

**Experiences Using DSMIT in Heterogenous
Environment and Visual System Management
Under AIX V3.2.5 and V4.1**

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Austin Center

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Before using this information and the product it supports, be sure to read the general information under "Special Notices" on page xiii.

First Edition (July 1994)

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Abstract

This document provides a general introduction to distributed system management using DSMIT/6000 on the RISC System/6000. Concepts and terminology are covered before describing in more detail experiences with the usage of Distributed SMIT/6000, to assume a system management of RISC System/6000 and OEM equipment such as HP and SUN. It also describes, by providing examples, how to integrate the customer applications usually running on HP and SUN systems and to make them executable on a RISC System/6000 through the DSMIT menus. A general introduction to Visual System Management (VSM), the graphical interface that performs system management tasks through direct manipulation of objects. It describes the additional features and functions provided with AIX Version 4.

This document is intended for customers and systems engineers who require a more detailed understanding of Distributed System Management Interface Tool and Visual System Management with AIX on the RISC System/6000, particularly the additional features provided with AIX Version 4.1. Some knowledge of AIX Version 3.2.5 is assumed.

(134 pages)

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Special Notices

This publication is intended to help customers and systems engineers understand the basics of AIX Distributed System Management Interface Tool and Visual System Management and the additional features and functions provided by AIX Version 4. It also provides examples to illustrate the usage of DSMIT to integrate the customer's applications on the server, and run it on the client. The information in this publication is not intended as the specification of any programming interfaces that are provided by AIX Version 4. See the PUBLICATIONS section of the IBM Programming Announcement for AIX Version 4 for more information about what publications are considered to be product documentation.

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Preface

This document is intended to assist customers and Systems Engineers in understanding and utilizing Distributed SMIT/6000 and VSM with AIX Version 3.2.5 and AIX Version 4 on the RISC System/6000. The concepts and terminology of DSMIT and VSM are explained first, providing a foundation for a more detailed examination of the elements involved. This will allow less- experienced readers to reach the level of understanding necessary to appreciate the new features and functions provided with AIX Version 4. Examples of the use of DSMIT to integrate the customers application are provided, as well as an overview in organizing and managing OEM equipment from DSMIT on the RISC System/6000. In order to more effectively convey the information, a comprehensive set of detailed scenarios provide step- by-step examples of common practical application.

How This Document is Organized

The document is organized as follows:

- Chapter 1, “Distributed SMIT: Related Concepts and Terminology”

This chapter describes general concepts relating to DSMIT. It elucidates on some of the terms and elements involved in DSMIT, provides a foundation for understanding the expressions and elements discussed further on in the guide. It is designed to bring those readers with little or no knowledge of system management interface tools under AIX to a level sufficient to appreciate the latter part of this guide. This chapter can be skipped by those readers who already have a good grasp of system management tools concepts.

- Chapter 2, “Visual System Manager General Concepts”

This chapter describes general concepts relating to VSM. It elucidates on some of the terms and elements involved in VSM. It provides a foundation for understanding the expressions and elements discussed further on in the guide. This chapter can be skipped by those readers who are already familiar with VSM concepts and terminology.

- Chapter 3, “Distributed SMIT Components”

This chapter describes the elements involved with DSMIT. They are:

- The elements of DSMIT:
 - DSMIT Server
 - DSMIT Client
 - The use of the DSMIT commands.
 - The tasks performed by DSMIT.
 - The description of the menus and different submenus.
 - The relationship between DSMIT and ODM.
- Chapter 4, “Using DSMIT to Run Client Applications”

This chapter, by means of practical examples, describes how to integrate client applications usually running on HP, SUN and RS/6000 systems and how to make them executable from an RS/6000 server.

- Chapter 5, “DSMIT Problem Solving Hints”

This chapter provides information to assist in trouble-shooting problems encountered when setting up DSMIT.

- Chapter 6, “Visual System Manager Functions”

This chapter describes the Visual System Management functions. Four functions are covered:

1. User and Group Manager
2. Storage Manager
3. Device Manager
4. Print Manager

- Chapter 7, “AIX Version 4.1 System Management and VSM Enhancements”

This chapter contains descriptions of all the new functions and features that enhance AIX System Management as well as Visual System Management with AIX Version 4. This information is new and should be read by anyone who is planning to manage the RISC System/6000 using VSM and AIX Version 4.1

- Chapter 8, “Future Developments”

This chapter attempts to cover a number of topics about future developments and capability of DSMIT and VSM.

- Appendix A, “DSMIT Customization Samples”

This appendix contains some examples on how to customize your DSMIT distributed management environment.

- Appendix B, “DSMIT Files”

This appendix contains examples of the DSMIT files.

- Appendix C, “Files Used to Add a Task to DSMIT”

This appendix contains examples of the files used to add a task to the DSMIT menus.

- Appendix D, “ODM Files for DSMIT”

This appendix contains example stanzas for DSMIT ODM.

- Appendix E, “List of the Printer Names Changed”

This appendix comprises two printers lists. The first one is a list of the printer names changed from AIX V3.2 to AIX V4.1. The second one is a list of the new printers supported by AIX V4.1.

Related Publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this document.

- *AIX Version 3.2 Visual Systems Management Quick Reference*, SC23-2518
- *AIX Distributed SMIT/6000 Version 1.1 Guide and Reference*, SC23-2561
- *AIX Version 3 for Risc System/6000 General Programing Concept*, SC23-2205

International Technical Support Organization Publications

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Chapter 1. Distributed SMIT: Related Concepts and Terminology

This chapter is an overview of the Distributed System Management Interface Tool (DSMIT) and some of its terms and elements. DSMTP extends the existing system management interface tool SMIT capability and functionality.

DSMIT works in a Client/Server model. Information is sent using sockets. All machines must have TCP/IP installed and running. These machines are connected in a network either using token-ring or Ethernet. The DSMTP program does not run in a graphical interface, it runs only in ASCII.

Figure 1 shows a network of heterogeneous systems in a DSMTP environment.

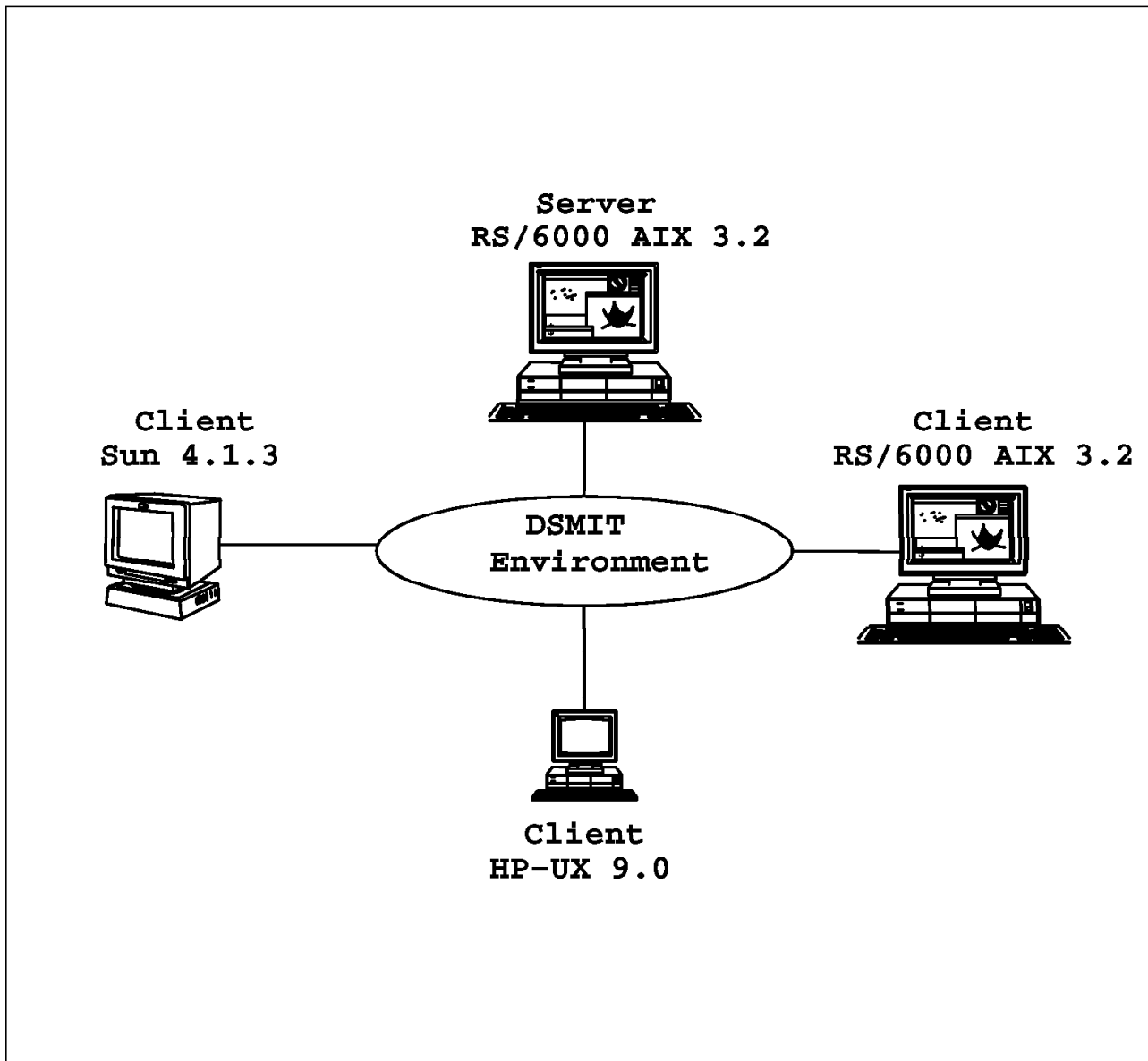


Figure 1. DSMTP Environment in a Network of Heterogeneous Systems

1.1 Overview

DSMIT allows the SMIT interface to build system management commands and execute them over other clients on a network. These clients can be running in different operating systems. All management functions are controlled from one single user interface. The SMIT functionality such as fast path, log files and flags can be found in the DSMIT program. DSMIT is a simple solution to distributed system management.

DSMIT frees the user from the details of complex command syntax, valid parameter values, and system command spelling, to build commands for system management tasks.

1.2 Distributed SMIT Terminology

In order to understand the DSMIT program, it is important to know the related terminology.

1.2.1 DSMIT Server

DSMIT Server is the machine that builds and distributes commands for running on DSMIT Client machines. It is the machine that defines a group of related machines, requires information from the system administrator, through its ASCII user interface, and sends the commands for all the machines defined in this group.

1.2.2 DSMIT Client

DSMIT Client is the machine that runs commands built by the DSMIT Server. Actually, DSMIT supports the following operating systems, with the DSMIT Client running on it:

- AIX* 3.2 and subsequent versions
- Sun OS** 4.1.3
- HP-UX** 9.0 (700 Series)

1.2.3 Working Collective

This specifies a current list of clients to receive commands built by the DSMIT Server. The working collective is a temporary list and must be redefined with each new DSMIT session. For instance, if one different group of DSMIT Clients needs to execute a command specified by the DSMIT Server, the actual working collective must be redefined with these new DSMIT Clients.

1.2.4 Domain of Clients

This specifies a permanent group of clients on which DSMIT can run commands. The difference between Domain of Clients and working collective is that when the first one is created, it is saved in a file and can be restored at any time. However, if the working collective is reset, it has to be restored manually.

1.2.5 Exclude

This excludes members from the working collective. After an exclusion, the member removed, will not receive commands from the DSMTP Server.

1.2.6 Include

This restores excluded members to the working collective. After an inclusion, the member included, comes back to receive commands from the DSMTP Server.

1.2.7 Union

This specifies the list of machines which meet any of the selected criteria on a DSMTP menu. There are three criterias available on the DSMTP menu, they are:

- Machine names
- Operating system names
- Domain names

The occurrence of just one of the criteria is enough to include a specific member in the working collective.

1.2.8 Intersection

This specifies the list of machines which meet all of the selected criteria.

1.2.9 Sequential Mode

This specifies that, the command built by the DSMTP Server, must be executed in one DSMTP Client at a time. It means, the DSMTP Server will wait for the output from one DSMTP Client, to send the command to the next DSMTP Client.

1.2.10 Concurrent Mode

This specifies that, the command built by the DSMTP Server, can be executed in all DSMTP Clients at the same time. Only when the DSMTP Server receives all the output from the DSMTP Clients, it will show its output.

1.3 Installing Distributed SMIT

The Distributed System Management Interface Tool (DSMIT) program provides the following software installation packages for DSMTP Servers and Clients:

- DSMTP Server
- DSMTP AIX 3.2 Client
- DSMTP Sun OS 4.1.3 Client
- DSMTP HP-UX 9.0 Client

All the software installation packages must be installed in an AIX System. For more information about how to install the DSMTP Client in Sun OS and HP-UX operating systems, see *AIX Distributed SMIT/6000 Version 1.1 Guide and references*.

The `/etc/inetd.conf` and `/etc/services` files are updated on client systems when the client software is installed.

1.4 Network Security Using Distributed SMIT

WARNING: The DSMIT program uses the same level of security as that provided by the Transmission Control Protocol/Internet Protocol (TCP/IP) `rsh` commands. Usage of DSMIT Client support subjects the client systems to the risk of unauthorized access. Unauthorized systems masquerading as the DSMIT Server system, can use TCP/IP commands such as, `rsh` and `rlogin`, to access the DSMIT Client system through the `/.rhosts` file. If the use of `/.rhosts` is not desired, the use of `/etc/security/dsmit.hosts` file can be used instead.

Chapter 2. Visual System Manager General Concepts

Visual System Manager (VSM) is a graphical interface that enables you to perform system management tasks through direct manipulation of objects (icons). For this reason, VSM must be run in an AIXwindows environment.

Though VSM builds the same commands as the System Management Interface Tool SMIT, you are not required to have a clear understanding of the AIX internal architecture or SMIT to administrate your system because of the intuitive drag and drop Graphical User Interface.

Most of the tasks performed in VSM consist of drag and drop actions. For example, to see the characteristics of a device, you just drag the icon that corresponds to that device and drop it on the information icon (the notebook on the Actions Area). Also you could drag the notebook to the device and get the same result.

2.1 Visual System Manager

The Visual System Manager is composed of four independent application programs:

- Users and Groups Manager
- Storage Manager
- Device Manager
- Print Manager

These Graphical User Interfaces are designed to suite the administration needs of a user managing their own workstation. Today, AIX Visual System Manager GUI does not have distributed facilities.

These four applications consist of the same basic user interface with the following components.

2.1.1 Template Area

This area contains sets of templates for the application objects, you can use the templates to create new objects and to add templates with different characteristics. You can pre-define your own templates by dragging a template into the template area, then fill out the pop-up window with the desired characteristics. You can use this function, for example, to create new users for the development department.

2.1.2 Work Area

This area contains objects (icons) for this application. In this area you can select any object to perform an action, or you can use View Controls and Display Controls. This is the area where you find the filesystems in the Storage Manager, or the devices in the Device Manager.

If the application uses different kinds of objects, then this area is divided into panes, containing similar objects. For example, in the Storage Manager, one pane contains the filesystems and a second one contains the volume groups.

2.1.3 Information Area

This area displays information about the object or area at the current cursor location. This is in addition to the help information which you can access dragging the ? icon on an object or area. This area is active at all times (unless you collapse it), giving valuable information about the objects and actions on the main window.

2.1.4 View Controls

You can drag and drop either of the View Controls on a Work Area or in a Template Area. The View Controls are *large icon control* and *small icon control*. these are used to select the size of the object icons in the desired area. The large icon is the default size, but you could choose the small icon size in areas where many objects cannot fit all together without the use of scroll bars. In some VSM applications you have two more View Controls, the *free form view control* which displays the objects in the selected area in a grid format (this is the default view), and the *tree form view* used to display the objects in a hierarchy form, with lines connecting dependent objects.

2.1.5 Display Controls

With the Display Controls you can change the way objects are displayed in the Work Area and Template Area.

The find icon is used to display a dialog to set the search criteria.

You can select the filter icon to display a dialog to set the filtering criteria for the objects in the selected area. For example, you can select only the devices belonging to a certain parent adapter.

In some VSM applications you have a sort display control, to sort objects according to a specific criteria, and other controls specific to the application.

2.1.6 Actions Area

This is the area where the action icons are displayed. Depending on the application, you will have different action icons. For example, in the Storage Manager you have 14 different actions (icons), while in the Users and Groups Manager you have 6.

2.1.7 Other Objects

There are other objects in the VSM user interface, these are described in this section.

The area control button is located at the left corner of an area title bar. You can collapse or display an area with a click on this button.

The sash button is located on the right corner of the line dividing two adjacent panes. By dragging this button you can resize both panes making one larger and the other one smaller.

The help button is located at the right bottom corner of the main window. You can use it to call the help window. In the help window you can navigate by point and click actions through the different topics contained in the help database.

The switch user button is located on the left bottom corner of any VSM main window when you invoke VSM with a user different from *root*, click on this button to switch to *root*.

The trash can icon is located on the bottom right corner of the Work Area in all VSM applications. To delete an object drag and drop it on this icon.

Pop-up windows appear when some actions take place in the VSM applications. Sometimes Pop-up windows are only informative. Other times you are prompted to fill in some information to continue with a procedure.

2.2 Users and Groups Manager

The Users and Groups Manager feature of VSM lets you:

- Create users and groups
- Show/change characteristics of users and groups
- Enable and disable users for login
- Change the password for a user
- Delete users and groups

2.3 Storage Manager

With the Storage Manager application of VSM you can perform the following tasks:

- Create new filesystems, logical volumes, and volume groups
- Show/change characteristics of filesystems, logical volumes and volume groups
- Enable or disable objects for use `varyon/varioff`, `mount`, `umount`, `chpv` commands
- Backup and restore filesystems or the entire system using `backup`, `restore`, `mksysb` commands
- Synchronize a filesystem
- Show the partitions of the physical and logical volumes and the state of those partitions
- Make a mirror copy of a logical volume
- Verify a filesystem
- `import/export` a volume group
- Reorganize the physical partitions in a volume group
- Move a physical partition from one physical volume to one or more physical volumes
- Delete a filesystem, logical volume or volume group

2.4 Device Manager

The Device Manager application of VSM allows you to:

- Access the Object Data Manager (ODM) database
- Define new devices
- Configure and unconfigure devices
- Show/change characteristics of devices
- Delete a device

2.5 Print Manager

With the Print Manager feature of VSM you can:

- Access the print queues
- Add new printers and queues
- Show/change characteristics of printers and queues
- Enable/disable printers and queues
- Set printer policy for a queue (first in first out or smallest job first)
- Delete printers, queues or print jobs

2.6 Visual System Manager Installation

VSM installation is done as with any regular IBM OPP or LPP via SMIT or with the `installp` command. Make sure to read any README files after the installation, since these will contain important update information on how to install or run VSM.

2.7 VSM Initialization

Since VSM is composed of different tools, you start these applications from an AIX windows environment with different commands.

For the:

- Users and Groups Manager, type `xuserm` at the command prompt of a client window
- Storage Manager, type `xlvm`
- Device Manager, type `xdevicem`
- Print Manager, type `xprintm`

2.8 Mouse Basics

After you get used to the default mouse mappings, working in VSM is very simple. The following terms are used throughout the online help information (Helpview) and are related to the mouse actions you can perform in VSM such as:

- Point

Slide the mouse on the desktop to position the pointer (mouse cursor) on an object (icon).

- Click or Select

Press and release the left mouse button without moving the pointer. A selected object appears within a black outline.

- Double Click

Quickly click twice on the left mouse button.

- Drag and Drop

Position the pointer on the object, press and hold the middle mouse button (or both left and right buttons on a two button mouse), then move the mouse to the location you want to drop the object and release. The location or target, can be an object, an area label, an area title bar, or a blank space in an area.

In Chapter 6, “Visual System Manager Functions” on page 45 you will find more in-depth information about VSM usability and components.

Chapter 3. Distributed SMIT Components

This chapter is intended to discuss the various components that make up a distributed system using DSMIT, such as, description of the menus and the different submenus, the commands and the relationship between DSMIT and the ODM. This chapter includes information related to DSMIT Version 1.1 running in AIX 3.2.

The DSMIT facility presents a menu based, task-oriented interface, to define a group of machines which will receive the commands, required to manage these machines. DSMIT guides you through the desired task with the use of menus and dialogs.

3.1 Elements of DSMIT

DSMIT works in a Client/Server model. One RS/6000* running AIX 3.2 must be defined as a DSMIT Server machine. This machine will be the single point to perform all the systems management tasks, sending commands over the network to DSMIT Client machines. These client machines could be RS/6000, SUN or HP workstations.

3.1.1 DSMIT Server

The DSMIT Server is a machine which communicates, via TCP/IP sockets, with the DSMIT Clients. It builds commands required for different operating systems, through its end user interface and sends them to these clients. The commands can be sent in sequential or concurrent mode. The responses to these commands are reported to the DSMIT Server by machine or hostname. The DSMIT Server must be an AIX machine.

3.1.1.1 Files Created/Changed by DSMIT

DSMIT creates or changes five different files. The files `/usr/share/DSMIT/dsmitos` and `/usr/share/DSMIT/hosts` are created during the DSMIT Server installation. The files `/usr/share/DSMIT/domains`, `$HOME/smit.script` and `$HOME/smit.log` are created, during the DSMIT session, if they haven't been created before. Otherwise, they will be appended, but not overwritten. You can see an example of the `/usr/share/DSMIT/hosts`, `/usr/share/DSMIT/dsmitos` and `/usr/share/DSMIT/domains` files. See Appendix B, "DSMIT Files" on page 107.

The `/usr/share/DSMIT/hosts` and `/usr/share/DSMIT/dsmitos` files must never be deleted. If the `/usr/share/DSMIT/hosts` file is deleted, when `dsm` is invoked, it will return an error and the program stops. The first time, this file is created with an entry which corresponds to the local machine name. So, at least, one machine could receive the commands built by the DSMIT Server. This file can be increased during the DSMIT session with a list of new DSMIT Client machines installed, in which DSMIT Server commands can be run.

The `/usr/share/DSMIT/dsmitos` file is created during the DSMIT Server installation and will be updated when each different kind of DSMIT Client is installed. The purpose of this file is to list the DSMIT Client operating systems. If this file is deleted you cannot insert any other client machine in the

/usr/share/DSPMIT/hosts file, because DSMIT would not find any type of operating system, to assign with the new DSMIT client.

The /usr/share/DSPMIT/domains file contains the list of domains used by the DSMIT Server. If this file is deleted, all the domains in the list will be lost. The file itself will be recreated again by the DSMIT Server automatically, when it will be requested.

The other two files \$HOME/smit.script and \$HOME/smit.log are created during a DSMIT session. These are the same file that SMIT uses. If the `dsmi` command is invoked with the `-s PathName` flag the `smit.script` file will be saved in the file specified by the `PathName` parameter. If the `dsmi` command is invoked with the `-l PathName` flag the `smit.log` file will be saved in the file specified by the `PathName` parameter.

You must have write permission on the directory where the `PathName` file will be built. So, if the default file will be used, the write permission for \$HOME/smit.script and \$HOME/smit.log files must be set up too, otherwise these files will not be updated.

3.1.2 DSMIT Client

The DSMIT Client is a machine that receives the commands from the DSMIT Server. It is responsible to provide the interface to translate the system management commands. This interface is implemented through two daemons: `srex`d and `crex`d. Those daemons are configured during the installation process. The /etc/inetd.conf and /etc/services files are updated and the `inetd` daemon, which controls all the daemons in the /etc/inetd.conf file, is refreshed.

3.1.2.1 DSMIT Client Configuration

DSMIT provides, in its software installation package, files to install DSMIT AIX Client, DSMIT SunOS 4.1.3 Client and HP-UX 9.0 Client. The DSMIT AIX Client must be installed on AIX systems designated as DSMIT Client but the clients files to HP and SUN must be installed on AIX systems designated as DSMIT Servers. After the installation, the necessary configuration to support each one of the clients will be provided.

The SUN client installation process creates two files in the /usr/share/DSPMIT/SunOS_4.1.3/inst.images directory of the server, a tar image and a shell script. Both of them must be transferred to the client, using the `ftp` command. The same command can be used to transfer the files created in the /usr/share/DSPMIT/HP-UX_9.0 directory for HP Clients.

The shell script files `installp.sun` and `installp.hp` provide the procedures to extract the files from the tar image, in which you can find the daemons and programs that will be executed during a session between the client and the server. This file also updates, the appropriate system files required to run those program and daemons.

The shell script file updates the /etc/services file by adding into this file the following lines:

- `rex 5679/tcp #srex`d port
- `rex 5678/udp #crex`d port

It updates the /etc/inetd.conf too, by adding into this file the following lines:

- `rex dgram udp wait root /usr/bin/crexd crexd -t30`
- `rex stream tcp nowait root /usr/bin/srexnd srexnd -i`

The shell script file does the following tasks too:

- Refresh the inetd daemon
- Check if srexnd and crexd are running
- Set up the right permission and ownership of all the new files and directories created during this process

The difference between the DSMIT AIX Client installation and the other two clients is that all the configuration needed by the DSMIT AIX Client, including the upgrade of the /etc/services and /etc/inetd.conf files, is made during its installation process. For the other clients, the installation is made in two steps. The first one prepares the DSMIT Server to establish contact with a different type of operating system and creates configuration files that will be sent to the new DSMIT Client. The second step will be executed in the DSMIT Client.

Although the DSMIT Client package is installed, it requires specific conventions on the SUN and HP systems to facilitate configuration and management of devices, subsystems and system builds. These conventions are made from DSMIT Server through the menu titled **System Management**, choosing the option **System Configuration**.

The **System Management** option performs all SMIT tasks, except it has one more option called **System Configuration**, when you invoke DSMIT for SUN and the HP working collective. See Figure 2.

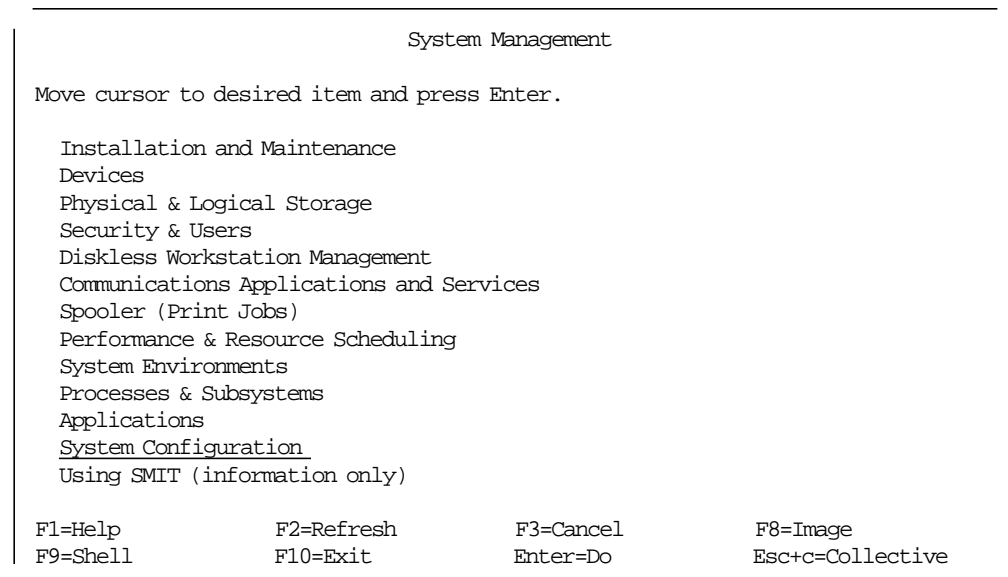


Figure 2. System Management Panel of DSMIT

```
System Configuration

Move cursor to desired item and press Enter.

List Pending Configuration Changes
Show Pending Configuration Changes
Remove Pending Configuration Changes
Reorganize RC Boot Files
Build Configuration Database
Build New Operating System
Install New Operating System
Reboot the System

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

Figure 3. System Configuration Panel of DSMIT

The **System Configuration** option provides the following options (see Figure 3) in which you can perform the following tasks:

- List Pending Configuration Changes menu
Displays the list of filenames that contain the operating system updates
- Show Pending Configuration Changes menu
Displays the contents of the operating system update files
- Remove Pending Configuration Changes menu
Displays the list of filenames that contain the operating system updates and you may select one or more files to delete
- Reorganize RC Boot Files menu
Reconstructs the `/etc/rc*` files
- Build Configuration Database menu
Generates a system description file to be used to build a new operating system
- Build New Operating System menu
Incorporates requested updates to the system configuration into the system description file (`/etc/conf/dfile`), then a new kernel is built from this system descriptor file
- Install New Operating System menu
Installs the latest version of the operating system built by SMIT
- Reboot the System menu
Reboots the system to activate changes in the new kernel

In order to run commands on the remote machines without supplying a password, the DSMIT Client system must have an entry in either the `/etc/security/dsmit.hosts` file or the `/.rhosts` file. It's better if you use `/etc/security/dsmit.hosts` to control access to the clients because the users cannot run `rsh` and `rlogin` commands without giving a password.

At this moment, a DSMIT Server request can be sent to the HP or SUN Clients to reconstruct the /etc/rc* files. During this process, a set of directories will be created containing shell scripts that perform the functions normally found in the system's /etc/rc* files. Those directories are /etc/rc0.d, /etc/rc1.d, /etc/rc2.d and /etc/rc3.d. The DSMIT Client machine must be rebooted to run all the script files, from the /etc/rc*.d directory, in the order of the leading sequence number. You can use the **Reboot the System** option from the **System Configuration** menu to start the reboot process.

After the system has rebooted, the system configuration files must be configured. These files are designed to emulate the customized database of AIX and to provide a single source for system hardware and software configuration. For HP systems this configuration is optional but if you want to configure it, this could be done using the /etc/conf/d file. For SUN systems, the information comes from the configuration files used to build the operating system and those reported by the auto configuration process during system startup. In both cases, you can use the **Build Configuration Database** option from the **System Configuration** menu to start this process.

3.2 DSMIT Command

The `dsmitt` and the `dsmitt -C` commands start the same ASCII version user interface. The DSMIT program doesn't have a MOTIF version for the Windows environment. However, if you are in a Microsoft Windows** environment, the window must be defined at least 80 columns by 24 rows to properly execute with the ASCII version. It displays a hierarchy of menus that lead to interactive dialogs. DSMIT builds and runs commands as directed by the user.

The working collective is limited to 200 members and a domain is limited to 250 members.

3.2.1 Command Syntax

The syntax for the `dsmitt` command is as follows:

```
dsmitt [ -C ] [ -D ] [ -f ] [ -h ] [ -t ] [ -v ] [ -X ] [ -x ] [ -l PathName ]
[ -s Pathname ] [ -o PathName &#x2013;k. [ [ -m | -n | -d ] FastPath ] [
-W Domain1,Domain2 ... ] [ -w Machine1,Machine2 ... ]
```

Most of the flags have the same meaning as when using the `smit` command. Just the new flags and those flags with different behavior will be described as follows:

- `-w Machine` Specifies the machines to be in the working collective
- `-W Doamin` Specifies the domains to be in the working collective

3.2.1.1 Functions Key Sequences

There are some additional function key sequences in the DSMIT interface:

- `Esc-m` Enables you to change a field in a common dialog screen by machine name.
- `Esc-f` Enables you to change a field in a command dialog screen by field name.

- `Esc-c` Enables you to either include or exclude a particular client from the working collective of clients.
- `/` Enables you to search a list and find occurrences of a character string in the list.
- `n` Enables you to get the next occurrence of the character string specified in the list.

3.2.2 Invoking DSMIT

After installing the DSMIT Server package in the Sever machine, you will be able to start the DSMIT Server program. You can start the DSMIT Server using one of the following commands:

- `dsmit`
- `dsmit -W domain_name`
- `dsmit -w host_name1,host_name2,...`

When one of these commands is executed, you see the first DSMIT Server program panel, (see Figure 4).

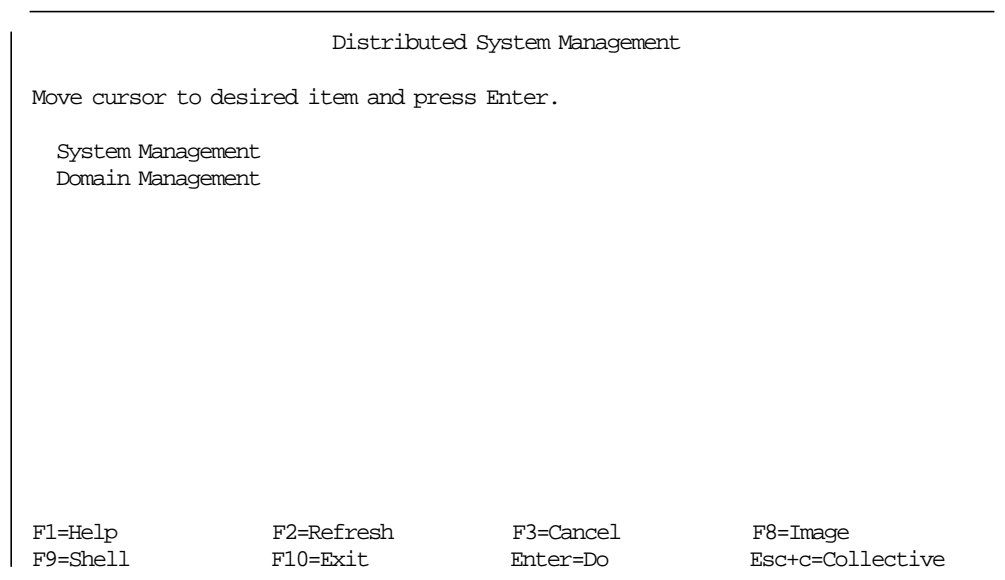


Figure 4. DSMIT Server Program User Interface

If the DSMIT Server program was started using `dsmit` then the working collective will be set up by default to the local machine as the only DSMIT Client. If the `-W domain_name` parameter was specified, the DSMIT program will set up the working collective with the machines defined in the domain `domain_name`. If the `-w host_name1,host_name2,...` parameters were specified, then the working collective will be set up with the DSMIT Clients `host_name1`, `host_name2` and so on.

For instance, You have already defined a domain of machines named `sports_domain` with three machines named `baseball`, `football` and `soccer`. Two new users, `sergio` and `ignacio`, must be included in each machine. You can type one of the following commands, in order to start the DSMIT Server program. The working collective will be defined automatically.

- `dsmit -W sport_domain`
- `dsmit -w baseball,football,soccer`
- `dsmit -W sport_domain user`
- `dsmit -w baseball,football,soccer user`

In all commands, the working collective will be defined with the machines baseball, football and soccer.

Notice in the last two commands, the fast path `user` was used to get into the DSMIT users panel. (See Figure 5).

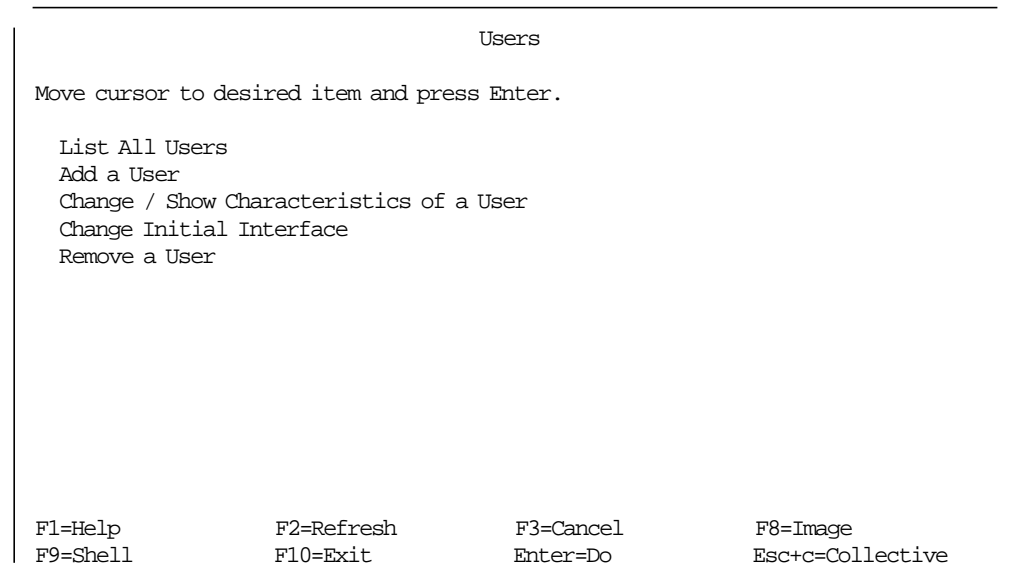


Figure 5. DSMIT Users Panel

DSMIT is a program that basically executes system management commands, so you need root authority to run most commands.

3.2.3 DSMIT Hierarchy of Menus

You can see in Figure 6 on page 18 the DSMIT Hierarchy of the main menus we will discuss in this chapter.

DSMIT Hierarchy of Menus

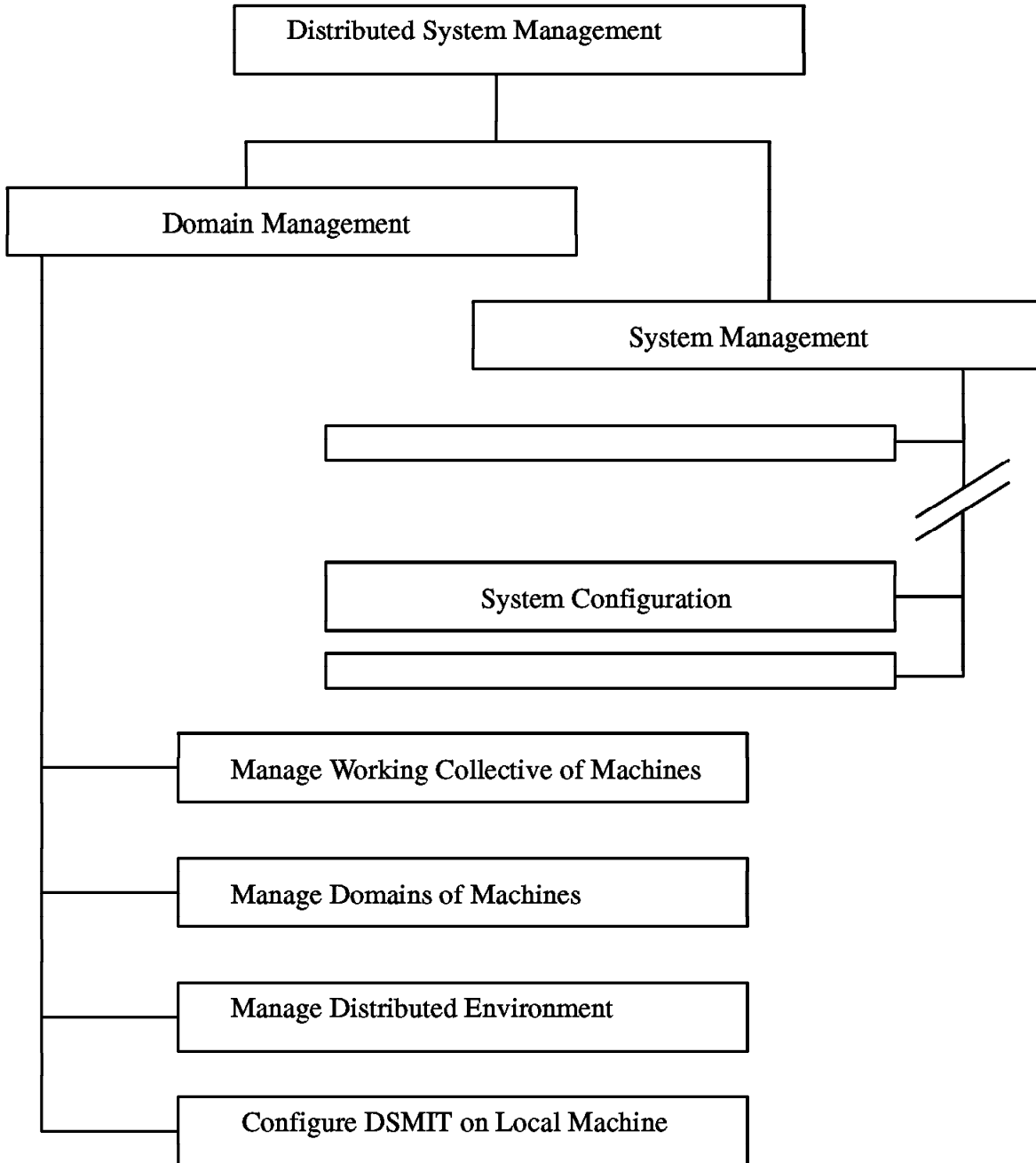


Figure 6. DSMIT Hierarchy of Main Menus

3.2.4 Tasks Performed by DSMTP

The menu titled **Distributed System Management** provides two options:

- System management
- Domain management

The tasks performed by DSMTP in the **System Management** option was discussed in the first part of this chapter. You can see the options provided by **Domain Management** on Figure 7.

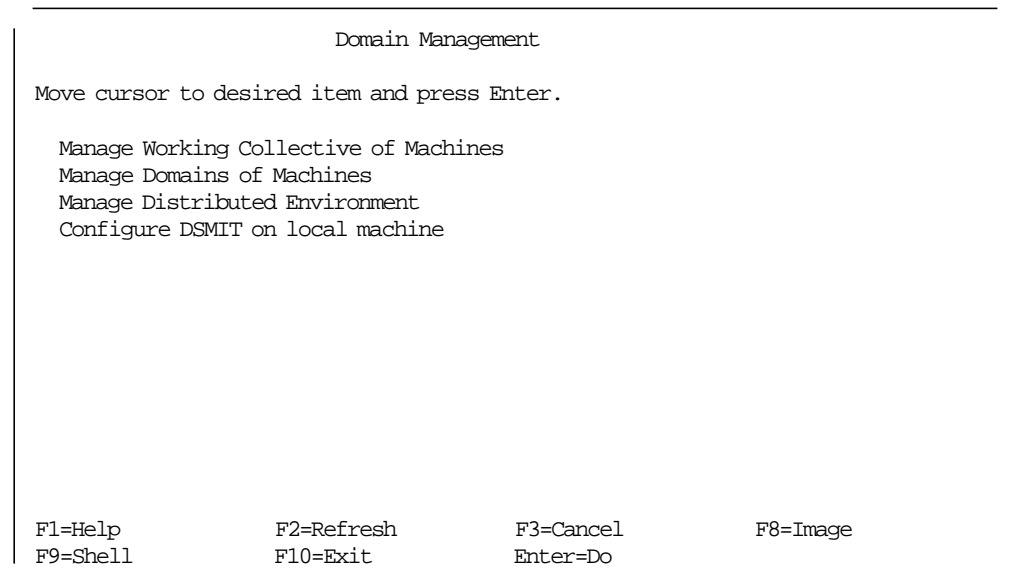


Figure 7. Domain Management Panel of DSMTP

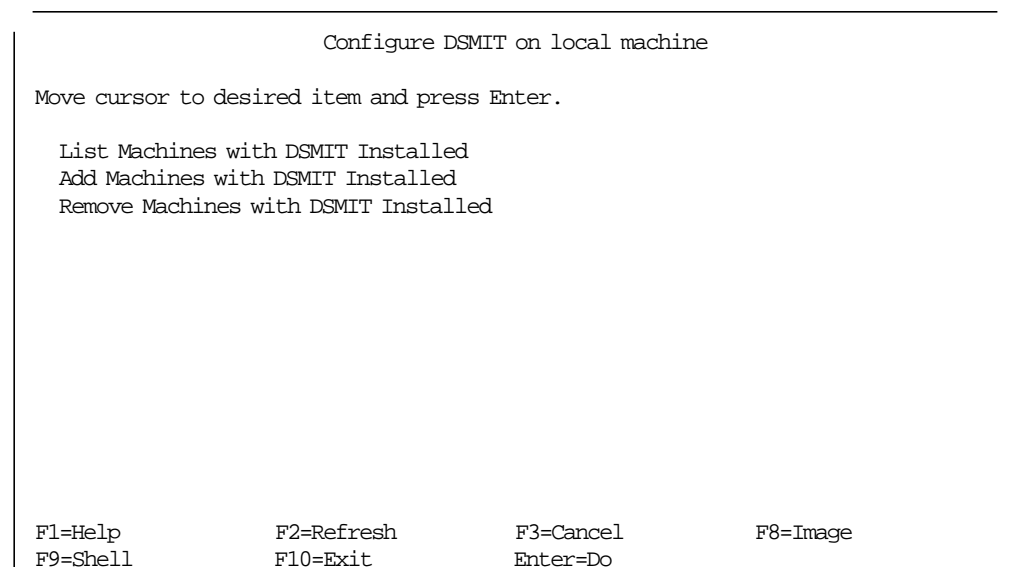


Figure 8. Configure DSMTP on local machine Panel of DSMTP

In each Domain Management option menu, a series of tasks can be performed. An example will be created in order to explain each one of the options.

The example is: You have three SUN machines named *usa*, *mexico* and *brazil*. The DSMIT Client configuration is installed. You want to create the same new user *ssantoro* in each machine and save this configuration for future commands.

You can see in Figure 9 the final configuration of this example.

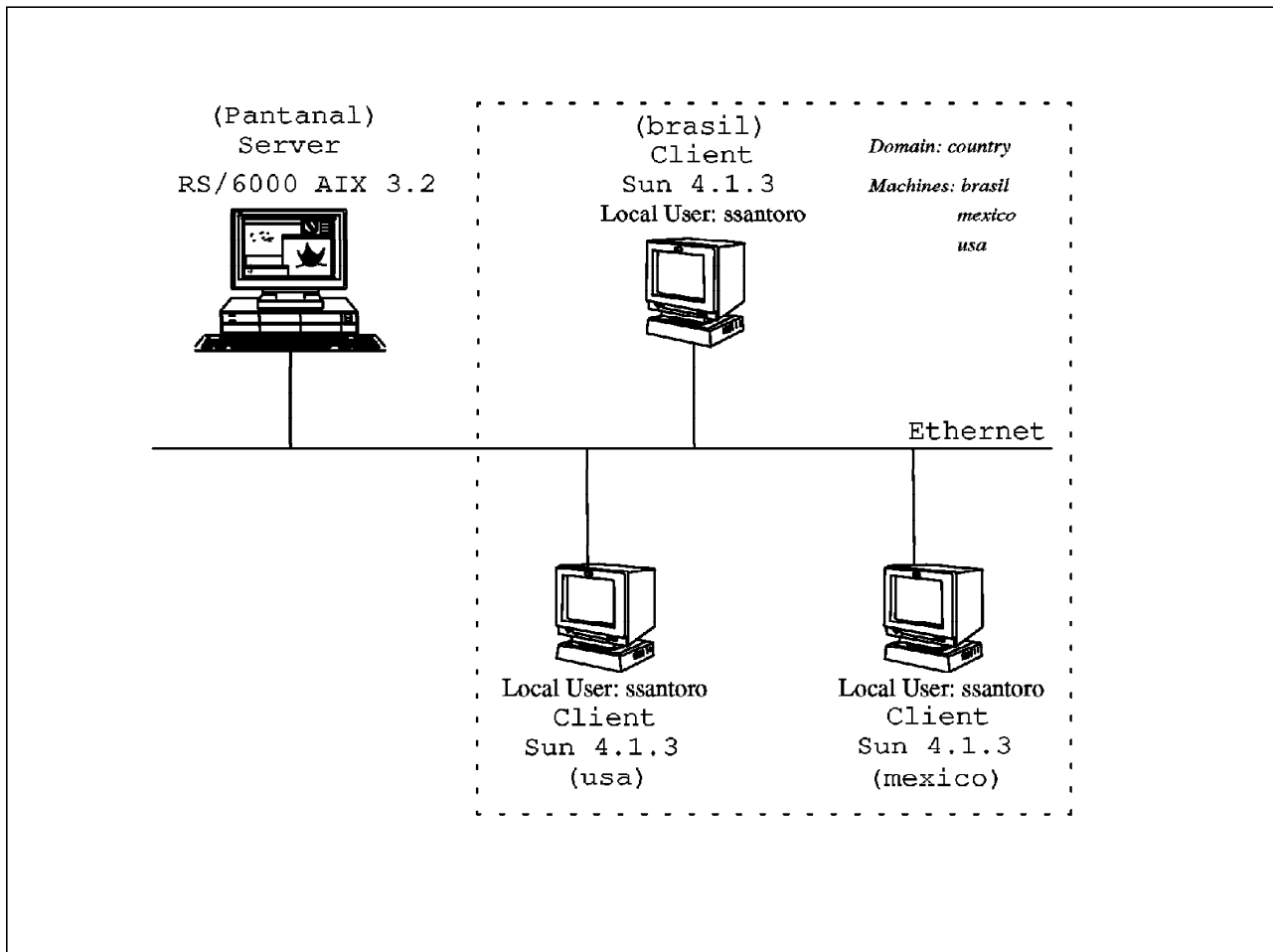


Figure 9. Example of The New Domain country

The first step is to insert all the new SUN machines in a list of machines that have DSMIT Client installed.

This can be done by selecting the **Add Machines with DSMIT Installed** option, from the **Configure DSMIT on local machine** menu (see Figure 8 on page 19). Enter the first SUN machine, *usa*, in the machine names(s) field, and the SunOS_4.1.3 operating system in the operating system Name field. Then, press **Enter** to start the command. You can see the screen in Figure 10 on page 21. Repeat this process for each one of the other machines. Then, you can proceed to the next step.

The menu titled **Configure DSMIT on local machine** can perform two other tasks:

- List all the machines in the DSMIT environment
- Remove, from /usr/share/DSMIT/hosts, the machines that have DSMIT installed

```

Add Machines with DSMIT Installed

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

* MACHINE Names(s)                                [Entry Fields]
* OPERATING SYSTEM Name                          [usa]
                                                    [SunOS_4.1.3] +

F1=Help      F2=Refresh      F3=Cancel      F4=List
F5=Reset     F6=Command     F7=Edit       F8=Image
F9=Shell     F10=Exit        Enter=Do

```

Figure 10. DSMIT Panel to Add Machines with DSMIT Installed

```

Manage Domains of Machines

Move cursor to desired item and press Enter.

List All Domains
Add Domain
Remove Domain(s)
Show Domain Members
Add Domain Members
Remove Domain Members
Redefine Domain Members

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

```

Figure 11. Manage Domains of Machines Panel of DSMIT

Now, we can create the new domain named *country* with those machines. After this process, we can access all the SUN Client machines specified in the *country* domain.

Select the **Add Domain** option, from the **Manage Domains of Machines** menu. (see Figure 11). In this panel, if you are using a union criteria you can select a specific list of machines which meet any of the selected criteria on this DSMIT menu. If you are using an intersection criteria, you can select a specific list of machines which meet all of the selected criteria. The three criteria available are domain name, machine name and operating systems (AIX, SUN and HP). In this example, we will use just the machine name criteria.

Enter, *country*, in the New Domain Name field. List all DSMIT Client machines defined, using the **F4** function. Select, using the **F7** function, each one of the machines, *usa*, *mexico* and *brazil*. Press **Enter** to confirm the machines. You can see the screen, before the command starts, in Figure 12 on page 22. Press **Enter** again to confirm the command. Then, the new domain *country* will be created.

The menu titled **Manage Domains of Machines** can perform the following tasks too:

- List all DSMIT domains, together with the list of members of each domain.
- Remove one or more domains.
- Show the list of machines composing a domain.
- Add machines to a domain.
- Remove machines from a domain.
- Redefine the list of machines composing a domain.

Add Domain

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

New Domain Name	[Entry Fields] [country]	
Specify machines using one or more criteria:		
MACHINE Name(s)	usa mexico brazil	+
OPERATING SYSTEM Name(s)		+
DOMAIN Name(s)		+
Union or intersection of above criteria?	union	+

F1=Help	F2=Refresh	F3=Cancel	F4=List
F5=Reset	F6=Command	F7=Edit	F8=Image
F9=Shell	F10=Exit	Enter=Do	

Figure 12. Add Domain Panel of DSMIT

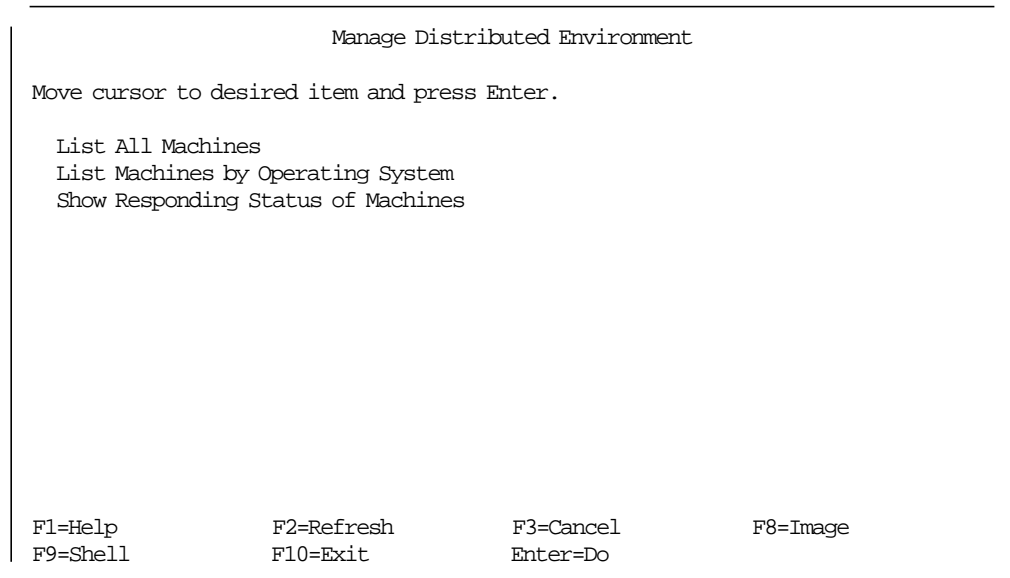


Figure 13. Manage Distributed Environment Panel of DSMIT

When you are working with some machines in a network, those machines are supposed to be up and running, but sometimes this is not the case. Then, to make sure that all machines are reachable, you can select the option **Show Responding Status of Machines** from the **Manage Distributed Environment** menu, (see Figure 13). Specify the *country* domain in the Domain Name(s) option and press **Enter** . The DSMIT command will return a status of each machine in the response field, see Figure 14 on page 24.

The **Manage Distributed Environment** menu can perform the following tasks too:

- List all the machines in the DSMIT environment.
- List machines of selected operating system(s).
- Show machines in the DSMIT environment and see if the communication works properly.

The domain *country* was set up for future use, but to build a command to create the user *ssantoro* the working collective must be set up with the content of the *country* domain.

```

                                COMMAND STATUS

Command: OK                stdout: yes                stderr: no

Before command completion, additional instructions may appear below.

Machine                    Response  Op. system
-----                    -
usa                        +        SunOS_4.1.3
mexico                     +        SunOS_4.1.3
brazil                     +        SunOS_4.1.3

F1=Help                    F2=Refresh                F3=Cancel                F6=Command
F8=Image                   F9=Shell                  F10=Exit

```

Figure 14. Show Responding Status of Machine Panel of DSMIT

```

                                Manage Working Collective of Machines

Move cursor to desired item and press Enter.

Show Working Collective Members
Show Responding Status of Working Collective Members
Add Working Collective Members
Remove Working Collective Members
Redefine Working Collective Members
Include Working Collective Members
Exclude Working Collective Members
Save Working Collective as Domain

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

```

Figure 15. Manage Working Collective of Machines Panel of DSMIT

Select the option **Redefine Working Collective Members**, from the **Manage Working Collective of Machines** menu (see Figure 15). Specify the *country* domain in the Domain Name(s) field and press **Enter** . Press **Enter** again, to complete the working collective setup.

The menu titled **Manage Working Collective of Machines** can perform other tasks too:

- Show the list of machines in the working collective
- Show for each machine in the working collective whether there currently is proper communication with the machine
- Add machines to the working collective

- Remove machines from the working collective
- Reinclude machines that were temporarily excluded from the working collective
- Temporarily exclude machines from the working collective
- Save the list of machines in the working collective as a Domain

Now, the command to create a user can be built. To reach in the **Common Dialogue for Create User** menu, select this sequence of menus:

- System Management
- Security & Users
- Users
- Add a User

You can see the **Common Dialogue for Create User** menu screen in Figure 16. Type the user name `ssantoro` in the user name field and press **Enter**. You will see a screen asking if you want to run the task in sequential or concurrent order. In other words, if you want to run the task one machine at a time or all the machines at the same time, see Figure 17 on page 26.

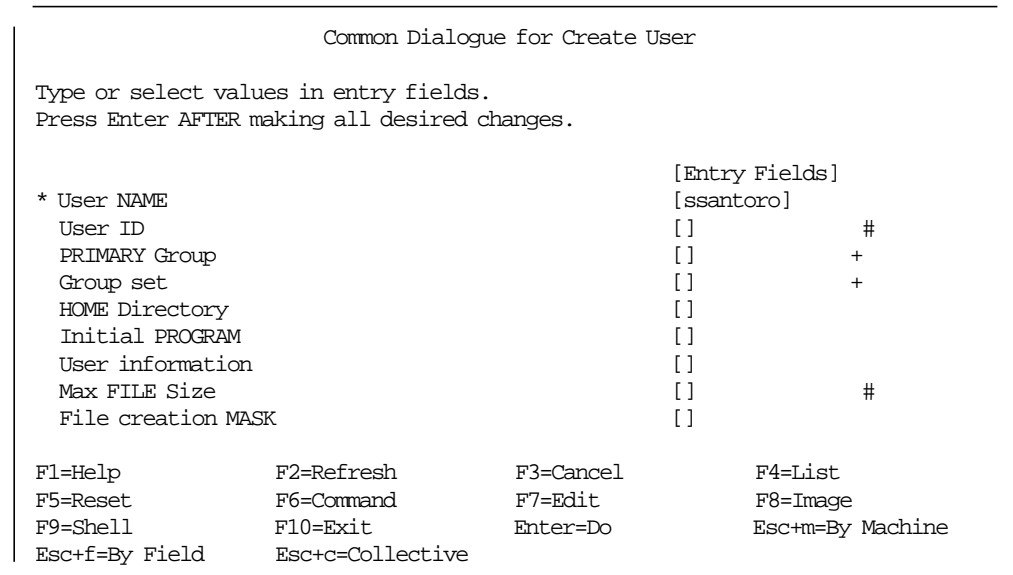


Figure 16. Common Dialogue for Create User Panel of DSMIT

```

Common Dialogue for Create User

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

* User NAME                                [Entry Fields]
User ID                                    [ssantoro] +
                                           [] +

Submit Command for Execution.

Continuing will submit the command(s) to all the machines
included in the Collective. This is your last chance to
stop before execution.
Press Enter to execute command(s) on all machines.
Press Cancel to return to dialogue.

# Distributed Execution Mode
sequential
concurrent

F1 F1=Help          F2=Refresh          F3=Cancel
F5 F8=Image         F10=Exit            Enter=Do
F9 /=Find           n=Find Next
Es

```

Figure 17. Panel to Choose which Distributed Execution Mode will be Executed

3.3 DSMIT and Object Data Manager (ODM)

The Object Data Manager (ODM) database has many purposes. It provides a reliable, object-oriented database facility for system management. This facility includes the commands and an editor to create and manipulate devices and system configuration data in a centralized database. The DSMIT Server uses a group of files in the ODM database to generate commands. The DSMIT program uses the same ODM database used by SMIT.

The ODM database directory is located in /usr/lib/objrepos. If you add any stanzas to the ODM database DSMIT uses these stanzas to expand its functionality. However, the ODM database files for SUN and HP specific stanzas are located in the /usr/share/DSMIT/SunOS_4.1.3 directory, for SUN and /usr/share/DSMIT/HP-UX_9.0 directory, for HP. You can find the /usr/share/DSMIT/AIX_3.3 directory, but it is a link to the /etc/objrepos directory. The /usr/share/DSMIT/dsmijos file, which defines the available operating system types, is updated with the SMIT ODM database directory name when the DSMIT Client software is installed on the DSMIT Server system. The HP and SUN ODM database directories are created by the system when their own DSMIT Client is installed.

If you have to support DSMIT in a different level of AIX, you must include the new ODM database, from that specific machine, in the /usr/share/DSMIT directory of the DSMIT Server. For instance, if you want to build commands in a new machine running AIX Version 4.1, perform the following steps:

1. Change the current directory to /usr/share/DSMIT:

```
cd /usr/share/DSMIT
```

2. Create the directory AIX_4.1 in the /usr/share/DSMIT directory:

```
mkdir AIX_4.1
```

3. Use the `echo` command to write the name of the new directory to the `dsmitos` file:

```
echo AIX_4.1 >> dsmitos
```

4. Change the current directory to the AIX_4.1 directory:

```
cd AIX_4.1
```

5. Copy the existing SMIT database from the specific machine to your machine. For instance, if you mounted the /usr/lib/objrepos directory from this remote machine in the /mnt directory, execute the command:

```
cp /mnt/sm* .
```

If you want to manage an application running in a client machine from the DSMIT Server, for instance, an HP machine, you must create your own menus and add them to the server ODM database. You can find an example in Chapter 4, “Using DSMIT to Run Client Applications” on page 29.

Chapter 4. Using DSMIT to Run Client Applications

This chapter explains briefly, how to manage an application running on a client machine using a DSMIT server machine. In our example, this application is running on an HP client machine with an HP_UX9.0 operating system.

4.1 Considerations on Managing an Application with DSMIT

In order to manage an application running on a client machine, the following conditions must be met:

- Communications must be up and running through TCP/IP protocol, either an Ethernet, a tokenring, or an X.25 network.
- DSMIT server and DSMIT client software must be installed and configured in the server and client machines, respectively.
- The application should be accessed from SMIT on the client and server machines, since DSMIT uses the same interfaces.

You have to modify the DSMIT ODM to add this application to the DSMIT menus. This is the scenario we describe.

- You must be root (super user) in the server machine in order to run DSMIT.

Since the procedure of adding an application to the DSMIT menus is complex and out of the scope of this book, we will only briefly describe it. If you need more information on this topic, refer to the *General Programming Concepts, System Management Interface Tool Overview for Programmers* and look at *Infoexplorer* under the topic *Object Data Manager (ODM) Overview for Programmers*.

4.2 How to Add Tasks to the DSMIT Database

Whenever you are adding tasks or developing new objects for the DSMIT database, it is strongly recommended that you set up a separate test repository. Also make sure you have a fresh backup of your system. To create a test database in the DSMIT server machine do the following:

1. Create a directory for testing use. For example create a /u/smit/test directory:

```
mkdir /u/smit /u/smit/test
```

You must have at least 1480 KB free disk space to work.

2. Make the test directory the current directory:

```
cd /u/smit/test
```

3. Define the test directory as the default object repository:

```
export ODMDIR=/u/smit/test
```

4. Create a new test DSMIT database in the test directory. For adding a task to the HP client database, in our example we issue the following commands:

```
copy /usr/share/DSMIT/HP-UX_9.0/sm* .
```

If you were adding tasks to manage a SUN client machine you would use:

```
copy /usr/share/DSMIT/SunOS_4.1.3/sm* .
```

If you were adding tasks to manage an AIX client you would issue:

```
copy /usr/lib/objrepos/sm* .
```

To add tasks to the DSMIT database:

1. Design the dialog for the command you want DSMIT to build.

For example the dialog we added is shown in Figure 20 on page 33.

2. Design the hierarchy of menus needed to get a DSMIT user to the dialog and determine when and how this hierarchy should be linked into the existing DSMIT database. The following steps are very useful to better understand these procedures:

- a. Start DSMIT (run the `dsmit` command), look for existing menu, selector, and dialog screens that perform tasks similar to the one you want to add, and find the menu screens to which you will add a task.
- b. Exit from DSMIT, then remove the existing SMIT log file. This allows you to isolate the trace of your next DSMIT session.
- c. Start DSMIT again with the `-v` flag and again look at the screens you want to add the new task to. This logs the objects IDs accessed for each screen.

You can find some sample outputs of the `smit.log` file using the `-v` flag in Appendix C, "Files Used to Add a Task to DSMIT" on page 109.

- d. Look at the `smit.log` file to determine the ID for each object class used as part of the menus.
- e. Use the object class IDs with the `odmget` command to retrieve the stanzas for these objects. The stanzas can be used as examples to guide you in your implementation.

Issue the command `odmget sm_menu_opt>menu_stanzas` to get a sample file of the stanzas used by DSMIT in an HP client machine. The default output of the `odmget` command is the *standard output* (the display), so you might want to redirect this output to a file, for example `menu_stanzas`, this will enable you to review the stanzas.

Under `/usr/lpp/smit/examples` you can find a sample file with the stanzas used by SMIT and DSMIT ODM.

- f. Look in the `smit.log` file for the command strings used while running through the screens to see if special tools are being utilized. (such as `sed` or `awk` scripts, `ksh` shell functions, environment variable assignment, and so on). When entering command strings, keep in mind that they are processed twice: the first time by the `odmadd` command and the second time by the `ksh` shell. Therefore, be careful when using special escape meta-characters (such as `\`) or quotation characters (such as `'` and `"`). Note also that the output of the `odmget` command does not always match the output of the `odmadd` command, especially when these characters or multi-line string values are used.
3. Code the dialog, menu, and selector objects by defining the ASCII object stanza file format required by the `odmadd` command. Use the output you got with the `odmget` command as a guide. In Appendix D, "ODM Files for DSMIT" on page 113 you can look at an example ASCII code for an ODM program.

4. Add the dialog, menu, and selector objects to the DSMIT test database with the `odmadd` command, using the name of your ASCII object stanza file.

For example, edit the file `new_stanzas` (with the vi editor type `vi new_stanzas`) based on the stanzas you have in the file `menu_stanzas`. In our case, we added the stanzas shown in Appendix C, “Files Used to Add a Task to DSMIT” on page 109 for our new menus.

Type `odmadd new_stanzas` to add your changes into the test database.

In Appendix C, “Files Used to Add a Task to DSMIT” on page 109 and Appendix D, “ODM Files for DSMIT” on page 113 you can find examples of stanza files.

5. Test and debug your additions by running DSMIT using the local test database `dsmit -o /u/smit/test`.

For more information on the debugging process, refer to the *AIX Distributed SMIT/6000 Version 1.1 Guide and Reference*.

6. Repeat these procedure for all object classes you need to add into DSMIT.

For instance, here we are manipulating the menu stanzas, you would follow the same procedure with the command stanzas:

```
odmget sm_cmd_opt>command_stanzas
```

and with the header stanzas:

```
odmget sm_name_hdr>header_stanzas
```

These procedures are intended to give you a general view of the tasks you must perform in order to add an application menu into DSMIT, it is necessary that you have experience in C programming and ODM knowledge before you use these procedures.

4.3 Starting the Client Application from the DSMIT Server

In our example, the task we are adding to DSMIT is a command from the AIX Performance Manager Agent (PAIDE) version 1.2 installed on the HP client machine to start/refresh the daemon `xmservd` on this machine.

The following conditions must be met before we can run this application:

- Communications must be up and running between client and server machines through the TCP/IP protocol.
- Performance Manager server software PTX Version 1.2 must be installed and configured on the server machine. In this case, it is the same server machine where the DSMIT server is installed.
- Performance Manager Agent (PAIDE) Version 1.2 must be installed and configured on the client machine. In our case, the client machine is an HP running on HP-UX_9.0.
- DSMIT Server and DSMIT Client software must be installed and configured on the server and client machines respectively.
- You must be working as root to perform DSMIT tasks.
- You must have performed the steps described in section 4.2, “How to Add Tasks to the DSMIT Database” on page 29 so the task is added to DSMIT menus.

To run the application on the client machine follow these steps:

1. Invoke DSMIT including the HP machine as the working collective. Type `dsmit -w hp_machine_name`, where `hp_machine_name` is the name you assigned to the client machine.
2. Select **System Management** from the DSMIT main menu.
3. Select **Applications** from the **System Management** menu (shown in Figure 18).

```
System Management
Move cursor to desired item and press Enter.

Software Installation & Maintenance
Devices
Physical & Logical Storage
Security & Users
Diskless Workstation Management & Installation
Communications Applications and Services
Spooler (Print Jobs)
Problem Determination
Performance & Resource Scheduling
System Environments
Processes & Subsystems
Applications
System Configuration
Using SMIT (information only)

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

Figure 18. DSMIT System Management Menu

Here is where we added the task into DSMIT menus, so the next screen is what we have created in ODM.

The DSMIT menu we added to ODM looks like the menu in Figure 19 on page 33.

4. Select the **Manage PAIDE Agent** option. Right now this is the only option in this menu, but if we want to add more applications to be managed with DSMIT on this or other client machines, we could add other options in this menu.



Figure 19. New DSMT Screen Added to ODM to Manage Client Application

5. Select the **yes** option in the last dialog screen, as seen in Figure 20, and press **enter**.

This will run the `/usr/bin/xmserverd -p3` command on the client machine, to start or refresh the `xmserverd` daemon.

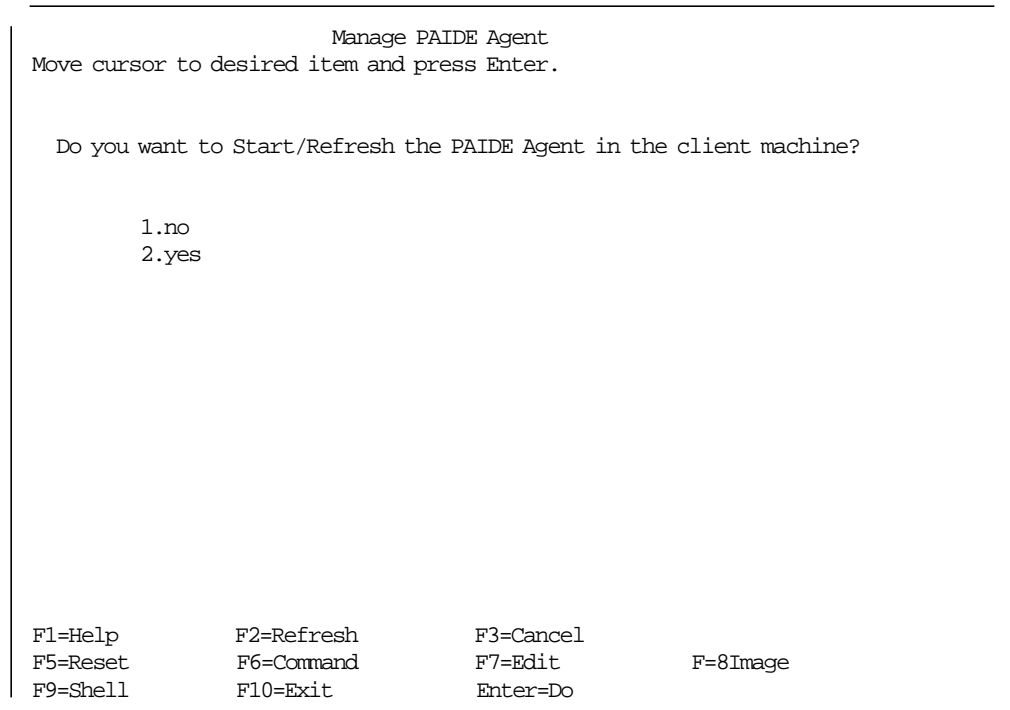


Figure 20. New DSMT Dialog Added to ODM to Manage Client Application

When the command status shows *OK*, indicating that the PAIDE agent on the client machine has been refreshed, we can start the Performance Manager 3-D Monitor on the server machine. This utility will display a window similar to Figure 21 on page 34 while monitoring the client HP machine.

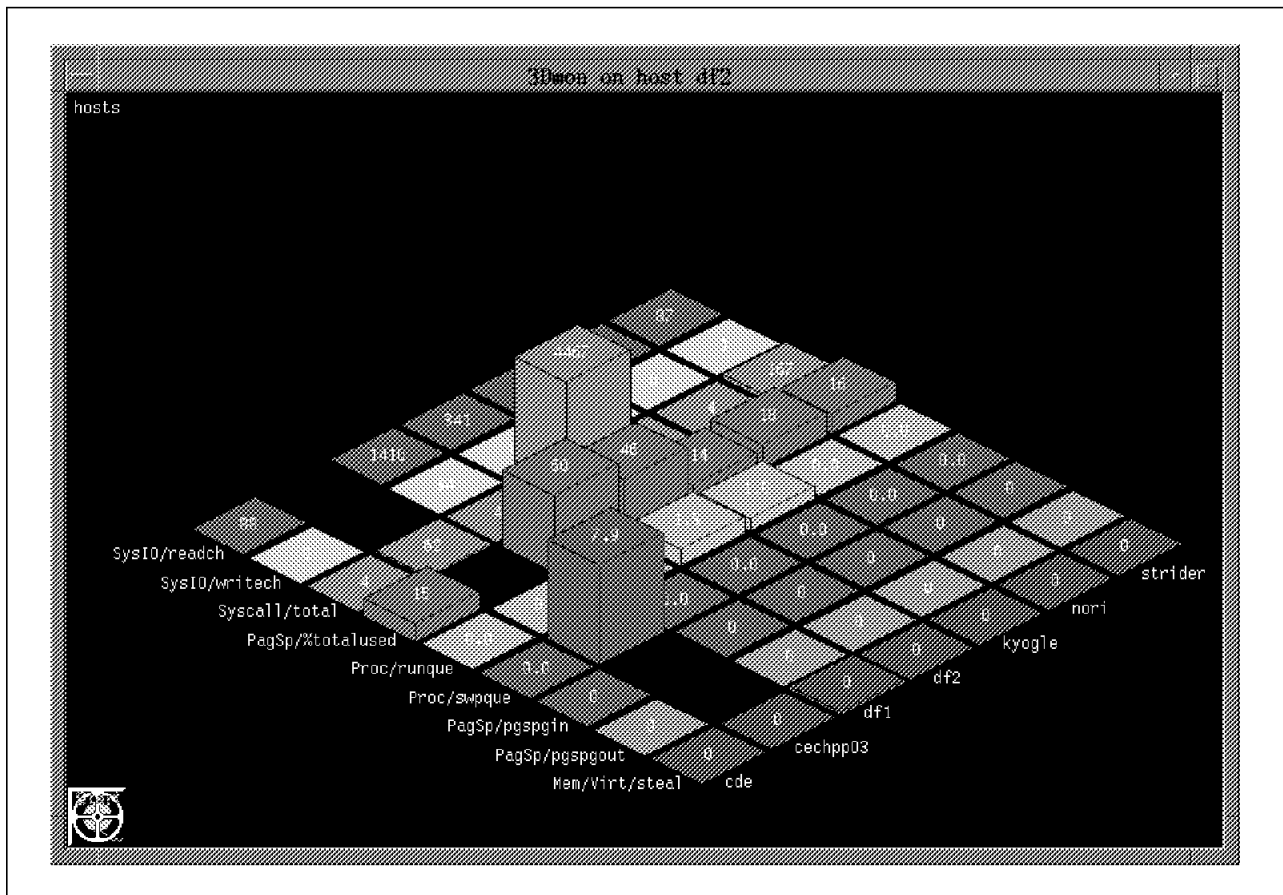


Figure 21. Performance Manager 3Dmon Window

In Figure 21, the blanks you notice in the bars for the HP client machine, are statistics not available to the server. Some values, like *SysIO* and *PagSp* are not available from HP_UX9.0.

This is a fairly simple example. The purpose of this chapter is to illustrate how the management of different tasks is made simple with the capabilities of DSMIT. Even when some programming is involved, the administrator or end user of DSMIT will find it very easy to use.

4.4 Managing Applications on AIX Clients

The same procedure described here could be used to add an AIX client application by manipulating the server's DSMIT ODM.

If the application you are planning to install on a client machine already has a SMIT interface, then you could perform the procedures described in this chapter or install the new application on the server machine.

For instance, if you have no disk space constraints on your DSMIT server machine, the easy way to go is to install this new LPP on the client machine and

also on the server machine. This would automatically include the new LPP in DSMIT ODM. If you have disk space constraints in the server machine, you can add this LPPs new menus with the following procedure:

1. Create a test directory following steps 1, 2 and 3 of section 4.2, "How to Add Tasks to the DSMIT Database" on page 29.

2. Copy the existing client machine SMIT ODM database into this directory:

```
rcp root@AIX_client:/usr/lib/objrepos/sm* .
```

Where AIX_client is the name of the client machine where the SMIT menus you want to add to the DSMIT server reside.

3. Set the ODM path and add required DSMIT dialogs:

```
ODMDIR=. /usr/bin/odmadd /usr/share/lpp/dsmit_server/ch* .add
```

4.5 When to Add an Application to DSMIT

Most applications can be managed from a centralized DSMIT server machine, as long as the application itself does not have a user interface or any special requirements that would not allow it to be managed with standard remote shells `rsh`.

If it is an interactive application, for example a password change, the `exec_mode` in `sm_cmd_hdr` must be "i" in the stanzas file. This will force DSMIT to run only in sequential mode, in an interactive fashion.

Chapter 5. DSMIT Problem Solving Hints

This chapter is intended to provide some hints on the use and setup of DSMIT. It deals with the most common problems encountered in a DSMIT distributed management environment and describes the solutions to these problems, or the means to avoid them in the first place.

These hints should help you to fix problems you might encounter when installing and using DSMIT, but are by no means exhaustive or complete. You should refer to InfoExplorer or other documentation for further information.

5.1 Reading System Messages

The starting point, when encountering a problem, is referring to the error messages you receive from DSMIT.

Some error messages give information on how to resolve the error incurred. If the message describes the cause of the problem and the possible solution, attempt to correct the problem. In Figure 22 you have a clear statement of the problem and how to correct it. Just proceed to edit the file `/etc/security/dsmite.hosts` on the client machine making sure your server host name is there.

```
                                COMMAND STATUS
Command: failed          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

HOST: 192.100.73.105
-----
The connection was refused or permission was denied.
Check that the machine is operational and that /etc/security/dsmite.hosts
is defined correctly.

command exit status is: -1.

F1=Help          F2=Refresh      F3=Cancel      F6=Command
F8=Image        F9=Shell       F10=Exit      /=Find
n=Find Next
```

Figure 22. Error Displayed by DSMIT With a Corrective Action

Some other messages are not so explicit (as in Figure 23 on page 38), so you have to work a little harder to determine the problem.

```

                                COMMAND STATUS
Command: failed          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

HOST: 192.100.73.105
-----
unsuccessful command initiation.
precise error message not available

command exit status is: 0

F1=Help          F2=Refresh          F3=Cancel          F6=Command
F8=Image         F9=Shell            F10=Exit           /=Find
n=Find Next

```

Figure 23. Unknown Error Displayed by DSMIT

In these cases, you have to verify a few conditions:

- Check the communications in both directions, ping the server from the client and the client from the server.

Sometimes when the networks become more complex, it is easy to find a condition where you have routers, gateways, name servers, and other network devices to reach a client from a server. Maybe you can reach the client machine with a `telnet` or `ping`, but can the client machine reach the server? This is very important since the DSMIT server must receive responses for the commands it issues to the client machine.

Also make sure the necessary TCP/IP services are running. After issuing a `ping client_machine_name` command, also check that the `inetd` daemon is running with a `ps -ef | grep inetd` command (in a SUN client machine, substitute the `-ef` flag with a `-aux` flag).

- Verify you followed all the installation procedures on all machines.

If you are working with a multi-client multi-vendor environment, make sure that every client machine you want to manage with the DSMIT server has the corresponding DSMIT client software installed. You don't want an HP machine with SUN DSMIT client software installed, or partially installed software.

Make sure the installation shells on the client SUN and HP machines finished successfully. If in doubt, run the installation shells again.

- Verify you are running the correct Operating System Version

Verify you are running AIX Version 3.2.0 or higher on any RS/6000 client machine.

On HP client machines, make sure you are running HP-UX 9.0.

On SUN client machines, make sure you are running SunOS 4.1.3

If you are running different AIX levels on client and server machines, follow the procedure described in the section *Databases* in the *AIX Distributed SMIT/6000 Version 1.1 Guide and Reference*, or look at section 3.3, "DSMIT and Object Data Manager (ODM)" on page 26 to add the different AIX level support on the DSMIT server machine.

Some other error messages are somehow clear but don't state any corrective action (as in Figure 24). However, you get a very good hint as to where the error was generated. In this example, the problem is in the communications between client and server machines.

```
COMMAND STATUS
Command: failed      stdout: yes         stderr: no

Before command completion, additional instructions may appear below.

HOST: 192.100.73.105
-----
Connection refused (connect: A remote host did not respond within the
timeout period.)

command exit status is: 0

F1=Help      F2=Refresh      F3=Cancel      F6=Command
F8=Image     F9=Shell        F10=Exit       /=Find
n=Find Next
```

Figure 24. Communications Error Displayed in DSMIT

In these situations, you can test the communication between both machines with a `ping` command or using the **Show Responding Status of Working Collective Members** option of the **Manage Working Collective of Machines** menu of DSMIT. If you receive a message similar to Figure 25 on page 40, then you can be sure there is a communication problem between client and server machines.

```

                                COMMAND STATUS
Command: OK                      stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

Machine                          Inc/Ex  Response  Op. System
-----                          -
192.100.73.105                   +        -        HP-UX_9.0

F1=Help          F2=Refresh      F3=Cancel      F6=Command
F8=Image         F9=Shell        F10=Exit       /=Find
n=Find Next

```

Figure 25. Show responding Status of Working Collective option in DSMIT

5.2 Hints on Installing OEM Clients

Since the installation for OEM client machines (you could install the DSMIT client option on an HP or SUN machine) is different to the normal `smit installp` procedures in AIX, you might find some difficulties while attempting these installations.

Here are some hints you might find useful to fulfill an OEM installation:

- Make sure the TCP/IP services required for DSMIT (for example `telnet`, `rlogin`, `ftp`, and `rsh`) are installed on the OEM client machine. `i1.stty` command `i2.refid=inx6.stty` command `i1.rlogin` command `i2.refid=inx6.rlogin` command `i1.telnet` command `i2.refid=inx6.telnet` command
- If you experience problems with the terminal type while in a `rlogin` or `telnet` session, remember to use the `stty` command. For example, on a SUN machine issue the `stty erase H` command (the `↵` H character will be keyed in by hitting the backspace key). In the HP machine issue the `stty parity none` command. Also you can use the `TERM` variable to set the correct keymap for the remote session.

On an HP machine issue the command:

```
TERM=vt100;export TERM
```

In a SUN machine issue the command:

```
setenv TERM=vt100
```

- When you are issuing the `installp.hp` or `installp.sun` shell scripts, make sure you change the file mode to 544 (issue the command `chmod 544 installp.hp` or `chmod 544 installp.sun`) before trying to run the shell script, since `ftp` will not write it in an executable mode. Also remember to set your path variable to the `/tmp` directory. Or issue the command as a local command, typing `./installp.hp` or `./installp.sun` instead.

- After the DSMIT client software installation check the existence of the file and path `/etc/security/dsmit.hosts`. If you cannot find it just create it with the commands `mkdir /etc/security` and `vi /etc/security/dsmit.hosts` adding the name of the server machine to this file. Make sure the name corresponds to the name in `/etc/hosts` file.

You can find examples of these files in Appendix B, “DSMIT Files” on page 107.

- Whenever a configuration change is made to an OEM client machine, make sure to rebuild the operating system with the **Reorganize RC Boot Files** option in the **System Configuration** menu of DSMIT. It is necessary to update any configuration changes to DSMIT or an error message similar to Figure 26 will appear when issuing a command to a removed device. In the opposite case when you have new devices you won’t be able to access them via DSMIT.

```

                                COMMAND STATUS
Command: failed          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

Host: 9.3.1.118
-----
nawk: can't open /usr/share/SMIT/configdb*
source line number 20

command exit status is: 0.

F1=Help          F2=Refresh          F3=Cancel          F6=Command
F8=Image         F9=Shell            F10=Exit           /=Find
n=Find Next

```

Figure 26. Command Issued to a Nonexistent Device in a OEM Machine

- We recommend that you have physical access to the client machines. Although all commands can be issued through the network, if a problem shows with a machine (for instance a communications failure) you will not be able to access that machine. This should be specially true when selecting the **Reboot the System** in the **System Configuration** menu of DSMIT.

For example, if during the reboot process you don’t get a response on the DSMIT menu in a reasonable time, you might want to have physical access to the client machine to see what the problem is.

5.3 Hints on Running DSMIT

In this section you will find some hints on how to perform the common administrative tasks with DSMIT, and how to avoid some common errors while performing these tasks.

It is not likely that you will have problems while running DSMIT commands, but some considerations are worth keeping in mind, such as:

- When you issue a command directed to a particular device on a working collective of machines, where this device can be found in most, but not all, machines, DSMIT will automatically exclude the machine(s) which does not have this particular device.

For example, you can issue a `chdev -l rmt0` command to use DSMIT to change the characteristics of all the tape drives in the machines included in the current working collective. If one of these machines does not have an `rmt0` device, DSMIT will exclude this machine as it issues the command through the network.

This will give an error message, but if you issue the command anyway, you will see the command successfully executes on the rest of the client machines.

Notice that the excluded machine will remain excluded from the working collective, so if you want to issue further commands to this machine you must add it back to the working collective.

- When you use the function key **F4** to list a series of objects, only the common objects will be displayed in the list.

For example, if you select the option **Change User Attributes** from the DSMIT **Users** menu and some of the machines in the working collective have a common user which other members of the Working Collective do not have, then this user will not be displayed in the **F4** list on the `Host_name` field.

- When adding an AIX Version to the DSMIT ODM on the server machine, make sure the client machine is not already installed, or you will experience duplication problems with the DSMIT menus.

For example, if you are adding a new AIX level to the DSMIT ODM as described in section 3.3, "DSMIT and Object Data Manager (ODM)" on page 26, where you are adding an AIX 4.1 directory to the server's ODM. First try to execute commands to the client machine before following this procedure, if the client responds to the DSMIT commands, you do not need to add a new AIX level directory to the server's ODM. If you added a new ODM directory and receive error messages while executing DSMIT, remove the new directory in the server machine.

- When you have additional LPPs on some client machines and add these LPPs to the server machine in order to have access to the LPP SMIT menus from the DSMIT server, be sure to add a new domain of machines which includes these clients. Now when you access them via DSMIT, you only issue commands to these clients and not the rest of the clients with the same operating system.

For example, let us assume you are installing a new LPP on some of your AIX client machines, for instance DCE. You also install this LPP on your server machine in order to add the DCE menus to DSMIT.

When you invoke DSMIT selecting a working collective by operating system criteria (in this case AIX), you would see the DCE options in the DSMIT menus. When you issue DSMIT commands to control DCE on the client machines, these commands would also be issued to the rest of the client machines running on an AIX operating system.

Even when the command is correctly issued to the DCE client machines, you would get error messages from the rest of the AIX clients.

What you would like to have is a new Domain of machines, for instance a `dce_dom` with all the machines with DCE installed. Then you would invoke DSMIT defining a working collective based on this Domain, issuing the command `dsmit -W dce_dom` would only work with the DCE machines.

- Notice that when running certain commands on OEM machines, although the option might be in the DSMIT menus, perhaps the option is not available in the OEM operating system.

For example if you select the option **Change/Show Characteristics of a Swap Space** of the **Swap Space** menu while working with a SUN client machine, you will receive an error message since the SunOS operating system does not support this function on the original swap space. You must first create a new swap space in order to access this option successfully.

- Be careful when running DSMIT commands on remote client machines, remember you are *super user*.

For example, if you select the option **Set the System Run Level** from the **Resource Controls** menu and change the level to **s** (Single User), you will no longer be able to recover that machine accessing it from the network.

Also if you shut down a remote client system with the **Stop the System** option in the **System environments** menu, you will lose contact with that machine, and will have to reset this client physically.

- Some commands take a long time to run, be patient.

This is especially true when you issue a command in concurrent mode to many client machines. Do not use a *sigkill* signal with the **Ctrl-c** sequence. It will give unpredictable results, since some machines perform the commands faster or are easier to access in the network. You can't tell where in the process the client machines are. Remember, when running DSMIT in concurrent mode, you get a response on the server machine after all the clients have responded to the command.

- When to choose sequential mode or concurrent mode?

If you have to manage a large number of machines and want to be sure of the response of all of them, choose sequential. This also has drawbacks, the response time is obviously longer.

If you are sure that your client machines are responding correctly and want to save time when issuing a distributed command, use the concurrent mode.

- At this point, you have noticed that some DSMIT commands can finish with a **Failed** status even when some of the machines in the working collective executed the command correctly.

To make sure of the consistency in your administration tasks, when you receive a **Failed** status command on DSMIT, check the messages on the screen and take note of the failing client machines, so you can correct the error condition and issue the DSMIT command again.

The file `smit.log` should help with this task.

- Remember when defining a working collective, all machines you want to include should have the same operating system.

You cannot issue the same command simultaneously to many machines with different operating systems. You should issue the command in two stages for a SUN and an AIX group or in three stages for a SUN, an AIX, and an HP group of machines.

- If you experience any problems when running DSMIT and have checked that communications, installation, and configuration are correct, refer to Appendix B, “DSMIT Files” on page 107, for examples of the files used by DSMIT. You can check the correct syntax of these files.

For more information on problem determination and solving on DSMIT, refer to the manual *AIX Distributed SMIT/6000 Version 1.1 Guide and Reference*.

5.4 Setting a Secure Environment

Since DSMIT uses the same level of security as that provided by the TCP/IP `rsh` command, the use of DSMIT Client support will subject the system to potential risk of unauthorized access.

Unauthorized systems masquerading as the DSMIT server can access the DSMIT clients by using TCP/IP commands such as `rsh` and `rlogin`. Therefore you, as the system administrator, must implement the necessary security procedures to protect your client systems and the secrecy of your DSMIT server.

Implement as many of the following measures as possible:

1. Use the file `/etc/security/dsmit.hosts` instead of `/.rhosts`.
2. Reduce the permissions on the `/etc/security/dsmit.hosts` file.
As root type in: `chmod 600 /etc/security/dsmit.hosts` on each client machine.
3. Maintain secrecy of the DSMIT server host name.
4. Deny `rlogin` and `telnet` on client machines as possible.
5. Limit users login to certain tty ports only using SMIT:
 - As root type in: `smit chuser`
 - Edit the field *Valid TTYs*
6. Limit the direct login of super user (root):
Administrators should use the `su` command.
Define the `system` group to be the only group with permission to use the `su` command.
7. Deny normal users the use of daemons like `cron` and `src`.
8. Define a default `userid` configuration with very restrictive conditions.

Chapter 6. Visual System Manager Functions

This chapter is intended to discuss the various components of Visual System Manager (VSM) graphical user interface tools and the various functions you can perform as the administrator of your RS/6000 running on the AIX operating system.

VSM is composed of independent applications to perform the different system administration tasks on your AIX system, though the four of them feature the same graphical user interface and components, so we describe in detail these components in the Users and Groups Manager application and the same apply for the rest of VSM tools. We discuss the differences as we describe each of them.

6.1 Users and Groups Manager

The Users and Groups Manager component of VSM is the graphical user interface designed to perform the various administrative tasks in your machine like adding or deleting users or changing passwords.

To call this application, type `xuserm` at the system prompt in any client window of the AIXwindows environment.

Figure 27 on page 46 shows the Users and Groups Manager main window, you can see the four active areas:

- Template Area
- Work Area
- Actions Area
- Information Area

In the Template Area there is one template item or icon with the characteristics to create a new user.

In the Work Area there are eleven objects, representing all the users created in this particular system.

The Groups Area is broken into two panes. The top pane, for users, has eleven objects corresponding to the users created in this system. User **nacho** is highlighted to show it has been selected for an action. The bottom pane, for groups, has fourteen objects to match the groups created in this system. Since there is no space to display all the groups in the pane, a scroll-bar is displayed at the right of the pane.

The Information Area at the bottom of the window displays information relevant to the Users templates. Remember if you want to get more detailed information about any topic, you can always use the ? icon on the Actions Area or the help button at the lower right corner of the main window.



Figure 27. AIX VSM Users and Groups Manager Main Window

6.1.1 Template Area

The Template Area contains two types of templates, you select them with the users templates button and the groups templates button at the left of the Templates Area. You click on either of these buttons to display the desired template in the Template Area.

To change or display the characteristics of a template, just double click on a template icon in this area. This action will pop-up a new window where you can see the template attributes and also type in the changes you want to make to this template.

To create new users or groups templates, just drag a template and drop it inside the Template Area. For example, if you want to create a template for all the new users in the development department, you select the users template with the users template type button, then drag and drop the users template into the Template Area. This will pop-up a dialog window where you can select the desired parameters for the new users you will create with this template, such as Primary group, Initial program, or any other characteristic you want to include in the template. Then just click on the **OK** button or **Apply** button, the new template will be added to the Template Area. In Figure 28 you can see the dialog box you use to create a new user template.

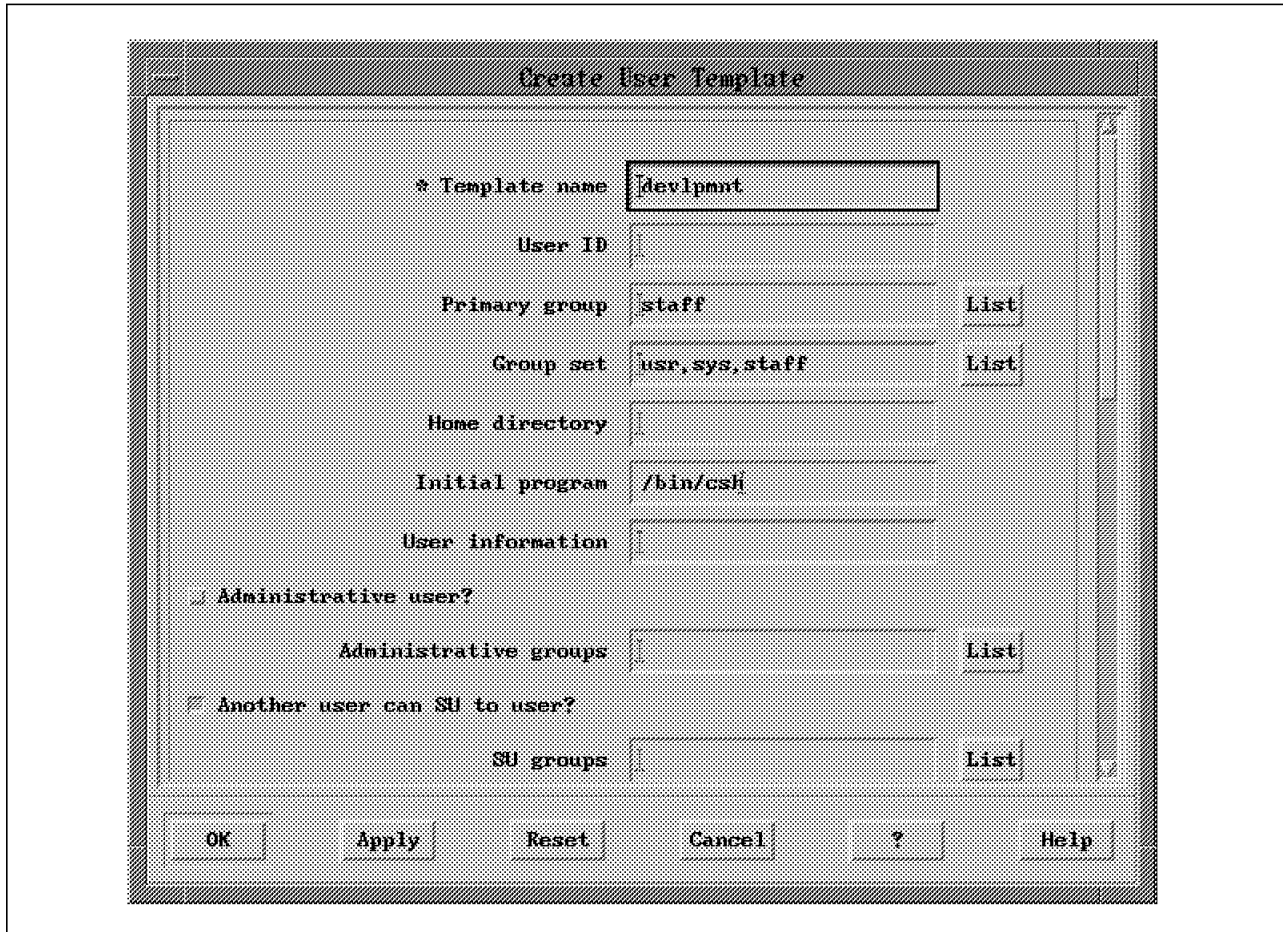


Figure 28. Create User Template Dialog Window

To add a new group template, you would use the same procedure.

6.1.2 Work Area

The Work Area in the Users and Groups Manager of the VSM contains two panes, one in the upper section of the area for users and the second one on the bottom for groups. You can change the size of one pane relative to the other with the sash button, located at the right side of the dividing line. Drag this button up or down to make one pane larger and the other one smaller.

The objects (icons) located in the users pane, correspond to the users created on your system. If the icon appears in a solid color, the user is enabled to login to the system. If the user is in faded color it is not enabled to login. Some users are created in the system as default and are disabled for login, this is normal

and some AIX applications use them for particular purposes. To disable a regular user from login to the system, just drag it to the lights off icon in the Actions Area, to enable it again drag it to the lights on icon.

To add a user, simply drag a template and drop it onto the users pane in the Work Area. The same procedure would be used to add a group.

To add a user to a particular group, drag the user and drop it on the group object, or drag the group and drop it on the user object.

To list the users belonging to a group, double click on the group and a Users Well will appear attached to the group with all the users belonging to this group in it. If you want to delete a user from a group, drag it from this Users Well and drop it on the trash. To close the Users Well of the group, double click on the group again.

To list the groups a user belongs to, double click on the user and a Groups Well will show this groups as you can see in Figure 29. To close this Groups Well, double click again on the user.

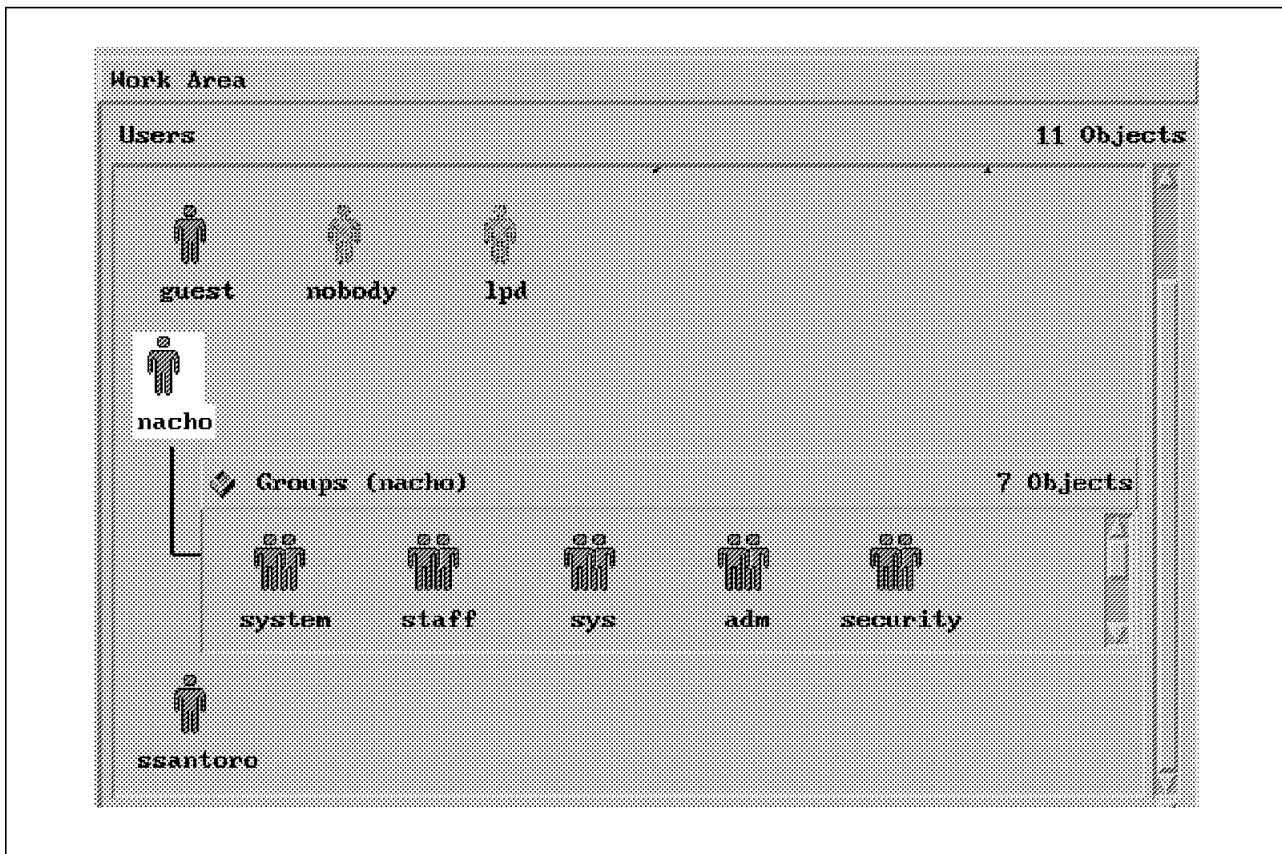


Figure 29. User Displaying an Attached Well for Groups

When you need to remove a user or a group, drag the object and drop it into the trash icon.

6.1.2.1 Other Controls

At the bottom left corner of the Work Area, you have various View and Display Controls.

- Large icon control
This displays Work Area and Template Area objects as large icons, this is the default view.
- Small icon control
This displays Work Area and Template Area objects as small icons, it is useful when you have many objects in a given area and you want to display them at the same time.
- Show Users Control
Drag and drop this icon on a group and it displays the users that are members of this group.
- Show Groups Control
Drag and drop this icon on a user to display the groups it belongs to as in Figure 29 on page 48. When you no longer need to see this Well, double click on the user icon to close it.
- Sort Display Control
This displays a dialog window where you can set the sort criteria, for instance you can sort users by name in ascending or descending order.
- Find Display Control
This displays a dialog window to set search criteria, you can use this search function in the Work Area or in the Template Area. To search for a particular user, drag and drop this icon on the users pane and key in the name of the user, after it is found, it will be highlighted with a white frame.
- Filter Display Control
This displays a dialog to set filtering criteria to show only a subset of objects in a particular pane of the Work Area or in the template Area. Objects excluded by this criteria will no longer be displayed in the area or pane, to display them again, use the reset button in the Filter Display Control dialog.

At the right bottom corner of the Work Area you find the trash icon, any object you want to delete, drag and drop it on this icon. You cannot drag and drop the trash on other objects.

6.1.3 Actions Area

This contains the actions you can perform upon the objects in the Work Area or the Template Area. These actions are:

- Item Help
This displays information about the selected object. To view the help for an object drag and drop the object on this icon or drag and drop this icon on an object. Figure 30 on page 50 shows a Helpview on the Filter Display Control.

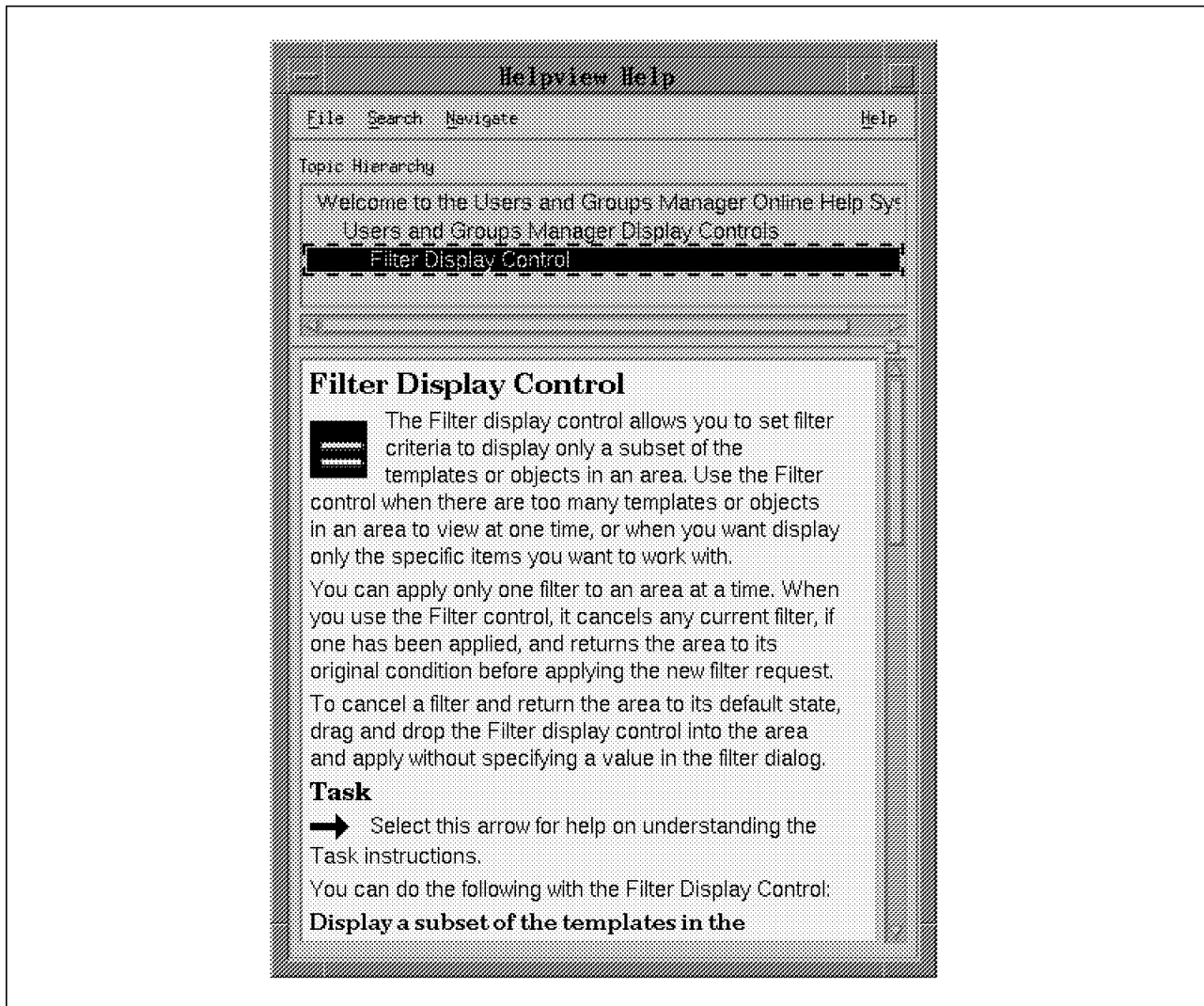


Figure 30. Helpview Window Example

- Notebook

This opens a dialog window displaying the attributes of the selected object and allows you to change those values. If you want to change a users initial program, drag and drop either the user on the Notebook or the Notebook on the user and change the attribute in the line corresponding to the initial program in the dialog window, click on the **OK** button and the change will be issued.
- On Action

This enables a user to login to the system.
- Off Action

This disables a user from logging into the system.
- Set Password Action

This displays a password dialog window where you can change or set a user's password.
- Change Initial Interface Action

This displays a dialog window where you can change a user's initial interface when the user logs in the system. From the dialog window you can select a normal command line, an AIXwindows session or a Desktop session. As shown in Figure 31 on page 51. This feature is for AIX Version 3.2.5 only.

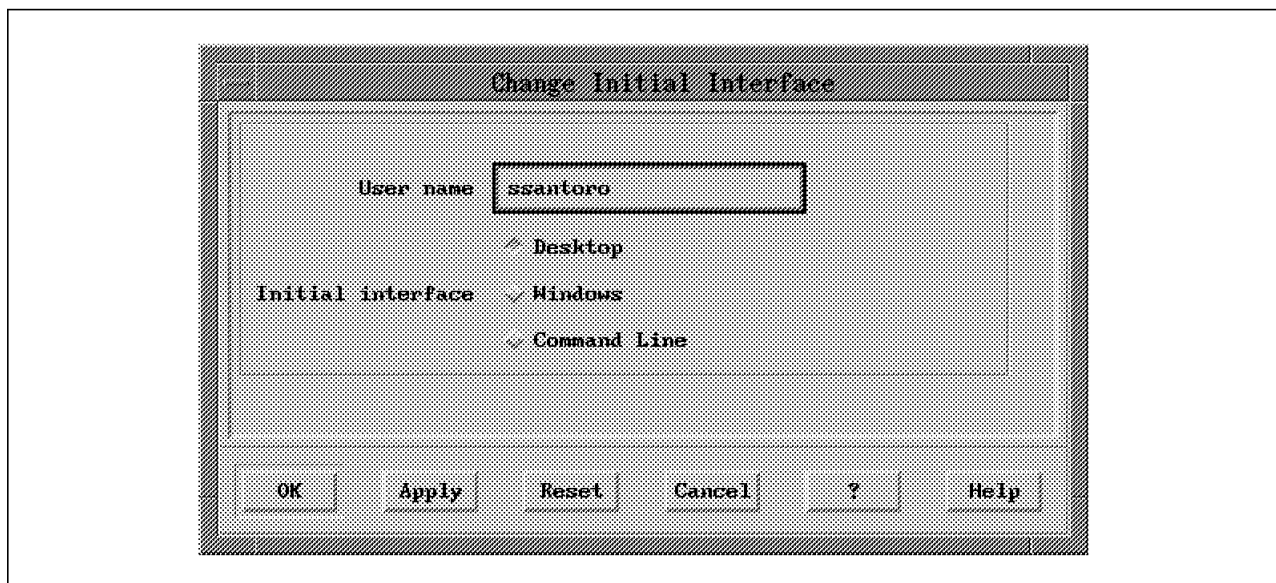


Figure 31. Dialog to Change a User's Initial Program

6.1.4 Information Area

Displays information about the object or area at the current cursor location. To get additional information about the object or area, drag and drop the ? icon on it. If you want general information about VSM or Users and Groups Manager click on the help button, located at the lower right corner of the main window.

At the bottom left corner of the main window, you can use the exit button to end the Users and Groups Manager application.

6.2 Storage Manager

The part of VSM to help you manage your system's hard disk resources is the Storage Manager. The user interface is very similar to the Users and Groups Manager, as you can see in Figure 32 on page 52, but besides the objects and templates which are obviously different, we will deal with the tasks you can perform with this helpful tool.

To run this application type `xlvm` at the command line in any AIXwindows client window prompt.

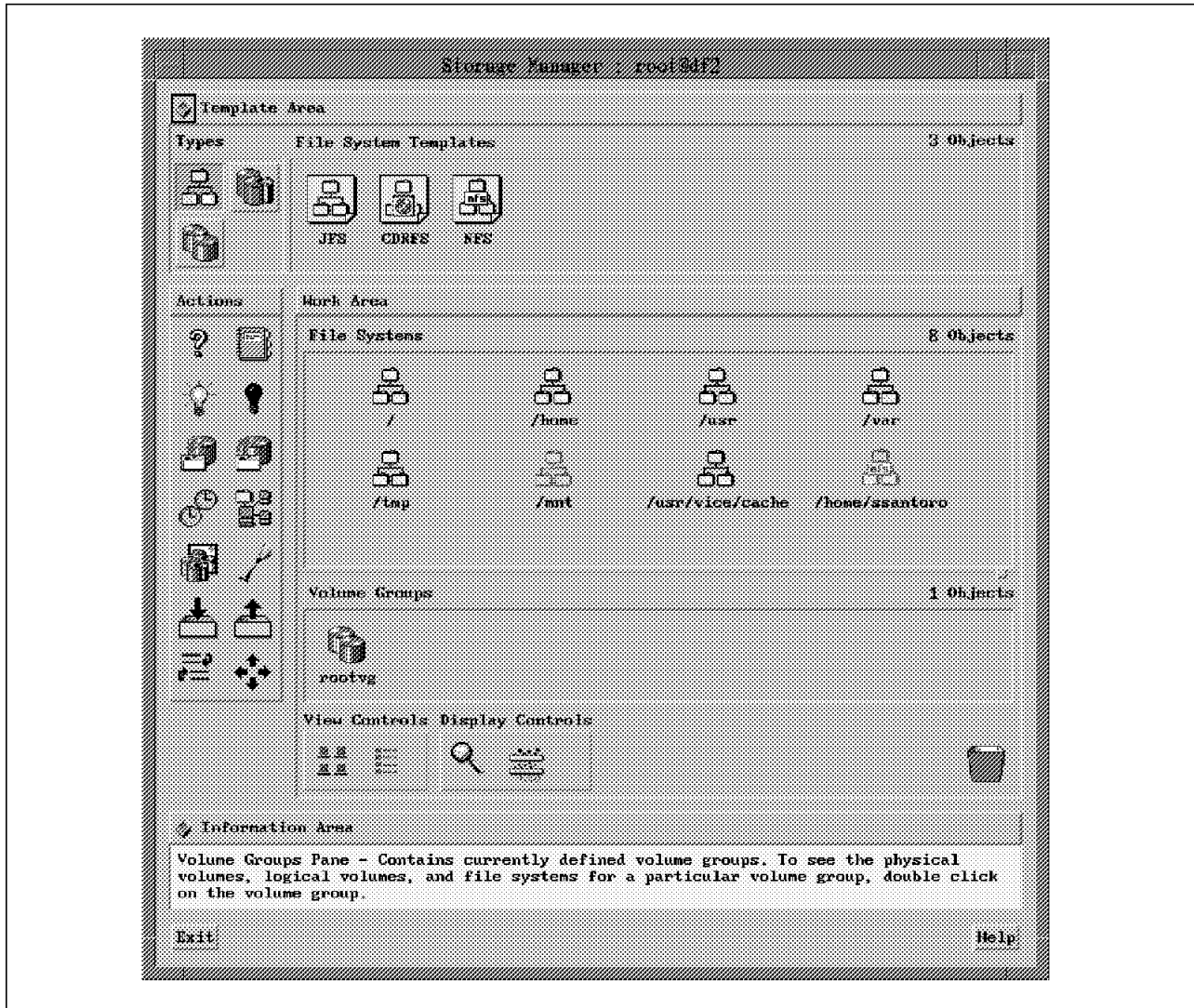


Figure 32. AIX VSM Storage Manager Main Window

The Template Area has three objects:

- Filesystem Template type
- Logical Volume Template type
- Volume Group Template type

Select the Filesystem Template Type, and the Template area will display three templates, a JFS or journaled filesystem template, a CDRFS or CDROM filesystem and a NFS or network filesystem template, as shown in Figure 33 on page 53. Drag and drop a template into the Work Area to create either of these filesystems and a dialog box will pop-up where you type in the characteristics of the new filesystem and click on the **OK** button to have it created.

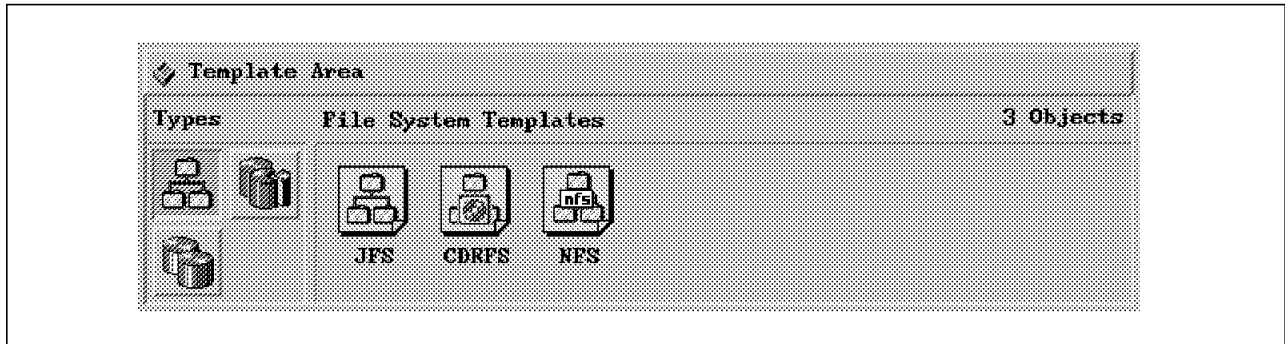


Figure 33. Storage Manager Template Area

At the Template Area, select the Logical Volume Template Type. Five objects corresponding to five templates are displayed:

- Journaled filesystem logical volume template
- Dump logical volume template
- Boot logical volume template
- Paging logical volume template
- JFS log logical volume template

To create any of these logical volumes, drag and drop on the volume groups pane in the Work Area. To create a new template, drag and drop in the Template Area.

At the Template Area, select the Volume Group Template type. Only one template is shown in the Template Area, to create a new Volume Group, drag and drop this template on the Volume Group pane in the Work Area. To create a new template, drag and drop this object in the Template Area.

6.2.1 Work Area and the Actions in Storage Manager

If you look at the Work Area of the Storage manager, notice it is divided into two panes.

The upper pane or Filesystems pane, contains all the filesystems created in your system. A solid color object, indicates a mounted filesystem, while a faded color shows whether it is a not mounted filesystem or a special filesystem (an example of a special filesystem is /mnt filesystem). Today, VSM will not display an AFS** or DFS filesystem.

The lower pane corresponds to the volume groups and will show all volume groups created in your system.

Double click on a volume group and a series of wells will be displayed showing the objects related with that particular volume group. The first well is for the physical volumes on which the volume group resides. The second well displays the logical volumes on the volume group, and the third well displays all the filesystems in the volume group.

Figure 34 on page 54 shows the volume group pane in the Work Area with the wells displaying the objects related to a volume group.

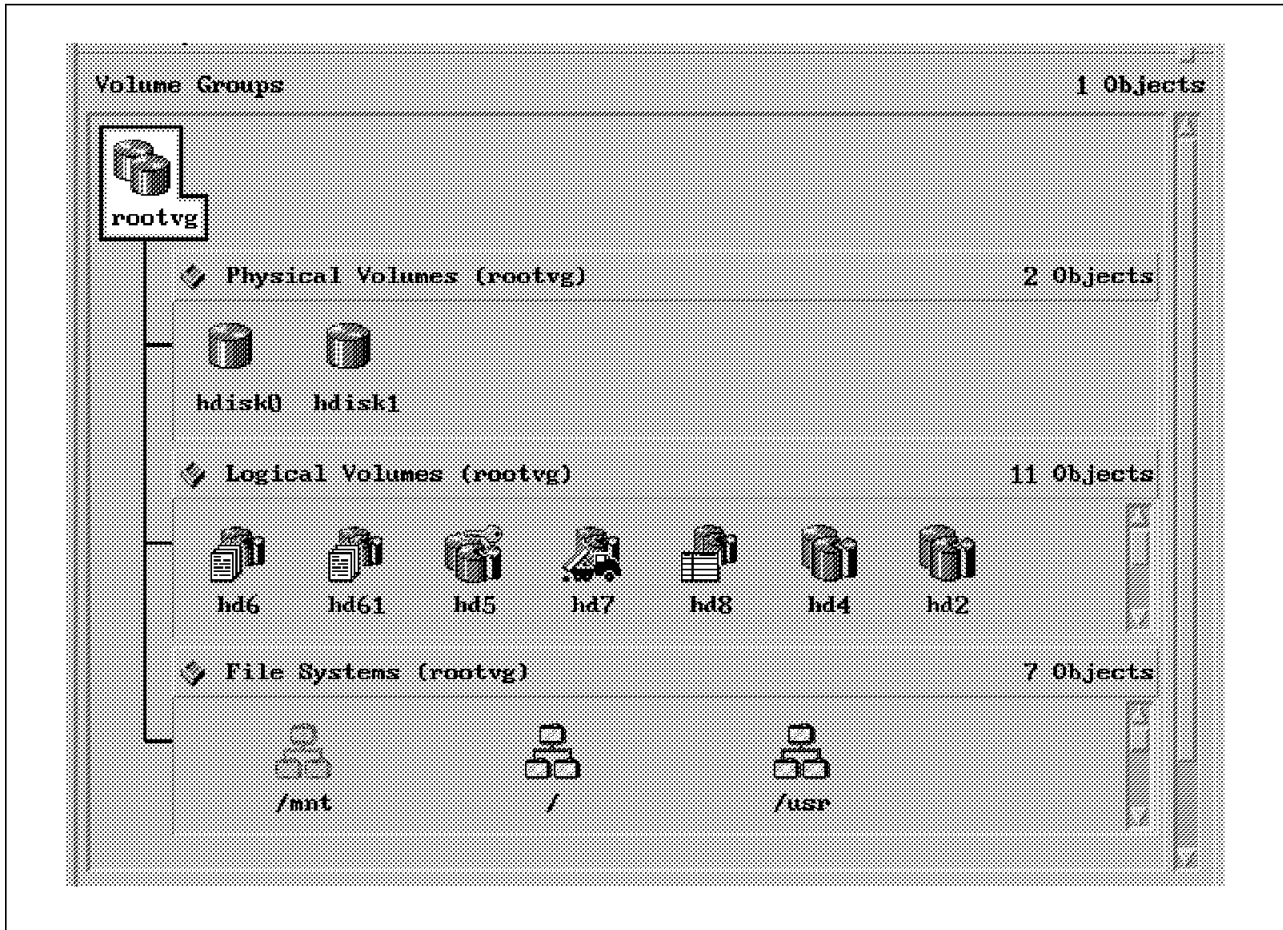


Figure 34. Volume Groups Pane Showing Objects Related to rootvg

The Actions Area contains fourteen objects representing specific commands you can execute with Storage Manager without the need to know the syntax of these commands.

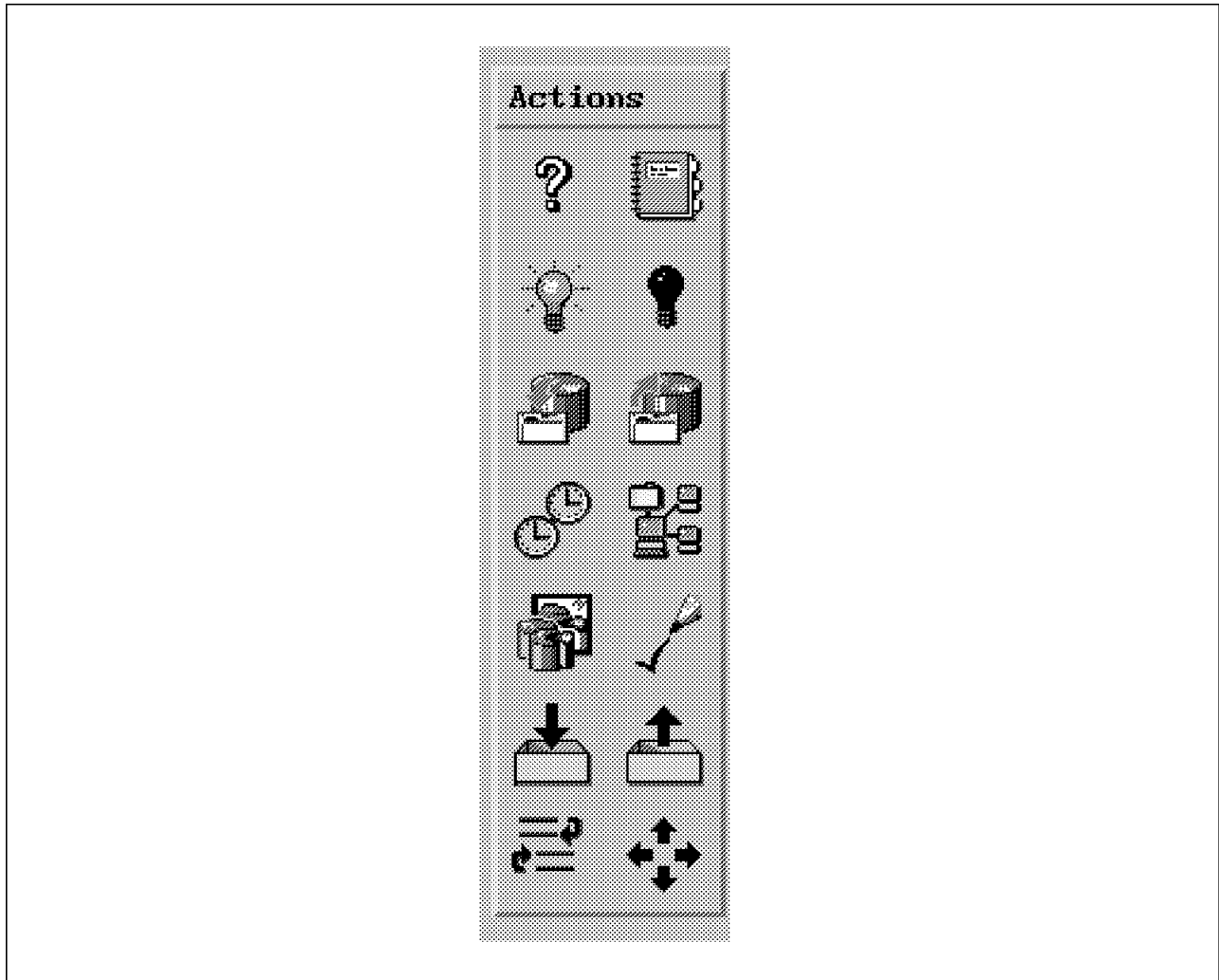


Figure 35. Storage Manager Actions Area

Figure 35 shows the Actions Area and the objects related to it.

- Item Help
Same function as described before.
- Notebook Action
Same function as described before.
- On Action
The On Action executes different commands on different objects.
Drag this action and drop it on a filesystem object and it mounts the filesystem, `mount`. On a volume group, it activates the volume group, `varyonvg`. On a physical volume, it makes it available to the system, `chpv`.
- Off Action
Drag this action and drop it on a filesystem to unmount it, `umount`. Drop it on a volume group to deactivate it, `varyoffvg`.
- Backup Action

You use this action on a filesystem to backup the contents of that particular filesystem, or on *rootvg* volume group to backup the entire volume group in an *mksysb* bootable image.

- Restore Action

This action is used to restore a filesystem from tape.

- Synchronize Action

To sync a journaled filesystem, or write all buffered files of the journal, drag and drop this object on a filesystem. To syncvg a volume group, or to ensure all copies of a mirrored logical volume are current, drag and drop this object on any physical volume, volume group or logical volume.

- Relate Action

Drag and drop on a physical volume to show the physical partition map, this is very useful to visualize the usage of a hard disk drive as seen in Figure 36.

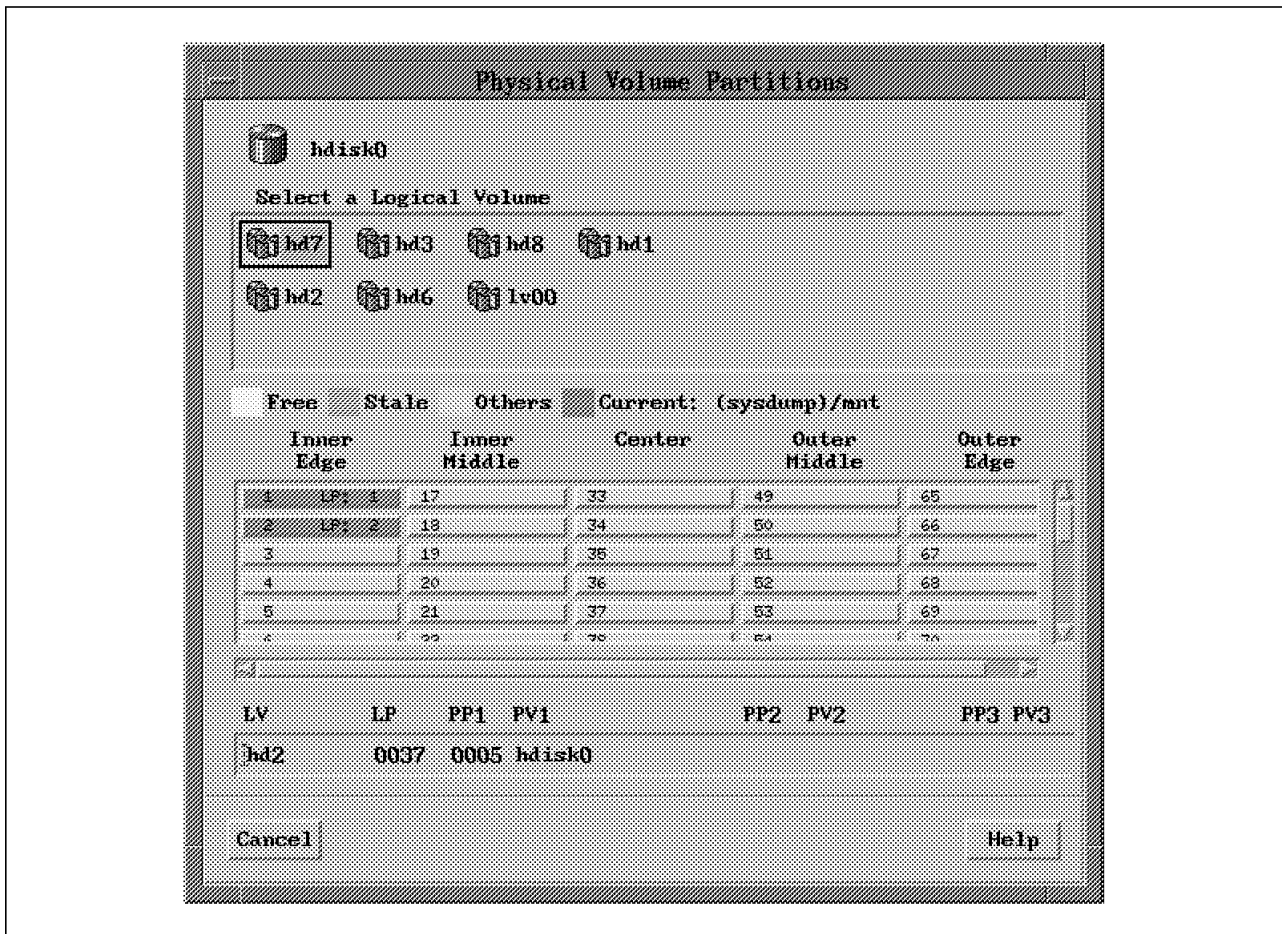


Figure 36. Storage Manager Show Physical Volume Partitions Pop-up Window

- Copy/Mirror Action

To make a copy of a logical volume *cp_{lv}*, or to make or add mirror copies of a logical volume *mk_{lv}copy*, drag and drop this object on a logical volume.

- Verify Action

Drag and drop on a filesystem to check the consistency of the filesystem `fsck`.

- Import VG Action

To import a known volume group with data on the system `importvg`, drag and drop this object on the physical volume where this volume group resides.

- Export VG Action

To export a volume group to make it available to other systems, or just to hide it from the current system, drag and drop this object on a volume group `exportvg`.

- Reorganize Action

The reorganize action `reorgvg` moves the allocated physical partitions within a volume group to improve the disk access time. To reorganize a volume group drag and drop this object on the volume group.

- Move Action

To move the physical partitions from one physical volume to another one or many others `migratepv`, drag and drop this object to the source physical volume. This is very useful to balance workloads among the disks of a volume group.

6.3 Device Manager

The Device Manager application of VSM is the easy way to add, delete, configure and change the characteristics of your system's devices.

To start this application, type `xdevicem` on the command prompt of any AIXwindows client window. See Figure 37 on page 58 for an example of the Device Manager main window.

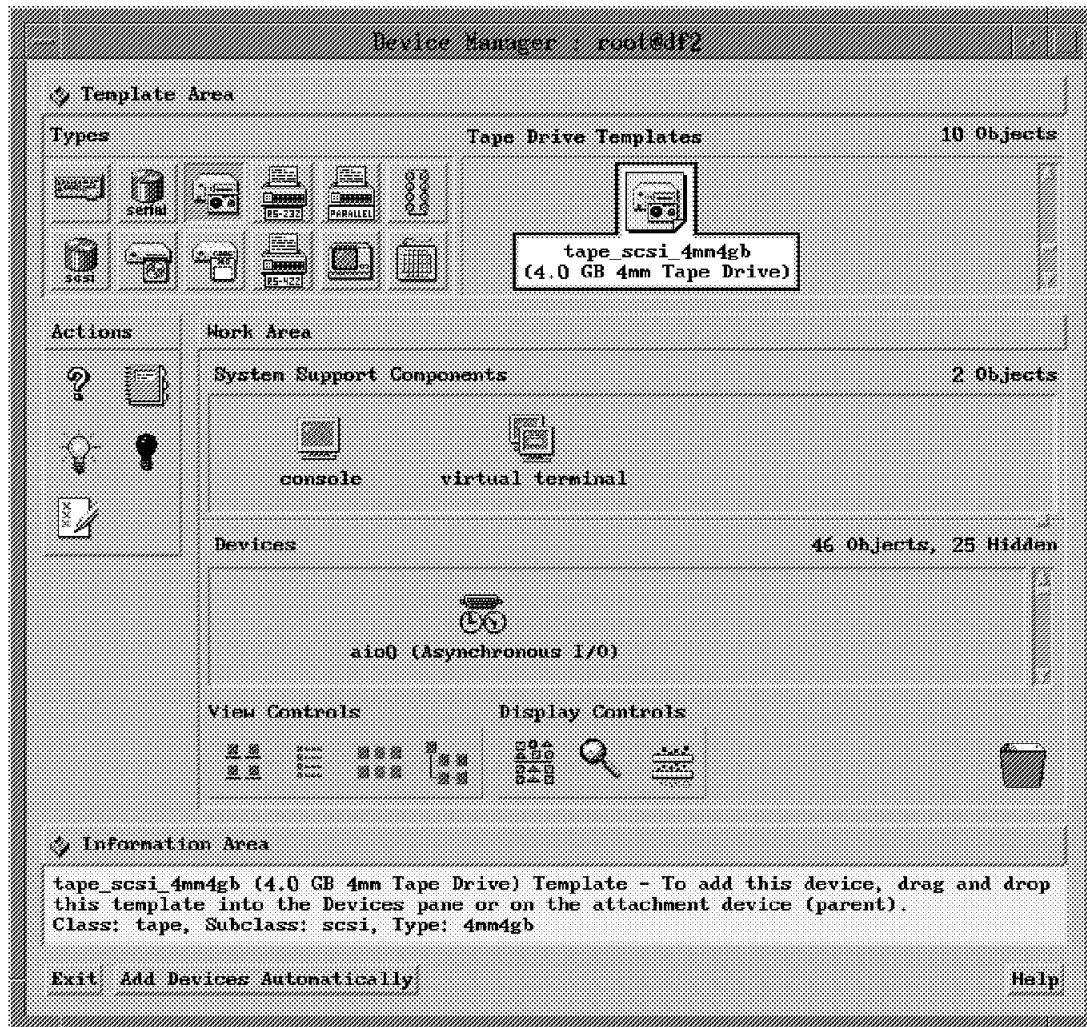


Figure 37. AIX VSM Device Manager Main Window

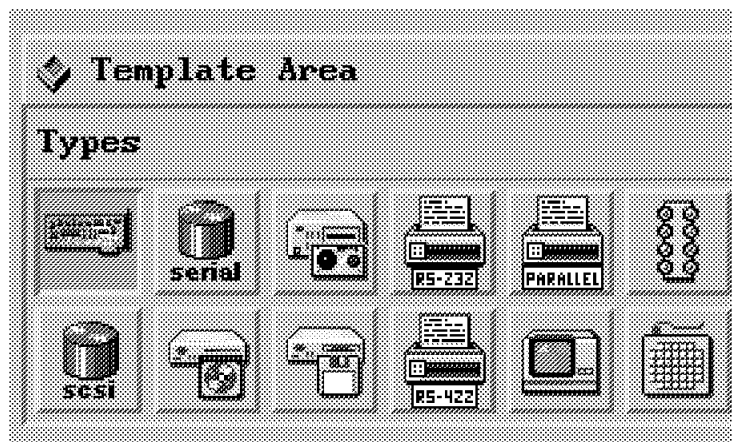


Figure 38. Device Manager Template Types in the Template Area

The types of templates in the Template Area (as shown in Figure 38) display the following template types:

- **SCSI Initiator Device Template Type**
Selecting this template type displays SCSI Initiator templates in the Template Area.
- **Serial-Link Fixed Disk Template Type**
This type displays templates in the Template Area, for serial-link disk drives.
- **Tape Drive Template Type**
This type displays templates for tape drive devices.
To add any of these tape drives to your system, just drag and drop the corresponding template on the Working Area and a dialog window allows you to set the characteristics of the new tape drive.
- **RS-232 serial Printer/Plotter Template Type**
Displays templates corresponding to the RS-232 printers and plotters supported on the RS/6000.
- **Parallel Printer/Plotter device template Type**
Displays templates corresponding to the printers and plotters supported on the RS/6000.
- **Dials Template Type**
Displays templates for dial devices. To add such devices on your system, drag and drop this object into the Work Area.
- **SCSI Fixed Disk Template Type**
Displays templates, corresponding to the different SCSI disk drives supported on the RS/6000, including SCSI, SCSI-2, and SCSI Differential hard disk drives.
- **CDROM Drive Template Type**
Displays templates for the standard CD-ROM, the enhanced CD-ROM and other SCSI CD-ROM devices.
- **Diskette Drive Template Type**
Displays templates for the diskette device.
- **RS422 Serial Printer/Plotter Device Template Type**
Displays templates for the RS422 serial printers supported on the RS/6000.
- **TTY Template Type**
Displays templates for RS232 or RS422 tty devices. To add a template for a tty type, drag and drop either object in the Template Area. To add a tty device, drag and drop either object in the Work Area. Both actions will display a dialog window, so you can key in the desired characteristics of the new device or template.
- **Lighted Programmable Function Keyboard (LPF Keys) Template Type**
Displays templates for this device. To add a lighted programmable function keyboard to your system, drag and drop this object in the Work Area.

When the action of adding an object to the system, or any other action in VSM, could not be performed, a pop-up error message window is displayed to inform the system has encountered an error condition.

You can display an error log by clicking on the log button at the lower right corner of this window, and a new window then displays the error log, as shown in Figure 39.

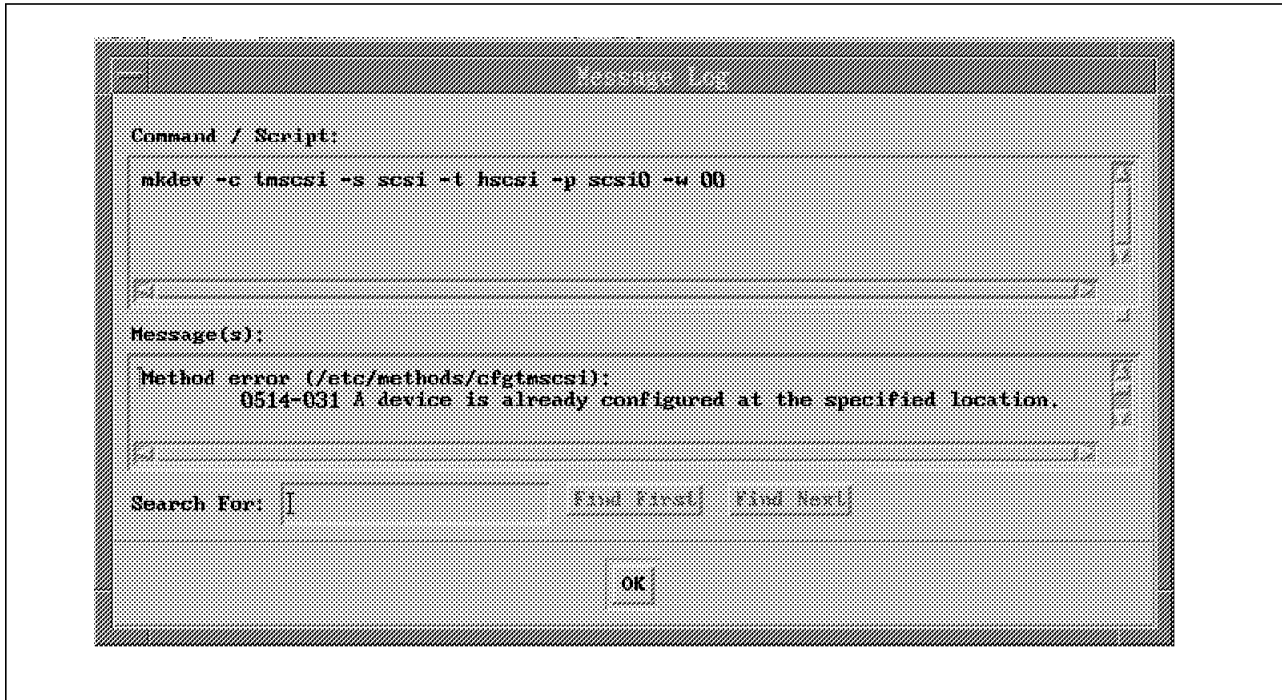


Figure 39. Pop-up Window for the Error Log

6.3.1 Work Area and Actions in the Device Manager

There are five actions you can perform with the Device Manager, as you can see in Figure 40 on page 61. You can:

- See the information for an object with the ? icon
- Use the notebook to change the characteristics of a device or template
- Use the On Action to activate a device
- Use the Off Action to unconfigure a device (remains as defined)
- Generate an error report on a device, this uses the `errpt` command to look at the error log, but confines the search to the device you select

The Work Area is divided into two panes, the upper pane corresponds to the system support components, that is the devices that allow you to communicate normally with your system. In this pane you find the console icon and the virtual terminal icon. With these two objects you can assign the system console or change the number of maximum virtual terminals allowed in your system, respectively. This pane is available in AIX Version 3.2.5 only.

In the lower pane you find the devices configured in your system. In Figure 40 on page 61 you can see the devices of this particular system in a dependence tree.

We used the Tree Form View Control located at the View Controls box at the bottom left corner of the Work Area to achieve this view.

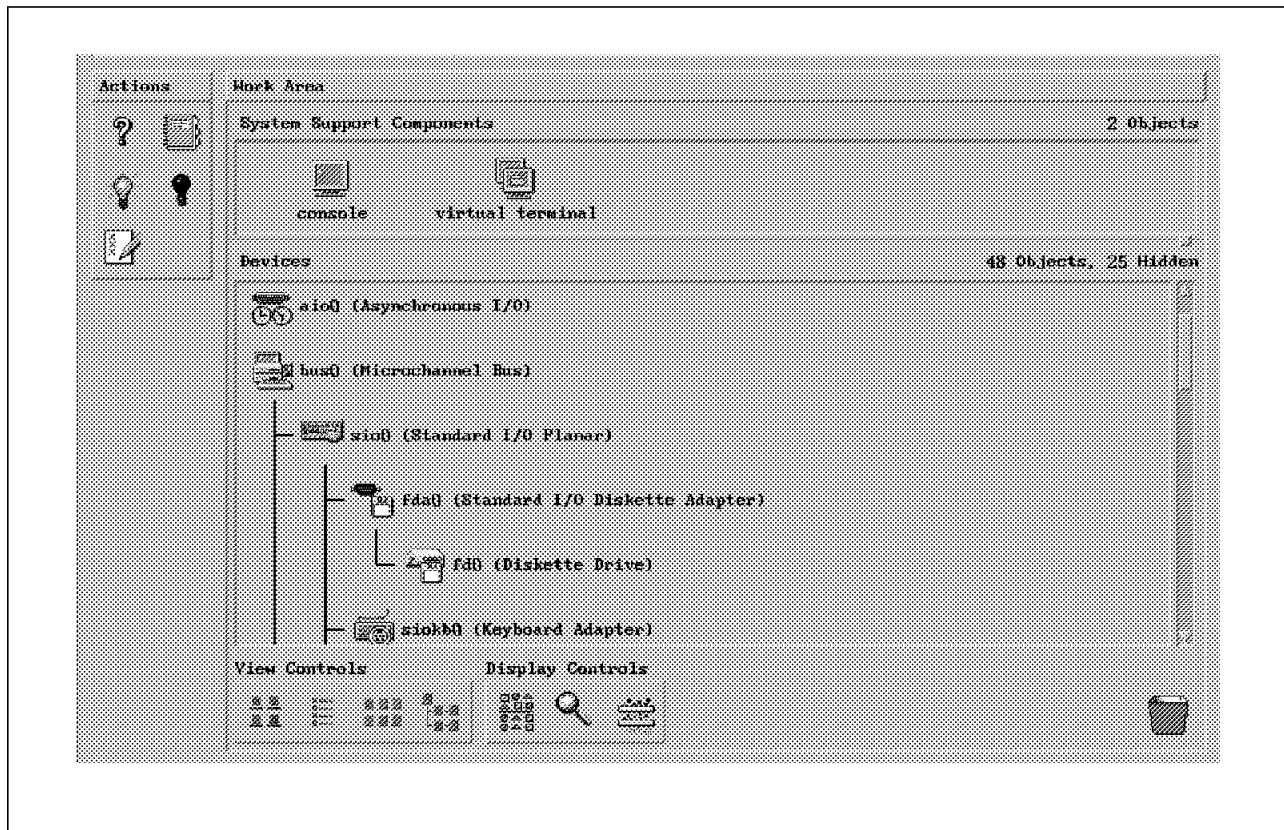


Figure 40. Work Area and Actions Area of the Device Manager

Notice that some actions cannot be performed against particular devices, for example you cannot configure the device `mous0` since it does not have a configuration method. Also be very careful when unconfiguring devices, since you might not be able to reconfigure them again without rebooting your system.

6.4 Print Manager

When you need a graphical tool to manage your printers, spoolers and print jobs, key in `xprintm` at a window prompt.

At the Template Area, you have two types of templates, one for printers and a second one for queues.

The Work Area is divided into two panes, the upper one is for queues and print jobs, while the bottom one is for print devices.

Figure 41 on page 62 shows the Print Manager main window.

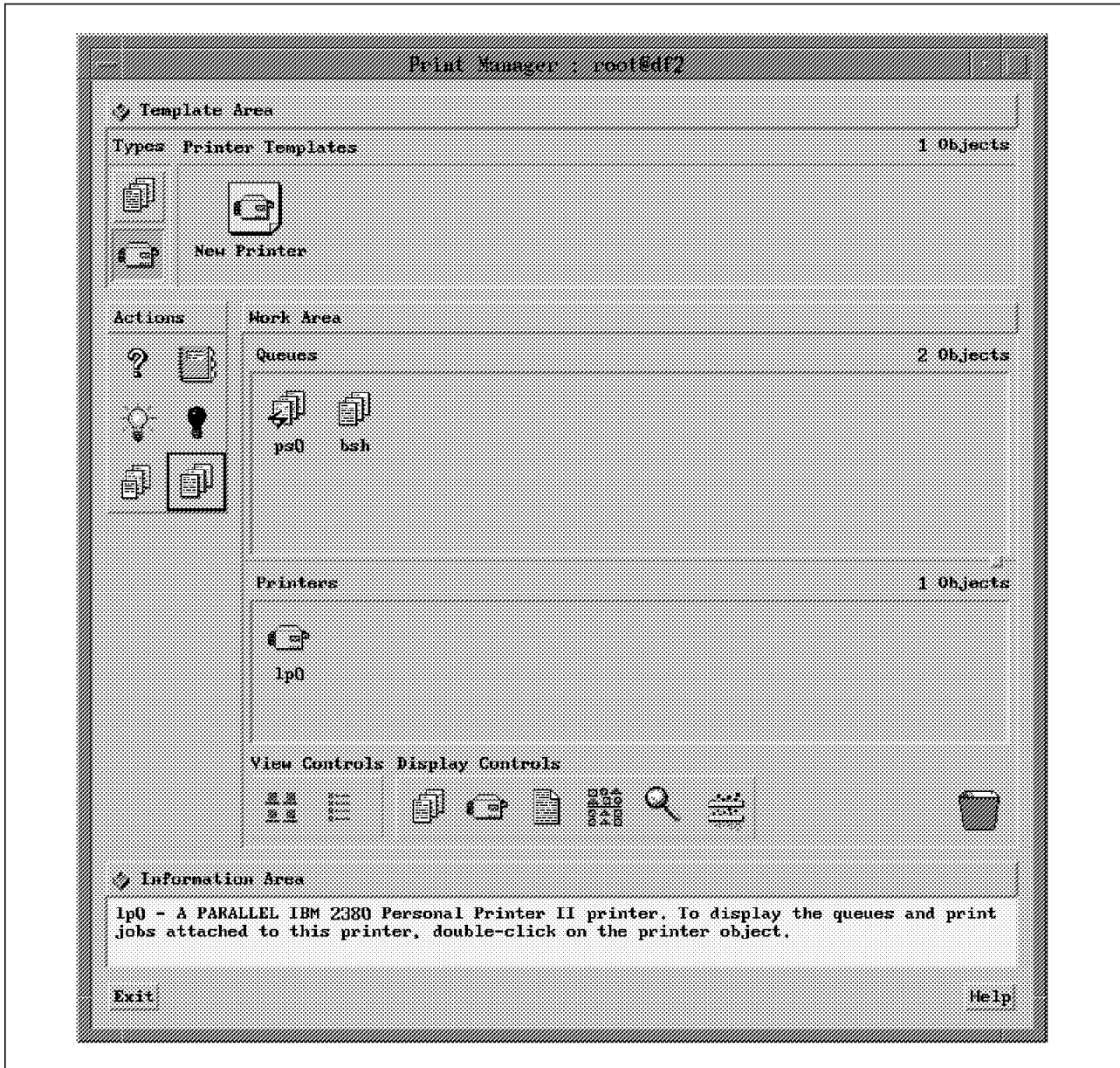


Figure 41. AIX VSM Print Manager Main Window

To display the print jobs associated with a queue, and the printers on which these jobs are to be printed, double click on a queue object. This action displays two wells attached to the queue: one for the printers and the other for the print jobs. You can also use the Display Controls at the bottom of the Work Area, where three new objects are found: a Queues Display Control, a Printers Display Control, and a Print jobs Display Control.

To close all displayed wells, just double click on the parent object.

To update the list of print jobs in the Print Jobs Well, close the well and then reopen it.

By enlarging the upper pane with the sash button, located to the right on the dividing line, you can get a better view of the print jobs running in a particular queue, as shown in Figure 42 on page 63.

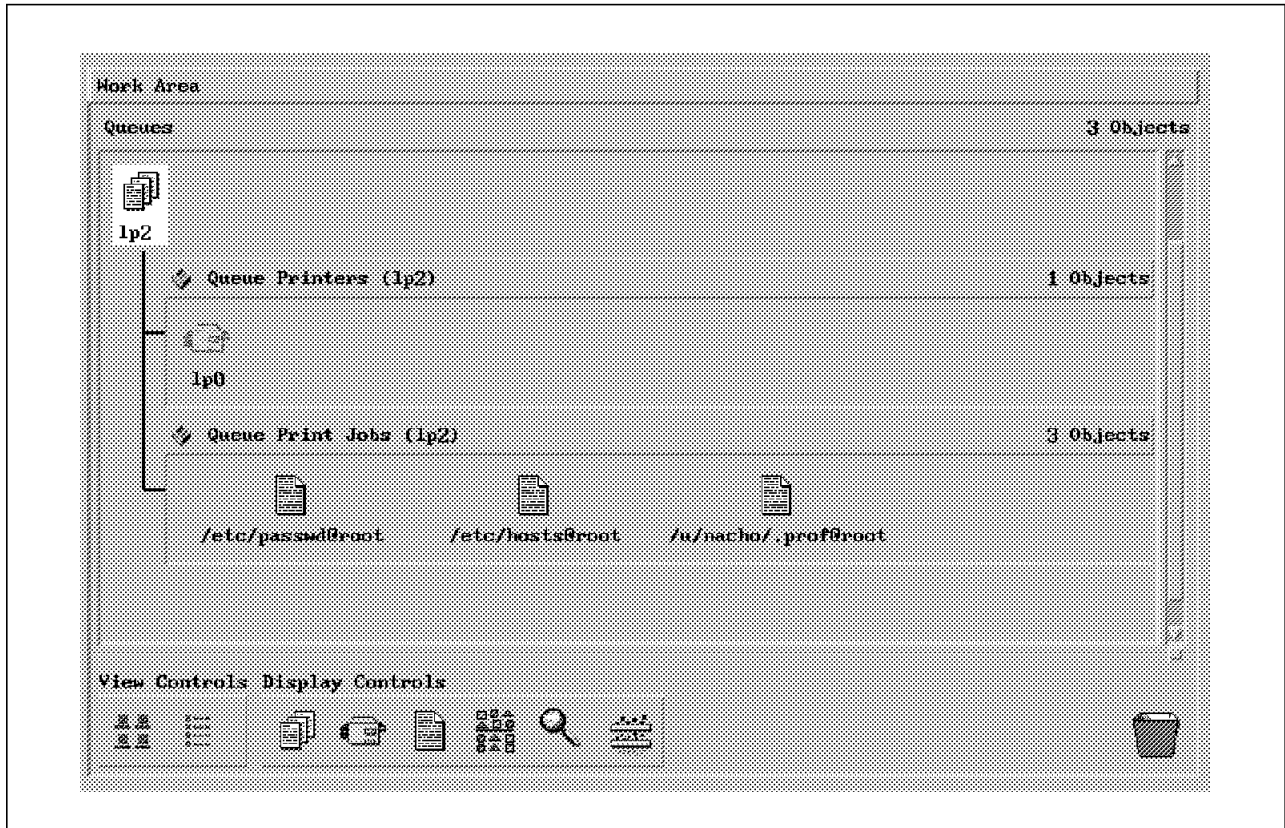


Figure 42. Queue Monitoring Using Print Manager

To cancel any print job just drag and drop the print job object from the well into the trash.

6.4.1 VSM the Easy Way to Manage Your AIX System

As you have seen in this chapter, the tools that are part of VSM provide an easy and straightforward way to manage your RS/6000, whether or not you are familiar with the administrative tasks and commands associated with it.

Chapter 7. AIX Version 4.1 System Management and VSM Enhancements

This chapter contains descriptions of all the new functions and features that enhance System Management with AIX Version 4.1. This includes all enhancements provided by AIX Visual System Management (VSM). A brief System Management point of view of the new COSE/Common Desktop Environment is also included.

This chapter is partitioned in three sections:

- System Management Enhancements

DSMIT has the same functions in AIX 3.2 and AIX 4.1. So, you can install and configure DSMIT in AIX 4.1, in the same way you have already been working in the AIX 3.2. DSMIT functionality was not changed but the System Management functions were enhanced. This function was included in the SMIT menu options. This part of the chapter will introduce the main functions enhanced in SMIT.

- VSM Enhancements

This part of the chapter shows all the enhancements found in the VSM application when executed in AIX 4.1.

- Common Desktop Environment Style Guide

This last part of the chapter introduces COSE/Common Desktop Environment and how to start the VSM application using this Desktop.

7.1 System Management Enhancements

AIX 4.1 includes some important features for System Management. It includes a Command Line Interface, a Software License Management, SMIT Printer Interface, Backup/Restore Support and Security.

7.1.1 Command Line Interface

The Command Line Interface is available just in AIX 4.1. These are useful for script writing and cron jobs. They can also be used inside C programs using system calls. The syntax for the Command Line Interface is as follows:

```
crex [ -w Machine1,Machine2 ... ] [ -W Domain1,Domain2 ... ] Command
```

```
srex [ -w Machine1,Machine2 ... ] [ -W Domain1,Domain2 ... ] Command
```

For example, if you want to create a new user *ssantoro* in three machines, *baseball*, *football* and *soccer*, which have the same operating system without use the DSMIT interface, you can do executing the following command:

```
crex -w baseball,footbal,soccer mkuser ssantoro
```

The user *ssantoro* will be created in each machine in a Concurrent Mode, because was used the `crex` command.

Now, if you have already defined a domain of machines named *sports-domain* with the same three machines, you can create the user *ssantoro* executing the following command:

```
crex -W sports-domain mkuser ssantoro
```

7.1.2 iFOR/LS Licence Management

An important improvement with AIX 4.1 is including a License Manager in SMIT. The License Management is made possible by the iFOR/LS application. iFOR/LS manages and distributes software licenses electronically and allows a customer to pay only for copies of an application which are actually used, instead of buying a copy for each machine, even those that rarely require the product.

This new feature has an important characteristic. It can be run in multiple platforms besides AIX such as, HP/UX8**, HP/UX9, SunOS4.1, DECstation** and NeXT** operating systems. Working in multiple platforms administrators can manage all license servers on a network from a single workstation without executing remote logins.

From the license servers point of view, they can operate independently, so the administrator can partition licenses among multiple servers. For instance, the administrator has 15 licenses from one application, in order to have an easier administration, the system administrator can install all the licenses in only one server. Another type of configuration is to install five licenses in three different servers to increase the availability of the application and balance license requests. If one of the license servers is down, the application can be invoked through another license server.

The license is associated with a specific machine. AIX uses the CPU ID, which is a hardware constant that distinguishes different machines.

In order to allow an application to work with the license server, the developers need to enable their code. There is a license program product named iFOR/LS Application Developer's Toolkit (ADK). It comprises the libraries that bind license management calls such as those to request and release licenses.

There are different types of software licenses. One does not make use of the network or the license server. This is called *Node Lock*. This type of license allows an unlimited number of users but only to a particular machine. In this case both the application and the license are installed on the same machine. The file that will be consulted to grant or not grant the access to an application is: `/usr/lib/netls/conf/nodelock`.

The other types of licenses require a server, they are:

- *Concurrent Use*

This type of license is similar to Node Lock but, in this case, this floating license allows users to load and run software over a network. Like the Node Lock license, the application is installed on one machine. When a software product is started, it communicates with the license server on the network, to have any license made available.

- *Use-Once*

This type of license allows users to run an application one time. The license server will not allow this application to be used again after its initial use.

Another way to use this is to install several Use-Once licenses, so the application can be invoked a predetermined number of times. For instance, a software product can be sent for demonstration with this type of license. A Use-Once license can also be invoked when a software product's Concurrent Use license has no more license to offer.

- **Compound License**

This type of license bundles a group of iFOR/LS licenses for later redistribution. When a compound license is received, an administrator can generate a limited number of licenses for target machines.

- **License Combinations**

This type of license provides great flexibility. A common form combines a Concurrent Use license and a Node Lock license. For instance, a large company has 80 machines and an application which can be executed only on 10 specific machines. This company can purchase 5 concurrent use licenses and 10 node lock licenses, one for each machine.

- **Developer Licences**

This type of license enables the license generator portion of the Application Developer's Toolkit to create licenses for testing.

Figure 43 shows the new SMIT dialog menu for Software License Management.

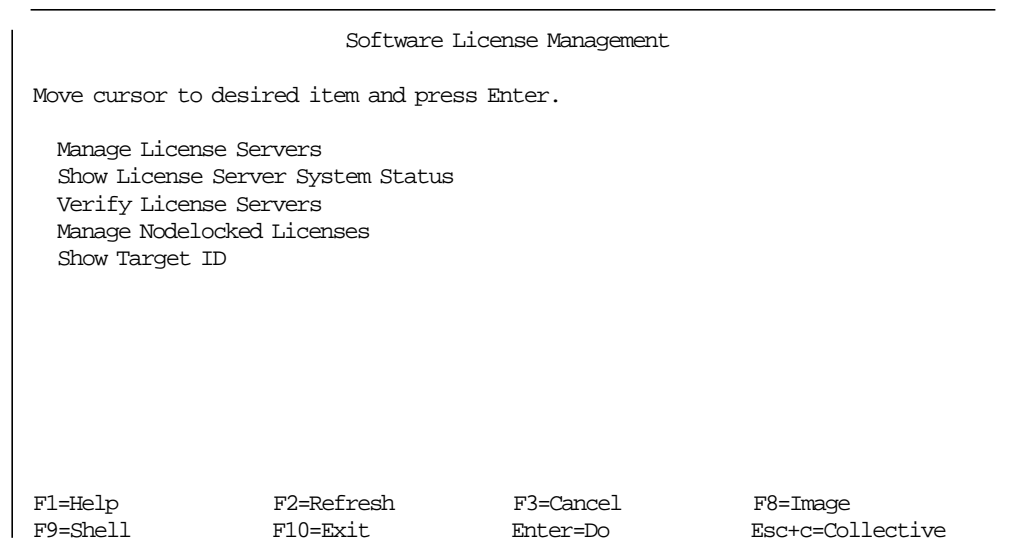


Figure 43. Software License Management Menu

This menu can perform several tasks:

- **Manage License Servers**

This task is responsible to manage all the license servers. You can manage product licenses, manage vendors and show all the information about the license servers on a network including address family, address, port number, target type and target ID. SMIT will open dialog menus for each different task.

- **Show License Server System Status**

This task shows the information concerning license servers and the licenses they contain such as, Total License Usage, Installed Licenses, Current License Usage and Licenses Held by a Specific User.

- Verify License Servers

This task shows the output from an attempt to test the license servers on a network.

- Manage Nodelocked Licenses

This task is responsible for managing a nodelocked license on a system. This task allows users to add a node locked license from a file, add a node locked license from the keyboard, delete a node locked license and show node locked licenses.

- Show Target ID

This task Shows the target ID of the current machine. This information is needed when ordering node lock licenses.

7.1.3 Printer Support

The SMIT Print Interface has been improved for AIX 4.1. The SMIT Print Interface allows system administrators to manage printers and attach unsupported printers with greater ease. The user can add or remove a print queue in a one step operation and when the user changes a print queue or submits a print job, only the valid changes for the selected queue are presented.

There are some important enhancements with the spooler. New commands and flags have been included to improve the spooler functionality. Users can move print jobs from one print queue to another and hold a spooled job by putting it in a holding state where this job will stay queued, not printed, until it is released.

It is important to know that some printer names have been changed from AIX 3.2 to AIX 4.1. AIX 4.1 also includes support for some Lexmark** printers and some new Japanese printers. See Appendix E, "List of the Printer Names Changed" on page 127 for the list of changes and the list of the new supported printers.

The new SMIT dialog menu for Print Spooling is shown in Figure 44 on page 69.

```

Print Spooling

Move cursor to desired item and press Enter.

Start a Print Job
Manage Print Jobs
List All Print Queues
Manage Print Queues
Add a Print Queue
Add an Additional Printer to an Existing Print Queue
Change / Show Print Queue Characteristics
Change / Show Printer Connection Characteristics
Remove a Print Queue
Manage Print Server
Programming Tools

F1=Help          F2=Refresh       F3=Cancel        F8=Image
F9=Shell         F10=Exit         Enter=Do         Esc+c=Collective

```

Figure 44. Print Spooling Menu

7.1.4 Backup/Restore Support

The **Physical & Logical Storage** SMIT menu option from AIX 3.2 was changed in AIX 4.1 to give support for new features implemented. The first change was the name. The new name is **System Storage Management**. This is one of the menu options from the first SMIT panel. The second and most important change was the option included in this menu, see Figure 45.

```

System Storage Management (Physical & Logical Storage)

Move cursor to desired item and press Enter.

Logical Volume Manager
File Systems
Files & Directories
Removable Disk Management
System Backup Manager

F1=Help          F2=Refresh       F3=Cancel        F8=Image
F9=Shell         F10=Exit         Enter=Do         Esc+c=Collective

```

Figure 45. System Storage Management Menu

Through the **Logical Volume Manager** you can select the **Back Up a Volume Group** menu option. This option will create a volume group backup image of a volume group which can be used to restore this volume group. This option is normally used for backing up users volume groups but it can be used to backup any volume group in the system. So, you can back up each of the volume groups on different tapes. For instance, the user can install a new system, via network install, with a `rootvg` volume group image that was created using this option.

Through the **File Systems** menu options you can select **Backup a File System** option. This option will create copies of your file system on a backup media, such as a magnetic tape or diskette. You cannot use a file as the target of the backup and all copies are in backup by *i-node* format. In AIX 3.2 you can find both device and file as output. If you were backing up a file it would be backed up by name, while backing up a filesystem would be backed up by inode number.

Through the **Files & Directories** menu options you can select the **Backup a File or Directory** option. This option will create copies of your files, directories or both on a backup media. Again, you cannot use a file as the target of the backup but the files or directories will be backed up by name. Basically, the file and directory backup was separated from the filesystems backup due to organizational reasons.

Through the **System Backup Manager** menu options you can select the **Back Up the System** option. In this option you can create a backup image of the operating system, list files in a system image backup and restore individual files from a system image backup. This backup can be an installable image of the `rootvg` .

The difference between the backup image created by the **System Backup Manager** option and the backup image created by the **Logical Volume Manager** is that the second backup image is bootable when in a tape and the first one is not, but can be used via Network Install.

If the system backup file has been created on one system type, it cannot be installed on different system type machines due the differences in the architectures. The same is true when a system backup file has been created on a uniprocessor machine. This image will not work on a multiprocessor machine.

7.1.5 Security

Security functional enhancements are included in AIX 4.1. A new option was created in the **Security & Users** menu options. The **Login Controls** option has been created to provide menus to change or show login controls for users or ports. See Figure 46 on page 71 for the options that SMIT allows to set up in the users **Login Controls** option.


```

Change / Show Login Attributes for a User

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

* User NAME                                [Entry Fields]
User can LOGIN?                             true                +
User can LOGIN REMOTELY?                    true                +
Valid TTYS                                  [ALL]
Allowed LOGIN TIMES                          []
Is this user ACCOUNT LOCKED?                false               +
Number of FAILED LOGINS before              [0]                 #
    user account is locked
Login AUTHENTICATION GRAMMAR                [compat]

F1=Help          F2=Refresh          F3=Cancel          F4=List
F5=Reset         F6=Command          F7=Edit            F8=Image
F9=Shell         F10=Exit            Enter=Do

```

Figure 46. Login Controls Menu

So, you can restrict the user account access. You can setup whether the user can log into the system with the `login` command, grant access using `telnet` or `rlogin` commands, specify the terminals that this user can access, specify the time of the day or the days of the week to access the account, lock the user account or specify the number of consecutive unsuccessful login attempts the user is allowed.

A new option was created in the **Passwords** menu options. The **Change / Show Password Attributes for a User** was created to change the attributes that control a user's password. See Figure 47 on page 72 for all of the options in the **Change / Show Password Attributes for a User** option.

```

Change / Show Password Attributes for a User

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

* User Name                                     [Entry Fields]
                                                ssantoro
Days to WARN USER before password expires    [0]          #
Password CHECK METHODS                        []
Password DICTIONARY FILES                    []
NUMBER OF PASSWORDS before reuse             [0]          #
WEEKS before password reuse                  [0]          #
Weeks between password EXPIRATION and LOCKOUT [-1]
Password MAX. AGE                             [0]          #
Password MIN. AGE                             [0]          #
Password MIN. LENGTH                          [0]          #
Password MIN. ALPHA characters               [0]          #
Password MIN. OTHER characters               [0]          #
Password MAX. REPEATED characters            [8]          #
Password MIN. DIFFERENT characters           [0]          #
Password REGISTRY                            []

F1=Help          F2=Refresh      F3=Cancel      F4=List
F5=Reset         F6=Command      F7=Edit        F8=Image
F9=Shell         F10=Exit        Enter=Do

```

Figure 47. Change / Show Password Attributes for a User Attributes Menu

So, You can manage the users password by checking the password triviality, password reuse and password lifetime.

7.2 VSM Enhancements

VSM for AIX 4.1 now is composed of six independent applications. All of them perform different system administration tasks. These applications are:

- Install and Update Software Manager
- Maintain Installed Software Manager
- Users and Groups Manager
- Storage Manager
- Device Manager
- Print Manager

The Install and Update Software Manager and Maintain Installed Software Manager applications are available exclusively with AIX 4.1. They are new management tools for software installation.

7.2.1 Command Line

You can start all the VSM applications through the command line. These commands are in the directory `/usr/bin/X11`:

- `xinstallm` is the command to start the Install Manager application.
- `xmaintm` is the command to start the Maintain Software Manager application.
- `xdevicem` is the command to start the Devices Manager application.
- `xprintm` is the command to start the Print Manager application.
- `xlvm` is the command to start the Storage Manager application.
- `xuserm` is the command to start the Users and Groups application.

7.2.2 Common Changes

The new Pop-Up Menu and a new Help Viewer Window are the common changes found in all VSM applications.

7.2.2.1 New Pop-Up Menu

VSM includes one facility to execute actions from a pop-up menu. Each specific application area has its own pop-up menu. For instance, the Template Area has the Template Area Menu that can be accessed by clicking and holding, in this area, the right mouse button. The options are:

- Show Large Icons - F5
- Show Small Icons - F6
- Minimize
- Maximize
- Help - F1

Using the first two options of this pop-up menu you can change the status size of the icons in the Template Area. You can execute this action using the view controls. Drag one of them and drop it in the Template Area. The **Minimize** and **Maximize** are related with the status size of the Template Area. You can open or close the Template Area by choosing the **Maximize** or **Minimize** menu

option, respectively. In the same way you can execute this action by clicking the Template Area Button at the left top corner of the Template Area. The last option is **Help**, that will open a pop-up menu with information for the specific area. The functions keys F5, F6 and F1, can be used to execute the actions.

There is no Template Area in the new tools but you will find the following menus in all tools:

- Main Window Menu
- Information Area Menu
- Specific Object Menu

Each tool will have its specific menu inside the work area. For instance, the Storage Manager Tool has two other menus:

- Volume Group Menu
- File System Menu

The Specific Object Menu means, if you click the right mouse button over an object, the specific menu for this object will be open. For instance, if you select an object that you want to execute an action, click the right mouse button over the object that executes this action, then a pop-up menu will show you the menu option.

7.2.2.2 Help Viewer Window

The Help Viewer Window has changed in AIX 4.1, also. It has more options to work with. There are four new buttons, Backtrack, History, Index and Top Level. The Online Help System option list was increased with more options. You can see in Figure 48 on page 75, the Help Viewer window with Logical Volume Template Type information.

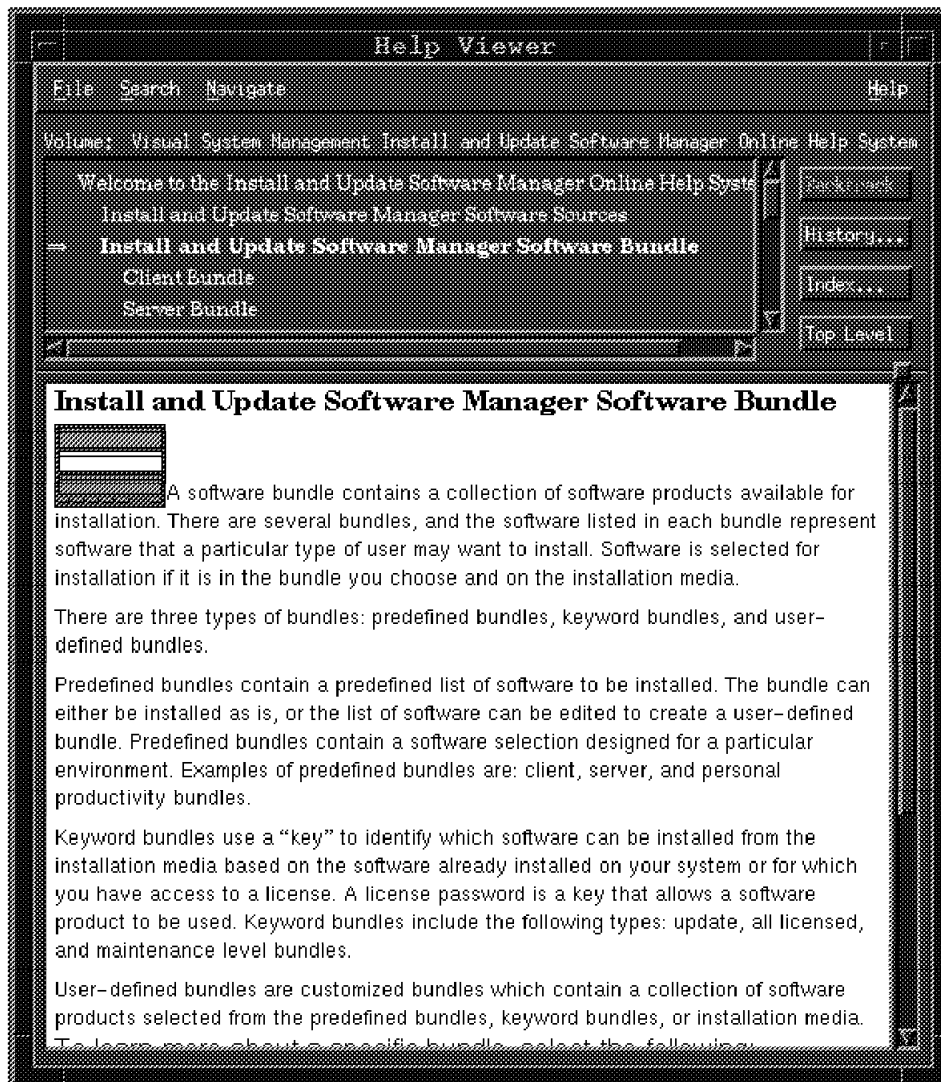


Figure 48. Example of the New Help Viewer window

7.2.3 Install and Update Software Manager

The Install and Update Software Manager is the new VSM application which has been designed to provide a means of understanding relationships between licensed products, installable filesets, maintenance levels, enhancements and fixes. Also, it is designed to provide an easy way to make selections for installation and fileset updates of the system.

To start this application click on the **Install and Update Software Manager** desktop icon or type `xinstallm`. Figure 49 on page 76 shows an example of the Install and Update Software Manager window.

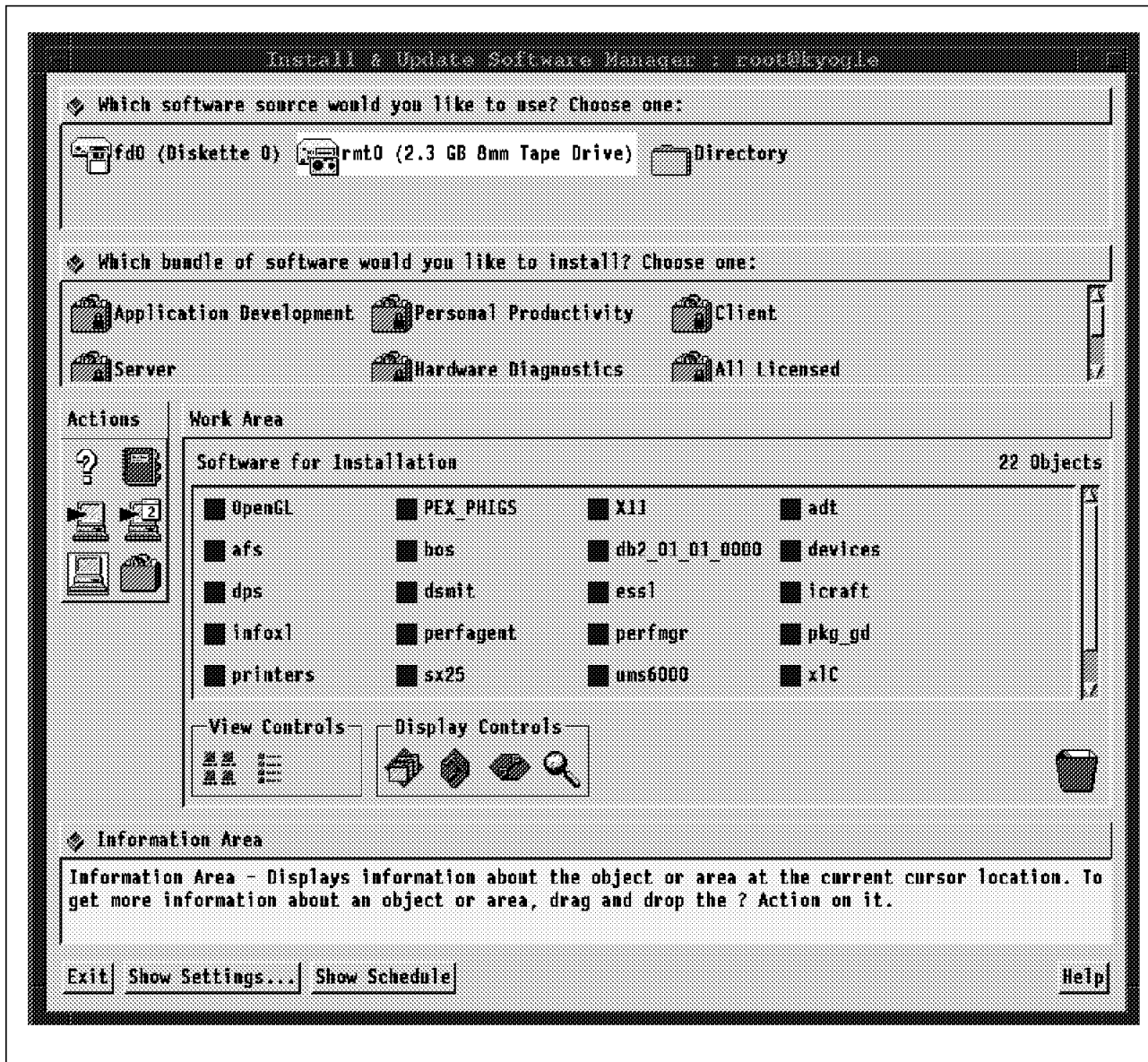


Figure 49. AIX VSM Install and Update Software Manager Window

7.2.3.1 Software Sources and Software Bundles Area

The Software Source Area contains the sources available on the system from which you can install your software. In Figure 49 you can see the diskette, 8mm tape drive and directories as software sources.

A software Bundle Area contains a collection of software products available for installation. There are several bundles. The software listed in each bundle represents software that a particular type of user may want to install. Software is selected for installation if it is in the bundle you choose and on the installation media. For more information about Software Bundle, drag the Help icon from the Action Area and drop in the Software Bundles Area.

7.2.3.2 Work Area and Actions

Basically, you can perform the following tasks using the Install Update Software Manager:

- Install or update software packages
- Set default install settings
- Preview size/options required for install packages
- Copy install images for use in future installs
- Create new install bundles

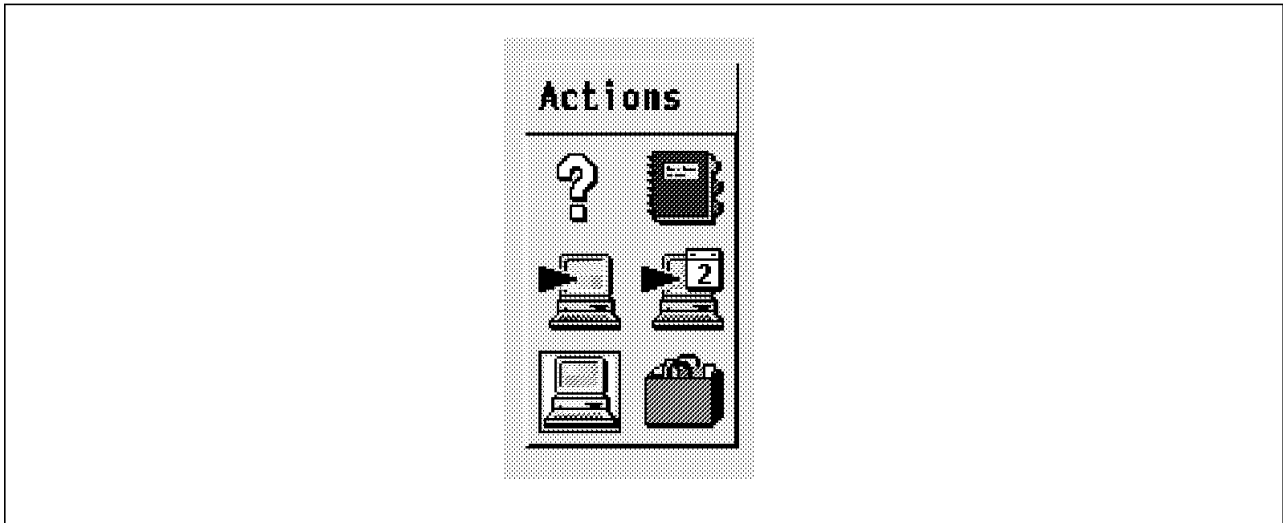


Figure 50. Install and Update Software Manager Action Area

The Action Area contains six objects that contain activities you can perform in this application, see Figure 50.

- Item Help
Same function as described before.
- Notebook Action
Same function as described before.
- Install/Update Action
To install an object just select the object and then select this action.
- Schedule Install/Update
To schedule an installation, select the objects and then select this action. A dialog window named Schedule a job will be displayed. You can set the date and time you want to start the installation, see Figure 51 on page 78.
- Preview Action
Select a software product and execute this action. It displays a dialog for you to view the size and space required to install or update this software product.
- Create a Bundle Action
To create a new Bundle, select the objects that you want to include in the new Bundle and select this action. A dialog window will be displayed. Enter the name of the new bundle.

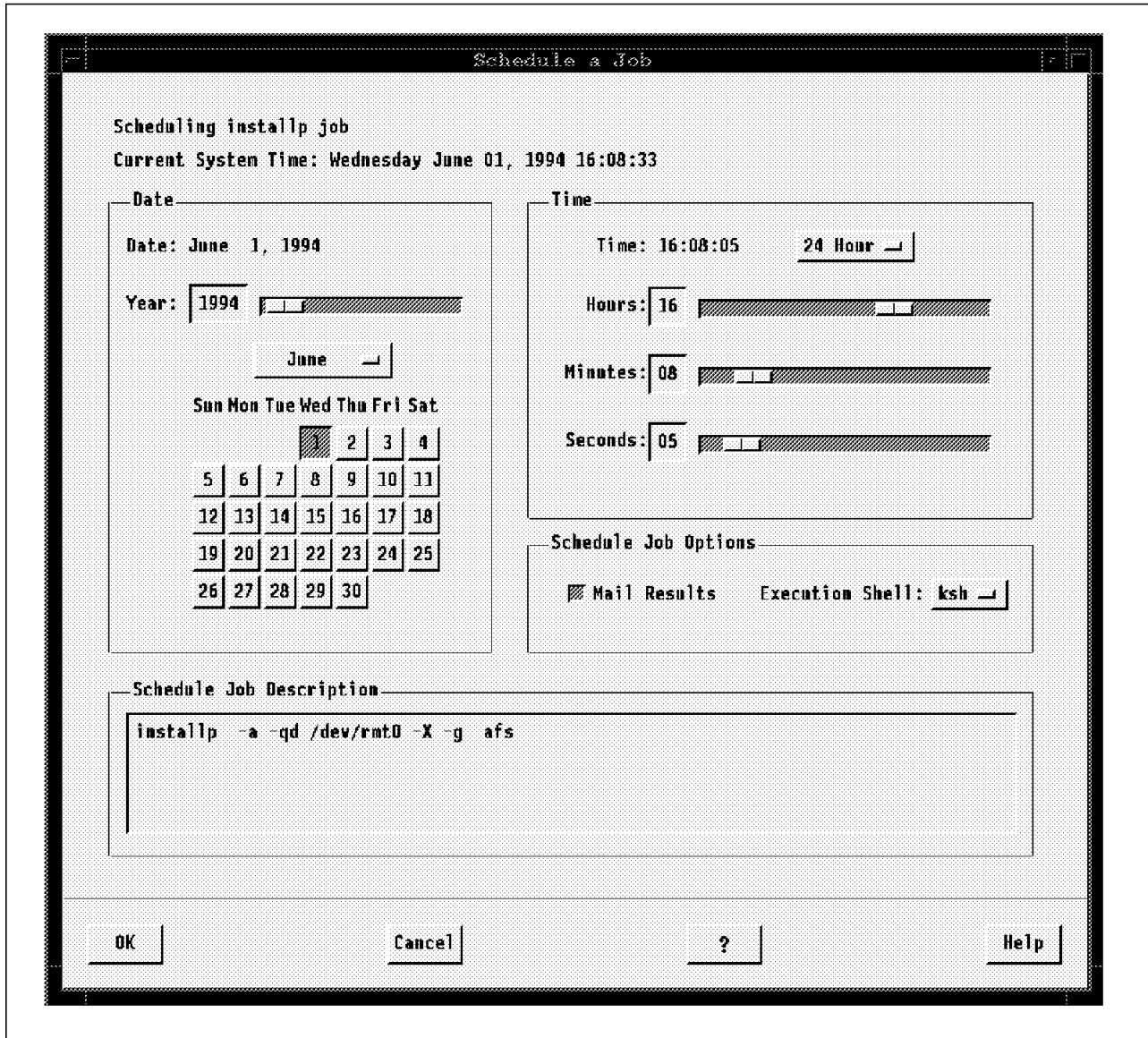


Figure 51. Schedule a Job Window

The Work Area has just one pane, the Software for Installation Pane. It contains software products to be installed or updated in your system. To see all the packages from one product, double-click on it. To see the product's filesets of a specific package, double-click on it, again.

The View Controls, at the bottom left corner of the Work Area, has the same objects, Show Large Icon and Show Small Icon. Their behavior is the same as described in the other applications.

The Display Controls, besides the View Controls, contains new objects. You can see these new objects in Figure 52 on page 79.

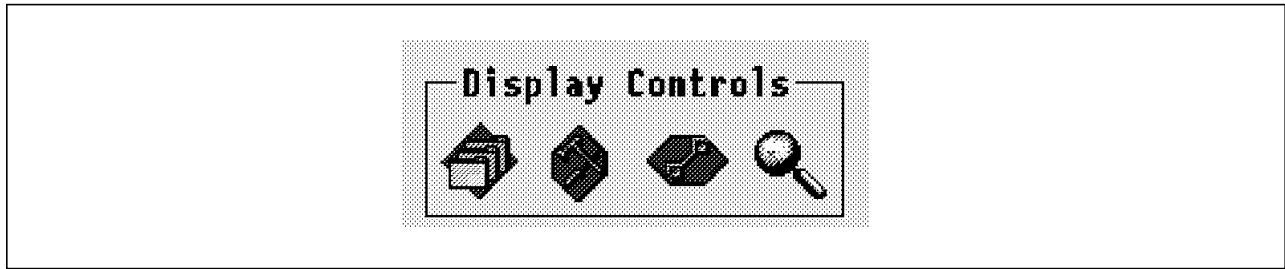


Figure 52. Display Controls Window

They are:

- Filesets Control

Drag and drop this control on a software product or package, in the Work Area, to display filesets.

- Maintenance Level Control

Drag and drop this control on a software product, package or fileset, in the Work Area, to display maintenance levels.

- Fixes Control

Drag and drop this control on a software product, package or fileset, in the Work Area, to display fixes.

- Find Display Control

Same function as described before.

7.2.3.3 Main Window Buttons

There are two new buttons in the bottom of the Main Window. See Figure 49 on page 76. The **Show Setting** and the **Show Schedule** buttons. The **Show Setting** displays a dialog to view or modify your installation or preview setting. To execute this action just click this button. See Figure 53 on page 80, the **Optional Install Settings Window**.

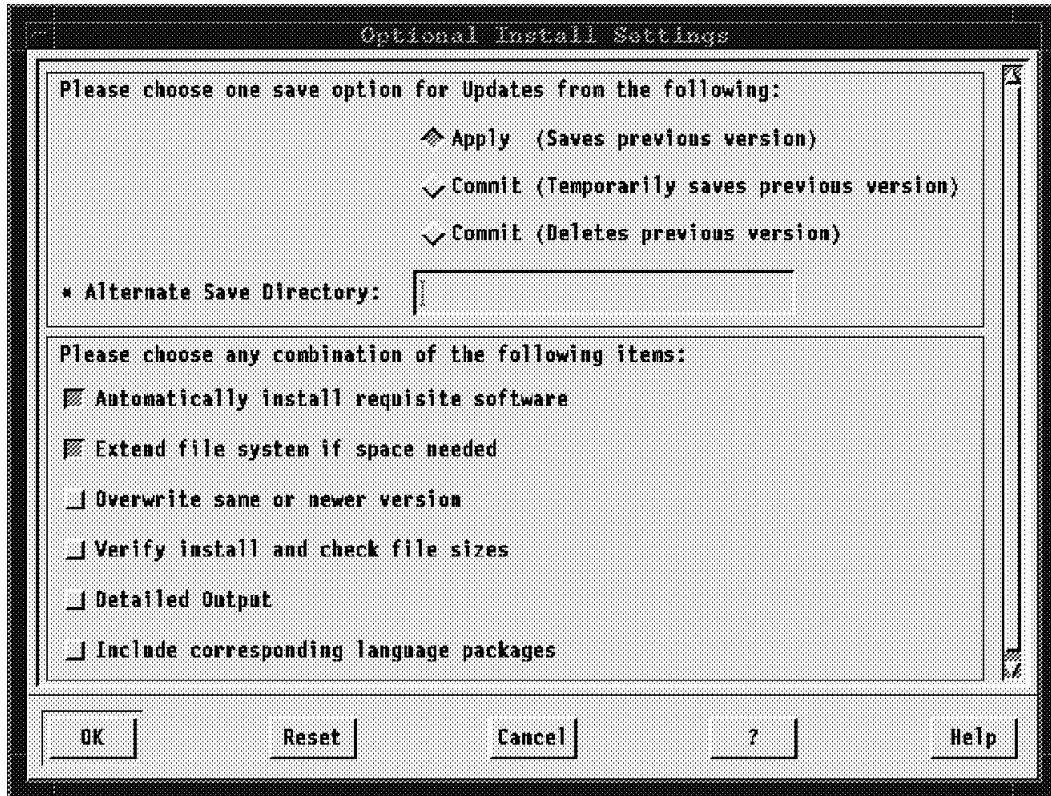


Figure 53. Optional Install Settings Window

The second button is the **Show Schedule** button. It displays a dialog to view or remove scheduled installation jobs. Just click this button to view or remove a scheduled job. See Figure 54 on page 81, **Remove or View Schedule Jobs Window**.

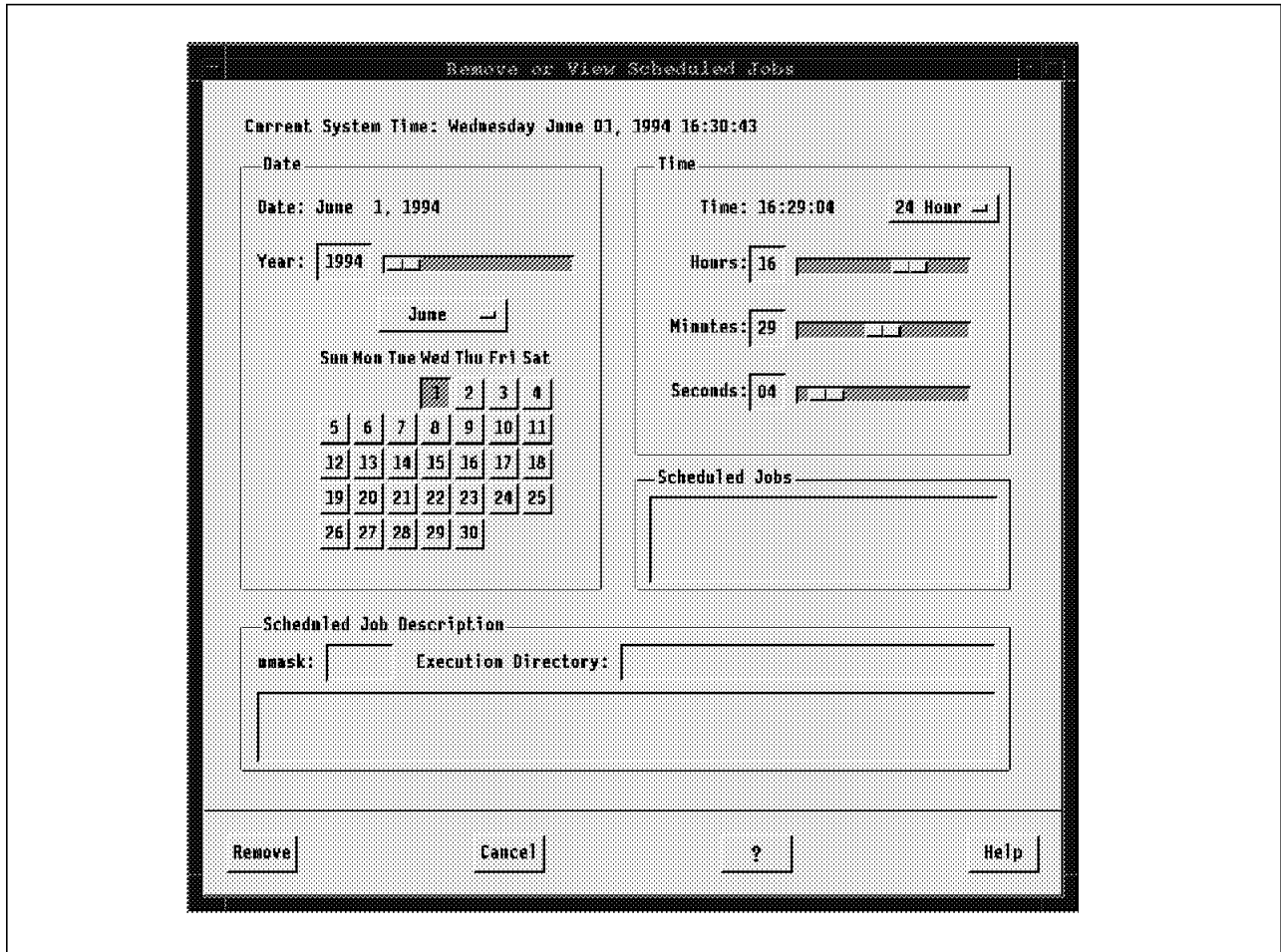


Figure 54. Remove or View Scheduled Jobs Window

7.2.4 Maintain Installed Software

The Maintain Installed Software Manager is the new VSM application which has been designed to provide the means of understanding relationships between installed products, filesets, maintenance levels, enhancements and fixes.

To start this application click the **Maintain Installed Software Manager desktop icon** or type `maint`. See Figure 55 on page 82, for an example of the **Maintain Installed Software Manager Window**.

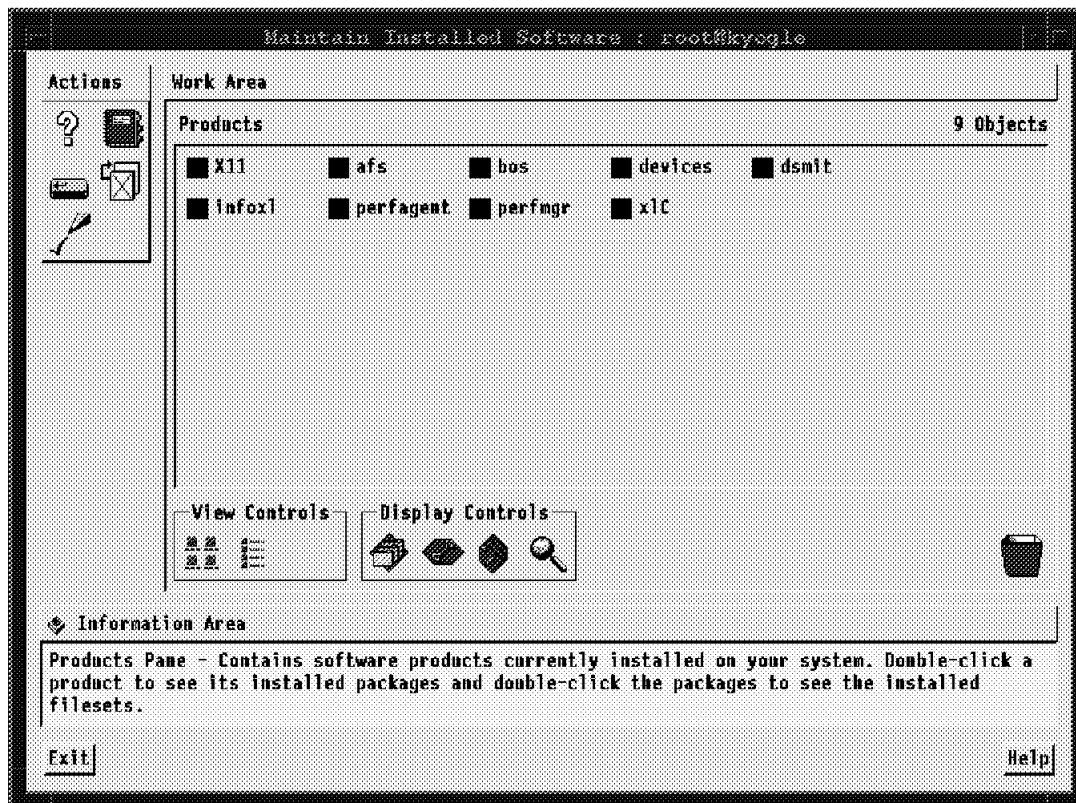


Figure 55. AIX VSM Maintain Installed Software Manager Window

7.2.4.1 Work Area and Actions

You can perform the following tasks using the Maintain Installed Software Manager:

- Commit installed software
- Reject installed software
- Cleanup installed software (inconsistent state)
- Verify installed software (dependencies are met)
- Deinstall software (drag icon to trash can)

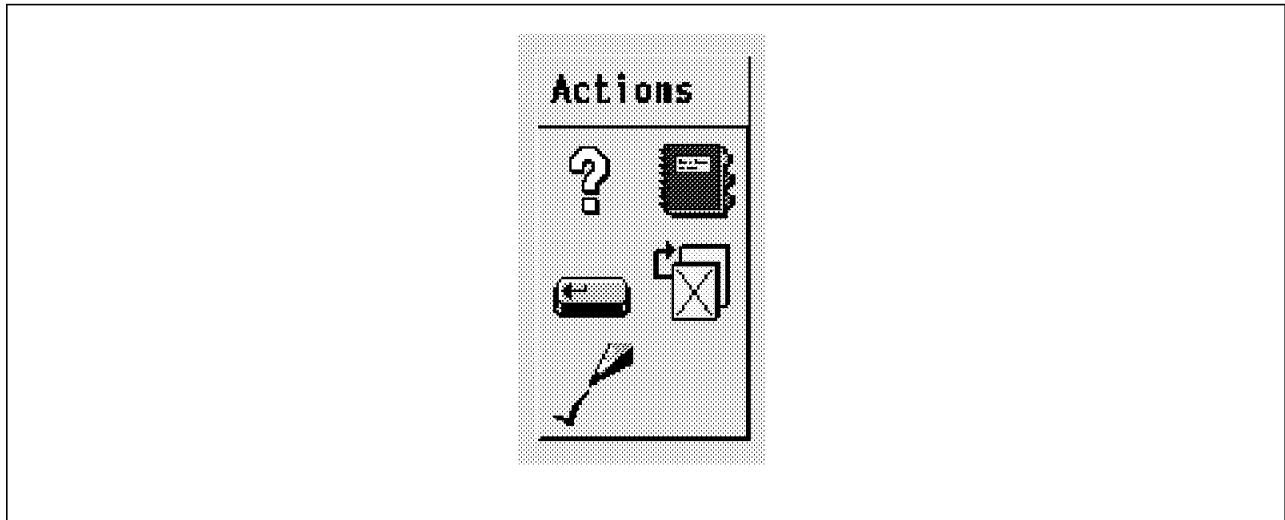


Figure 56. Maintain Installed Software Manager Action Area

The Action Area contains five objects with activities that you can perform in this application. See Figure 56.

- Item Help
Same function as described before.
- Notebook Action
Same function as described before.
- Commit Action
Opens a dialog to remove the previous version of the software and keep the update you installed. Drag and drop the Commit action on the object to commit an update.
- Reject Action
Opens a dialog to reject a software update you installed and restore the previous installed version. Drag and drop the Reject action on the object to reject an update.
- Verify Action
Verify the installed file's size to ensure that it is complete and does not have to be reinstalled. Drag and drop the Verify action on the object to verify the file size.

The Work Area has just one pane, the Products Pane. It contains software products currently installed on your system. To see all the installed packages for one product, double-click on it. To see the installed filesets of a specific package, double-click on it, again.

The View Controls and the Display Controls, at the bottom left corner of the Work Area, have the same objects. Their behavior is the same as described in 7.2.3, "Install and Update Software Manager" on page 75 .

7.2.5 Enhancements of the Users and Groups Manager

The Users and Groups Manager, basically, has two different changes in the Action Area:

- Change Initial Interface Action has been removed
- Change Language Action has been included

See Figure 57 The Users and Group Manager Window is shown in Figure 57.

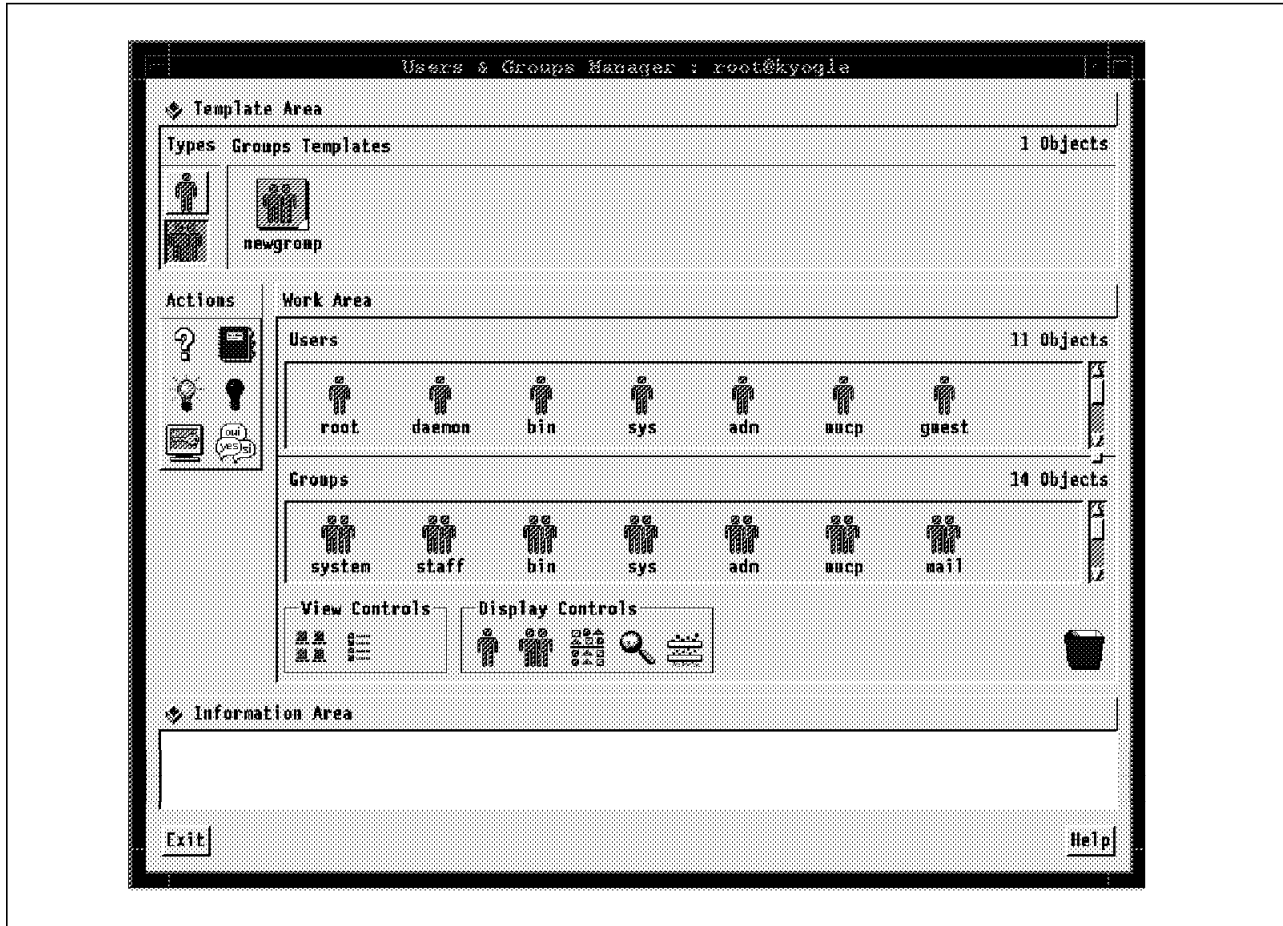


Figure 57. Users and Groups Manager Window

The menus and message text from the user's interface, can be configured to a specific language, for each user, using the Change Language Action. Drag and drop the Change Language Action on the user and choose the language you want to assign for this user.

See Figure 58 on page 85 the new Action Area from the Users and Groups Manager window.

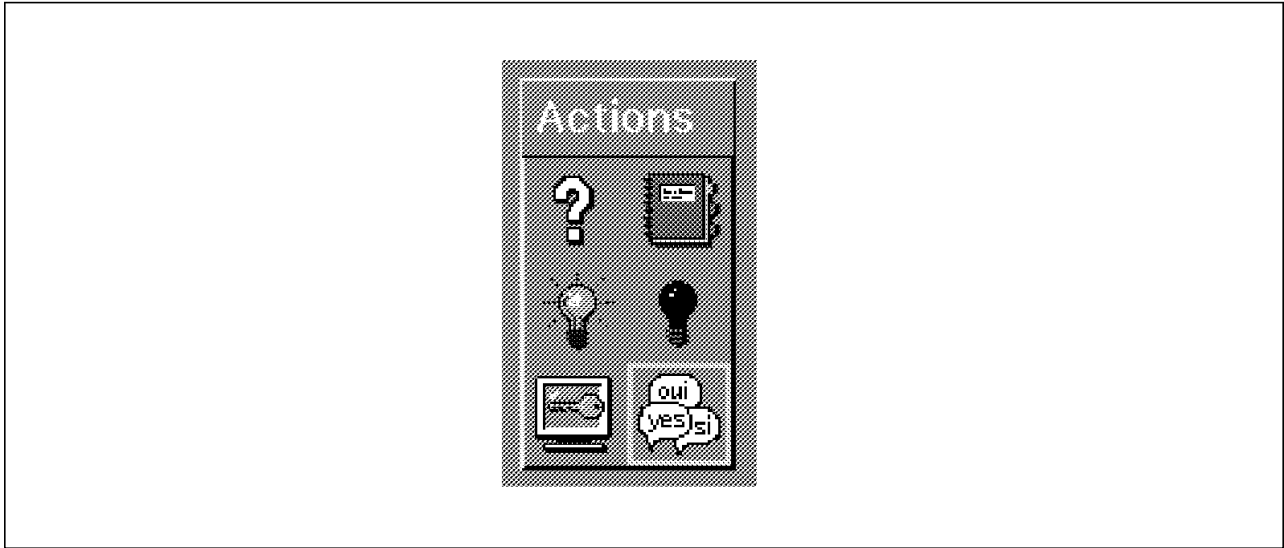


Figure 58. Users and Groups Manager New Action Area

7.2.6 Enhancement of the Storage Manager

The behavior of the Storage Manager is the same in both versions. You will see a difference just in two object actions:

- Backup Action
- Restore Action

Figure 59 on page 86 shows the new Storage Manager Window.

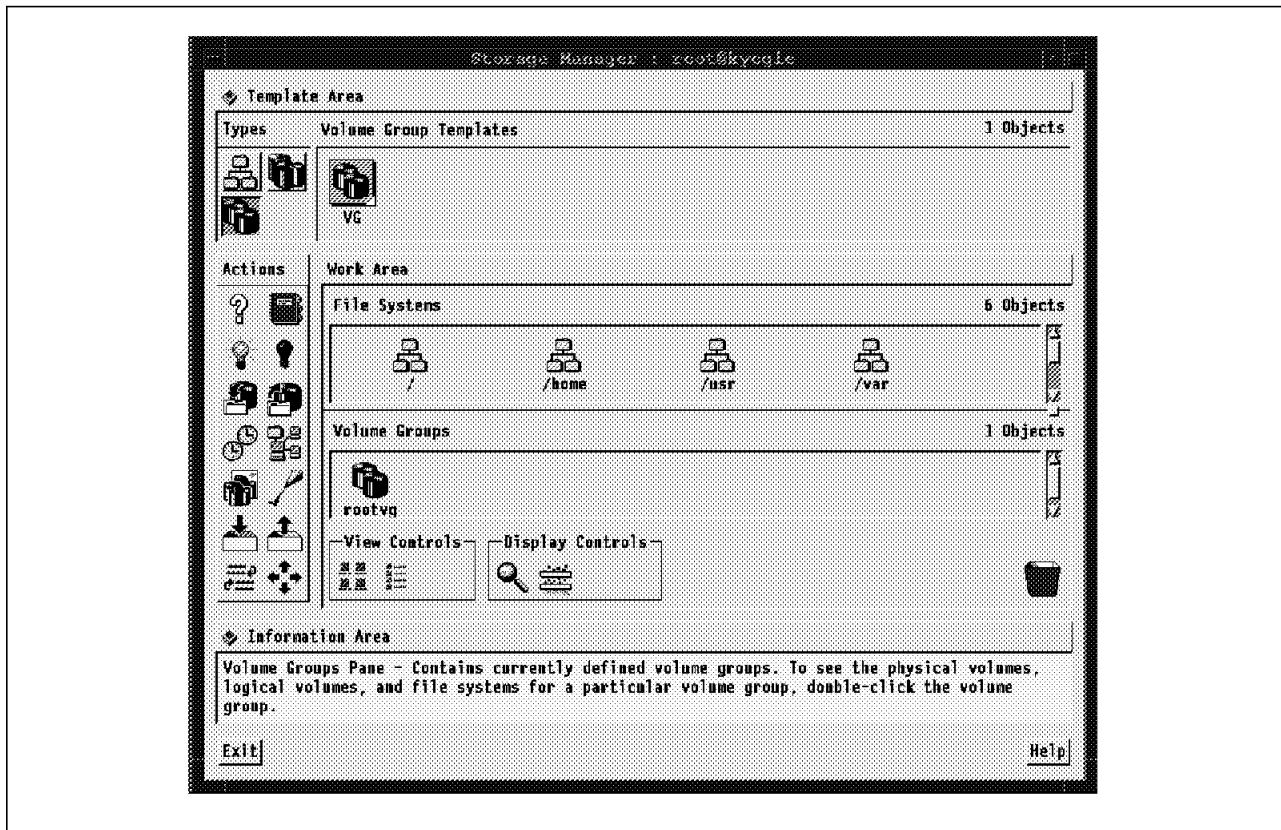


Figure 59. New Storage Manager Window

You can use the Backup Action to backup the contents of a particular filesystem or backup the entire volume group in a `mksysb` bootable image. Now, you can backup a Volume Group or a Logical Volume, too. Drag and drop the Backup Action in one of these objects to execute the backup of it.

The Restore Action allows you to choose a specific filesystem to be restored, from a filesystem pop-up menu.

7.2.7 Enhancement of the Device Manager

The Device Manager application has the same types of templates in the Template Area and the same object actions but some changes are found in the Work Area.

7.2.7.1 Work Area in the Device Manager

The Work Area is no longer divided in two panes. The system support components pane, where you could find the console icon and the virtual terminal icon, is no longer available. There is no other object that executes the same action as the virtual terminal icon. The console icon has been substituted for a button, named Assign/Redirect Console, at the bottom of the main window. In the Devices Manager Work Area you will find the Devices pane.

You can see the new Device Manager Window in Figure 60 on page 87.

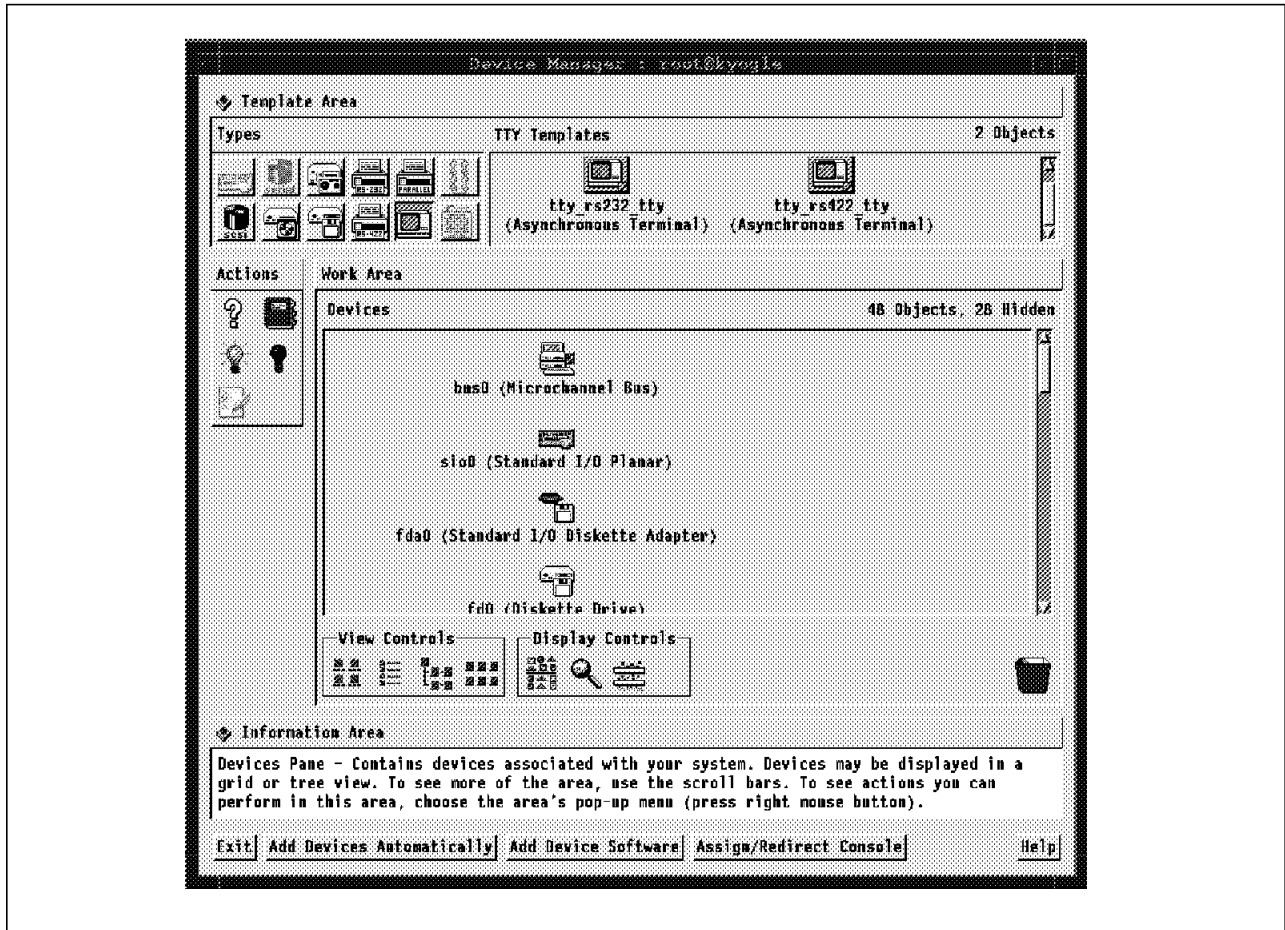


Figure 60. New Device Manager Window

7.2.7.2 Main Window in the Device Manager

There are two new buttons in the Devices Manager Main Window, they are:

- Add Device Software
- Assign/Redirect Console

We have already discussed the Assign/Redirect Console button.

The Add Device Software button allows you to install a device driver and create a template. Click on the Add Device Software button to add a device driver and, if a button type exists for the driver added, click the button to view the new template.

7.2.8 Enhancement of the Printer Manager

Basically, the behavior of the Printer Manager is the same in both versions. You will find a difference in the Main Window buttons and in the Work Area Display Controls. You can see the new Printer Manager window application in Figure 61 on page 88.

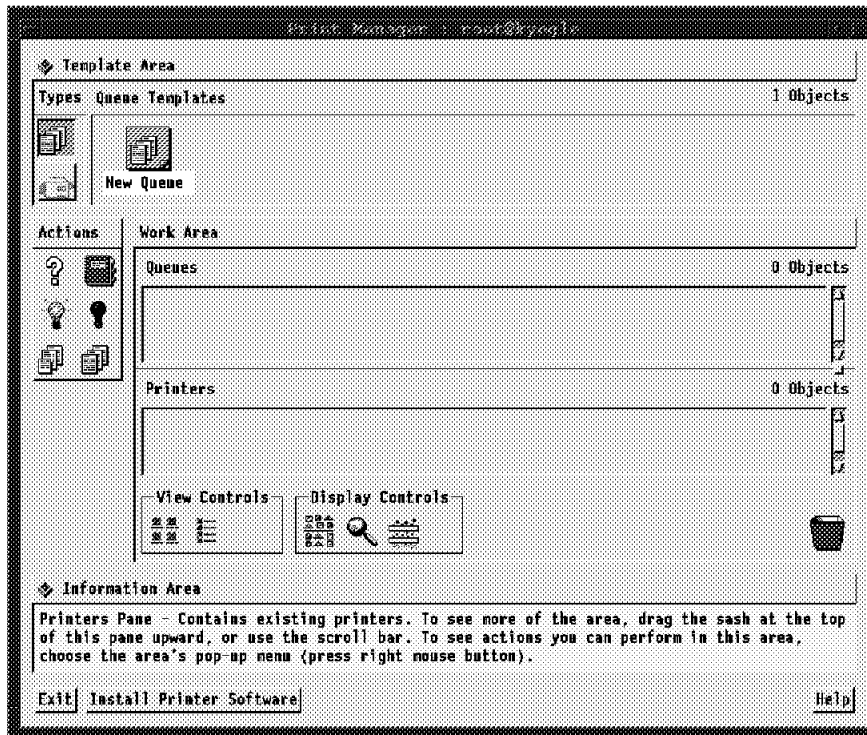


Figure 61. New Printer Manager Window

In the previous version, the Printer Manager had the Queues Display Control, Printers Display Control and Print Jobs Display Control. In the new version these Display controls don't exist anymore.

The Install Printer Software button was included in the Main Window. It is used to install printer software or additional printer drivers.

7.3 Common Desktop Environment Style Guide

AIX 4.1 has a new graphic user interface for desktop. It is the Common Desktop Environment (CDE). This replaces the X11 desktop (xdt) which is not available in AIX 4.1. This snapshot of the COSE/CDE specification is a result of cross company development. Common Operating System Environment (COSE) is a recent consortium composed of UNIX** market leaders: SUN, HP, IBM, DEC**, Bull**, and others.

A runtime desktop package is based on X11R5 and Motif 1.2. This CDE environment cross company development intends to become the common graphical user operating environment used on most major workstation vendor platforms.

7.3.1 COSE Desktop Management

The COSE Desktop combines management tools to perform some group of functions. These groups are:

- Session Management
- Window Management
- File Manager
- Customization

7.3.1.1 Session Management

The Session Management combines the Login Manager and the Session Manager. The Login Manager provides a Graphical User Interface for user login, authenticates the user and invokes the user session. It prompts for login and password, gives the user authentication and starts the session.

The Session Manager is responsible for initializing the user's session at login and saving the state of the user's session at logout. For instance, the user can initialize the session to the state it was in when they logged out at the last time or to a specific state which they have explicitly saved, just configuring the Session Manager for it. The hardware configuration, all the running applications, X11 resources values, colors and fonts are included in the saved session state. The Desktop Window Manager is started by the Session Manager.

7.3.1.2 Window Management

The Window Management combines the Window Manager, the Workspace Manager and the Front Panel. The Window Manager is a superset of the OSF/Motif mwm Window Manager which includes support for multiple workspaces and support for the front panel. The user can configure features, such as, root window pop-up menu and window menu for client windows, changing the X resources and configuration files.

The Workspace Manager provides support for multiple workspaces. One user session can be started with a number of workspaces determined by a resource when the workspace manager starts up, but the user can delete, add or rename a workspace dynamically. A workspace is a virtual screen and you can place windows in it. The Workspace Manager and the Session Manager work together in order to save the workspace state between sessions. There are workspace switches in the Front Panel where you can switch from one workspace to another.

The Front Panel is an entry point into the system. It provides access to applications, information, devices and other objects. This Front Panel is located at the bottom of all workspaces. You can see Figure 62 on page 90 for an example of the Front Panel.

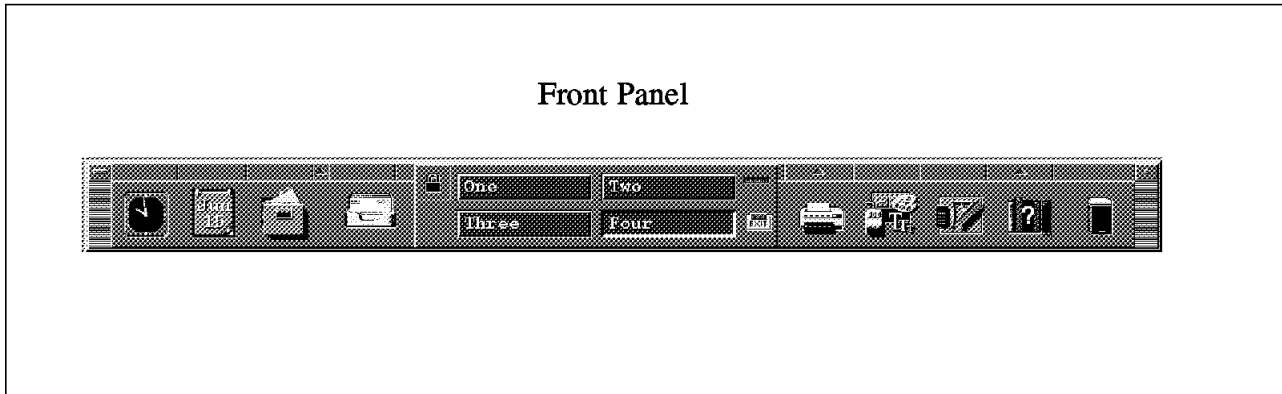


Figure 62. Common Desktop Environment Front Panel

7.3.1.3 File Manager

The File Manager provides a Graphical User Interface for file manipulation and application execution to the file system. In the File Manager terminology, an *Object* can be a data file, an executable file or a directory and a *Folder* is a directory. Through this GUI the user can manipulate features. So, the user can:

- Traverse folders via a double-click or a menu.
- Change folder display modes.
- Create, move, copy, rename and delete objects via menus and/or drag-and-drop.
- Invoke actions on objects via menus, double-click and/or drag-and-drop.
- Locate objects by name or contents.
- Place frequently used objects on a desktop/workspace.

For instance, the user can remove a directory, dragging the icon of this directory from the File Manager and dropping it over the trash container. The user can print a file dragging this icon and dropping over the print action.

Two additional tools are supported by the Common Desktop Environment File Manager: the toolboxes and the trash container. The toolboxes organize the tool objects such as Actions and have the same appearance and function as folder windows but the user cannot traverse above the main toolbox folder. The action of dragging an object from a toolbox to another toolbox/folder, is to copy the object to the new location, instead of moving it.

The trash container differs from a folder window because users may move, restore or delete a trash object but may not traverse out of the trash container or copy, rename or execute any other manipulation on a trash object.

For instance, if a user moves an executable file to the trash container, he cannot execute this file while it is in the trash container. There are some File Manager dialogs that allow users to configure many of their features.

7.3.1.4 Customization

The Style Manager is responsible for environment customization in the desktop. The Style Manager is comprised of the User Interface, which is invoked from the Front Panel, and the code that allows the end user to customize, interactively, the system behavior and some visual elements for the desktop environment. See Figure 63 the Style Manager icon from the Front Panel and the Style Manager Main Window.

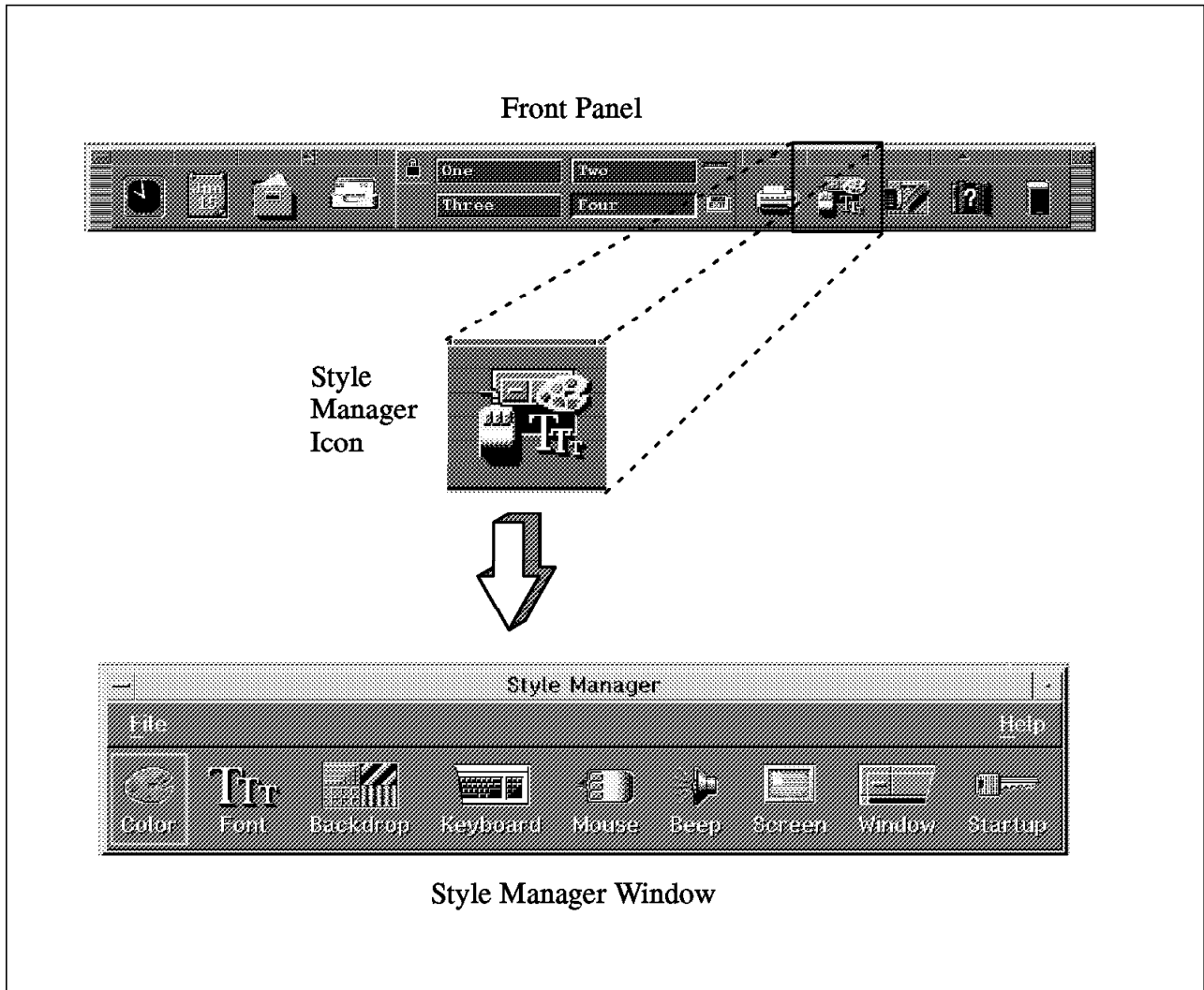


Figure 63. Style Manager Icon and the Style Manager Main Window

There is one customization icon for each one of the following areas:

- Color.

This area sets in a workspace, the color palette used for window colors. In most applications, this color changes can be dynamic.

- Font

This area allows the user to change the user's font and the system font sizes.

- Backdrop

This area allows the user to change, dynamically, the background full screen image.

- **Keyboard**

This area allows the user to change, dynamically, the key click volume and the character repeat capability.
- **Mouse**

This area allows the user to change, dynamically, the mouse button click setting, the pointer acceleration and the pointer movement threshold.
- **Beep**

This area allows the user to change, dynamically, the beeper volume, the tone and the duration of the beep.
- **Screen**

This area allows the user to set the number of minutes before the screen times out and if the screen will be saved and/or locked at the time out.
- **Window**

In this area, any customization made by the Style Manager will take effect just after the Window Manager is restarted. The Style Manager is responsible to communicate with the Window Manager to restart it. The user can customize how a window acquires focus, if the window raises when it receives focus and where window icons are replaced.
- **Startup**

This area allows the user to set how the session begins and ends. Now, the Style Manager communicates with the Session Manager component of CDE to achieve this functionality.

7.3.2 CDE Icons for VSM Applications

All the changes were made into VSM for compliance with the COSE/CDE Style Guide. This desktop provides all the icons that represent each one of the VSM applications. To see these application icons, first click the mouse in the Application Manager Icon, from the Common Desktop Environment (CDE) window. The Application Manager Window will be opened. See Figure 64 on page 93.

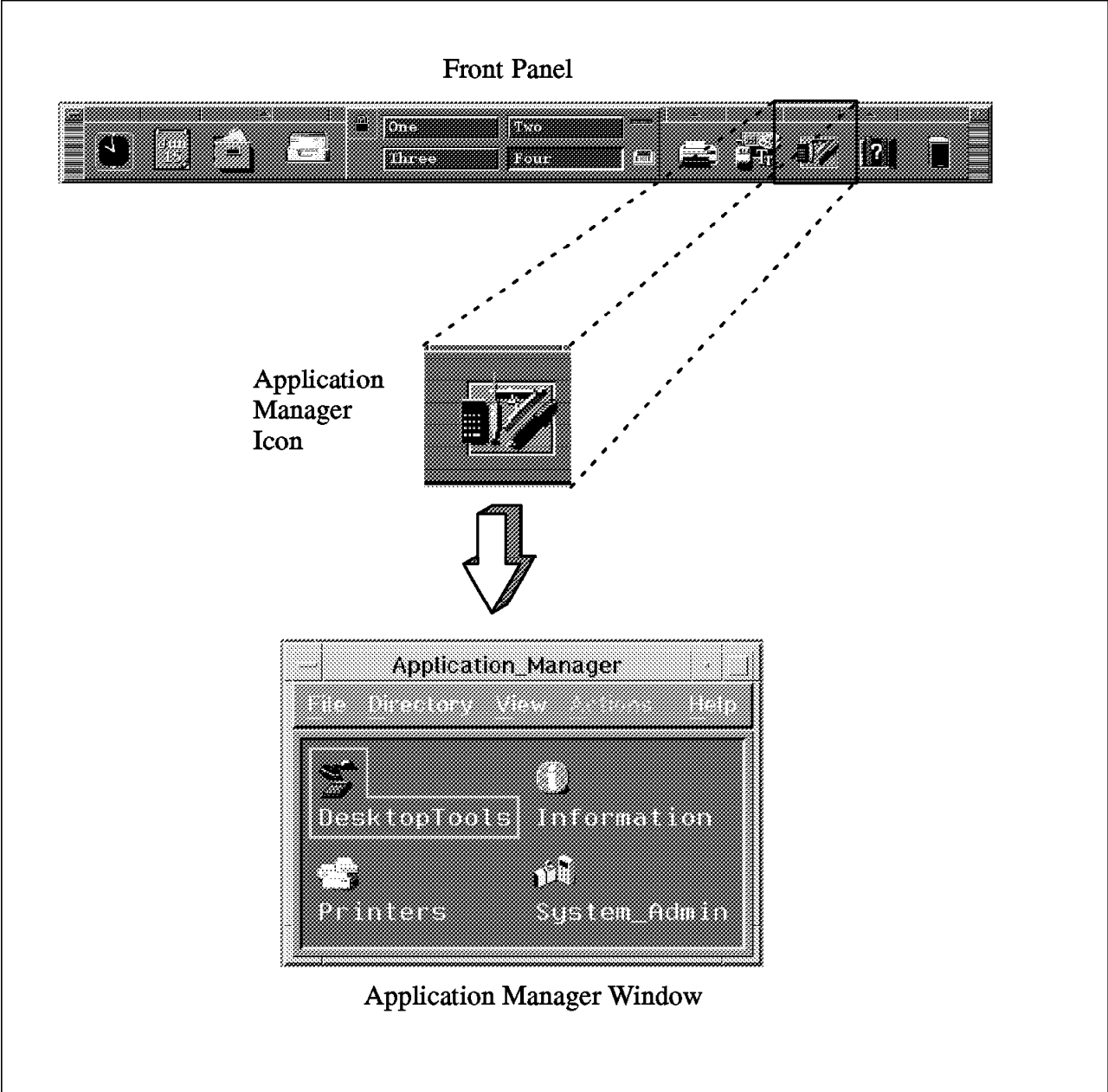


Figure 64. Application Manager Icon and the Application Manager Window

With a double-click, select the **System_Admin** icon. You will see Figure 65 on page 94, the System Administration Window. There are 13 different icons in this window. The (go up), ChangePassword, EditResources and ReloadApps are not VSM applications.



Figure 65. System Administration Window

The icon named *Set Date and Time* gives you a user interface to setup the date and the time for the system. You can see in Figure 66 on page 95, the Set Date and Time window.

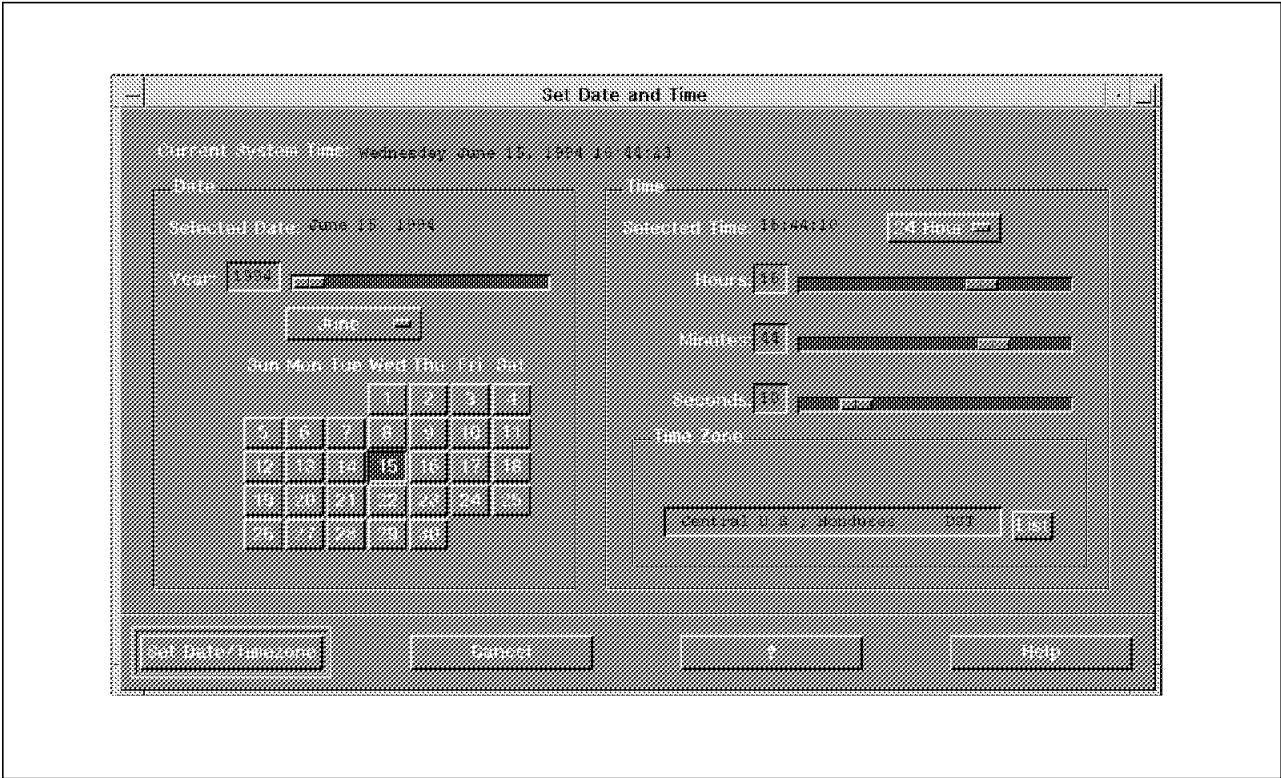


Figure 66. Set Date and Time Window

The Easy Install icon is designed to provide a default path to install optional program products. The items that require user input are the input device and the optional program products the user needs. When you click on this icon you will see Figure 67, the Easy Install window.

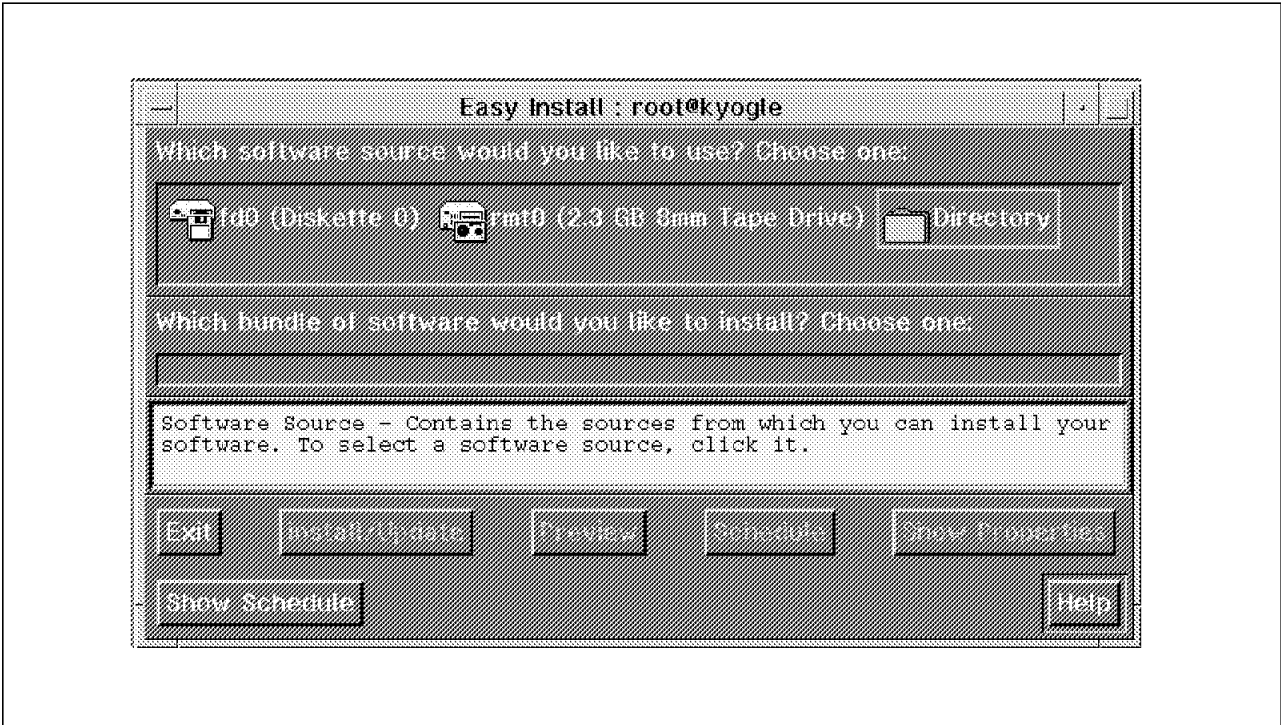


Figure 67. Easy Install Window

The Easy Install icon is a fast path because you can find all of its functions when you are using the Install Manager application. The Easy Install is one of the Visual Install Interfaces which, together with Install and Update Software Manager and Maintain Software Manager, was designed to improve the usability of installation in AIX 4.1. The Show Schedule icon is a fast path also. You can find its function in the Storage Manager application. The other icons, Devices Manager, Install Manager, Maintain Software, Print Manager, Storage Manager and Users & Groups, are the VSM applications. So, to start each of the VSM applications just double-click the left mouse button on the icon which you want to execute.

Chapter 8. Future Developments

The intention of this chapter is to cover a number of topics that may affect the DSMIT and VSM users in the near future. **There is no commitment from IBM* on delivery of these functions.** However, we considered it worthwhile to describe what they are and how these functions could potentially provide more interest to the system management administrators using or considering these tools.

8.1 Future Developments For DSMIT

The enhancements we might soon encounter for DSMIT deal with two important subjects: the security, and the addition of new OEM client machines, that is, new operating systems supported. Though, we don't exclude possible enhancements in functionality and/or ease of use.

Possibly, the very next supported OEM operating system will be SUN Solaris** 2.2

Any new client operating system that could be added to DSMIT will depend on the market demand and feasibility of implementation. The first one is based on the feedback from IBM customers upon their needs.

The improvements coming for DSMIT security, are compliant with DCE Kerberos security, using an authentication protocol to verify an administrator's network identity. An instance of shared-secret authentication protocol.

This implementation works as follows:

1. The administrator acquires a credential locally on the server machine, DSMIT prompts for a password at a login utility, AIX 4.1 login process, or during DSMIT invocation.
2. To establish a DSMIT session between a server and a client machine, a ticket is formatted containing: the ticket identification, a time-stamp, and the session key. Each ticket contains a unique key, one ticket is issued per managed machine, whether in the working collective or not. One ticket is also issued per transaction.
3. Each DSMIT transaction is audited by AIX 4.1 facilities on server and client machines.
4. Sensitive data is encrypted, passwords are detected and encrypted by DSMIT.
5. The initial key and password distribution is performed by a *DSMIT-security-cfg* utility program, run in every DSMIT machine to create the necessary security related files and set protection levels at configuration time. Also, changes in security configuration are performed by an authenticated administrator and using *DSMIT-security-cfg* utilities. No SMIT, DSMIT or manual handling of secured configuration files takes place.

New improvements on Kerberos and DCE security will also be reflected in future DSMIT versions.

8.2 Future Developments for VSM

As Graphical User Interfaces are more demanded by UNIX system users and administrators, we should expect a good deal of new tools and functionality for VSM. In the near future two groups of applications are outstanding, one for developers and the other for administrators:

- Developer Applications Integration:

- C++** interface to the VSM library.

The current *libvsm.a* interface is through standard C subroutine calls. In the future we will have C++ classes for developers to use to create VSM applications.

- SMIT-like developers interface

Programming with shells and stanzas in a visual environment.

For applications in which most of the necessary tasks can be performed by running command line programs, we will have a way to automatically generate the VSM interface at run time. This is similar to the way SMIT works. For example, SMIT has the menu and dialog definitions stored in the ODM and creates the screens at run time. In a similar manner, a VSM engine will read a data file and create the VSM graphical user interface.

- Third party GUI based application developing tools

Third party GUI developers will be able to create their own VSM applications using the VSM library. Currently the library file *libvsm.a* is shipped on the system. In the future the documentation and necessary include files required for third party development of VSM-like applications will also be shipped. This will enable other applications to maintain the VSM look and feel.

- Administration Applications:

- Workstation Assistant

An integration tool for all VSM applications, presenting a common initial interface to all administrative tasks.

- Workload Manager

An application which allows the user to view and modify processes running on the system. Processes could be deleted or their priority could be changed dynamically.

- Performance Manager

This could be a set of tools independent of VSM for fine tuning the system's resources with a graphical interface. To enable the user with a visual perspective of the throughput on the system.

- Problem Manager

An application that will allow the user to view error logs. Showing the errors and the possible solutions.

As standards become more popular and applications' interfaces more alike, we should also see the integration of new managing and developing tools, and other type of applications from IBM and third parties. For example SystemView*, NetView*, Expectk, and so on.

8.3 Distributed Visual System Manager (DVSM)

The next step in systems management is a distributed management tool, with a Graphical User Interface to make it more user friendly, it should be OMF and COSE compliant, consistent with VSMs GUI, and DSMIT. The first applications we might find for DVSM could be:

- Users and Groups Manager

A single user name with only one password and with the same properties no matter what machine the user logs in on to, independent of operating system and vendor. This is what a centralized Users and Groups Manager would allow you, and with a Graphical User Interface to make things easy.

- Print Manager

If all workstations had a printer attached, each user could take care of his own printer administration. In a homogeneous environment with different operating systems and a few print servers around to take care of all print requests, a graphical administration tool to manage all the printing sub-system is of great value.

As workstations become more powerful and affordable, the graphical applications become more complex, more popular and receive more focus. In the near future, we will surely see many improvements in this area.

Appendix A. DSMIT Customization Samples

This Appendix contains some examples on how to customize your DSMIT distributed management environment. It includes some graphic examples on different environments and how to customize DSMIT servers to manage these environments.

A.1 Scenario 1: Managing a Simple AIX Network Environment

This is a common implementation where you have a simple network (whether tokenring or Ethernet) and a number of AIX client machines managed with one AIX server, as shown in Figure 68.

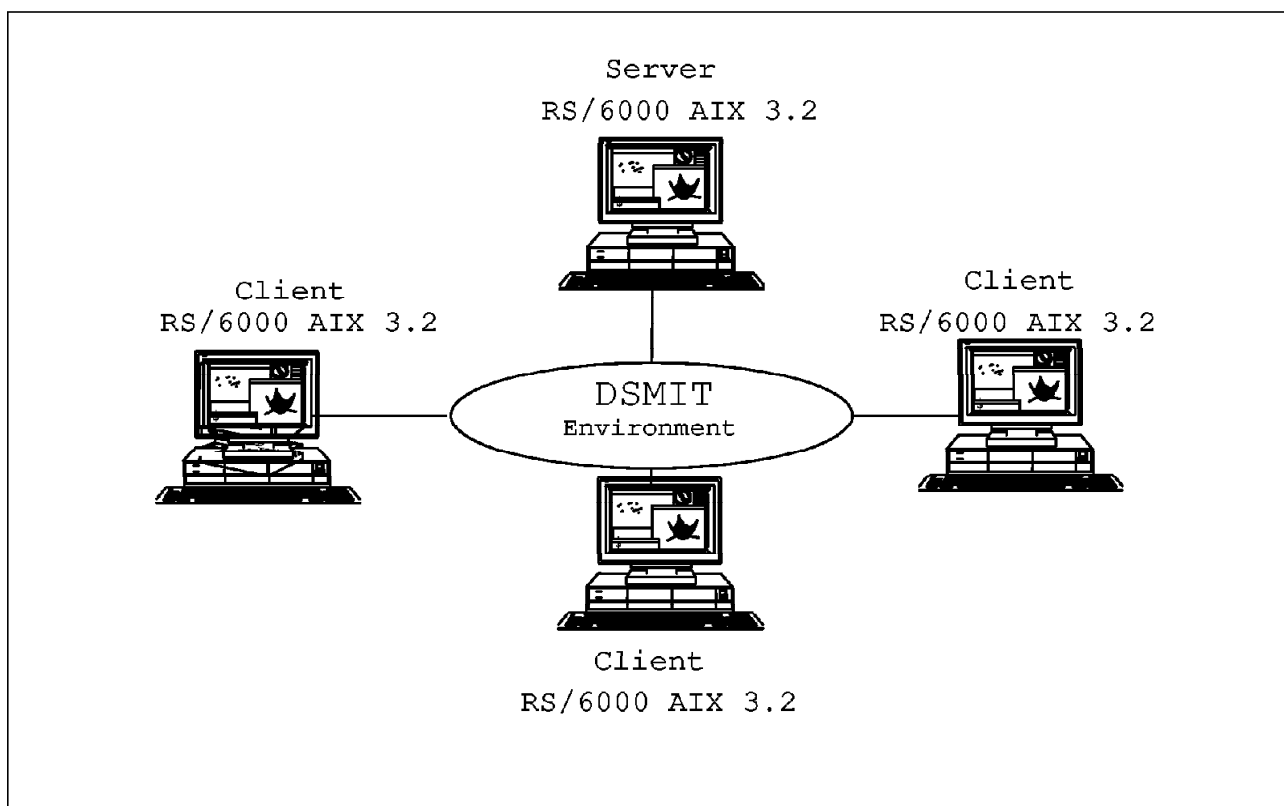


Figure 68. Managing a Simple AIX Network

To manage a simple network, you would want to define a single Domain, and a single working collective based on this Domain.

For example, let's call our Domain `mgg_dom`. You would include all the AIX machines in the LAN in this Domain with the **Add Domain** option in the **Manage Domains of Machines** menu of DSMIT.

When you start DSMIT, and want to work with all the machines in your LAN, you could invoke it with the command `dsmit -W mgg_dom`, this would automatically define the working collective based on the `mgg_dom` Domain, including all the machines in the LAN.

A.2 Scenario 2: Managing Multiple Operating Systems

For this example, we have chosen a DSMIT server managing three operating systems: AIX, SunOS, and HP-UX, as shown in Figure 69. Any of the client machines shown here could represent several clients of this kind. For example, an AIX client could represent four AIX clients and so on.

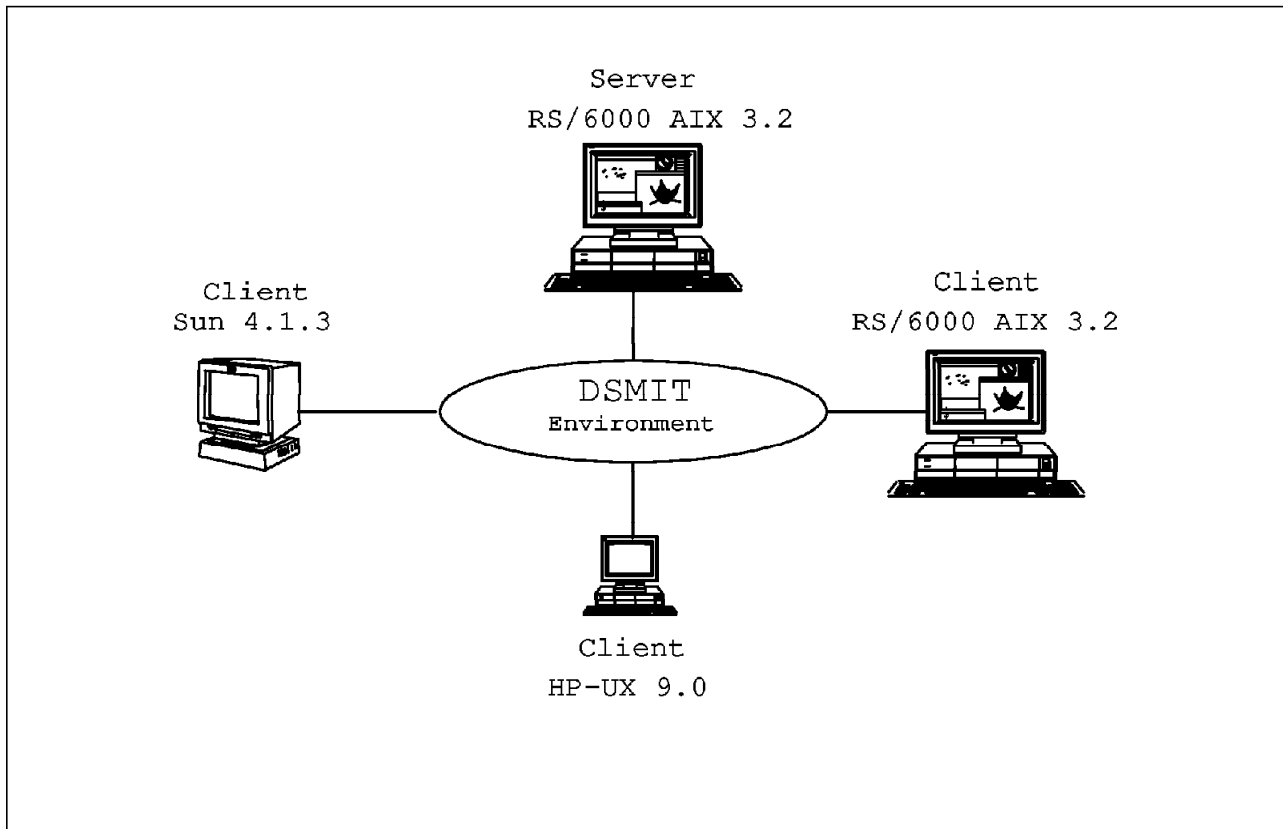


Figure 69. Managing Multiple Operating Systems

For practical purposes, you would define three domains here, so when you want to work with a particular operating system, you could do so defining a working collective based on either of the three domains.

Let's call our domains `aix_dom`, `hp_dom`, and `sun_dom`.

Using the DSMIT menus, you would define each of these domains grouping all the machines running the same operating system.

When invoking DSMIT for, let's say, working with the SUN machines, you would use the command `dsmit -W sun_dom` defining the working collective for the session upon the `sun_dom` domain. This would include in the collective all the SUN machines.

If you want to perform a common task on all the machines in the network, for example creating a new user, you would perform the task for every domain. That is, you would start DSMIT three times with the commands:

```
dsmit -W aix_dom mkuser
```

```
dsmit -W sun_dom mkuser
```



```
dsmit -W hp_dom mkuser
```

In order to create a user in all the network machines.

A.3 Scenario 3: Managing Multiple Local Area Networks

This scenario is very similar to the prior one for DSMIT, with the peculiarity that we are adding new components to the network, such as bridges or gateways, as shown in Figure 70.

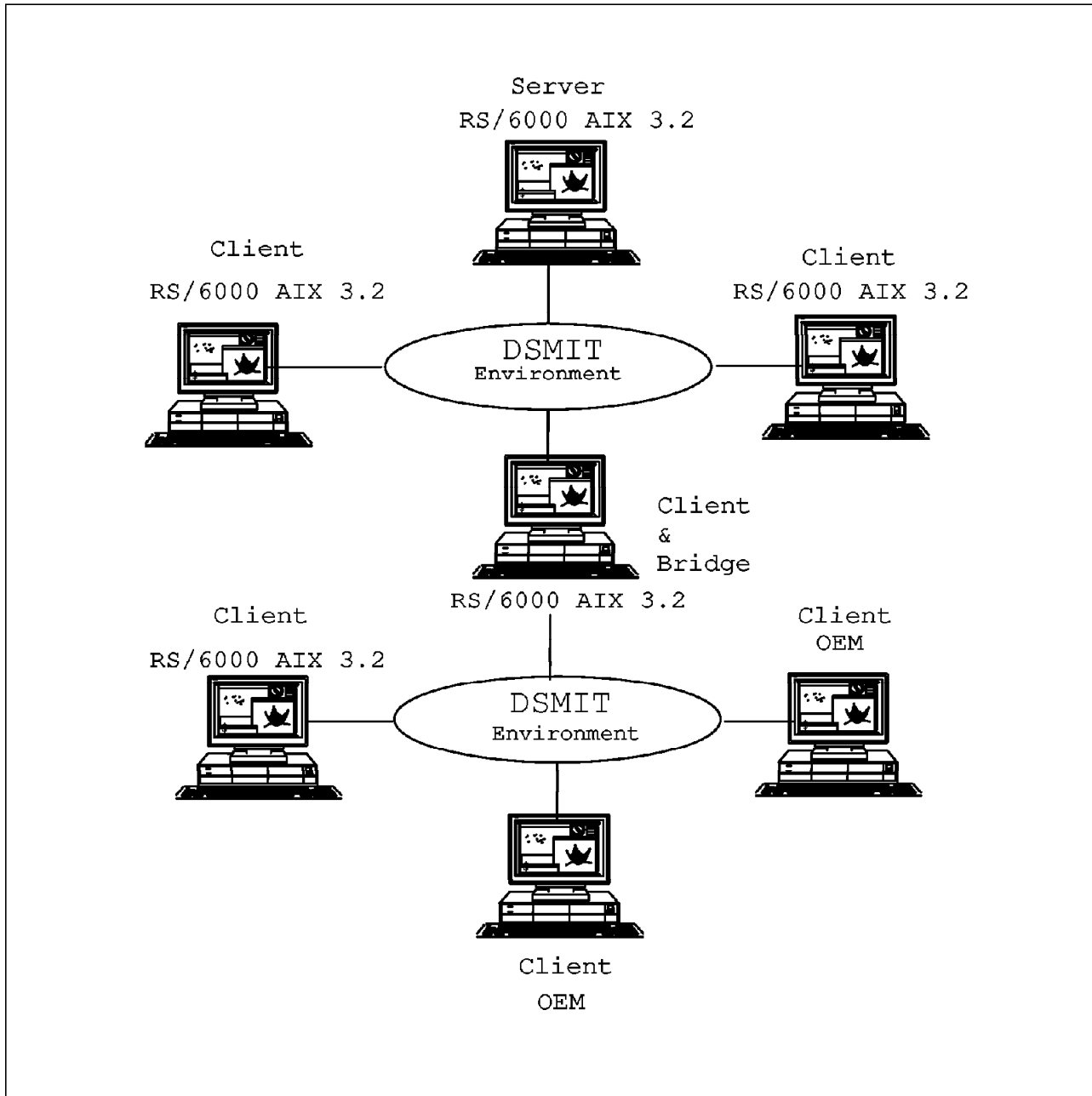


Figure 70. Managing Multiple LANs

For DSMIT, a complex network is the same as a simple one, but you must be careful when implementing DSMIT in such an environment. Make sure the

communications are correctly setup, and the server can reach all the client machines as well as the client machines can reach the server.

The domains and working collectives, would be defined in the same fashion as in the previous example, with a Domain for every operating system you want to manage.

A.4 Scenario 4: Managing Different Software Configurations

You might encounter a similar implementation in your LAN, where you have several AIX clients with different LPPs installed as shown in Figure 71.

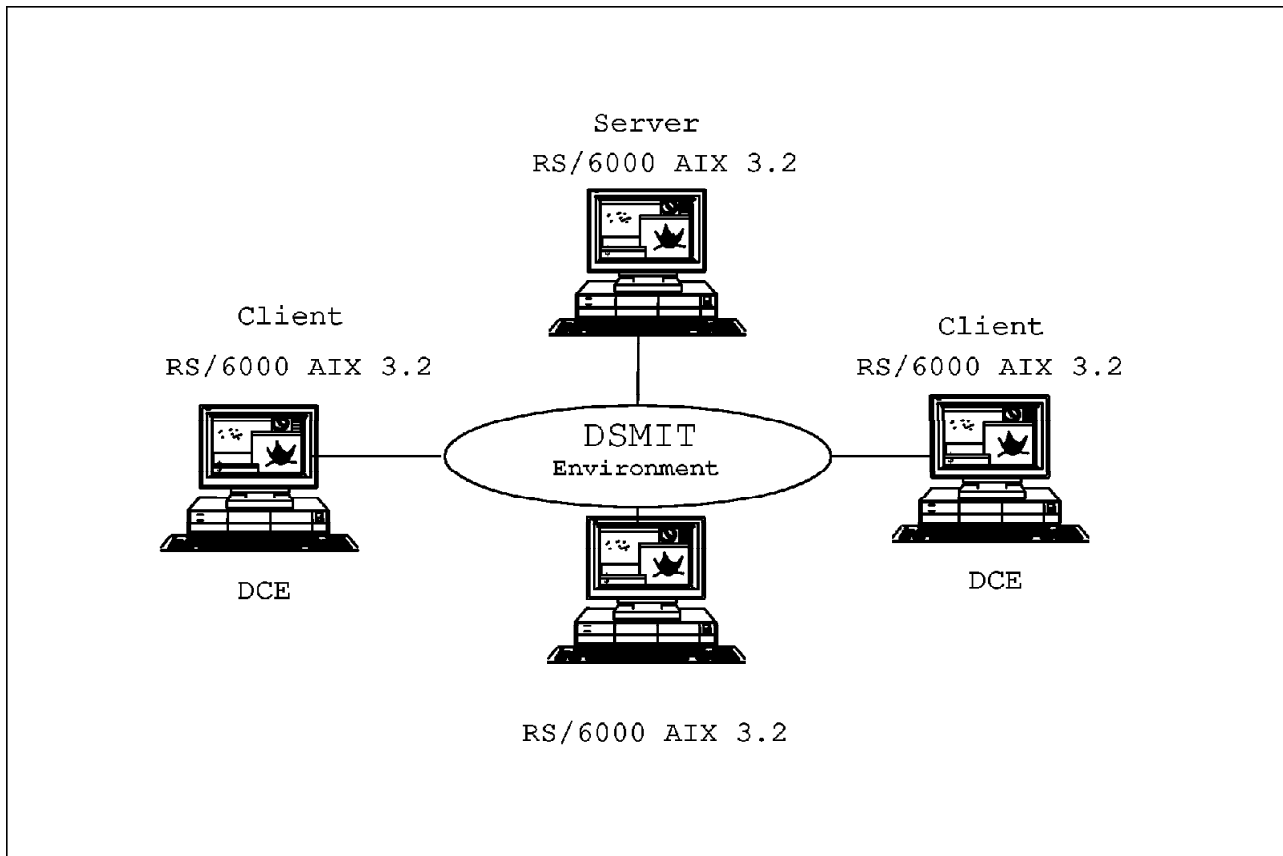


Figure 71. Managing Different Software Configurations

In these cases you could define separate domains for machines with similar software configuration. In our example, we are defining two domains: one to group all the machines in the LAN, for instance a `mng_dom`. A second one to group the machines with DCE installed, for instance `dce_dom`.

Whenever you want to perform a common task in all the machines in the network, you would define the working collective upon `mng_dom`, with the command `dsmit -W mng_dom`.

Whenever you want to perform management tasks with the DCE machines, you would define the working collective upon `dce_dom`, with the command `dsmit -W dce_dom`.

This would apply for any groups of machines you want to separate or distinguish based on the software sensitive to SMIT and DSMIT (AIX LPPs) installed on those particular machines.

Remember to also install the LPP you want DSMIT to manage in the server machine in order to add the corresponding SMIT menus for the LPP into the DSMIT menus on the server, or follow the procedure described in Chapter 4, “Using DSMIT to Run Client Applications” on page 29 to perform this task.

A.5 Scenario 5: Managing Systems Through a WAN

As in A.3, “Scenario 3: Managing Multiple Local Area Networks” on page 103, the communications over a Wide Area Network using X.25 services running on TCP/IP protocol, should be transparent to DSMIT, as long as the client and server machines can communicate with each other. Figure 72 on page 106 shows an example of such configuration.

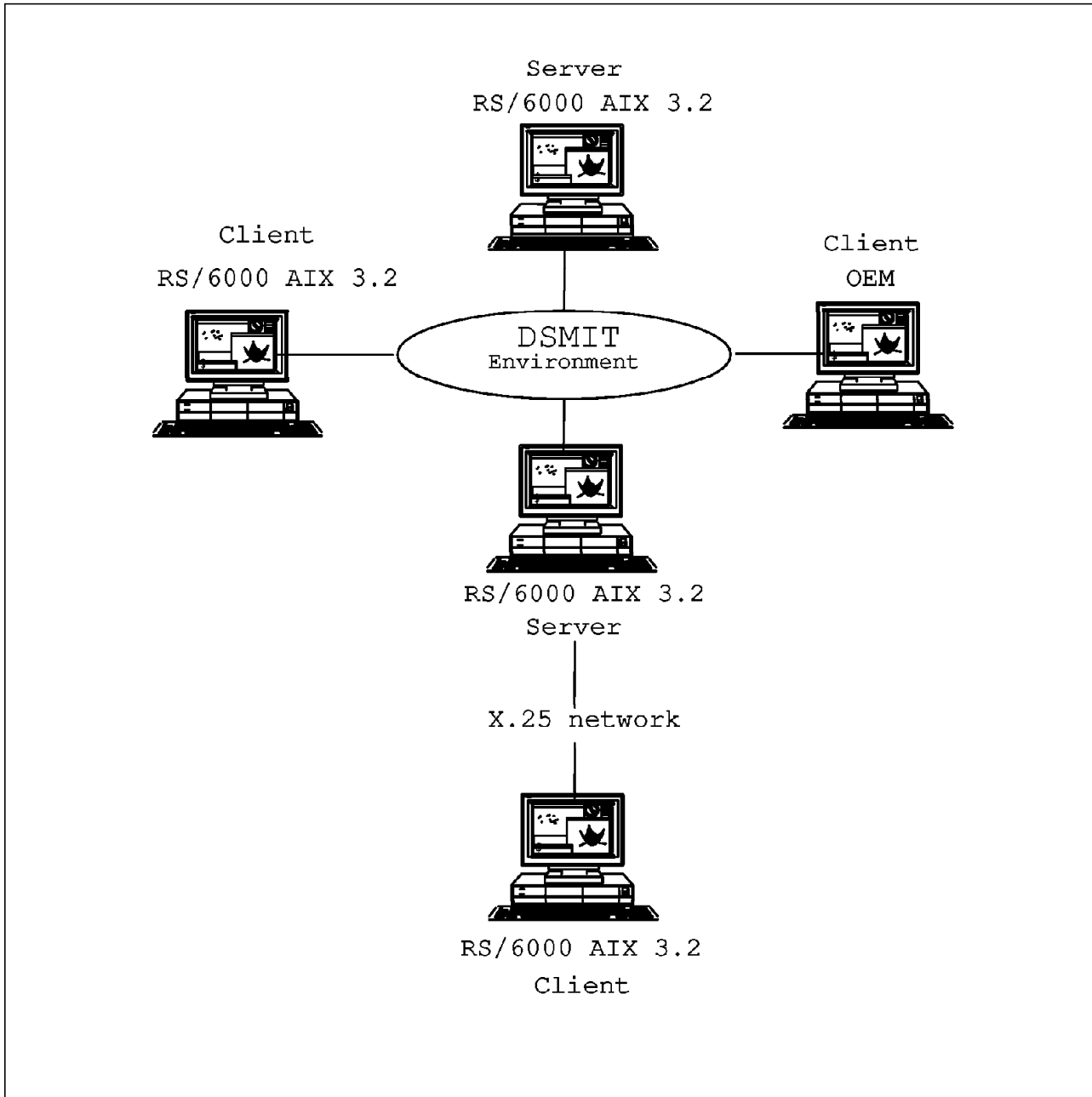


Figure 72. Managing Systems through a WAN

If you have one remote machine to manage over a WAN, for instance, we are calling ours `far_aix`, you could invoke DSMIT using the command `dsmit -w far_aix` to include this machine as the working collective.

If you have several remote machines you want to manage with DSMIT over a WAN, you could create a domain including all these machines, for example, let's call it `rmt_dom`, so you could issue DSMIT commands to all these remote machines using `rmt_dom` domain to define the working collective, typing `dsmit -W rmt_dom` when invoking DSMIT.

Appendix B. DSMIT Files

This appendix contains an example of the DSMIT files.

```
#
# This is an example of the /usr/share/DSMIT/hosts file.
#
df1:AIX_3.2:0
usa:SunOS_4.1.3:0
mexico:SunOS_4.1.3:0
brazil:SunOS_4.1.3:0
baseball:HP-UX_9.0:0
soccer:HP-UX_9.0:0
football:HP-UX_9.0:0
pantanal:AIX_3.2:0
cedro:AIX_3.2:0
# End of File
```

```
#
# This is an example of the /usr/share/DSMIT/dsmitos file.
#
AIX_3.2
HP-UX_9.0
SunOS_4.1.3
# End of File
```

```
#
# This is an example of the /usr/share/DSMIT/domains file.
#
sports:baseball,soccer,football
ibm_domain:df1,pantanal,cedro
country:usa,mexico,brazil
# End of File
```

Appendix C. Files Used to Add a Task to DSMIT

This appendix contains examples of the files used to add a task to the DSMIT menus.

This is an example of a smit.log file using the `-v` flag and navigating through DSMIT to the **Applications** option.

```
•Jun 01 1994, 11:32:31"
  Starting SMIT
(Menu screen selected,
FastPath   = †dsmitt,
id_seq_num = ††,
next_id    = †dsmitt,
title      = †Distributed System Management†.)
(Menu screen selected,
FastPath   = †top_menu_alias†,
id_seq_num = †010†,
next_id    = †top_menu_alias†,
title      = †System Management†.)
(Menu screen selected as FastPath,
id         = †__ROOT__†,
id_seq_num = †0†,
next_id    = †top_menu†,
title      = †System Management†.)
(Menu screen selected,
FastPath   = †top_menu†,
id_seq_num = †0†,
next_id    = †top_menu†,
title      = †System Management†.)
(Menu screen selected,
FastPath   = †appst,
id_seq_num = †100†,
next_id    = †appst,
title      = †Applications†.)
1800-014 There are currently no additional
SMIT menu screen entries available for this
item. This item may require installation of
additional software before it can be accessed.

(Specified sm_menu_opt with
id = †appst,
was not found in SMIT/ODM database.)

•Jun 01 1994, 11:32:48"
  Exiting SMIT
```

This is an example of a smit.log file using the `-v` flag and navigating through DSMIT to list all running processes in the client HP machine.

```
•Jun 01 1994, 11:39:37"
  Starting SMIT
(Menu screen selected,
FastPath   = †dsmitt†,
id_seq_num = ††,
next_id    = †dsmitt†,
title      = †Distributed System Management†.)
(Menu screen selected,
FastPath   = †top_menu_alias†,
id_seq_num = †010†,
next_id    = †top_menu_alias†,
title      = †System Management†.)
(Menu screen selected as FastPath,
id         = †__ROOT__†,
id_seq_num = †0†,
next_id    = †top_menu†,
title      = †System Management†.)
(Menu screen selected,
FastPath   = †top_menu†,
id_seq_num = †0†,
next_id    = †top_menu†,
title      = †System Management†.)
(Menu screen selected,
FastPath   = †srct†,
id_seq_num = †095†,
next_id    = †srct†,
title      = †Processes & Subsystem†.)
(Menu screen selected,
FastPath   = †process†,
id_seq_num = †010†,
next_id    = †process†,
title      = †Processes†.)
(Dialogue screen selected,
FastPath   = †pst†,
id         = †pst†,
title      = †Show all Current Processes†.)
•Jun 01 1994, 11:39:51"
  Command_to_Execute follows below:
>> ps -ef

      Output from Command_to_Execute follows below:
---- start ----
HOST: 192.100.73.104
-----

      root    10      0  0  May 31  ?           0:00 syncdaemon
      root     6      0  0  May 31  ?           0:00 sockregd
      root   172      1  0  May 31  ?           0:00 /usr/vue/bin/vuelogin
daemon 173    172  0  May 31  ?           0:12 /usr/bin/X11/X :0
      root    52      1  0  May 31  ?           0:04 /etc/syncer
      lp      56      1  0  May 31  ?           0:00 lpsched
      root   146      1  0  May 31  ?           0:00 /etc/cron
```



```

    root    83    66  0  May 31  ?           0:00 /etc/netfmt -f /usr/adm/nettl.LOG
00 -F -C -c /usr/adm/conslo
    root    64     1  0  May 31  ?           0:00 /etc/nktl_daemon 0 0 0 -1 0 1 -2
    root   117     1  0  May 31  ?           0:00 /etc/inetd
    root    66     1  0  May 31  ?           0:00 /etc/ntl_reader 0 1 1 1 1000 /usr
/adm/nettl /usr/adm/conslog
    root    93     1  0  May 31  ?           0:03 /etc/portmap
    root    87     1  0  May 31  ?           0:00 /etc/rlbdaemon
    root    97     1  0  May 31  ?           0:00 /usr/etc/rpc.mountd
    root    99     1  0  May 31  ?           0:00 /etc/nfsd 4
    root   101    99  0  May 31  ?           0:00 /etc/nfsd 4
    root   102    99  0  May 31  ?           0:00 /etc/nfsd 4
    root   103    99  0  May 31  ?           0:00 /etc/nfsd 4
    root   104     1  0  May 31  ?           0:00 /etc/biod 4
    root   105     1  0  May 31  ?           0:00 /etc/biod 4
    root   106     1  0  May 31  ?           0:00 /etc/biod 4
    root   107     1  0  May 31  ?           0:00 /etc/biod 4
    root   110     1  0  May 31  ?           0:00 /etc/pcnfsd
    root   112     1  0  May 31  ?           0:00 /usr/etc/rpc.statd
    root   114     1  0  May 31  ?           0:00 /usr/etc/rpc.lockd
    root   137     1  0  May 31  ?           0:00 /etc/smtpd
    root   148     1  0  May 31  ?           0:00 /etc/ptydaemon
    root   142     1  0  May 31  ?           0:00 /etc/ncs/llbd
    root   163     1  0  May 31  ?           0:00 /etc/syslogd
    root   258   117  0  May 31  ttys0      0:00 telnetd
    root   169     1  0  May 31  ?           0:00 /usr/audio/bin/Aserver
    root   170   169  0  May 31  ?           0:00 /usr/audio/bin/Aserver
nchris  259   258  0  May 31  ttys0      0:00 -ksh
    root   681   680  0  11:32:34 ttys1      0:00 -sh
    root   677   669  0  11:08:19 ?           0:00 vuegreet -display cechpp03:0
    root   695   681  6  11:35:47 ttys1      0:00 ps -ef
    root   680   117  0  11:32:34 ttys1      0:00 telnetd
daemon  672     1  0  11:08:18 ?           0:00 gmd
    root   669   172  0  11:08:18 ?           0:00 /usr/vue/bin/vuelogin

```

command exit status is: 0.

---- end ----

(Command process used stdout and stderr file
descriptors connected to SMIT via pipes.)

•Jun 01 1994, 11:40:07"

•Jun 01 1994, 11:40:12"

Exiting SMIT

The following is an example of an ASCII **stanzas** file to add menus to DSMIT using the `odmadd` command.

```
#this is to add an application in the DSMIT menu for an HP machine
#running the client part of xperf software.
#these stanzas are to start the xmservd daemon on the HP machine
#by selecting this option in Software menu
#-----
sm_menu_opt:
  id          = †top_menu†
  id_seq_num = †100†
  next_id     = †apps†
  text        = †Applications†

sm_menu_opt:
  id          = †apps†
  id_seq_num = †101†
  next_id     = †startcln†
  text        = †Manage PAIDE Agent†

sm_menu_opt:
  id          = †startcln†
  id_seq_num = †111†
  next_id     = †startcln†
  text        = †Start/Refresh Performance Agent Now†
```

Appendix D. ODM Files for DSMIT

This appendix contains example stanzas for DSMIT ODM:

```
-----  
# SMIT Example Program:  
# The following example program is designed to help you write your own  
# stanzas.  If you add these stanzas to the SMIT directory that  
# comes with the 4.1 operating system, they will be accessible  
# through SMIT by selecting the †Applications† item in the  
# main menu.  
  
#-----  
# Intro:  
# Unless you are creating an entirely new SMIT database, you will  
# first have to decide where to insert the menu for your application.  
# Your new menu will then point to other menus, name headers, and dialogs.  
# For this example, we are inserting a pointer to the demo menu  
# under the †Applications† menu option.  The next_id for the  
# Applications menu item is †apps†, so we begin by creating a menu_opt  
# with †apps† as its id.  
#-----  
sm_menu_opt:  
  id          = †apps†  
  id_seq_num  = †010†  
  next_id     = †demo†  
  text        = †SMIT Demos†  
  next_type   = †m†  
  
sm_menu_opt:  
  id          = †demo†  
  id_seq_num  = †010†  
  next_id     = †demo_queue†  
  text        = †Demo 1: Add a Print Queue†  
  next_type   = †n†  
  
sm_menu_opt:  
  id          = †demo†  
  id_seq_num  = †020†  
  next_id     = †demo_mle_inst_lang_hdr†  
  text        = †Demo 2: Add Language for Application Already Installed†  
  next_type   = †n†  
  
#----  
# Since demo_mle_inst_lang_hdr is a descriptive, but not very  
# memorable name, an alias with a simpler name can be made to  
# point to the same place.  
#----  
sm_menu_opt:  
  id          = †demo_lang†  
  next_id     = †demo_mle_inst_lang_hdr†  
  next_type   = †n†  
  alias       = †y†  
  
sm_menu_opt:  
  id_seq_num  = †030†
```

```

id = †demo†
next_id = †demo_lspv†
text = †Demo 3: List Contents of a Physical Volume†
text_msg_file = †smit.cat†
next_type = †n†

sm_menu_opt:
id_seq_num = †040†
id = †demo†
next_id = †demo_date†
text = †Demo 4: Change / Show Date, Time†
text_msg_file = †smit.cat†
next_type = †n†

#-----
# Demo 1
# -----
# Goal: Add a Print Queue. If the printers.rte package is
# not installed, install it automatically. If the
# user is running MSMIT (Motif SMIT), then launch a
# graphical program for this task. Otherwise, simply
# branch to the SMIT print queue task.
#
# Topics:      1. cooked output & cmd_to_classify
#              2. SMIT environment variable (msmit vs. ascii)
#              3. ghost name_hdr
#              4. super-ghost name_hdr
#              5. creating an †OK / cancel† option
#              6. dspmsg for translations
#              7. exit/exec mode
#              8. id_seq_num for a name_hdr option
#-----

#----
# Topics: 1,4
# Note that the next_id is the same as the id. Remember that the
# output of the cmd_to_classify will be appended to the next_id,
# since the type is †c†, for cooked. So, the next_id will
# actually be either demo_queue1 or demo_queue2.
# None of the output of the name_hdr is displayed, and there is
# no cmd_to_list in the demo_queue_dummy_opt, making this name_hdr
# a super-ghost.
#----
sm_name_hdr:
id = †demo_queue†
next_id = †demo_queue†
option_id = †demo_queue_dummy_opt†
name = †Add a Print Queue†
name_msg_file = †smit.cat†
name_msg_set = 52
name_msg_id = 41
type = †c†
ghost = †y†
cmd_to_classify] = †\
x()
{
    # Check to see if the printer file is installed.
    lslpp -l printers.rte 2>/dev/null 1>/dev/null
    if •• $? != 0 ""

```

```

        then
        echo 2
        else
        echo 1
        fi
    }
xt
]next_type ]]      = tm†

#----
# Topics: 2,4
# Having determined that the printer software is already installed,
# now we want to know if the gui program should be run, or if we
# should branch to the ascii SMIT screen for this task.  To do,
# this, we can check the value of the environment variable SMIT,
# which will be tm† for motif or ta† for ascii.  Here again
# we tack the output of the cmd_to_classify onto the next_id.
#----
sm_name_hdr:
    id                = tdemo_queue†
    next_id           = tmkpg†
    option_id         = tdemo_queue_dummy_opt†
    has_name_select   = tt
    ghost             = ty†
    next_type         = tm†
    type              = tc†
    cmd_to_classify   = t\
gui_check()
{
    if • $SMIT = \tm\† "; then
        echo gui
    fi
}
gui_check†

sm_name_hdr:
    id = tmkpggui†
    next_id = tinvoke_gui†
    next_type = td†
    option_id = tdemo_queue_dummy_opt†
    ghost = ty†

#----
# Topics: 7
# Note: the exec_mode of this command is te†, which
# exits SMIT before running the cmd_to_exec.
#----
sm_cmd_hdr:
    id = tinvoke_gui†
    cmd_to_exec = t/usr/bin/X11/xprint†
    exec_mode = te†
    ghost = ty†

sm_cmd_opt:
    id = tdemo_queue_dummy_opt†
    id_seq_num = 0

#----
# Topics: 3,5

```

```

# The printer software was not installed. Install the software
# and then loop back to demo_queue1 to check the SMIT
# environment variable.
# This is a ghost name_hdr. The cmd_to_list of the
# sm_cmd_opt is displayed immediately as a pop-up option
# instead of waiting for the user to input a response.
# In this ghost, the cmd_opt is a simple OK/cancel box
# that prompts the user to press return.
#----
sm_name_hdr:
  id                = †demo_queue2†
  next_id           = †demo_queue1†
  option_id         = †demo_queue_opt†
  name              = †Add a Print Queue†
  name_msg_file     = †smit.cat†
  name_msg_set      = 52
  name_msg_id       = 41
  ghost             = †y†
  cmd_to_classify   = †\
install_printers ()
{

  # Install the printer package.
  /usr/lib/assist/install_pkg †printers.rte† 2>&l >/dev/null
  if •• $? != 0 ""
  then
    echo †Error installing printers.rte†
    exit 1
  else
    exit 0
  fi
}
install_printers †
next_type          = †n†

#----
# Topics: 5,6,8
# Here a cmd_opt is used as an OK/cancel box.
# Note also that the command dspmsg is used to
# display the text for the option. This will allow
# for translation of the messages.
# Note: the id_seq_num for the option is 0. Only one
# option is allowed per name_hdr and it's
# id_seq_num must be 0.
#----
sm_cmd_opt:
  id                = †demo_queue_opt†
  id_seq_num        = †0†
  disc_field_name   = ††
  name              = †Add a Print Queue†
  name_msg_file     = †smit.cat†
  name_msg_set      = 52
  name_msg_id       = 41
  op_type           = †l†
  cmd_to_list       = †x()\
{
if • $SMIT = †a† " \n\
then \n\
dspmsg -s 52 smit.cat 56 \

```

```

    Press Enter to automatically install the printer software.\n\
    Press F3 to cancel.\n\
    \n\
    else \n\
    dspmsg -s 52 smit.cat 57 Click on this item to automatically install
    the printer software.\n\ \n\
    fi\n\
    } \n\
x†
    entry_type          = tt†
    multi_select        = tn†

```

```

#-----
--
#
# Demo 2
# -----
# Goal: Add a Language for an Application Already Installed.
#       It is often more clear to the user to get some
#       information before displaying the dialog screen.
# Name Headers (sm_name_hdr) can be used for this purpose.
#       In this example, two name headers are used to determine the
#       language to install and the install device. The dialog
#       has entries for the rest of the information needed to
#       perform the task.
#
#
# Topics:      1. Saving output from successive name_hdrs with
cooked_field_name
#              2. Using getopt inside cmd_to_exec to process cmd_opt info
#              3. Ring list vs. cmd_to_list for displaying values cmd_opts

```

```

#-----
--
#----
# Topic: 1
# This is the first name_hdr. It is called by the menu_opt for this
# function. We want to save the user's input for later use in the
# dialog. The parameter passed into the cmd_to_classify comes from
# the user's selection/entry. Cmd_to_classify cleans up the output
# and stores it in the variable specified by cooked_field_name.
# This overrides the default value for the cmd_to_classify output,
# which is _cookedname. The default must be overridden because we
# also need to save the output of the next name_hdr.
#----
sm_name_hdr:
    id          = †demo_mle_inst_lang_hdr†
    next_id     = †demo_mle_inst_lang†
    option_id   = †demo_mle_inst_lang_select†
    name        = †Add Language for Application Already
Installed†
    name_msg_file = †smit.cat†
    name_msg_set  = 53
    name_msg_id   = 35
    type          = †jt†
    ghost         = †nt†

```

```

cmd_to_classify          = \
  foo() {
    echo $1 | sed -n \ts/*.**\*\(\.*\*\*\)\.*\/\1/p\
  }
  foot
cooked_field_name       = \add_lang_language\
next_type                = \n\
help_msg_id              = \2850325\

sm_cmd_opt:
  id                     = \demo_mle_inst_lang_select\
  id_seq_num             = \0\
  disc_field_name        = \add_lang_language\
  name                   = \LANGUAGE translation to install\
  name_msg_file          = \smit.cat\
  name_msg_set           = 53
  name_msg_id            = 20
  op_type                = \l\
  entry_type             = \n\
  entry_size             = 0
  required               = \
  prefix                 = \-l \
  cmd_to_list_mode       = \a\
  cmd_to_list            = \usr/lib/nls/lsmle -l\
  help_msg_id            = \2850328\

#----
# Topic:1
# This is the second name_hdr. Here the user's input is passed
# directly through the cmd_to_classify and stored in the
# variable add_lang_input.
#----
sm_name_hdr:
  id                     = \demo_mle_inst_lang\
  next_id                = \demo_dialog_add_lang\
  option_id              = \demo_add_input_select\
  has_name_select        = \y\
  name                   = \Add Language for Application Already
Installed\
  name_msg_file          = \smit.cat\
  name_msg_set           = 53
  name_msg_id            = 35
  type                   = \j\
  ghost                  = \n\
  cmd_to_classify        = \
  foo() {
    echo $1
  }
  foot
  cooked_field_name      = \add_lang_input\
  next_type              = \d\
  help_msg_id            = \2850328\

sm_cmd_opt:
  id                     = \demo_add_input_select\
  id_seq_num             = \0\
  disc_field_name        = \add_lang_input\
  name                   = \INPUT device/directory for software\
  name_msg_file          = \smit.cat\

```



```

name_msg_set           = 53
name_msg_id            = 11
op_type                = †††
entry_type             = †††
entry_size             = 0
required               = †y†
prefix                 = †-d †
cmd_to_list_mode      = †††
cmd_to_list            = †/usr/lib/instl/sm_inst list_devices†
help_msg_id            = †2850313†

#----
# Topic: 2
# Each of the cmd_opts formats it's information for processing
# by the getopt command (a dash and a single character, followed
# by an optional parameter). The colon following the letter in the
# getopt command means that a parameter is expected after the
# dash option. This is a nice way to process the cmd_opt information
# if there are several options, and especially if one of the options could
# potentially be left out, causing the sequence of $1, $2, etc.
# to get out of order.
#----
sm_cmd_hdr:
    id                 = †demo_dialog_add_lang†
    option_id          = †demo_mle_add_app_lang†
    has_name_select    = ††
    name               = †Add Language for Application Already
Installed†
name_msg_file         = †smit.cat†
name_msg_set          = 53
name_msg_id           = 35
cmd_to_exec           = †\
foo()
{
while getopt d:l:S:X Option ††$@\†
do
    case $Option in
        d) device=$OPTARG;;
        l) language=$OPTARG;;
        S) software=$OPTARG;;
        X) extend_fs=†-X†;;
    esac
done

if †† /usr/lib/assist/check_cd -d $device = ††† ††
then
    /usr/lib/assist/mount_cd $device
    CD_MOUNTED=true
fi

if †† $software = ††ALL\† ††
then
echo †Installing all software for $language...†
else
echo †Installing $software for $language...†
fi
exit $RC
}
foot

```

```

ask                = tyt
ghost              = tnt
help_msg_id        = †2850325†

sm_cmd_opt:
  id                = †demo_mle_add_app_lang†
  id_seq_num        = †0†
  disc_field_name   = †add_lang_language†
  name              = †LANGUAGE translation to install†
  name_msg_file     = †smit.cat†
  name_msg_set      = 53
  name_msg_id       = 20
  entry_type        = tnt
  entry_size        = 0
  required          = tyt
  prefix            = †-l †
  cmd_to_list_mode  = †a†
  help_msg_id       = †2850328†

#----
# Topic: 2
# The prefix field precedes the value selected by the user, and
# both the prefix and the user-selected value are passed into
# the cmd_to_exec for getopt's processing.
#----
sm_cmd_opt:
  id                = †demo_mle_add_app_lang†
  id_seq_num        = †020†
  disc_field_name   = †add_lang_input†
  name              = †INPUT device/directory for software†
  name_msg_file     = †smit.cat†
  name_msg_set      = 53
  name_msg_id       = 11
  entry_type        = tnt
  entry_size        = 0
  required          = tyt
  prefix            = †-d †
  cmd_to_list_mode  = †l†
  cmd_to_list       = †/usr/lib/instl/sm_inst list_devices†
  help_msg_id       = †2850313†

sm_cmd_opt:
  id                = †demo_mle_add_app_lang†
  id_seq_num        = †030†
  name              = †Installed APPLICATION†
  name_msg_file     = †smit.cat†
  name_msg_set      = 53
  name_msg_id       = 43
  op_type           = †l†
  entry_type        = tnt
  entry_size        = 0
  required          = tyt
  prefix            = †-S †
  cmd_to_list_mode  = ††
  cmd_to_list       = †\
    list_messages ()
    {
      language=$1
      device=$2

```

```

        ls1pp -Lqc | grep \t.msg.$language\t | cut -f2,3 -d\&: & >
/tmp/msg_installed.$$
        installp -d $device -L | grep .msg.$language | grep -vf
/tmp/msg_installed.$$ /tmp/msg_list.$$
        /usr/lib/instl/sm_inst installp_format -iems -O -P
/tmp/msg_list.$$ | grep -v \t #\t
        rm -f /tmp/msg_list.$$ /tmp/msg_installed.$$
    }
    list_messages†
    cmd_to_list_postfix      = †add_lang_language add_lang_input†
    multi_select             = †,†
    value_index              = 0
    disp_values              = †ALL†
    help_msg_id              = †2850329†

#----
# Topic: 3
# Here, instead of a cmd_to_list, there is a comma-delimited set
# of Ring values in the disp_values field. This list is displayed
# one item at a time as the user presses tab in the cmd_opt
# entry field. However, instead of passing a yes or no to the cmd_hdr, here
# it is more useful to use the aix_values field to pass either
# a -X or nothing. The list in the aix_values field must match one-to-one
with
# the list in the disp_values field.
#----
sm_cmd_opt:
    id_seq_num = †40†
    id = †demo_mle_add_app_lang†
    disc_field_name = ††
    name = †EXTEND file systems if space needed?†
    name_msg_file = †smit.cat†
    name_msg_set = 53
    name_msg_id = 12
    op_type = tr†
    entry_type = tn†
    entry_size = 0
    required = ty†
    multi_select = tn†
    value_index = 0
    disp_values = †yes,no†
        values_msg_file = †sm_inst.cat†
    values_msg_set = 1
    values_msg_id = 51
    aix_values = †-X,†
    help_msg_id = †0503005†

#-----
--
#
# Demo 3
# -----
# Goal: Show Characteristics of a Logical Volume.
# The name of the logical volume is entered by the
# user and passed to the cmd_hdr as _rawname.
#
# Topics: 1. _rawname

```

```

# 2. Ringlist & aix_values

#-----
--

#----
# Topic: 1
# No rawname is needed, since we only have one name_hdr and
# we can just use the default variable name _rawname.
#----
sm_name_hdr:
  id = †demo_lspv†
  next_id = †demo_lspvd†
  option_id = †demo_cmdlvmpvns†
  has_name_select = ††
  name = †List Contents of a Physical Volume†
  name_msg_file = †smit.cat†
  name_msg_set = 15
  name_msg_id = 100
  type = †j†
  ghost = ††
  cmd_to_classify = ††
  raw_field_name = ††
  cooked_field_name = ††
  next_type = †d†
  help_msg_id = †0516100†

sm_cmd_opt:
  id_seq_num = †0†
  id = †demo_cmdlvmpvns†
  disc_field_name = †PVName†
  name = †PHYSICAL VOLUME name†
  name_msg_file = †smit.cat†
  name_msg_set = 15
  name_msg_id = 101
  op_type = †l†
  entry_type = †††
  entry_size = 0
  required = †††
  cmd_to_list_mode = †l†
  cmd_to_list = †lsvg -o|lsvg -i -p|grep -v †•:P"†|cut -f1 -d† ††
  cmd_to_list_postfix = ††
  multi_select = †n†
  help_msg_id = †0516021†

#----
# Topic: 1
# The cmd_to_discover_postfix passes in the name of the physical
# volume, which is the raw data selected by the user in the
# name_hdr - _rawname.
#----
sm_cmd_hdr:
  id = †demo_lspvd†
  option_id = †demo_cmdlvmlspv†
  has_name_select = †y†
  name = †List Contents of a Physical Volume†
  name_msg_file = †smit.cat†
  name_msg_set = 15

```

```

name_msg_id = 100
cmd_to_exec = †lspvt†
ask = †n†
cmd_to_discover_postfix = †_rawname†
help_msg_id = †0516100†

sm_cmd_opt:
id_seq_num = †01†
id = †demo_cndlvm1spv†
disc_field_name = †_rawname†
name = †PHYSICAL VOLUME name†
name_msg_file = †smit.cat†
name_msg_set = 15
name_msg_id = 101
op_type = †l†
entry_type = †t†
entry_size = 0
required = †+†
cmd_to_list_mode = †l†
cmd_to_list = †lsvg -o|lsvg -i -p|grep -v †•:P"†|cut -f1 -d† ††
help_msg_id = †0516021†

```

```

#----
# Topic: 2
# Here a ringlist of 3 values matches with the aix_values we
# want to pass to the sm_cmd_hdr's cmd_to_exec.
#----

```

```

sm_cmd_opt:
id_seq_num = †02†
id = †demo_cndlvm1spv†
disc_field_name = †Option†
name = †List OPTION†
name_msg_file = †smit.cat†
name_msg_set = 15
name_msg_id = 92
op_type = †tr†
entry_type = †n†
entry_size = 0
required = †n†
value_index = 0
disp_values = †status,logical volumes,physical partitions†
values_msg_file = †smit.cat†
values_msg_set = 15
values_msg_id = 103
aix_values = † , -l, -p†
help_msg_id = †0516102†

```

```

#-----
--
#
# Demo 4
# -----
# Goal: Change / Show Date & Time
#
# Topics:]1. Using a ghost name header to get variable
#       values for the next dialog screen.
# 2. Using a cmd_to_discover to fill more than one
#       cmd_opt with initial values.

```

```

# 3. Re-ordering parameters in a cmd_to_exec.

#-----
--

#----
# Topic: 1
# This ghost name_hdr gets two values and stores them in the variables
# daylight_y_n and time_zone for use in the cmd_opts for the next
# dialog. Note how the output of cmd_to_classify is colon delimited,
# as is the list of field names in cooked_field_name.
#----
sm_name_hdr:
  id = †demo_date†
  next_id = †demo_date_dial†
  option_id = †date_sel_opt†
  name_msg_set = 0
  name_msg_id = 0
  ghost = †y†
  cmd_to_classify = †if • $(echo $TZ | awk †{ if (length($1) <=6 )
{printf(†2\†)} else {printf(†1\†)} }†) = 1 " \n\
then\n\
  echo $(dspmsg smit.cat -s 30 18 †yes†)\†:$TZ\†\n\
else\n\
  echo $(dspmsg smit.cat -s 30 19 †no†)\†:$TZ\†\n\
fi ††
  cooked_field_name = †daylight_y_n:time_zone†

sm_cmd_opt:
  id_seq_num = †0†
  id = †date_sel_opt†

#----
# Topic: 2,3
# Here the cmd_to_discover gets six values, one for each of the
# editable sm_cmd_opts for this screen. Note how the cmd_to_discover
# output is two lines, the first with a # followed by a list of
# variable names, and the second line the list of values. Both
# lists are colon delimited.
# We also see here how the cmd_to_exec takes the parameters from
# the cmd_opts and can re-order them when calling the command.
#----
sm_cmd_hdr:
  id = †demo_date_dial†
  option_id = †demo_chtz_opt†
  has_name_select = †y†
  name = †Change / Show Date & Time†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 21
  cmd_to_exec = †date_proc ( ) †]# MM dd hh mm ss yy\n\
# dialogue param order]# 3 4 5 6 7 2\n\
{\n\
date \†$3$4$5$6.$7$2\†\n\
}\n\
date_proc †
  exec_mode = †P†
  cmd_to_discover = †disc_proc() \n\
{\n\

```

```

TZ=\t$1\t\n\
echo $#cur_month:cur_day:cur_hour:cur_min:cur_sec:cur_year#\n\
date +%m:%d:%H:%M:%S:%y\n\
}\n\
disc_proct
  cmd_to_discover_postfix = ++
  help_msg_id = †055101†

#----
# The first two cmd_opts get their initial values (disc_field_name) from the
# name_hdr.
#----
sm_cmd_opt:
  id_seq_num = †04†
  id = †demo_chtz_opts†
  disc_field_name = †time_zonet†
  name = †Time zonet†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 16
  required = †y†

sm_cmd_opt:
  id_seq_num = †08†
  id = †demo_chtz_opts†
  disc_field_name = †daylight_y_nt†
  name = †Does this time zone go on daylight savings time?\n†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 17
  entry_size = 0

#----
# The last six cmd_opts get their values from the cmd_to_discover.
#----
sm_cmd_opt:
  id_seq_num = †10†
  id = †demo_chtz_opts†
  disc_field_name = †cur_year†
  name = †YEAR (00-99)†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 10
  entry_type = †#†
  entry_size = 2
  required = †++†
  help_msg_id = †055102†

sm_cmd_opt:
  id_seq_num = †20†
  id = †demo_chtz_opts†
  disc_field_name = †cur_month†
  name = †MONTH (01-12)†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 11
  entry_type = †#†
  entry_size = 2
  required = †++†

```

```

help_msg_id = †055132†

sm_cmd_opt:
  id_seq_num = †30†
  id = †demo_chnz_opt†
  disc_field_name = †cur_day†
  name = †DAY (01-31)\n†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 12
  entry_type = †#†
  entry_size = 2
  required = †+†
  help_msg_id = †055133†

sm_cmd_opt:
  id_seq_num = †40†
  id = †demo_chnz_opt†
  disc_field_name = †cur_hour†
  name = †HOUR (00-23)†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 13
  entry_type = †#†
  entry_size = 2
  required = †+†
  help_msg_id = †055134†

sm_cmd_opt:
  id_seq_num = †50†
  id = †demo_chnz_opt†
  disc_field_name = †cur_min†
  name = †MINUTES (00-59)†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 14
  entry_type = †#†
  entry_size = 2
  required = †+†
  help_msg_id = †055135†

sm_cmd_opt:
  id_seq_num = †60†
  id = †demo_chnz_opt†
  disc_field_name = †cur_sec†
  name = †SECONDS (00-59)†
  name_msg_file = †smit.cat†
  name_msg_set = 30
  name_msg_id = 15
  entry_type = †#†
  entry_size = 2
  required = †+†
  help_msg_id = †055136†
----

```


Appendix E. List of the Printer Names Changed

This appendix is comprised of two printers list. The first one is the list of the printer names changed from AIX 3.2 to AIX 4.1 and the second one is a list of the new printers supported by AIX 4.1.

Table 1. AIX 3.2, AIX 4.1 Printer Name Changes

AIX 3.2 Name	AIX 4.1 Name		AIX 3.2 Name	AIX 4.1 Name
2380	ibm2380		2380-2	ibm2380-2
2381	ibm2381		2381-2	ibm2381-2
2390	ibm2390		2390-	ibm2390-2
2391	ibm2391		2391-2	ibm2391-2
3812-2	ibm3812-2		3816	ibm3816
4019	ibm4019		4029	ibm4029
4037	ibm4037		4039	ibm4039
4070	ibm4070		4072	ibm4072
4076	ibm4076		4079	ibm4079
4201-2	ibm4201-2		4201-3	ibm4201-3
4202-2	ibm4202-2		4202-3	ibm4202-3
4207-2	ibm4207-2		4208-2	ibm4208-2
4212	ibm4212		4216-31	ibm4216-31
4224	ibm4224		4226	ibm4226
4234	ibm4234		5202	ibm5202
5204	ibm5204		5575	ibm5575
5577	ibm5577		5585	ibm5585
6180	ibm6180		6182	ibm6182
6184	ibm6184		6185-1	ibm6185-1
6185-2	ibm6185-2		6186	ibm6186
6252	ibm6252		6262	ibm6262
7372	ibm7372		prt1021	bull1021
prt1070	bull1070		prt0201	bull201
prt0411	bull411		prt0422	bull422
prt4512	bull451		prt4513	bull451
prt4542	bull454		prt4543	bull454
prt0721	bull721		prt9222	bull922
prt9232	bull923		prt9242	bull924
prt9282	bull924N		prt9702	bull970
pr88	bullpr88			

Support for Lexmark Printers

- IBM 4037 5E PAGE PRINTER
- IBM 4076 EXECJET II PRINTER
- IBM 2380 PLUS & 2381 PLUS PRINTERS
- IBM 2390 PLUS & 2391 PLUS PRINTERS

Support for New Japanese Printers

- 4039 page printer
- 5573-H02 dot impact printer
- 5577-J02/K02 dot impact printer
- 5579-K02 dot impact printer
- 5584-G02/H02 (Inazoh) - IBM-Japan's A4 size page printer.
- Canon LASER SHOT LBP-B406G is the follow-on model of LBP-B406S/D/E and a B4 size page printer.
- Canon LASER SHOT LBP-A404PS/Lite (PostScript printer)
- OKI MICROLINE 801PS+F, 801PSII/+F, 800PSIILT (PostScript printer) The OKI MICROLINE 801PS+F and 801PSII/+F are B4 size PostScript printer. The OKI MICROLINE 800PSIILT is A4 size PostScript printer.

List of Abbreviations

AFS	Andrew File System	NIS	Network Information Service
AIC	AIXwindows Interface Composer/6000	NLS	National Language Support
ANSI	American National Standards Institute	OEM	Original Equipment Manufacturer
API	Application Programming Interface	ODM	Object Data Manager
APA	all points addressable	OPP	Optional Program Product
ASCII	American National Standard Code for Information Interchange	PID	Process Identifier
AIX	Advanced Interactive Executive	POST	Power On self Test
BOS	Base Operating System	PMP	Preventive Maintenance Package
DSMIT	Distributed System Management Interface Tool	RAM	Random Access Memory
HFT	High Function Terminal	RISC	Reduced Instruction Set Computer
IBM	International Business Machines Corporation	ROM	Read Only Memory
IPL	Initial Program Load	ROS	Read Only Storage
ISO	International Organization for Standardization	SLIP	Serial Line Internet Protocol
ITSO	International Technical Support Organization	SMIT	System Management Interface Tool
LAN	Local Area Network	SNMP	Simple Network Management Protocol
LPFK	Lighted Programmable Functions Keys	TFTP	Trivial File Transfer Protocol
LPP	Licensed Program Product	TCP/IP	Transmission Control Protocol/Internet Protocol
MIT	Massachusets Institute of Technology	UIL	User Interface Language
NFS	Network File System	VSM	Visual System Management
		WAN	Wide Area Network
		XDM	X Window Display Manager
		XDMCP	X Window Display Manager Control Protocol

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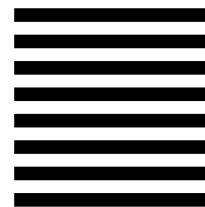
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