allowed list takes priority over the denied list. For these reasons, ALL is not allowed in the denied list if the allowed list is empty.

14.8 Performance Setup

You might enhance the managed system performance by manually or automatically changing the logical memory block size. The system kernel uses the memory block size to read and write files. By default, the logical memory block size is set to Automatic. This setting allows the system to set the logical block memory size based on the physical memory available. You can also manually change the logical memory block size. See Figure 14-36.

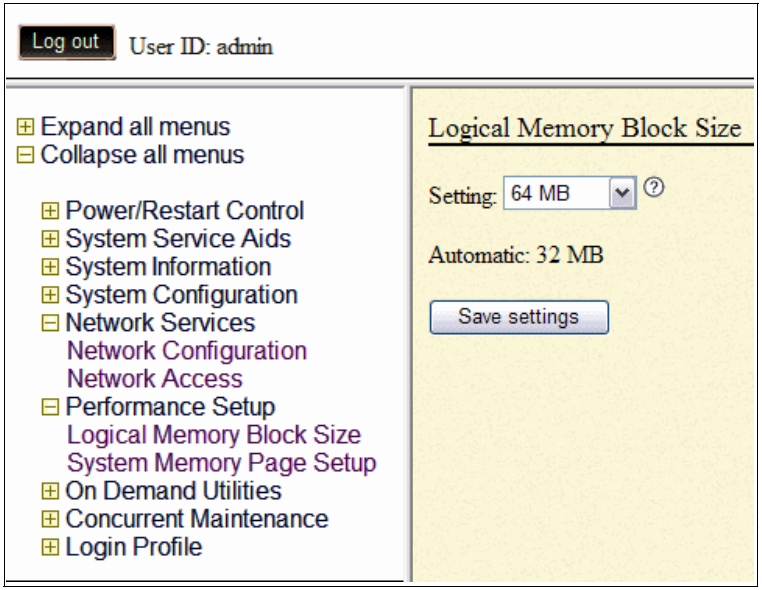


Figure 14-36 Performance Setup

To select a reasonable logical block size for your system, consider both the performance desired and the physical memory size. Use the following guidelines when selecting logical block sizes:

- On systems with a small amount of memory installed (2 GB or less), a large logical memory block size results in the firmware consuming an excessive amount of memory. Firmware must consume at least 1 logical memory block. As a general rule, select the logical memory block size to be no greater than 1/8th the size of the system's physical memory.
- On systems with a large amount of memory installed, small logical memory block sizes result in a large number of logical memory blocks. Because each logical memory block must be managed during boot, a large number of logical memory blocks can cause boot performance problems. As a general rule, limit the number of logical memory blocks to 8 K or less.

Note: The logical memory block size can be changed at run time, but the change does not take effect until the system is restarted

Select **Logical Memory Block Size**. select the logical memory block size and click **Save settings**.

14.8.1 System Memory Page Setup

Improve your system performance by setting up the system with larger memory pages. You can improve your system performance by setting up the system with larger memory pages. Performance improvements vary depending on the applications running on your system. Only change this setting if advised by service and support.

To change the system memory page setup, select **System Memory Page Setup**. In the right pane, select the settings that you want, and then click **Save settings**.

14.9 On Demand Utilities

Activate inactive processors or inactive system memory without restarting your server or interrupting your business. Capacity on Demand (CoD) allows you to permanently activate inactive processors or inactive system memory without requiring you to restart your server or interrupt your business. You can also view information about your CoD resources.Important: Use this information if a hardware failure causes the system to lose its Capacity On Demand or Function On Demand purchased capabilities, and if there has never been an HMC

managing the system. If an HMC is managing the system, use the HMC to perform the following tasks instead of the ASMI.

Important: To decide whether you need Capacity on Demand, refer to Chapter 13, “Capacity on Demand” on page 373.

14.9.1 CoD Order Information

After you determine that you want to permanently activate some or all of your inactive processors or memory, you must order one or more processor or memory activation features. You then enter the resulting processor or memory-activation key that is provided by your hardware provider to activate your inactive processors or memory.

To order processor or memory activation features select **On Demand Utilities** → **Select CoD Order Information**. The server firmware displays the information that is necessary to order a Capacity on Demand activation feature. Record the information that is displayed and click **Continue**. See Figure 14-37.

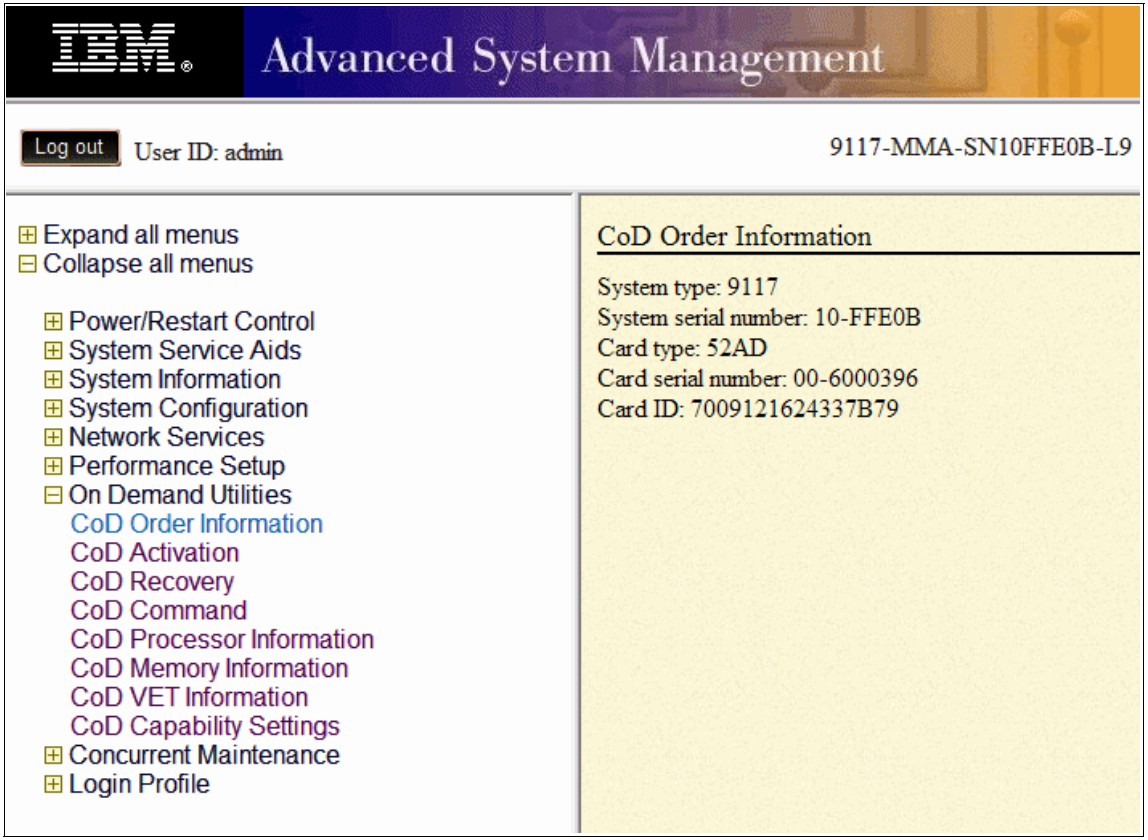


Figure 14-37 CoD Order Information

14.9.2 CoD Activation

To activate this feature click **On Demand Utilities** → **CoD Activation**. Enter the activation key into the field and click **Continue** to perform the specified operation (Figure 14-38).

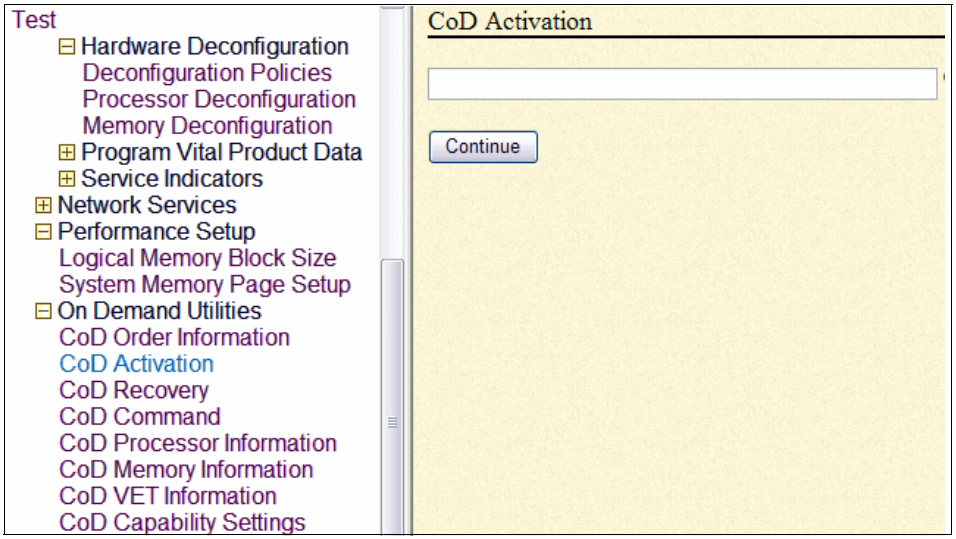


Figure 14-38 CoD Activation

14.9.3 CoD Recovery

This process is to resume the booting process of the server firmware after the CoD activation keys are entered. Resuming the server firmware causes the CoD key to become recognized and the hardware to become activated. This option allows the server to complete the startup process that has been delayed up to one hour in order to place the server into the On Demand Recovery state that was needed to enter the CoD activation keys.

Select **On Demand Utilities** → **CoD Recovery**. Enter the activation key into the field and click **Continue** to perform the specified operation (Figure 14-38).

14.9.4 CoD Command

Select **On Demand Utilities** → **CoD Recovery**. Enter the command into the field and click **Continue**.

14.9.5 Viewing Information about CoD Resources

When CoD is activated on your system, you can view information about the CoD processors, the memory that is allocated as CoD memory, and Virtualization Engine™ technology resources.

Select **On demand Utilities**. Then, select one of the following options for the type of information that you want to view:

- **CoD Processor Information** to view information about the CoD processors.
- **CoD Memory Information** to view information about available CoD memory.
- **CoD Vet Information** to view information about available Virtualization Engine technologies.
- **CoD Capability Settings** to view information about the CoD capabilities that are enabled.

14.10 Login Profile

In this section, we look at how to change passwords, view login audits, change the default language, and update the installed languages.

14.10.1 Change Password

You can change the general user, administrator, and HMC access passwords. If you are a general user, you can change only your own password.If you are an administrator, you can change your password and the passwords for general user accounts. If you are an authorized service provider, you can change your password, the passwords for general and administrator user accounts, and the HMC access password.

Passwords can be any combination of up to 64 alphanumeric characters. The default password for the general user ID is general, and the default password for the administrator ID is admin. After your initial login to the ASMI and after the reset toggle jumpers are moved, the general user and administrator passwords must be changed. The HMC access password is usually set from the HMC during initial login. If you change this password using the ASMI, the change takes effect immediately.

Note: As a security measure, you are required to enter the current user's password into the Current password for current user field. This password is not the password for the user ID you want to change

To change the password, select **Login Profile** → **Change password**. In the window that opens, enter the appropriate information and click **Continue**.

14.10.2 Retrieve Login Audits

You can view the login history for the ASMI to see the last 20 successful logins and the last 20 logins that failed. To view login audit, Select **Login Profile** → **Retrieve Login Audits**.

14.10.3 Change Default Language

You can select the language that is displayed on the ASMI welcome window prior to login and during your ASMI session if you do not choose an alternative language at the time of login. You must provide all requested input in English-language characters regardless of the language selected to view the interface.

To change the default language, select **Login Profile** → **Change Default Language**. Select the language and click **Save Settings**.

14.10.4 Update Installed Languages

A maximum of five languages can be supported on the service processor at any given time. By default, English is always installed. Languages installation changes take effect when the firmware is updated. See Figure 14-39.

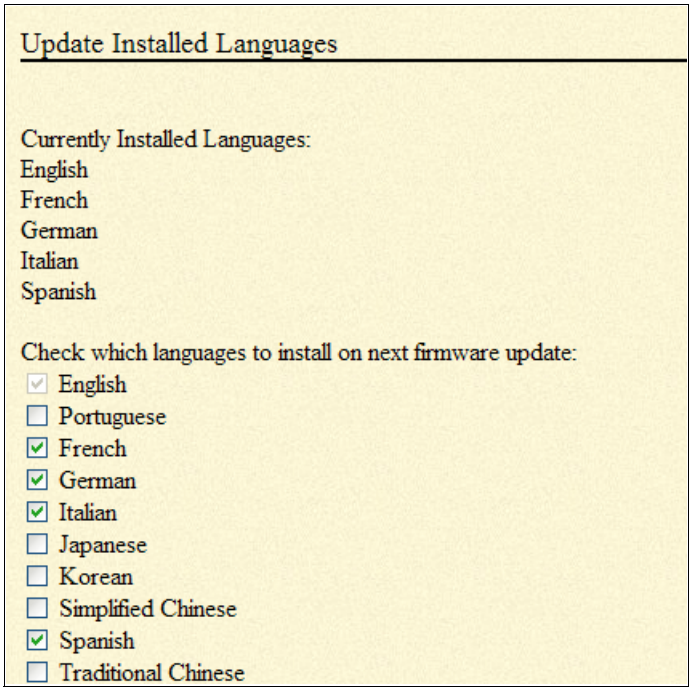


Figure 14-39 Update Installed Languages

To select which language to install at the next firmware update, select **Login Profile** → **update installed language** → select five languages → **Save Settings**.

14.10.5 User Access Policy

This menu enables the admin user to grant or deny the access to service and development personnel by enabling or disabling dev, celogin, celogin1, and celogin2. Enabling access policy for celogin1 and celogin2 requires new passwords to be set even they have been set before.

To enable user access, select **Login Profile** → **user access policy**. Then, select the user ID and policy setting and click **Continue**. Enter the admin password and new password for the user.

You have the following password options:

- **Current password for user ID**: As a security measure, the current password must be supplied.
- **New password for user**: Enter the new password for the user whose password you want to change.
- **New password again**: Enter the new password for the user again for verification.

A

An example of backing up HMC Critical Console Data

You can back up Critical Console Data to a mounted remote system using the HMC option. This appendix provides an example of how to use this option.

Using the HMC option to back up Critical Console Data

A Network File System (NFS) is the only supported file system for this HMC option. The IBM i5/OS has an NFS that can be used to save the HMC's Critical Console Data. The HMC uses standard NFS communications. The NFS uses UDP by default, not TCP/IP.

To ensure communications through the network, ports 111 and 2049 must be opened on all network equipment between the HMC and the IBM i5/OS partition for UDP. The NFS Server on i5/OS partition must be started and a directory should be created in the root file system then exported.

Perform the following steps to prepare back up critical console data to an IBM i5/OS partition:

1. Ensure that the NFS server is running on the i5/OS. To check whether NFS server is running, you can see if port 111 and 2049 are listening for UDP by enter the command **NETSTAT *CNN** as shown in Figure A-1. The port name for port 111 is *sunprc*.

```
                        Work with TCP/IP Connection Status
                                                                System:   RCHAS60
Type options, press Enter.
  3=Enable debug   4=End   5=Display details   6=Disable debug
  8=Display jobs

     Remote             Remote      Local
Opt  Address            Port        Port        Idle Time  State
  _   *                  *           ftp-con >   070:11:47  Listen
  _   *                  *           telnet      000:01:05  Listen
  _   *                  *           smtp        070:11:01  Listen
  _   *                  *           89          070:11:42  Listen
  _   *                  *           sunrpc      014:22:52  Listen
  _   *                  *           sunrpc      014:43:04  *UDP
  _   *                  *           netbios >   070:11:04  Listen
  _   *                  *           netbios >   000:00:21  *UDP
  _   *                  *           netbios >   000:00:20  *UDP
  _   *                  *           netbios >   016:12:55  Listen
  _   *                  *           snmp        000:02:35  *UDP
  _   *                  *           ldap        015:40:53  Listen
                                                                          More...
F3=Exit   F5=Refresh   F9=Command line   F11=Display byte counts   F12=Cancel
F20=Work with IPv6 connections   F22=Display entire field   F24=More keys
```

Figure A-1 Work with TCP/IP Connection Status

2. You can check the port number by pressing F14 as shown in Figure A-2.

```
                        Work with TCP/IP Connection Status
 ■          ■                                                  System:   RCHAS60
Type options, press Enter.
  3=Enable debug   4=End   5=Display details   6=Disable debug
  8=Display jobs

     Remote             Remote  Local
Opt  Address             Port    Port  Idle Time  State
 _   *                         *     21  070:11:47  Listen
 _   *                         *     23  000:01:05  Listen
 _   *                         *     25  070:11:01  Listen
 _   *                         *     89  070:11:42  Listen
 _   *                         *    111  014:22:52  Listen
 _   *                         *    111  014:43:04  *UDP
 _   *                         *    137  070:11:04  Listen
 _   *                         *    137  000:00:21  *UDP
 _   *                         *    138  000:00:20  *UDP
 _   *                         *    139  016:12:55  Listen
 _   *                         *    161  000:02:35  *UDP
 _   *                         *    389  015:40:53  Listen
                                                                 ■       More...
F3=Exit   F5=Refresh   F9=Command line   F11=Display byte counts   F12=Cancel
F15=Subset   F20=Work with IPv6 connections   F24=More keys
```

Figure A-2 Work with TCP/IP Connection Status - port number

3. Ensure that port 2049 is also available for UDP by scrolling down the page, as shown in Figure A-3.

```
                        Work with TCP/IP Connection Status
 ■          ■                                                  System:   RCHAS60
Type options, press Enter.
  3=Enable debug   4=End   5=Display details   6=Disable debug
  8=Display jobs

     Remote             Remote  Local
Opt  Address             Port    Port  Idle Time  State
 _   *                         *    990  070:11:45  Listen
 _   *                         *    992  070:11:49  Listen
 _   *                         *   2001  047:03:34  Listen
 _   *                         *   2002  047:03:34  Listen
 _   *                         *   2049  014:43:14  *UDP
 _   *                         *   2301  070:11:53  Listen
 _   *                         *   2809  070:10:00  Listen
 _   *                         *   3000  070:11:54  Listen
 _   *                         *   4111  070:10:33  Listen
 _   *                         *   4620  070:09:31  Listen
 _   *                         *   4621  070:09:31  Listen
 _   *                         *   4625  070:09:29  Listen
                                                                 More...
F3=Exit   F5=Refresh   F9=Command line   F11=Display byte counts   F12=Cancel
F15=Subset   F20=Work with IPv6 connections   F24=More keys
```

Figure A-3 Work with TCP/IP Connection Status - next page

If the NFS server is not running, you can start the NFS server by typing the command QSYS/STRNFSSVR SERVER (*ALL).

4. Creating and exporting a directory to be used for the back up in i5/OS partition. After the NFS server is started, a directory needs to be created and the exported to the NFS. Enter the command **mkdir hmcdata** to create the directory, and then confirm the directory was created by entering **wrklnk** as shown in Figure A-4.

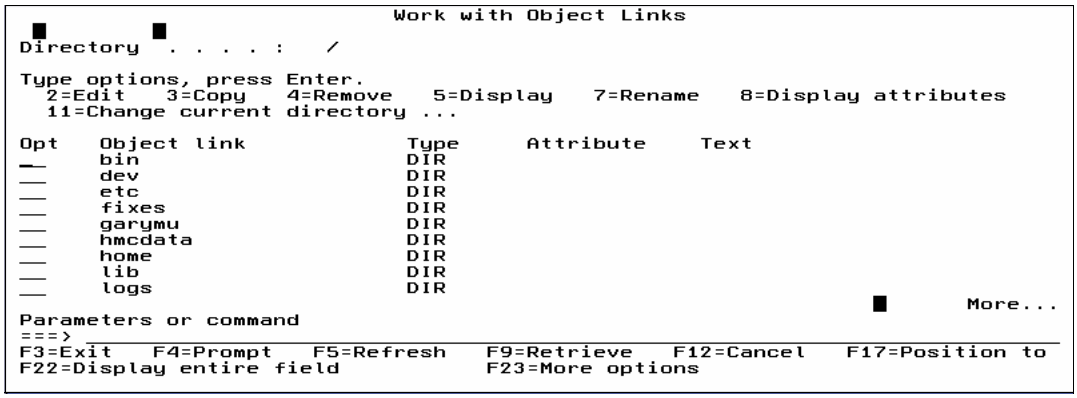


Figure A-4 Work with Object Links

5. Make sure that for the directory, user *public has read, write, and execute authority by typing option **9** (Work with Authority) for the directory, as shown in Figure A-5.

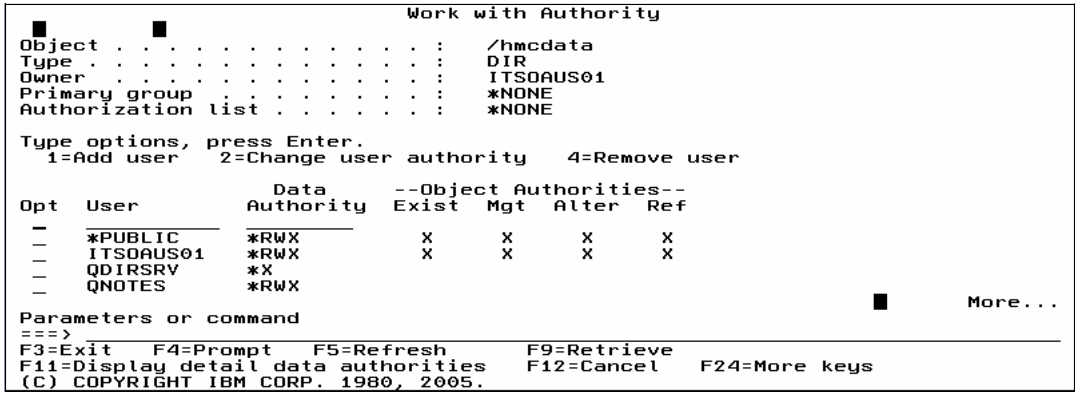


Figure A-5 Work with Authority

6. After the directory has been created, you can export the directory to the NFS by using IBM System i Navigator. In the System i Navigator window, open **Network**, then **Servers**, and then click **TCP/IP**. In the right pane, right-click NFS and select **Exports** as shown in Figure A-6.

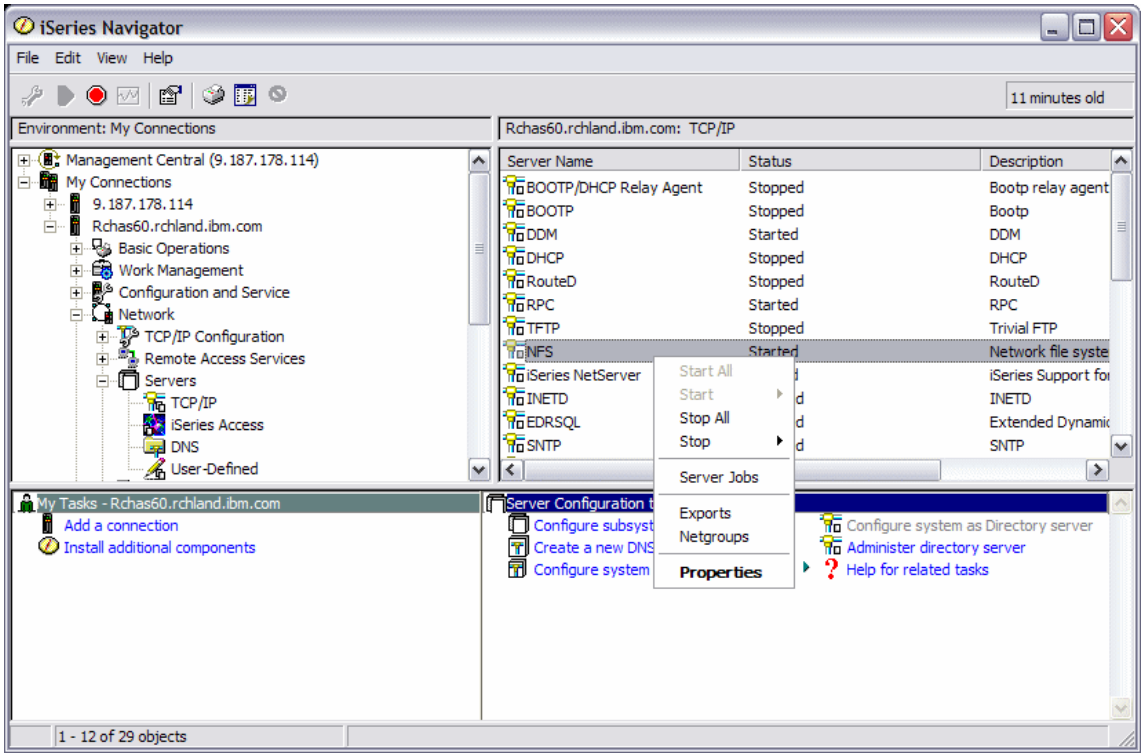


Figure A-6 System i Navigator

7. In the NFS Exports window, click **OK** (Figure A-7).

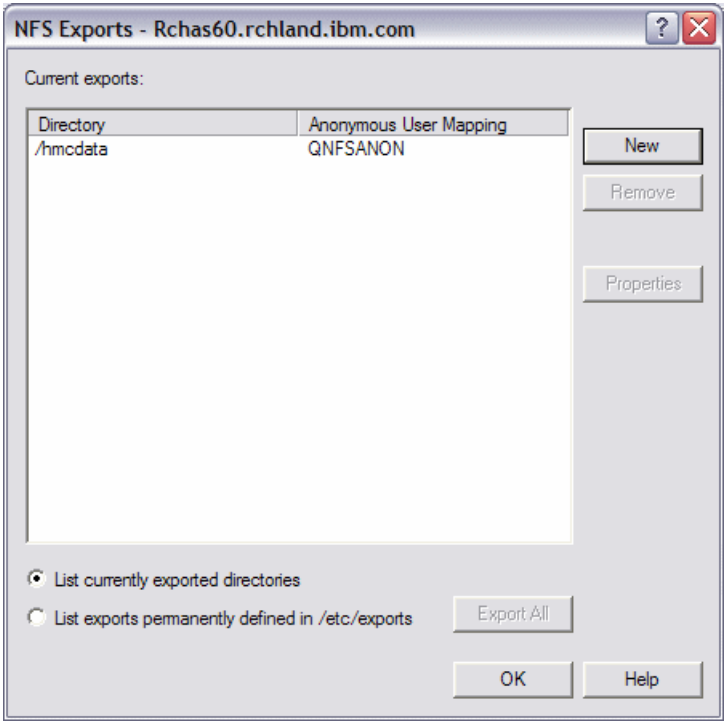


Figure A-7 NFS Exports

8. Perform the HMC Back up Critical Console Data to a mounted file system by clicking **HMC Management**, and then **Back up HMC Data** in the HMC window.
9. Select **Back up to mounted remote system** in the Back up HMC Data window (Figure A-8) and then click **Next** to continue with next window.

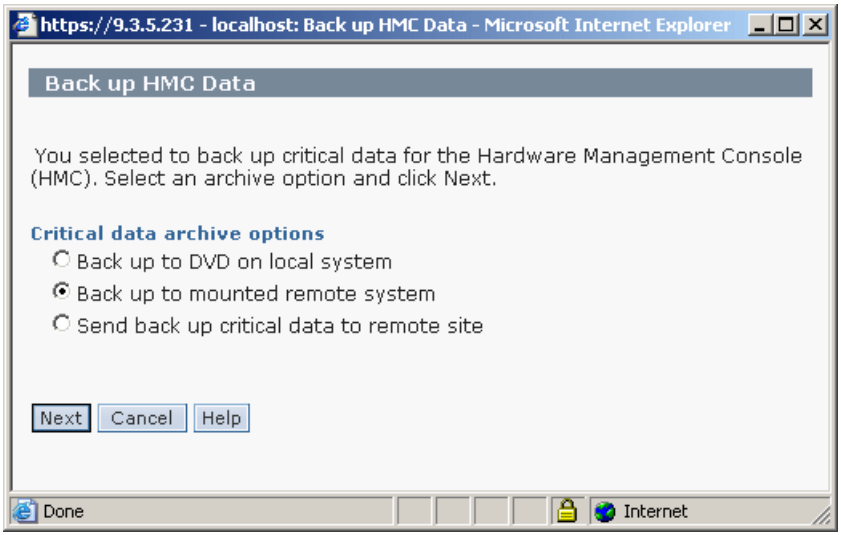


Figure A-8 Back up Critical Console Data

10. Enter the server name and the directory as shown in Figure A-9. Click **OK** to start HMC Back up Critical Console Data.

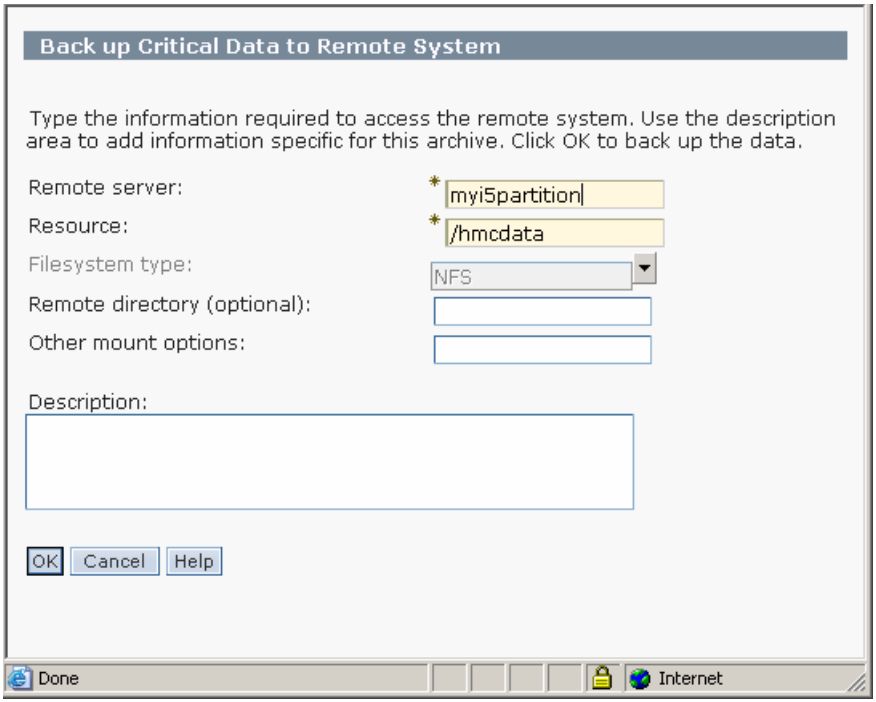


Figure A-9 Back up Critical Data to Remote System

11. The Backup Critical Console Data Progress window displays as shown in Figure A-10. The backup can take several minutes to complete.

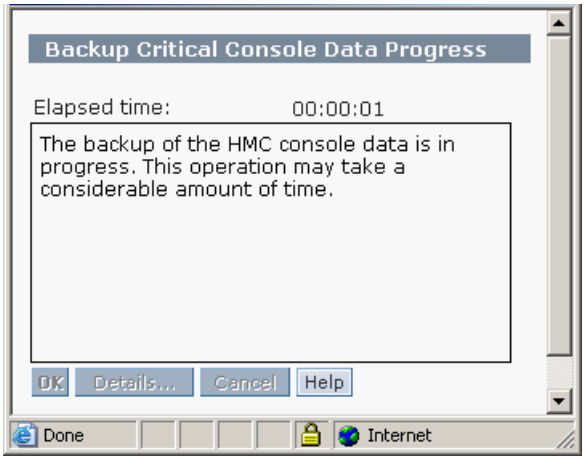


Figure A-10 Backup Critical Console Data Progress

You can also check the Backup Critical Console Data progress for the creation of the file by entering **`wrklnk`** on the 5250 console.

B

Introduction to IBM Director

IBM Director is an integrated, easy-to-use suite of tools that provide customers with flexible systems management capabilities to help realize maximum systems availability and lower IT costs.

This appendix provides an overview of the IBM Director for managing System p servers. It helps you to understand the specifics of IBM Director on System p platform and to decide if IBM Director is the best way to manage your environment.

Overview of IBM Director

IBM Director is an integrated suite of tools that provides you with a system management solution for heterogeneous environments, including IBM System p environment. IBM Director works with the Hardware Management Console (HMC) to provide a comprehensive system management solution. With IBM Director, IT administrators can view and track the hardware configuration of remote systems in detail and monitor the usage and performance of critical components, such as processors, disks and memory.

IBM Director is provided at no additional charge for use on IBM systems.

Extensions to IBM Director are available for customers who want additional capabilities from a consistent, single point of management. IBM Director also complements and integrates with other popular systems management products using its upward integration modules.

For more information about IBM Director, refer to:

- IBM Director information on the Web:

  `http://www-03.ibm.com/servers/eserver/xseries/systems_management/ibm_director/`

- *IBM Director on System p5*, REDP-4219
- *Implementing IBM Director 5.20*, SG24-6188

IBM Director is designed to manage complex environments that contain a large number of servers. Figure 14-40 shows a sample environment that can be managed using IBM Director.

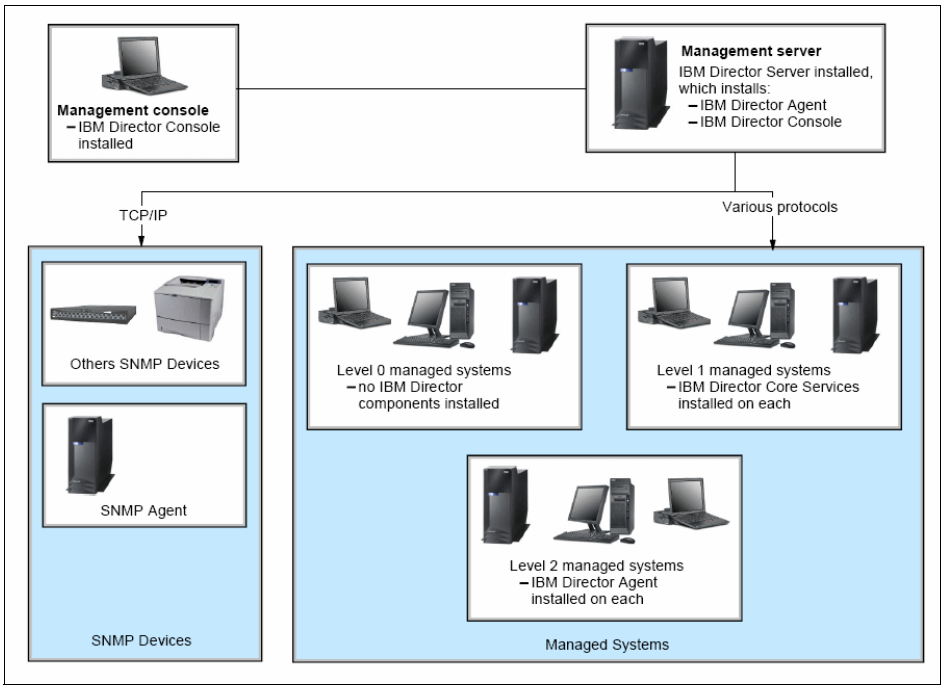


Figure 14-40 IBM Director environment

IBM Director components

IBM Director product consists of four components:

- **IBM Director Core Services**

  Systems that have IBM Director Core Services installed on them are referred to as Level-1. Level-1 control provides hardware specific functionality for IBM Director to communicate with and administer the managed system. IBM Director provides support for installing IBM Director Core Services on System p and System i servers and LPARs. You would not install it on an LPAR running the VIO Server.

- **IBM Director Agent**

  Systems that have IBM Director Agent installed on them are referred to as Level-2 managed systems. Level-2 provides enhanced functionality with which IBM Director can communicate with and administer the managed

system. System p or System i systems and LPARs can have IBM Director Agents installed on them.

- **IBM Director Console**

  This is the graphical user interface for IBM Director Server from which the system administrator can perform tasks in IBM Director. This is automatically installed with the Director Server on System p, running AIX or Linux. The IBM Director console provides the same GUI, independently of the machine type and operating system.

- **IBM Director Service**

  This is the main component of IBM Director that contains the management repository and data, the server engine and the application logic. It provides all the management functions of IBM Director.

IBM Director can also manage systems on which no component of IBM Director is installed. Such managed systems are referred to as Level-0 managed systems. These systems must at minimum support either the Secure Shell (SSH) or Distributed Component Object Model (DCOM) protocol.

IBM Director capabilities

IBM Director provides a comprehensive suite of system management capabilities for managing System p and System i servers when the system management capabilities are enhanced with access to an HMC that is connected to the System p and System i servers. Management capabilities can vary depending on the operating system hosting the management server, the operating system of the managed system, and the agent level installed on it.

This section provides a list of the tasks available for a System p management server and the features available from a managed System p server.

IBM Director Server Tasks

Note: IBM Director management server tasks that are available are the same whether they are running on AIX or Linux on POWER.

When running in a System p server, almost all of the IBM Director Server tasks are available. The following list includes both core features and extensions:

- Base Director tasks available on System p server: Discovery, Associations, Group Management, System Status, Inventory, Event Log Viewer, Event

Action Plan, Resource Monitor, Process Management, Remote Control, Remote Session, File Transfer, CIM Browser, SNMP Browser, Scheduler, Update Assistant, Microsoft Cluster Browser, Discovery preferences, Console preferences, Server preferences, User administration, Encryption administration, Message Browser, command line interface.

- Platform tasks available on System p server: Hardware/System Status. Hardware Control, Asset ID™, Configure SNMP Agent, Network Configuration, System Accounts.
- BladeCenter® tasks available on System p server: BladeCenter Configuration Wizard, BladeCenter Management C Module Launch, Switch Management Launch.
- IBM system x specific functions
  - Available on System p platform: Management Processor Assistant Launch, Configure Alert Standard Format.
  - Not Available on System p platform: ServeRAID™ Manager.
- Other platform specific tasks available on System p platform: HMC Support, z/VM® Center Management.
- Advanced Server Tasks
  - Available on System p platform: Rack Manager, Software Distribution.
  - Not available on System p platform: Capacity Manager, System Availability, Remote Deployment Manager, Virtual Machine Manager.

IBM Director Agent features

Depending on the agent level, a System p managed system provides different features for management.

Agentless managed systems

A managed System p server on which no IBM Director component is installed is named as an agentless system or Level-0. An agentless managed system provides the following basic features:

- Discovery
- Remote session (requires **ssh**)
- Power control
- Promotion to Level-1 or Level-2 through Update Assistant

Agent Level-1 managed system

Managed systems that have IBM Director Core Services (but not IBM Director Agent) installed on them are referred to as Level-1. It provides hardware specific

functionality for IBM Director to communicate with and administer the managed system.

The IBM Director Core Services package installs on Linux:

- A Service Location Protocol (SLP) service agent.
- An Secure Sockets Layer (SSL) enabled CIMOM.
- An optional ssh server.
- Platform specific instrumentation.

IBM Director Core Services provide a subset of IBM Director Agent functionality. Level-1 Agent provides management entirely through standard protocols. You can perform the following tasks on a Level-1 managed system:

- All Level-0 functions.
- Collecting inventory.
- Promotion to Level-2 management by distributing the IBM Director Agent package.
- Managing events using event action plans, event subscription, and the event log.
- Monitoring hardware status.
- Running command line programs.
- Distributing system update packages through Software Distribution.

Agent Level-2 managed system

A managed system on which the IBM Director Agent is installed is referred to as Agent Level-2 managed system. It provides enhanced management functionalities, which vary depending on the operating system on which it is installed.

IBM Director extensions for System p

IBM Director extension are plug in modules which extend the capabilities of IBM Director:

- Install time extensions provided on the base IBM Director CD, installed along with IBM Director Server.
- Free extensions that available for download at no charge.
- Fee based extensions, product that require a license.

Install time extensions

Depending on the platform on which you install IBM Director Server, the installation package comes with different install time extensions, which are automatically installed with the server software.

When installing IBM Director Server on System p (AIX 5L or Linux), the installation package contains:

- Cluster System Management (CSM) hardware control utilities
- Flexible Service Provider
- Collection Services extensions
- IBM Director Agent
- ASMLIB
- System x™ extension
- BladeCenter extension
- IBM Director HMC common code extension
- IBM Director HMC console extension

C

Moving existing System i LPAR profiles to HMC

This appendix discusses how to migrate IBM System i LPAR profiles from a System i that does not have an HMC to a System i which is running logical partitions and is managed by an HMC. The HMC or IVM is required for any system i that is running logical partitions. The HMC or IVM creates and manages all LPAR configuration profiles.

Saving LPAR profiles using System i Navigator

This section discusses how to save System i LPAR profiles from a system that does not have a HMC by using System i Navigator. Follow these steps:

1. Load i5/OS V5R3 on all the logical partitions of the current system.
2. Do a complete system save of the current system.
3. Export the LPAR configuration:
   a. Start an System i Navigator session and select the system that is partitioned as shown in Figure C-1.

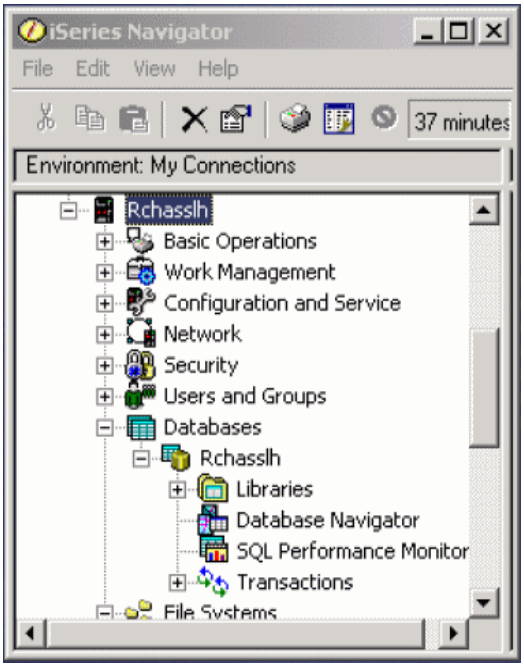


Figure C-1 Starting System i Navigator

b. Click **Configuration and Service** as shown in Figure C-2.

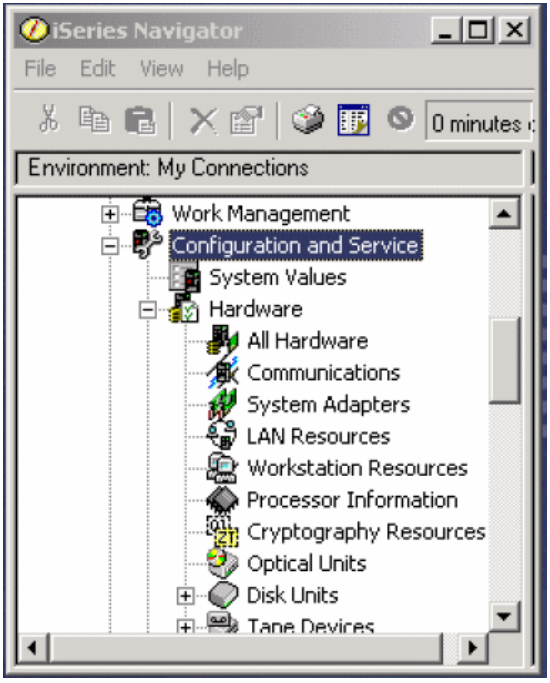


Figure C-2 System i Navigator Panel

c. Select **Logical Partitions**, then right-click and select **Configure Partition** as shown in Figure C-3.

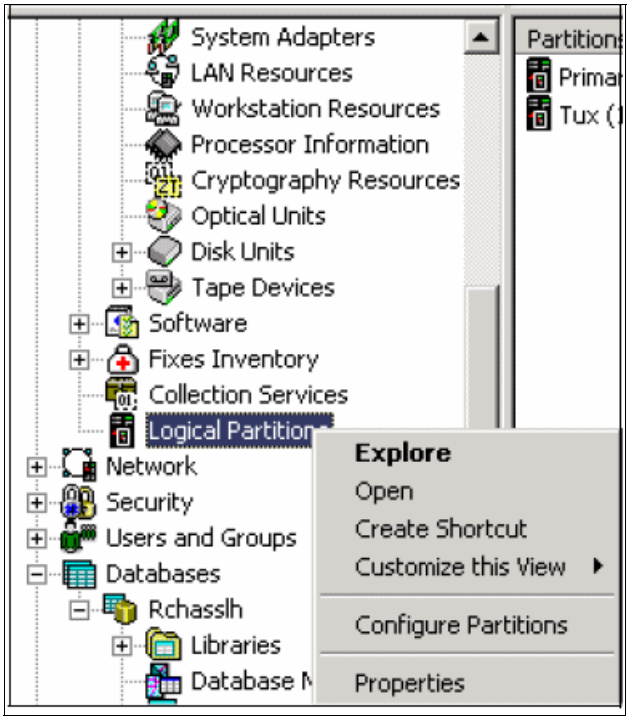


Figure C-3 System i Navigator Panel - Logical Partition

d. A list of partition configurations displays as shown in Figure C-4.

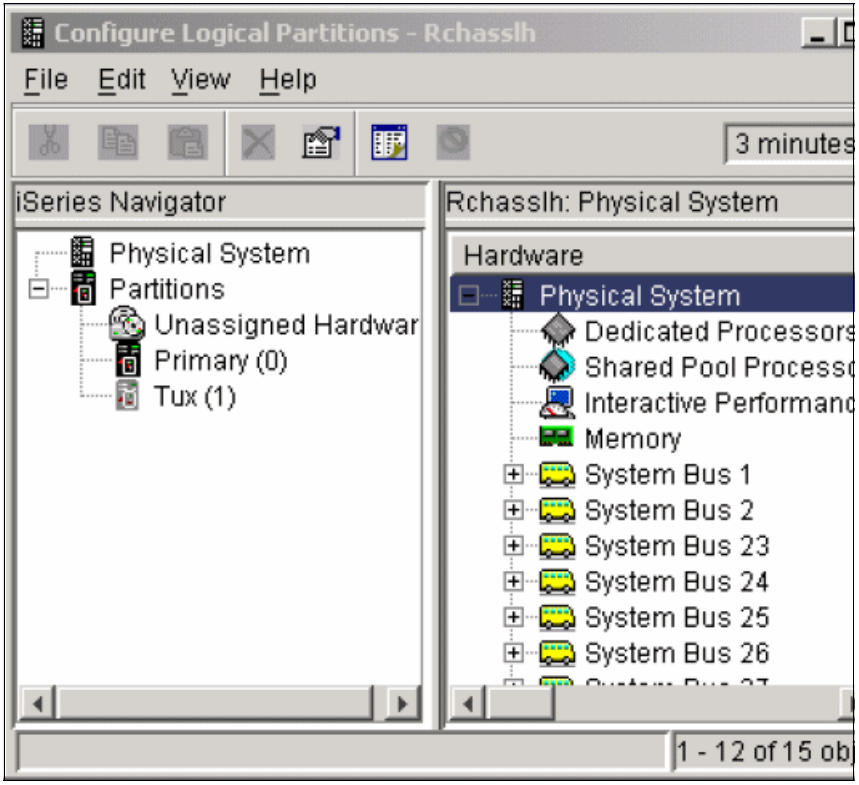


Figure C-4 System i Navigator Panel - Physical System

e. Right-click **Physical System** and select **Recovery**. Then select **Save All Configuration Data** as shown in Figure C-5.

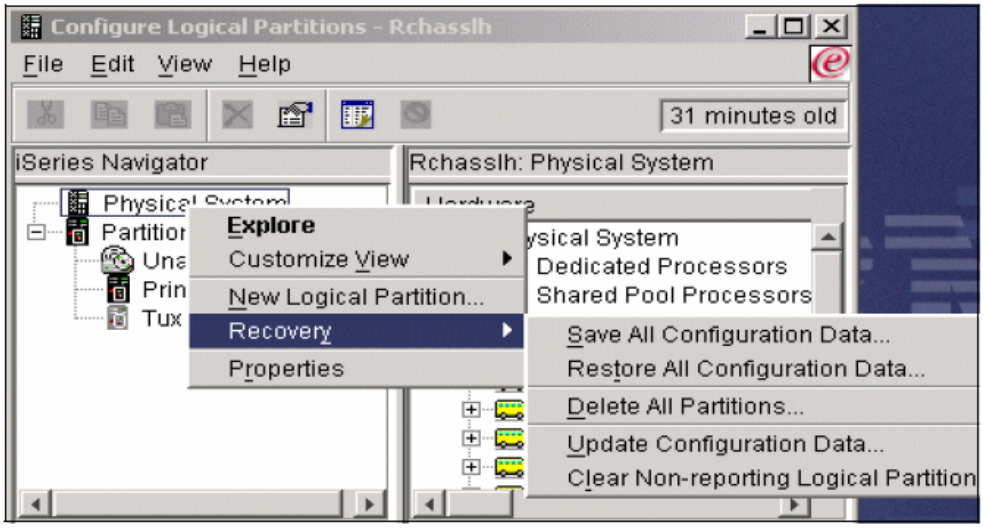


Figure C-5 System i Navigator Panel

f. Enter a file name as shown in Figure C-6. The file should have been created prior to this step. You can browse for the file name as well. Click **OK**. The file is saved to the media of your choice. We recommend CD or diskette. The HMC uses either media.

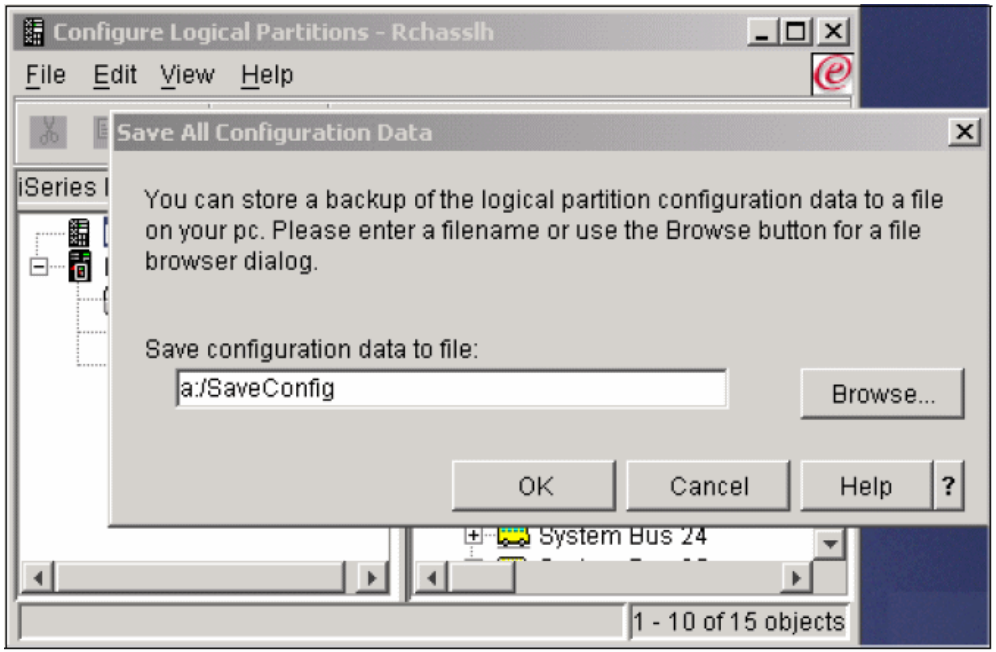


Figure C-6 System i Navigator Save Configuration Data Panel

Importing LPAR profiles to HMC

This section describes how to import System i LPAR profiles that you have already saved before by using System i Navigator to an HMC using restricted shell. Using the restricted shell to finish this task requires the administrator to be logged onto the HMC locally. Follow these steps:

1. Complete the setup of the HMC.
2. Import or migrate the LPAR configurations to the HMC.

   During the migration of the LPAR configurations, partition P0/Primary is reassigned the next available partition number, Pn+1. The Primary partition, as you know it today, no longer exists. The HMC is now used to manage the partitions.

   To start the import process, a command is executed using the command line from an restricted shell terminal session at the HMC.

3. Perform the following steps to migrate the configuration data to the HMC:
   a. Log on to the HMC with the default system administrator user ID *hscroot* with its password.
   b. In the HMC workplace window, click **HMC Management** as shown in Figure C-7.

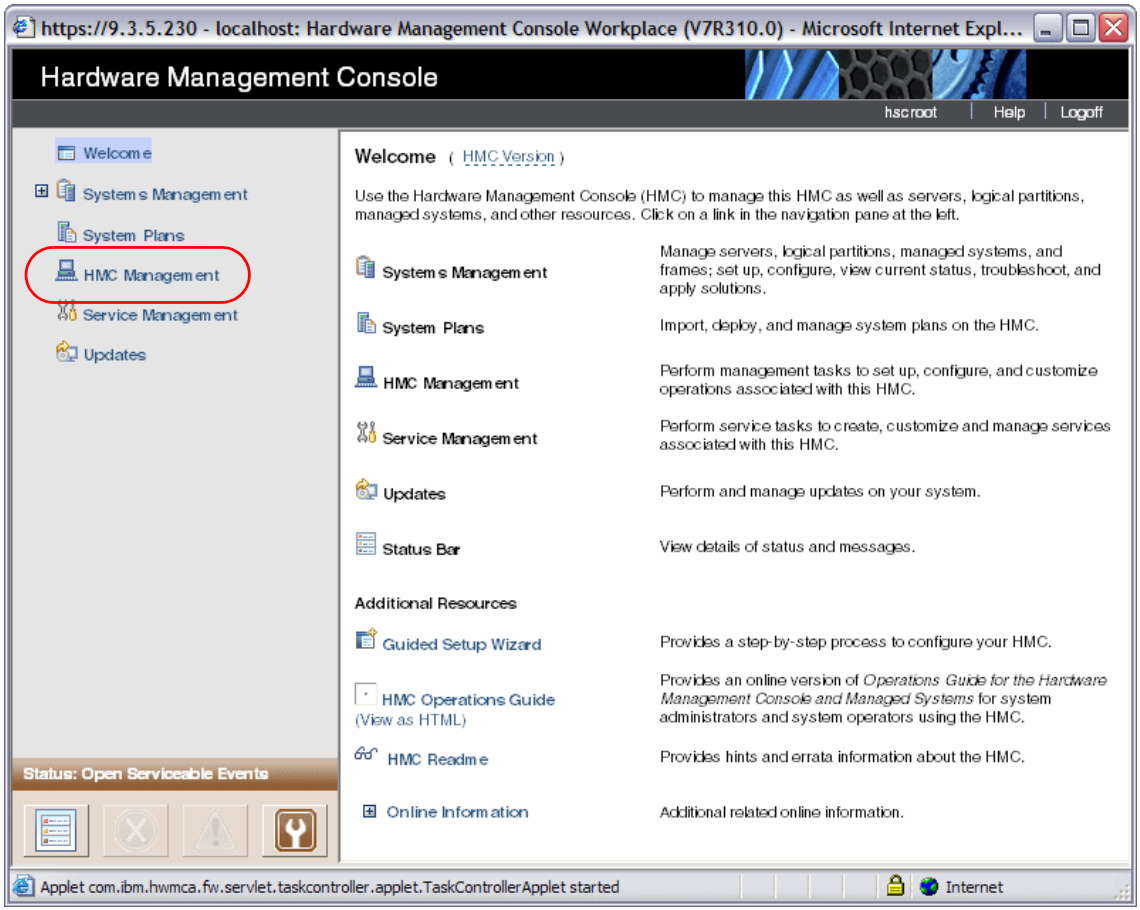


Figure C-7 HMC Welcome Screen

c. Then, Select **Remote Virtual Terminal** as shown in Figure C-8.

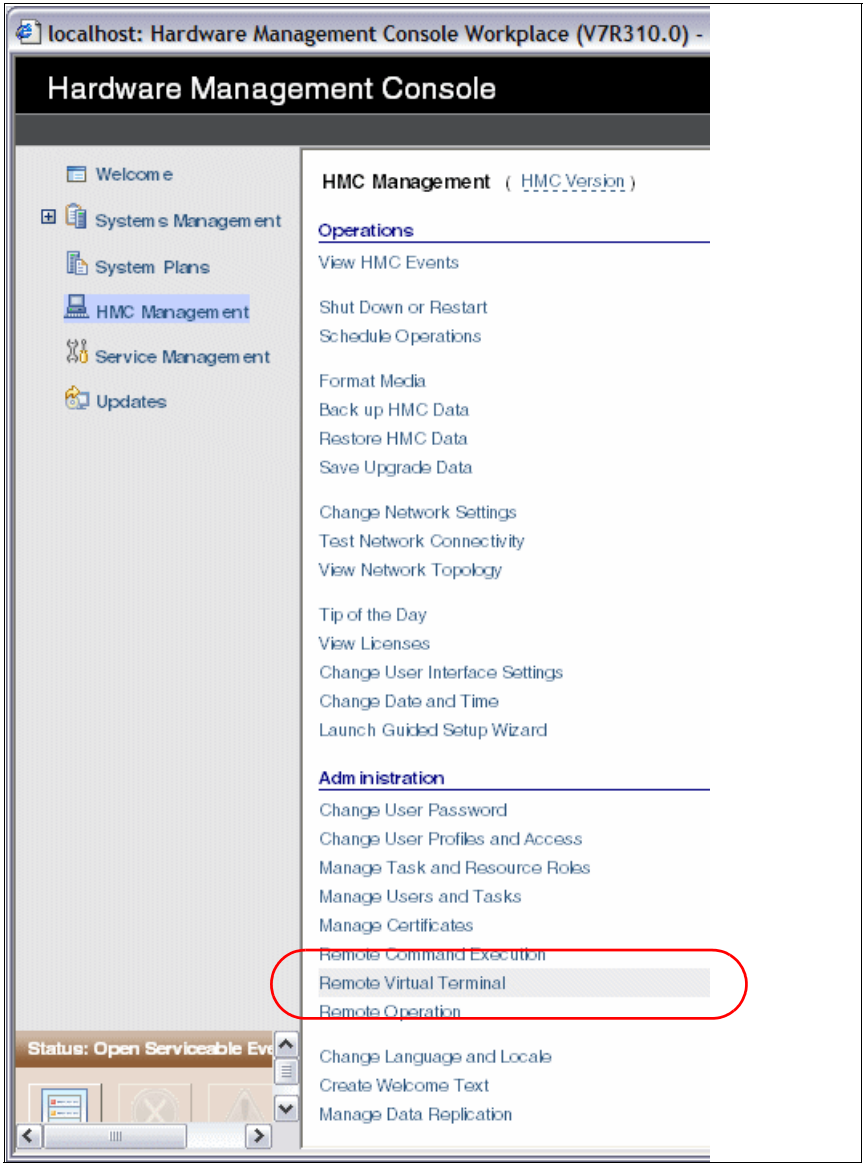


Figure C-8 HMC Management

d. A restricted shell terminal displays as shown in Figure C-9. You can enter the commands to start the migration process. Load your diskette or CD that contains your configuration data into your HMC drive. Then, enter the following command:

```
migrcfg -t 1 -m [system-name] -f [filename]
```

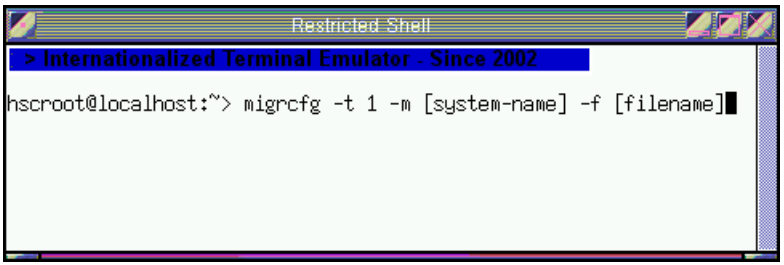


Figure C-9 Restricted Shell Terminal - Command

4. After the LPAR configurations are migrated as shown in Figure C-10, correct any resource reallocations resulting from P0/Primary being reassigned. Allocate new hardware resources as required. Validate the new Pn+1 partition (former primary) against the configuration and resource allocation documentation gathered in early steps.

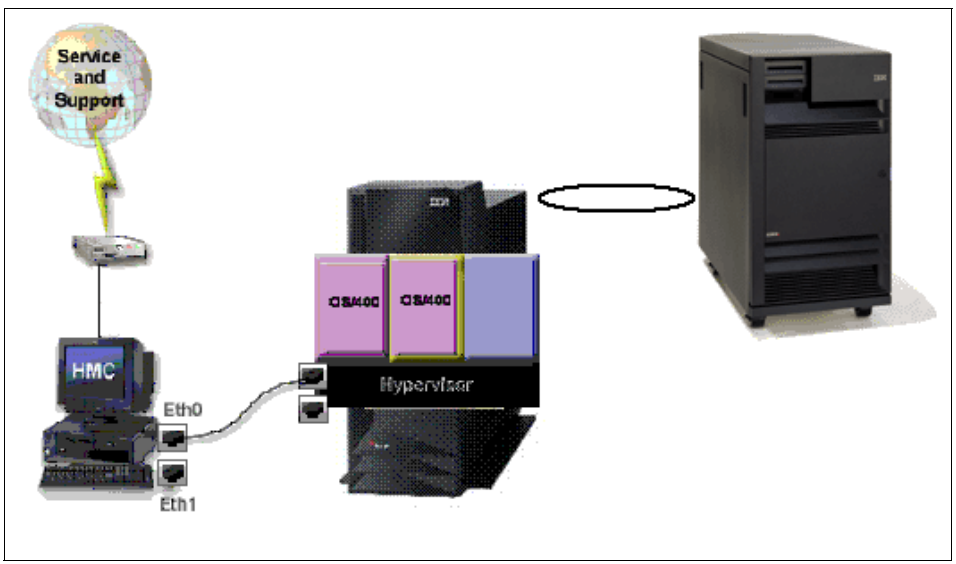


Figure C-10 Example of i5 System

5. After all allocations have been made and partition profiles verified, the partitions can be activated. In both of the scenarios listed earlier, all partitions moved over intact.

As with any new install, migration, or upgrade, getting a backup of the new information is critical. Refer to 11.1, “Critical Console Data backup” on page 304.

Related publications

We consider the publications that we list in this section particularly suitable for a more detailed discussion of the topics that we cover in this book.

IBM Redbooks

For information about ordering these publications, see “How to get IBM Redbooks publications” on page 507. Note that some of the documents that we reference here might be available in softcopy only.

- *LPAR Simplification Tools Handbook*, SG24-7231
- *A Practical Guide for Resource Monitoring and Control (RMC)*, SG24-6615
- *Advanced POWER Virtualization on IBM System p5: Introduction and Configuration*, SG24-7940
- *IBM System p Advanced POWER Virtualization Best Practices*, REDP-4194
- *Advanced POWER Virtualization on IBM System p5: Introduction and Configuration*, SG24-7940
- *IBM Director on System p5*, REDP-4219
- *Implementing IBM Director 5.20*, SG24-6188

Other publications

This publication is also relevant as a further information source:

- *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085

Online resources

These Web sites are also relevant as further information sources:

- Hardware Information Center

  http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp

- HMC Support Web Site

  http://www14.software.ibm.com/webapp/set2/sas/f/hmc/home.html

- Host Channel Adapter

  http://publib.boulder.ibm.com/infocenter/eserver/v1r3s/index.jsp?topic=/iphae/iphaeinfinibandproducts.htm

- man pages for the CLI

  http://www14.software.ibm.com/webapp/set2/sas/f/hmc/power6/related/hmc_man_7310.pdf

- IBM Corporate site

  http://www.ibm.com

- Fix Level Recommendation Tool (FLRT)

  https://www14.software.ibm.com/webapp/set2/flrt/home

- Firmware downloads

  http://www14.software.ibm.com/webapp/set2/firmware/gjsn

- IBM Electronic Support

  http://www.ibm.com/support/electronic

- Contract requirements for On/Off CoD

  http://www-912.ibm.com/supporthome.nsf/document/28640809

- CoD Web site

  http://www-03.ibm.com/systems/p/cod/

- CoD activation codes

  http://www-03.ibm.com/systems/p/cod/activation.html

- CoD requesting Trial activation

  https://www-912.ibm.com/tcod_reg.nsf/TrialCod?OpenForm

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Hardware Management Console V7 Handbook

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0.875”<->1.498”
460 <-> 788 pages

Hardware Management Console V7 Handbook

Discusses both POWER6 and POWER5 technologies

Documents the improved Remote Client Access

Describes the improved user interface

The IBM Hardware Management Console provides systems administrators a tool for planning, deploying, and managing IBM System p and IBM System i servers. This IBM Redbooks publication is designed for system administrators to use as a desk-side reference when managing partition-capable System i and System p servers using the HMC.

The major functions that the HMC provides are server hardware management and virtualization (partition) management.

In this book, we discuss how to:

- Configure the HMC
- Manage software levels on the HMC
- Use service functions on the HMC
- Update firmware of managed systems
- Move profiles from System i servers that previously did not connect to a HMC
- Use System Planning Tool deployments

In addition, we explain how to use the new HMC graphical user interface and the new HMC commands that are available with the HMC software Version 7, Release 3.

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