

IBM Remote Deployment Manager 4.30



# User's Reference



IBM Remote Deployment Manager 4.30



# User's Reference

**Note:**

Before using this information and the product it supports, read the general information in Appendix G, "Notices," on page 375.

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## About this document

This document provides information about using IBM® Remote Deployment Manager (RDM) 4.30. RDM provides administrators with centralized control of systems from a remote console. With RDM, you can perform the following tasks:

- Administer servers, workstations, desktop computers, point-of-sale systems, and mobile computers that are connected to the local area network (LAN) or wide area network (WAN)
- Deploy operating systems, applications, BIOS code and other system firmware
- Back up and restore operations for the primary partition
- Maintain systems

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## How this document is organized

Chapter 1, “Introducing Remote Deployment Manager,” on page 3 contains an overview of Remote Deployment Manager, including its components and features.

Chapter 2, “IBM Director Console and RDM tasks,” on page 7 contains information about IBM Director and RDM elements, including IBM Director Console, RDM menu items, RDM task templates, and images.

Chapter 3, “Working with RDM templates,” on page 15 contains information about creating RDM tasks, using RDM templates, and working with property sheets.

Chapter 4, “Using Image Management,” on page 29 contains information about saving, deleting, replicating, importing, and exporting an image.

Chapter 5, “Configuring systems and tasks,” on page 41 contains information about configuring target systems and tasks. This chapter also provides information about the System/Task Configuration (STC) window.

Chapter 6, “Importing and exporting,” on page 49 contains information about importing and exporting RDM system data, RDM tasks, RDM images, and data.

Chapter 7, “CMOS Update,” on page 61 through Chapter 22, “Windows Native Install,” on page 239 describe the RDM tasks that you can create and customize. Each chapter in this part discusses a different task, and the chapters are alphabetical by the task name.

Chapter 25, “Utilities,” on page 279 describes the utilities that RDM provides when it is installed. The information includes DOS, Symantec, RAID configuration, RDM, and other utilities.

Chapter 24, “Command-list commands,” on page 271 describes the RDM command-list commands. You can use these commands to customize the RDM task scripts.

Chapter 26, “Solving RDM problems,” on page 335 lists solutions to problems that you might encounter with RDM.

Appendix A, “Additional cloning procedures using Sysprep,” on page 343 contains procedures for using Sysprep version 2.0 to clone Microsoft® Windows® systems.

Appendix B, “Creating custom system environments,” on page 355 contains instructions on how to create your own DOS system environments.

Appendix C, “RDM data and files,” on page 359 contains information about how RDM stores its data.

Appendix D, “Linux directories,” on page 363 provides a list of Linux® operating-system directories that you must avoid as mount points.

Appendix E, “Terminology summary and abbreviation list,” on page 369 contains a summary of RDM terminology and a list of abbreviations used in the RDM documentation.

Appendix F, “Getting help and technical assistance,” on page 373 contains information about accessing IBM Support Web sites for help and technical assistance.

Appendix G, “Notices,” on page 375 contains product notices and trademarks.

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## Notices that are used in this document

This document contains the following notices that highlight key information:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or difficult situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

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## RDM documentation

Online help is accessible from most of the windows in RDM. To access the online help, use either the Help menu or Help button.

The following documents are available in Portable Document Format (PDF) from the IBM Remote Deployment Manager Web site at [http://www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/resources/index.html](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/resources/index.html). Check this Web page regularly for new or updated RDM documentation.

- *IBM Remote Deployment Manager 4.30 Installation and Configuration Guide* Fifth Edition, April 2006 (rdm430\_installconfig\_guide.pdf)
- *IBM Remote Deployment Manager 4.30 User's Reference* Fifth Edition, April 2006 (rdm430\_userref\_guide.pdf)
- *IBM Remote Deployment Manager 4.30 Compatibility Guide* Fourteenth Edition, May 2006 (rdm430\_compat\_guide.pdf)

The *IBM Remote Deployment Manager 4.30 Compatibility Guide* lists hardware that IBM has tested with RDM.

You also can download RDM white papers from [http://www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/resources/index.html](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/resources/index.html). The white papers include a troubleshooting guide and provide additional information about using RDM.

For planning purposes, the following IBM Director documents are available in Portable Document Format (PDF) from the IBM Director 5.10 publications Web site at <http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-61788>:

- *IBM Director 5.10 Installation and Configuration Guide* Fourth Edition, October 2005 (dir5.10\_docs\_install.pdf)
- *IBM Director 5.10 Systems Management Guide* Fourth Edition, October 2005 (dir5.10\_docs\_sysmgt.pdf)

In addition, the following IBM Redbooks™ documents might be of interest:

- *IBM eServer™ BladeCenter® Systems Management with IBM Director V4.1 and Remote Deployment Manager V4.1* (REDP-3776)
- *Implementing Systems Management Solutions using IBM Director* (SG24-6188)

You can download these documents from the IBM Redbooks Web site at <http://www.ibm.com/redbooks/>.

**Note:** Be sure to note the date of documents and to determine the level of RDM software to which the Redbooks documents refers.

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## RDM resources on the World Wide Web

The following Web pages provide resources for understanding, using, and troubleshooting RDM and other deployment and systems-management tools.

### **IBM Remote Deployment Manager page**

[http://www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/extensions/rdm.html](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/extensions/rdm.html)

This Web page provides an overview of IBM Remote Deployment Manager. From this Web page, you can download the latest RDM documentation and white papers. The white papers provide a troubleshooting guide and information about using RDM.

### **IBM ServerGuide™ page**

[http://www.ibm.com/servers/eserver/xseries/systems\\_management/serverguide.html](http://www.ibm.com/servers/eserver/xseries/systems_management/serverguide.html)

This Web page provides an overview of the IBM ServerGuide™ program.

### **IBM ServerGuide Scripting Toolkit page**

[http://www.ibm.com/servers/eserver/xseries/systems\\_management/sgstk.html](http://www.ibm.com/servers/eserver/xseries/systems_management/sgstk.html)

This Web page provides an overview of IBM ServerGuide Scripting Toolkit and links to the latest version of the toolkit for download.

### **IBM UpdateXpress page**

[http://www.ibm.com/servers/eserver/xseries/systems\\_management/ibm\\_director/extensions/xpress.html](http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/extensions/xpress.html)

This Web page provides an overview of IBM UpdateXpress. It also contains links to pages from which you can download UpdateXpress, order an UpdateXpress CD, or purchase a subscription to UpdateXpress updates.

### **IBM ServerProven® page**

<http://www.ibm.com/servers/eserver/serverproven/compat/us/>

The ServerProven<sup>®</sup> Web page provides information about IBM System x<sup>™</sup> (which includes IBM eServer xSeries<sup>®</sup>, and IBM System x3nnn servers), IBM BladeCenter<sup>™</sup>, and IBM IntelliStation<sup>®</sup> hardware compatibility with IBM systems-management tools.

**IBM Support page**

<http://www.ibm.com/pc/support/>

This is the IBM Support Web site for IBM hardware and systems-management software.

**IBM Systems Management Software: Download/Registration page**

[http://www.ibm.com/servers/eserver/xseries/systems\\_management/xseries\\_sm/dwnl.html](http://www.ibm.com/servers/eserver/xseries/systems_management/xseries_sm/dwnl.html)

Use this Web page to download IBM systems management software, including IBM Director.

**IBM System x Systems Management page**

[http://www.ibm.com/servers/eserver/xseries/systems\\_management/index.html](http://www.ibm.com/servers/eserver/xseries/systems_management/index.html)

This Web page presents an overview of IBM systems management and IBM Director. Click **IBM Director** for the latest information and documentation.

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## Part 1. Introducing Remote Deployment Manager



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## Chapter 1. Introducing Remote Deployment Manager

IBM Remote Deployment Manager (RDM) is a flexible and powerful tool that you can use to remotely perform configuration, deployment, and retirement operations on both IBM and non-IBM systems. You can use RDM to perform the following tasks:

- Update system firmware
- Modify configuration settings
- Install operating systems and applications
- Back up and recover primary partitions
- Securely erase data from disks

RDM is an IBM Director extension. RDM integrates seamlessly with IBM Director; you can use the same administrative console to perform both deployment and management tasks.

---

### RDM environment and terminology

A *system* is a server, workstation, desktop computer, mobile computer (laptop), or point-of-sale system.

The systems in an RDM environment are referred to in the following ways:

- An *RDM server* is a server on which both IBM Director Server and RDM Server are installed.
- An *RDM console* is a system on which both IBM Director Console and RDM Console are installed.
- A *remote deployment server* is a system on which RDM Deployment Server is installed. This system must be in a different subnet than the RDM server. RDM Console can be installed on this system also.
- A *target system* is a system against which an RDM task is run.

---

### RDM components

The RDM software has three components:

- RDM Server
- RDM Console
- RDM Deployment Server (also known as D-Server)

### RDM Server

RDM Server is the main component of Remote Deployment Manager. It contains the application logic, monitors the status of RDM tasks, and stores data both in the IBM Director database and in its own database.

When you install RDM Server, RDM Console and RDM Deployment Server are installed automatically also.

## RDM Console

RDM Console is the graphical user interface (GUI) component of Remote Deployment Manager. RDM Console must be installed on any Director console from which a system administrator will remotely access the RDM server and perform RDM tasks.

## RDM Deployment Server (D-Server)

RDM Deployment Server (also known as D-Server) handles communication between RDM Server and target systems. Using Multicast Trivial File Transfer Protocol (MTFTP) and Trivial File Transfer Protocol (TFTP), it also delivers commands, data files, and applications to target systems.

The instance of RDM Deployment Server that is installed on the RDM server contains the *master repository*, which is the collection of files that RDM uses to run tasks on target systems. These files can include system environments, images, utilities, and batch files.

The instance of RDM Deployment Server that is installed on a remote deployment server contains a *remote repository*.

The following table lists information about the services that RDM Deployment Server contains.

Table 1. RDM Deployment Server (D-Server) services

| Service name                  | What it does   |
|-------------------------------|--|
| RDM D-Server service          | Relays communication between RDM Server and the target systems.  |
| Symantec Unicast Image Server | The server component of the imaging tool. Together with the imaging tool's client component, it can create images of partitions or restore partitions from images. These images are used with the Donor Image, Power Restore, and Windows Clone Install tasks. |

---

## How RDM works

RDM utilizes the Wired for Management (WfM) technology, including the Preboot Execution Environment (PXE), to perform tasks on target systems."

RDM automatically listens on the local area network (LAN) for new PXE-enabled systems that start (boot) from the network. When RDM discovers a PXE-enabled system that does not have an entry in the IBM Director database, it runs the default scan task on the system. The task queries the system for basic hardware information and stores the data in the IBM Director database. RDM then assigns a default name to the system, in the form *MachinetypeMachinemodel-Serialnumber*, and an object that represents the new system is displayed in IBM Director Console. You now can run RDM tasks on the target system.

**Note:** To specify which systems receive PXE responses from the RDM D-Server, edit and save the `pxeconfig.xml` file, which is located in the Program Files/IBM/RDM/local/ directory. Instructions for editing this file are provided in the form of comments in the file itself. For your changes to take effect, you must restart the RDM D-Server.

The following steps occur when you run a task on a target system:

1. RDM Deployment Server sends a wake-up packet to the target system. This packet contains the media access control (MAC) address of the network interface card (NIC) that is present in the target system; if the NIC supports Wake on LAN<sup>®</sup>, it can power-on the system. In order for Wake on LAN to work, system has to be shut down properly.
2. The target system powers-on and starts (boots) from the network. It then broadcasts a DHCPDISCOVER message. It receives an IP address from the Dynamic Host Configuration Protocol (DHCP) service and the fully qualified name of an RDM bootstrap loader program from RDM Deployment Server.
3. The target system downloads and runs the RDM bootstrap loader program. The RDM bootstrap loader program sends a message to RDM Deployment Server, asking for instructions, and RDM Deployment Server relays the message to RDM Server.
4. RDM Server sends the fully qualified name of a system environment to the target system.
5. The RDM bootstrap loader program creates a virtual diskette drive A in memory, downloads the system environment from the RDM repository, and then installs that system environment on the target system.
6. The RDM bootstrap loader program downloads the system environment from the RDM repository and installs it on virtual diskette drive A of the target system.
7. The target system starts (boots) from the virtual diskette drive A. The rdagent program starts automatically. This program sets standard environment variables that are used by all RDM tasks.
8. The rdagent program then runs in a loop, requesting a command from the task command list, running the command, and reporting the success of the operation to RDM Server. At the end of the loop, rdagent shuts the system down as instructed by the last command from RDM Server. The task is completed when the final command is run.



---

## Chapter 2. IBM Director Console and RDM tasks

This chapter provides information about the following IBM Director and RDM elements:

- IBM Director Console
- RDM menu items
- RDM task templates
- Images
- Applying tasks to target systems

---

### IBM Director Console

IBM Director Console is the GUI that provides access to IBM Director Server and RDM Server. When you add RDM to your IBM Director environment, the RDM tasks and menu items are added to IBM Director Console.

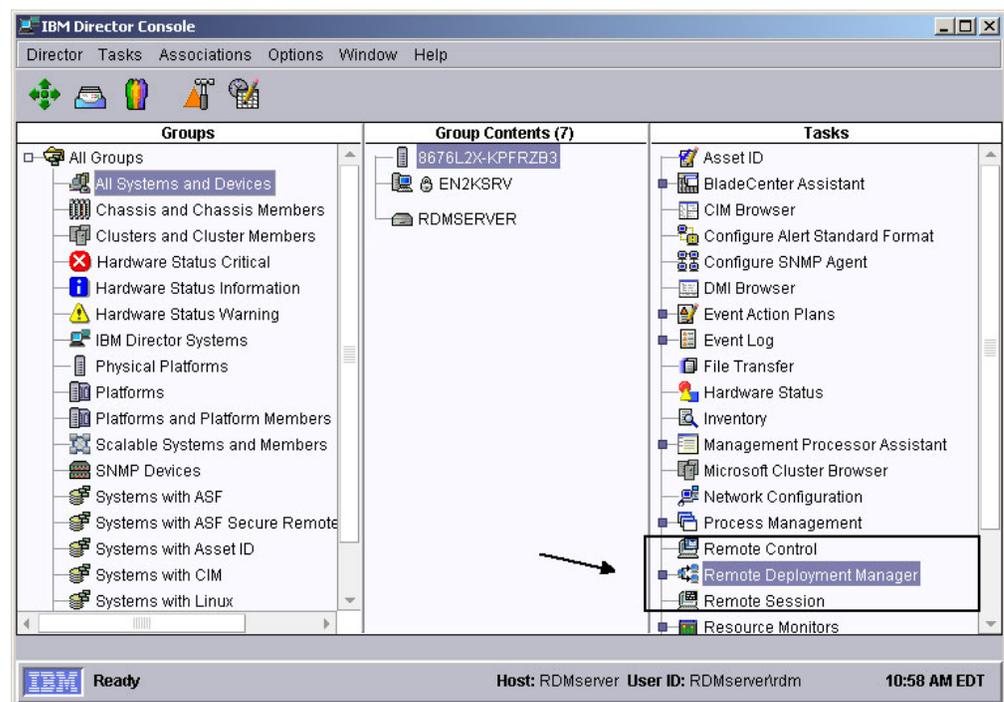


Figure 1. IBM Director Console window

For more information, see the "Using IBM Director Console" section of the *IBM Director 5.10 Systems Management Guide*.

---

### RDM menu items

When you click **Tasks** → **Remote Deployment Manager Tools**, an RDM-specific menu is displayed.

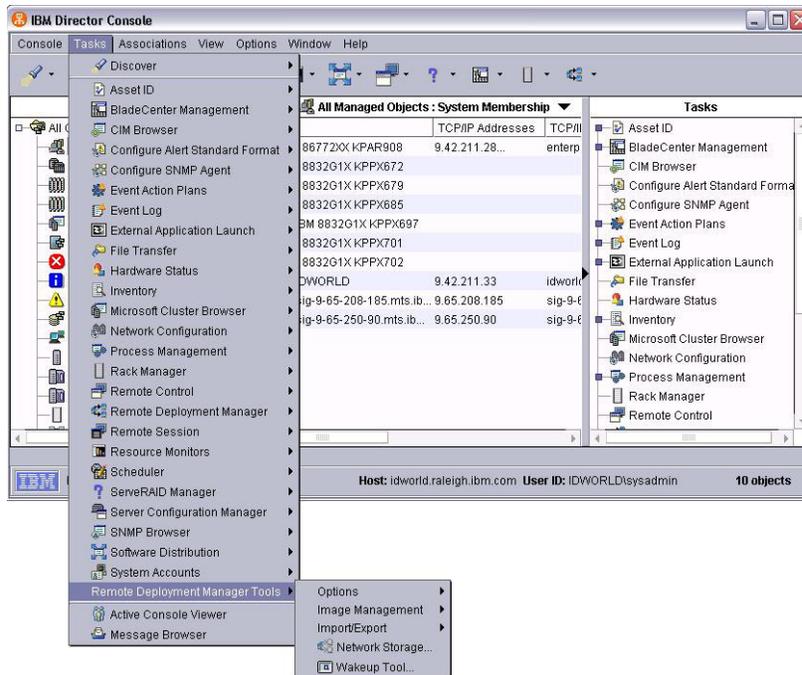


Figure 2. RDM menu options

The menu contains the following items:

**Options**

Enables you to modify RDM Server and RDM Deployment Server (D-Server) options

**Image Management**

Enables you to create and modify images, as well as specify images and files that you want to replicate to remote repositories

**Import/Export**

Enables you to import and export images, system data, and tasks

**Network Storage**

Enables you to add Fibre Array Storage Technology (FAST) storage servers and BladeCenter Fibre Channel switch modules to the RDM database

**Wakeup Tool**

Runs the Wakeup Tool

**Web resources for RDM**

To access a list of online resources for RDM from the Director Console, go to **HelpIndex** on the Director console. A window opens, displaying an index. Click **O** then click **Online help**. This will open a window with links to Web sites that provide resources for understanding, using, and troubleshooting RDM and other deployment and systems-management tools.

---

## RDM task templates

When you expand Remote Deployment Manager in the Tasks pane, the RDM task templates are displayed. A *template* is a prototype of a specific RDM task, and has two uses:

- To create new tasks
- To contain default parameter values

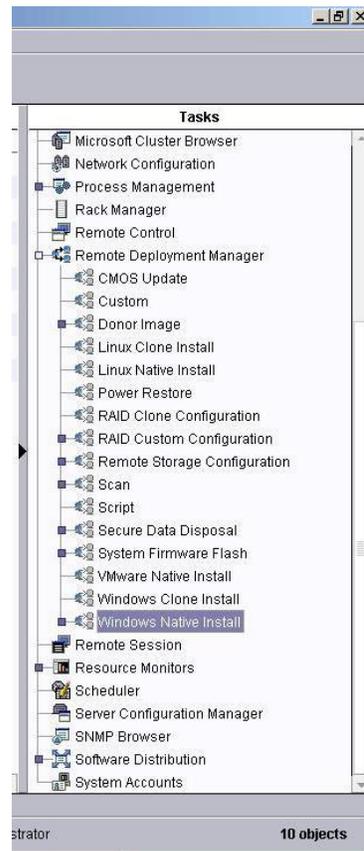


Figure 3. RDM tasks displayed in IBM Director Console

The task templates enable you to create tasks that perform the following operations:

### CMOS Update

Configure BIOS settings that are saved to the complimentary metal oxide semiconductor (CMOS) chip

### Custom

Perform a user-defined operation

### Donor Image

Create or deploy an image of a donor system (both Linux<sup>®</sup> and Windows systems are supported in RDM 4.30)

### Linux Clone Install

Install a supported version of Linux using an image cloned from another system

### Linux Native Install

Install a supported Linux distribution

**Power Restore**

Back up or restore either the boot partition or master boot record

**RAID Clone Configuration**

Configure a redundant array of independent disks (RAID) adapter using a configuration file

**RAID Custom Configuration**

Configure a RAID adapter using custom settings

**Remote Storage Configuration**

Configure remote storage devices

**Scan** Obtain hardware information about a system

**Script** Run a sequence of RDM tasks

**Secure Data Disposal**

Securely erase the hard disks of a target system, in preparation for disposing of or reassigning the computer

**System Firmware Flash**

Update firmware

**VMware Native Install**

Install VMware Server ESX

**Windows Clone Install**

Install a supported version of Windows using an image cloned from another system

**Windows Native Install**

Install a supported version of Windows using Microsoft installation files

For more information, see the task-template-specific chapters, Chapter 7 through Chapter 22.

---

## Images

Most RDM tasks are based on images. An *image* is a file or collection of files that are used when a task is run. Some tasks use multiple images, for example, a CMOS Update task requires both a system firmware image and a corresponding CMOS update image.

You create images either by using the Image Management option or by running a task, such as the Get Donor or Get Host Profile task. When you create an image, RDM saves the files that make up the image to the RDM repository and the metadata about the image to the RDM database. You then can create an RDM task that uses the applicable image or images.

The following list contains examples of RDM images:

- A ZIP file that contains the i386 directory from a Windows 2000 installation CD. Using this image, you can create a Windows Native Install task designed to deploy Windows 2000 to target systems.
- A ZIP file that contains the files from a BIOS update diskette. Using this image, you can create a System Firmware Flash task that can be used to update the BIOS code on target systems.

- A CMS file that contains the BIOS configuration settings from a donor system. Using this image and the corresponding BIOS image, you can create a CMOS Update task that can be used to update the BIOS settings that are saved to the CMOS chip on target systems.
- A PowerQuest-formatted set of files that is a copy of the boot partition of a donor system running Windows. You can use this image to create a Windows Clone Install task that can be used to deploy Windows to target systems.

For information about creating images, see Chapter 4, “Using Image Management,” on page 29.

---

## Applying tasks to target systems

After a task has been created, it can be applied to a system or a group. From IBM Director Console, you can apply a task to a target system or group in either of the following ways:

- Drag the task onto the object that represents the system or group
- Drag the object that represents the target system or group onto the task icon
- Rerun the task from the Director scheduler window.
- Run the task via the BladeCenter Configuration Manager.

After performing the drag-and-drop operation, you are prompted either to configure the selected systems for the task or to run Scheduler.

You also can run RDM tasks by using DIRCMD (the IBM Director command-line interface), the BladeCenter Deployment wizard, or by creating an event action plan designed to run an RDM task when a specific event occurs. See the *IBM Director 5.10 Systems Management Guide* for more information.

**Note:** RDM 4.30 includes an event action plan that is imported into IBM Director. DelayHbaConfig is kicked off when a scan detects that a fibre card has changed. In order to enable this, you must associate the event action plan with the device, as described in the *IBM Director Systems Management Guide*.

---

## Status icons

Status icons appear next to the target systems that are represented in the Group Contents pane. These icons provide information about the status of RDM tasks that are being run on the target systems.

The following table shows the RDM status icons and describes their meanings.

Table 2. RDM status icons

| Icon  | What it means  |
|---|--|
|  | <p><b>Connect</b></p> <p>This icon is displayed when the task or command-list processing is running on the RDM server.</p> |
|  | <p><b>Running task</b></p> <p>This icon is displayed when an RDM task is running on the target system.</p>                 |

Table 2. RDM status icons (continued)

| Icon  | What it means   |
|---|---|
|  | <p><b>Waiting</b></p> <p>This icon is displayed when a target system has been assigned a task, but the system has not yet communicated with the RDM server. It may be in the process of booting up or not yet powered on. The "Running Task" icon is displayed next to this icon at the same time. The Waiting icon is cleared once the target system connects to the RDM server.</p> |
|  | <p><b>Error</b></p> <p>This icon is displayed when an error occurred during an RDM task.</p>  |

**Note:** For more information on IBM Director status icons, please refer to your IBM Director documentation.

Status icons are removed automatically; it is never necessary to remove them manually. If you prefer to remove them manually, right-click on a system in the Group Contents pane; then, click **Remote Deployment Manager** → **Clear Status Icons**.

**Note:** Performing the action above will remove all RDM status icons currently displayed.

---

## Part 2. Understanding RDM tasks

RDM tasks contain six major components, most of which you can modify. Each of these major components is described below:

### **Command list**

This is an ASCII text file that contains the list of steps that comprise the task. It defines the overall task logic. You can modify the commandlist file for most tasks.

### **Batch files**

These are standard batch files that contain more details of the task logic. Often, RDM encapsulates task logic into batch files and calls the batch files from the command list. You can modify the batch files.

### **Images**

These are data files used by the task. You must create all images that your tasks need.

### **System environments**

These are the operating systems under which RDM tasks run. RDM downloads them to a virtual disk drive and runs them on target systems. They are typically IBM DOS 7.1, but they can also be Linux or WinPE. You can create or modify DOS 7.1 system environments.

### **Parameters**

These are data values used by a task at run time. You can give default values at the template, task, or system level. You can create new parameters and modify the values of existing parameters.

### **Metadata**

RDM stores information about its tasks and its systems in the RDM database and the Director database. You cannot create or modify the metadata.



## Chapter 3. Working with RDM templates

This chapter provides information about task templates and creating tasks.

### Task templates

Each RDM task is based on a template. Figure 4 shows the set of templates that RDM provides.

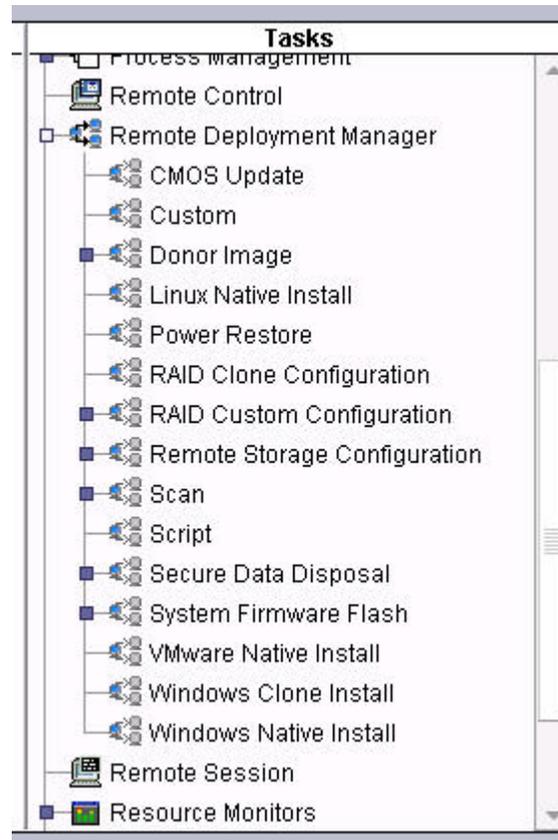


Figure 4. RDM task templates

### Predefined tasks

RDM provides some predefined tasks. Expand a template to view all tasks associated with that template. Any tasks you can view immediately after a new RDM installation are predefined tasks.

### Creating a task

To create a task, right-click a task template and then click **Create new task**. Either a template notebook opens or a task creation wizard starts. When you provide values and click **OK**, the data is validated, ensuring that you create a usable task. When you are finished, the task is displayed in the Tasks pane under the template that you used to create the task.

After you create a task, you can edit the task properties without affecting its template. To change task properties, right-click a task and then click **Edit task**. The

task notebook opens. You also can use **Edit task** to view the collected information, properties, and default parameter values that are associated with a task.

**Notes:**

1. Whenever you click **OK** (even if you made no changes in the notebook GUI), RDM will regenerate the task based on the data that is displayed in the notebook. For some templates, this involves RDM recreating certain files in the task folder. If you had previously customized the task by modifying one of those files, the regenerated file may not contain your customized changes, and you may have to recreate them. For this reason, it is always prudent to make backup copies of everything you change in the task folder.
2. If you close the task notebook by clicking **Cancel**, nothing is changed (even if you made changes in the notebook GUI).

## Default parameter values

Each task and template has *default parameter values*.

The values specified by a template are applied to any task that is created from that specific template. If you change the template, the changes are reflected in any task that you create after that template was changed. Tasks that are created from the template before it was changed are unaffected.

When you create a task from a template, you can provide additional parameter values or change the default parameter values. For example, you can create a Windows Native Install task that specifies a particular multi-user product key or the name of a department.

The default parameter values are displayed in *property sheets*. Depending on the template that you use to create a task, the property sheet is accessed either through a template notebook or a task creation wizard. A *template notebook* is a window that displays a notebook with tabs for different groups of properties.

To change template properties, right-click a template and then click **Edit template**. The template notebook opens. You also can use **Edit template** to view the collected information, properties, and default parameter values that are associated with a template.

---

## Task properties

Most task templates provide the following property groups:

- General
- Setup
- Advanced: Command list
- Advanced: User parameters
- Advanced: Task folder

These property groups are explained in the following sections.

**Note:** Some task templates also include an Advanced: Miscellaneous or Misc property group. These pages provide task-specific configuration options and are discussed in the sections that describe those tasks.

**Note:** Within property sheets, a hot key (shortcut key) is supported where an underlined letter in a field label or command is displayed. Press Alt and the

underlined letter to move to that field, select a check box, or run that command.

## General properties

The general properties are displayed on the General page.

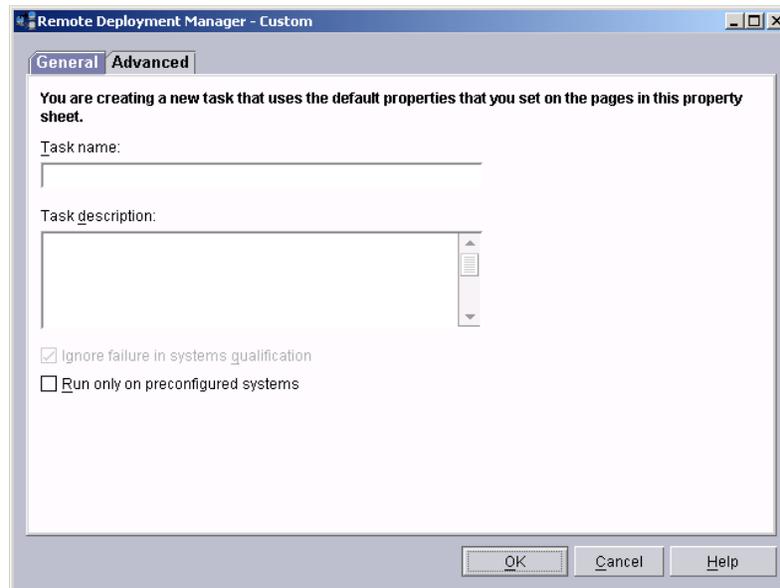


Figure 5. General page example

The General page provides the following entry fields and options:

### Task name

Type a task name. The name must be unique among the other tasks in RDM. You cannot modify this field if you are editing the template properties.

### Task description

(Optional) Type a description of the task in this field.

### Ignore failure in systems qualification

(Optional) Select this option to force the task to run on target systems that fail system qualification. Target systems that fail system qualification are reported in an exception list.

**Note:** Running tasks on unqualified systems can lead to runtime errors, undefined results, or task failure.

### Run only on preconfigured systems

(Optional) Select this option to validate preconfiguration when the task is run. Preconfigured systems are those that already have their system or task parameter values in the database.

## Setup

Click the **Setup** tab to open the Setup page. The Setup page contains template-specific fields. For information about a specific setup page, see the template-specific chapter in Part 3.

## Advanced properties - Command list

Click the **Advanced** tab to open the Advanced page. In the left pane, click **Command list**; the command list is displayed in the right pane. The *command list* contains the commands that are run when you invoke a task.

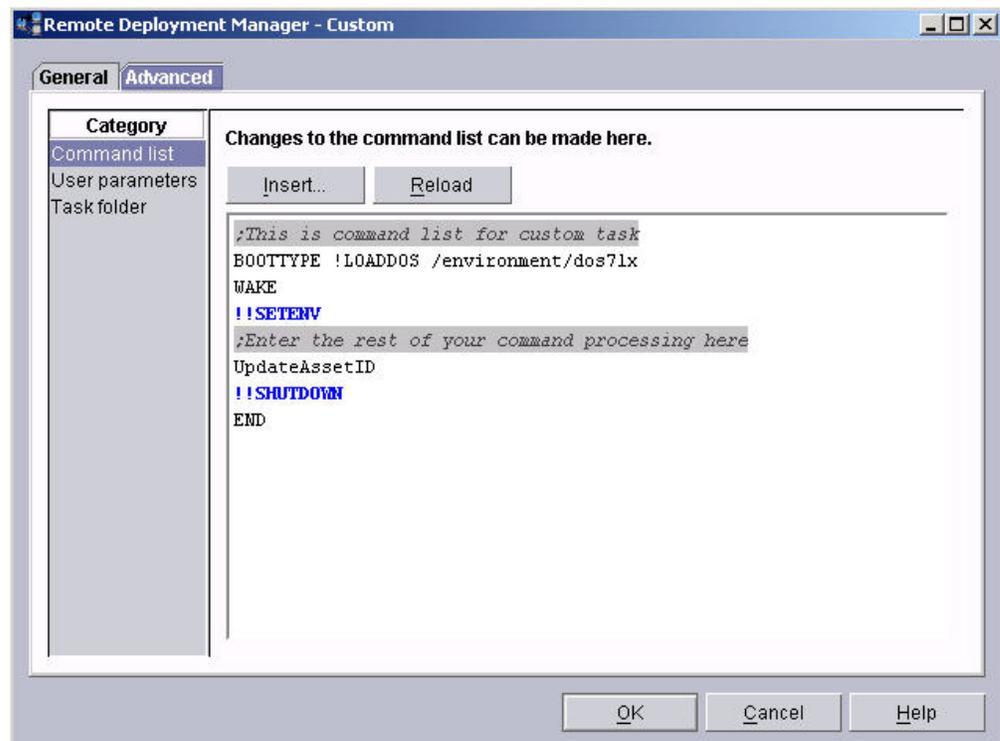


Figure 6. Advanced page: “Command list” pane

Click in the “Command list” pane to add, edit, or delete commands. For information about RDM command-list commands, see Chapter 24, “Command-list commands,” on page 271.

You also can use the Command List Editor wizard to select an image to be used with the task. RDM then generates the applicable command-list syntax and inserts it into the command list.

Complete the following steps to use the Command List Editor wizard:

1. Click in the right pane where you want to insert a command, and then click **Insert**. The Command List Editor wizard starts.

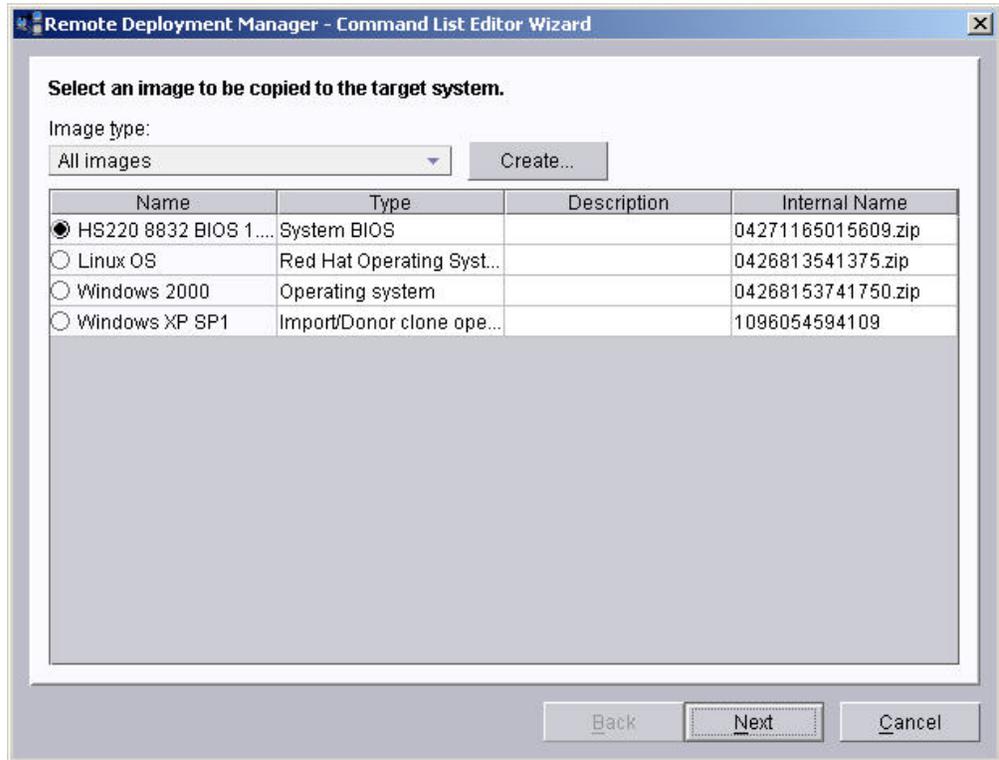


Figure 7. Command List Editor wizard, window one

2. Select the image, and then click **Next**. The second Command List Editor window opens.

**Build commands to insert into the command list editor.**

Target operating system: Windows  
Transfer mode:  Unicast  Multicast

Comment:

MTFTP destination file path: MTFTP destination file name:

Generate an unzip command  
Unzip destination path:

Generated commands:

Back Finish Cancel

Figure 8. Command List Editor wizard, window two

- If the application is an application or service pack image from a Windows Native Install template, the wizard automatically inserts statements that will install the application under Windows. In this case, click **Finish**. The Advanced page reopens and the modified command list is displayed.
- If the application is not an application or service pack image from a Windows Native Install template, specify the following information about the image:
  - a. Click **Unicast** or **Multicast** to select how the image is sent to the target system.
  - b. In the **Target operating system** field, select the operating system that is running on the target system.
  - c. (Optional) In the **Comment** field, type a brief description about the image.
  - d. In the **MTFTP destination file path** field, type the path of the file that is created on the target system.
  - e. In the **MTFTP destination file name** field, type the name of the file that is created on the target system.
  - f. (Optional) Select the **Generate an unzip command** check box to specify that the image be unzipped on the target system. In the **Unzip destination path** field, type the path where the unzipped files are to be extracted. If you select this option, RDM deletes the zipped file that was downloaded to the MTFTP destination file path after the contents of the file are unzipped.

In the **Generated command** field, the command is displayed. Click **Finish**. The Advanced page reopens and the modified command list is displayed.

To save the command-list changes, click **OK**. Click **Reload** to restore the command list to the last-saved version.

**Note:** If you are using a Windows operating system, images larger than 2 GB will be split into several smaller files.

## Advanced properties - User parameters

Click the **Advanced** tab to open the Advanced page. In the left pane, click **User parameters**; user parameters are displayed in the right pane.

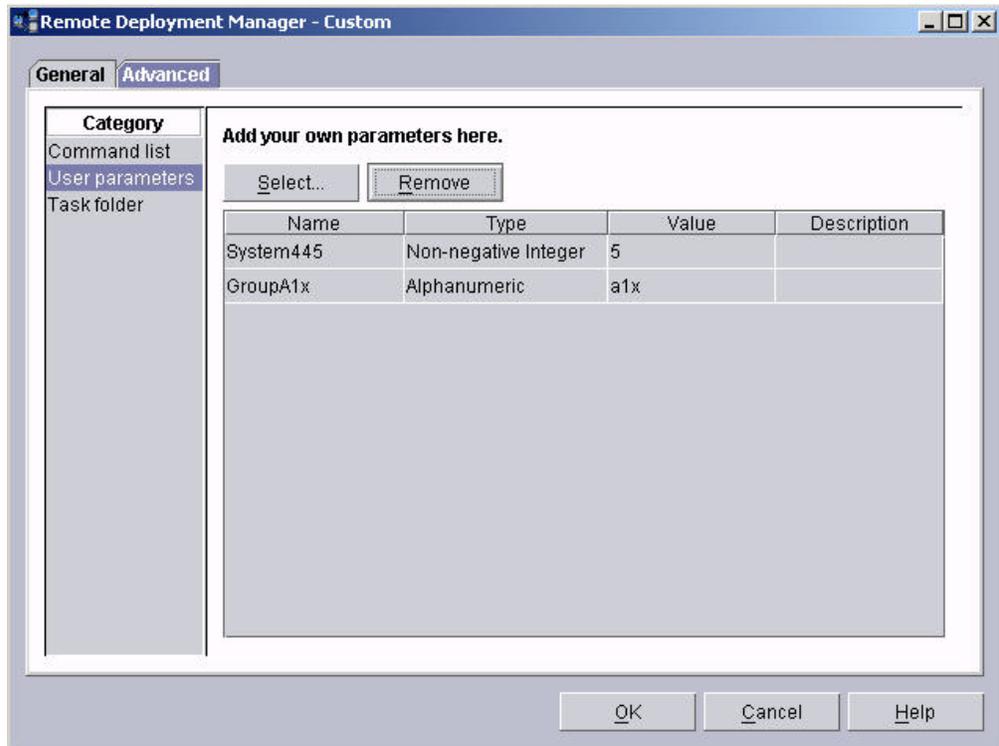


Figure 9. Advanced page: "User parameters" pane

Click **Select**. The User Parameters window opens.

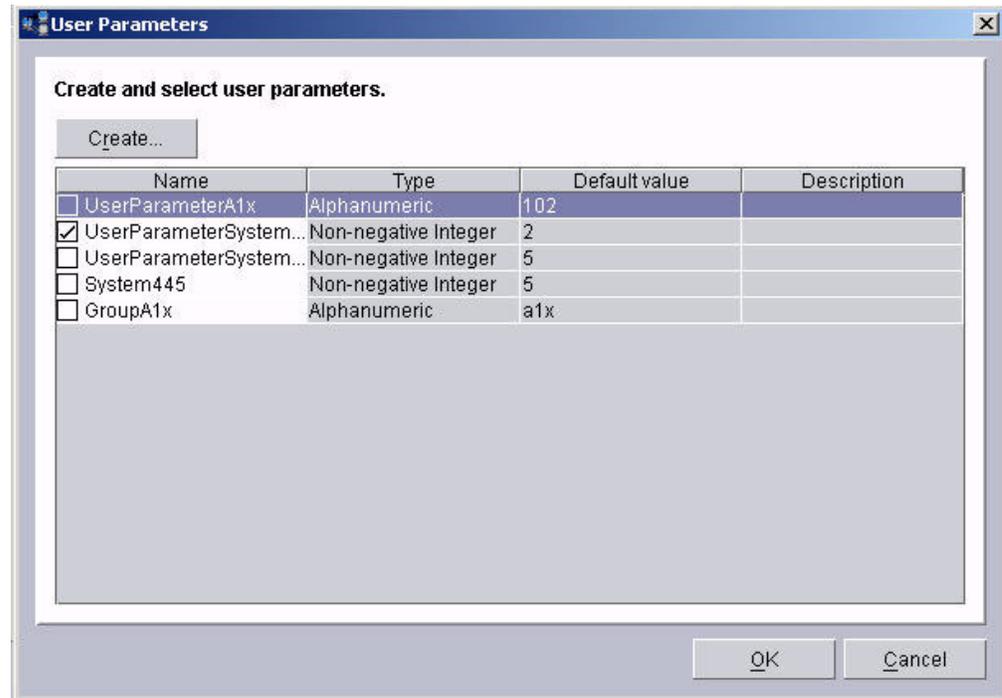


Figure 10. User Parameters window

Select the applicable check boxes of the user parameters that you want to use. If the list is empty, the template does not have any user parameters associated; however, you can create user parameters. For information about user parameters, see “Creating a user parameter.”

Click **Remove** to remove a selected user parameter from the list.

### Creating a user parameter

Complete the following steps to create a user parameter:

1. In the “User parameters” pane, click **Select**. The User Parameters window opens (see Figure 10).

2. Click **Create**. The Create User Parameter window opens.

**Create the user parameter**

Name:  
GroupA1x

Description:

Data type:  
Alphanumeric

Default Value:  
a1x

Display in STC  
 Read only

OK Cancel

Figure 11. Create User Parameter window

3. Specify the values for the user parameter:
  - a. In the **Name** field, type a name. The user parameter name can be up to 32 characters in length; it can include alphanumeric characters, hyphens (-), and underscores (\_) only.
  - b. (Optional) In the **Description** field, type a brief description.

- c. In the **Data Type** field, select one of the following data types:

**Non-negative integer**

A whole number greater than zero

**Alphanumeric**

A string of alphanumeric characters

**String**

A string

**Director Inventory**

The value of a selected IBM Director inventory item

- d. In the **Default Value** field, type or select the default value for the user parameter.

**Notes:**

- 1) If you selected **Director Inventory** as the data type, the **Inventory query item** field is filled in with IBM Director inventory items, from which you select a single item. When the task is qualified, the value of the IBM Director inventory item is retrieved from the IBM Director database, and the value is associated with the specified user parameter.
  - 2) If you selected **Non-negative integer**, **Alphanumeric**, or **String** as the data type, the value that you enter in the **Default Value** field must not exceed 255 characters.
- e. (Optional) Select the **Display in STC** check box to add the user parameter to the STC window. User parameters that are displayed in the STC window can be modified on a per-system basis. Selecting this check box enables the **Read only** check box.
- f. (Optional) Select the **Read only** check box to make sure that the user parameter value cannot be modified from the STC window.
4. Click **OK**. The user parameter now is displayed in the User Parameters window.

## Using a user parameter

When you execute a task and your command list contains a `!!SETENV` statement, RDM provides the user parameters and their values as environment variables. For example, if you create alphanumeric user parameters named `FIRSTNAME`, `MIDDLENAME`, and `LASTNAME`, RDM runs `SET=` statements that might look like the following:

```
SET FIRSTNAME=FRANKLIN
SET MIDDLENAME=DELANO
SET LASTNAME=ROOSEVELT
```

Your task logic can make use of these user parameter values by using tokens like `%FIRSTNAME%`, `%MIDDLENAME%`, and `%LASTNAME%` in batch files or text files. In the command list, you would use tokens like `%%FIRSTNAME%%`, `%%MIDDLENAME%%`, and `%%LASTNAME%%`.

**Note:** To use a user-parameter token in a text file, you must run RDM's `LCCUSTOM.EXE` utility against the text file to substitute the parameters.

The `!!SETENV` statement can be used regardless of the value of the `BOOTTYPE` command in your command list. That is, RDM can set up the environment variables in DOS, Microsoft Windows, or Linux.

User parameters of type non-negative integer, alphanumeric, and string work as described above, using the name of the user parameter at task execution time. However, user parameters of type director inventory are quite different. They use a modification of an IBM Director name. There are two different methods for using director-inventory user parameters.

The first method is used for a single-valued inventory item. For example, if you create a director-inventory user parameter named `ABC`, and select the single-valued inventory item `CPUSPEED`, RDM appends the number 1 to the IBM Director column name to get the actual name used in the system environment. Because `CPUSPEED` is a single-valued IBM Director inventory item, the actual name used in the system environment would be `CPUSPEED1`. RDM executes a statement like the following example:

```
SET CPUSPEED1=2800
```

You must use a string like `%CPUSPEED1%` (and not like `%ABC%`) in your task customization to reference the user parameter in a batch file. You never use the `ABC` name other than when creating the user parameter.

The second method is used for a multi-valued inventory item. For example, if you create a director-inventory user parameter named `XYZ`, and select the multi-valued Director inventory item `PCIDEVID`, the actual names used in the system environment would be `PCIDEVID1`, `PCIDEVID2`, `PCIDEVID3`, and so on. RDM would execute statements as follows:

```
SET PCIDEVID1=23
SET PCIDEVID2=18258
SET PCIDEVID3=513
```

You never use the `XYZ` name other than when creating the user parameter.

## Editing or deleting a user parameter

You can edit or delete a user parameter only when you are working with a template property sheet. You can delete a user parameter only if it is not used by any existing tasks.

Complete the following steps to edit or delete a user parameter:

1. In the “User parameters” pane, click **Select**. The User Parameters window opens.

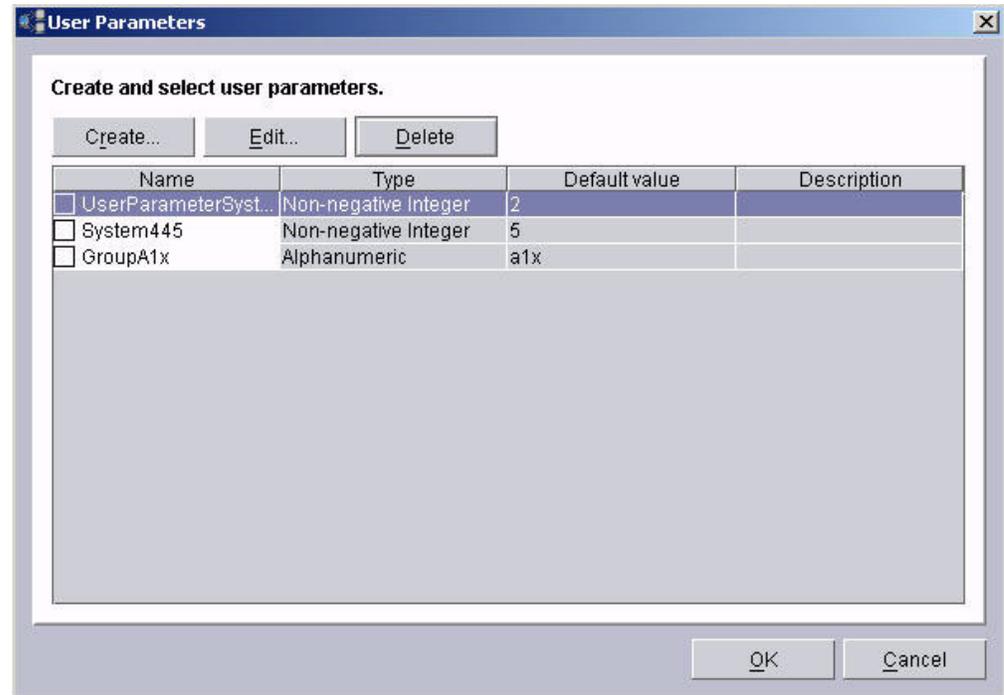


Figure 12. User Parameters window when editing or deleting a user parameter

**Note:** If you are working with a task, the User Parameters window displays the **Create** button. If you are working with a template, the User Parameters window also displays an **Edit** and **Delete** button.

2. From the list of user parameters, select the user parameter that you want to edit or delete.
3. Click **Delete** to delete the user parameter, or click **Edit** to open the Edit User Parameter window.
4. Make the applicable changes to the parameter.

**Notes:**

- a. When you edit the user parameter, you can change only the description. This has no effect on the underlying value of the user parameter.
- b. You can delete or edit a user parameter only if a task is not currently using it.

## Advanced properties - Task folder

Click the **Advanced** tab to open the Advanced page. In the left pane, click **Task folder**; the right pane displays the fully-qualified directory path that contains the command-list file, and sometimes other task-related files. This window is useful when customizing tasks, since user customization often involves changing files in the task folder.

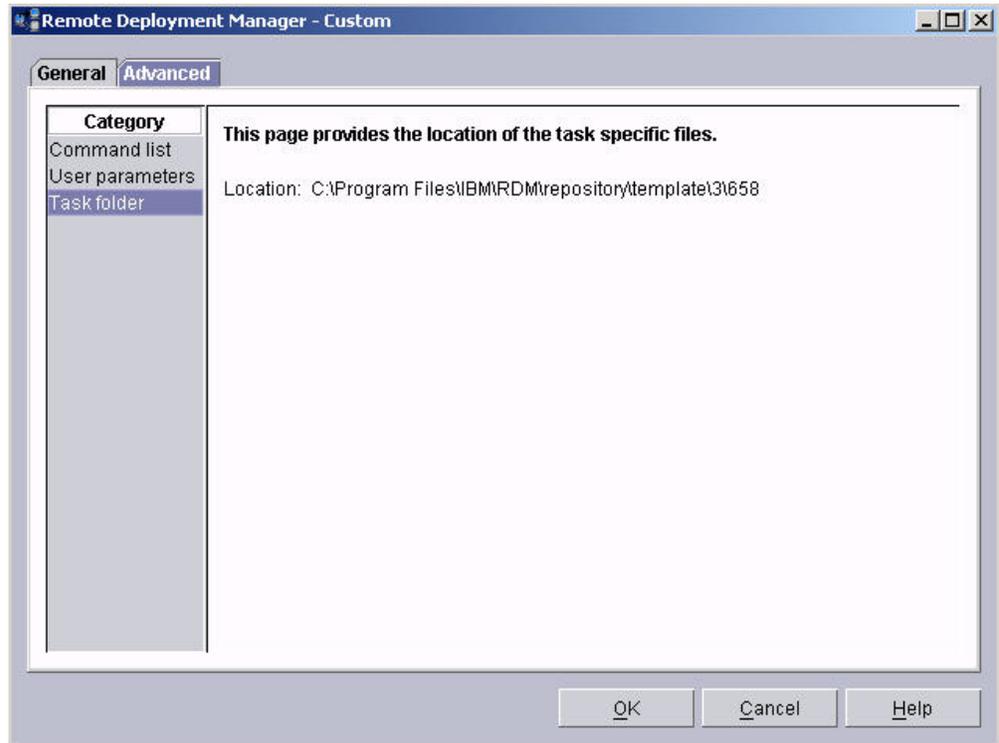


Figure 13. Advanced page: "Task folder" pane

---

## Chapter 4. Using Image Management

You can use the Image Management option to perform the following tasks:

- Create an image
- Modify an image
- Delete an image
- Replicate an image or file

---

### Starting Image Management

To start Image Management, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

You also can access the Image Management option from task creation wizards,

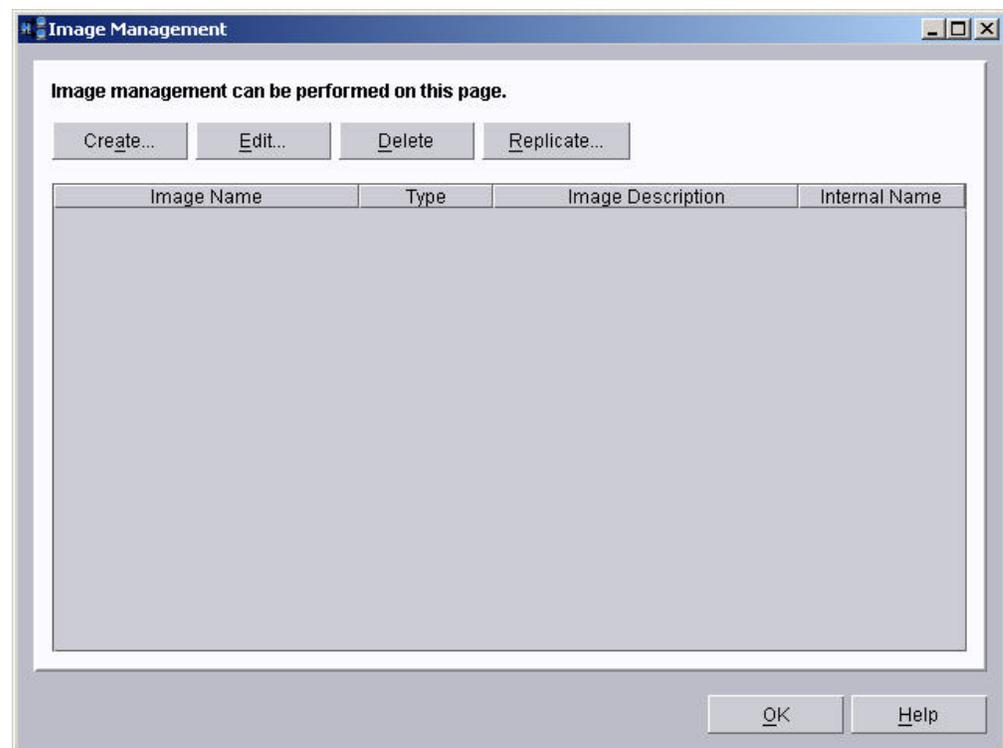


Figure 14. Image Management window

task property sheets, and template property sheets.

---

### Creating an image

When you create an image, RDM copies the files and directories that you specify and saves those files and directories into an image file with a unique file name. In most cases, the image file is a ZIP file.

RDM automatically names the image file. You can use the Image Management option to assign a meaningful name and description to the image. However, in the RDM repository, the image file retains the file name that was automatically generated by RDM.

Complete the following steps to create an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

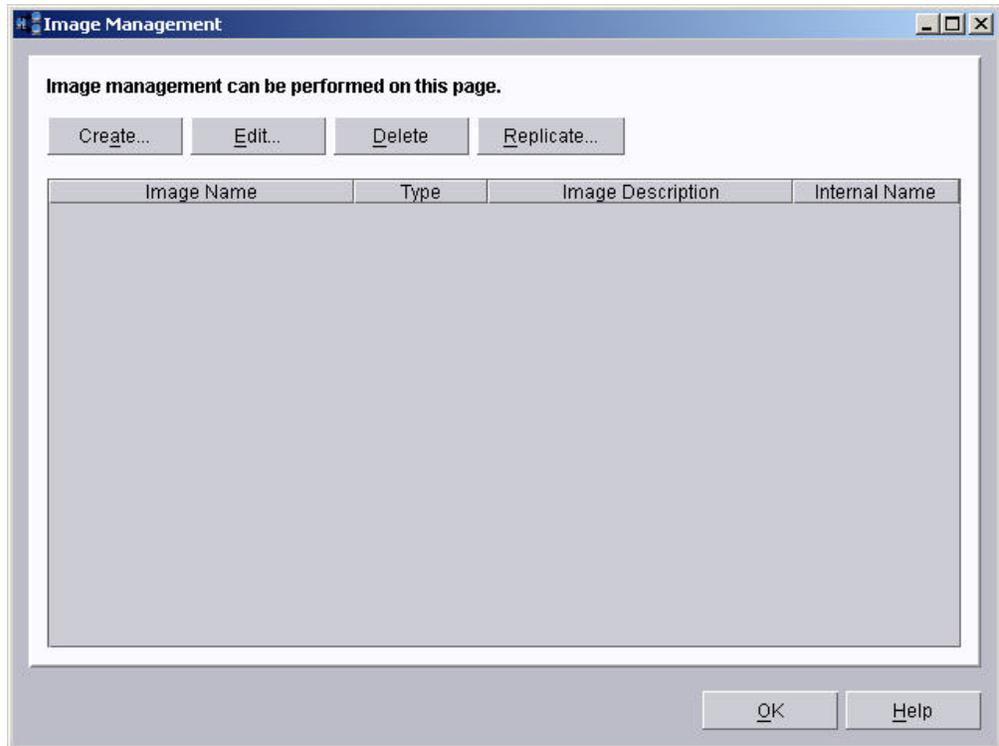


Figure 15. Image Management window

2. Click **Create**. The Create Image window opens.

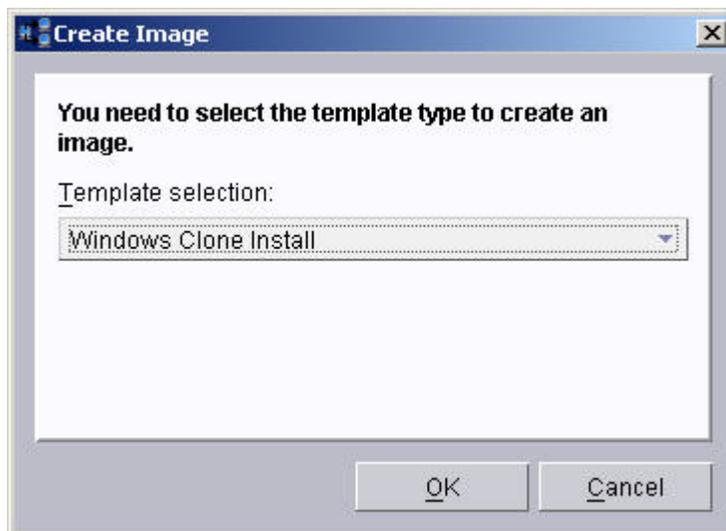


Figure 16. Create Image window

3. In the **Template selection** field, select one of the following types of images.
  - System Firmware Flash

- CMOS Update
- Custom
- Linux Clone Install
- Linux Native Install
- RAID Clone Configuration
- Windows Clone Install
- Windows Native Install

For information about using a specific type of image, see Part 3.

4. Click **OK**. The applicable window opens and the General page is displayed.

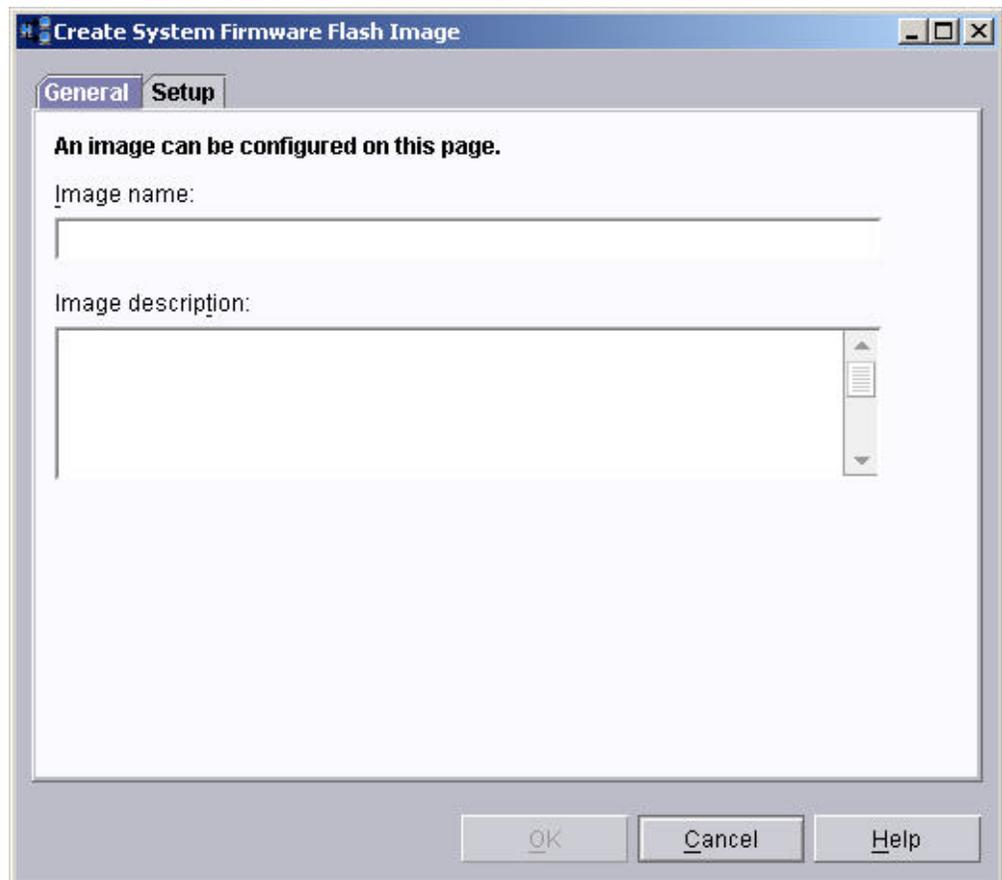


Figure 17. Create System Firmware Flash Image window: General page

5. Set the properties for the image:
  - a. In the **Image name** field, type a name for the image. When you create a task, this name is displayed in the list of images.
  - b. (Optional) In the **Image description** field, type a brief description of the image. The image description can be a maximum of 255 characters long.
6. Click **Setup**. The Setup page is displayed.

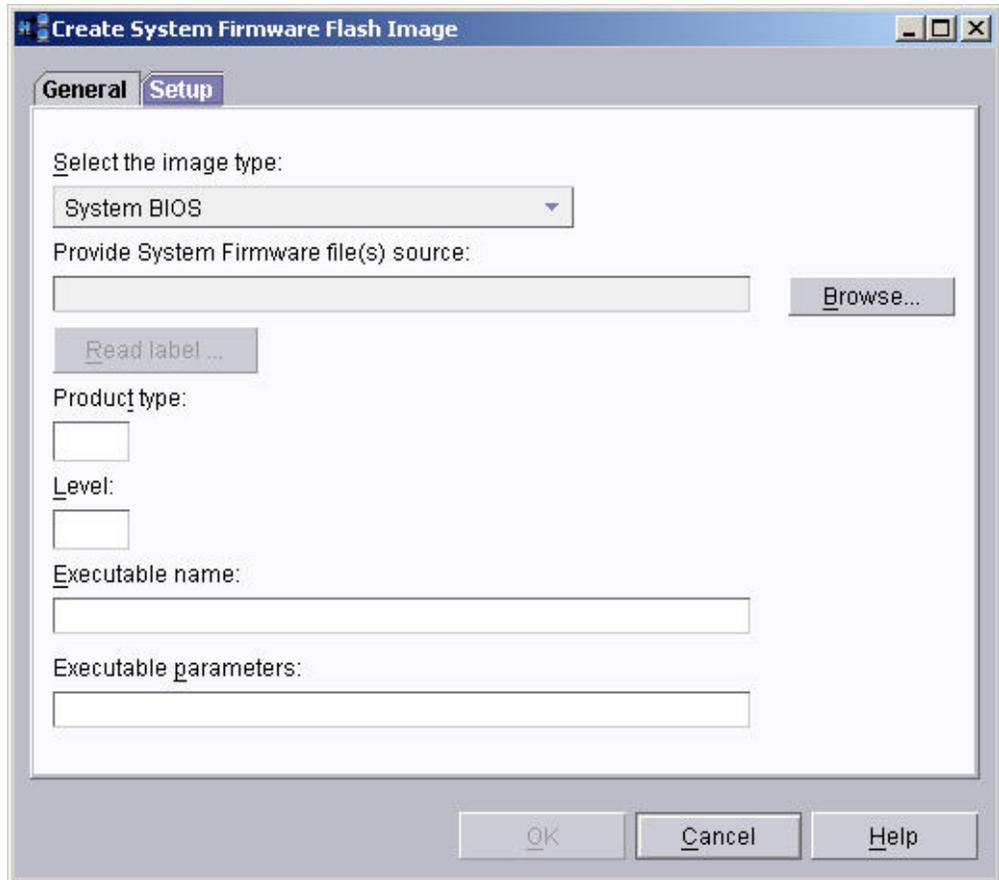


Figure 18. Create System Firmware Flash Image window: Setup page

**Note:** The Setup page is different for each type of task. See the task-specific chapters in Part 3 for more information.

7. Complete the applicable fields. To specify the files that are used to build the image, click **Browse**. The “Select directory” window opens.

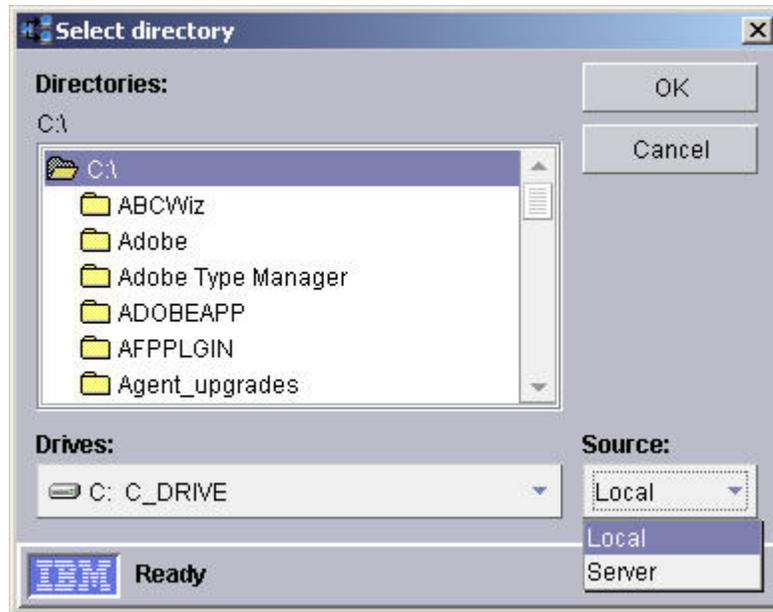


Figure 19. “Select directory” window

8. Specify the source files for the image:
  - a. In the **Source** field, select the system where the source files are located. You can choose between the local system or the RDM server.
 

**Note:** If the local system is the RDM server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.
  - b. Navigate to the source files and select them.
9. Click **OK**. The Task Image Creation Progress window opens. The image is created and the files that are used to build the image are saved



Figure 20. Task Image Creation Progress window

- to the master repository.
10. Click **OK**.

## Modifying an image

### Important:

1. You cannot use RDM to modify the content of an image. If you want to modify the content of an image, you typically delete and then recreate the image. However if the underlying file for the image is a .ZIP file, it is possible to modify the contents of that file, outside of RDM. For example, an IBM Director Agent image contains a DIRAGENT.RSP file that you might want to change.
2. To modify an image, use only the Image Management option. If you use a command-line interface or an application to modify files or directories in an RDM repository, RDM tasks that use the image might fail.

You can use the Image Management option to modify properties that are associated with an image, such as the image name, image description, and executable-file parameters.

Complete the following steps to modify the properties that are associated with an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

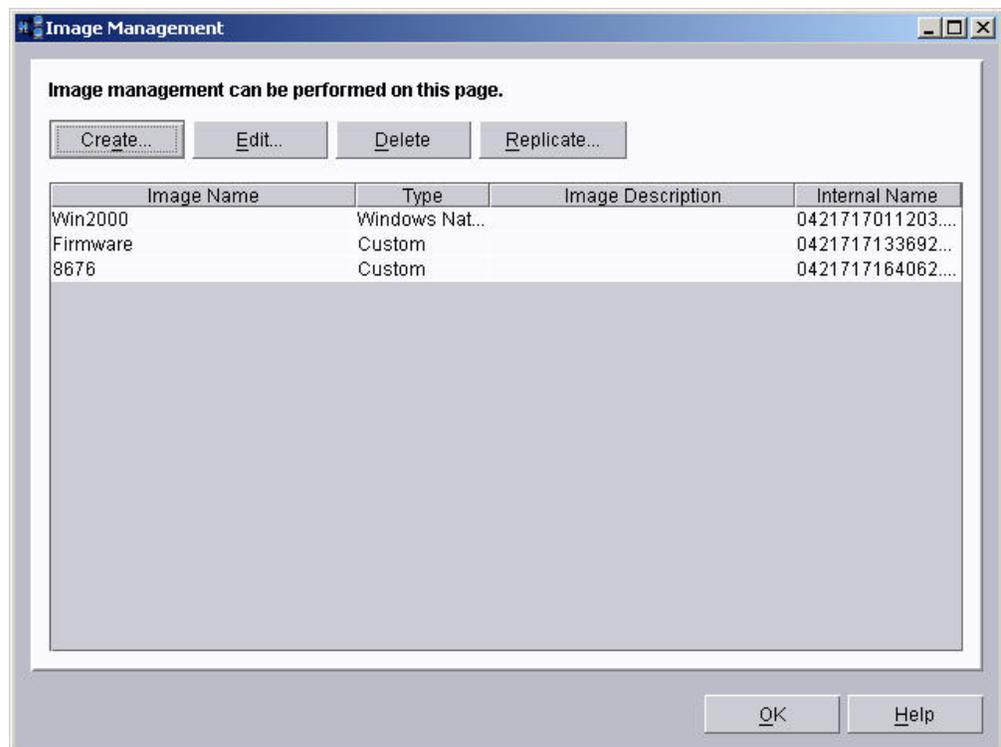


Figure 21. Image Management window

2. From the list of images, click the image that you want to modify.
3. Click **Edit**. The applicable window opens and the General page is displayed.

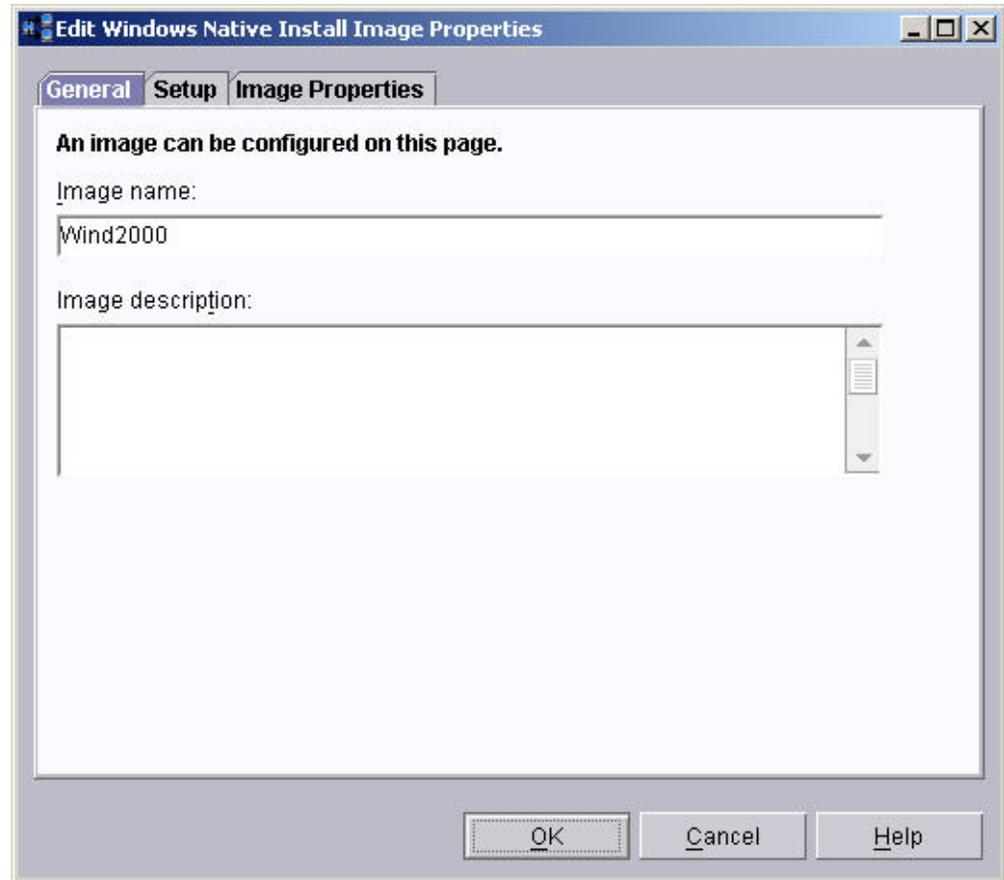


Figure 22. General properties

4. On the General and Setup pages, edit the image properties that you want to modify. Read-only attributes, such as the internal name and size, are displayed on the Image Properties page.

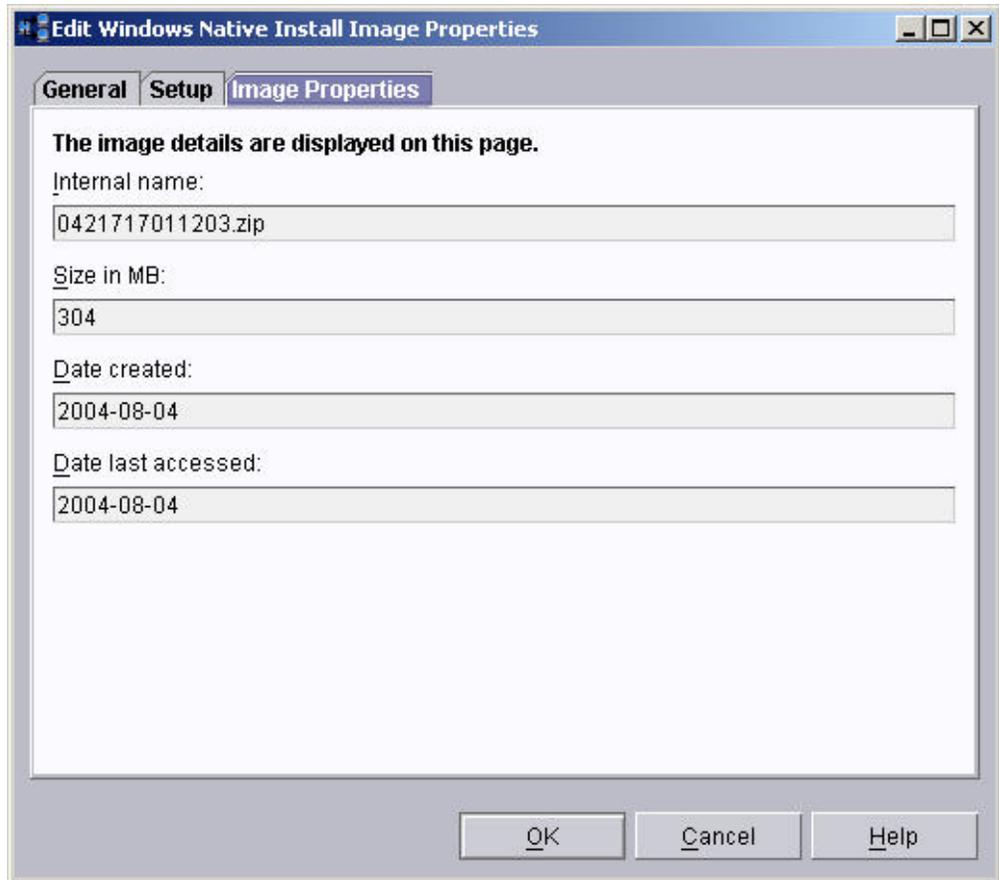


Figure 23. Image Properties page

5. Click **OK**.

---

## Deleting an image

You can use the Image Management option to delete an image, provided that the image file is not associated with any existing tasks or STC data. When an image is deleted, it also is deleted from each distributed repository.

Complete the following steps to delete an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

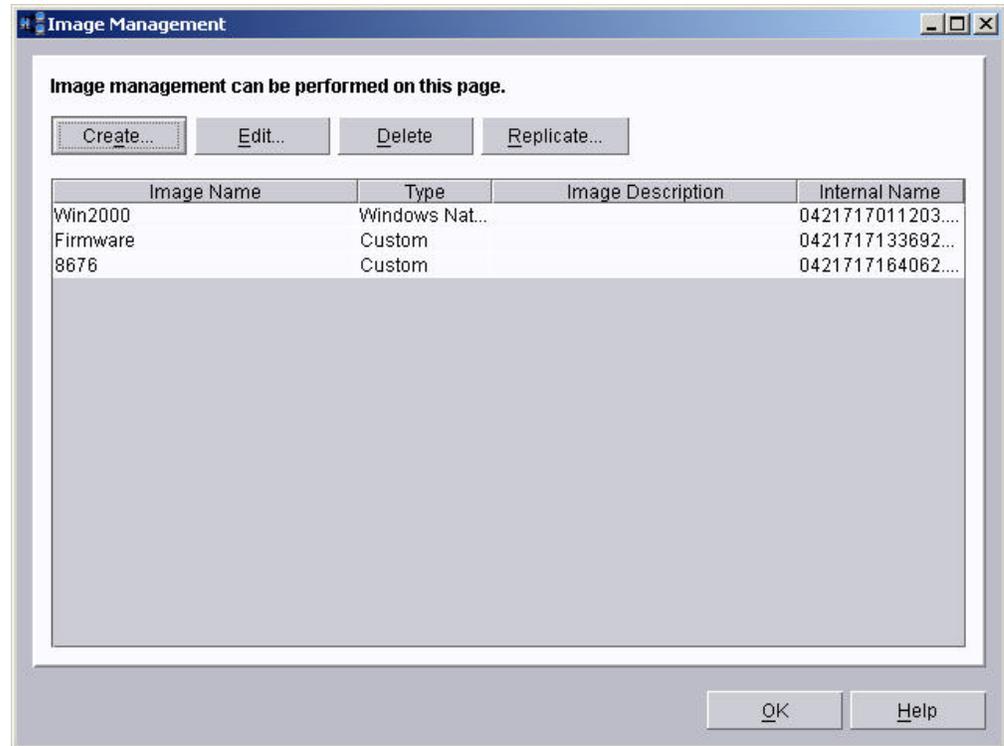


Figure 24. Image Management window

2. From the list of images, select the image that you want to delete.
3. Click **Delete**. The image is deleted.

---

## Replicating an image or file

You can use the Image Management option to copy images or files from the master repository to a distributed repository. You can replicate images or files to multiple remote repositories at the same time.

Complete the following steps to replicate an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

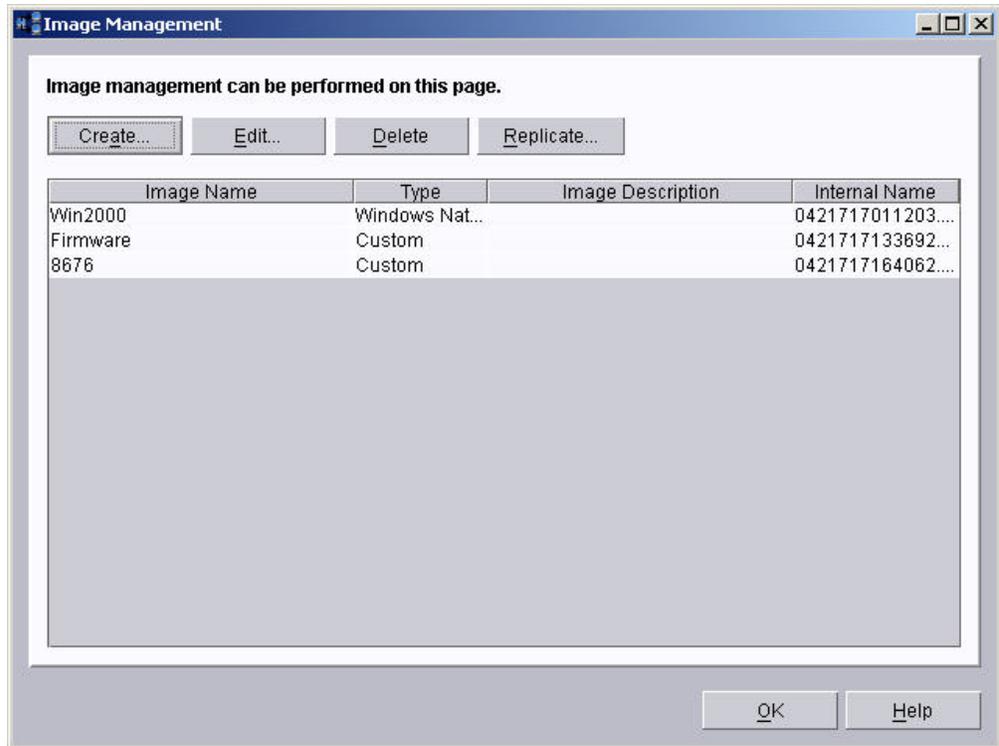


Figure 25. Image Management window

2. Select the image or images that you want to replicate; then, click **Replicate**. The Replicate Images window opens.



Figure 26. Replicate Images window

3. Select the remote deployment servers:
  - a. Click **D-Server**. The DServers window opens.

- b. Select the remote deployment server to which you want to replicate the image. To select multiple servers, press Ctrl and select the servers.
  - c. Click **OK**. The remote deployment servers are displayed in the Replicate Images window.
4. Click **OK**. The image is replicated.



---

## Chapter 5. Configuring systems and tasks

This chapter provides information about the System/Task Configuration (STC) window. Each task in RDM provides access to a System/Task Configuration window that is specific to that task. For some tasks, the fields in a System/Task Configuration window display read-only task-related information for the selected system. For a task that requires configuration, you can use the fields in the System/Task Configuration window to display or enter information that is required to run that task. The information that you enter is specific to the target system on which you plan to run the task. For example, the serial number for a VMware installation might be different for each target system to which you deploy VMware. You can use the VMware Native Install System/Task Configuration window to enter the serial number for a specific target system.

---

### System/Task Configuration

The System/Task Configuration window associates one or more target systems with a task and defines all the parameters that are needed to run that task on each of the systems. Some RDM tasks must be configured through the System/Task Configuration window before you can run the tasks against target systems.

The following steps outline what RDM does when a System/Task Configuration window is opened:

1. RDM attempts to fill in the values for all of the parameters that are used by the task. The parameter values are retrieved from one of the following sources:
  - A default value from the task. If a target system has not been previously configured for a specific task by using the STC window, the default values that are saved to the task are used by RDM.
  - A previous STC configuration that is in the database. When a task is initially configured for a specific target system, the STC values are permanently saved to RDM and are used each time that task is run against that system. RDM continues to use the saved STC values until you change them. These values cannot be changed by modifying the default values that are used by the task or the template. To change the values for the target system from within the STC window, you can do either of the following:
    - Go to the field that you want to edit and enter the data.
    - Right-click on the system, select the **Unconfigure System** option, and a context menu opens. Be aware that this will delete all data for that system from this task.
2. RDM qualifies the task by verifying that the task can be run against the selected system. (In other words, that the system's hardware components and configuration are compatible with the task's requirements.) If there are any qualification errors, RDM displays an error message. From the error message window, you can select the **Ignore Failure** option to ignore errors for the systems that fail qualification. These systems will continue to be configured in STC. Otherwise the systems are removed from the list of systems to be configured in the STC window.
3. You can optionally enter values in the STC window.
4. RDM validates the task by verifying the parameter values. RDM displays a validation error message for the systems that fail validation. These messages will continue to be displayed until all of the validation errors are resolved.

5. RDM then stores STC data in the RDM database for the target systems that have been configured and have passed validation.

You can use any of the following methods to open a System/Task Configuration window for an RDM task:

- Drag the task onto the object that represents the system or group. A context menu is displayed. Click **Configure systems**.
- Drag the object that represents the target system or group onto the task icon. Click **Configure systems**.
- Right-click a task. A context menu is displayed. Click **Configure systems**.

The STC window opens, with the selected systems shown in the STC grid.

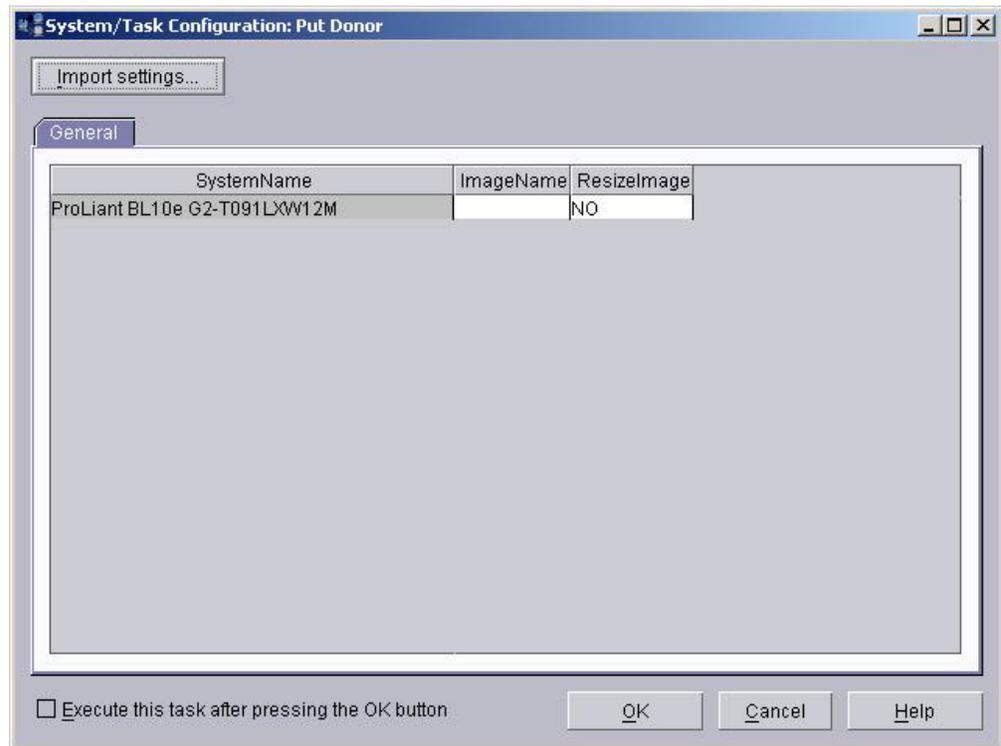


Figure 27. Put Donor task: System/Task Configuration window

If the task has multiple tabs, click each tab and edit the applicable STC information.

Select a value for **ResizelImage** to indicate how to use the free disk space on the target system:

**NO** leaves the free space on the target system intact.

**PROPORTIONAL**

resizes the image to fill the available disk space.

When the STC information is complete, you can select the **Execute this task after pressing the OK button** check box (lower left corner of the STC window). When you click **OK**, a window is displayed that lets you select one of the following options:

- **Schedule**
- **Execute Now**

- **Cancel**

To remove a system from the System/Task Configuration window, right-click a system, and then click **Remove System**. This option removes the configured system from the window, but it does not remove its data from the RDM database.

---

## Importing STC settings

For tasks that require configuration, you can use the System/Task Configuration window to import the applicable STC data to RDM.

Importing STC data might be useful if you have a large number of systems that you plan to deploy. Typically, the system information for a target system, such as the IP address, subnet masks, domain name system (DNS) server, Windows Internet Naming Service (WINS) server, and computer name, are determined during the planning stage, prior to deployment. If the information is already in an accessible format, such as a spreadsheet, you can export or cut-and-paste the applicable data into a comma-separated value (CSV) file. You can then import the data to RDM to avoid having to retype it.

## Creating a CSV file

In RDM, you can import STC data only from a CSV file. (You can use a CSV file that does not have the .csv extension, but it must still be a CSV file.) You can use an ASCII text editor to create or edit an existing CSV file that contains STC data. You also can use a spreadsheet program to create the data and export it to a CSV file. You can then import the data into RDM.

Use the following guidelines to create the CSV file:

- The header row (the first line of the CSV file) must contain the case-sensitive names (headers) of the corresponding columns that are displayed in the System/Task Configuration window. Headers can be in any order, but they must be separated by commas. SystemName is the only required header.
- The remaining lines can contain the STC data for each target system that you want to include. The STC data must correspond to the headers in the first line of the CSV file and must be separated by commas.

**Note:** Null values must be delimited.

- If a header does not correspond to a column in the System/Task Configuration window, RDM ignores that header and does not import the corresponding data.
- If a system name does not correspond to an STC system name, RDM ignores that line and does not import any of the data for that system.
- You can omit column names and data from the CSV file for STC data that you do not want to import.

## Importing STC data from a CSV file

Complete the following steps to import STC data from a CSV file:

1. Drag the target system that you want to configure onto a task. A context menu is displayed.

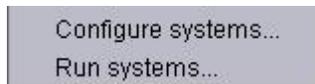


Figure 28. Context menu

2. Click **Configure systems**. The STC window opens, with the selected system shown in the STC grid.
3. Click **Import settings** to import parameter values for the systems displayed in the STC. The “Locate the file to be imported” window opens.

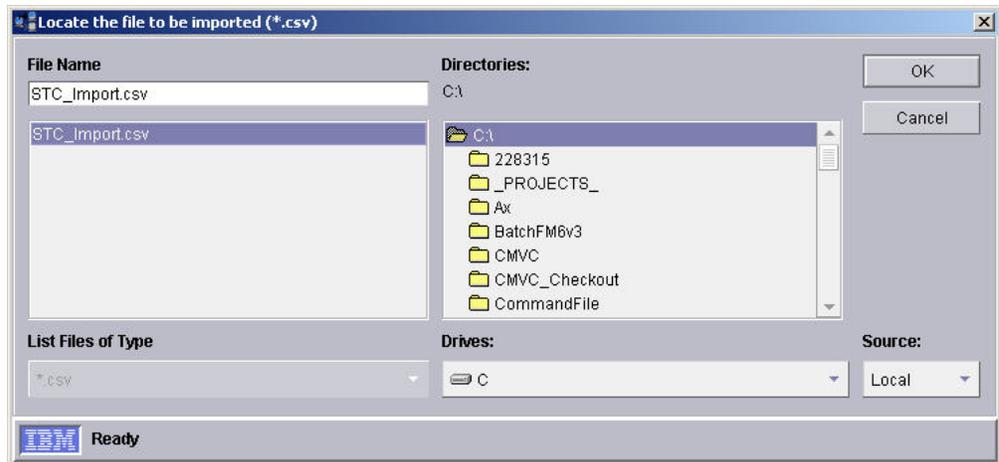


Figure 29. “Locate the file to be imported” window

4. In the **Source** field, select the system where the source files are located. You can choose between the local system or the RDM server.

**Note:** If the local system is the RDM server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.

5. In the **Directories** list, navigate to the directory where the CSV file is saved.
6. In the **File Name** list, select the CSV file that you want to import.
7. Click **OK**. The values from the CSV file are imported to the System/Task Configuration window.

## Target system qualification

System qualification determines whether a target system meets the hardware requirements that are necessary to run a specific task. By default, when you configure a system that does not meet the requirements for a specific task, a System Qualification Errors window opens.

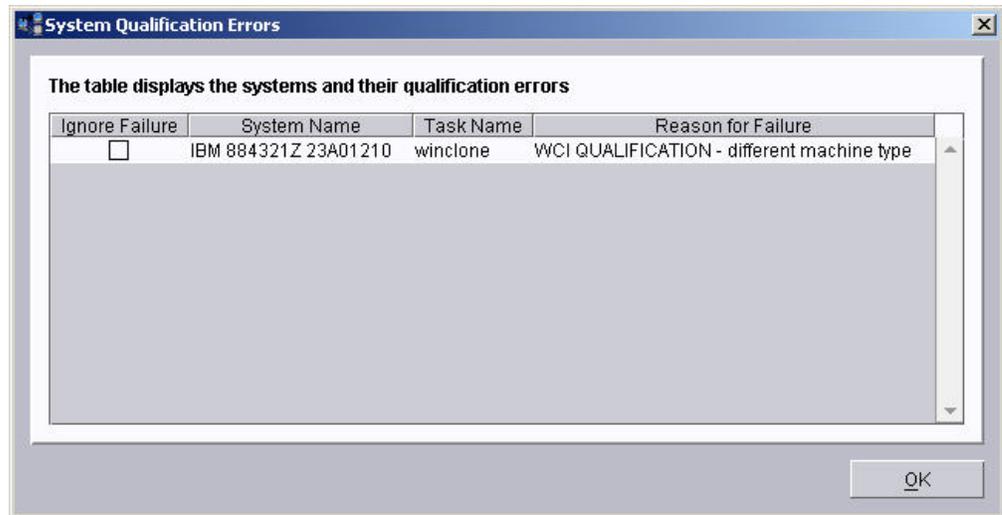


Figure 30. System Qualification Errors window

If the **Ignore Failure** check box is available, you can select it to ignore the system qualification errors and continue with configuring the system.

**Note:** For some tasks and templates, you can select the **Ignore failure in systems qualification** check box to ignore the system qualification errors on systems that you configure or run the task against.

System qualification errors also might occur due to one of the following conditions:

- The target system inventory data that is stored in the database is out-of-date. To make sure that RDM has the most current inventory data for a target system, run a Scan task against the target system.
- The target system inventory data that is stored in the database is in the process of being updated. This can happen if the target system has just been added to RDM and the data is still being populated. This also can happen if prior to system qualification, you run a task against the target system and as a result, some of the inventory data is still being updated. Make sure that no tasks are running against the target system.

Depending on the task, there are a different set of requirements that are used to determine whether it can be run against the target system:

#### **CMOS Update**

One of the CMOS Update images that is used by the task must correspond to the BIOS product code and level that is used on the target system.

#### **Custom**

System qualification is always skipped for Custom tasks.

#### **Get Donor**

System qualification is always skipped for the Get Donor task.

#### **Linux Clone Install**

System qualification is always skipped for Linux Clone Install tasks.

#### **Linux Native Install**

System qualification is always skipped for Linux Native Install tasks.

#### **Power Restore**

System qualification is always skipped for Power Restore tasks.

### **RAID Clone Configuration**

System qualification depends on the type of clone file that is specified for the task:

- Configuration backup files require that a ServeRAID™, IDEal RAID, or integrated small computer system interface (SCSI) controller with RAID capabilities be installed.
- Command files require that a ServeRAID, IDEal RAID, or integrated SCSI controller with RAID capabilities be installed. In addition, the target system must have physical drives at the channel/SCSI IDs that are called in the configuration commands, and the physical drives must have adequate size to accommodate the logical drives that are defined. The file type must match the RAID controller type. The RAID level specified in the command file must be supported by the RAID controller. The logical drive letter specified in the command file is checked for validity. The specified clone command file must exist. The syntax of the command file is checked for validity.

### **RAID Custom Configuration**

Target systems must have a ServeRAID, IDEal RAID, or integrated SCSI controller with RAID capabilities installed. Target systems must have enough adequately sized physical drives to support the task configuration. The file type must match the RAID controller type. The RAID level specified in the command file must be supported by the RAID controller. The logical drive letter specified in the command file is checked for validity. The syntax of the command file is checked for validity.

### **Remote Storage Configuration**

The target systems must have the applicable adapter for the task. The target system also must have been scanned in when it was on an active fabric. For information about system qualification for the Remote Storage Configuration built-in tasks, see Chapter 16, “Scan,” on page 179.

### **Scan**

System qualification is always skipped for Scan tasks.

### **Script**

All tasks within a script (except those that are configured to ignore system qualification errors) must pass the qualification that is specified for each task. For example, if a Script task includes a System Firmware Flash task and a Windows Native Install task, both tasks must pass their individual qualifications for the Script task to qualify.

### **Secure Data Disposal**

If a specific drive is selected, it must be present on the target system. If a drive is not specified, at least one drive must be present on the target system.

### **System Firmware Flash**

One of the System Firmware images that is used by the task must correspond to the product code that is used on the target system.

The “Deploy latest system firmware” task requires further qualification: if the **Always Flash** option is selected for the task, target systems are flashed even if the version is the same. If the **Apply only when the latest version is newer than the current system BIOS level** option is selected, target systems that have the same or earlier version are disqualified.

### **VMware Native Install**

System qualification is skipped for VMware Native Install tasks.

### **Windows Clone Install**

Target systems must have the same number of network cards or more as

defined by the task. Also, the machine type for target systems must match the machine type that is defined in the donor image for the selected task.

### **Windows Native Install**

Target systems must have the following hardware:

- The applicable number of disk drives that are specified in the task.
- A minimum of 4 Gigabyte (GB) hard disk drive space. Additionally, there must be enough physical disk drive space on the applicable disks for the partitions that are specified in the task.
- The applicable number of network cards as defined in the task.
- The applicable amount of memory that the target system is required to have depends on the version of Windows that is being deployed:
  - Windows 2000 Professional requires 32 MB
  - Windows XP requires 64 MB
  - Windows 2000 Server requires 128 MB
  - Windows 2000 Advanced Server requires 128 MB
  - Windows Server 2003, Standard Edition requires 128 MB
  - Windows Server 2003, Enterprise Edition requires 128 MB
  - Windows Server 2003, Web Edition requires 128 MB



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## Chapter 6. Importing and exporting

This chapter provides information about how to use the Import/Export option to copy tasks, images, and system data from one RDM Server installation and save them to another.

**Note:** RDM does not support exporting system-specific configuration information (STC data) for a task. For example, you can export a System Firmware Flash task and the BIOS image that it uses, but you cannot export the STC data for the target systems that have been configured to use the task.

You can export or import RDM data from both Windows and Linux-based RDM installations. The RDM data that you export is not operating-system specific. As a result, RDM data that is exported from RDM running on a Windows system can be imported to RDM that is running on a Linux system, and vice versa.

From the **Tasks** menu in IBM Director Console, you can:

- Import and export RDM system data
- Import and export RDM task
- Import and export RDM images

**Note:** Importing and exporting can be relatively slow operations. The speed is directly proportional to the amount of data being imported or exported. If your amount of data is large, you should select an appropriate time to run an import or export task, so that it does not affect other RDM work.

---

### Importing and exporting RDM system data

In RDM 4.30, each target system is represented by a set of data that is stored in the IBM Director database. You can import this system data from RDM version 3.x or later, or you can export the data from your current version of RDM.

Importing system data is useful when you already have information that describes the systems that you want to import. For example, you might want to add systems to RDM that are already in production, but you do not want to restart the systems (which would initiate the Basic Scan task and populate the database with system data for each supported system). If the system data that you want to import exists in a format that you can access, such as a spreadsheet or another system-management tool, you can use an ASCII text editor to convert the information to the format that is used by RDM. You can then import the information to RDM.

**Note:** Typically, after you import system data to RDM you must run a Scan task against the new systems that are displayed to make sure that the data in RDM is updated.

Exporting system data is useful when you want to use the information in another system-management tool. It is also useful when you want to manage the systems through another RDM server. For example, when you upgrade to RDM version 4.30 from 3.x, you must first uninstall RDM 3.x. To avoid losing the system data from the 3.x installation, you can export the system data before you uninstall RDM. The system data that you export is saved as a text file to the directory that you specify.

After you install RDM 4.30, you can import the system data from the text file. For information about exporting system data from RDM version 3.x, see your *RDM 3.x Operations Guide*.

## Exporting RDM system data

You can use the Export RDM 4.x Systems option to export system data to a comma-separated value (CSV) file. Possible uses for the file are to import the system data into another system-management application or to import the system data into another instance of RDM Server. If you import the system data into another instance of RDM Server, you can use IBM Director Console to access the target systems that are included in the CSV file.

Complete the following steps to export RDM 4.x systems:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Import/Export** → **Export RDM 4.x Systems**. The Export Systems window opens.

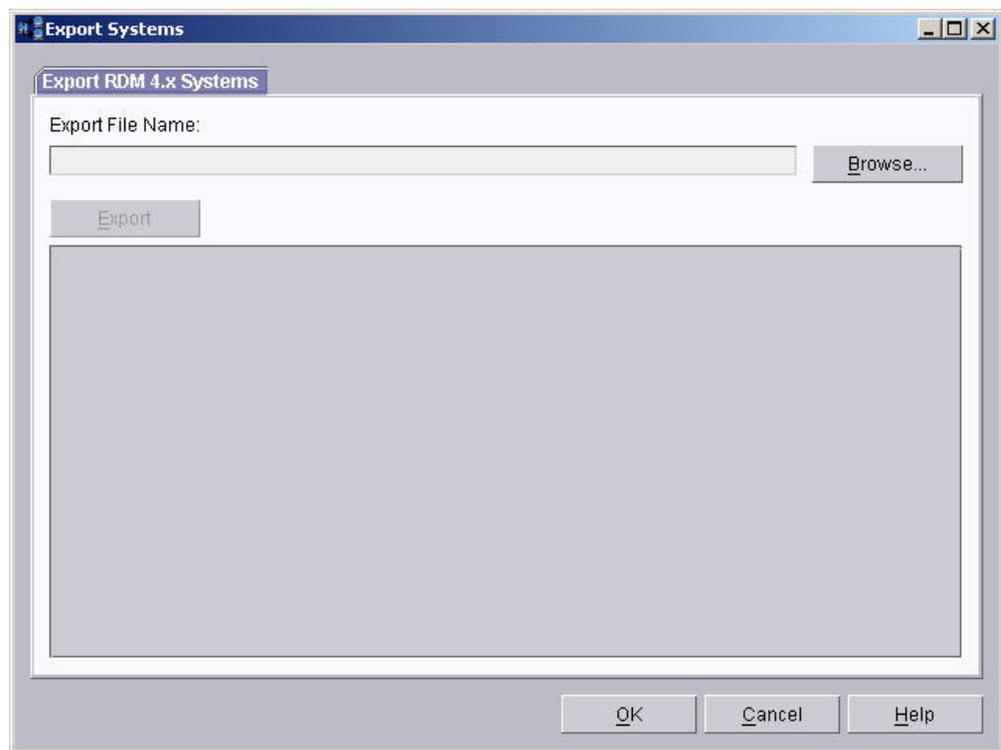


Figure 31. Export Systems window

2. Complete the following step to select the directory to which the file is exported:
  - a. Click **Browse**. The Export File window opens.

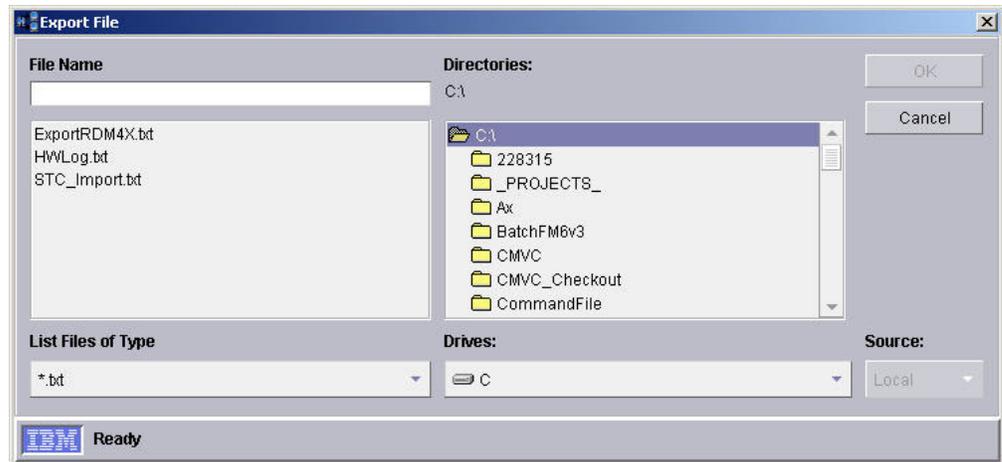


Figure 32. Export File window

- b. In the **Source** field, select the system where the source file is to be exported. You can choose between the local system or the RDM server.

**Note:** If the local system is the RDM server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.

- c. Navigate to the directory where you want to save the file.
3. In the **Name** field, type a name for the exported systems file.

**Note:** If you save the file to a network directory and you plan to import it to another instance of RDM Server, make sure that the directory is accessible from the system on which you plan to import it.

4. Click **OK**. The Export Systems window opens and the file name that you specified is displayed.
5. Click **Export**. The Export Progress indicator is displayed.
6. Click **OK**.

## Saving system data to a CSV file

You can use an ASCII text editor to create a CSV file that includes RDM system data. You can then import the data into RDM. After you import the system data, the new systems are displayed in IBM Director Console. You can run RDM tasks against the new systems.

Use the following guidelines to create a CSV file that includes RDM system data:

- Use an ASCII text editor to create or edit the CSV file. Typically, the CSV file is created by using a spreadsheet program; then, it is edited using an ASCII text editor.
- By default, the file will have a .csv file extension, but you can specify any extension.
- The first line of the CSV file must be the following string (including the quotation marks):  
"\$IBM RDM"

- The second line of the CSV file must contain the headers of the system data that you want to import. Headers can be in any order, but they must be separated by commas. At a minimum, the following headers must be included in the second line of the CSV file:

**Valid** The value that you enter for a target system in this field indicates whether the system can be imported to RDM. To import the target system to RDM, you must set the value to 1.

**System Name**

The value that you enter represents the system name that will be displayed in IBM Director Console.

**NIC MAC Address.0**

The value that you enter represents the mac address of the first NIC on the target system.

**Note:** Unrecognized headers are ignored. The corresponding system data for an unrecognized header is also ignored.

- The remaining lines can contain the system data for each target system that you want to include. The system data that you include must correspond to the headers in the second line of the CSV file and must be separated by commas.

## Importing RDM system data

You can use one of the following two options to import applicable RDM system data into RDM 4.30:

- Import RDM 3.x Systems
- Import RDM 4.x Systems

After you import the system data into RDM, the new systems are displayed in IBM Director Console. You can run RDM tasks against the new systems.

**Note:** After importing system data, make sure that you run an RDM scan against the new systems before you run any other RDM tasks.

Complete the following steps to import system data into RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Import/Export**; then, click the applicable version of RDM system data that you want to import (**Import RDM 3.x Systems** or **Import RDM 4.x Systems**). The Import Systems window opens.
2. Click **Browse**. The Import File window opens.
3. In the **Source** field, select the system where the file that you want to import is located. You can choose between the local system or the RDM server.

**Note:** If the local system is the RDM server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.

4. Navigate to the directory from which you want to import the file.
5. In the **File Name** list, select the file you want to import.
6. Click **OK**. The Import Systems window opens and the file name that you specified is displayed.
7. Click **OK**. The systems are imported.

---

## Importing and exporting RDM tasks

You can use RDM to import or export RDM tasks from one instance of RDM Server to another. Importing and exporting an RDM task is useful when you have multiple instances of RDM Server that require the same RDM task. Rather than recreate the task on each RDM server, you can create the task once, export it, and then import it on the RDM server on which you want to use it. You also can import or export multiple tasks at once.

### Exporting RDM tasks

You can use the Export RDM tasks option to export specific RDM tasks to a directory that you specify.

When they are run, some RDM tasks use other RDM resources, such as images, files, parameters, and subtasks. For example, to successfully run an Update CMOS task, you must also have a corresponding firmware flash image for the Update CMOS task to use.

**Note:** The System Firmware Flash images that are used by the Deploy latest firmware task are not exported with that task. This is because Deploy latest firmware task is not associated with a specific image until you actually run the task against a target system. When you run this task against a target system, the latest System Firmware Flash image is selected from the repository for that system.

When you export a task, the applicable resources that are associated with the task are also exported.

**Note:** When you export a Windows Native Installation task, you have the option whether or not to include the task's drivers.

RDM exports the images to a directory. RDM will create the directory and copy the appropriate files. All you have to do is to specify the directory name. It is a best practice to select a name that reflects the content of the extract.

**Note:** If you want to import the task, you must navigate to the *export\_directory* and select the \*.xml file that RDM created when the task was exported.

Complete the following steps to export one or more RDM tasks:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Import/Export** → **Export RDM Tasks**. A warning window opens to indicate that no other RDM actions should be performed during the task export process. Also, make sure that no other RDM tasks are currently running before you continue.

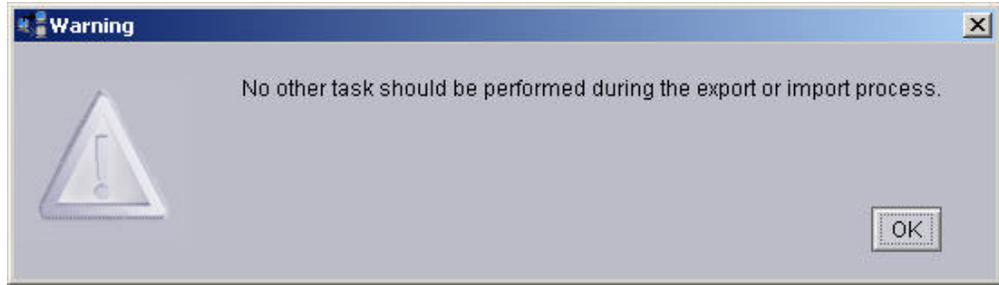


Figure 33. "Export warning" message

2. Click **OK**. The Export Tasks window opens.

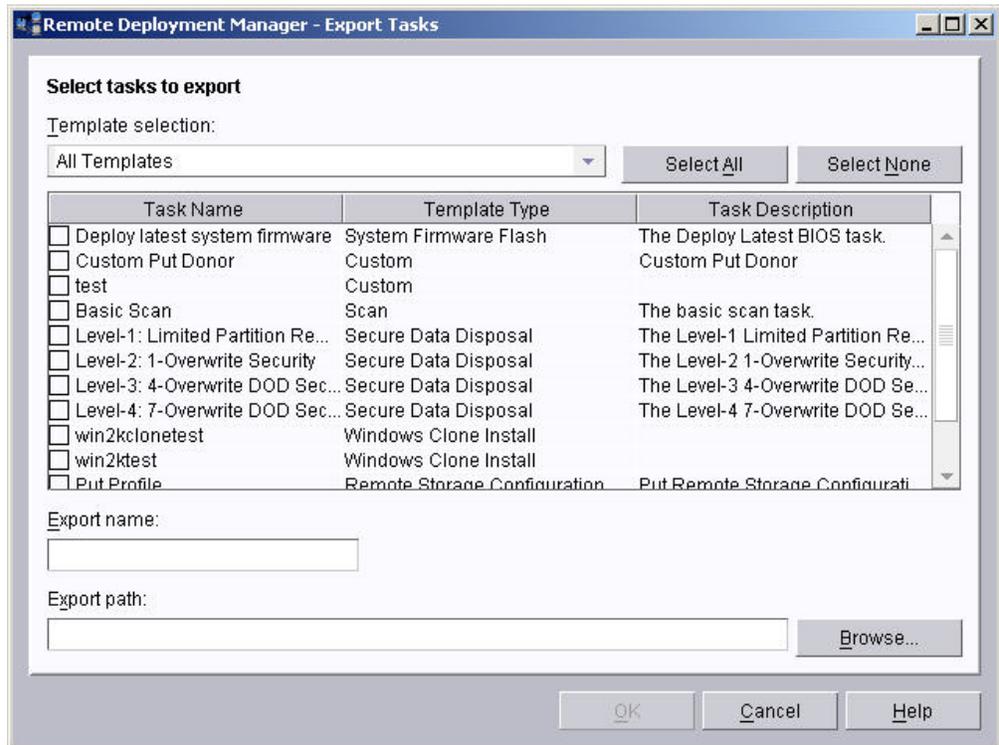


Figure 34. Export Tasks window

3. In the list of tasks, click the check box for each task that you want to export.

**Notes:**

- a. To display only the tasks that are associated with a specific template, in the **Template selection** list, select a template.
- b. To select all the tasks in the list of tasks, click **Select All**.
- c. To clear all the selected tasks in the list of tasks, click **Select None**.
4. In the **Export Name** field, type a descriptive name for the directory to which the exported files are to be saved. RDM uses the name that you type to create an export directory that contains the exported tasks and related files.
5. Select the base directory to which you want to export the files:
  - a. Click **Browse**. The Select Export Location window opens.

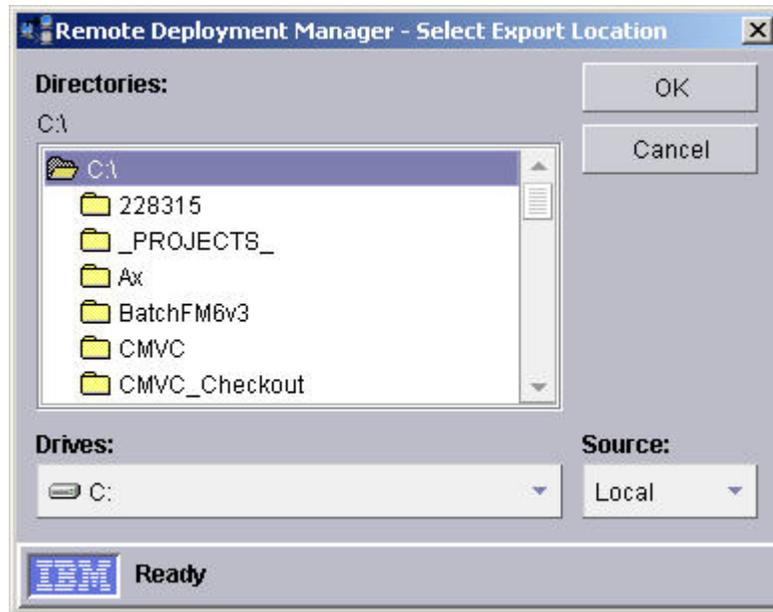


Figure 35. Select Export Location window

- b. In the **Source** field, select the system to which you want to export the files. You can choose between the local system or the RDM server.

**Note:** If the local system is the RDM server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.

- c. Navigate to the base directory where you want to save the export file; then, click **OK**.

**Note:** In the base directory that you specify, RDM creates an *export\_directory* in which it saves the export file that you created in step 4 on page 54.

6. Verify the export information; then click **OK**. The Export Task Progress window opens. When the task export process is completed a confirmation window opens.
7. Click **OK**.

## Importing RDM tasks

You can use the **Import RDM Data** option to import into RDM an RDM task that has been exported to an export directory. When you import a task, the applicable resources that the task uses, such as parameters, images, and other tasks are also imported. For information about importing a task, see “Importing data” on page 57.

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## Importing and exporting RDM images

You can use RDM to import or export RDM an image from one instance of RDM Server to another. Importing and exporting an RDM image is useful when you have multiple RDM installations in different networks that require the same deployment image. Rather than recreate the image on each RDM server, you can create the

image once, export it, and then import it to the instance of RDM Server on which you want to use it. You can then deploy the image from that instance of RDM Server to the applicable systems.

## Exporting RDM images

You can use the **Export RDM Images** option to export specific RDM images to a directory. RDM creates the directory and copies the appropriate files. All you have to do is to specify the directory name. It is a best practice to select a name that reflects the content of the extract.

Complete the following steps to export one or more RDM images:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Import/Export** → **Export RDM Images**. A warning window opens to indicate that no other RDM task should be run during the image export process.
2. Click **OK**. The Export Images window opens.
3. In the list of images, select the check box for each image that you want to export.

### Notes:

- a. To show only the images that are associated with a specific template, in the **Template selection** list, select a template.
  - b. To select all the images in the list of images, click **Select All**.
  - c. To clear all the selected images in the list of images, click **Select None**.
4. In the **Export Name** field, type a descriptive name for the directory to which the exported files are to be saved. RDM creates a directory with that name that contains the exported image.
  5. Complete the following steps to select the base directory that you want to export the files to:
    - a. Click **Browse**. The Select Export Location window opens.
    - b. In the **Source** field, select the system to which you want to export the files. You can choose between the local system or the RDM server.  
  
**Note:** If the local system is the RDM server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.
    - c. Navigate to the base directory where you want to create the new directory; then click **OK**. RDM will create the new directory and the appropriate files and subdirectories.
  6. Verify the export information; then click **OK**. The Export Image Progress window opens. When the image export is completed a confirmation window opens.
  7. Click **OK**.

## Importing RDM images

You can use the **Import RDM data** option to import into RDM an RDM image that has been exported to an export image file. For information about importing a task, see “Importing data” on page 57.

**Note:** In RDM 4.30, images of Software Delivery Assistant and System Migration Assistant files will no longer be supported. If an imported task or image

includes an image of an SDA or SMA file, the SMA/SDA image will be removed and a message will be displayed, indicating that it was not imported.

---

## Importing data

You can use the **Import RDM Data** option to import the following two types of RDM data:

- Images
- Tasks

If you have a task or image file that has been exported from RDM, you can import them to an instance of RDM Server and deploy them to supported systems.

**Note:** For some templates (including WNI, WCI and BIOS), when importing pre-4.30 tasks or images RDM will also upgrade or convert data such as task folder files, commandList, and image support files to the RDM 4.30 level. When importing pre-4.30 data, you should assume the data will go through some type of upgrade/conversion process.

If you import a task or image to instance of RDM Server that already has a corresponding task or image with the same name, RDM automatically renames the imported task or image by appending a number to the end of the image or task name. If you import a task that contains a user-defined parameter and the imported parameter has the same name as an existing user-defined parameter, the data types must also be the same. The default value of the user-defined parameter that you import replaces the default value of the existing parameter in the task templates that use that parameter (this does not affect the value of the user-defined parameters with the same name that are used by existing tasks).

If you import a task that contains a user-defined parameter and the imported parameter has the same name as an existing user-defined parameter but the data types are different, the import process fails.

Complete the following steps to import data to RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Import/Export** → **Import RDM Data**.
2. Click **OK**. The Import Data window opens.
3. Complete the following steps to select the data file that you want to import. This file will be an XML file.
  - a. Click **Browse**. The Select Import Data File window opens.
  - b. From the **Source** list, select the system where the data that you want to import is located. You can choose between the local system or the RDM server.

**Note:** If the local system is the RDM server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.

- c. Navigate to the directory where the RDM export \*.xml file is saved. Select the file; then, click **OK**.
4. Click **OK**.

5. After clicking **OK**, if the import includes any previously supported applications that are not supported in RDM 4.30 (such as SMA and SDA), a message box displays indicating that image types which are no longer supported were excluded from the import.

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## Part 3. Running RDM tasks



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## Chapter 7. CMOS Update

You can use the CMOS Update template to create a CMOS Update task that remotely configures BIOS settings on one or more target systems. The settings that you can update might include:

- Assignments for devices and input/output (I/O) ports
- Power-on password
- Start options, including startup (boot) sequences
- Interrupt request (IRQ) settings

The BIOS settings of a computer are saved to the Complementary Metal Oxide Semiconductor (CMOS) chip. To create a CMOS Update image, you must first configure a donor system so that it has the applicable BIOS code (system firmware flash) and settings. You can capture the BIOS settings that are saved to the CMOS chip by using a CMOS configuration utility. On IBM systems, this utility is included on the BIOS update diskette that is used to update BIOS code on that system. The BIOS code on the BIOS update diskette must be at the same level as the BIOS code on the donor system. The utility saves the settings to a CMS file (a file with a .cms extension). You can then use RDM and the CMS file to create a CMOS Update image.

Finally, you can create a CMOS Update task that uses the CMOS Update image. The CMOS Update image can be used only with its corresponding System BIOS image, which has a specific BIOS version and level. The BIOS code on the target system must be at that same version and level.

Before you use the CMOS Update template to create a task, make sure that you have a BIOS update diskette, which also contains the CMOS configuration utility (typically, srcmosxx.exe or cmosutil.exe, where xx is a two-letter model-specific designation).

This chapter provides the procedures that you must complete in the following order to create and then run a CMOS Update task:

1. Prepare the donor system:
  - a. Install the appropriate system BIOS firmware on the donor system. For example, you could do this with an RDM System Firmware Flash task.
  - b. Configure the CMOS settings on the donor system as applicable.

For information about how to prepare a donor system to copy the CMOS settings, see “Preparing the donor system” on page 62.
2. Save the BIOS settings from the donor system to a CMS file. For information about how to save BIOS settings to a file, see “Saving the BIOS settings to a CMS file” on page 62. For example, it is possible to create an RDM task to do this.
3. Use the RDM Image Management option and the CMS file to create the CMOS Update image. For information about how to save CMOS settings to RDM, see “Creating a CMOS Update image” on page 63.
4. Use the RDM Image Management option to create a System BIOS image, based on the System Firmware Flash template.
5. Create a CMOS Update task that uses the CMOS Update image. For information about how to create a CMOS Update task, see “Creating a CMOS Update task” on page 67.

6. Run the CMOS Update task against the applicable target systems. For information about how to run a CMOS Update task, see “Running a CMOS Update task” on page 71.

---

## Preparing the donor system

Before you create a CMOS Update image, update the BIOS code on the donor system with the applicable system firmware or make sure that the BIOS code on the donor system is at the same level as the code on the BIOS update diskette. You also must create the System BIOS image so that it can be used in conjunction with the CMOS Update image that you want to create. For information about how to update the BIOS code on a donor system and how to create a System BIOS image, see “Creating a System Firmware Flash image in RDM” on page 202.

After you update or verify the BIOS code on the donor system, configure the applicable BIOS settings, such as power-on password and boot options. For example, boot the donor system and press the F1 key to display the BIOS settings. Make the appropriate changes, and then save those changes.

The target systems to which you deploy a specific CMOS Update image must also have the corresponding BIOS code.

---

## Saving the BIOS settings to a CMS file

After you update the BIOS code on the donor system and configure the BIOS settings as needed, you can use the applicable utility that is packaged with the BIOS update diskette to save the settings as a CMS file. The procedure in this section uses the `cmosutil.exe` utility. Some IBM BIOS update diskettes use a different CMOS utility or a different command-line syntax. Use the flash utility that comes with your BIOS code. For information about the utility, see the applicable readme file on the BIOS update diskette.

You can also create a custom task to capture BIOS settings, as described in Chapter 7, “CMOS Update,” on page 61.

You cannot create a CMS file from Windows or Linux. You must capture the settings from DOS.

Complete the following steps to save the BIOS settings to a CMS file:

1. Copy the `cmosutil.exe` file onto a DOS-startable (bootable) diskette.
2. Power off the donor system.
3. Insert the DOS-startable (bootable) diskette into the diskette drive of the donor system.
4. Start the donor system.
5. At the DOS prompt, type the applicable command to save the CMS file. To which command to use with the utility, see the readme file that comes with the utility that you use. For example, this version of the `cmosutil.exe` utility uses the following command:

```
cmosutil /s filename.cms
```

where *filename* is the name of the CMS file to which you want the settings to be saved.

## Creating a CMOS Update image

You can use the CMS file that you created and the Image Management option to create a CMOS Update image. A CMOS Update image is a group of settings that are associated with a specific system machine type and BIOS code level.

Complete the following steps to create a CMOS Update image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

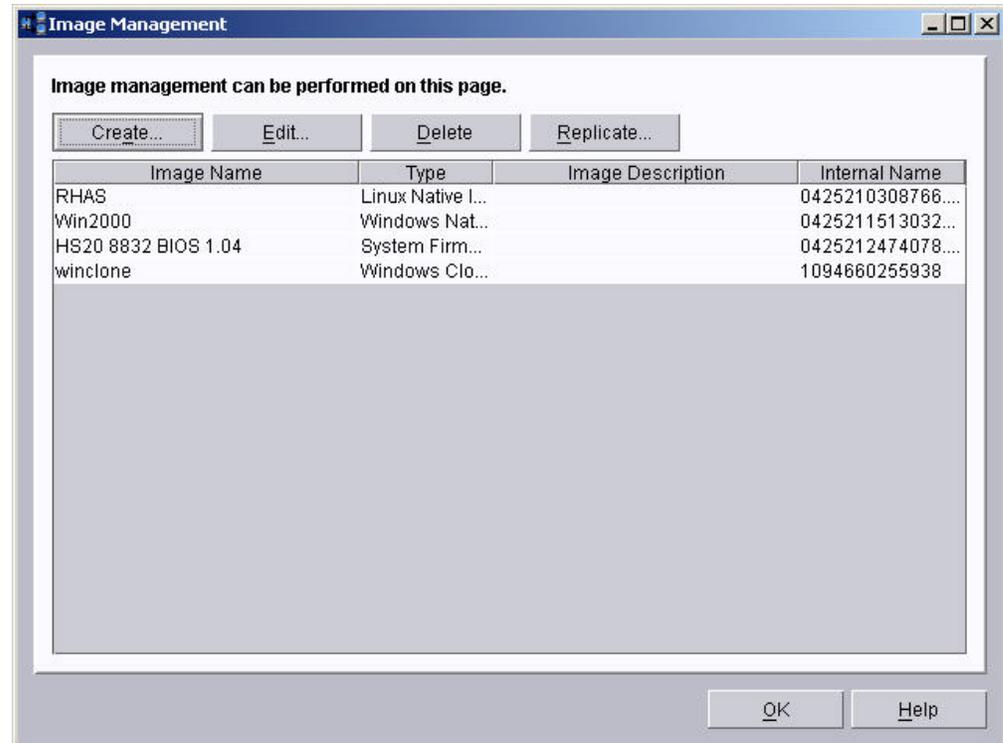


Figure 36. Image Management window

2. Click **Create**. The Create Image window opens.

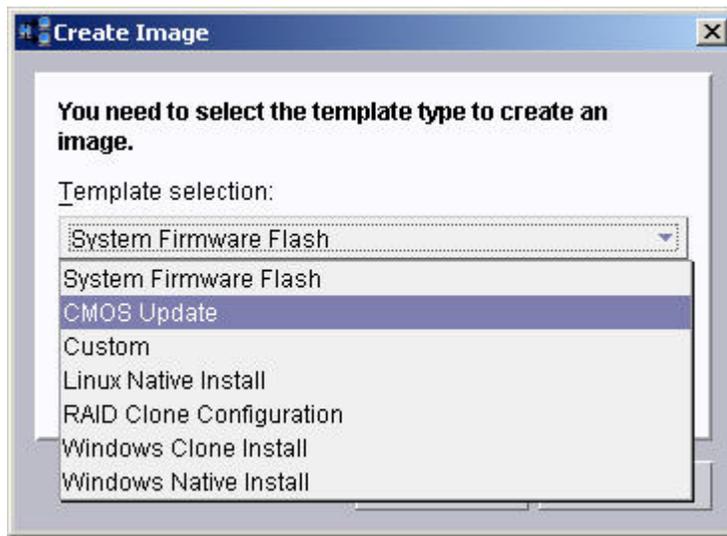


Figure 37. Create Image window

3. In the **Template selection** field, select **CMOS Update**; then, click **OK**. The Create CMOS Update Image window opens and the General page is displayed.

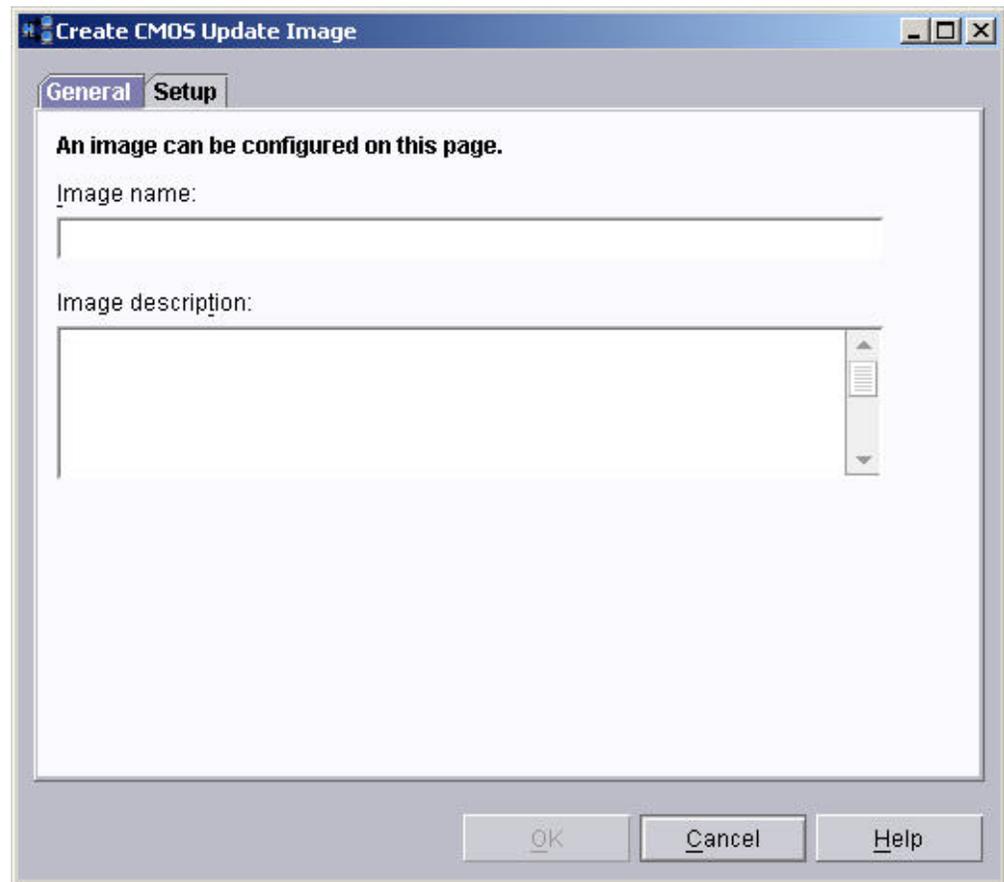


Figure 38. Create CMOS Update Image window: General page

4. In the **Image name** field, type a name for the CMOS Update image. Later, when you create a task, the name that you type in this field will be displayed in the list of images that you can select to add to the task.
5. (Optional) In the **Image description** field, type a brief description for the CMOS Update image.

6. Click **Setup**. The Setup page is displayed.

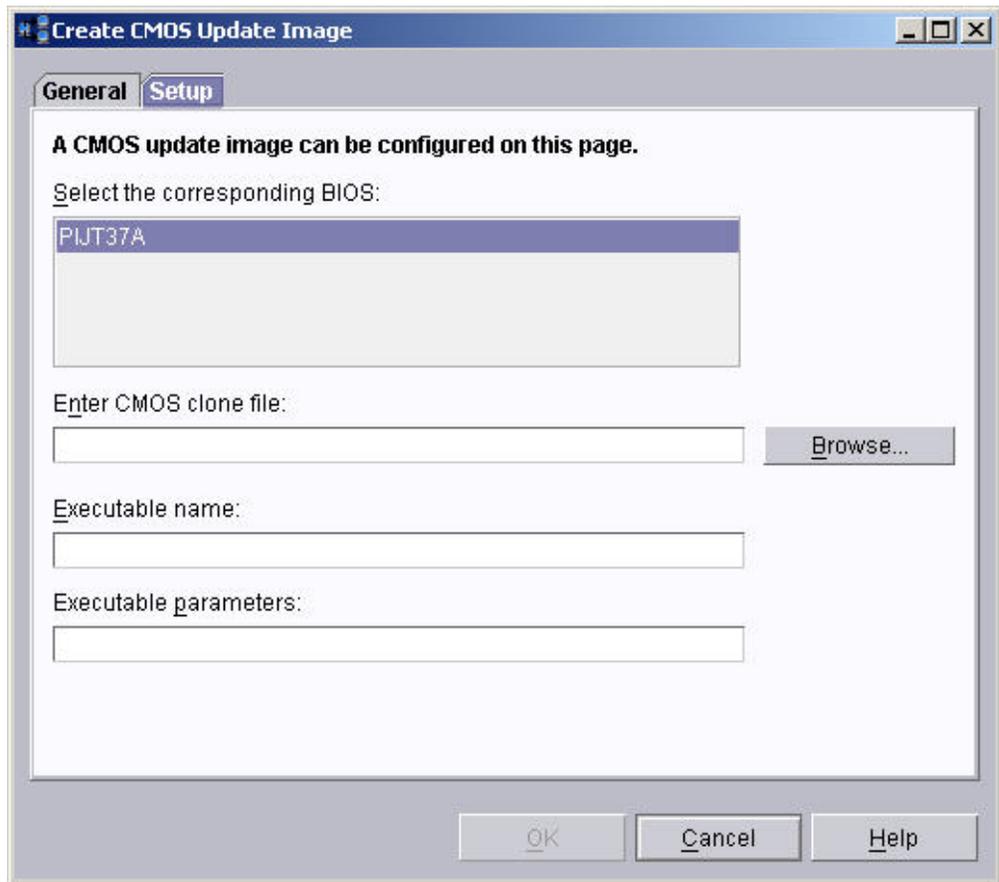


Figure 39. Create CMOS Update Image window: Setup page

7. In the **Select the corresponding BIOS** field, select the applicable System BIOS image that corresponds to this CMOS Update image.

**Note:** You must select the System BIOS image that corresponds to the BIOS configuration settings that are saved in the CMOS Update image. If you select the wrong System BIOS image, the CMOS Update task that you create might fail when you run it.

8. Complete the following steps to select the file:
  - a. Click **Browse**. The “Locate the CMOS donor file” window opens.

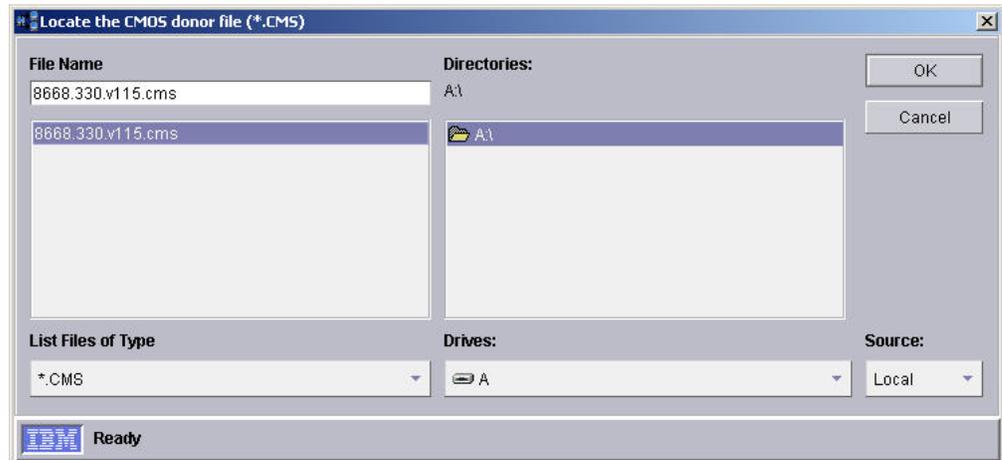


Figure 40. “Locate the CMOS donor file” window

- b. In the **Source** field, select the system where the source file is located. You can choose between the local system or the RDM server.

**Note:** If the local system is the RDM server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.
    - c. If the CMS file is on a diskette, insert it into the diskette drive.
    - d. Navigate to the CMS file, and select it.
    - e. Click **OK**.
  9. Click **OK**. The Task Image Creation Progress window opens. The CMOS Update image is created.
  10. Click **OK**.

---

## Creating a CMOS Update task

To apply a CMOS Update image to a target system, you must create a CMOS Update task that contains the CMOS Update image that you want to deploy. When creating the CMOS Update task, you can select an existing CMOS Update image to use, or you can create a new one.

You can associate multiple CMOS Update images with a single task. When you run the task, the applicable CMOS Update image is applied to each system according to the BIOS code level on that system.

Complete the following steps to create a CMOS Update task:

1. Right-click **CMOS Update** and click **Create new task**. The CMOS Update window opens.

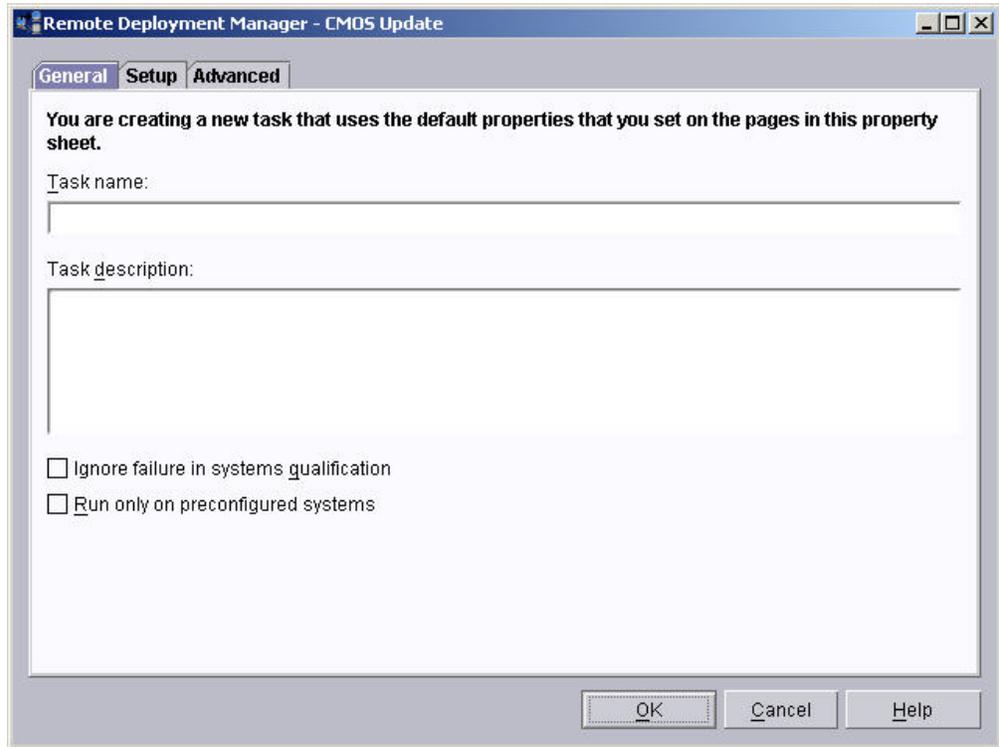


Figure 41. CMOS Update window: General page

2. In the **Task name** field, type a name for the task.
3. (Optional) In the **Task description** field, type a brief description of the task.

4. Click the **Setup** tab. The Setup page is displayed.

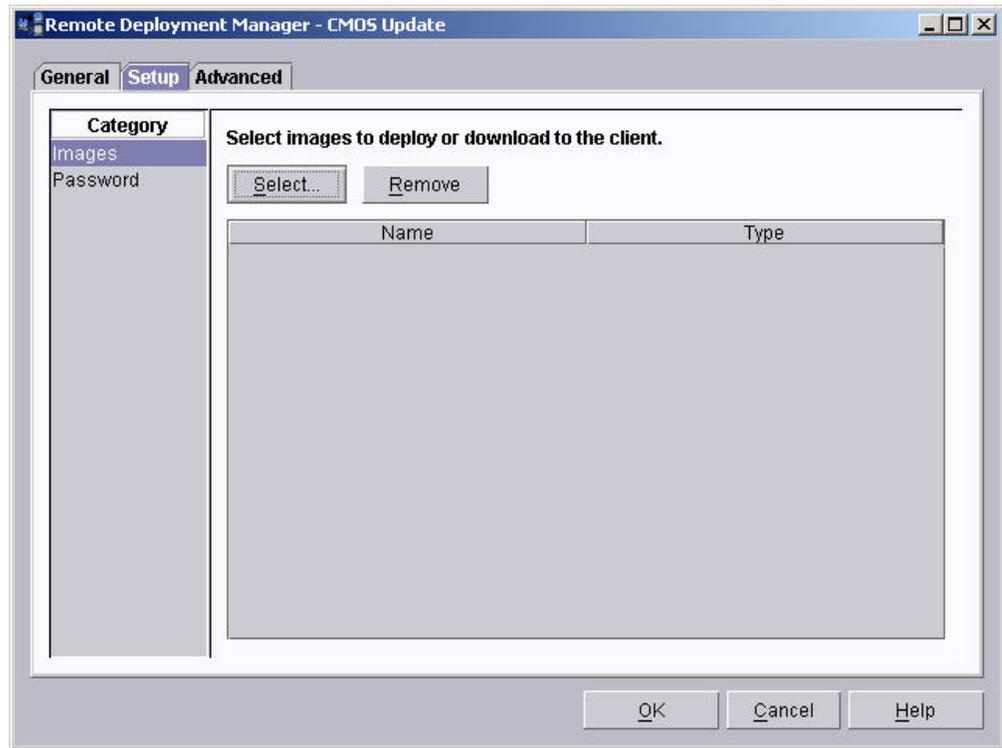


Figure 42. CMOS Update window: Setup page

5. In the Category pane, select **Images**; then, click **Select**. The Image Selection window displays the CMOS Update images that have been imported to the RDM repository.

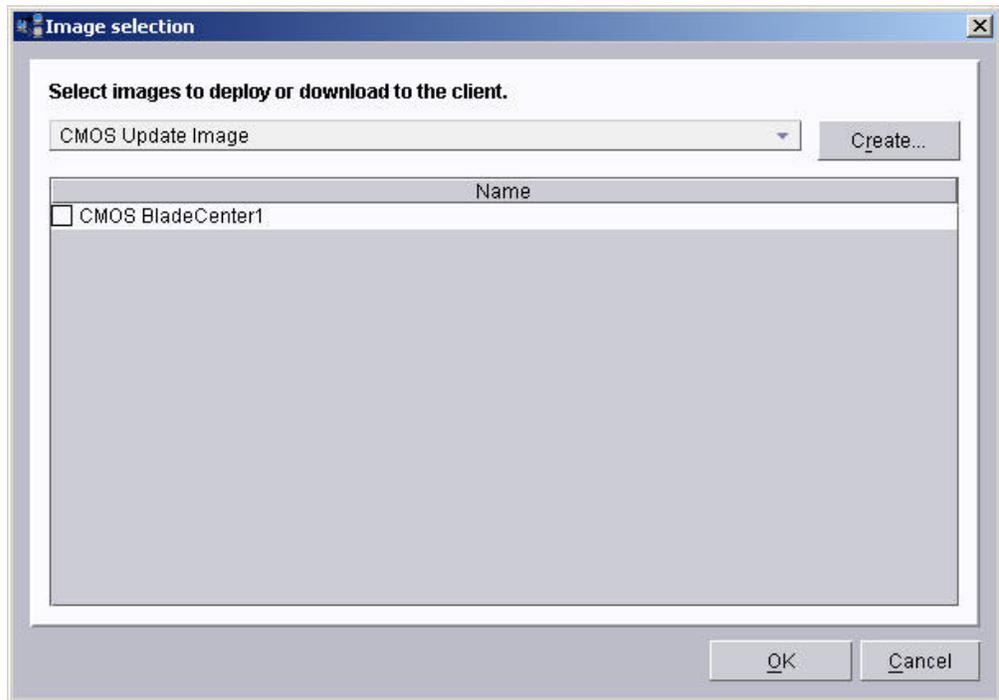


Figure 43. Image Selection window

6. From the **Name** list, select each image that you want to use; then, click **OK**. The Setup page displays the CMOS Update images that you associate with the task.

**Note:** If you have not already used RDM Image Management to create a CMOS Update image and associate it with a System BIOS image, you can click **Create** to create the image.

7. Complete the following steps if a password is required to access the CMOS settings on the target system:
  - a. In the Category pane, select **Password**. The password options are displayed.

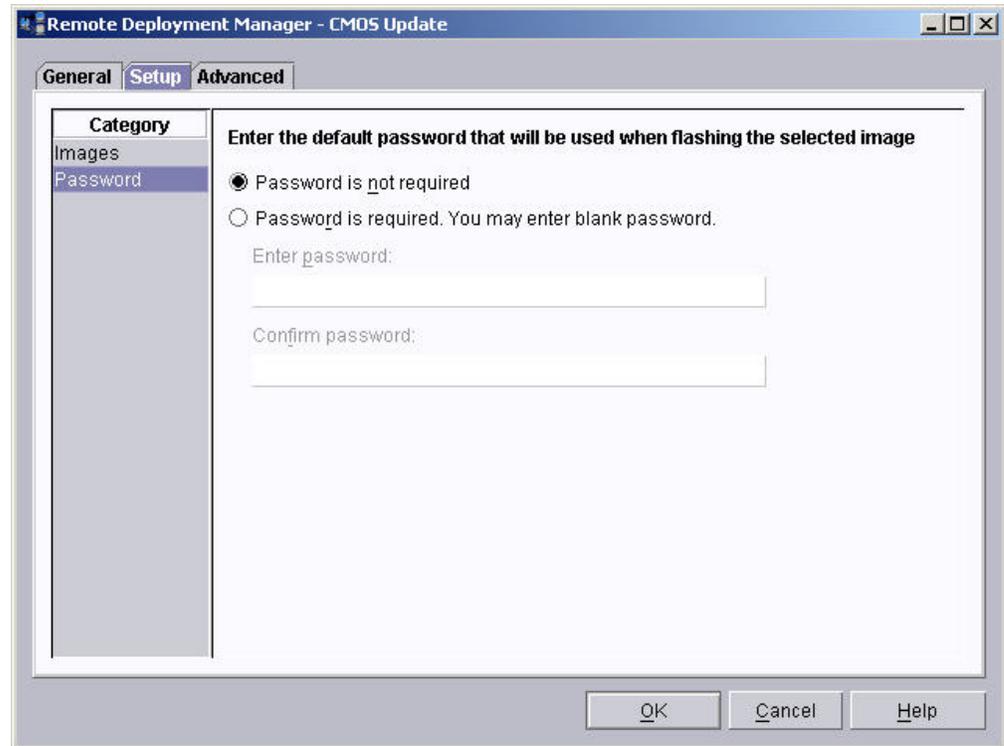


Figure 44. CMOS Update window: Setup page: Password category

- b. Select **Password is required**.
  - c. In the **Enter Password** field, type the password that is required to access the target system CMOS settings.
  - d. In the **Confirm Password** field, retype the required password.
8. Click **OK** to create the task. The task is displayed in the Tasks pane under **CMOS Update**.

---

## Running a CMOS Update task

After you create a CMOS Update task, you can use RDM to run the task on the target systems that you specify.

Complete the following steps to run a CMOS Update task:

1. From IBM Director Console, expand the **Remote Deployment Manager** task tree. The RDM tasks are displayed.
2. Expand the **CMOS Update** task tree.
3. Drag the CMOS Update task that you want to use to the target system or group that you want to update; then, select **Run systems**. The CMOS Update window opens.
4. To run the task immediately, click **Execute Now**.
5. To schedule the task to run in the future, click **Schedule**; then, complete the applicable fields in the Schedule window.

If a CMOS Update task fails, an error code is displayed on the monitor of the target system during the startup process.

**Note:** You might have to press F8 during the startup process on the target system to step through each command that is being processed and to make note of where the CMOS update fails.

Complete the following steps to display the error codes and their descriptions:

1. Start the system from a DOS diskette that contains the utility program that you used to create the CMS file.
2. At a command prompt, type the applicable command:

```
A:\CMOSUTIL /?
```

or

```
A:\SRCMOSxx /?
```

where *xx* is a two-letter model-specific designation.

The error codes and their descriptions are displayed.

---

## Using the lccmos.bat file

During a remote update of the CMOS settings, RDM runs one of the following programs, `lccmos.bat`, `cmosutil.exe`, or `srcmosxx.exe`, depending on the BIOS image. Here is an example of the command RDM runs:

```
CALL LCCMOS.BAT %CMOSFILE%
CALL CMOSUTIL.EXE /R %CMOSFILE%
CALL SRCMOSNV.EXE %CMOSFILE% /UPDATE /NOREBOOT /QUIET
```

If you understand the process of updating BIOS settings, you might create or modify an `lccmos.bat` file to customize this process. See the `readme` file on the BIOS update diskette for more information.

The utility programs for different IBM systems might require different command-line syntax. For example, to perform a CMOS update on an xSeries 330 server, you must create an `lccmos.bat` file. The default RDM file cannot be used because the required syntax is different. For example:

```
REM LCCMOS.BAT file created by the customer for xSeries 330
REM to override the default syntax for CMOSUTIL.EXE.
cmosutil.exe /R %1
```

Any system whose `cmosutil` program uses `-s` and `-r` to save and restore, rather than `/s` and `/r`, requires an `lccmos.bat` file. Make a note of what syntax each system uses when you create the CMS file initially. Use one of the following commands in your batch file:

```
cmosutil.exe -r filename.cms
cmosutil.exe -r %1
```

## Chapter 8. Custom

The Custom task template is a general-purpose template that you can use to create additional tasks that are not installed with RDM. You can use the Custom task template to create a task that performs the RDM commands that you define.

### Creating a Custom task

Complete the following steps to create a Custom task:

1. Right-click **Custom**. The Custom menu is displayed.
2. Click **Create new task** on the Custom menu. The Custom window opens and the General page is displayed.

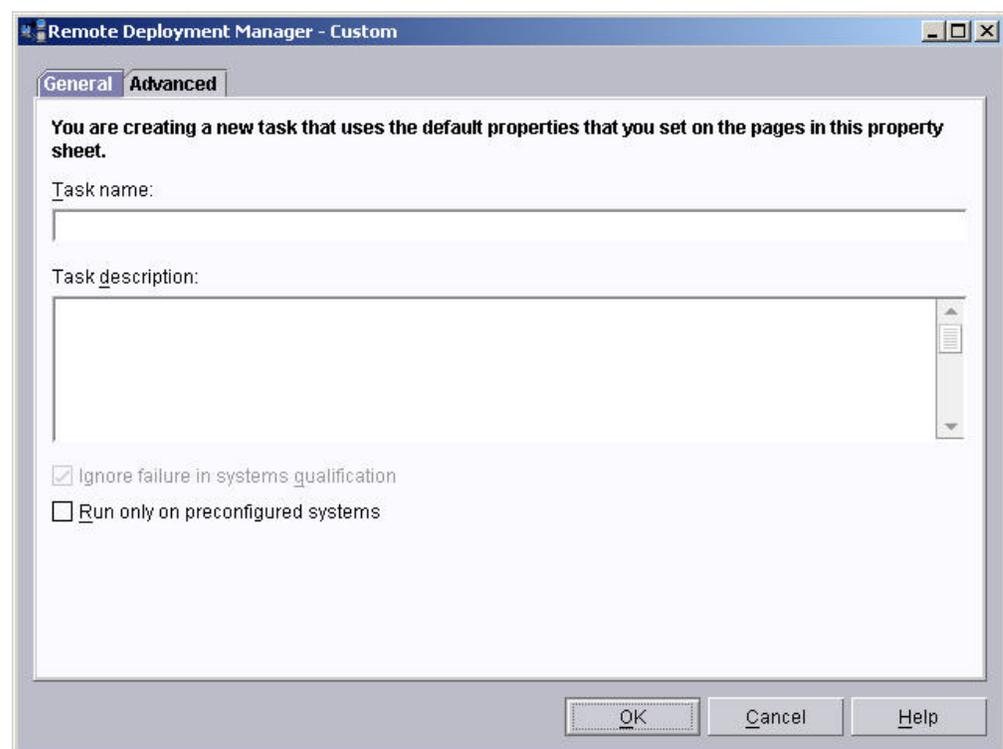


Figure 45. Custom window: General page

3. Complete the following steps to provide the basic information for the task:
  - a. In the **Task** name field, type a descriptive name to identify the task.
  - b. In the **Task description** field, type a brief description of the task.
  - c. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that have been pre-configured for use with the task using the System/Task Configuration window. For information, see Chapter 5, "Configuring systems and tasks," on page 41.

**Note:** System qualification is always disabled for Custom tasks.

4. Click the **Advanced** tab. The available information categories are displayed in the left pane:
  - Command list
  - User parameters
  - Task folder

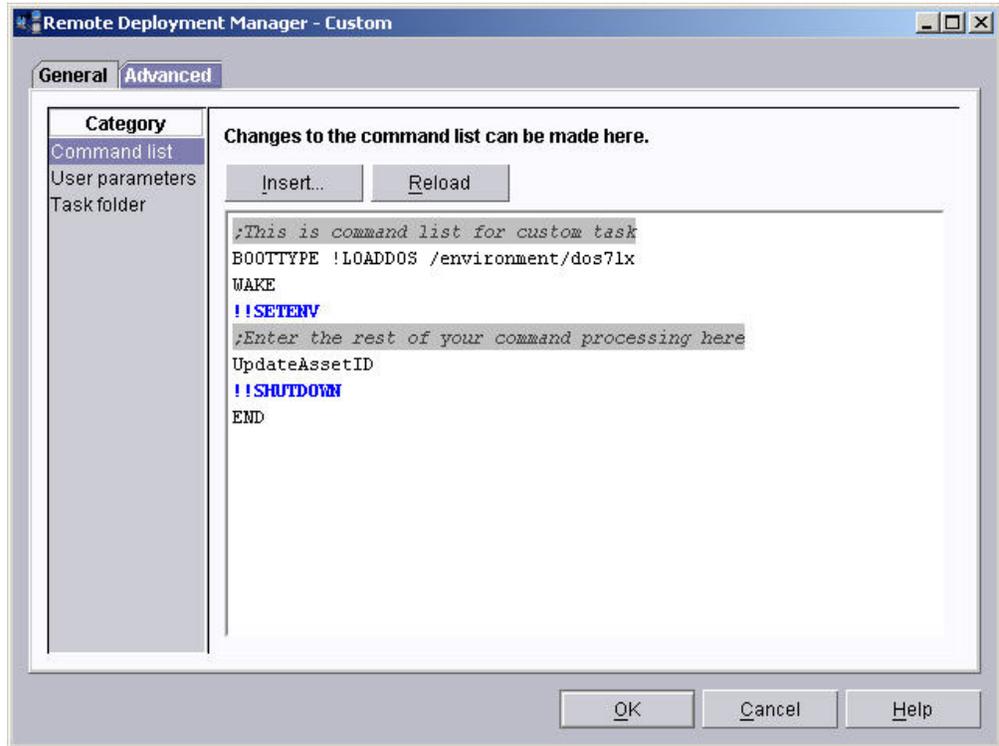


Figure 46. Custom window: Advanced page

5. In the left pane, click **Command list**; then, add any commands needed for the task. The command list is a list of RDM, DOS, and Linux commands that you can add to a task which will invoke them when the task is run.

**Notes:**

- a. RDM does not check the syntax or verify the commands that you add to the Command list.
- b. To restore the command list to its original state, click **Reload**.

Refer to Chapter 24, "Command-list commands," on page 271 for information on commands and syntax within a command list.

6. (Optional) Select and include an image. For information, see "Advanced properties - Command list" on page 19.
7. (Optional) Add a parameter to the User parameter list. For information, see "Advanced properties - User parameters" on page 22.
8. Click **OK**. The task is displayed in the IBM Director Tasks pane under the Custom task template.

---

## Creating a Custom task to capture BIOS settings (CMOS configuration)

You can create a Custom task that saves the BIOS settings from a target system as a CMS file. The file is saved to a directory on the RDM server. You can then use the CMS file to create a CMOS Update image in RDM.

Before you create this task, consider the following information:

- Make sure that you already created the applicable System BIOS image that will be used with the BIOS settings that you capture. For information about creating a System BIOS image, see Chapter 19, “System Firmware Flash,” on page 201
- Make note of the internal image name of the System BIOS image. This image name will be used in this procedure.
- Make note of the CMOS configuration utility that was provided with the BIOS update diskette that you used to create the System BIOS image for your target system. Also make note of the parameters that are used by the utility to capture the BIOS settings. On many IBM systems, the utility is named `cmosutil.exe` and it uses the following syntax to capture the BIOS settings: `cmosutil /s capturefile`

Complete the following steps to create a Custom task to capture the BIOS settings that are saved to a target system:

1. Right-click **Custom**. The Custom menu is displayed.
2. Click **Create new task**. The Custom window opens and the General page is displayed.
3. In the **Task** name field, type  
Get CMOS Settings
4. Click the **Advanced** tab. The available information categories are displayed in the left pane: Command list, User parameters, and Task folder.
5. In the left pane, click **Command list**; then, edit the command list so that it displays as follows:

```
;This is command list for custom task
BOOTTYPE !LOADDOS /environment/dos71x
WAKE
!!SETENV
;Enter the rest of your command processing here
!%RAMDSK%
!mtftp get %%SERVER_IP%%
template\%%TASKTEMPLATEID%\%%TASKTOID%\cmoscapt.bat
cmoscapt.bat!cmoscapt.bat
UpdateAssetID
!!SHUTDOWN
END
```

**Note:** The syntax lines that begin with `!mtftp` and `template\` must be typed as one continuous line, with no line breaks.

For information on commands and syntax that can be used within a command list, see Chapter 24, “Command-list commands,” on page 271.

6. Create the BiosImage parameter:
  - a. In the left pane click **User parameters**; then, click **Select**. The User Parameters window opens.
  - b. Click **Create**. The Create User Parameter window opens.
  - c. In the **Name** field, type  
BiosImage
  - d. In the **Data type** field, select **String**.

- e. Leave the **Default Value** field blank.
  - f. Select the **Display in STC** check box.
  - g. Click **OK**. The User Parameters window displays the new BiosImage user parameter.
  - h. Select the **BiosImage** check box in the Name column.
7. Create the CMOSImageFile parameter:
- a. Click **Create**. The Create User Parameter window opens.
  - b. In the **Name** field, type  
CMOSImageFile
  - c. In the **Data type** field, select **String**.
  - d. Leave the **Default Value** field blank.
  - e. Click the **Display in STC** check box.
  - f. Click **OK**. The User Parameters window displays the new CMOSImageFile user parameter.
  - g. Select the **CMOSImageFile** check box in the Name column.
8. Click **OK**. The User parameters list displays the two new parameters.
9. Click **OK** to save the task.

10. Make a note of the task folder name and location for the new task:
  - a. After creating the new Get CMOS Settings task, right-click on the task, and select **Edit Task**.
  - b. Click the **Advanced** tab.
  - c. In the left-pane, click **Task folder**.
  - d. In the right pane, make a note of the location of the task folder.
  - e. Click **Cancel** to close the task.
11. Create the supporting DOS batch file.

**Note:** The Get CMOS Settings task has been created; however you must provide a supporting DOS batch file to enable the task to work.

- a. Open an ASCII text editor.
- b. Type the following text, making sure to modify the CMOSUTIL line as applicable to reflect the CMOS capture utility that you are using:

```
@ECHO OFF
ECHO *****
ECHO * Remote Deployment Manager
ECHO * (C) Copyright IBM Corp. 2003 All rights reserved.
ECHO *****
ECHO * Batch file for CMOS Capture task.
ECHO *****
SET RDRASLEVEL=0
SET RDSTATUS=RDCMOS000I
REM Change directory to RAMDISK
%RAMDSK%
RDAGENT /L "Getting BIOS Image %BiosImage%"
MTFTP get %SERVER_IP% image\%BiosImage% bios.zip
if errorlevel 1 goto MTFTPERR
unzip -C bios.zip
del bios.zip
RDAGENT /L "Capturing %CMOSImageFile%"
REM Modify the line below for the appropriate capture utility
CMOSUTIL /s %CMOSImageFile%
IF errorlevel 0 goto CAPTURED
SET RDSTATUS=RDCMOS001E
RDAGENT /L "Capture failed"
GOTO END
:CAPTURED
RDAGENT /L "%CMOSImageFile% Captured"
Echo "Attempting File Transfer"
MTFTP put %SERVER_IP% %CMOSImageFile% %CMOSImageFile%
IF errorlevel 1 goto MTFTPERR
RDAGENT /L "%CMOSImageFile% Transferred to DServer"
GOTO CMOSDONE
:MTFTPERR
call mftfprc.bat
echo "MTFTP Error"
a:
goto END
:CMOSDONE
a:
echo "CMOS Capture complete."
SET RDSTATUS=RDCMOS000I
:END
```

- c. Save the file as cmoscapt.bat in the CMOS capture task folder.

12. This task can be used to capture the BIOS settings from multiple target systems. Before you run the task on a target system, you must configure the task for that system. Complete the following steps to configure a target system to use the Get CMOS Settings task:
  - a. Drag the **Get CMOS Settings** task to the target system; and then, select the **Configure systems**.
  - b. Click the **User Parameters** tab.
  - c. In the **BiosImage** field, type the internal image name from RDM of the System BIOS image for that target system.
  - d. In the **CMOSImageFile** field, type the name to be used for the CMS file. This file will be created under DOS. The name that you type must use the DOS 8.3 file naming conventions.
  - e. (Optional) Select the **Execute this task after pressing the OK button** check box.
  - f. Click **OK**.

When you run the task, the CMS files are saved in the *rdm\_installation/temp* directory where *rdm\_installation* is the directory in which RDM has been installed.

You can use the CMS files to create CMOS Update images.

---

## Chapter 9. Donor Image

The Donor Image template provides access to the Get Donor and the Put Donor tasks.

**Note:** If RDM is installed on a Linux system, you cannot use the Donor Image, Windows Clone Install, or Linux Clone Install templates or their tasks. RDM must be installed on a Windows system in order to use these templates and tasks.

The Get Donor task creates an RDM image that includes the entire contents (all partitions) of the first hard disk drive of the donor system. The drive can contain Windows or Linux partitions. The system that you copy the image from is called the *donor system*.

The Put Donor task is used to deploy a donor image. The *donor image* is the content of the partitions from the *donor system*.

**Note:** The Put Donor task is used only to restore the clone image, unchanged, to the hard disk drive. The image will be at the exact same state it was in when you ran the Get Donor task. To make changes to the clone image and deploy it to multiple systems, use the Windows Clone Install or Linux Clone Install tasks.

RDM 4.30 contains Symantec DeployCenter 5.6, which gives you the ability to capture and restore multiple partitions and to use a high-compression algorithm. In particular, you no longer have to upgrade the RDM cloning tool to get this functionality. RDM uses this tool in the following types of tasks:

- Get Donor
- Put Donor
- Windows Clone Install
- Linux Clone Install
- Power Restore

If you already have a PQI file that you want to use as a donor image, you can use the Image Management option and that file to create the donor image. For information about creating a donor image by using the Image Management option and a PQI file, see “Using the Image Management option and a PQI file” on page 90.

This chapter provides the procedures that you typically complete in the following order to create and deploy a donor image:

1. Prepare the donor system.
2. Create a donor image.
3. Deploy a donor image.

After you create a Windows donor image, you can use the Put Donor or Windows Clone Install task to deploy the donor image to target systems. For information about the Put Donor task, see “Deploying a donor image” on page 91. For information about the Windows Clone Install task, see Chapter 21, “Windows Clone Install,” on page 221.

**Note:** This section provides the minimal steps that are required to create a donor image. For information about Windows cloning procedures, see Appendix A, “Additional cloning procedures using Sysprep,” on page 343.

After you create a Linux donor image, you can use the Linux Clone Install task to deploy the donor image to target systems. For information about the Linux Clone Install task, see Chapter 10, “Linux Clone Install,” on page 93.

---

## Preparing the Windows donor system

Complete the following steps to prepare the donor system:

1. Install the Windows operating system.
  - If you use a Windows Native Install task to build your donor system (including operating system and applications), it will be easier to change your donor system later.
  - If you use ServerGuide to install the operating system on your donor system, you must repeat the manual installation procedure to make changes to the donor system later.
2. Install and configure the applications.
3. Run the Sysprep utility on the donor system to prepare the hard disk drive to be copied.

**Note:** Typically, before you run the Get Donor task on a Windows donor system, you use the Microsoft System Preparation utility (Sysprep) to prepare the donor system. However, Get Donor will capture whatever is on the drives, whether you ran Sysprep or not.

These steps are used to prepare the Windows operating system to be cloned. Typically, Windows cloning is used to clone applications that require no configuration or for applications that can be configured using RDM. Some applications, however, cannot be effectively cloned using RDM because they require complex configurations or because after they are configured, their configurations cannot be changed.

After the target system has been prepared, you can run the Get Donor task. The Get Donor task uses a Symantec utility to create the donor image and save it as a PQI file. You can apply the donor image to one or more target systems that use the same Hardware Abstraction Layer (HAL). The best results are achieved when the hardware configuration of the donor system matches that of the target system. If you have systems that differ greatly in configuration, manufacturer, or model, create a separate image for each system type.

For information about additional donor preparations that might be required for your system, see Appendix A, “Additional cloning procedures using Sysprep,” on page 343, and the RDM white paper: *Using RDM to Deploy Applications* at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-53487>.

## Installing and configuring applications

To avoid having to install applications on each deployment system later, install the applications and configure them before creating the donor image.

**Note:** If your application requires a difficult configuration (such as configuring IBM Director Agent) and also has a silent install capability, you can instead install that application as part of the Windows Clone Install task.

Complete the following steps to install and configure the applications on a donor system:

1. Log on to the donor system by using the administrator account.
2. Install and configure the applications as necessary.

## Running Sysprep

Before performing any of the steps in this documentation, read the *Microsoft Windows Corporate Deployment Tools User's Guide*.

**Note:** To complete a Windows Clone Install task using an image that contains a Windows XP operating system, you must first run Sysprep and be sure to select the **Run mini-setup** check box. (This check box only displays with Windows XP.)

RDM currently supports Sysprep versions 1 and 2. Both versions of Sysprep provide the following features:

- Makes sure that unique SIDs are generated when the donor image is distributed to a target system.
- Makes sure that the Windows Mini-Setup wizard runs the first time that the target system is started. The Mini-Setup wizard is a subset of the Windows Setup process; it provides prompts for user-specific information, configures operating-system settings, and detects new hardware. You can automate the Mini-Setup wizard by including an answer file (sysprep.inf) in the directory where the Sysprep utilities are located.

If you use Sysprep version 2 or later, you also can use the following features:

### Mass storage support

To add support for multiple mass storage devices, Sysprep must pre-process the sysprep.inf file, and the file must contain a [SysprepMassStorage] section. The -bmsd parameter populates the [SysprepMassStorage] section in the sysprep.inf file so that it can be pre-processed the next time Sysprep is run. You also can add the BuildMassStorageSection = Yes string to the [Sysprep] section of the sysprep.inf file to automatically build the mass storage section when you run Sysprep. The sysprep.inf file must be in same directory as the sysprep.exe program when it is run.

**Note:** The version of Sysprep that comes with Windows XP does not support the -bmsd parameter. You can, however, run the version of Sysprep that comes with Windows Server 2003 on a Windows XP installation and use the -bmsd parameter.

### Factory mode

The -factory parameter prepares a donor system that will start in a network-enabled state *before* the Windows Mini-Setup wizard runs. This enables you to update device drivers, run Plug and Play enumeration, install applications, or make configuration changes before the target system is delivered to the user. The winbom.ini file is the answer file for the Factory mode.

### Reseal support

The -reseal parameter clears the Event Viewer logs and prepares the target system for delivery to the user. You must use the -reseal parameter after you perform tasks in Factory mode.

**Clean** The -clean parameter removes unused mass storage device drivers and phantom Plug and Play device drivers from the Windows registry and device manager.

Sysprep Version 2.0 is supported on Windows XP and Windows Server 2003 only. If the donor system is running Windows 2000, you must use Sysprep Version 1. Sysprep Version 1 does not support Factory mode or mass storage. Sysprep Version 1.1 supports mass storage, but it does not support the -bmsd parameter or the [BuildMassStorageSection] section in the sysprep.inf file.

Complete the following steps to run the Sysprep utility on the donor system:

1. Make sure you have the following two utilities: sysprep.exe and setupcl.exe utilities. They are available on the Windows 2000, Windows 2003, and Windows XP operating system CDs (in the support\deployment\deploy.cab file), or you can download updated versions from <http://www.microsoft.com>.
2. Make sure that the donor system is part of a workgroup. If the donor system is joined to a domain, Sysprep removes it from the domain.
3. If the password of the donor system is not blank, then you must remember it for later use in the Windows Clone Install task.
4. Create a directory on a USB or network drive. For this procedure, the directory is named Deploy.
5. Unzip *d*:\support\deployment\deploy.cab into the Deploy directory, where *d* is the drive letter of the disk drive.
6. Copy the Deploy directory to the desktop of the donor system.
7. Double-click on the Deploy folder.
8. Double-click on the sysprep.exe file.
9. The Sysprep utility prepares the donor system for imaging and removes system settings to prevent conflicts when you deploy the image. A message window opens.
10. Click **OK** to continue.

**Note:** Depending on the version of Sysprep that you use, the GUI that is displayed might be different. Make sure that the **MiniSetup** check box is selected. Also, if applicable, select whether to run in Factory or Reseal mode.

11. For Microsoft Windows XP Professional, a new window opens. Select **MiniSetup** and make sure that **Shutdown** is selected; click **OK** for Sysprep to be completed. After Sysprep is completed, the donor system is shut down.

After Sysprep is run on most mobile computers and some point-of-sale terminals, the computer does not shut down automatically. You can manually shut down the computer without any errors when the blue screen with the mouse pointer appears after a few minutes.

The Mini-Setup option that is used with Sysprep for Windows XP Professional has limitations on its definition of new users. A clone installation of Windows XP Professional which uses the new login screen will not display the RDM-assigned user. Press Ctrl+Alt+Del twice in rapid succession to display the classic login screen.

After you prepare the donor system, you are ready to use the get donor task to create the pqi file from it. Before you can run the Get Donor task with the donor system, you must first configure it via Configure systems.

By default, the Get Donor task creates an image that includes the entire contents (all partitions) of the first hard disk drive of the donor system. You can modify the default behavior by editing the store.txt file, located in the \Program Files\IBM\RDM\local\env\71c\capture directory and then executing the mkimages.bat batch file, located in the \Program Files\IBM\RDM\local\env directory. Refer to the *Symantec™ DeployCenter 5.6 User Guide* for information about the syntax used by DeployCenter. This document is included in the \Program Files\IBM\RDM\docs directory.

The Put Donor task is used to deploy a donor image to another system.

**Note:** Only images with a sysprep type of "None" can be deployed using the Put Donor task.

You cannot modify the template or the Get Donor task. However, the Put Donor task has the following options:

- Edit task
- Copy task
- Configure systems

Any copy of the Put Donor task can also be deleted.

---

## Preparing the Linux donor system

Complete the following steps to prepare the donor system:

1. Install the Linux operating system.
2. Install and configure the applications.

These steps are used to prepare the Linux operating system to be cloned. Typically, Linux cloning is used to clone applications that require no configuration or for applications that can be configured using RDM. Some applications, however, cannot be effectively cloned using RDM because they require complex configurations or because after they are configured, their configurations cannot be changed.

## Installing and configuring applications

The Get Donor task creates an image that includes the entire contents of all partitions containing a recognized file system on the first active disk drive of the donor system. To avoid having to install common applications on each deployment system later, install the most common applications and configure them.

## Cloning Linux Ext2/Ext3 partitions with Symantec Image Center

In order to clone Linux Ext3 & Ext2 partitions with the Symantec Image Center utility, the following file-system features must be disabled:

- ext\_attr
- resize\_inode
- dir\_index

### Modifying Ext3 file system attributes during installation (SLES 9.0 only)

By default, SLES 9.0 selects the ReisterFS file system, which is not supported by the Symantec utilities. These partitions must be changed to Ext3 or Ext2 before proceeding (with Ext3 being required if you want to enable journaling).

Complete the following steps for all SLES 9.0 partitions whose **File System** value is ReiserFS:

1. Navigate to the Installation Settings: Suggestion window. Click the **Change** button, and select **Partitioning** from the button submenu. The Suggested Partitioning window is displayed.
2. In the **Choose** section of the window, select **Base partition setup on this proposal**, then click **Next**. The Expert Partitioner window is displayed.
3. Select the partition then click **Edit**.
4. Change **File System** to Ext2 or Ext3.
5. Remove all file system attributes by selecting **Fstab options**, and verifying that the following check boxes are NOT selected:
  - Access Control Lists (ACLs)
  - Extended User Attributes
6. Click **OK**.

### Configuring partitions manually after installation (RHEL AS 4 only)

RHEL AS 4 does not allow you to disable file system features at installation time, so they must be disabled as a post-installation step.

**Note:** You must disable SELinux during installation.

To disable the extended file system attributes:

1. Start a normal installation using the RHEL AS 4 installation media.
2. At the partition configuration screen, switch to the second virtual terminal (ALT-F2) to perform manual partition configuration.

This section includes procedures on how to perform manual partition configuration after installation of RHEL AS 4.

**Important:** In each procedure, the following partition configuration will be used:

Table 3.

| Partition | Device | Mount Point | File system | Size      |
|-----------|--------|-------------|-------------|-----------|
| 1         | sda    | /boot       | ext3        | 150 MB    |
| 2         | sda    | swap        | swap        | 512 MB    |
| 3         | sda    | /           | ext3        | Remaining |

Please alter the parameters described below as needed to fit your own configuration requirements.

**Creating new partitions:** Complete the following steps to perform manual partition configuration after RHEL AS 4:

1. From a command prompt, start fdisk.
2. Type the following command and press Enter:

```
# fdisk /dev/sda
```
3. The following output is displayed:

```
Command (m for help):
```
4. First, you must delete all existing partitions by typing the following, then pressing Enter:

```
d
```

5. The following output is displayed:  
Command (m for help):
6. Start the process to create new partitions by entering:  
n
7. The following output is displayed:  
Command action  
e extended  
p primary partition (1-4)
8. Define the Partition Type as Primary by entering:  
p
9. The following output is displayed:  
Partition number (1-4):
10. Define this partition as Partition 1 by entering:  
1
11. The following output is displayed:  
First cylinder (...):
12. Define the First Cylinder as 1 by entering:  
1
13. The following output is displayed:  
Last cylinder or ...:
14. Define the Last Cylinder (and thus the Partition Size) as +150M by entering:  
+150M
15. Repeat for all partitions, specifying the appropriate Partition Size and First Cylinder for each.

***Specifying correct partition type:***

**Note:** For each partition in this procedure:

- 0x83 corresponds to Partition Type Linux
- 0x82 corresponds to File System Type Linux swap

Complete the following steps to specify the correct Partition Type for each partition.

1. First, make sure the main fdisk command prompt is displayed:  
Command (m for help):
2. Start the process to specify the correct Partition Type by entering:  
t
3. The following output is displayed:  
Partition number (1-4):
4. Specify the Partition Number as 1 by entering:  
1
5. The following output is displayed:  
Hex Code (type L to list code):
6. Specify the Partition Type as Linux by entering:  
83
7. Repeat for all partitions, specifying the appropriate Partition Type for each.

***Formatting new partitions:*** Complete the following steps to format your new partitions:

1. First, make sure the main fdisk command prompt is displayed:  
Command (m for help):
2. Write the changes to disk by entering:  
w
3. The following output is displayed:  
Partition 1 (/boot):
4. Format Partition 1 as the boot device by entering:  
# mkfs.ext3 /dev/sda1 -O^resize\_inode -O^dir\_index
5. The following output is displayed:  
Partition 2 (swap):
6. Format Partition 2 as the swap device by entering:  
# mkswap /dev/sda2
7. The following output is displayed:  
Partition 3 (/):
8. Format Partition 3 by entering:  
# mkfs.ext3 /dev/sda3 -O^resize\_inode -O^dir\_index
9. Continue with the normal Linux partition configuration by returning to the main virtual terminal (by pressing ALT-F1).
10. Click the **Disk Druid** button on the partition configuration window in the installation interface. Assign the appropriate mount points for each partition.
11. When prompted, select Do Not Format to leave the partition unchanged, meaning that the installer will NOT format the partition.
12. Continue with the installation.

**Disabling extended attributes:** Complete the following steps to disable the extended file system attributes:

1. Boot from the first CD (disc 1) of the installation media. At the boot prompt, enter:  
linux rescue
2. When prompted, choose to NOT mount any of the file systems, then boot to a shell prompt.
3. At the shell prompt, enter the following command for each partition that contains an ext3/ext2 file system (with the previously mentioned attributes set):  
debugfs -w /dev/\$DEVICE -R "feature ^ext\_attr"

Where *\$DEVICE* is: *sda1* for the first partition on a SCSI disk and *hda1* for the first partition on an IDE disk

4. Using the example partition layout, you would enter the following commands:
  - For Partition 1:  
debugfs -w /dev/sda1 -R "feature ^ext\_attr"
  - For Partition 3:  
debugfs -w /dev/sda3 -R "feature ^ext\_attr"

**Note:** Do not make any changes to the swap partition.

5. Next, you must disable SELinux. Find and mount the root partition. Using the example partition layout (where the root partition is located on partition 3, device sda3), you would issue the following command:

```
#mount -t ext3 /dev/sda3 /mnt
```

*Disabling SELinux:* Complete the following steps to reverse the changes made to the SELinux file in the previous procedures:

1. Open the following file:

```
/mnt/etc/sysconfig/selinux
```

2. Within the SELinux file, change this line:

```
SELINUX=enforcing (or SELINUX=permissive)
```

to

```
SELINUX=disabled
```

3. Unmount /dev/sda3 and find your boot partition. Using the example partition layout, you would issue the following commands:

```
#umount /dev/sda3
```

```
#mount -t ext3 /dev/sda1 /mnt
```

4. Open the following file:

```
/boot/grub/grub.conf
```

5. Within the grub.conf file, find the line containing kernel and remove the following text:

```
selinux=off
```

6. Unmount the partition by entering:

```
#umount /dev/sda1
```

7. The system may now be booted and customized, prior to cloning.

---

## Creating a donor image

You can create a donor image by using the Get Donor task, or you can use the Image Management option and an existing PQI file.

## Using the Get Donor task

After you prepare the donor system, configure the donor system and the Get Donor task. This lets you enter the appropriate parameter values in the System/Task Configuration window. Then, you can run the Get Donor task to create the donor image. The Get Donor task uses a Symantec utility (pqimgctr.exe) to create the donor image. The resulting image can be from one to several gigabytes in size.

The Symantec utility can obtain an image only from an Ethernet-connected donor system. Systems in a Token Ring network cannot be used to obtain a donor image.

**Note:** Get Donor always stores the image in the master repository. In this atypical case, RDM first creates the image in the remote repository, and then it copies it to the master repository. When you are in this situation, it is highly likely that you will want to use the image to deploy other systems that are served by that same remote D-Server. To avoid extra image copying, use the following statement in the \Program Files\IBM\RDM\local\dserver.ini file to force RDM to leave the image on the remote D-Server (in addition to putting it into the master repository):

```
LeaveCloneImage=yes
```

You must restart the remote D-Server after modifying the dserver.ini file for your changes to take effect.

Complete the following steps to create a donor image:

1. In the Tasks pane, expand **Remote Deployment Manager**; then, expand **Donor Image**. The Get Donor and Put Donor tasks are displayed.
2. Drag Get Donor onto the donor system in the middle pane. A menu is displayed, with two options: **Configure systems** and **Run systems**.

**Note:** Because of system-resource limitations, do not run more than a few Get Donor tasks concurrently.

3. Click **Configure systems** to configure the Get Donor task for the specific system. The System/Task Configuration: Get Donor window opens.

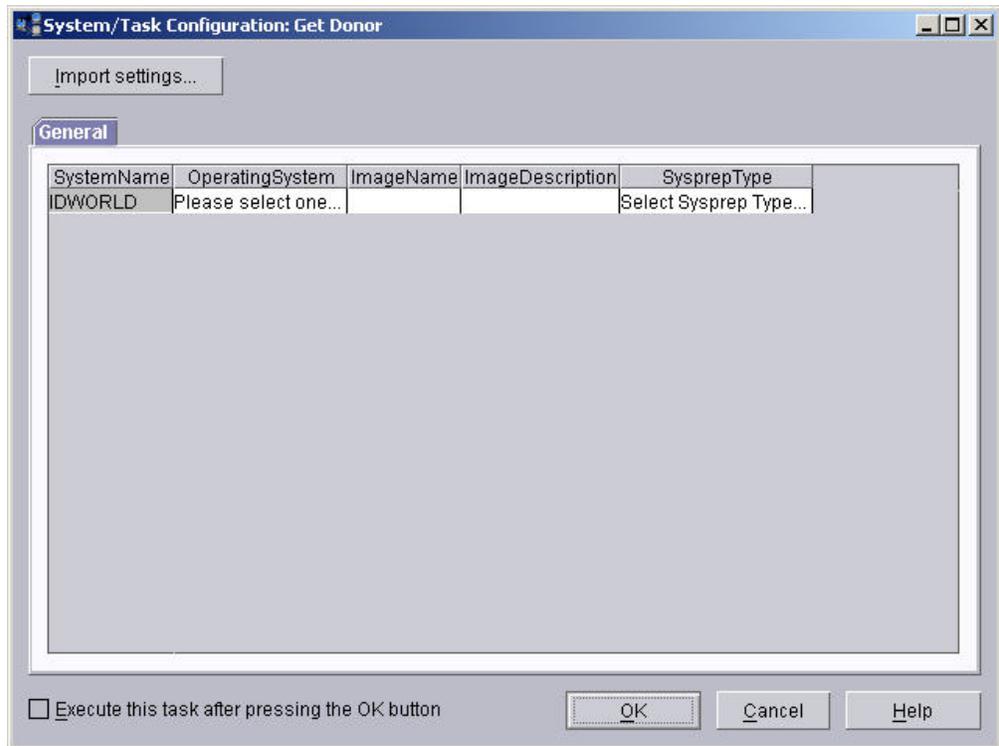


Figure 47. System/Task Configuration: Get Donor window

4. In the **OperatingSystem** field, select the operating system that is installed on the donor system.

**Note:** In the **OperatingSystem** field, the Red Hat Enterprise Linux 4 (AS, ES) and SUSE Linux Enterprise Server 9 (SLES 9) options do not differentiate between the 32-bit or 64-bit versions, but both 32-bit and 64-bit versions are supported, if installed on the donor system.

5. In the **ImageName** field, type a descriptive name for the donor image.
6. (Optional) In the **ImageDescription** field, type a description for the image.
7. In the **SysprepType** field:
  - For a Windows system, select the applicable sysprep type. If you prepared the donor system in factory mode, select Factory. If you prepared the system in reseal mode, select Reseal. If you did not run sysprep.exe on the donor system, then select None.
  - For a Linux system, the only available option is None.

**Note:** If you create several large donor image files, the RDM server might run out of disk space. RDM does not monitor the hard disk space on the server for the Get Donor task; you must make sure that there is enough disk space to perform the task. The size of the donor image file is dependent on the data that you are saving. Typically, the file is compressed to half the size of the used data on the applicable partition or disk; however, there is no way to predict how large a donor image will be. For information about resolving this issue, see the RDM white paper: *RDM 4.20 Troubleshooting* at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-53487>

8. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then, click **OK**.

**Note:** If you run the task without selecting the check box, you can run it later from the Tasks pane. Drag the Get Donor task to the configured system; then, click **Run systems**. An RDM message window opens.

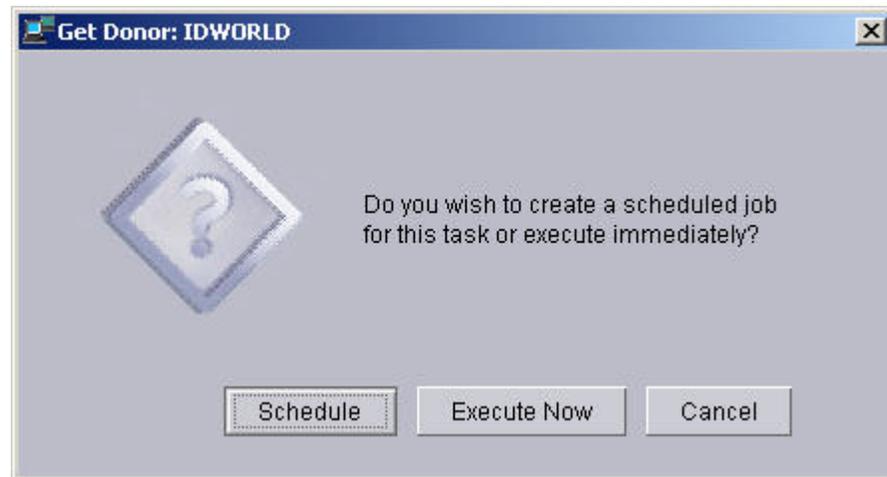


Figure 48. Get Donor (Built-in) window

9. Click **Execute Now**. RDM powers on the donor system and creates the donor image. Progress is displayed on the monitor of the target system. The resulting image can be several gigabytes in size, depending on what is installed on the donor system.

**Note:** When you run the Get Donor task against a target system that is served by a remote deployment server, the target system will be suspended after `capture.bat` is completed. During this time, the remote deployment server is copying the donor image to the RDM server. If you cancel the Get Donor task while the task is running, you might not be able to run the task again until the canceled task finishes copying the donor file to the RDM server. When this copying is complete, the target system shuts down and the task is complete.

After you successfully create a Windows donor image, you can use the Windows Clone Install task or the Put Donor task to deploy the image. For information about Windows Clone Install, see Chapter 21, “Windows Clone Install,” on page 221. For information about the Put Donor task, see “Deploying a donor image” on page 91.

After you successfully create a Linux donor image, you can use the Linux Clone Install task to deploy the image. For information about Linux Clone Install, see Chapter 10, “Linux Clone Install,” on page 93.

**Note:** If RDM is installed on a Linux system, you cannot use the Donor Image, Windows Clone Install, Linux Clone Install, or Power Restore templates or their tasks. RDM must be installed on a Windows system in order to use these templates and tasks.

## Using the Image Management option and a PQI file

Complete the following steps to create a donor image by using the Image Management option and a PQI file:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.
2. Click **Create**. The Create Image window opens.
3. In the **Template selection** field, select **Windows Clone Install** or **Linux Clone Install** (whichever is applicable to your PQI file); then, click **OK**.
  - If you selected **Windows Clone Install**, the Create Windows Clone Install Image window opens.
  - If you selected **Linux Clone Install**, the Create Linux Clone Install Image window opens.
4. Set the properties for the image:
  - a. In the **Image name** field, type a name for the image.
  - b. (Optional) In the **Image description** field, type a brief description of the image.
5. Click **Setup**. The Setup page is displayed.
6. In the **Select Operating System** field, click to select the operating system of the PQI file.
7. In the **Select Sysprep Type** field, click to select the sysprep type.

**Note:** For information on the Reseal and Factory sysprep options, see “RDM-supported options in Sysprep version 2.0” on page 343.

8. In the **Enter machine type** field, type the four-digit machine type number of the target system.
9. Click **Browse** to locate and select the Windows or Linux Clone Install source file, named clone.pqi. RDM will automatically include that file and any files that go with it (clone.002, clone.003 and so on.)
10. Click **OK**. The Windows Clone Install Image window (or the Linux Clone Install Image window) closes.

### Notes:

1. Any Windows or Linux clone image created via the Image Management option will be saved in the repository under the RDM-generated timestamp folder.
2. The PQI image will always be named clone.pqi regardless of its original source name.
3. If the source clone image is made up of multiple files, the files must reside in the same folder as the PQI file. It is also a best practice to ensure that these files all have the same base name, with extensions of .002, .003 and so on.

## Deploying a donor image

You can deploy a donor image by using the Put Donor, Windows Clone Install, or Linux Clone Install tasks. For more information about using the Windows Clone Install task, see Chapter 21, “Windows Clone Install,” on page 221. For more information about using the Linux Clone Install task, see Chapter 10, “Linux Clone Install,” on page 93.

**Note:** Only images with a sysprep type of “none” can be deployed using the Put Donor task.

## Using the Put Donor task

After you create the donor image, you can use the Put Donor task to deploy the image to another system.

Complete the following steps to deploy a donor image:

1. In the Tasks pane, expand **Remote Deployment Manager**; then, expand **Donor Image**. The Get Donor and Put Donor tasks are displayed.
2. Right-click the donor system in the Group Contents pane and drag the system to the **Put Donor** task to access the configuration menu.
3. Click **Configure systems** to configure the Put Donor task for the specific system. The System/Task Configuration: Put Donor window opens.

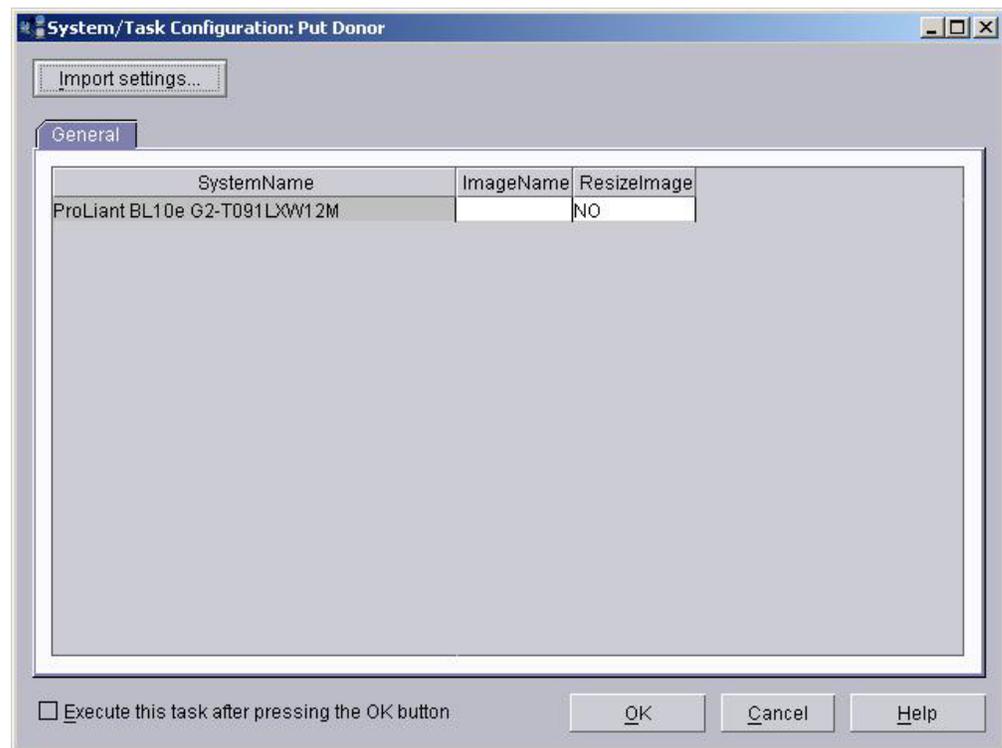


Figure 49. System/Task Configuration: Put Donor window

4. In the **ImageName** field, select the image that you want to deploy.
5. Select a value for **ResizeImage** to indicate how to use the free disk space on the target system:
  - NO** leaves the free space on the target system intact.

## PROPORTIONAL

resizes the image to fill the available disk space.

6. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then, click **OK**.

**Note:** If you run the task without selecting the check box, you can run it later from the Tasks pane. Drag the Put Donor task to the configured system; then, click **Run systems**.

An RDM message window opens.

7. Select one of the following options:
  - Click **Schedule** to schedule the task to run at a later time against the systems that you selected.
  - Click **Execute Now** to run the task immediately against the system that you selected.
  - Click **Cancel** to cancel the run command for the task.

---

## Chapter 10. Linux Clone Install

You can use the Linux Clone Install template to create tasks that use a clone image to install Linux on target systems. You select the image from a list of Linux clone images. The same image can be downloaded to multiple systems.

The image typically contains the operating system and applications designed to meet the requirements of a specific end user, department, or group of end users that perform similar tasks. The image consists of an exact bit-by-bit copy of all partitions on the first hard disk in the donor system.

**Note:** If RDM is installed on a Linux system, you cannot use the Donor Image, Windows Clone Install, Linux Clone Install, or Power Restore templates or their tasks. RDM must be installed on a Windows system in order to use these templates and tasks.

The Linux Clone Install template uses a wizard to gather the configuration information and create tasks.

This chapter provides the procedures that you must complete in the following order to create a Linux Clone Install task and run it on a target system:

1. Create a Linux Clone Install image.
2. Create a Linux Clone Install task.
3. (Optional) Configure the target systems.
4. Run the Linux Clone Install task.

---

### Creating a Linux Clone Install image

Before you can run a Linux Clone Install task, you must create an installation image.

**Note:** To create an LCI image using the Get Donor task, see the "Creating a Donor Image" section for more information.

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.
2. Click **Create**. The Create Image window opens.
3. In the **Template Selection** field, select **Linux Clone Install**.
4. Click **OK**. The Create Linux Clone Install Image window opens.
5. On the General page, complete the following steps to provide the basic information for the task:
  - a. In the **Image name** field, type a descriptive name to identify the image.
  - b. (Optional) In the **Image description** field, type a brief description of the image.
6. Click the **Setup** tab. The Setup page of the Create Linux Clone Install Image window is displayed.
7. In the **Select Operating System** field, click to select the operating system of the image.
8. In the **Select Sysprep Type** field, the only selectable option is None.
9. Click **Browse** to locate and select the Linux Clone Install source file.

**Notes:**

- a. This file must have a .pqi file extension.
  - b. If the image is multiple-file, the other files must all be in the same directory.
10. Click **OK**.

---

## Creating a Linux Clone Install task

**Note:** If the donor system for the Linux Clone Install (LCI) task you are creating is a Remote Deployment Server, and if you want to deploy the LCI task back to the donor system, you must shut down the donor and remove the Remote Deployment Server entry from IBM Director Console before creating the task.

Complete the following steps to create a Linux Clone Install task:

1. Right-click **Linux Clone Install**. The Linux Clone Install task menu is displayed.
2. Click **Create new task**. The Linux Clone Install window opens.
3. Provide the basic information for the task:
  - a. In the **Task name** field, type a descriptive name to identify the task.
  - b. (Optional) In the **Task description** field, type a brief description of the task.
  - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
4. Click **Next**. The Select images window is displayed.
5. Select the image:
  - a. Click **Select**. The Image selection window is displayed.
  - b. From the list of images, click the image to be used.
  - c. Click **OK**. The Image selection window closes.
6. Click **Next**. The Network environment window is displayed. Use this window to set up the TCP/IP protocol settings to be used on the target system.
  - To configure TCP/IP IP addresses and settings to be assigned through DHCP, see "Configuring TCP/IP through DHCP" below.
  - To configure TCP/IP IP addresses and settings manually, see "Configuring TCP/IP manually" below.
7. When you have finished configuring TCP/IP IP addresses and settings, click **Finish**.

## Configuring TCP/IP through DHCP

To configure TCP/IP IP addresses and settings to be assigned through DHCP:

1. Select the **Use DHCP server** check box. If this option is selected, the other fields on this window are not available, and all of the values are obtained from the DHCP Server on the network.

**Notes:**

- a. If **Use DHCP server** is selected, a DHCP server must be present on the network when you run the task.
  - b. If **Use DHCP server** is *not* selected, you must provide the networking information.
2. Click **Next**, then click **Finish**.

When you create a task, it is added to the Tasks pane under **Linux Clone Install**. Right-click on the task to edit, copy or delete it.

## Configuring TCP/IP manually

To configure TCP/IP IP addresses and settings manually, you have two options:

- You can leave the IP address range blank. You then manually assign an IP address to each system during System/Task Configuration (STC). This option is the best choice if either of the following conditions apply:
  - You use multiple subnets. RDM does not check for unique IP addresses on multiple subnets.
  - You use multiple operating system installation tasks of a single type, or multiple types of installation tasks (for example, Windows Clone Install, Windows Native Install and Linux Native Install). RDM validates unique IP addresses within a single task, not across multiple tasks. If there is any overlap of address ranges within tasks, duplicate IP addresses are possible.
- You can specify an IP address range. RDM then assigns an IP address to each system during system qualification. This option can be used for deploying tasks on a single subnet. An example is a classroom lab where you redeploy the same image on all systems before every class. You could set up a classroom installation task with the reserved range of addresses for the classroom.

For manual configuration, the following fields are enabled:

*Table 4. Linux Clone Install task: Network environment window field definitions*

| Field                      | Content  |
|----------------------------|--|
| <b>IP start<br/>IP end</b> | <p>Leave these fields blank or type the starting and ending IP addresses for the range of available addresses to be assigned to target systems. RDM uses the IP address range to select a unique IP address for each target system when the system is qualified. Obtain these values from your network administrator.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. If you specify a starting IP address, you must also specify an ending IP address.</li> <li>2. If you specify a range of IP addresses, you must make sure there is no overlap of the range with any other installation task. RDM validates unique IP addresses within the individual task, not across multiple tasks.</li> </ol> |
| <b>Subnet mask</b>         | Type the subnet mask for unattended installations. It can be typed now or during STC. Obtain this value from your network administrator.   |
| <b>Gateway IP</b>          | Type the IP address for the default gateway to use on the target system. This setting is optional. Obtain this value from your network administrator.  |
| <b>Use DNS domain name</b> | If this check box is selected, type the name of the DNS domain in the <b>DNS domain name</b> field.  |
| <b>Primary DNS IP</b>      | Type the IP address for the primary DNS server.<br><b>Note:</b> The Primary DNS IP address is required if the <b>Use DNS Domain Name</b> box is checked.   |
| <b>Secondary DNS IP</b>    | Type the IP address for the secondary DNS server. This server is used if the primary DNS server is not available.  |

Table 4. Linux Clone Install task: Network environment window field definitions (continued)

| Field     | Content  |
|-----------|--|
| Host name | The host name of the target machine will be set to the value placed in this field. If you are assigning a range of IP addresses, then this option is not available, and the host name will be set to the machine name. |

When you have finished manually configuring TCP/IP IP addresses and settings, click **Finish**.

When you create a task, it is added to the Tasks pane under **Linux Clone Install**. Right-click on the task to edit, copy or delete it, or to configure systems.

---

## Running the Linux Clone Install task

Complete the following steps to use a Linux Clone Install task to install Linux on a target system:

1. Expand **Linux Clone Install**. The Linux Clone Install tasks are displayed.
2. Drag the Linux Clone Install task onto the target system. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 5, “Configuring systems and tasks,” on page 41.
5. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then click **OK**. Otherwise, go to step 6.
6. Click **OK**.
7. After the task is completed, log on to the target system using a user account with administrator privileges so that the Linux Clone Install task cleanup script can run.

### Notes:

1. RDM uses the system name for the Linux computer name. If the assigned computer name is not valid, RDM changes the computer name using the following rules:
  - Remove spaces and characters that are not valid from the computer name. The following characters are not valid: `~!@#%&\*( )=+[]{}|;\:;'"<>/?. For example, *pear rfrsh* would be changed to *pearrrfrsh*.
  - Truncate from the end to make the computer name no longer than 63 characters.
  - Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
  - Add *\_1*, *\_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.
2. If the video settings of the installation image are not valid for the graphics device of the target system, Linux Setup changes the video settings to the closest match for the graphics device of the target system.
3. To conserve disk space, the Linux Clone Install image is deleted from the D-Server repository following deployment. To retain the image on the D-Server, you must add the following text to the dserver.ini file:  

```
LeaveCloneImage=yes
```

You must restart the D-Server after modifying the dserver.ini file for your changes to take effect.

4. Refer to the instructions listed in "Preparing the Linux donor system" to prepare a system with ext2 and ext3 file systems.



---

## Chapter 11. Linux Native Install

You can use the Linux Native Install template in RDM to create a task that remotely installs the Linux operating system onto target systems.

The Linux Native Install template uses a wizard to gather the configuration information and create tasks.

Before you create the task, you can use the Image Management option in RDM to save the applicable Linux installation files as a Linux installation image. The Linux Native Install task that you create uses the Linux installation image to deploy the Linux operating system to the target systems that you run the task against.

This chapter provides the procedures that you must complete in the following order to create a Linux Native Install task and deploy Linux to a target system:

1. Create a custom Linux installation image.
2. Create a Linux Native Install task.
3. (Optional) Configure the systems.
4. Run the Linux Native Install task.

Right-click **Linux Native Install** in the Tasks pane to display two options:

- *Create New Task* - starts the Linux Native Install wizard. You are guided through a series of windows in a predefined order. The data you enter is validated for each window when you click **Next**. Most of the wizard pages are very similar to the tabs in the property sheet for this task. All the crucial information on each page can be changed by clicking **Back**.

Click **Finish** on the last page of the wizard to complete the task. A Linux install task folder is created. The name of the folder is the task number.

- *Edit Template* - accesses the template notebook containing all of the properties for the template. The values set in the template notebook are the defaults used when you create a new Linux Native Install task.

When you create a task, it is added to the Tasks pane under **Linux Native Install**. Right-click the new task to edit, delete, or copy the task.

When RDM scans a system, it assigns a default name to the system, in the form *MachinetypeMachinemodel-Serialnumber*. This *system name* is displayed in IBM Director Console. When a Linux Native Install task is run on a system without an operating system, RDM uses this system name for the TCP/IP host name. If a Linux Native Install task is run on a system on which Linux is already installed, RDM recognizes and uses the TCP/IP host name.

---

### Creating an operating-system image

Before you can use RDM to deploy a Linux installation, you must create an operating-system image.

Complete the following steps to create a Linux native installation image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

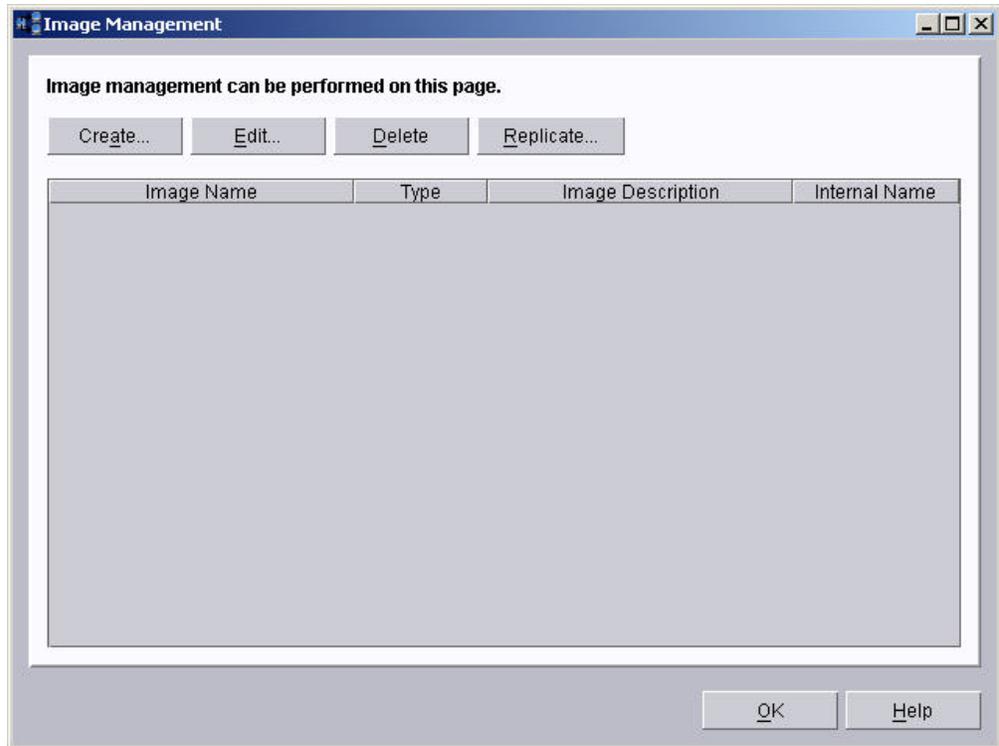


Figure 50. Image Management window

2. Click **Create**. The Create Image window opens.

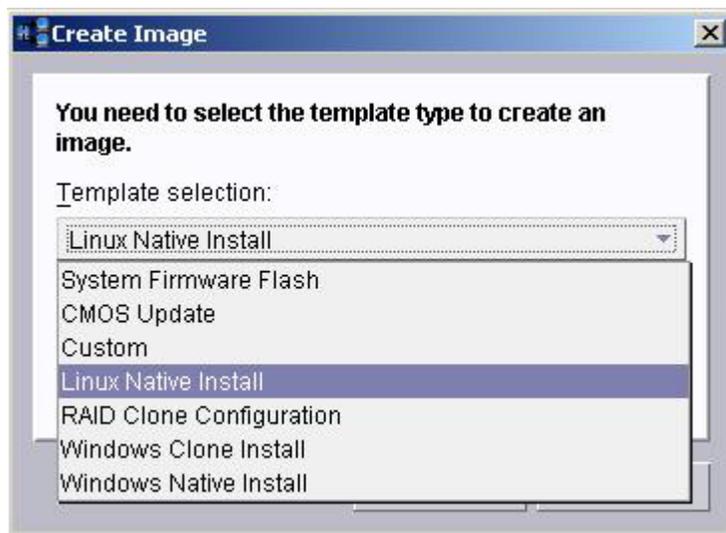


Figure 51. Create Image window

3. In the **Template selection** field, select **Linux Native Install**; then, click **OK**. The Create Linux Native Install Image window opens and the General page is displayed.

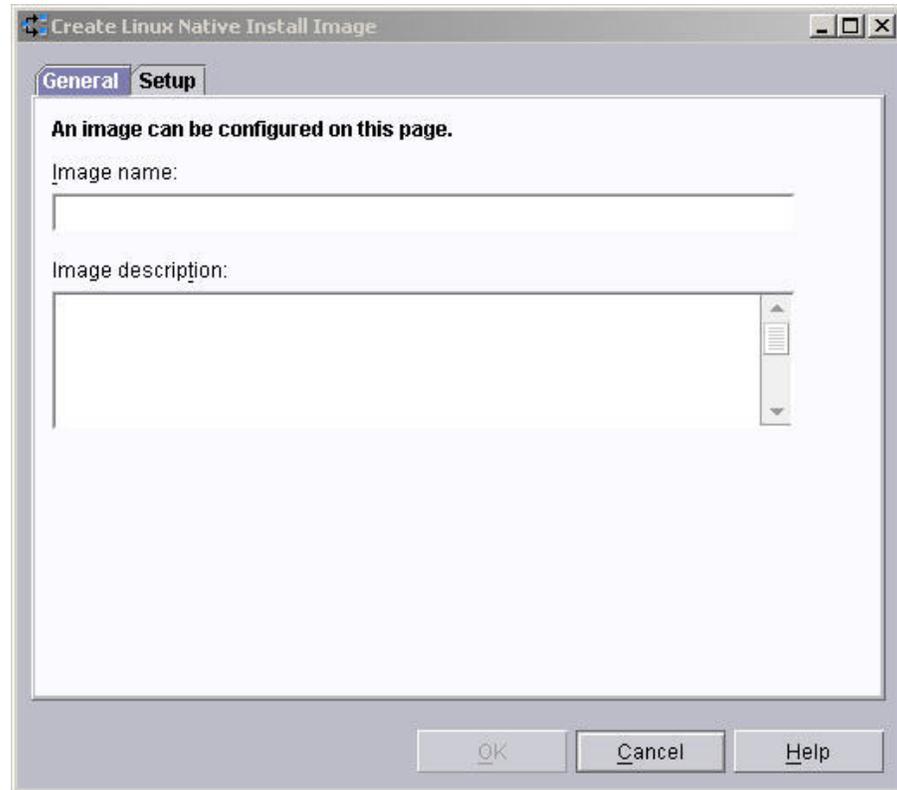


Figure 52. Create Linux Native Install Image window: General page

4. In the **Image name** field, type a name for the Linux image.
5. (Optional) In the **Image description** field, type a brief description for the Linux installation image.
6. Click **Setup**. The Setup page is displayed.

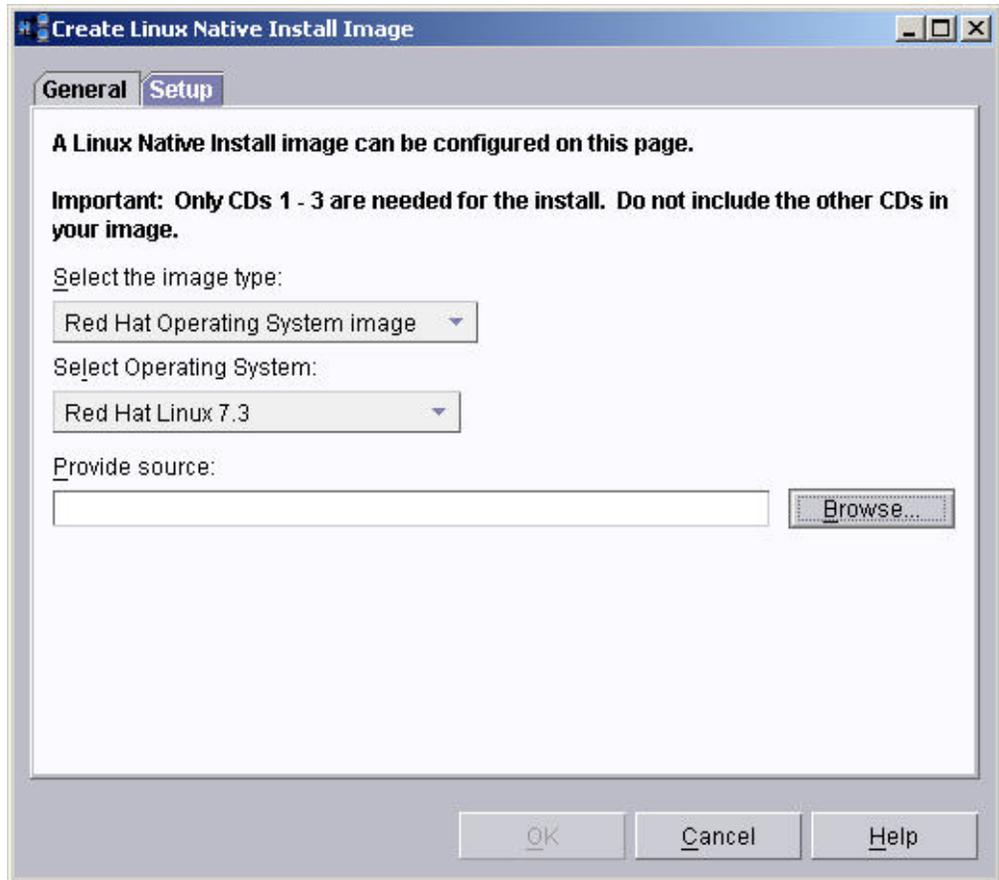


Figure 53. Create Linux Native Install Image window: Setup page

7. In the **Select the image type** field, select **Red Hat Operating System image**.
8. In the **Select Operating System** field, select the applicable Red Hat® Linux operating system. In RDM 4.30, the following versions are supported:
  - a. Red Hat Linux 7.3
  - b. Red Hat Linux 8.0
  - c. Red Hat Enterprise Linux AS 2.1
9. Insert the Linux Installation CD into the CD-ROM drive.

**Notes:**

- a. If the Linux installation files are saved to a shared network drive, you do not have to insert the installation CD into the CD-ROM drive. The installation files, however, must be accessible from the RDM console that you use to create the Linux Native Install task.
- b. Only CDs 1-3 are required to save the installation files to RDM.
10. Click **Browse** and navigate to the Linux RPM-GPG-KEY file.
11. Click **OK**. The Task Image Creation Progress window opens and displays the progress of the image being created.
12. When prompted, remove the first CD from the CD-ROM drive and insert the next CD into the CD-ROM drive.
13. When prompted, remove the second CD from the CD-ROM drive and insert the third CD into the CD-ROM drive.
14. When finished, click **Done**; then, click **OK**.

After you have created the Linux native installation image, you can create a Linux Native Install task.

---

## Creating an IBM Director Agent image

Before you can use RDM to deploy IBM Director Agent for Linux with a Linux operating-system installation image, you must create an IBM Director Agent installation image.

Complete the following steps to create a IBM Director Agent installation image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

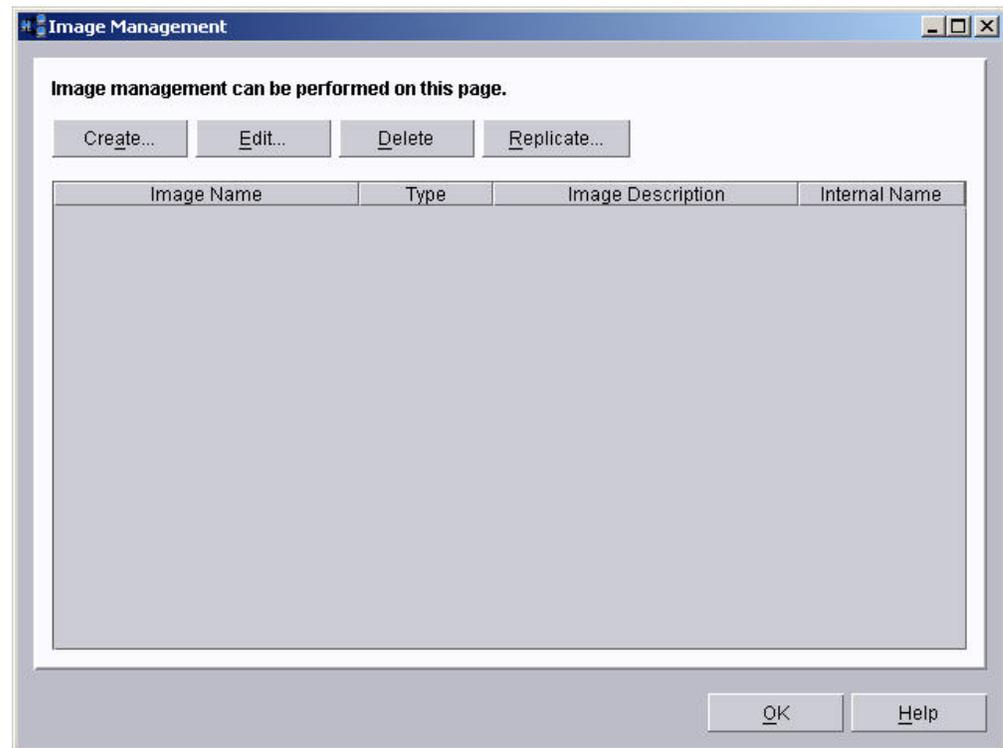


Figure 54. Image Management window

2. Click **Create**. The Create Image window opens.

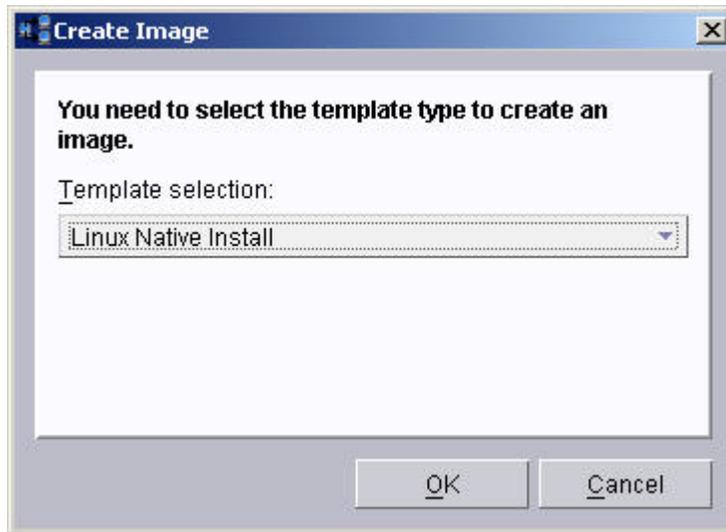


Figure 55. Create Image window

3. In the **Template selection** field, select **Linux Native Install**; then, click **OK**. The Create Linux Native Install Image window opens and the General page is displayed.

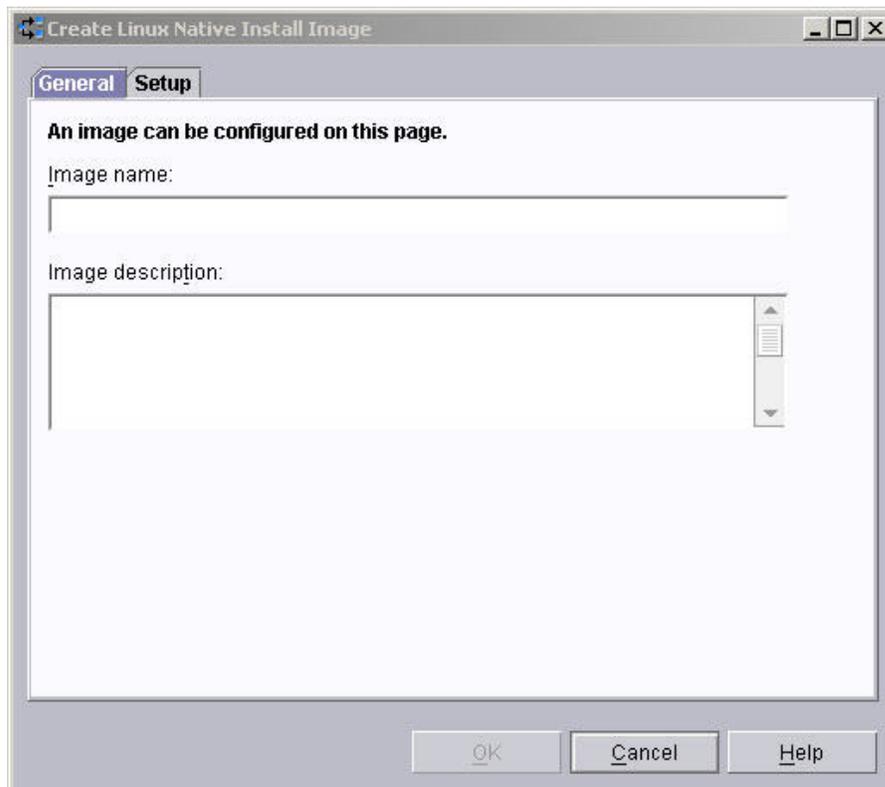


Figure 56. Create Linux Native Install Image window: General page

4. In the **Image name** field, type a name for the IBM Director Agent installation image.
5. (Optional) In the **Image description** field, type a brief description for the IBM Director Agent installation image.

6. Click **Setup**. The Setup page is displayed.

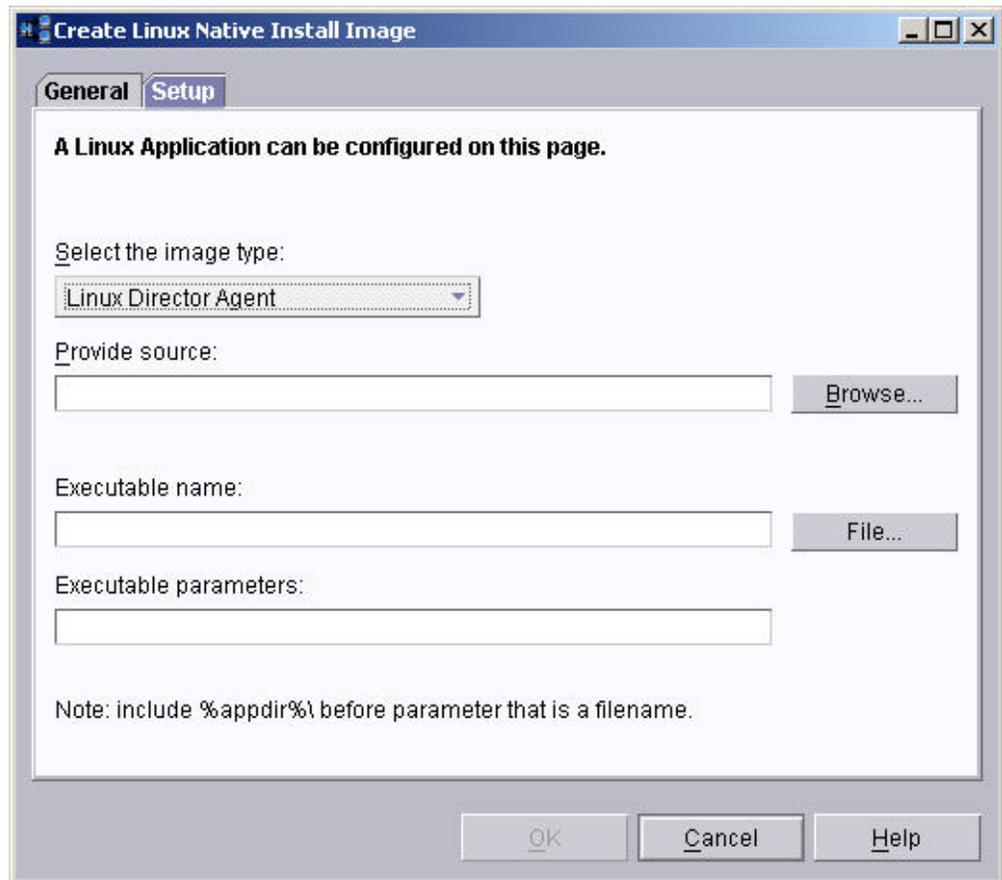


Figure 57. Create Linux Native Install Image window: Setup page

7. In the **Select the image type** field, select **Linux Director Agent**.
8. Insert the IBM Director 5.1 or later, CD into the CD-ROM drive.
9. Click **Browse**; then, select the `dirinstall` file in the `director/agent/linux/i386` directory.
10. (Optional) Type any executable parameters you want to pass to the installer.
11. Click **OK**. The Task Image Creation Progress window opens and the progress of the image being created is displayed.
12. Click **OK**.

---

## Creating a Linux application installation image

Before you can use RDM to deploy an application installation image with a Linux operating-system installation image, you must create an application installation image.

Complete the following steps to create an application installation image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

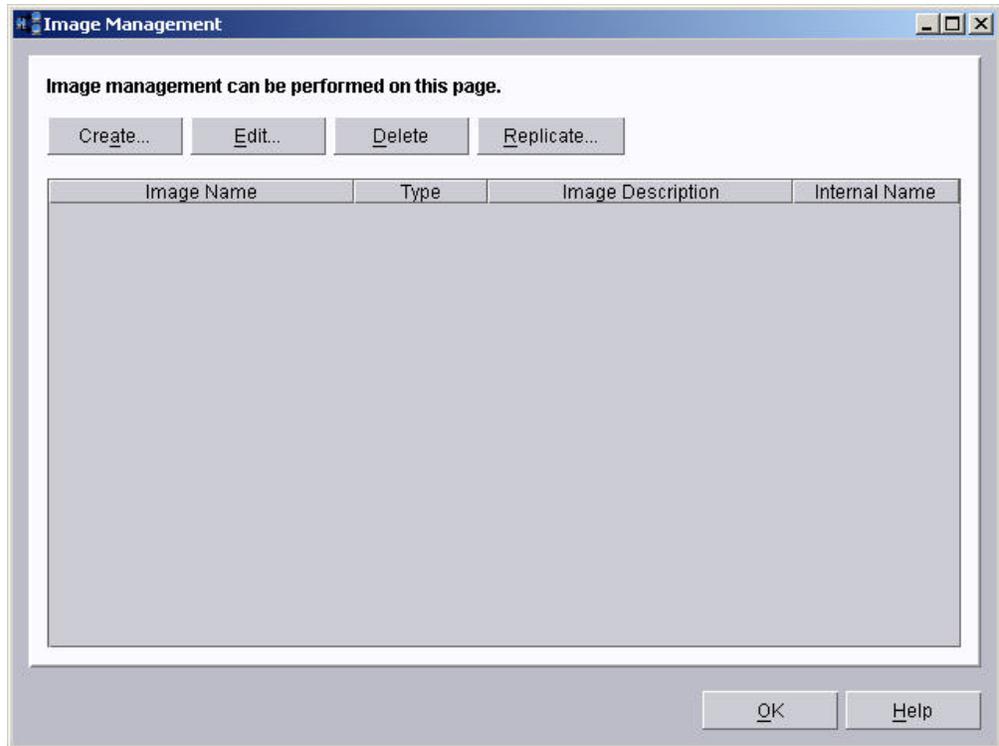


Figure 58. Image Management window

2. Click **Create**. The Create Image window opens.

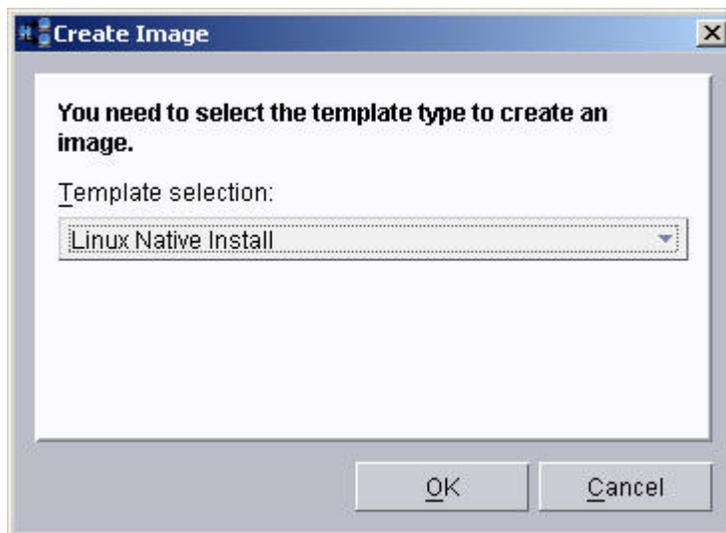


Figure 59. Create Image window

3. In the **Template selection** field, select **Linux Native Install**; then, click **OK**. The Create Linux Native Install Image window opens and the General page is displayed.

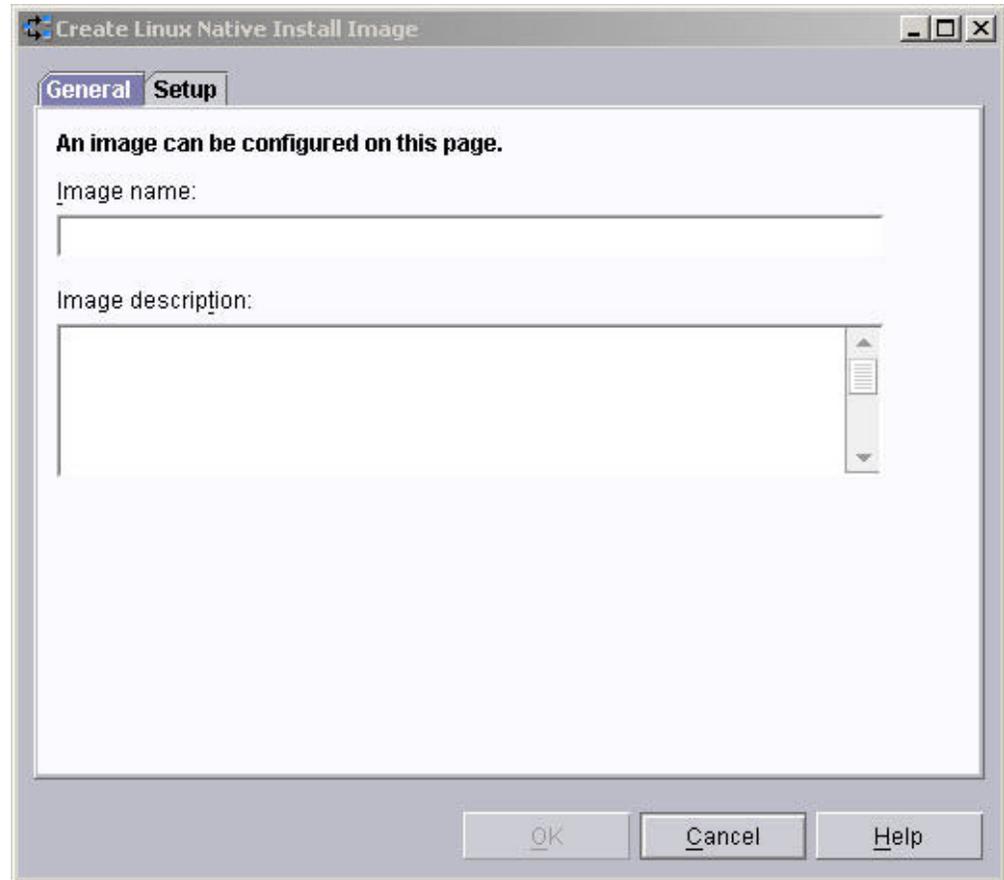


Figure 60. Create Linux Native Install Image window: General page

4. In the **Image name** field, type a name for the application installation image.
5. (Optional) In the **Image description** field, type a brief description for the application installation image.
6. Click **Setup**. The Setup page is displayed.
7. In the **Select the image type** field, select **Linux Application**.

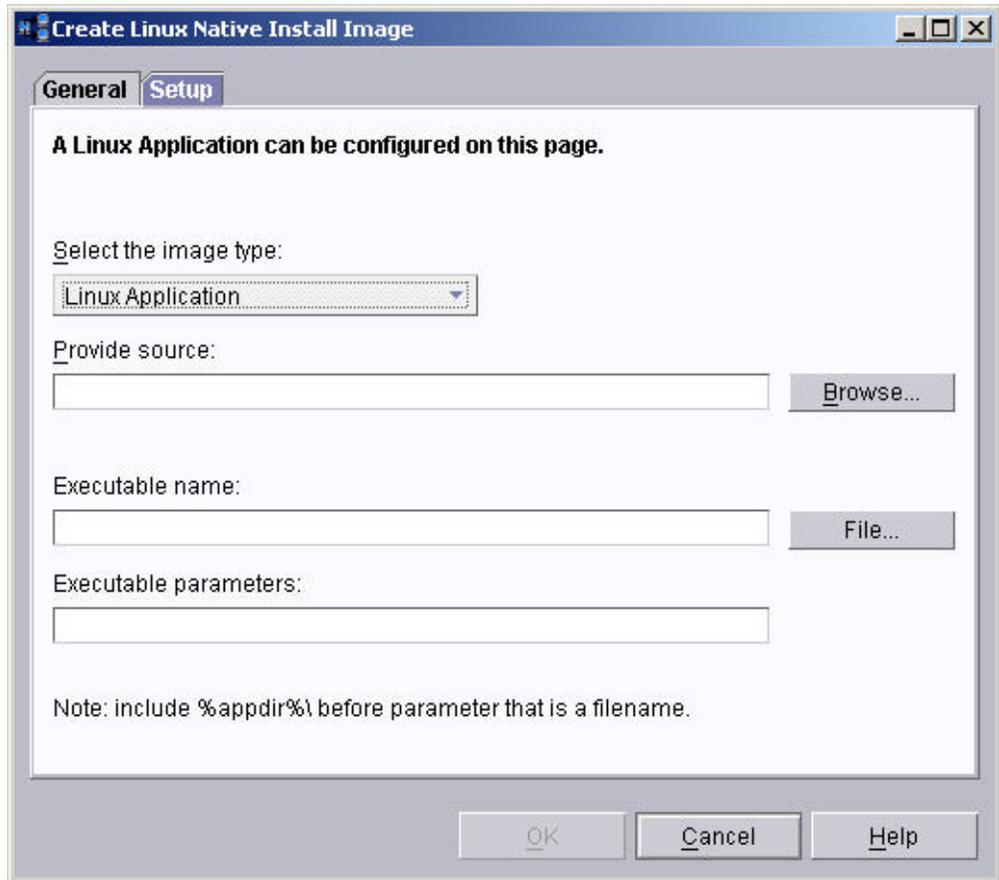


Figure 61. Create Linux Native Install Image window: Setup page

8. Click **Browse**; and then select the directory that contains the installation files.
9. Click **OK**.
10. Click **File**. Select the application install file in the directory you selected in step 8.
11. (Optional) Type any executable parameters you want to pass to the installer.
12. Click **OK**. The Task Image Creation Progress window opens.
13. Click **OK**.

---

## Creating a Linux Native Install task

Complete the following steps to create a Linux Native Install task:

1. Right-click **Linux Native Install**. The Linux Native Install task menu is displayed.
2. Click **Create new task**. The Linux Native Install window opens.

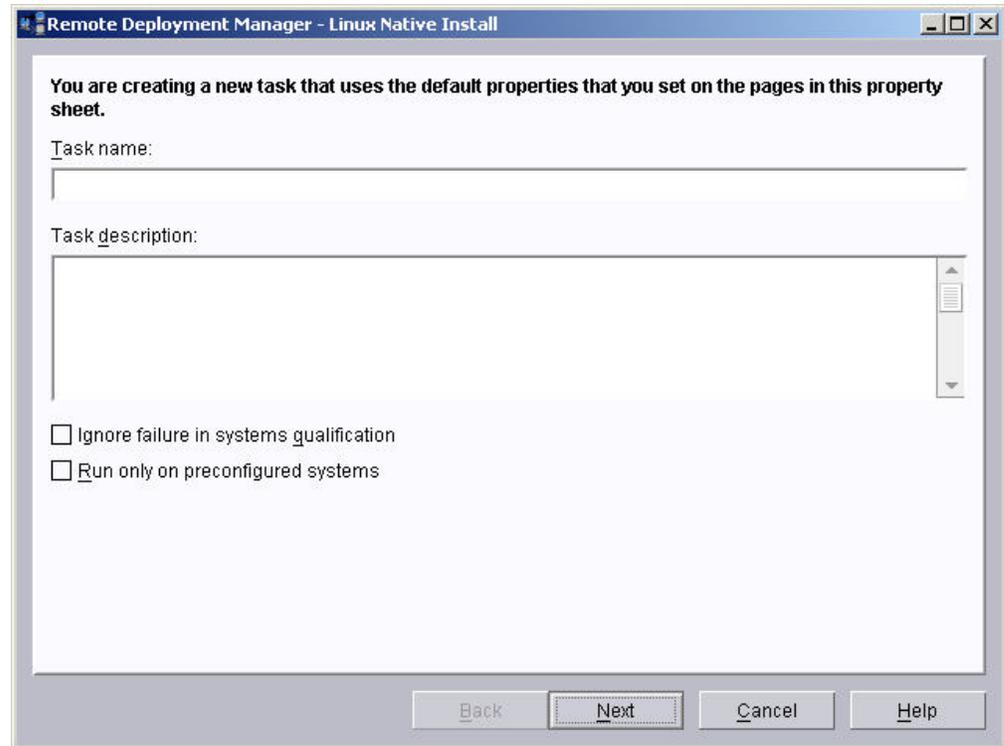


Figure 62. Linux Native Install task: “You are creating a new task” window

3. Provide the basic information for the task:
  - a. In the **Task name** field, type a descriptive name to identify the task.
  - b. (Optional) In the **Task description** field, type a brief description of the task.
  - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
  - e. Click **Next**. The list of associated images is displayed.
4. Select the Linux native installation image to be used on target systems:
  - a. Click **Select**. The “Image selection” window opens.

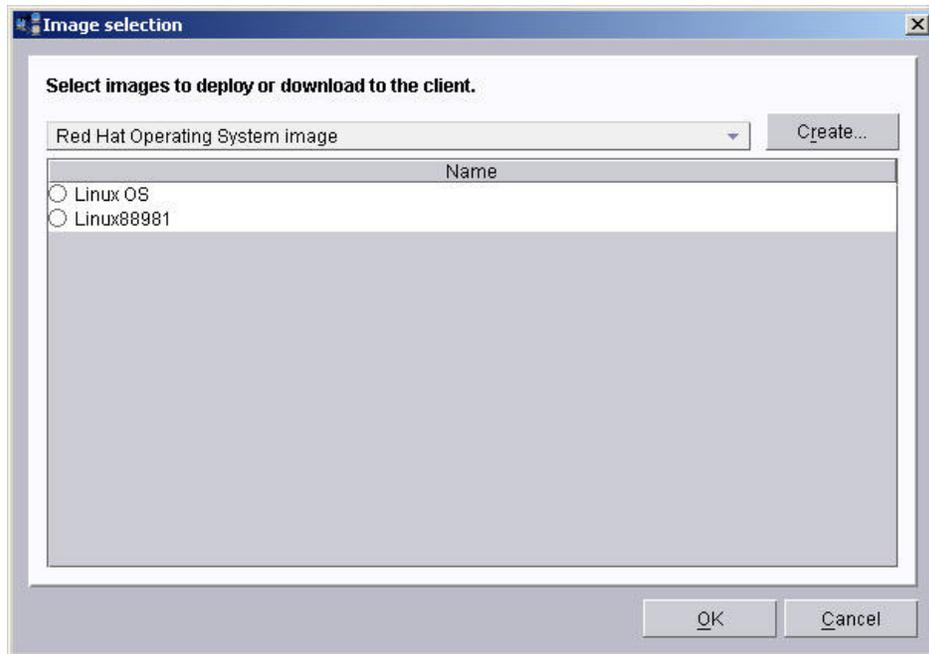


Figure 63. "Image selection" window

- b. Select the Linux native installation image that you want to use; then, click **Next**.

**Note:** If you have not already created the Linux native installation image, you can click **Create** to create the image. For information, see "Creating an operating-system image" on page 99.

- c. Click **OK**. The list of associated images displays the selected Linux native installation image.

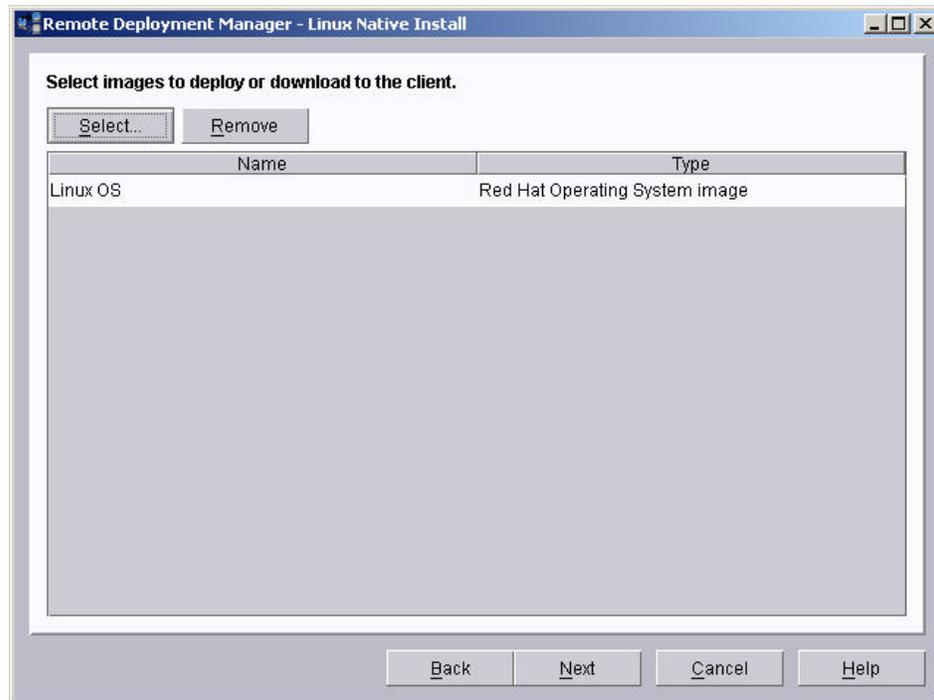


Figure 64. Linux Native Install task: "Select images" window

- d. (Optional) Select an IBM Director 5.1 for Linux installation image to include with the operating-system installation image. For information on creating an IBM Director 5.1 for Linux installation image, see "Creating an IBM Director Agent image" on page 103.
  - e. (Optional) Select one or more application installation images to include with the operating-system installation image. For information on creating an IBM Director 5.1 for Linux installation image, see "Creating a Linux application installation image" on page 105.
5. Click **Next**. The Partition Configuration window is displayed.

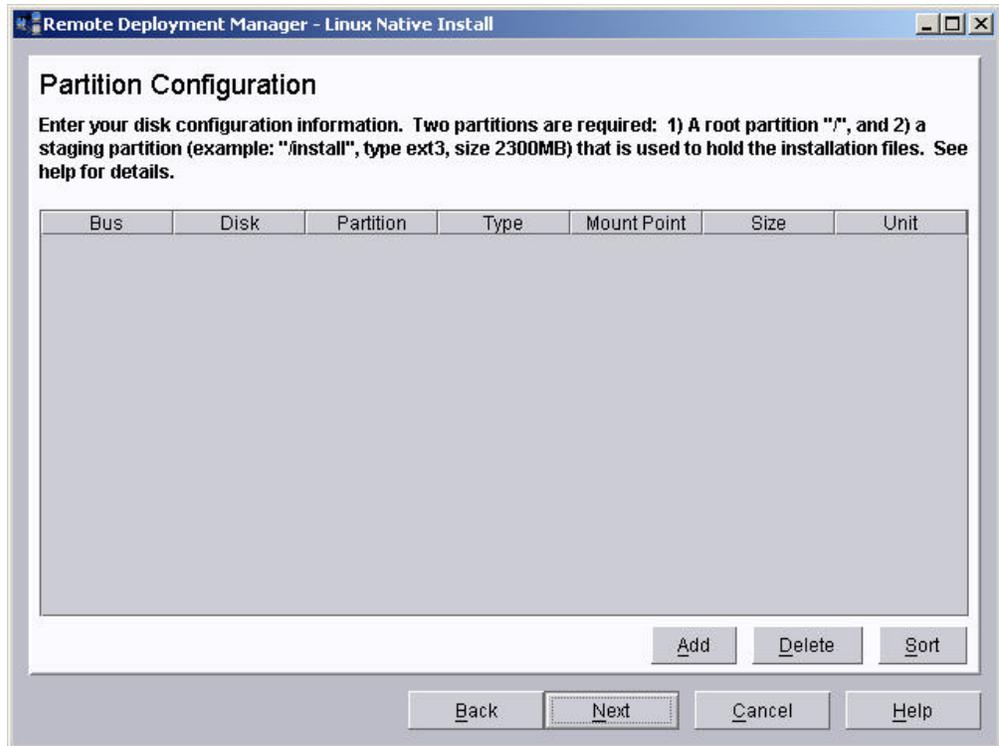


Figure 65. Linux Native Install task: Partition Configuration window

6. Configure the partitions:

**Note:** To successfully deploy a Linux native installation, only a root partition (/) and a staging partition (for an example, /install) are required.

- a. Click **Add** to add a partition. The “Enter the data for the new partition” window opens.

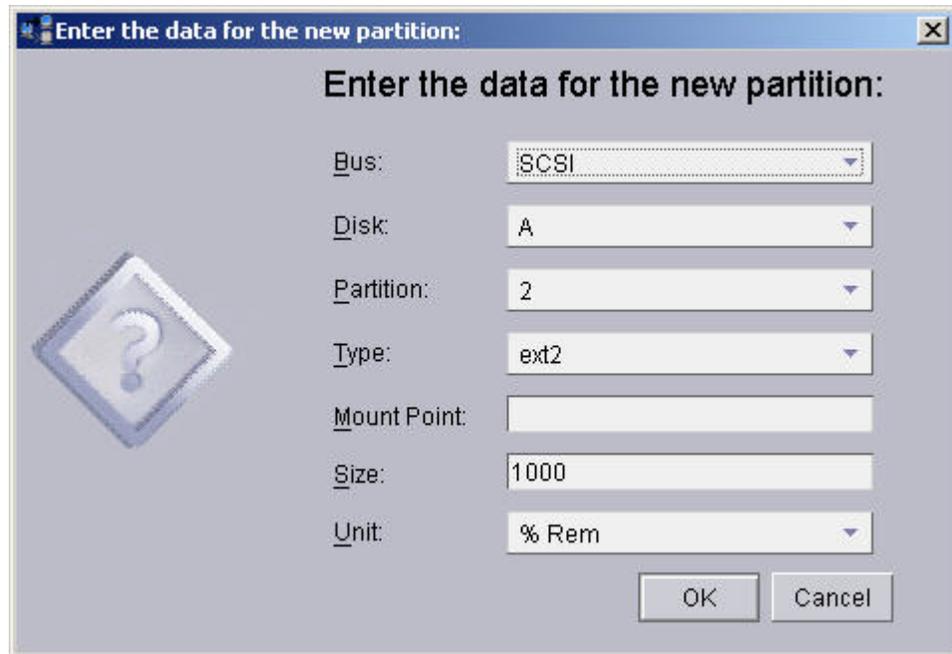


Figure 66. “Enter the data for the new partition” window

- b. In the **Bus** field, select whether the hard drive is connected to a **SCSI** or **IDE** bus.

**Note:** When you create a Linux Native Install task for a blade server with IDE RAID configured, you must select SCSI as the drive type instead of IDE.

- c. In the **Disk** field, select drive letter of the hard disk drive to which you want to add the partition.
- d. In the **Partition** field, select the partition number for the partition.

**Note:** Partitions 1 through 4 are primary partitions. Partitions 5 and up are extended partitions.

- e. In the **Type** field, select the type of file system for the partition.
- f. In the **Mount Point** field, type the mount point for the selected partition.
- g. In the **Size** field, type the size in megabytes (MB) or as a percentage of the total size remaining, depending on the specified Unit.
- h. In the **Unit** field, select the unit of measure for the size of the partition. Select **MB** for Megabyte, or **% Rem** for percentage remaining. % rem allocations cannot exceed 100% for the primary partitions (1 through 4). % rem allocations for partitions 5 through 16 must not exceed 100%.
- i. Click **Next**. The Boot Loader Configuration window is displayed.



Figure 67. Linux Native Install task: Boot Loader Configuration window

7. Select one of the following boot loader options to be used on target systems:

**Use GRUB as the boot loader**

This option uses the *Grand Unified Boot loader (GRUB)*, a multi-platform boot loader. If a password is required to access the boot loader, select **GRUB Password**; then, type the password in the **GRUB Password** and **Confirm** fields.

**Use LILO as the boot loader**

This option uses the *Linux Loader (LILO)*.

8. Click **Next**. The Regional Parameter Setup window is displayed.

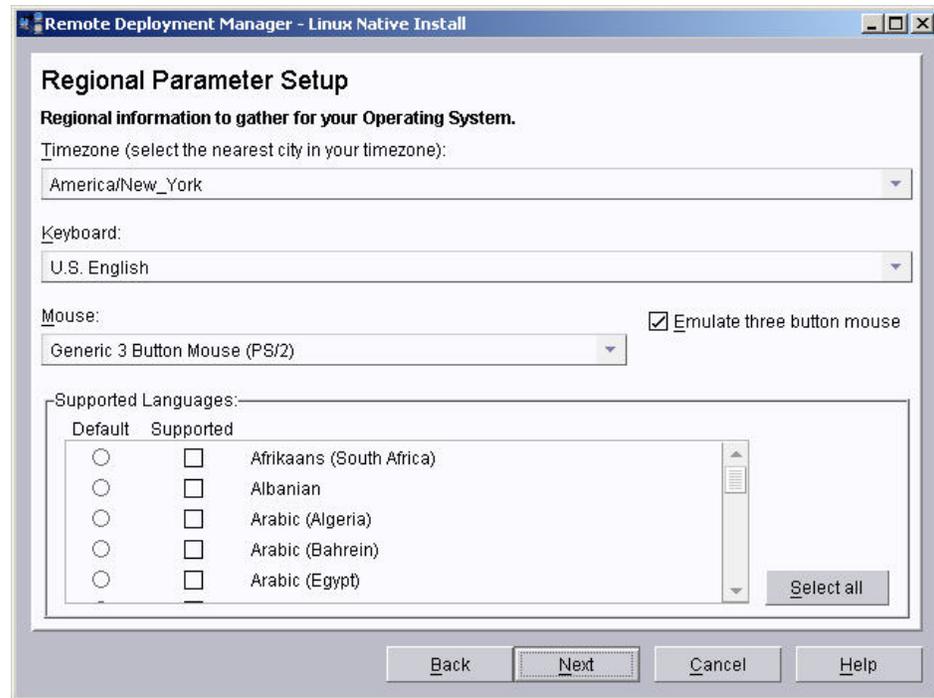


Figure 68. Linux Native Install task: Regional Parameter Setup window

9. Configure the regional information:
  - a. In the **Timezone** field, select the time zone.
  - b. In the **Keyboard** field, select the keyboard layout.
  - c. In the **Mouse** field, select the type of mouse.
  - d. To emulate a three button mouse, select **Emulate three button mouse**.
  - e. In the **Supported Languages** list, select the languages that you want the deployment to support.
10. Click **Next**. The TCP/IP Setup Information window is displayed.

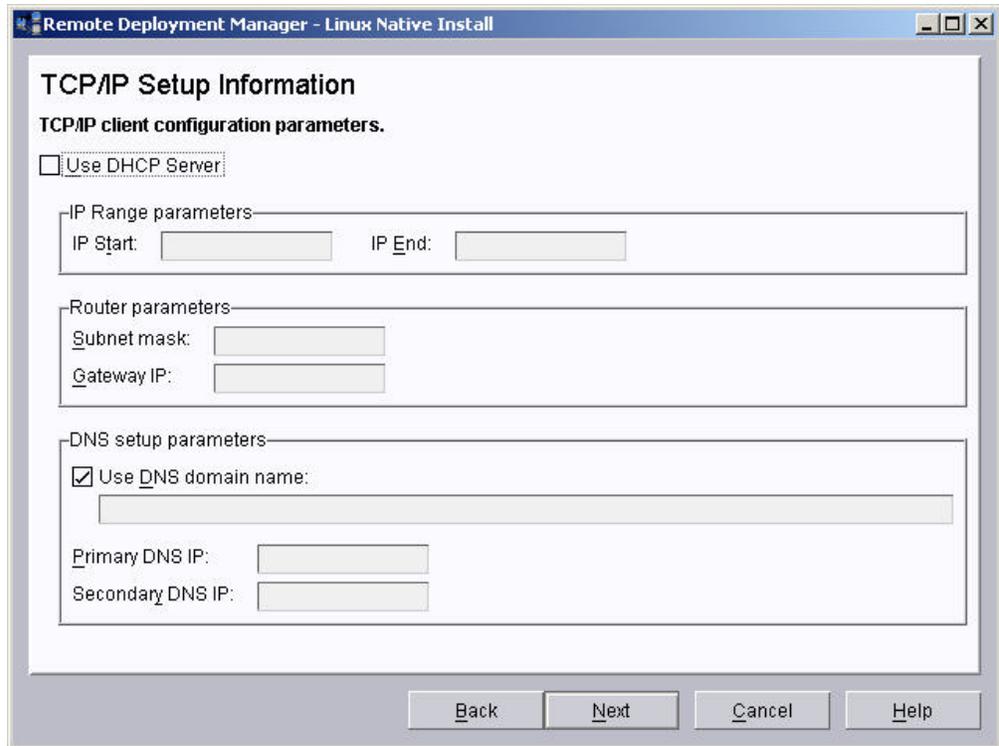


Figure 69. Linux Native Install task: TCP/IP Setup Information window, with Use DHCP Server check box cleared

11. Configure the TCP/IP settings:
  - a. By default, the **Use DHCP Server** check box is selected, which configures the target system to automatically be configured using a DHCP server. Clear the **Use DHCP Server** check box to configure the TCP/IP settings.
  - b. In the **IP Range parameters** fields, type the starting and ending IP addresses to indicate the range of IP addresses that can be used for the target system.
  - c. In the **Subnet mask** field, type the subnet mask to be used by the target system.
  - d. In the **Gateway IP** field, type the IP address for the gateway to be used by the target system.
  - e. To configure the target system to use a DNS domain name, select the **Use DNS domain name** check box; then, type the domain name in the field.
  - f. To provide the IP address for the primary DNS, in the **Primary DNS IP** field, type the IP address.
  - g. To provide the IP address for the secondary DNS, in the **Secondary DNS IP** field, type the IP address.
12. Click **Next**. The Password Authentication window opens.

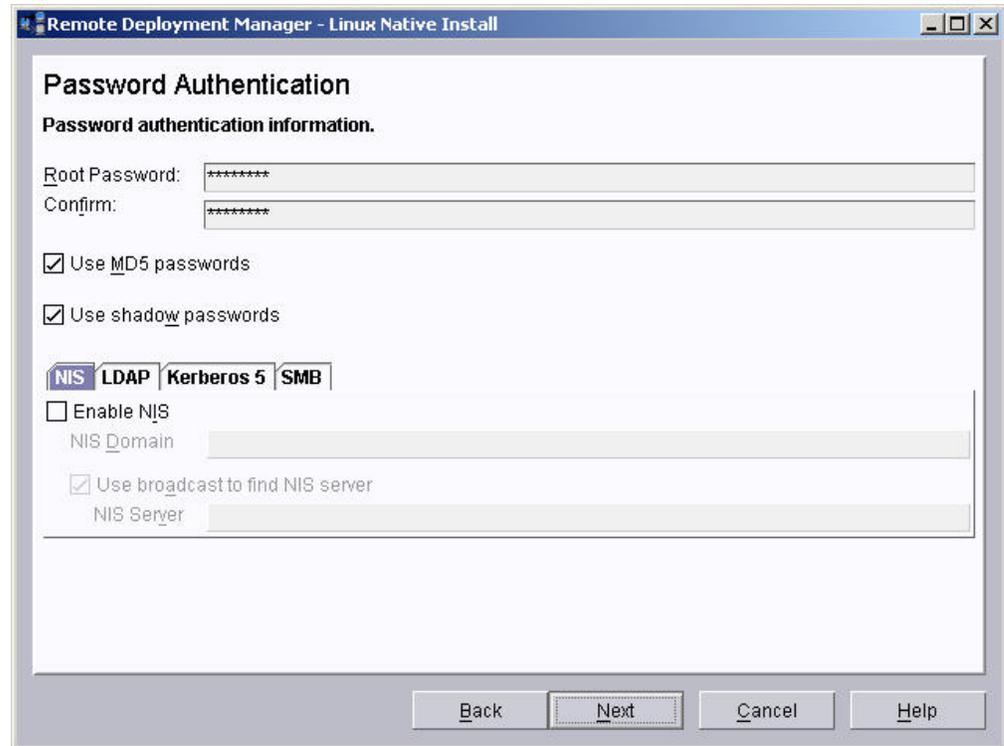


Figure 70. Linux Native Install task: Password Authentication window

13. Configure password authentication:
  - a. In the **Root Password** field, type the password for the root account to be used on target systems.
  - b. In the **Confirm** field, retype the password.
  - c. To enable message digest 5 (MD5) passwords, which supports passwords up to 256 characters, select the **Use MD5 passwords** check box. The default is eight characters or less.
  - d. To enable shadow passwords, select the **Use shadow passwords** check box. Shadow passwords is a Red Hat Linux feature that encrypts the passwords and saves them in a secured file. To access the file, a user must have a higher level of permission.
  - e. Click the **NIS** tab to configure Network Information Service (NIS); then, complete the applicable fields on the NIS page.
  - f. Click the **LDAP** tab to configure Lightweight Directory Access Protocol (LDAP); then, complete the applicable fields on the LDAP page.
  - g. Click the **Kerberos 5** tab to configure network authentication to use the Kerberos 5 protocol; then, complete the applicable fields on the Kerberos 5 page.
  - h. Click the **SMB** tab to configure Server Message Block (SMB) protocol for file sharing; then, complete the applicable fields on the SMB page.
14. Click **Next**. The Group Packages Selection window is displayed.

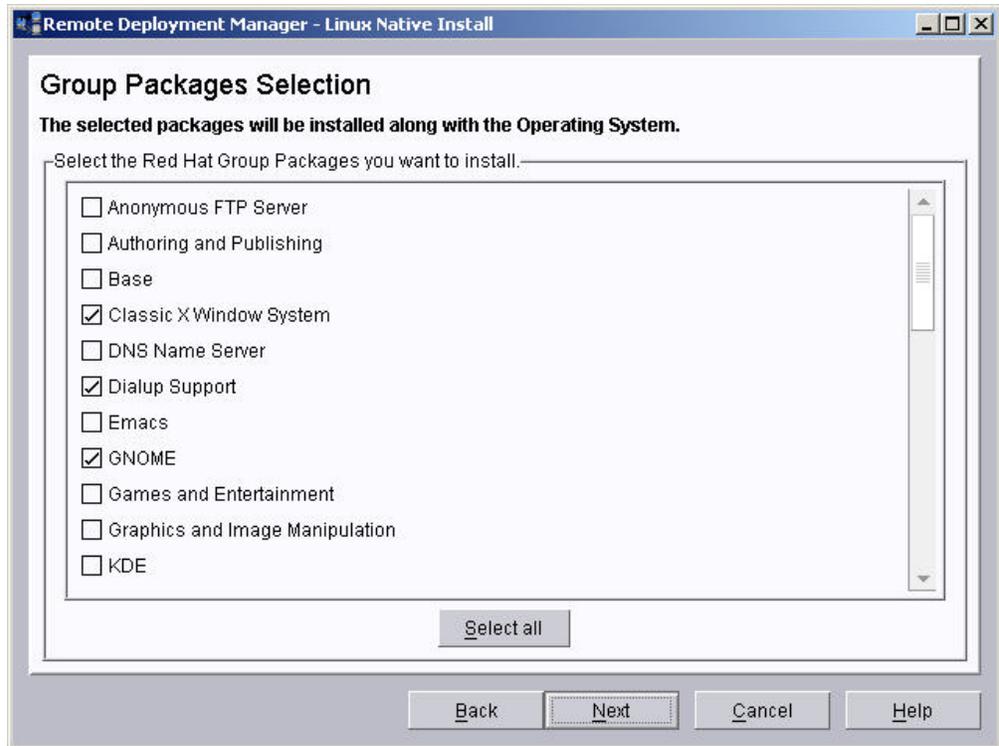


Figure 71. Linux Native Install task: Group Packages Selection window

15. Select the packages to be installed:
  - a. Available optional packages are listed. Select each group of packages to be installed. Selected groups are indicated with a check mark. To select all groups, click **Select all**.

Required packages are installed automatically as part of the installation options.

**Note:** If **X Windows** is selected, the Classic X Window System (Red Hat 7.3) and the X Window System (Red Hat 7.3 and 8.0) packages are installed even if they are not selected.

16. Click **Next**. The Firewall Configuration window is displayed.

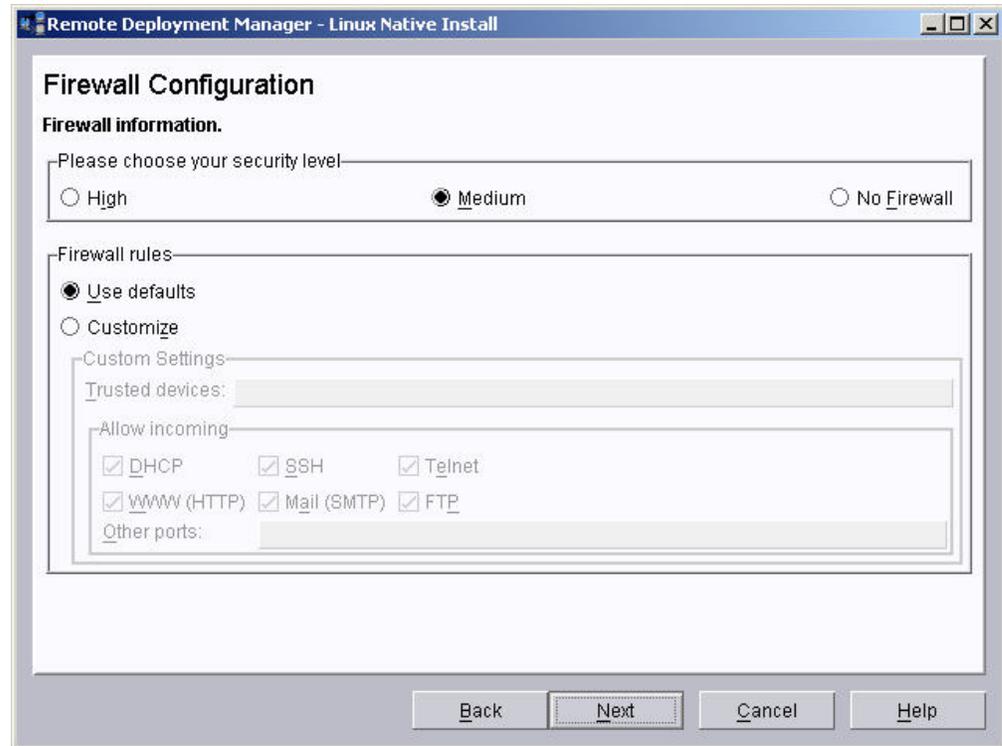


Figure 72. Linux Native Install task: Firewall Configuration window

17. Select **High**, **Medium** or **No Firewall** to set the security level.

**Notes:**

a. **High**

If you choose **High**, the system will not accept connections that are not explicitly defined. By default, the **High** setting enables only the following connections:

- DNS replies
- DHCP - so any network interfaces that use DHCP can be properly configured

If you choose **High**, your firewall will not allow the following:

- Active mode FTP (passive mode FTP, used by default in most clients, should still work)
- Internet Relay Chat (IRC) Direct Client Connection (DCC) file transfers
- RealAudio
- Remote X Window system clients

If you are connecting your system to the Internet, but do not plan to run a server, this is the safest choice. If additional services are needed, you can choose **Customize** to use specific services through the firewall.

b. **Medium**

If you choose **Medium**, your firewall will not allow remote systems to have access to certain resources on your system. By default, access to the following resources is not allowed:

- Ports lower than 1023 - the standard reserved ports, used by most system services, such as FTP, Secure Shell (SSH), telnet, and HTTP
- The Network File System (NFS) server port (2049)

- The local X Window System display for remote X clients
  - The X Font server port (by default, xfs does not listen on the network, it is disabled in the font server)
  - If you want to use resources such as RealAudio, while still blocking access to normal system services, choose **Medium**. Select **Customize** to allow specific services through the firewall.
- c. **No Firewall**
- Selecting **No Firewall** provides complete access to your system and does not perform security checking. Security checking is the disabling of access to certain services. This should only be selected if you are running on a trusted network (not the Internet) or plan to do more firewall configuration later.
18. For each of the three security levels, by default **Use defaults** is selected. Choose **Customize** to add trusted devices or to use additional incoming services:
- **Trusted Devices**  
 Selecting any of the Trusted Devices allows access to your system for all traffic from that device; it is excluded from the firewall rules. For example, if you are running a local network, but are connected to the Internet through a PPP dialup, you can check eth0 and any traffic coming from your local network will be allowed. Selecting eth0 as trusted means all traffic over Ethernet is allowed, but the ppp0 interface is still blocked by a firewall. If you want to restrict traffic on an interface, leave it cleared.  
 It is not recommended that you make any device that is connected to public networks, such as the Internet, a trusted device.
  - **Allow Incoming**  
 Enable these options to use specified services to pass through the firewall.
    - **DHCP**  
 If you allow incoming DHCP queries and replies, you allow any network interface that uses DHCP to determine its IP address. DHCP is normally enabled. If DHCP is not enabled, your system can no longer get an IP address from a DHCP server.
    - **SSH**  
 SSH is a suite of tools for logging into and executing commands on a remote system. Use this option if you plan to use SSH tools to access your system through a firewall. Install the openssh-server package to access your system remotely, using SSH tools.
    - **Telnet**  
 Telnet is a protocol for logging into remote systems. Telnet communications are unencrypted, and provide no security from network snooping. Allowing incoming Telnet access is not recommended. If you do want to allow inbound Telnet access, you will need to install the telnet-server package.
    - **WWW (HTTP)**  
 The HTTP protocol is used by Apache (and by other Web servers) to serve Web pages. Use this option if you plan on making your Web server publicly available. This option is not required for viewing pages locally or for developing Web pages. Install the Apache package if you want to serve Web pages.
    - **Mail (SMTP)**  
 Use this option for incoming mail delivery through your firewall so that remote hosts can connect directly to your system to deliver mail. You do not need to use this if you collect your mail from your Internet service

provider (ISP) server using Post Office Protocol, version 3 (POP3) or Internet Message Access Protocol (IMAP), or if you use a tool such as fetchmail. An improperly configured symmetric multiprocessing (SMTP) server can allow remote systems to use your server to send spam.

– **FTP**

The FTP protocol is used to transfer files between systems on a network. Use this option if you plan on making your FTP server publicly available. Install the wu-ftpd (and possibly the anonftp) package for this option.

– **Other ports**

You can access ports that are not listed here by listing them in the Other ports field. Use the following format: port:protocol. For example, if you want to allow IMAP access through your firewall, you can specify imap:tcp. You can also explicitly specify numeric ports; to allow UDP packets on port 1234 through the firewall, type 1234:udp. To specify multiple ports, separate them with commas. For example: 2112:tcp,2393:udp.

**Note:** Type the protocol name in lowercase.

19. Click **Next**. The X Windows Setup window is displayed.

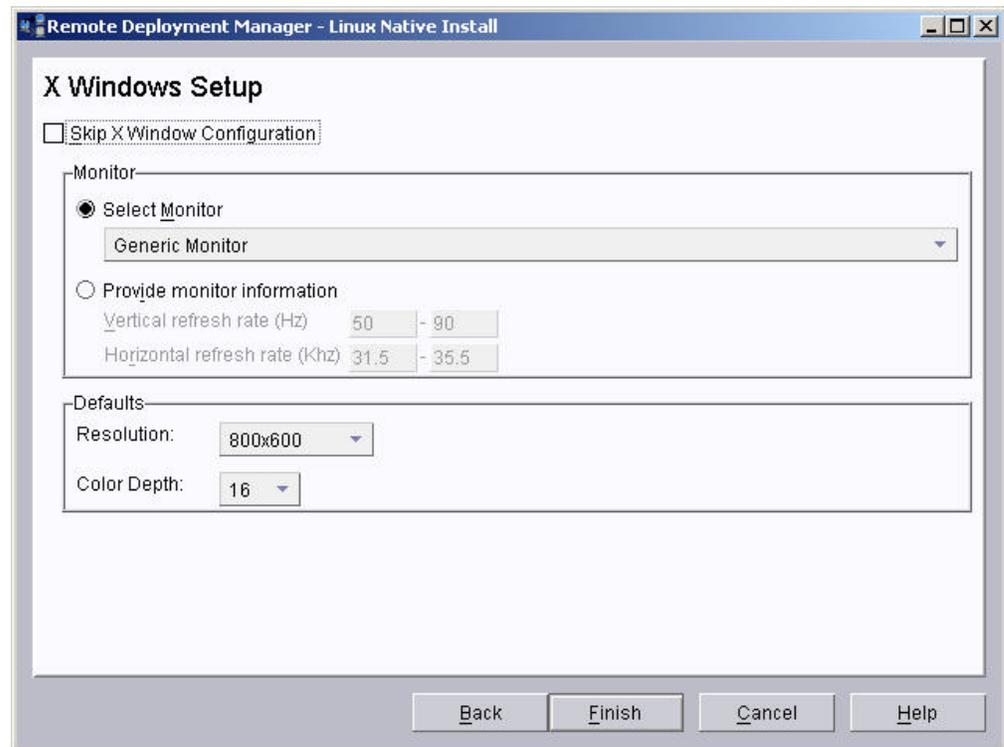


Figure 73. Linux Native Install task: X Windows Setup window, with Skip X Windows Configuration check box cleared

20. Configure the X Windows settings:

- a. By default, the **Skip X Window Configuration** check box is selected. Clear the **Skip X Window Configuration** check box to configure X Windows.

**Notes:**

- 1) If the **Skip X Window Configuration** check box is selected, the Linux Native Install task will not configure the X Window System. You must configure the X Window System after the installation is complete.
  - 2) RDM cannot configure X Window System support for systems with a Remote Supervisor Adapter II. For X Windows support, you must configure the X Window System after the installation is complete. For information, see “Configuring X Windows for systems with a Remote Supervisor Adapter II” on page 124.
- b. In the Monitor group box, select one of the following options:
    - **Select Monitor**
    - **Provide monitor information**
  - c. If you select **Select Monitor**, you must also select the monitor type to be used on the target system.
  - d. Click **Provide monitor information** to set the monitor parameters.
    - 1) Type the minimum and maximum vertical refresh rates in the **Vertical refresh rate** fields.
    - 2) Type the minimum and maximum horizontal refresh rates in the **Horizontal refresh rate** fields.
  - e. Select the **Resolution** and **Color Depth** settings the Linux Native Install task will use as its default monitor settings.

**Note:** If you allow the default monitor (Generic Monitor) to remain, and do not select the actual monitor that you will be using, Linux will ignore any resolutions higher than 800x600. If you select your actual monitor (and it allows higher resolutions), the resolution you specify is used.

21. Click **Finish**. The Linux Native Install task is displayed in the IBM Director Console Tasks pane.

---

## Creating a customized Linux Native Install operating-system image

You can use the Image Management option to create custom Linux installation images to RDM Deployment Server. You can then use RDM to deploy those images to target systems within your network.

Complete the following steps to create a custom Linux installation image.

1. Obtain the installation source files for the Red Hat distribution.
2. Copy the Red Hat installation CDs to a directory on the RDM server (the server where RDM Server is installed). Maintain the directory structure.
3. Determine which package files are required for the installation.
  - a. Navigate to the comps file. (The comps file is the file in which package groups are defined.) This file is typically located in the installation source tree directory: /RedHat/base.

**Note:** The comps file is named “comps” in Red Hat Linux 7.3 and Red Hat Enterprise Linux Advanced Server 2.1. It is named comps.xml in Red Hat Linux 8.0 and Red Hat Enterprise Linux Advanced Server 2.1 Quarterly Update 2 or later.

- b. Make a backup copy of the comps file.
- c. Open the comps file in an ASCII text editor and determine the packages or package groups that you want to remove. (Red Hat Package Manager

(RPM) packages typically have interdependencies. If you remove a file that is required for the installation, the installation will fail.) If you remove a package or package group from the comps file, you also must remove all references to that package or package group from the comps file, otherwise the installation will fail.

- d. Remove the corresponding sections in the comps file for each package or package group that you want to remove.
- e. Save and close the comps file.
4. From the installation source files that you copied to your Linux system, remove the unnecessary package files (those files that you removed mention of from the comps file). Typically, these files are located in the installation source tree directory `/RedHat/RPMS` and have a `.rpm` file extension.
5. To regenerate the `hdlist` file, issue the following command from a command prompt on a Linux system:  

```
genhdlist --withnumbers installation_source_tree
```

where `installation_source_tree` is the path to the installation source tree you modified in step 4.
6. Create an operating-system installation image using the contents of `installation_source_tree` on the RDM server. For information, see “Creating an operating-system image” on page 99.

**Important:** When you create the task that will use the customized installation image, select only the packages and package groups present in the modified comps file, otherwise the installation will fail.

---

## Running a Linux Native Install task

After you create a Linux Native Install task, you can run the task against one or more target systems.

Complete the following steps to use a Linux Native Install task to install Linux on a target system:

1. Expand **Linux Native Install**. The Linux Native Install tasks are displayed.
2. Drag the Linux Native Install task that you want to run onto the target system that you want to install Linux. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 5, “Configuring systems and tasks,” on page 41.
5. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then click **OK**. Otherwise, go to step 6.
6. Click **OK**.

**Note:** If the assigned computer name is not valid, RDM changes the computer name using the following rules:

- Remove spaces and characters that are not valid from the computer name. The following characters are not valid: ``~!@#%&^*()=+[]{} \ | ; : " , < > / ?`.

For example, `pear rfrsh` would be changed to `pearrfrsh`.

- Truncate from the end to make the computer name no longer than 63 characters.

- Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
- Add *\_1*, *\_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.

---

## Configuring X Windows for systems with a Remote Supervisor Adapter II

RDM cannot configure X Windows support for systems with a Remote Supervisor Adapter II. You must configure X Windows on these target systems after the installation task is completed. Be sure to select the “X Window System” and “Classic X Window System” packages for Red Hat 7.3 and the “X Window System” package for Red Hat 8.0. Once the Linux Native Install task is completed, you can configure X Windows on the target system.

(Red Hat Linux 7.3 only) Complete the following steps to configure X Windows:

1. From a shell prompt, run the following command:  
`xconfigurator --expert`
2. When the screen that allows you to select your video adapter driver is displayed, select the following driver:  
`VESA driver (generic)`
3. For the resolution use:  
`1024x768`
4. For color depth use:  
`16`
5. When you get to the “Starting X” window where it asks “XConfigurator will now start X to test your configuration”, select **OK**. For the GUI prompt asking if you want to have X Windows start on reboots, select **Yes**.
6. Click **OK** on the informational message that follows.
7. You should now be back at a shell prompt. To go to X Windows, type the following command:  
`init 5`  
You should now have a graphical login screen.

(Red Hat Linux 8.0 only) Complete the following steps to configure X Windows:

1. From a shell prompt, run the following command:  
`redhat-config-xfree86 --set-driver='vesa' --forceui`  
The Resolution and Color Depth settings are displayed. Pick **1024x768** for Resolution, and **Thousands of colors (16 bit)** for Color Depth. On the **Setup** tab, you can select your Monitor Type and Video Card. The Video Card value is already set to what is needed so do not change it, but you should select your Monitor Type. Click **OK** when finished.
2. Back at a shell prompt, type the following command:  
`Xtest`  
At the *Can you see this message?* prompt, click **Yes**. At the *Would you like to have your computer start up in graphical mode when your system starts up?* prompt, click **Yes**.
3. You should now be back at a shell prompt. To go to X Windows, type the following command:  
`init 5`

You should now have a graphical login screen.



---

## Chapter 12. Power Restore

Power Restore performs two related operations, backups and restores of the boot partition and the Master Boot Record. The Power Restore task uses the Power Restore program and the DeployCenter application from Symantec.

This chapter explains how Power Restore performs the following work:

- The save-to-backup operation, which creates a backup image of the boot partition (usually the C: drive) of the target system and also can create a backup copy of the Master Boot Record
- The restore operation, which restores the boot partition from the selected image and also can restore the Master Boot Record from its backup copy

Power Restore works with images and partitions. An image is one or more related files and it is a copy of all the used sectors on the boot partition of the target system. A partition is a division of a disk that Power Restore uses to store up to two images in the Power Restore partition.

Information about the image files (whether they exist or not, their creation date and optional comments) are stored in the Power Restore Information Sector on the hard disk drive. The backup copy of the Master Boot Record is stored in another sector on the hard disk drive. Neither of these sectors is used by Windows or DOS.

The Power Restore partition is the same size as the active (boot) partition on the target system and is on the same drive as the boot partition. The Power Restore partition is a hidden partition, which reduces the risk of users accidentally deleting the image files.

Power Restore can be run in the following ways:

- As an RDM task
- Locally on a target system using one of the following methods:
  - A startable (bootable) diskette or CD
  - IBM Boot Manager

Review the operational guidelines before you run the Power Restore task.

**Note:** If RDM is installed on a Linux system, you cannot use the Donor Image, Windows Clone Install, Linux Clone Install, or Power Restore templates or their tasks. RDM must be installed on a Windows system in order to use these templates and tasks.

---

### Operational guidelines

See the compatibility guide for the list of release-related items for the Power Restore task.

- Power Restore is backwards compatible with Power Restore backups created with RDM 3.1 and later. It is incompatible with backups created with LCCM 3.0 and earlier.
- If you attempt to perform a Save operation on a system with an LANClient Control Manager™ (LCCM) 3.0-style Rapid Restore partition, the partition is replaced with an RDM 4.2-style Power Restore partition and a new Power Restore-style backup image is created.

- If you attempt to perform a Restore operation on a system with an LCCM 3.0-style Rapid Restore partition, RDM indicates a restore failure.

The Power Restore task has the following restrictions:

- The Power Restore backup partition must be the same size as the boot partition
- The Power Restore backup partition must exist on the same drive as the boot partition
- The Power Restore backup partition must be the fourth partition-table entry in the Master Boot Record
- Power Restore backups can only be made of the boot partition and the Master Boot Record; no other partitions can be backed up with Power Restore
- No more than two backup “image file” collections can exist in the Power Restore backup partition
- Restoring the Master Boot Record from a backup copy can repair a corrupted Master Boot Record, but it does not restore changes made to Windows itself (for example Windows registry information) when you use Windows tools to delete or change partitions

---

## Running Power Restore as an RDM task

You can run Power Restore as an RDM task to save and restore backups of the boot partition and the Master Boot Record. Backups of the boot partition are saved in image files. If you select Boot Partition the image file options become available. There can be up to two image files: the **A image file** and the **B image file**. You can select either of the images, or you can choose to save to or restore from the **Older of A or B image files** or the **Newer of A or B image files**, if both image files exist on the system.

**Note:** When deploying the following tasks to an Intellistation MPro system with a SAS HostRAID controller, it is recommended that you increase the timeout value (the number of minutes that the server waits for a system response before generating a fail event) to 720, due to possible slow execution of these tasks:

- Windows Clone Install
- Windows Native Install
- Power Restore

In the IBM Director Tasks pane, expand the **Remote Deployment Manager** group. Right-click **Power Restore** in the Tasks pane to display two options:

- *Create New Task* - accesses the task notebook. All of the property sheets are available for editing.
- *Edit Template* - accesses the template notebook containing all of the properties for the template. The values set in the template notebook are the defaults used when you create a new Power Restore task.

## Creating a Power Restore task using RDM

When you create a task, it is added to the Tasks pane under **Power Restore**. Right-click the new task to edit, delete, or copy the task.

Complete the following steps to specify what operations and images you want created in the new Power Restore task:

1. From IBM Director Console, expand the **Remote Deployment Manager** task in the Tasks pane.
2. Right-click **Power Restore**. The Power Restore menu is displayed.
3. Click **Create new task**. The Power Restore window opens.
4. Click the **Setup** tab. The Setup page is displayed.

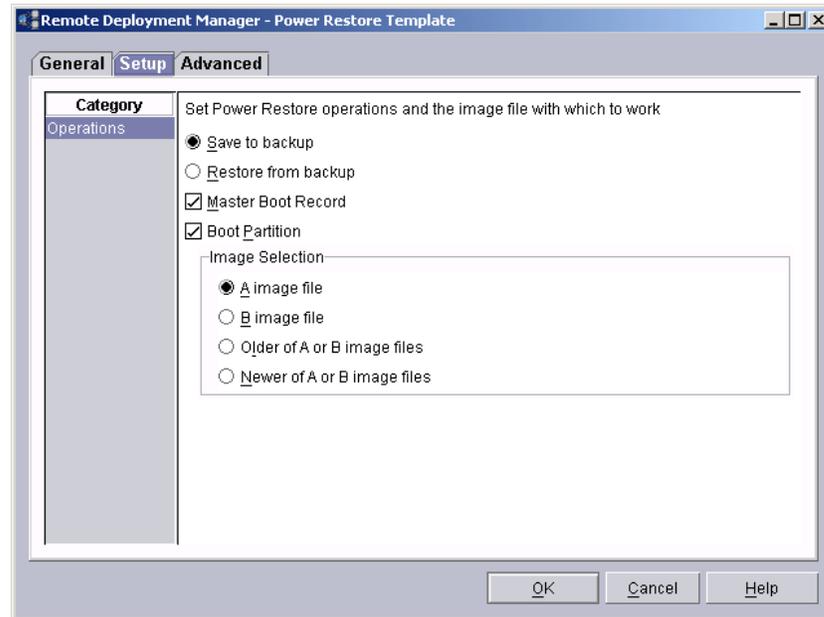


Figure 74. Power Restore Operations category

5. Select which operation you want to perform:
  - Save to backup
  - Restore from backup
6. Select what you want to backup (select either or both):
  - Master Boot Record
  - Boot Partition

**Note:** If you choose the Boot Partition option and the selected image file does not exist, the restore task fails.

7. Select which type image you want to use:
  - A image file
  - B image file
  - Older of A or B image files
  - Newer of A or B image files
8. Click **OK**.

The new task appears in the IBM Director Tasks pane under Power Restore.

---

## Running Power Restore locally on the target system

Power Restore tasks are normally run as an RDM task. You can run Power Restore locally on a target system, without using IBM Director Console, by using one of the following local media:

- A startable (bootable) Power Restore diskette
- A startable (bootable) Power Restore CD-ROM
- The Power Restore partition on the target system

**Note:** To use the Power Restore partition, IBM Boot Manager for Power Restore must be installed on the target system.

You can use the aforementioned local media to perform the following tasks:

- Start the Power Restore backup and restore operations from a startable (bootable) diskette or CD-ROM.
- Start the Power Restore backup and restore operations by pressing the F11 function key, during the boot process of a PC, on which you have installed IBM Boot Manager.
- Create the Power Restore partition from a startable (bootable) diskette or CD-ROM.
- Install IBM Boot Manager from a startable (bootable) diskette or CD-ROM.

## Using a startable disk to run Power Restore

You can install or start Power Restore from a startable disk (either a diskette or a CD-ROM). Both the install process and start process use the same disk. You must first prepare the diskette, and then create the startable CD-ROM from the diskette image to create a startable CD-ROM. Creating the diskette involves formatting it as a boot diskette and then copying specific files onto it.

### Creating a Power Restore start diskette and CD-ROM

Complete the following steps to create a startable Power Restore Installation/Start diskette:

1. Insert a blank diskette into drive A on the Windows RDM Server or the first diskette drive on the Linux RDM Server
2. If running RDM on Linux, make sure the diskette is unmounted.
3. For Windows navigate to the following directory: `rdm\repository\environment\dos\restore`
4. Run file `build_pr.bat`
5. For Linux navigate to the following directory: `/opt/IBM/RDM/repository/environment/dos/restore`
6. Type the following command:  

```
./build_pr.sh
```

You need to use the Power Restore Installation/Start diskette as the boot image when creating a startable Power Restore Installation/Start CD-ROM. The CD-ROM can be made using any of several popular CD-authoring software packages, a CD-ROM recorder, and a CD-R or CD-R/W disc.

### Running Power Restore from startable disk

There are several states a system can be in when it is booted from the Power Restore diskette or CD-ROM. These states and their resulting actions include:

| State  | Action  |
|--|---|
| RDM 4.x-style Power Restore partition is on system   | Power Restore interface is displayed  |
| RDM 3.1-style Power Restore partition is on system   | Power Restore partition and files are updated to RDM 4.x-style and Power Restore interface is displayed                                     |
| LCCM 3.0-style "Rapid Restore" or "Rave" partition is on system  | Rapid Restore/Rave partition is removed and replaced with an RDM 4.x-style Power Restore partition and Power Restore interface is displayed |
| No Rapid Restore/Rave or Power Restore partition is on system, but adequate* free space exists on system   | Power Restore partition is created and Power Restore interface is displayed   |
| No Rapid Restore/Rave or Power Restore partition is on system and no adequate* free space exists on system | Error message is displayed  |

\* The Power Restore partition uses the same amount of space that is used by the boot partition. Additional partitions (such as extended partitions with logical drives defined on them) might exist on the system prior to adding a Power Restore partition. No more than four partitions, including the Power Restore partition, can exist on a system.

Complete the following steps to run Power Restore from a startable disk:

1. Change the BIOS settings on the system to boot from the diskette or CD-ROM, depending on which type of disk you want to use.
2. Insert the applicable disk into the appropriate drive.
3. Reboot or power-on the system. The Power Restore interface is displayed.
4. When the Power Restore interface is displayed, select which actions you want to perform.

## Using IBM Boot Manager to run Power Restore

You can use IBM Boot Manager to run Power Restore on a system. Instead of booting from a startable diskette or CD-ROM, the system is booted from the Power Restore partition on the hard disk drive.

**Note:** All partitions on the system, including the Power Restore partition, must be created and formatted prior to installing IBM Boot Manager. If an unformatted partition is present, the installation will not complete.

You need to perform the following tasks before using IBM Boot Manager:

1. Have Power Restore already installed on the system
2. Create a startable IBM Boot Manager for Power Restore disk
3. Install IBM Boot Manager for Power Restore
4. Reboot the system

### Creating a startable IBM Boot Manager for Power Restore installation diskette

To work with IBM Boot Manager, the Power Restore partition must be formatted as a startable FAT32 drive. IBM PC DOS 7.1, while it does understand the FAT32 file system, cannot be used if the physical start of the partition is more than four gigabytes from the physical start of the drive. This four-gigabyte starting limitation is restrictive for current computers that have hard disk drives that are much larger than eight gigabytes. To circumvent this limitation you must use versions of

Microsoft DOS that work with FAT32, such as the DOS that comes with Windows 98 and Windows 98 Second Edition. You will have to obtain the Microsoft Windows 98 or Windows 98 Second Edition.

To create a startable IBM Boot Manager for Power Restore Installation diskette, perform the following steps:

1. From Microsoft Windows 98 or Windows 98 SE, format a diskette with system files by either using the format a: /s command from a Command Prompt window or right-click the diskette icon in My Computer or Windows Explorer, choosing the Format option, and then select **Copy system files** in the Format window.
2. Copy the sys.com, himem.sys, and ramdrive.sys files from the Windows 98 or Windows 98 SE system to the diskette (in default installations, the files himem.sys and sys.com can be found in the \windows folder and the file ramdrive.sys can be found in the \windows\command folder).
3. Insert the diskette into drive A on the Windows RDM Server or the first diskette drive on the Linux RDM Server.
4. If running RDM on Linux, make sure the diskette is unmounted.
5. For Windows navigate to the following directory: rdm\repository\environment\dos\restore
6. Run file build\_bm.bat
7. For Linux navigate to the following directory: /opt/IBM/RDM/repository/environment/dos/restore
8. Type the following command:  

```
./build_bm.sh
```

You need to use the IBM Boot Manager for Power Restore Installation diskette as the boot image when creating a startable IBM Boot Manager for Power Restore Installation CD-ROM. The CD-ROM can be made using any of several popular CD-authoring software packages, a CD-ROM recorder, a CD-R or CD-R/W disc.

## Installing IBM Boot Manager for Power Restore

IBM Boot Manager for Power Restore cannot be installed as an RDM task. Installing IBM Boot Manager for Power Restore requires Power Restore to be present on the system. To install IBM Boot Manager for Power Restore on a system, set the system to boot from the diskette drive or CD-ROM, insert the IBM Boot Manager Installation diskette or CD-ROM in the appropriate drive, and power up the system. The installation is automatic and requires one reboot. When it is finished, it will prompt you to remove the diskette or CD-ROM and to power the system off.

### Notes:

1. All partitions on the system must be formatted prior to installing IBM Boot Manager. If an unformatted partition is present, the installation will not complete.
2. IBM Boot Manager requires you to define the Power Restore partition in a particular entry in the Master Boot Record. If you create an additional partition on the hard disk drive after you installed IBM Boot Manager, IBM Boot Manager will not function correctly. You will need to uninstall then install both the Power Restore partition and IBM Boot Manager again for Boot Manager to work.

Installing IBM Boot Manager for Power Restore requires Power Restore to be present on the system.

## Creating a Power Restore task locally on the target system

You can run Power Restore locally on a system by using either a startable disk or IBM Boot Manager. When you run Power Restore locally on the target system, the system accesses one of two types of interfaces:

- GUI-based interface - Use this interface if the system has a video card capable of a 640 x 480 resolution, 256-color graphics mode. The interface looks like Figure 75:

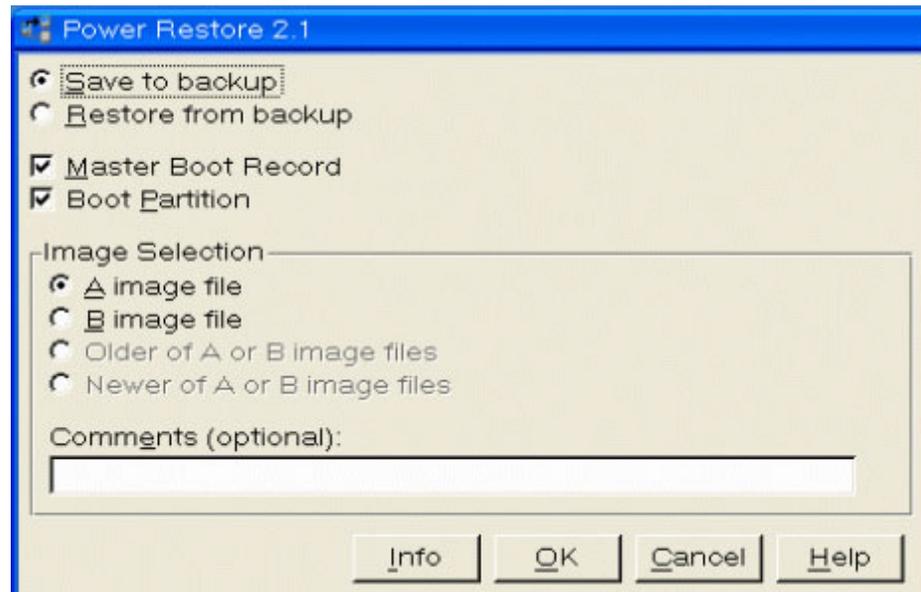


Figure 75. Power Restore GUI-based user interface

- Text-mode variation of the GUI interface - Use this interface if the system does not meet the previous GUI based requirements. The interface looks like Figure 76 on page 134:

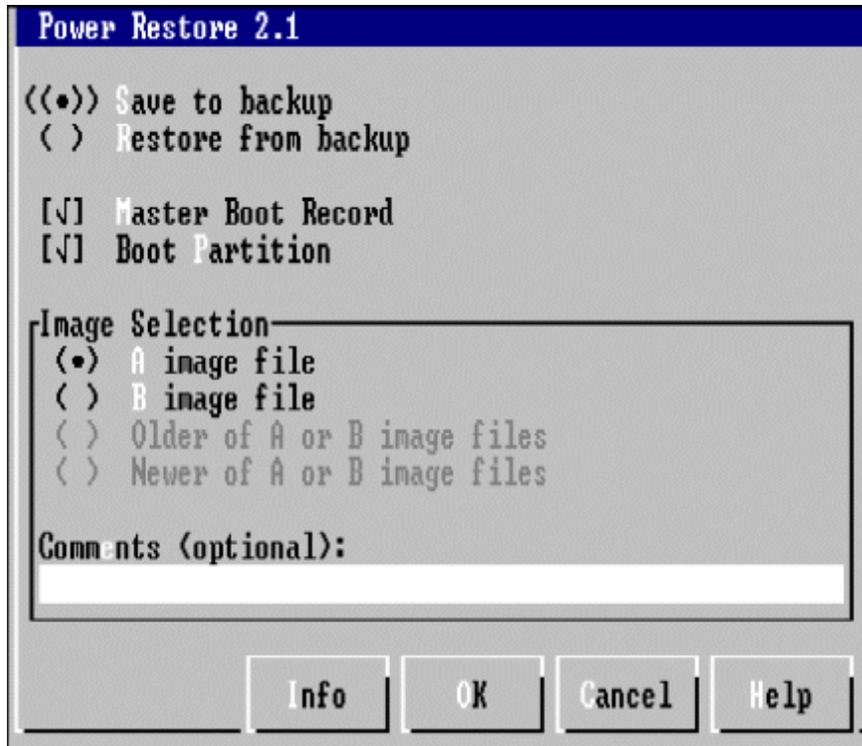


Figure 76. Power Restore text-based user interface

You can use the Power Restore interface to perform the following tasks:

- Select whether to perform a Save operation or a Restore operation
- Select whether to perform the operation on the Master Boot Record, the boot partition or both
- Select which image file to save the boot partition to or restore it from
- Define optional comments related to the selected image file on Save operations
- View optional comments related to the selected image file on Restore operations
- View the dates of the image files
- View a help window on the use of the user interface
- View information about the partition table on the boot drive

Click **OK** to perform the specified operation in the new task or **Cancel** to exit without performing any Save or Restore actions. When the selected action has finished, the system will power-off.

**Note:** Some systems cannot be powered off by software and must be powered off manually.

The user interface is designed to prevent you from making wrong choices, such as attempting to restore the boot partition from a non-existent image file.

---

## Removing the Power Restore partition and IBM Boot Manager

This section describes the procedures used to remove the Power Restore Partition and IBM Boot Manager. If you are removing the Power Restore partition you must also remove the IBM Boot Manager for Power Restore application.

## Removing the Power Restore partition

Removing the Power Restore partition requires the removal of both the hidden partition and the Power Restore Information Sector. Failure to do so can allow a Power Restore task to run on the target system but to fail in its operation.

Complete the following steps to remove the Power Restore partition:

1. Create a startable DOS diskette (Power Restore Uninstall Diskette).
2. Copy PARTTOOL.COM from RDM\repository\environment\dos\restore\bootmanager to the new Power Restore Uninstall Diskette.
3. Boot the system using the IBM Boot Manager for Power Restore Uninstall Diskette.
4. Run the PARTTOOL /O /P /X command, either directly or from a batch file, to remove the Power Restore partition.
5. Run the PARTTOOL /O /P /F command, either directly or from a batch file, to flush the Power Restore information sector.
6. If IBM Boot Manager for Power Restore is installed on the target system, go to “Removing IBM Boot Manager for Power Restore.”
7. Remove the Power Restore Uninstall Diskette and power-off the system.

### Notes:

- a. Removing the Power Restore partition frees up the space it used but does not add that space to any of the remaining partitions.
- b. If you do not perform step 5 in this process (flush the Power Restore information sector), subsequent attempts to install Power Restore on the system will fail since the Power Restore installation process will incorrectly determine that the Power Restore partition still exists on the system.

## Removing IBM Boot Manager for Power Restore

Complete the following steps to remove IBM Boot Manager for Power Restore:

1. Create a startable DOS diskette (Power Restore Uninstall Diskette).
2. Copy the following files from the IBM Boot Manager for Power Restore Installation Diskette or CD to the new IBM Boot Manager for Power Restore Uninstall Diskette:
  - BMGR.EXE
  - BMGR.SCR
  - BOOT.BIN
3. Copy PARTTOOL.COM from RDM\repository\environment\dos\restore\bootmanager to the new Power Restore Uninstall Diskette.
4. Boot the system using the IBM Boot Manager for Power Restore Uninstall Diskette.
5. Run the following commands, either directly or from a batch file:
  - BMGR /R
  - PARTTOOL /O /P /N
6. Remove the IBM Boot Manager for Power Restore Uninstall Diskette and power off the system.



---

## Chapter 13. RAID Clone Configuration

You can use the RAID Clone Configuration template to create tasks that configure the following RAID controllers:

- IBM ServeRAID controllers
- Integrated SCSI controllers with RAID capabilities (LSI 1020 or LSI 1030)
- IDEal RAID controllers
- ServeRAID-7t serial advanced technology attachment (SATA) controller
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers
- ServeRAID-8i SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SATA controllers
- LSI1064 (LSI Logic Integrated RAID) controllers
- ServeRAID-8k SAS controllers
- ServeRAID-8k-l SAS controllers

The RAID Clone Configuration template uses a file to specify the RAID configuration information.

For information about RAID and RAID configurations, see the documentation that came with your RAID controller.

---

### Creating a RAID configuration file

To use the RAID Clone Configuration template, you must create a file that contains the RAID configuration information. There are two types of configuration files:

#### Configuration backup file

This text file contains the output that is generated when a backup or retrieve configuration command is run against a RAID controller that has the configuration that you want to clone. You can manually modify the backup files for the following models:

- IDEal RAID controllers
- ServeRAID-7t SATA controller
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers
- ServeRAID-8i SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SATA controllers
- ServeRAID-8k SAS controllers
- ServeRAID-8k-l SAS controllers

You cannot manually modify the backup files for integrated SCSI controllers with RAID capabilities (LSI 1020 or LSI 1030) and earlier ServeRAID controller models.

#### Configuration command file

This is a DOS batch file that contains the applicable commands that are needed to configure a RAID controller.

**Note:** Command files can only be used with the following controllers:

- IBM ServeRAID controllers

- Integrated SCSI controllers with RAID capabilities (LSI 1020 or LSI 1030)
- IDEal RAID controllers
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- LSI1064 (LSI Logic Integrated RAID) controllers

The following table contains information about the command-line utilities that you can use to create a configuration file.

*Table 5. Command-line utilities used to configure RAID controllers*

| Type of RAID controller   | Utility      | For information, see       |
|---|--------------|----------------------------|
| Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)                   | cfg1030      | "cfg1030.exe" on page 303  |
| IDEal RAID controller   | hypercfg     | "hypercfg.exe" on page 306 |
| ServeRAID-7e (Adaptec HostRAID) for SCSI controller   | raidsel.exe  | "raidsel.exe" on page 310  |
| ServeRAID-7t SATA controller  | acu.exe      | "acu.exe" on page 299      |
| ServeRAID-7e (Adaptec HostRAID) for SATA controller (except for IntelliStation)             | acuichv.exe  | "acuichv.exe" on page 300  |
| ServeRAID-7e (Adaptec HostRAID) for SATA controller (for IntelliStation only)               | acusiv.exe   | "acusiv.exe" on page 302   |
| ServeRAID-8i SAS controller<br>ServeRAID-8k SAS controller<br>ServeRAID-8k-l SAS controller | acusas.exe   | "acusas.exe" on page 301   |
| ServeRAID-8e (Adaptec HostRAID) for SAS controller  | acusashr.exe | "acusashr.exe" on page 302 |
| ServeRAID-8e (Adaptec HostRAID) for SATA controller   | acuahci.exe  | "acuahci.exe" on page 300  |
| LSI1064 (LSI Logic Integrated RAID) controller  | cfggen.exe   | "cfggen.exe" on page 305   |
| Remaining ServeRAID controller models   | ipssendl     | "ipssendl.exe" on page 307 |

**Note:** For RAID configuration utilities based on acu.exe (acu.exe, acusas.exe, acusashr.exe, acuahci.exe, acusiv.exe, and acuichv.exe), RAID clone files should not include any build or verify % lines. After running the `acu /r clonfile`, you must edit the clonfile and remove any build, clear, or verify % lines.

To use the RAID configuration utilities, you must create a DOS-startable diskette with the applicable utility on the diskette.

## Creating a DOS-startable diskette

For all RAID controllers, you must copy the applicable utility onto a DOS-startable diskette.

If you installed RDM in the default location, the RAID configuration command-line utilities are in the following ZIP files. You can copy the applicable utility onto a DOS-startable diskette from these ZIP files:

|                    |  |
|--------------------|--|
| <b>For Linux</b>   | d:\Program Files\IBM\rdm\repository\environment\dos\DOSUTILS.ZIP |
| <b>For Windows</b> | d:/opt/IBM/RDM/repository/environment/dos/DOSUTILS.ZIP           |

where *d* is the drive letter of the hard disk drive.

To create a DOS-startable diskette for the remaining ServeRAID controller models, complete the following steps:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. Insert a blank diskette into the diskette drive.
3. At the DOS or command prompt, type the following command and press Enter:  
e:\diskette\tools\dsk4w32 e:\diskette\dos.img a:

where

- *e* is the drive letter of the CD-ROM drive.
  - *a* is the drive letter of the diskette drive.
4. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
  5. Remove the diskette from the diskette drive and label the diskette *IBM ServeRAID Support for DOS*.

The *IBM ServeRAID Support for DOS* diskette provides the ipssend.exe utility, the ServeRAID device driver for DOS (ipsraspi.sys), and a sample config.sys file. Make sure that the following line is included in the config.sys:

```
device=ipsraspi.sys
```

## Creating a configuration backup file

You can create a configuration backup file by using the applicable command-line utility to save information about a RAID controller configuration to a diskette or physical drive.

The following characteristics of the donor and target systems must be identical:

- Type of RAID controller
- Number and size of physical drives
- Channels to which the physical drives are attached

In other words, the drives must be connected in exactly the same sequence on all of the systems.

The RAID controller in the donor system must be correctly configured before you create the backup file.

Complete the following steps to create a configuration backup file.

1. Start (boot) the applicable diskette on the donor system:
2. From the command prompt, type the applicable command:

| <b>RAID controller</b>  | <b>Command</b>  |
|---|---|
| Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030) | cfg1030 backup <i>controller filename</i>                             |
| IDEal RAID controller   | hypercfg /1 / <i>filename</i>   |
|   | <b>Note:</b> If you do not provide a file name, hypercfg.dat is used. |

| RAID controller   | Command   |
|---|---|
| ServeRAID-7e (Adaptec HostRAID) for SCSI controller   | raidse1 save <i>filename</i><br><b>Note:</b> You must provide a file name with the extension .xml.                              |
| ServeRAID-7t SATA controller  | acu /r <i>filename</i><br><b>Note:</b> You must provide a file name. If you do not provide the file extension, .mlc is used.    |
| ServeRAID-7e (Adaptec HostRAID) for SATA controller   | acusiv /r <i>filename</i><br><b>Note:</b> You must provide a file name. If you do not provide the file extension, .mlc is used. |
| <ul style="list-style-type: none"> <li>• ServeRAID-8i SAS controller</li> <li>• ServeRAID-8k SAS controller</li> <li>• ServeRAID-8k-l SAS controller</li> </ul> | acusas /r <i>filename</i>   |
| ServeRAID-8e (Adaptec HostRAID) for SAS controller  | acusashr /r <i>filename</i>   |
| ServeRAID-8e (Adaptec HostRAID) for SATA controller   | acuahci /r <i>filename</i>  |
| Remaining ServeRAID controller models   | ipssend backup <i>controller filename</i><br><b>Note:</b> You must provide a file name.   |

where *controller* is the controller number and *filename* is the fully qualified name of the configuration backup file.

The backup file is created on the diskette.

**Note:** You can modify the configuration backup file only for the following controller models:

- IDEal RAID controllers
- ServeRAID-7t SATA controller
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers
- ServeRAID-8i SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SATA controllers
- ServeRAID-8k SAS controllers
- ServeRAID-8k-l SAS controllers

### Creating configuration backup files for ServeRAID-7t SATA controllers

If you are creating a configuration backup file for the ServeRAID-7t SATA controller, the following properties are used:

- Read cache is always enabled.
- Write cache is always disabled.
- Arrays are created using the maximum size. If you enter a different size, the maximum size is used.
- Depending on the configuration method for the RAID level, a wait option determines if the method completes in the foreground or background.

| RAID level | Configuration method | Wait option setting |
|------------|----------------------|---------------------|
| 1          | Quick Init           | Wait=Yes            |
| 5          | Clear                | Wait=Yes            |
| 5EE        | Clear                | Wait=Yes            |
| 6          | Clear                | Wait=Yes            |
| 10         | Build/Verify         | Wait=No             |
| 50         | Clear                | Wait=Yes            |
| 60         | Clear                | Wait=Yes            |

If you require different settings, you must create a custom configuration file using the RAID Clone Configuration task.

### Creating configuration backup files for ServeRAID-8i SAS controllers

If you are creating a configuration backup file for the ServeRAID-8i SAS controller, the following properties are used:

- Read cache is always enabled.
- Write cache is always enabled.
- Arrays are created using the maximum size. If you enter a different size, the maximum size is used.
- Depending on the configuration method for the RAID level, a wait option determines if the method completes in the foreground or background.

| RAID level | Configuration method | Wait option setting |
|------------|----------------------|---------------------|
| 1          | Quick Init           | Wait=Set            |
| 1E         | Quick Init           | Wait=Set            |
| 5          | Clear                | Wait=Yes            |
| 5EE        | Clear                | Wait=Yes            |
| 6          | Clear                | Wait=Yes            |
| 10         | Quick Init           | Wait=Set            |
| 50         | Clear                | Wait=Yes            |
| 60         | Clear                | Wait=Yes            |

If you require different settings, you must create a custom configuration file using the RAID Clone Configuration task.

### Creating configuration backup files for ServeRAID-8e (Adaptec HostRAID) for SAS or SATA controllers

If you are creating a configuration backup file for a ServeRAID-8e (Adaptec HostRAID) for SAS or SATA controller, the following properties are used:

- Read cache is always disabled.
- Write cache is always disabled.
- Arrays are created using the maximum size. If you enter a different size, the maximum size is used.
- Depending on the configuration method for the RAID level, a wait option determines if the method completes in the foreground or background.

| RAID level | Configuration method | Wait option setting |
|------------|----------------------|---------------------|
| 1          | Quick Init           | Wait=Set            |
| 10         | Quick Init           | Wait=Set            |

If you require different settings, you must create a custom configuration file using the RAID Clone Configuration task.

### Creating configuration backup files for ServeRAID-8k-I SAS controllers

If you are creating a configuration backup file for the ServeRAID-8k-I SAS controller, the following properties are used:

- Read cache is always disabled.
- Write cache is always disabled.

## Creating a configuration command file

You can create a DOS batch file that contains the applicable commands for configuring a RAID controller.

**Note:** The following controllers do not support command files:

- ServeRAID-7e (Adaptec HostRAID) for SATA controllers
- ServeRAID-8i SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SATA controllers

### Example of a configuration command file for a ServeRAID controller

The following batch file might be used to configure a ServeRAID controller.

```
REM ServeRAID Command File for RDM
IPSENDL SETCONFIG 1 DEFAULT NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSENDL STRIPESIZE 1 32
if ERRORLEVEL 1 goto RDS_ERROR
IPSENDL CREATE 1 LOGICALDRIVE NEWARRAY 500 1 1 0 3 0 NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSENDL CREATE 1 LOGICALDRIVE A MAX 1 1 0 3 0 NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSENDL CREATE 1 LOGICALDRIVE NEWARRAY MAX 5E 1 3 3 4 1 7 3 6 NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSENDL SETSTATE 1 4 0 HSP
if ERRORLEVEL 1 goto RDS_ERROR
:RDS_ERROR
```

This batch file contains commands that perform the following actions on controller 1:

1. Restores the controller to the factory-default settings.
2. Sets the controller stripe size to 32 KB.
3. Creates a logical drive on a new array; the size of the logical drive is 500 MB, the RAID level is 1, and it is made up of physical drives at channel 1, SCSI ID 0 and channel 3, SCSI ID 0.
4. Creates a logical drive on array A; the logical drive uses all available space in the array, the RAID level is 1, and it is made up of physical drives at channel 1, SCSI ID 0 and channel 3, SCSI ID 0.

5. Creates a logical drive on a new array; the logical drive uses all available space in the array, the RAID level is 5E, and it is made up of physical drives at the following locations:
  - Channel 1, SCSI ID 3
  - Channel 3, SCSI ID 4
  - Channel 1, SCSI ID 7
  - Channel 3, SCSI ID 6
6. Creates a hot spare drive from the physical drive at channel 4, SCSI ID 0.

### **Example of a configuration command file for an integrated SCSI controller with RAID capabilities**

The following batch file might be used to configure an integrated SCSI controller with RAID capabilities.

```
REM LSI53C1020/1030 Command File for RDM
CFG1030 SETCONFIG 1 DEFAULT NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
CFG1030 CREATE 1 LOGICALDRIVE NEWARRAY 500 1 1 0 1 1
if ERRORLEVEL 1 goto RDS_ERROR
CFG1030 SETSTATE 1 1 2 HSP
if ERRORLEVEL 1 goto RDS_ERROR
:RDS_ERROR
```

This batch file contains commands which perform the following actions on controller 1:

1. Restores the controller to the factory-default settings.
2. Creates a logical drive on a new array; the size of the logical drive is 500 MB, the RAID level is 1, and it is made up of physical drives at channel 1, SCSI ID 0 and channel 1, SCSI ID 1.
3. Creates a hot spare drive from the physical drive at channel 1, SCSI ID 2.

### **Example of a configuration command file for an IDEal RAID controller**

The following batch file might be used to configure an IDEal RAID controller.

```
REM IDEal RAID Command File for RDM
hypercfg /am /s
```

This batch file contains a command that creates a RAID level-1 configuration.

### **Example of a configuration command file for a ServeRAID-7e (Adaptec HostRAID) for SCSI controller**

The following batch file might be used to configure an ServeRAID-7e (Adaptec HostRAID) for SCSI controller.

```
REM ServeRAID-7e (Adaptec HostRAID) for SCSI controller Command File for RDM
raidse1 -D all
raidse1 -Z all
raidse1 -l 1 -g d0b0t410 d0b0t510
raidse1 -a build d0b0t410 -p high
```

This batch file contains commands that perform the following actions:

1. Delete all arrays in an existing configuration.
2. Clears all the physical drives on the HostRAID channel.
3. Creates a logical drive on a new array; the logical drive uses all available space in the array, the RAID level is 1, and it is made up of physical drives at the following locations:
  - Controller 0 (d0), Channel 0 (b0), SCSI ID 4 (t4)
  - Controller 0 (d0), Channel 0 (b0), SCSI ID 5 (t5)

4. Builds the RAID array. The -p high parameter forces the initialization of the array.

---

## Creating a RAID Clone Configuration image

You can use RDM Image Management to import a RAID Clone Configuration file to the RDM repository. You can then create RAID Clone Configuration tasks to configure RAID controllers on target systems by using the file that you imported.

Complete the following steps to create a RAID Clone Configuration image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

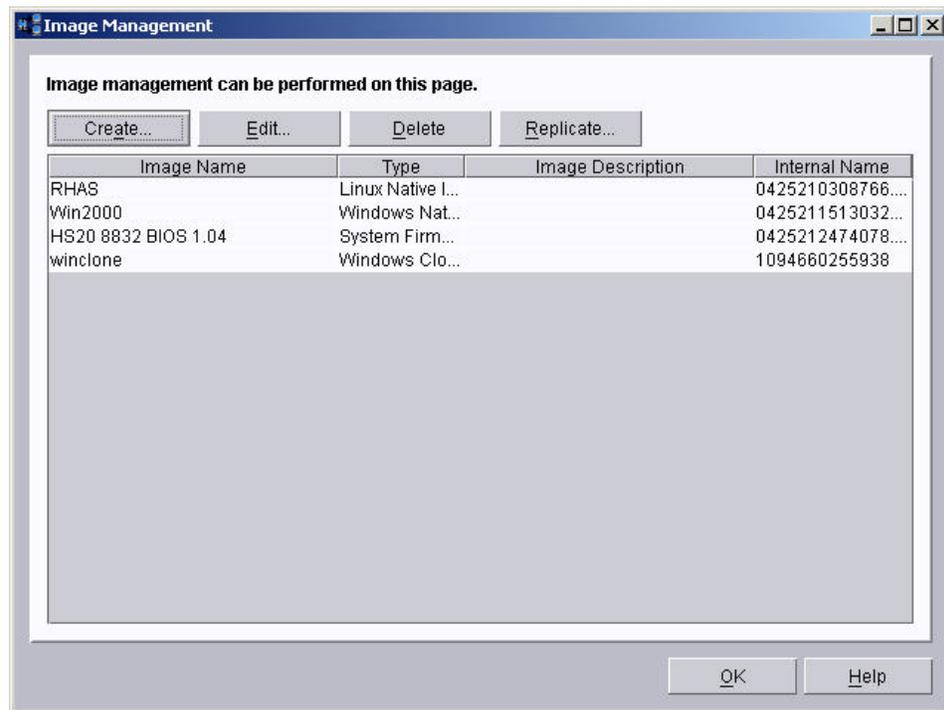


Figure 77. Image Management window

2. Click **Create**. The Create Image window opens.

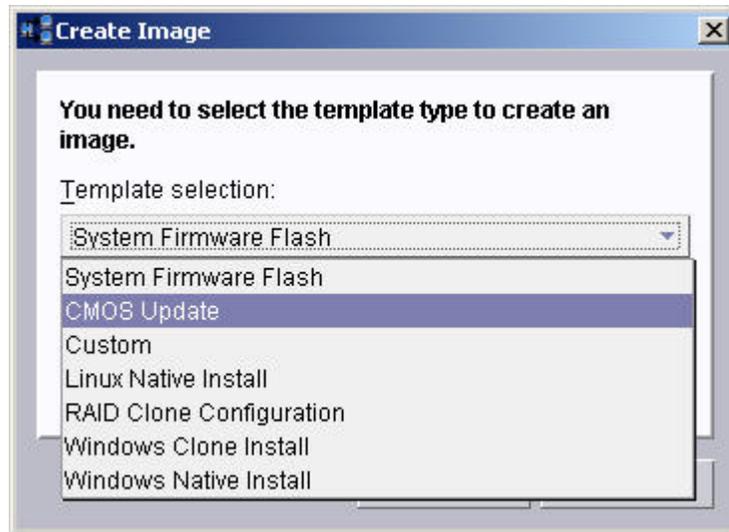


Figure 78. Create Image window

3. In the **Template selection** field, select **RAID Clone Configuration**; then, click **OK**. The Create RAID Clone Configuration Image window opens, and the General page is displayed.

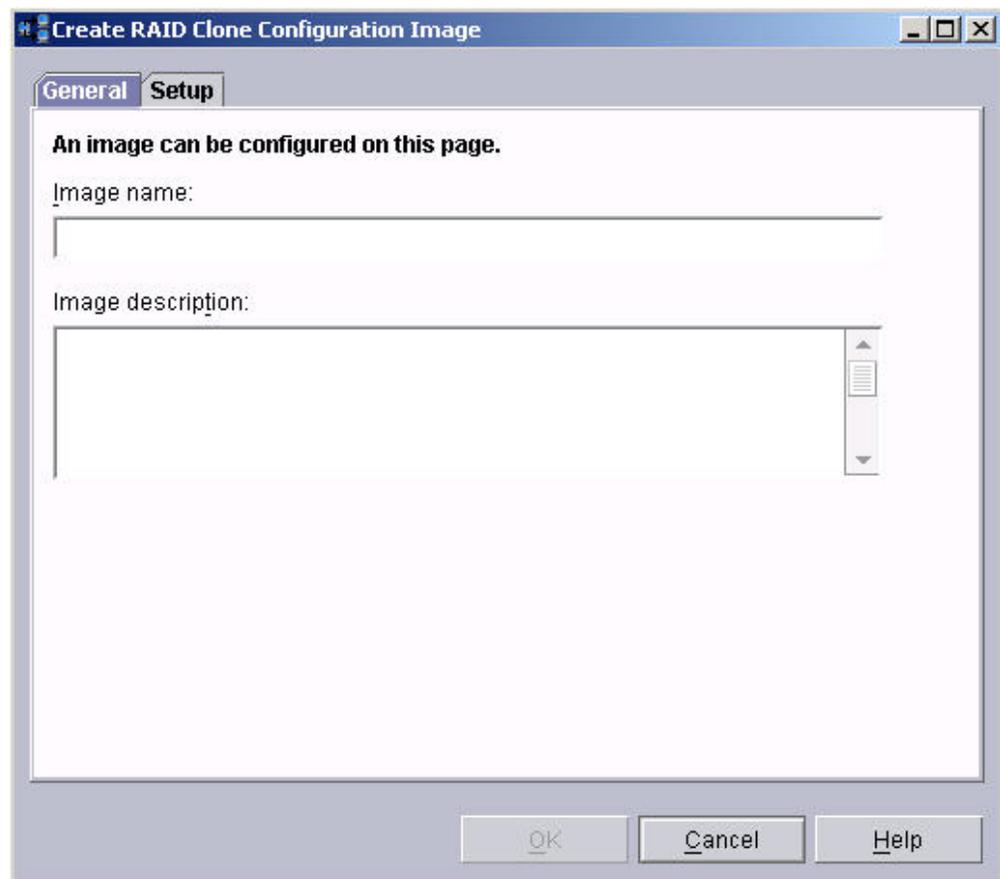


Figure 79. Create RAID Clone Configuration Image window: General page

4. In the **Image name** field, type a name for the RAID Clone Configuration image. Later, when you create a task, the name that you type in this field will be displayed in the list of images that you can select to add to the task.
5. (Optional) In the **Image description** field, type a brief description for the RAID Clone Configuration image.
6. Click **Setup**. The Setup page is displayed.

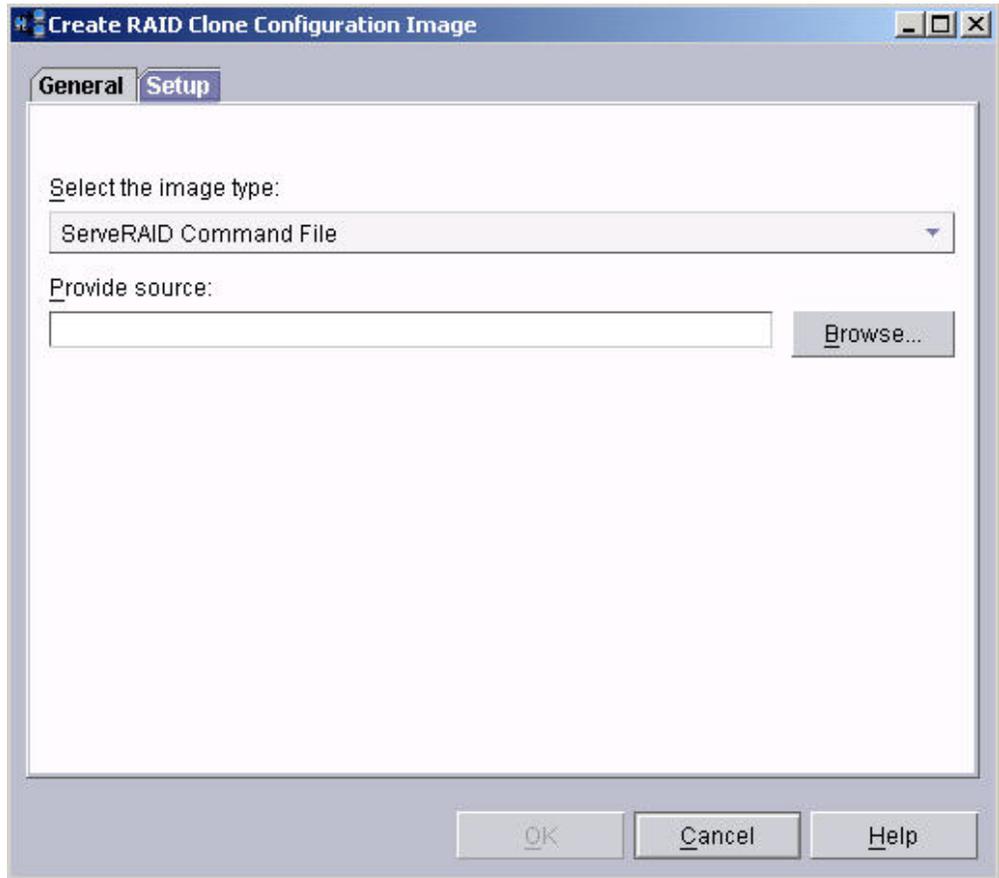


Figure 80. Create RAID Clone Configuration Image window: Setup page

7. In the **Select the image type** field, select the RAID file type that you want to use to deploy the RAID Clone Configuration image.
8. In the **Provide source** field, type the fully qualified file name of the RAID configuration file.  
Otherwise, to navigate to the RAID Clone Configuration file, click **Browse**. The "Locate the RAID clone file" window opens.

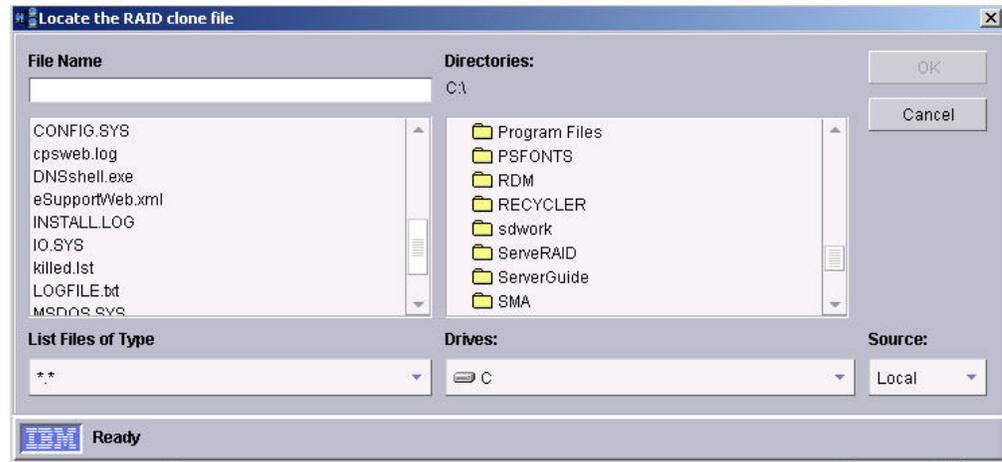


Figure 81. "Locate the RAID clone file" window

Complete the following steps to select the file:

- a. In the **Source** field, use one of the following options:
    - Select **Local** to browse the directories on the RDM console that you are using.
    - Select **Server** to browse the directories on the RDM server.
  - b. If you saved the image file to a diskette, insert the diskette, navigate to the file and select it. Otherwise, navigate to the directory to which you saved the file.
  - c. Click **OK**.
9. Click **OK**. The Task Image Creation Progress window opens.
  10. When the image is complete, click **OK**.

---

## Creating a RAID Clone Configuration task

Complete the following steps to create a RAID Clone Configuration task:

1. In the Tasks pane, click **RAID Clone Configuration** → **Create new task**. The RAID Clone Configuration window opens, and the General page is displayed.

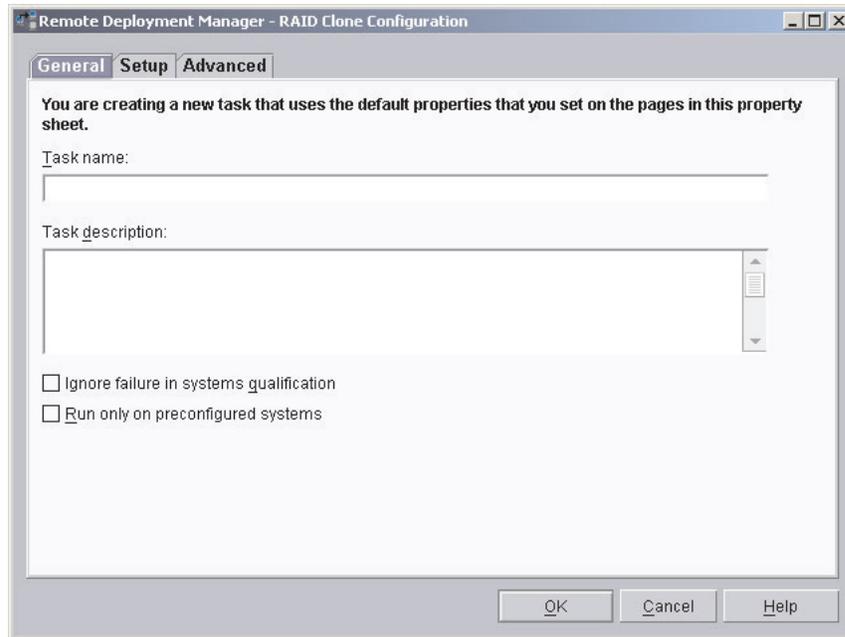


Figure 82. RAID Clone Configuration window

2. Set the basic properties for the task:
  - a. In the **Task name** field, type a unique name for the task.
  - b. (Optional) In the **Task description** field, type a description of the task.
  - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values stored in the RDM database.
3. Click the **Setup** tab. The Setup page is displayed.

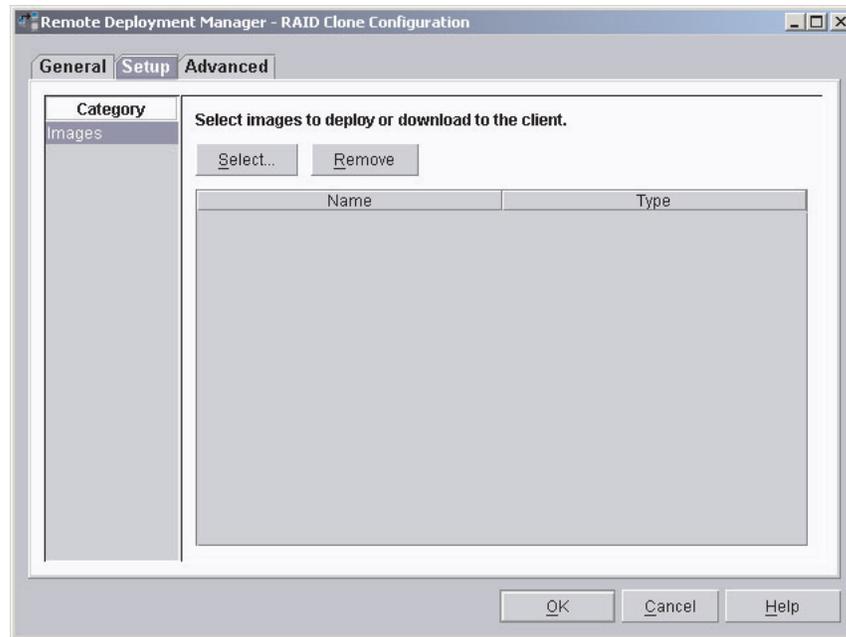


Figure 83. RAID Clone Configuration window: Setup page

4. In the right pane, click **Select**. The Image Selection window opens.

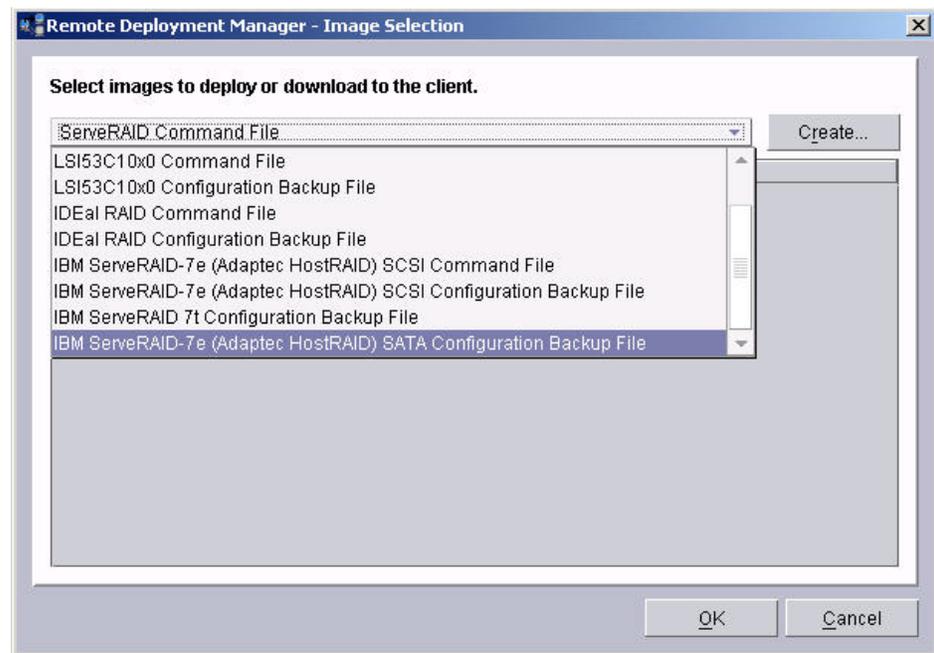


Figure 84. Image Selection window

5. If an image file for the task already exists, go to step 6. Otherwise, create a RAID Clone Configuration image. See “Creating a RAID Clone Configuration image” on page 144.
6. Select the RAID Clone Configuration file and then click **OK**. The Setup page is displayed again, and the RAID Clone Configuration file is displayed in the right pane.

7. Click **OK**. The new task is displayed under RAID Clone Configuration in the Tasks pane of IBM Director Console.

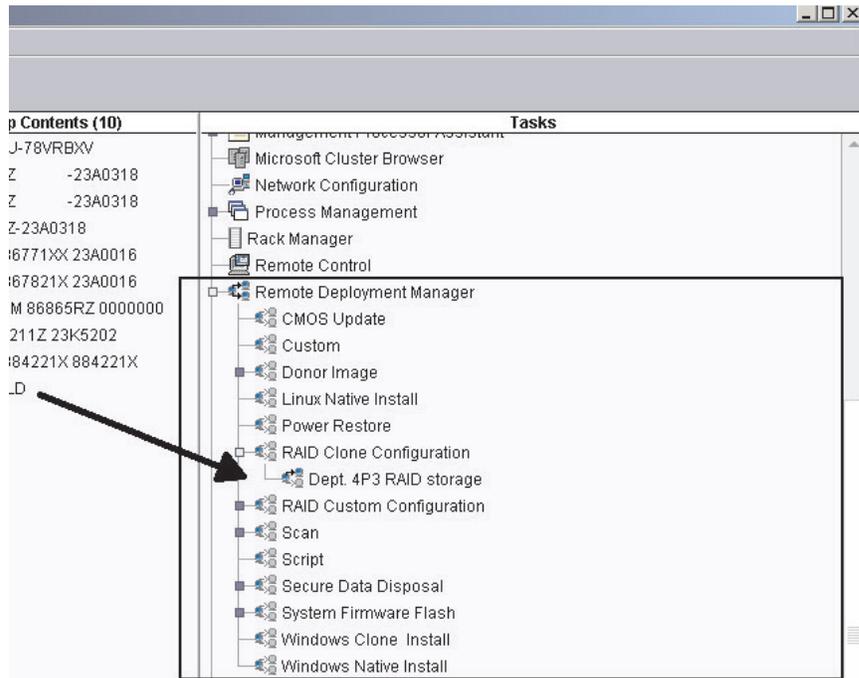


Figure 85. IBM Director Console Tasks pane: RAID Clone Configuration task

---

## Chapter 14. RAID Custom Configuration

You can use the RAID Custom Configuration template to create tasks that configure the following RAID controllers:

- IBM ServeRAID controllers
- Integrated SCSI controllers with RAID capabilities (LSI 1020 and LSI 1030)
- IDEal RAID controllers
- ServeRAID-7t SATA controllers
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers (for IntelliStation only)
- ServeRAID-8i SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SAS controllers
- ServeRAID-8e (Adaptec HostRAID) for SATA controllers
- LSI1064 (LSI Logic Integrated RAID) controllers
- ServeRAID-8k SAS controllers
- ServeRAID-8k-l SAS controllers

For information about RAID and RAID configurations, see the documentation that came with your RAID controller.

The Express RAID Configuration task is created already. The RAID Custom Configuration template uses a wizard to gather the RAID configuration information and create other tasks.

---

### Express RAID Configuration task

The Express RAID Configuration task is a built-in task. It configures a RAID controller by performing the following actions:

- Creates arrays by grouping together same-sized physical drives.
- Creates one logical drive per array.
- Assigns a RAID level according to the number of physical drives in array:
  - An array with a single physical drive is assigned RAID level-0 for those RAID controllers that support single-drive arrays.
  - An array with two physical drives is assigned RAID level-1.
  - An array with three physical drives is assigned either RAID level-1 with a spare physical drive or RAID level-5, depending on the RAID controller.
  - An array with four physical drives could be assigned RAID level 1, 5, 5EE, 6, or 10 depending on the RAID controller.
- If extra drives are available, and the RAID level is not RAID level-0, RAID level-5E, or RAID level-5EE, a hot-spare drive is designated for the controller.

---

### Creating a RAID Custom Configuration task

For ServeRAID-6 controllers and earlier models, you must create a new RAID Custom Configuration task if you want to:

- Use RAID level-1E, RAID level-5E, or RAID level-5EE
- Restrict the maximum size of a logical drive

Complete the following steps to create a RAID Custom Configuration task:

1. In the Tasks pane, click **RAID Custom Configuration** → **Create new task**. The RAID Custom Configuration window opens.

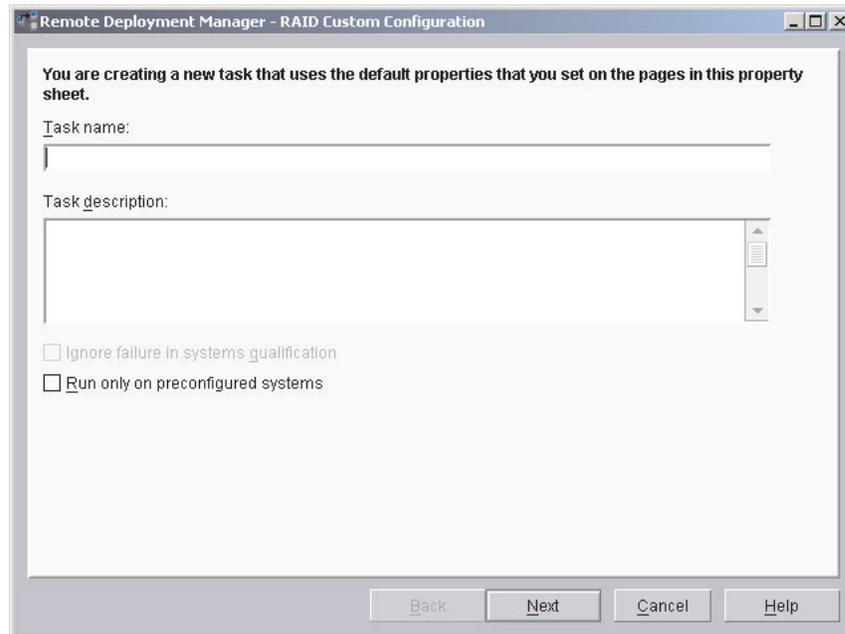


Figure 86. RAID Custom Configuration window

2. Set the basic properties for the task:
  - a. In the **Task name** field, type a unique name for the task.
  - b. In the **Task description** field, type a description of the task.
  - c. Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values that are stored already in the RDM database.
3. Click **Next**. The General Controller Information window opens.

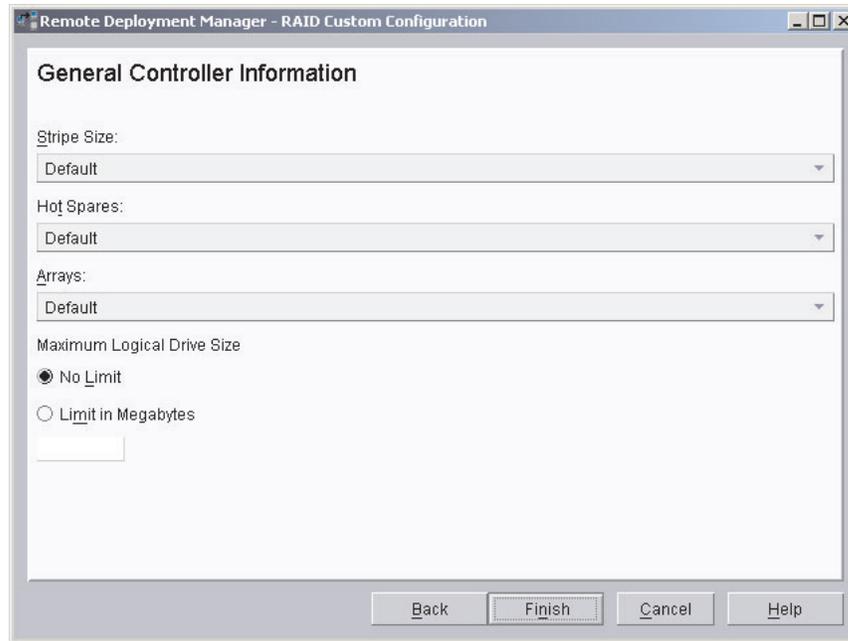


Figure 87. General Controller Information window

4. Configure the RAID controller:
  - a. In the **Stripe Size** field, select the stripe size, in bytes.

Table 6. Valid stripe sizes for RAID controllers

| RAID controller   | Valid stripe sizes  | Default stripe size |
|---|---|---------------------|
| ServeRAID controller  | 8 KB, 16 KB, 32 KB, and 64 KB   | 8 KB                |
| Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030) | 1 MB<br><b>Note:</b> If you select a stripe size other than Default or 1M, when the task is run, a system qualification error is generated indicating an invalid stripe size. | 1 MB                |
| IDEal RAID controller   | 64 KB, 128 KB, 256 KB, 512 KB, 1 MB, 2 MB, and 4 MB   | 64 KB               |
| ServeRAID-7e (Adaptec HostRAID) for SCSI controller                       | 16 KB, 32 KB, and 64 KB   | 64 KB               |
| ServeRAID-7t SATA controller  | 16 KB, 32 KB, and 64 KB   | 64 KB               |
| ServeRAID-7e (Adaptec HostRAID) for SATA controller                       | 16 KB, 32 KB, and 64 KB   | 32 KB               |
| ServeRAID-8i SAS controller   | 16 KB, 32 KB, 64 KB, 128 KB, 256 KB and 512 KB  | 64 KB               |
| ServeRAID-8e (Adaptec HostRAID) for SAS controller                        | 16 KB, 32 KB, and 64 KB   | 64 KB               |
| ServeRAID-8e (Adaptec HostRAID) for SATA controller                       | 16 KB, 32 KB, and 64 KB   | 64 KB               |
| LSI1064 (LSI Logic Integrated RAID) controller                            | There is no concept of stripe size for this controller, any size is accepted and ignored.   | N/A                 |

Table 6. Valid stripe sizes for RAID controllers (continued)

| RAID controller                           | Valid stripe sizes                                   | Default stripe size |
|---|--|---------------------|
| ServeRAID-8k (Adaptec HostRAID) for SAS   | 16 KB, 32 KB, 64 KB, 128 KB, 256 KB, 512 KB, 1024 KB | 256 KB              |
| ServeRAID-8k-l (Adaptec HostRAID) for SAS | 16 KB, 32 KB, 64 KB, 128 KB, 256 KB, 512 KB, 1024 KB | 256 KB              |

- b. In the **Hot Spares** field, select the number of hot-spare drives. You can select any number in the range 0 through 8. If the RAID level is 1, 1E, or 5, the default value is 1; otherwise, the default value is 0. Whether you can specify a hot-spare drive depends on the RAID level of the logical drive and the number of physical drives in the array.

**Note:** You cannot assign a hot-spare drive for a RAID level-0 logical drive. Nor can you assign a hot-spare drive for RAID level-5E and RAID level-5EE logical drives as they have built-in spare drives.

- c. In the **Arrays** field, select the number of arrays. You can select any number in the range 0 through 8. If you select the default value, the arrays are configured according to the algorithm that is used for the Express Configuration task.
- d. Set the maximum size of the logical drive. By default, **No Limit** is selected. If you select **Limit in Megabytes**, type the maximum size (in MB) of the logical drive.

**Notes:**

- 1) (IDEal RAID, ServeRAID-7e (Adaptec HostRAID) for SCSI, ServeRAID-7t SATA, ServeRAID-7e (Adaptec HostRAID) for SATA, and ServeRAID-8e (Adaptec HostRAID) for SAS or SATA controllers) You cannot limit the maximum size of the logical drive. These controllers use the maximum size even if you select **Limit in Megabytes**.
  - 2) (ServeRAID controllers and integrated SCSI controllers with RAID capabilities (LSI 1020 and LSI 1030)) Consider setting a maximum logical drive size if the operating system that you plan to install has restrictions concerning the size of logical drives.
5. If you selected **Default** in the **Arrays** field, go to step 11 on page 157. Otherwise, click **Next**. The Array Information window opens.

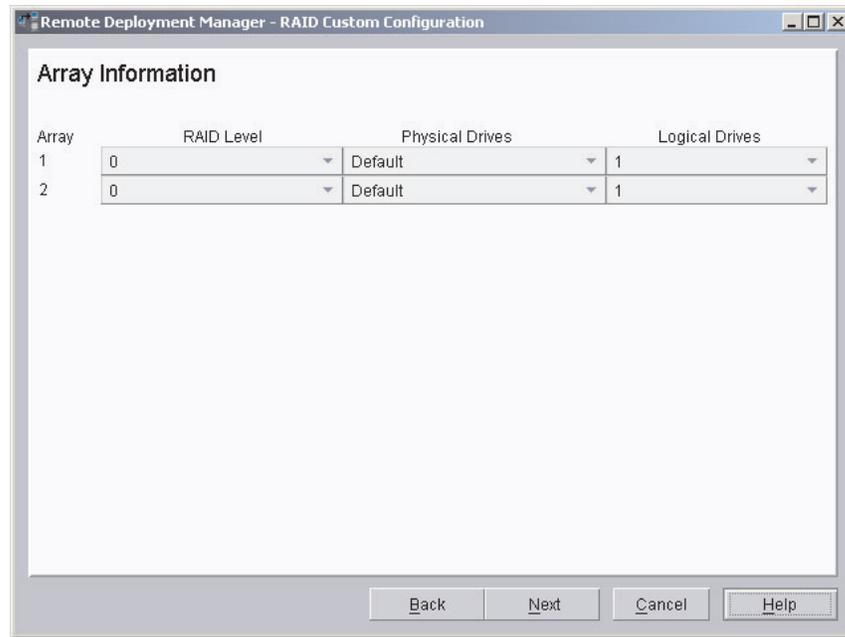


Figure 88. Array Information window

6. Configure the array:
  - a. In the **RAID Level** field, select a RAID level. This RAID level is used for all logical drives in the array.

Table 7. Valid RAID levels for RAID controllers

| RAID controller   | Valid RAID levels   |
|---|---|
| ServeRAID-4x,5i,6i,6M,7K controllers and earlier models                   | 0, 1, 1E, 5, 5E, or 10<br><b>Note:</b> If you select RAID level-5EE for one of these models, the RAID level is changed automatically to RAID level-5E.  |
| ServeRAID-6i controller and later models                                  | 0, 1, 1E, 5, 5EE, or 10<br><b>Note:</b> If you select RAID level-5E for one of these models, the RAID level is changed automatically to RAID level-5EE. |
| Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030) | 1 and 1E  |
| IDEal RAID controller   | 0 and 1   |
| ServeRAID-7e (Adaptec HostRAID) for SCSI controller                       | 0, 1, and 10  |
| ServeRAID-7t SATA controller  | 0, 1, 5, and 10   |
| ServeRAID-7e (Adaptec HostRAID) for SATA controller                       | 0, 1, and 10  |
| ServeRAID-8i SAS controller   | 0, 1, 1E, 5, 5EE, 6, 10, 50 and 60  |
| ServeRAID-8e (Adaptec HostRAID) for SAS controller                        | 0, 1, and 10  |
| ServeRAID-8e (Adaptec HostRAID) for SATA controller                       | 0, 1, and 10  |
| LSI1064 (LSI Logic Integrated RAID) controller                            | 0, 1, and 1E  |

Table 7. Valid RAID levels for RAID controllers (continued)

| RAID controller                                      | Valid RAID levels  |
|--|--------------------|
| ServeRAID-8k (Adaptec HostRAID) for SAS controller   | 0, 1, 1E, 5, 6, 10 |
| ServeRAID-8k-l (Adaptec HostRAID) for SAS controller | 0, 1, 10           |

- b. In the **Physical Drives** field, select the number of physical drives that make up the array. You can select any applicable number in the range 1 through 16, as long as the number of physical drives is available and allowable for the selected RAID level. If you select the default value, the minimum number of physical drives that are required for the specified RAID level is allocated. If you select the default value for the last array, the maximum number of available physical drives is allocated
- c. In the **Logical Drives** field, select the number of logical drives in the array. See the following table for the maximum number of logical drives that you can configure on each RAID controller.

Table 8. Maximum number of logical drives that you can configure for each RAID controller

| RAID controller   | Maximum number of logical drives |
|---|----------------------------------|
| ServeRAID controller  | 8                                |
| Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030) | 1                                |
| IDEal RAID controller   | 8                                |
| ServeRAID-7e (Adaptec HostRAID) for SCSI controller                       | 4                                |
| ServeRAID-7t SATA controller  | 4                                |
| ServeRAID-7e (Adaptec HostRAID) for SATA controller                       | 4                                |
| ServeRAID-8i SAS controller   | 8                                |
| ServeRAID-8e (Adaptec HostRAID) for SAS controller                        | 4                                |
| ServeRAID-8e (Adaptec HostRAID) for SATA controller                       | 4                                |
| ServeRAID-8k (Adaptec HostRAID) for SAS controller                        | 8                                |
| ServeRAID-8k-l (Adaptec HostRAID) for SAS controller                      | 8                                |

7. Repeat steps 6a on page 155 to 6c for each array.
8. Click **Next**. The Logical Drive Information window opens.

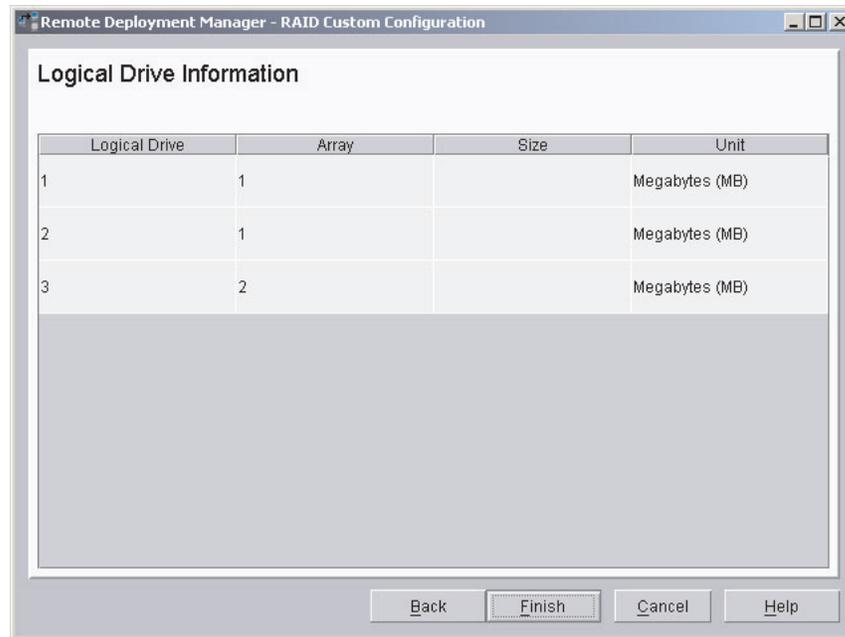


Figure 89. Logical Drive Information window

9. Configure the logical drive:
  - a. In the **Size** field, type the size of the logical drive (in MB or as a percentage of the available space).
  - b. In the **Unit** field, select the unit of measurement.

**Notes:**

- a. (IDEal RAID, ServeRAID-7e (Adaptec HostRAID) for SCSI, ServeRAID-7t SATA, and ServeRAID-7e (Adaptec HostRAID) for SATA controllers) Regardless of the size that you select, the logical drive is configured to use the maximum available physical drive space.
  - b. Logical drives that are assigned a size in MB are configured before logical drives that are assigned a size as a percentage of the available space. For example, if you specify that an array contains three logical drives of sizes 2000 MB, 50%, and 4000 MB, and if the total available size for the array is 16 GB, the size of logical drive 2 is 5 GB ( $.50 * (16 \text{ GB} - 6 \text{ GB})$ ).
10. Repeat steps 9a to 9b for each logical drive.
  11. Click **Finish**. The new task is displayed in the Tasks pane under the RAID Custom Configuration task.

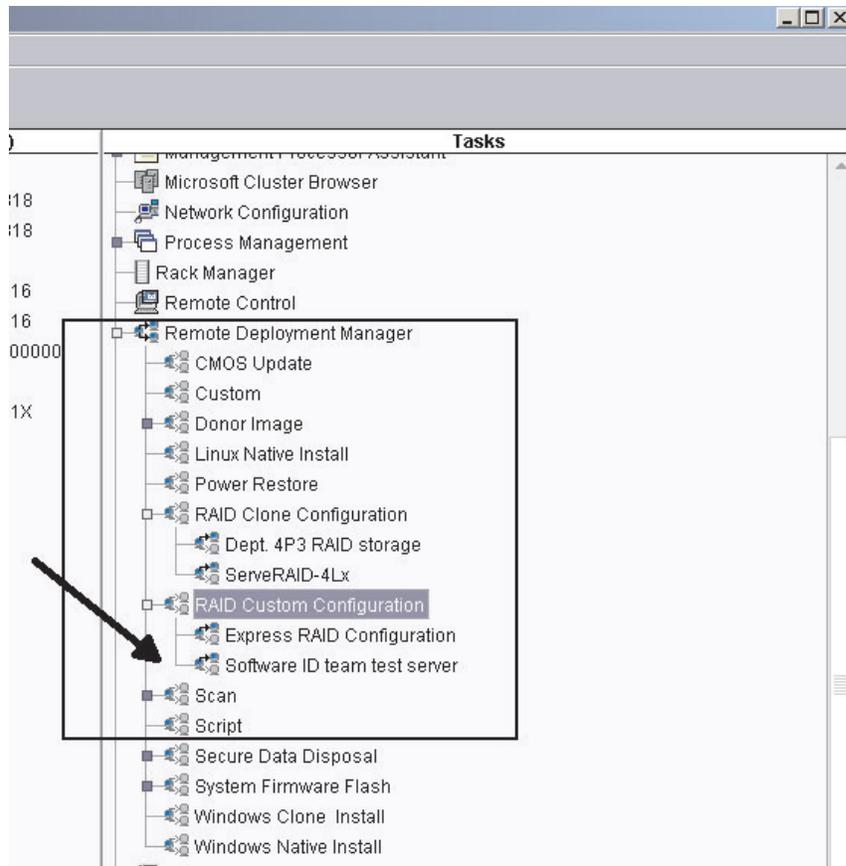


Figure 90. IBM Director Console Tasks pane: RAID Custom Configuration task

---

## Chapter 15. Remote Storage Configuration

You can use the Remote Storage Configuration template to create tasks that allocate and deallocate a logical unit number (LUN) on a remote storage network. This chapter provides information about how to use the built-in Remote Storage Configuration tasks that are installed with RDM, and it also provides the steps that are required to create remote storage configuration tasks.

Working with network storage devices requires the following tasks:

- Add the network storage devices. Use the Network Storage tool to add information about your network storage devices. See “Network storage devices and switches” on page 162 for more information.
- Configure the remote storage. Use the Remote Storage Configuration task to configure your network storage devices. See “Configuring remote storage” on page 165 for more information.

FASTT Storage Manager 8.42 or later must be installed on the RDM server. The path environment variable must include the directory that contains SMcli.exe. The Storage Partitioning Premium Feature key must also be installed on the FASTT storage server. The QLogic adapters in the fabric must have version 1.35 or later BIOS code.

---

### Supported devices

See the compatibility guide for the list of supported Fibre Channel storage servers and switches. Nonsupported switches can be a functional part of the fabric if one of the supported BladeCenter Fibre Channel switches is present in the network.

Shared LUNs are not supported by remote storage in RDM 4.20.3. This has the following effects:

- You cannot create a shared LUN by using an Allocate LUN task.
- The Get profile task will not save information about shared LUNs, and put profile will not restore any shared LUN information.
- The Delete Mapping and LUNs task will not delete any shared LUN or its mapping.
- The Configure Fibre host bus adapter (HBA) task will not configure boot to a shared LUN.

---

### Network storage configuration examples

Network storage devices can have different configurations. Each of the three network configurations that are shown use a BladeCenter chassis with a Fibre Channel switch. In each configuration, RDM Server must have IP connectivity to both the network storage devices and the BladeCenter unit.

Figure 91 on page 160 is a basic network storage configuration.

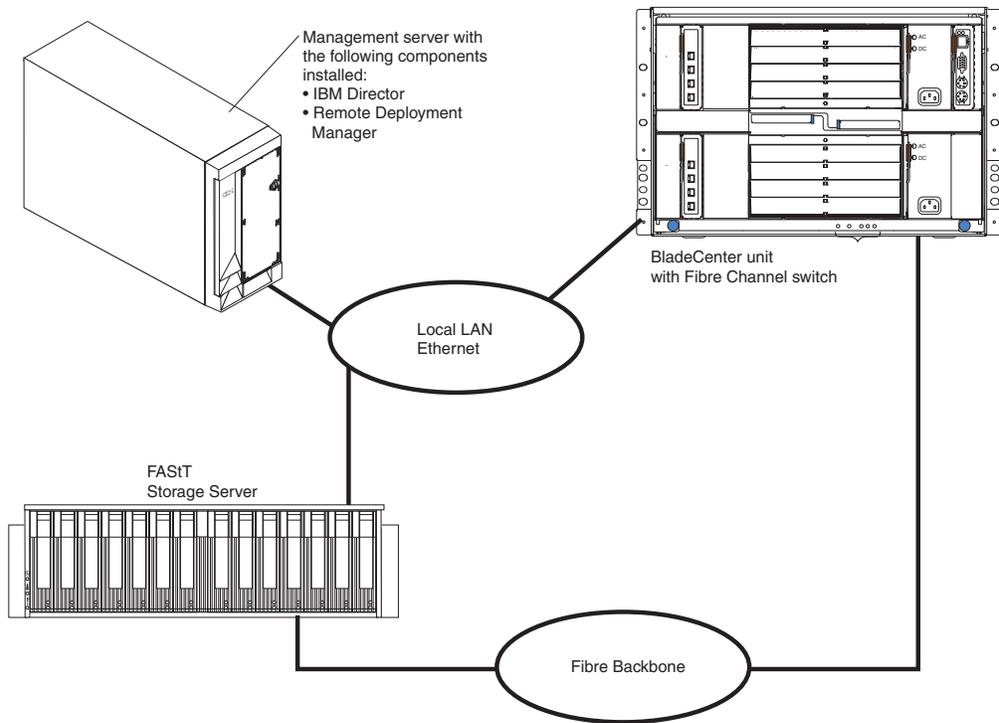


Figure 91. Basic network storage configuration

Figure 92 on page 161 shows a configuration that incorporates an external Fibre Channel switch or stand-alone server into the fabric. The stand-alone server must have a QLogic Fibre Channel adapter installed.

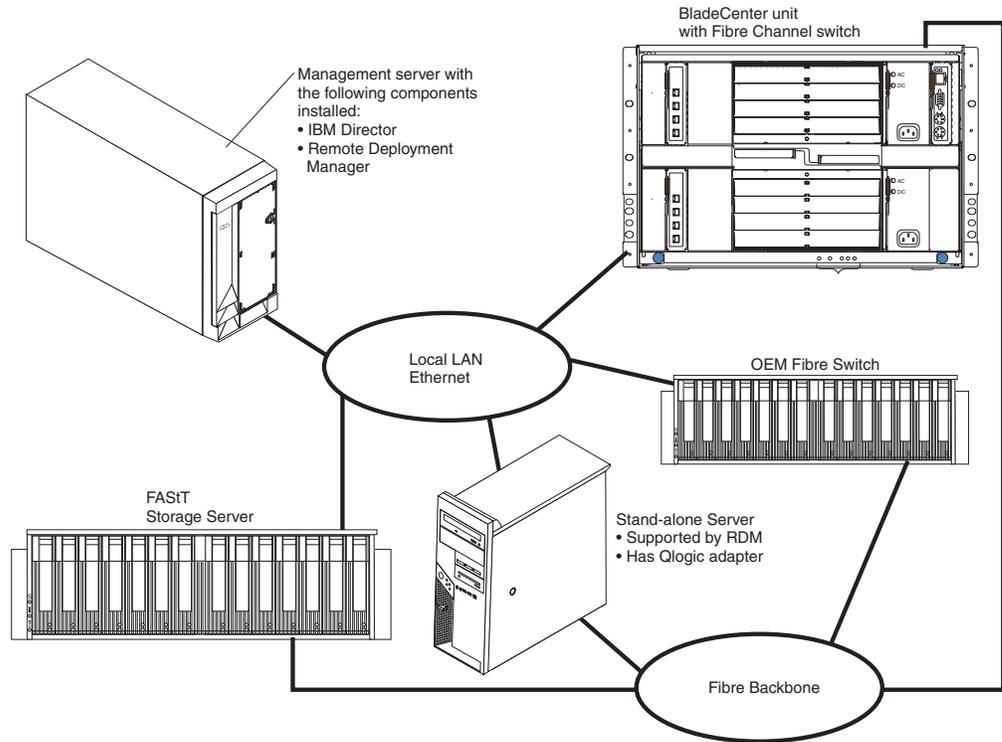


Figure 92. Network storage configuration with external Fibre Channel switch and stand-alone server

Figure 93 on page 162 shows a configuration of storage devices in a remote network. The remote storage devices must be able to communicate over Ethernet with RDM Server.

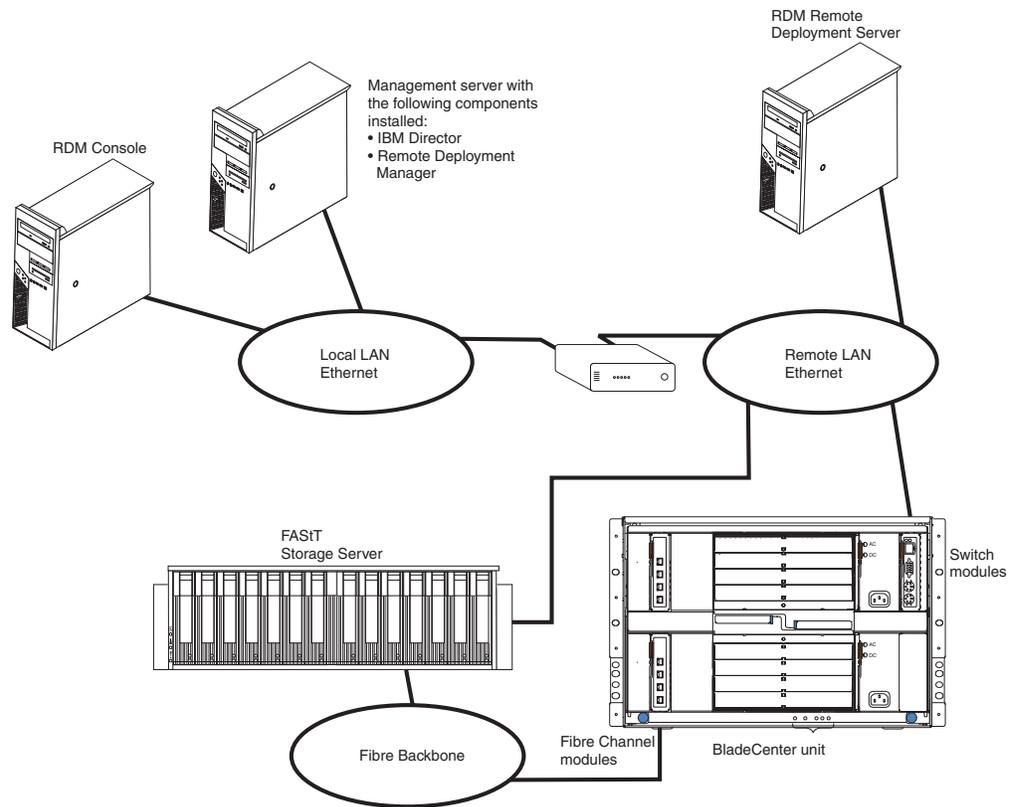


Figure 93. Network storage configuration with Remote Deployment Server

## Network storage devices and switches

RDM provides a Network Storage notebook in which you can enter information about the Fibre Channel storage servers and switches in the storage area network (SAN). You can use Remote Storage Configuration to add network storage devices and switches to the SAN.

### Adding a network storage device

Complete the following steps to add information about a network storage device:

1. In IBM Director Console click **Tasks → Remote Deployment Manager Tools → Network Storage**. The Network Storage Configuration window opens. Previously added storage devices and their associated information are displayed.

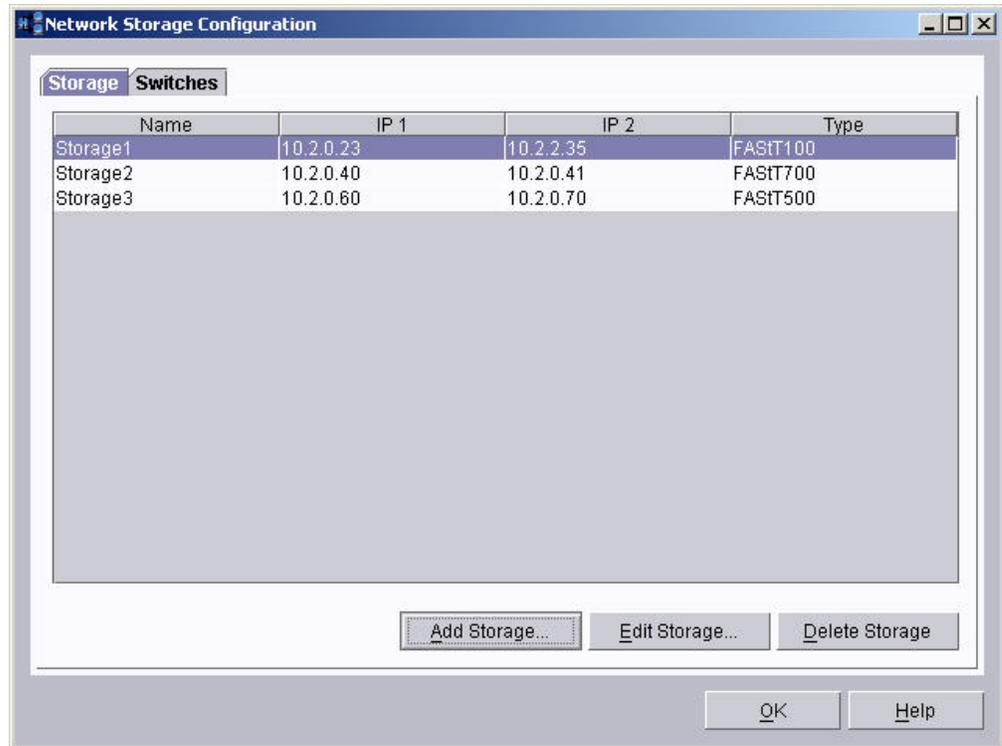


Figure 94. Network Storage Configuration window: Storage page

2. Click **Add Storage** to add a network storage device. The Add Storage window opens.

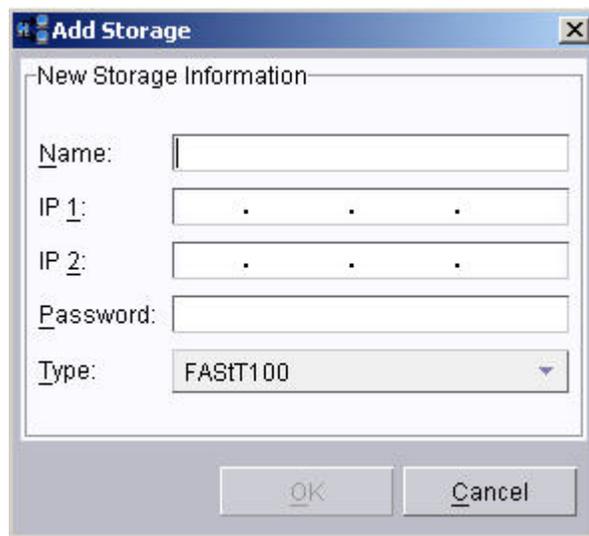


Figure 95. Add Storage window

3. In the **Name** field, type a name (maximum of 255 characters) to identify the network storage device in the RDM storage device list. There are no character restrictions for this field.
4. In the **IP 1** field, type the first IP address of the selected network storage device that you want to add.

5. If both controllers on the FASTT storage server are enabled, in the **IP 2** field, type an IP address.
6. If a password has been enabled on the FASTT storage server, in the **Password** field, type the password.
7. In the **Type** field, select the storage device type for the network storage device. The following choices are available:
  - DS4100/FASTT100
  - FASTT200
  - FASTT500
  - DS4300/FASTT600
  - DS4400/FASTT700
  - DS4500/FASTT900
8. Click **OK** to add the selected data for the new storage device. The Network Storage Configuration window opens.

## Adding a switch

Complete the following steps to add information about a switch:

1. In IBM Director Console click **Tasks → Remote Deployment Manager Tools → Network Storage**. The Network Storage Configuration window opens.
2. Click the **Switches** tab. The Switches page is displayed. Previously added switches and their associated information are displayed.

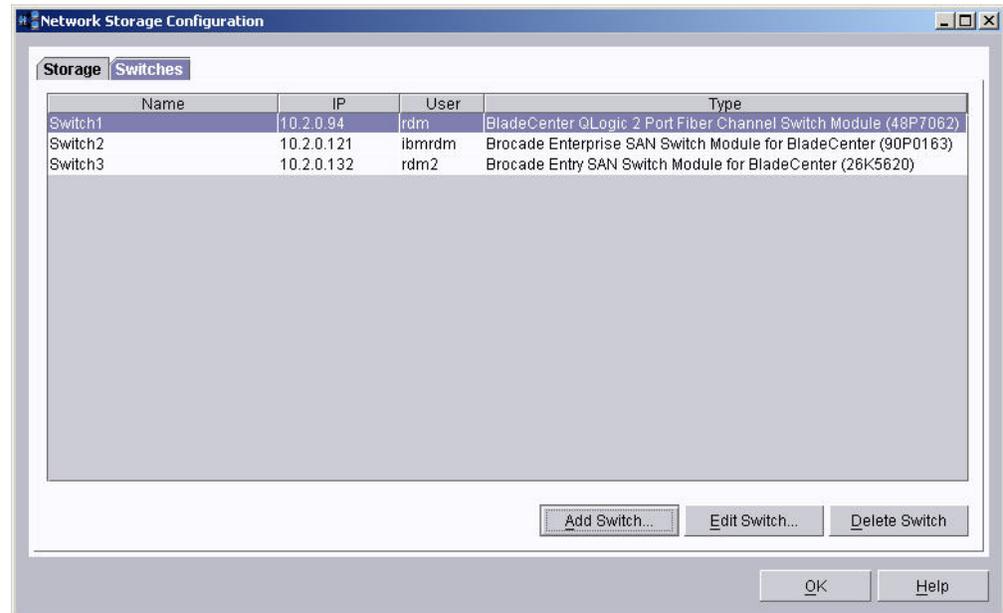


Figure 96. Network Storage Configuration window: Switches page

3. Click **Add Switch**. The Add Switch window opens.

**Note:** When adding a switch, add only two per fabric, one as the primary and the second as a backup-failover switch.

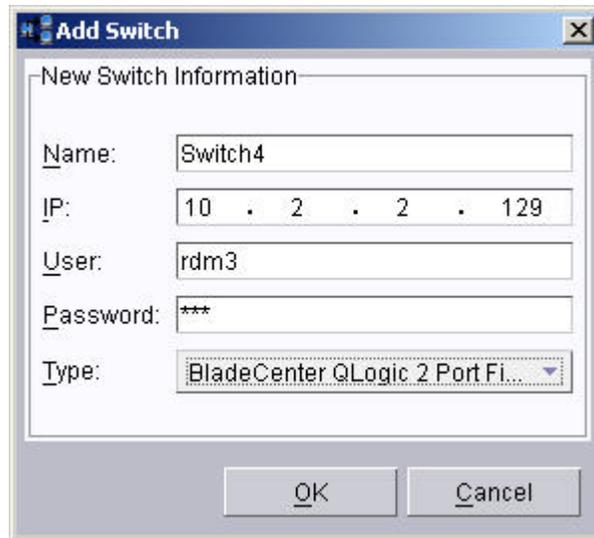


Figure 97. Add Switch window

4. In the **Name** field, type a descriptive name for the switch.
5. In the **IP** field, type the IP address of the switch.
6. If security has been enabled for the switch, in the **User** field, type the user ID that is used to access the switch.
7. In the **Password** field, type a password.
8. In the **Type** field, select the switch type from the following choices:
  - BladeCenter McData 6 Port Fibre Channel Switch Module
  - BladeCenter QLogic 2 Port Fibre Channel Switch Module
  - BladeCenter QLogic 4 GB Fibre Channel Switch Module
  - BladeCenter QLogic 6 Port Fibre Channel Switch Module
  - Brocade 4 GB SAN Switch Module for BladeCenter
  - Brocade Enterprise SAN Switch Module for BladeCenter
  - Brocade Entry SAN Switch Module for BladeCenter
9. Click **OK**. The Network Storage Configuration window opens.

---

## Configuring remote storage

After you add the required information about your network storage devices and switches, you must configure them by using the Remote Storage Configuration task. You can modify and configure remote storage in the following ways:

- Modify the defaults and policy settings in the Storage Server Provisioning Tool (SSPT) file SSPTSetting.xml
- Create a new Allocate LUN task
- Configure a system by using one of the following options:
  - User-created Allocate LUN task
  - One of the five built-in Remote Storage Configuration tasks

## Modifying the SSPTSetting.xml file

SSPT performs the background remote storage configuration function for RDM. The Remote Storage Configuration task options are controlled by the SSPTSetting.xml file, which is in the RDM\local directory. The settings in the SSPTSetting.xml file

affect all the remote storage tasks except the Configure HBA and Get Host Profile tasks. This file controls the following items:

- Zoning policy
- Storage allocation policy
- Default zone, host groups, and device names (for example, LUN prefix)

You can change the configuration by modifying the values in the SSPTSetting.xml. The modified values do not take effect until you restart IBM Director. The following table contains information about the commonly used fields in the SSPTSetting.xml file and what those modifiable fields represent.

Table 9. SSPTSetting.xml file field definitions

| Element                           | Content  |
|-----------------------------------|--|
| HostGroupName                     | Use this field to specify the default host group name RDM_Group.   |
| DeviceNamePrefix                  | Use this field to specify the default LUN name prefix DEV_.  |
| PoolAllocationPolicy              | Use the default MINIMAL to select the smallest drive that will satisfy the requested LUN size.<br><br>If you select the MAXIMAL option the configuration takes the largest number of same size drives that will satisfy the requested LUN size.  |
| UseOfDifferentSizedDevicesEnabled | Use this field to specify the use of different size devices to satisfy the storage request.<br><br>If you get a failure message that states Not enough space and the FAStT Storage Manager shows that you have enough storage space for the request, change this setting to true.<br><br>Enabling the use of different sized storage devices is one solution that might fix the problem and let you complete the storage request.<br><br>The default is false. |
| FabricZoningEnabled               | Use this to set up zones for future connections.<br><b>Note:</b> If zoning was previously disabled, any connections that were made through the switch will be lost and need to be manually added to the zone, after enabling this option.<br><br>The default is true.  |
| FabricNumberOfZones               | Use this field to specify the maximum number of Fibre Channel zones you want created by SSPT.<br><br>The default value is 16.  |
| FabricZoneName                    | Use this field to specify the zone name prefix that SSPT will use.<br><br>The default name is RDMZone.   |

Table 9. SSPTSetting.xml file field definitions (continued)

| Element               | Content   |
|-----------------------|---|
| FabricInstallZoneName | <p>Use this field to specify the zone name prefix that RDM/SSPT will use when installing operating systems.</p> <p>SSPT will create a special install zone to eliminate multiple paths during installations.</p> <p>The default name is RDMInstallZone.</p> |
| FabricZoneSetName     | <p>Use this field to specify the zone set name that SSPT will use if no active zone set has been found in the fabric.</p> <p>The default name is RDMZoneSet.</p>  |

## Creating an Allocate LUN task

To configure storage devices that are on a remote SAN, RDM uses the values you set in the template to allocate and deallocate LUNs when you deploy a server. To access the template expand the Remote Deployment Manager group. Right-click the **Remote Storage Configuration** task. Two options are available:

- Allocate LUN Task
- Edit template

Select **Allocate LUN Task** then **Create New** to define the characteristics of a storage server and assign a name to that LUN. This task allocates a LUN on a remote storage server and configures the client HBA to detect any boot LUN (LUN 0) that is allocated. The Create New Allocate LUN task uses the standard RDM notebook that consists of these tabs: **General**, **Setup**, and **Advanced**. Use the Setup page to create, configure and delete LUNs.

To create a new Allocate LUN task, complete the following steps:

1. From the IBM Director Console Tasks pane, right-click **Remote Storage Configuration**.
2. Click **Create New Allocate LUN Task**. The Remote Storage Configuration window opens.

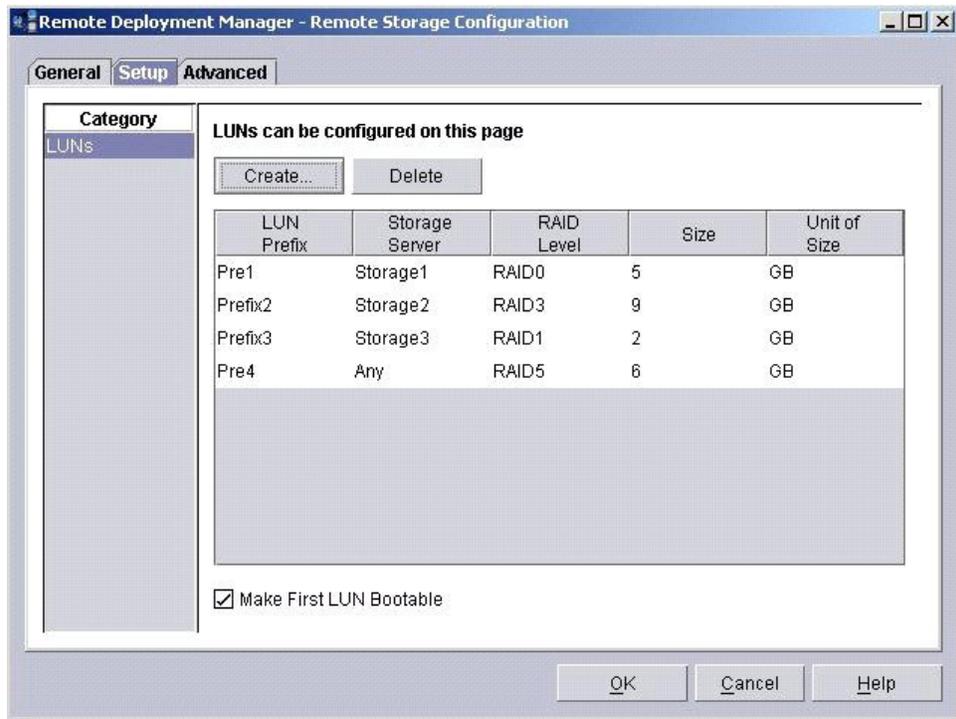


Figure 98. Remote Storage Configuration: Configuring LUNs

3. Enter the General and Advanced tab information. The **General** and **Advanced** properties are explained in Chapter 3, “Working with RDM templates,” on page 15. The remainder of this procedure provides information about the Setup properties for Remote Storage Configuration.
4. Click the **Setup** tab.
5. Click the **Make First LUN Bootable** check box to make the first LUN in the list LUN 0. This check box is selected by default. If you do not select this check box the first LUN receives the first available LUN number (for example LUN 1).
6. Click **Create**. The Create LUN window opens.

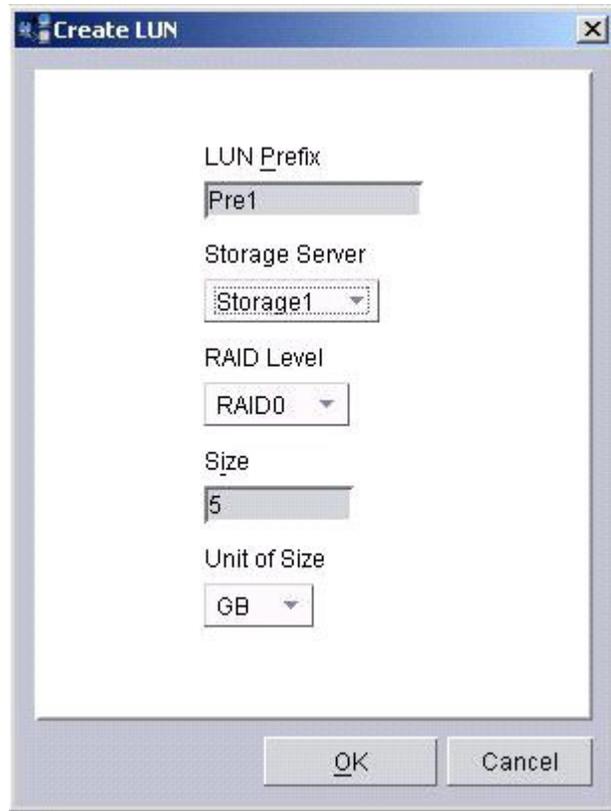


Figure 99. Create LUN window

7. In the **LUN Prefix** field, type a LUN prefix (maximum of 10 characters and double quotes can not be used in the name). This prefix is combined with a unique ID to create a LUN name. If you leave this field blank, the default prefix **DEV\_** is used. You can modify the default prefix in the SSPTSetting.xml file. See “Modifying the SSPTSetting.xml file” on page 165.
8. In the **Storage Server** field, select a storage server to allocate space from, or select **Any** to allocate space from any available storage server. This field lists all the supported storage servers.
9. In the **RAID Level** field, select the applicable storage server. This field lists all the supported RAID levels for the currently selected storage server. If the selected storage server is **Any**, the list includes all RAID levels that are supported by any supported storage server.
10. In the **Size** field, type a number (maximum of 6 digits) to specify the amount of space to allocate on the storage server. The number that you type represents Megabyte (MB), Gigabyte (GB), or Terabyte (TB), depending on which unit of size that you selected in the **Unit of Size** field.
11. In the **Unit of Size** field, select a unit of size, which is used with the number that you typed in the **Size** field.
12. Click **OK**. The Remote Storage Configuration window opens.

## Configuring a system on a user-created Allocate LUN task

You can configure a system on a Remote Storage task that you created by using the Allocate LUN task or one of the five built-in tasks.

Complete the following steps to configure a system by using a user-created allocate LUN task:

1. Expand the **Remote Storage Configuration** group icon.
2. Drag a target system onto a user-created Allocate LUN task.
3. Click **Configure systems**.

If qualification succeeds, the STC page displays the selected LUN that you dropped onto the task, the SystemName is the name of the target system. You can configure the target system by modifying the fields on the STC page. (In the following illustration, the user-created Allocate LUN task is named “allocate 10 GB boot lun”).

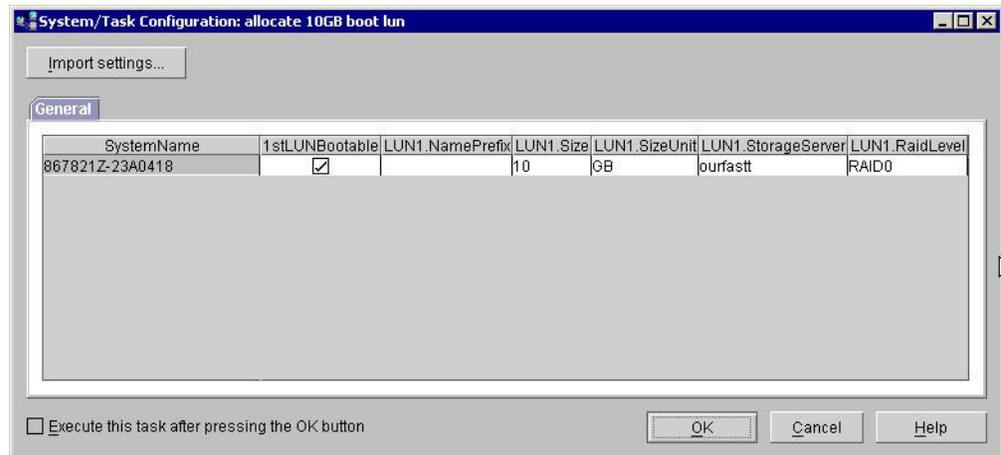


Figure 100. “System/Task Configuration: allocate 10 GB boot lun” window

4. In the **1stLUNBootable** field, select the check box to make the first LUN in the list LUN 0. This check box is selected by default.
5. In the **LUN1.NamePrefix** field, type a LUN prefix (maximum of 10 characters). This prefix is combined with a unique ID to create a LUN name. If you leave this field blank, a default prefix is used.
6. In the **LUN1.Size** field, type a number (maximum of 6 digits) to specify the amount of space to allocate on the storage server. The number that you type represents MB, GB, or TB, depending on which unit of size that you selected in the **LUN1.SizeUnit** field.
7. In the **LUN1.SizeUnit** field, select a unit of size, which is used with the number that you typed in the **LUN1.Size** field.
8. In the **LUN1.StorageServer** field, select a storage server to allocate space from, or select **Any** to allocate space from any available storage server. This field lists all the supported storage servers.
9. In the **LUN1.RAIDLevel** field, select the applicable storage server. This field lists all the supported RAID levels for the currently selected storage server. If the selected storage server is **Any**, the list includes all RAID levels that are supported by any supported storage server.
10. Click **OK**.

## Using built-in Remote Storage Configuration tasks

You can configure remote storage by running one of the five built-in tasks of Remote Storage Configuration. To run these tasks, expand the Remote Storage Configuration group icon. The five built-in tasks are displayed.



Figure 101. Remote Storage Configuration: Five built-in tasks

**Note:** In the Allocate LUN task and all five built-in tasks, RDM performs system qualification when you click **Configure systems**. The following error messages can occur during the system qualification process:

- If the target system does not contain a supported host bus adapter (HBA) you will get an error message stating No fibre HBA detected.
- If no fabric name is shown in the host bus adapter table, when viewing the IBM Director inventory on the target system, you will get an error message stating No fabric name detected. Please ensure that the system is connected to an active fabric and rescan it.

The following sections explain how to use each of the five built-in tasks.

### Configure Fibre HBA Boot Settings

This task configures the host bus adapter to boot from a LUN 0 that is currently allocated and mapped to the system on a remote storage server. You can modify the boot settings for any LUN 0. A system can have only one LUN 0 mapped to it per server. You cannot use this task if you do not have a LUN 0 on the server.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon. Select a blade with a fibre HBA and drag it to the **Configure Fibre HBA Boot Settings** task. Click **Configure systems**.

**Note:** You might receive a qualification error message stating This system does not have any LUNs mapped. This error occurs when no LUNs are defined for the target system on any storage server.

3. If qualification succeeds, the System/Task Configuration (STC) page is displayed, and it lists all the LUNs that are currently mapped to the system.

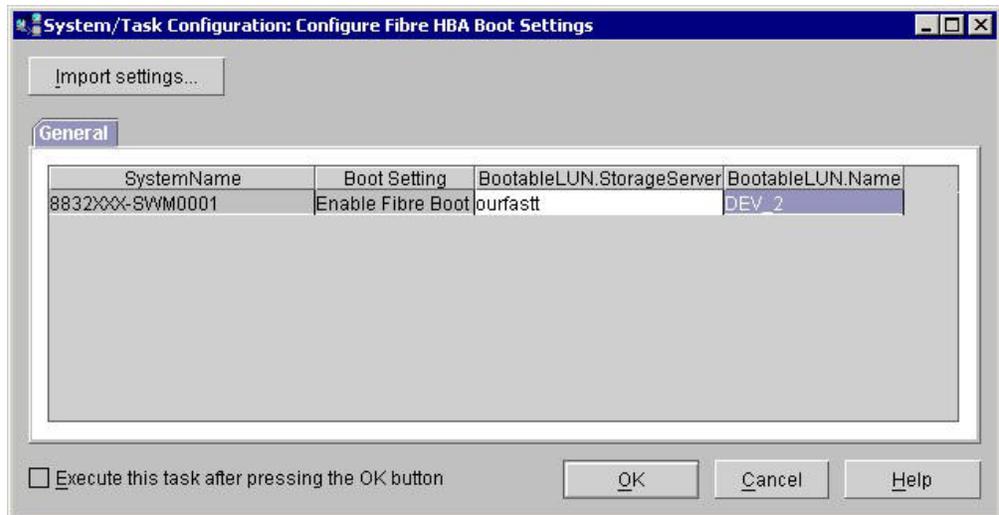


Figure 102. System/Task Configuration: Configure Fibre HBA Boot Settings

The **SystemName** field contains the name of the target system you are configuring. This field is not editable.

4. In the **BootableLUN.StorageServer** field, select the storage server to which you want the target system to boot. This field lists all the supported storage servers that are configured and have bootable LUNs (LUN 0).
5. In the **BootLUN.Name** field, enter or select the name of the boot LUN that is mapped to the server listed in the **BootableLUN.StorageServer** field.
6. Use the **Boot Setting** field to modify the boot setting for the LUN currently selected.
7. Click **OK**.

### Delete Mapping

This task deletes the LUN mappings for the target system. The actual LUNs are not deleted.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Delete Mapping**. Click **Configure systems**.

**Note:** A qualification error message states This system does not have any LUNs mapped. This error occurs when no LUNs are defined for the target system on any storage server.

3. If qualification succeeds, the STC page is displayed, and it lists all the LUNs that are currently mapped to the system.

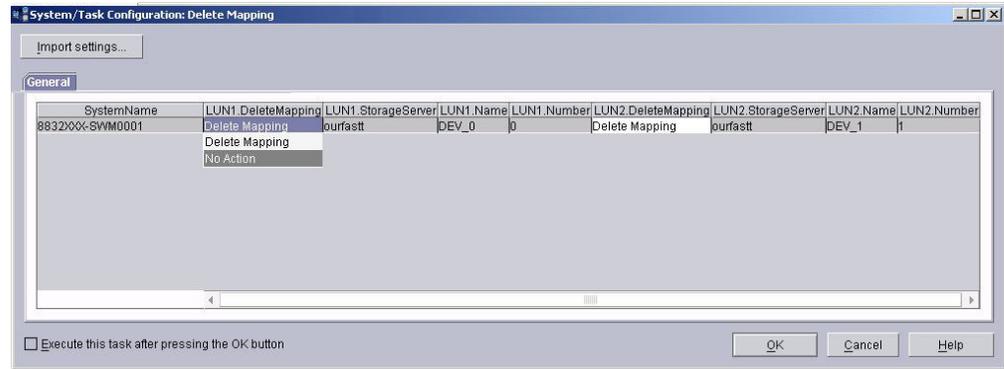


Figure 103. System/Task Configuration: Delete Mapping

4. In the **DeleteMapping** field, click one of the following options:
  - Select **Delete Mapping** to delete the mapping for the selected LUN (LUN1 or LUN2) on the selected system.
  - Select **No Action** to keep the current mapping.

**Note:** The default for this task is **Delete Mapping**. When you drag a system onto the Delete Mapping task and it runs without displaying the STC page, this task deletes all the mappings.

5. Click **OK**.

## Delete Mapping and LUNs

This task deletes the LUN mappings for the target system and deletes the LUNs.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Delete Mapping and LUNs**. Click **Configure systems**.

**Note:** A qualification error message states This system does not have any LUNs mapped. This error occurs when no LUNs are defined for the target system on any storage server.

3. If qualification succeeds, the STC page is displayed, and it lists all the LUNs that are currently mapped to the system.

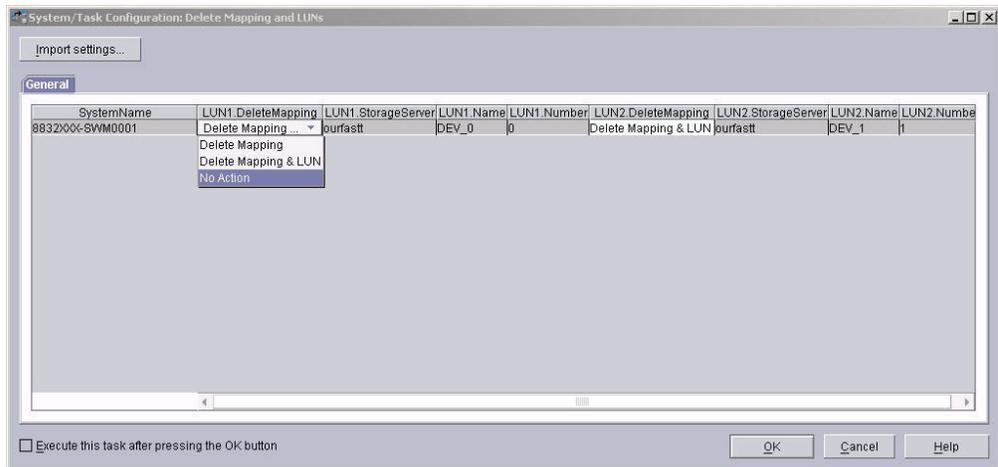


Figure 104. System/Task Configuration: Delete Mapping and LUNs

4. In the **DeleteMapping** field, select one of the following options:
  - Select **Delete Mapping** to delete the mapping for the selected LUN (LUN1 or LUN2) on the selected system.
  - Select **Delete Mapping & LUN** to delete the mapping for the LUN on the selected system and delete the LUN configuration.

**Note:** The default for this task is **Delete Mapping & LUN**. When you drag a target system onto the Delete Mapping and LUN task and it runs, without displaying the STC page, this task deletes all the mappings and associated LUNs.

- Select **No Action** to keep the current mapping.
5. Click **OK**.

## Get Profile

This task captures the current mapping of remote storage LUNs to a target system and the corresponding fabric settings. Get Profile stores this information in a remote storage image.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Get Profile**. Click **Configure systems**.
3. If qualification succeeds, the STC page is displayed, and it lists all the LUNs that are currently mapped to the system.

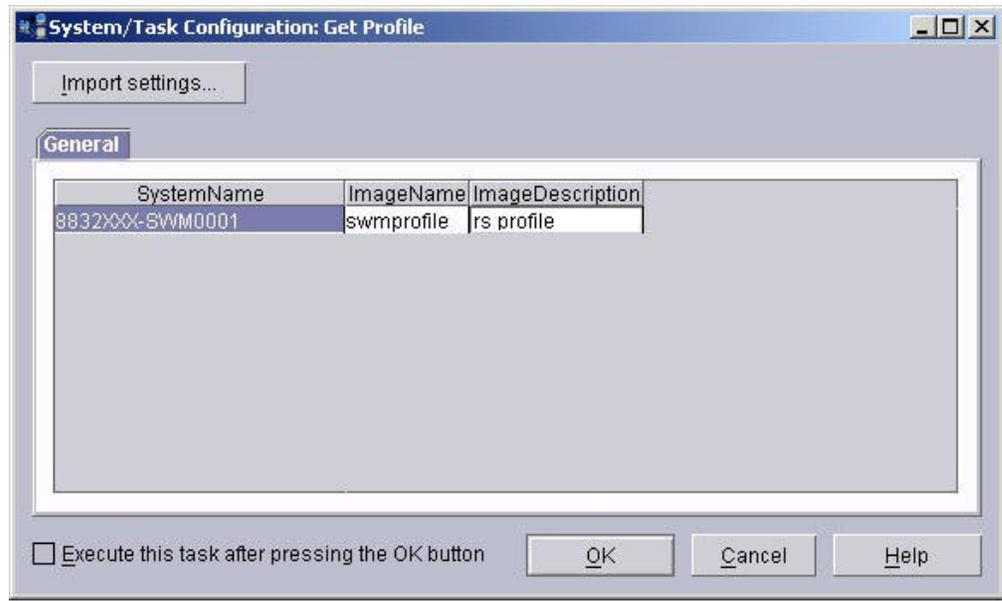


Figure 105. System/Task Configuration: Get Profile

4. In the **ImageName** field, type the name of profile image to which you want to save the LUN configuration. The name must be unique.
5. In the **ImageDescription** field (optional), type a brief description of the profile image that you are creating.
6. Click **OK**.

### Put Profile

This task restores or distributes the mappings that were previously saved through the Get Profile task. It also reconfigures the target system to detect the new mappings.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Put Profile**. Click **Configure systems**.
3. If qualification succeeds, the STC page is displayed.

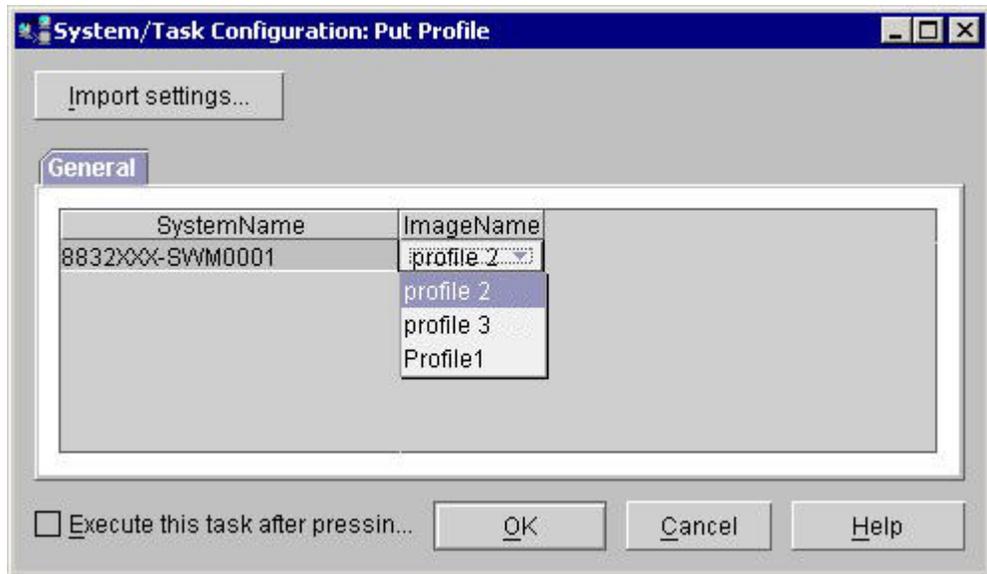


Figure 106. System/Task Configuration: Put Profile

4. In the **ImageName** field, select the profile image that contains the LUN configuration that you want to deploy.
5. Click **OK**.

---

## Configuring remote storage tasks for dual boot

You can configure remote storage tasks for dual boot. After deploying operating system environments to the LUNs you configured and obtained their host profiles, you can schedule tasks to map the host to a different LUN (operating system) at specific times. The following illustration shows a host (Server Z) with two LUNs, one with a Windows image and the other with a Linux image. The task maps each LUN to the host at the previously scheduled time.

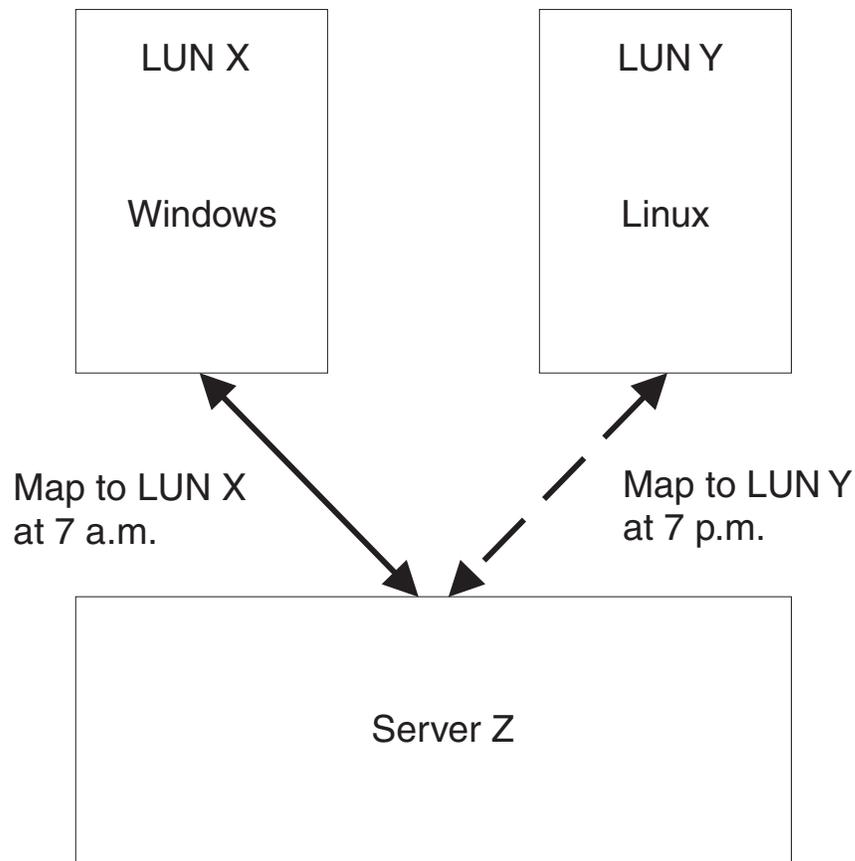


Figure 107. Configuring remote storage for dual-boot operating systems

The following procedure is an example of how to create and schedule a dual-boot environment on remote storage:

1. Select **Create New Allocate LUN Task** to allocate boot LUN X to Server Z.
2. Deploy the Windows operating system and applications to LUN X.
3. Select **Get Profile** on LUN X to obtain a Windows profile image for Server Z (the image name is windows\_serverz).
4. Select **Delete Mapping** to delete the Server Z mapping to LUN X.
5. Select **Create New Allocate LUN Task** to allocate boot LUN Y to Server Z.
6. Deploy the Linux operating system and applications to LUN Y.
7. Select **Get Profile** on LUN Y to obtain a Linux profile image for Server Z (image name linux\_serverz).
8. Select **Delete Mapping** to delete the Server Z mapping to LUN Y.
9. Copy the Put Profile task to create a new Put Profile task for the Windows environment (windows\_put).
10. Drag Server Z onto the Windows Put Profile task (windows\_put) and configure it, specifying the Windows image name windows\_serverz.
11. Copy the Put Profile task to create a new Put Profile task for the Linux environment (linux\_put).
12. Drag Server Z onto the Linux Put Profile task (linux\_put) and configure it, specifying the Linux image name linux\_serverz.
13. Use the IBM Director Scheduler to schedule the windows\_put task to map the Windows profile on Server Z at 7 a.m.

14. Use the Director Scheduler to schedule the `linux_put` task to map the Linux profile on Server Z at 7 p.m.

You can expand this same procedure to boot a number of different images from a single server. You also can use this procedure to dynamically move images between different servers.

---

## Chapter 16. Scan

You can use the Scan template to create tasks that query the hardware of target systems and add that inventory information to the IBM Director database. Since RDM tasks cannot run until a system has been scanned, the Scan task is the first RDM task that you run against each target system. The Scan task accomplishes the following:

- Adds the target system to IBM Director Console, if the system was not already displayed
- Obtains hardware information about the system.
- Optionally, obtains user-defined information that you enter at the target system.
- Optionally, renames a BladeCenter blade.

**Note:** In IBM Director Console, the Group Contents pane lists all of the systems that are detected by IBM Director. Some of these systems could have been discovered by using the RDM Scan task and some could have been discovered by using one of the IBM Director discovery tools. If one of these systems has not been scanned by using the RDM Scan task, some of the other RDM tasks cannot run successfully against that system. Make sure that an RDM Scan task has been run against each system that is displayed in the Group Contents pane before you try to run another RDM task against it.

---

### Basic Scan task

The Basic Scan task is a built-in task. It is the default Scan task that is used by RDM when a system that is unknown to RDM boots to the network. Typically, the only modification that you will make to the Basic Scan task is to enable BladeCenter naming. You should create a new Scan task if you require additional customization.

**Notes:**

1. A system with a fibre HBA card requires an extra reboot to complete a Scan task. To discover and scan a system with a fibre HBA card for the first time, do one of the following:
  - Change the primary boot sequence to boot to the network before the hard disk and then power on the system.
  - Power on the system and press F12 to boot to the network. When the system reboots performing a Scan task, press F12 again to boot to the network.
  - Discover the systems using IBM Director discovery tools and then run a Scan task on these systems.
2. No RDM tasks can be run against a native managed object, including the Basic Scan task. A native managed object (NMO) is a system that is managed through the installation of IBM Director Agent.

## Creating a Scan task

You can use the Scan template to create new Scan tasks. The values set in the template are the defaults that are used when you create a new Scan task.

Complete the following steps to create a new Scan task:

1. In the Tasks pane, right-click **Scan** then click **Create New Task**. The Scan window opens and the General page is displayed.

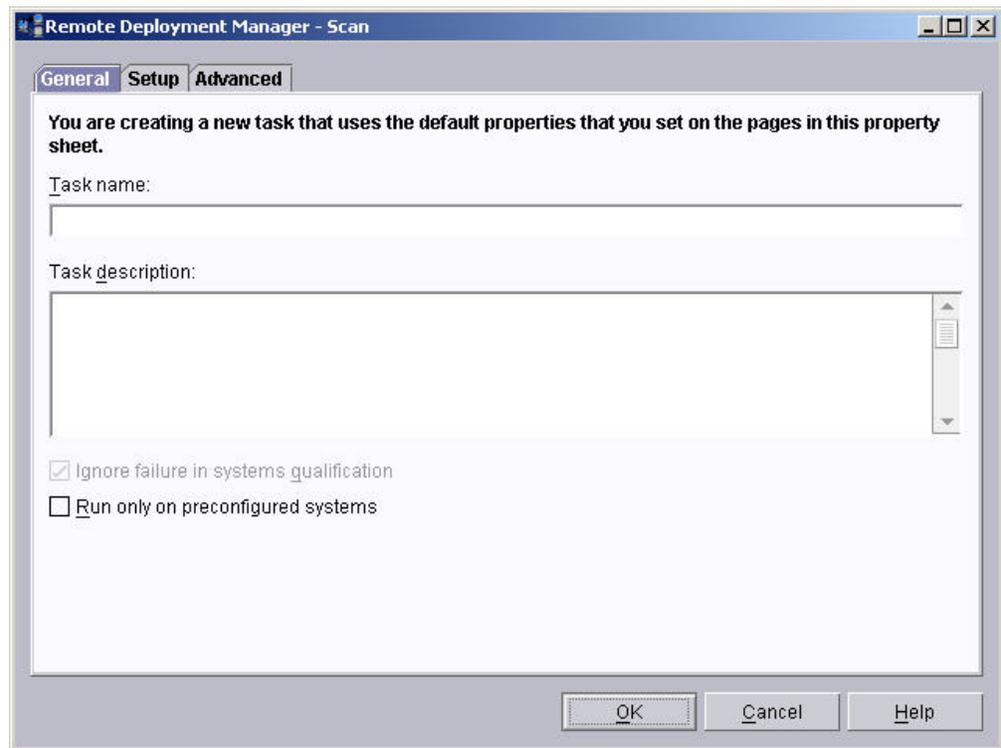


Figure 108. Scan task: General page

2. In the **Task name** field, type a unique name for the task.
3. (Optional) In the **Task description** field, type a description of the task.
4. Click the **Setup** tab. The Setup page is displayed.

The Setup page contains properties that let you customize the settings of the user prompts. You can create user prompts, assign a language to display the prompts, and set a timeout requirement for user responses. For more information about user prompts, see "Working with user prompts" on page 185. The Setup page also lets you enable automatic naming of blade servers.

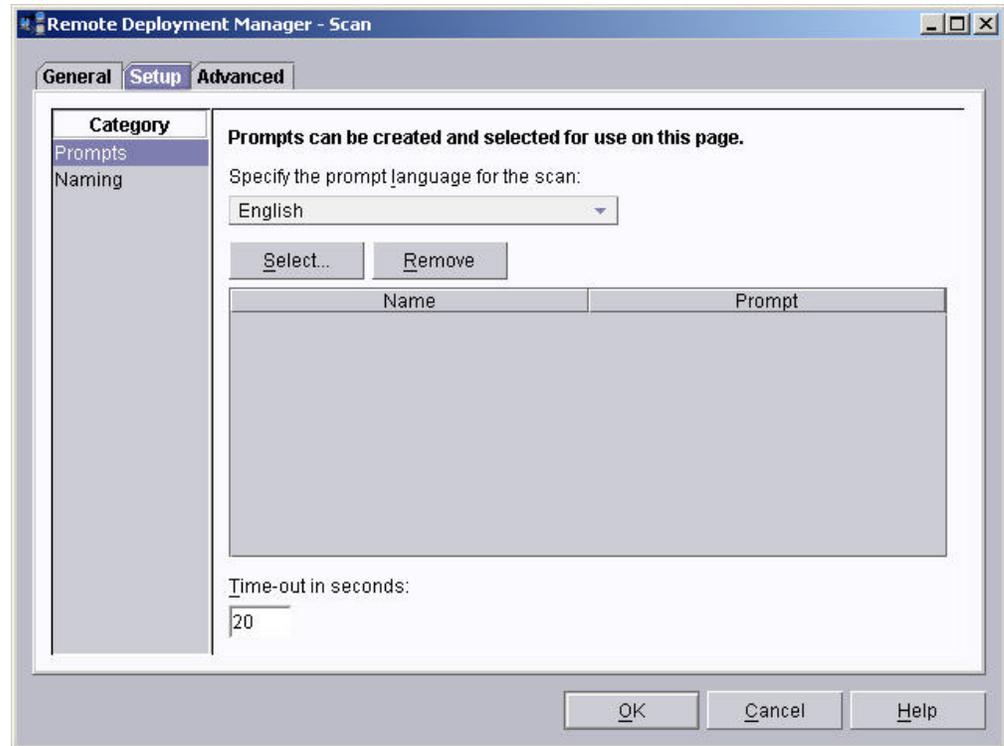


Figure 109. Setup page

5. (Optional) Configure the prompts:
  - a. Click on the **Time-out in seconds** field to enter the number of seconds to wait for the user response after the first prompt is displayed. At run time, if you do not enter any data before the prompt times out, RDM uses a null value for that prompt (and the task completes in the normal way.)
  - b. Click **Select** in the right pane to add prompts to the template. The User Prompts window is displayed.

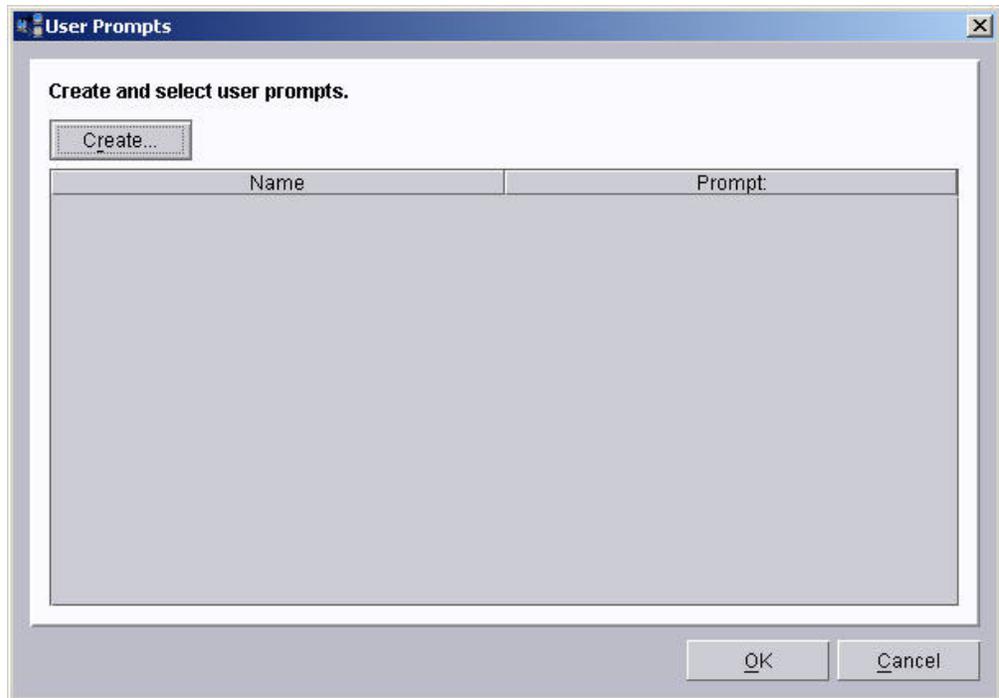


Figure 110. User Prompts window

- c. Click **Create**. The Create User Prompt window is displayed.



Figure 111. Create User Prompt window

- d. In the **Name** field type a unique name for the prompt. You must use only valid alphanumeric characters.
- e. In the **Prompt** field, type the user prompt. This is the text that will be displayed on the target system.
- f. Click **OK**. The User Prompts window reopens and the selected user prompts are displayed.

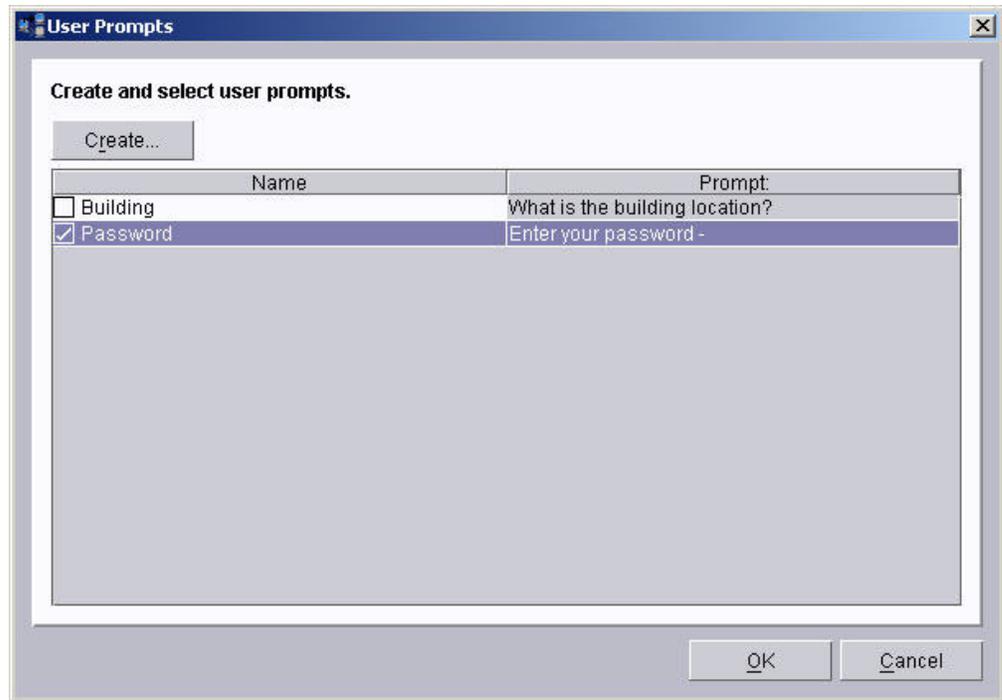


Figure 112. User Prompts window

- g. Select the check box for each prompt that you want to use in this Scan task.
- h. Click **OK**. The Scan window opens and the selected user prompts are displayed.

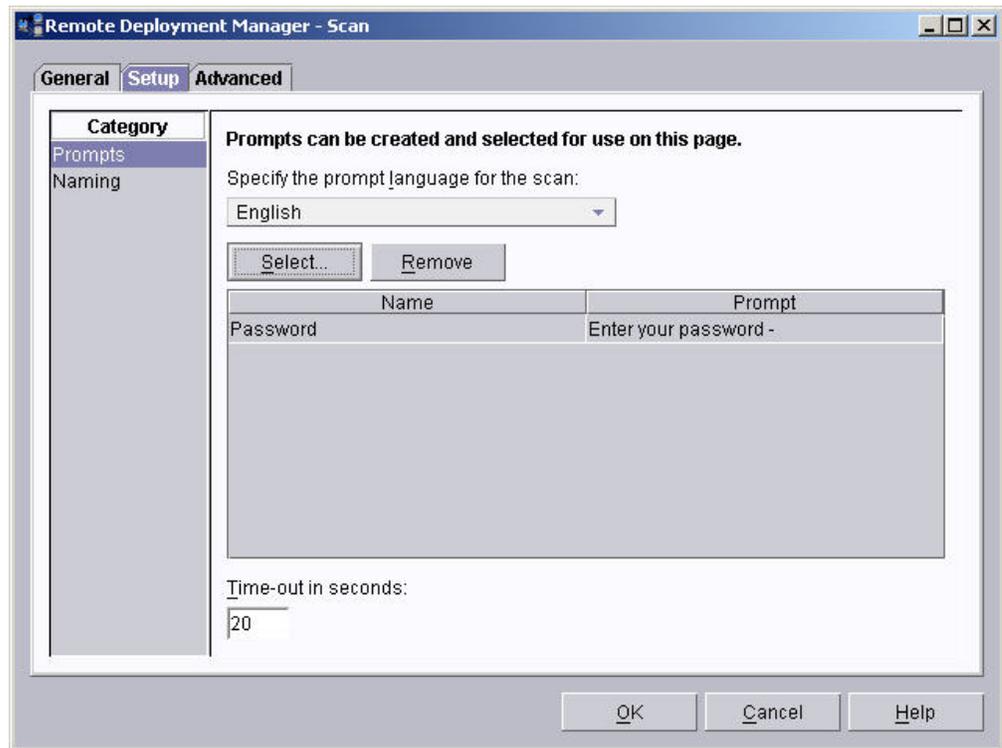


Figure 113. Setup page with selected prompts

6. (Optional) Complete the following steps to rename blade servers automatically when they are scanned:
  - a. In the Category pane click **Naming**. The Naming page is displayed.

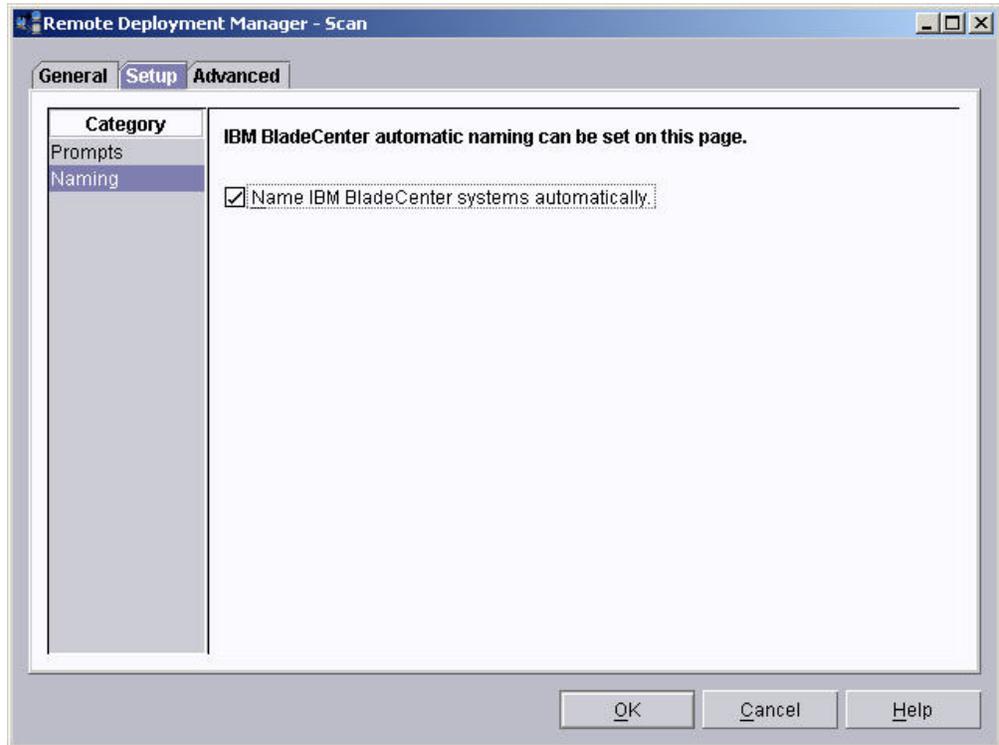


Figure 114. Naming page

- b. Select the **Name IBM BladeCenter systems automatically** check box to ensure that blade servers are automatically named.

**Note:** If you clear the **Name IBM BladeCenter systems automatically** check box, the task does not change the name of the blade server. If you are discovering the blade via the Scan task, the blade will get the default RDM name.

When this Scan task is run against a blade server, the blade server is automatically given the following name: *BladeCenterChassis-BBayNumber* where *BladeCenterChassis* is the name of the BladeCenter chassis, and *BayNumber* is the number of the bay. If the BladeCenter chassis for the blade server has not been detected by IBM Director, *BladeCenterChassis* is the Universal Unique Identifier (UUID) of the blade server.

**Note:** If you select the blade renaming option, the task will always rename blade servers. Make sure not to run such a Scan task against a blade server that you do not want to rename.

You can modify the renaming algorithm by altering the values in the `SystemNaming.properties` file. For information about modifying the `SystemNaming.properties` file see, “Configuring the renaming algorithm” on page 185.

7. Click **OK**. The new task is displayed in the RDM Scan tree.

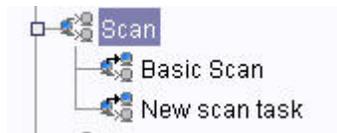


Figure 115. Created Scan task in Scan tree

---

## Configuring the renaming algorithm

Scan tasks that you configure to automatically rename BladeCenter systems use the RDM default renaming algorithm. The renaming algorithm is defined in the SystemNaming.properties text file, which is located in the applicable directory on the RDM server:

---

|                    |  |
|--------------------|--|
| <b>For Linux</b>   | <code>/RDM_installation/local</code>   |
| <b>For Windows</b> | <code>d:\RDM_installation\local</code> |

---

where *d* is drive letter of the hard disk drive and *RDM\_installation* is the directory where RDM is installed.

To change the default renaming algorithm, you must modify the system SystemNaming.properties file.

**Note:** Changes that you make to the renaming algorithm in the SystemNaming.properties file will be used by any Scan task in which the **Name IBM BladeCenter systems automatically** check box is selected.

Complete the following steps to modify the renaming algorithm that is used with the Scan task:

1. Navigate to the SystemNaming.properties file and use an ASCII text editor to open it.

**Note:** The file is fully commented and contains information about how to change the renaming algorithm.

2. Modify the naming conventions as applicable.
3. Save and close the file.

---

## Working with user prompts

You can use user prompts when you need information from the person who is operating the target system. The prompt that you create is displayed on the monitor of the target system when the Scan task is run against that system. For example, you might configure the default Scan task to prompt a user to answer the following two questions:

- What is your department number?
- What is your city?

If a new system is set up on your network and is configured to boot to the network, the two prompts that you created are displayed the first time the system is turned on. The answers by the person who is operating the target system are saved to the IBM Director database. Using these two user prompt values, you also could customize the Scan task to modify the name of the target system in IBM Director.

When you are working with a Scan task or template, the user prompts that you create can be used only with other Scan tasks. The responses to these user prompts can be used with any other RDM task or template.

## Removing a user prompt from a Scan task or template

You can remove a user prompt from a Scan task or template. If you are working with the Scan template, a user prompt that you remove is no longer available in the default list of user prompts for new Scan tasks that you create by using the template. Existing tasks, however, that already use that user prompt are not affected and will continue to use it. If you are working with a specific Scan task, a user prompt that you remove is no longer used when that task is run against a target system. The user prompt also is removed from the default list of user prompts on the Setup page for that Scan task. Removing a user prompt does not delete it from RDM. For information about deleting a user prompt, see “Editing or deleting a user prompt” on page 187.

Complete the following steps to remove a user prompt from a Scan task or template:

1. In the Tasks pane, right-click on the Scan template or the Scan task that you want to modify; then, click **Edit task** or **Edit template** as applicable. The Scan window opens and the General page is displayed.

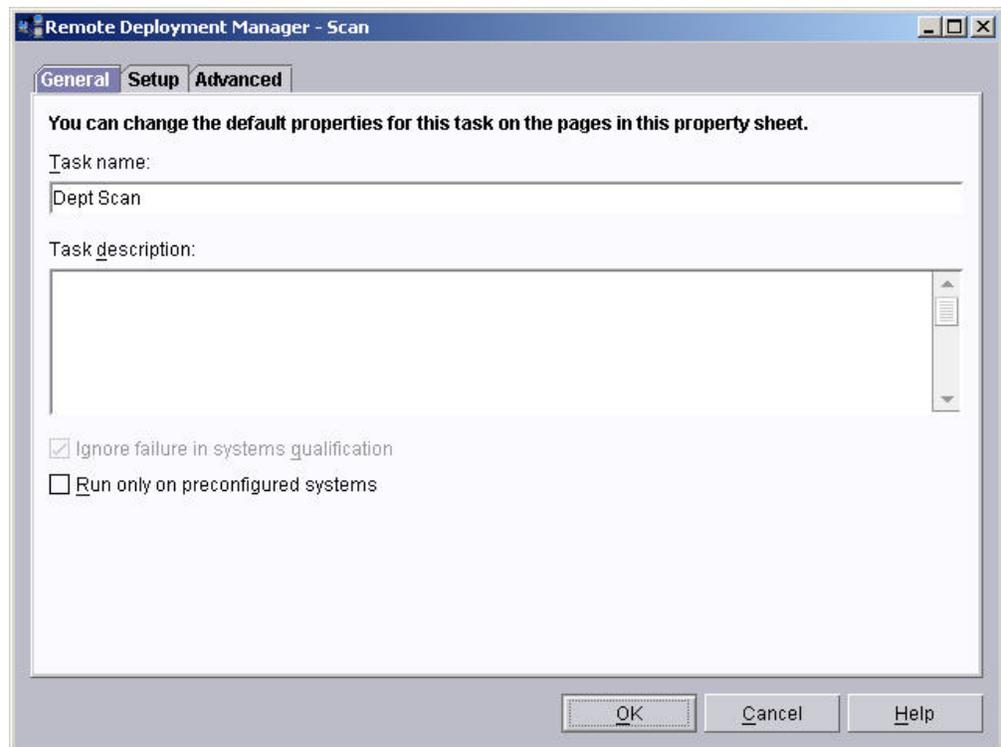


Figure 116. Scan template: General page

2. Click the **Setup** tab. The Setup page is displayed.

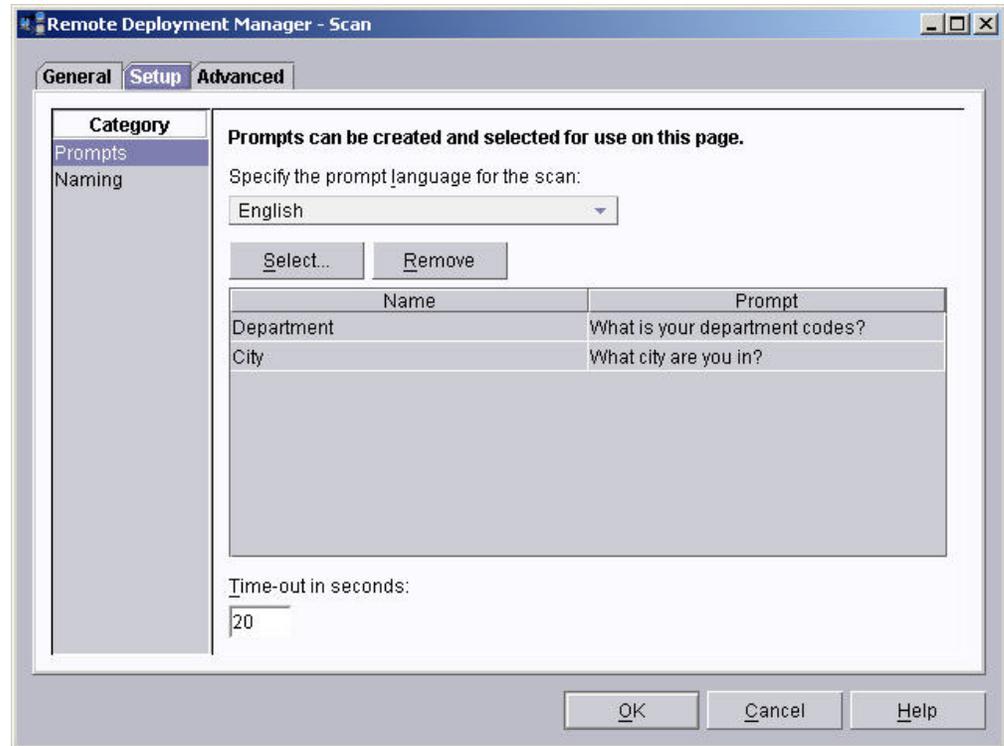


Figure 117. Scan template: Setup page

3. In the left pane, click **Prompts** to view the Prompts pane. In the Prompts pane, you can select and remove user prompts that the template or task uses. The user prompts that are displayed in the Prompts pane will be used by the Scan task or template.
4. Select the user prompt that you want to remove; then, click **Remove**.

## Editing or deleting a user prompt

You can edit or delete a user prompt only when you are working with the Scan template property sheet. You cannot edit or delete a user prompt when you are working with a task. You can delete a user prompt only if it is not being used by any existing tasks.

Complete the following steps to edit or delete a user prompt:

1. In the Tasks pane, right-click on the Scan template; then, click **Edit template**. The Scan window opens and the General page is displayed.

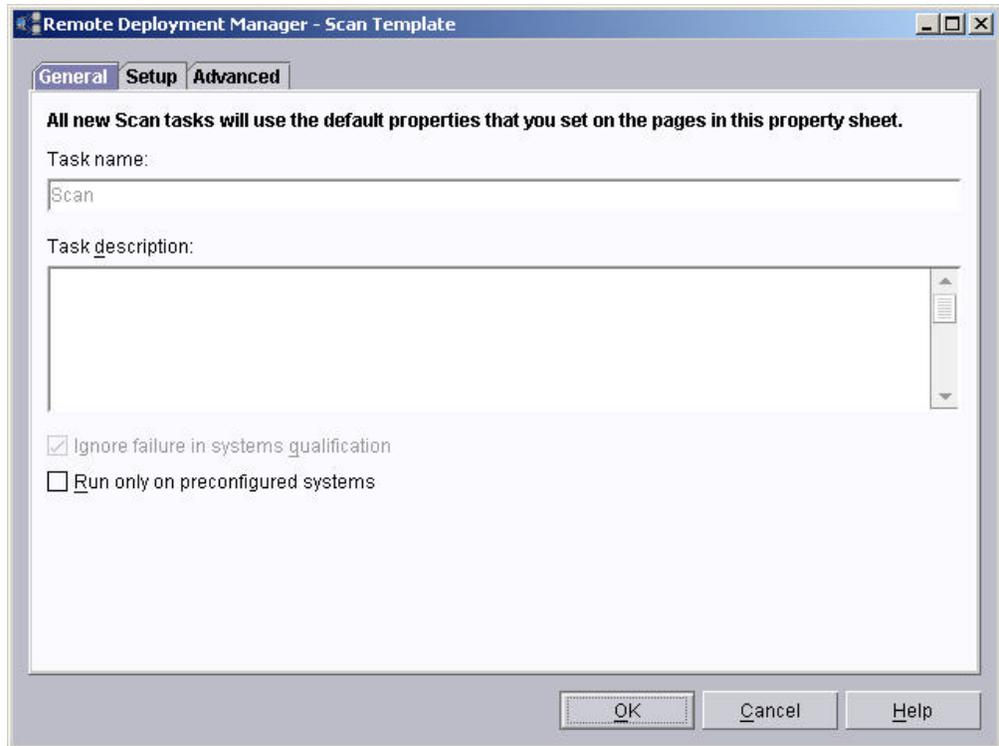


Figure 118. Scan template: General page

2. Click the **Setup** tab. The Setup page is displayed.

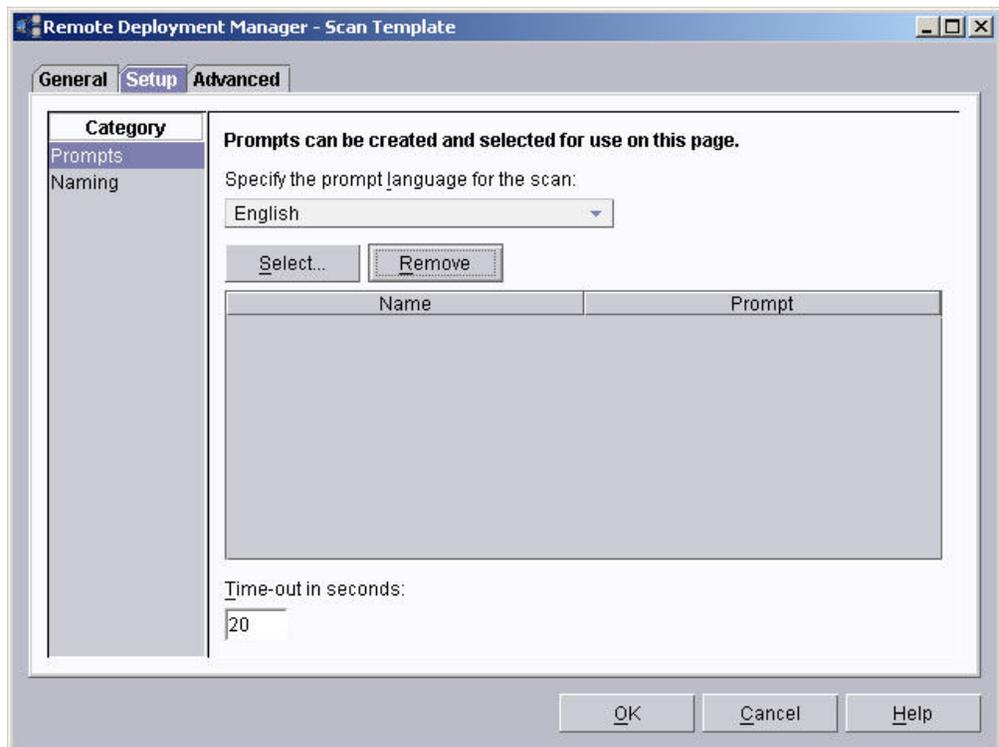


Figure 119. Scan template: Setup page

3. In the left pane, click **Prompts** to view the Prompts pane.  
The user prompts that are displayed in the Prompts pane will be used by tasks that are created by using the Scan template.
4. Click **Select**. The User Prompts window opens.

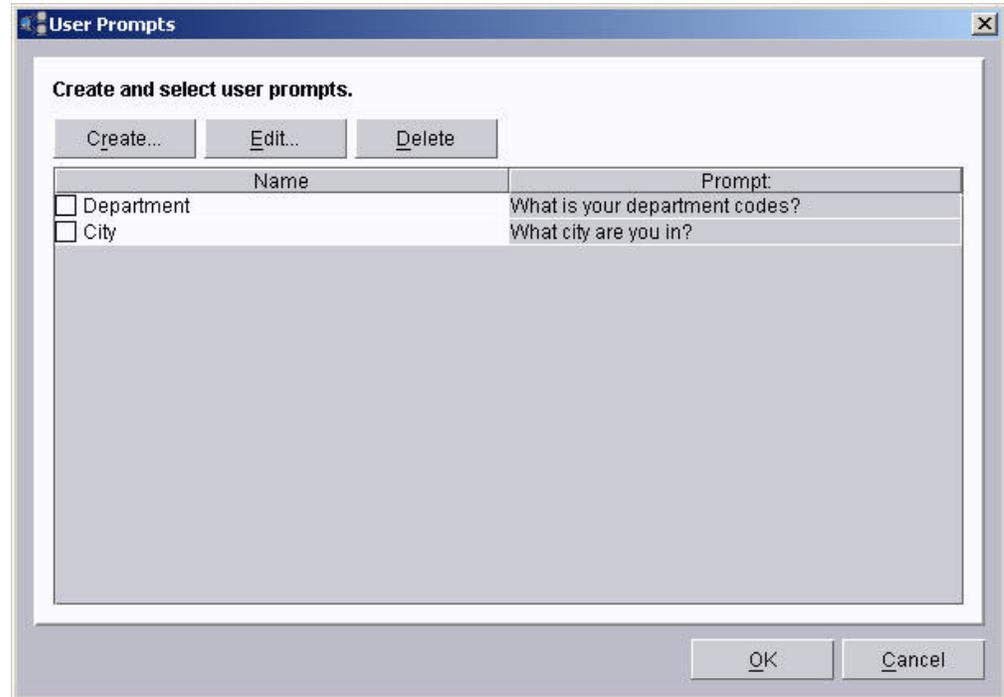


Figure 120. Scan template: User Prompts window

5. (Optional) Complete the following steps to edit a user prompt:
  - a. Select the user prompt that you want to edit; then, click **Edit**. The Edit User Prompt window opens. You cannot change the name of a user prompt. You can change only the user prompt that is displayed on the target system.
  - b. In the **Prompt** field, edit the user prompt text as applicable.
  - c. Click **OK**.
6. (Optional) To delete a user prompt, select the user prompt that you want to delete; then, click **Delete**.

## Working with user prompt responses

You can use the response from a user prompt to rename the target systems that you run the Scan task against. The renaming algorithm is defined in the SystemNaming.properties text file. You can use the following variable name to access the response from a user prompt:

`RDM.user_prompt_name`

where `user_prompt_name` is the name that you assigned the user prompt that created. For example, you can create a user prompt that asks, “What department are you in?” You name the prompt DEPT. To access the response to the user prompt in the SystemNaming.properties text file, you use the RDM.DEPT variable. For information about configuring the renaming algorithm, see “Configuring the renaming algorithm” on page 185.



---

## Chapter 17. Script

You can use the Script template to create a task that runs a sequence of other RDM tasks against a target system. You can choose existing tasks as subtasks of a Script task. The subtasks are run against the target system in the order you specify. Typically, a Script task consists of all the steps required to roll out a system, for example:

1. Flashing the system firmware
2. Updating CMOS
3. Configuring RAID
4. Installing an operating system and applications

The Script task is one of the most common tasks that is run in RDM.

Right-click **Script** in the Tasks pane to display two options:

- *Create New Task* - accesses the task notebook.
- *Edit Template* - accesses the template notebook containing all of the properties for the template. The values set in the template notebook are the defaults used when you create a new Script task.

When you create a task, it is added to the Tasks pane under **Script**.

---

### Qualification considerations

When you select **Ignore failure in systems qualification** for a Script task, the selection applies to that Script task and all of its subtasks. The purpose for ignoring qualification errors on a Script task is to handle those situations in which one subtask depends upon the work of another subtask to be completed before its own qualification can pass. For example, a system with an unconfigured RAID array will generate errors when qualification for a Windows Native Install task is run against that system. However, with a Script task, you can put a RAID Custom Configuration task before a Windows Native Install task to enable the RAID to be configured before the Windows Native Install task is run. By selecting **Ignore failure in systems qualification** in the Script task, the Script task does not run the individual subtask qualifications as part of its own qualification and does not report errors.

The previous situation could also be handled by selecting **Ignore failure in systems qualification** on the Windows Native Install task. That solution might not be desired, especially if that task is also used on other systems outside of the Script task. Some errors that could be caught by qualification would not be realized until running the task against a system.

**Note:** Select the **Ignore failure in systems qualification** check box if you include two tasks in a Script task, and one task depends on the other to configure hardware.

## Task selection

Complete the following steps to create a Script task:

1. Right-click **Script** in the Tasks pane, then click **Create New Task**. The Script window is displayed.

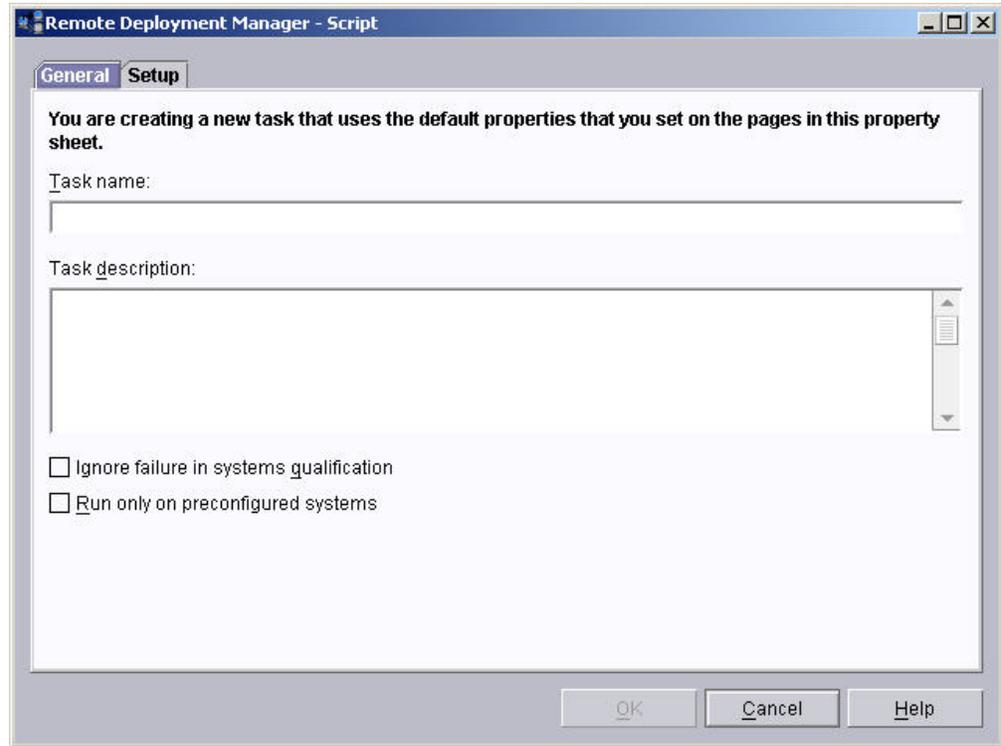


Figure 121. Script window: General tab

2. Provide the basic information for the task:
  - a. In the **Task name** field, type a descriptive name to identify the task.
  - b. In the **Task description** field, type a brief description of the task.
  - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.

**Note:** When you select **Ignore failure in systems qualification for a Script task**, the selection applies to that Script task and all of its subtasks. For information about Script task qualification, see “Qualification considerations” on page 191.

- d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
3. Click the **Setup** tab.
  4. Select **Task Selection** in the **Category** field.

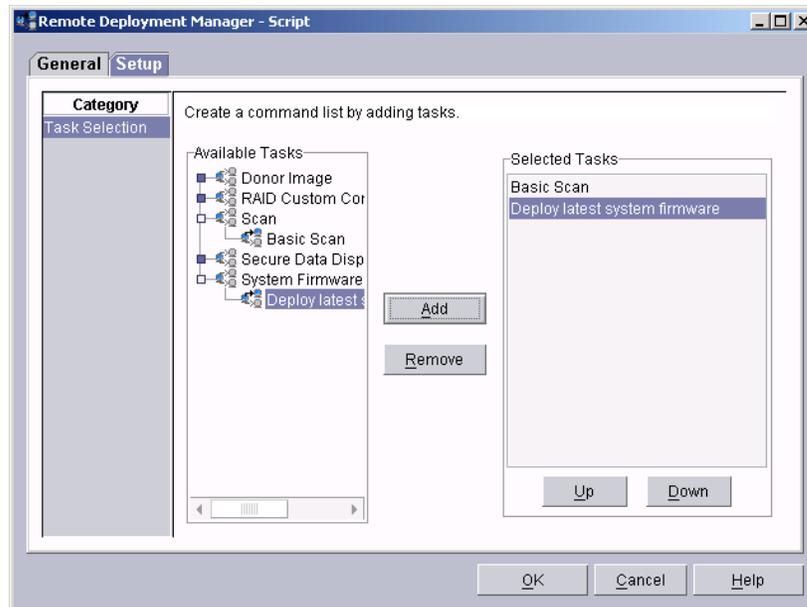


Figure 122. Task Selection category for Script

The **Available Tasks** group box contains a tree view of all RDM tasks. The **Selected Tasks** group box contains an ordered list of the tasks that are contained in this Script task. The tasks are run in the order in which they occur in this list (top task first).

5. In turn, select each task that you want to include in the script, and then click **Add**. When you click **Add**, the highlighted tasks are copied from the **Available Tasks** group box to the **Selected Tasks** group box.

**Note:** You also can drag each task to the **Selected Tasks** group box.

6. Order the tasks in the **Selected Tasks** group box as applicable. Highlight one item or multiple consecutive items, and then click **Up** or **Down** to change their order sequence.

**Note:** You can click **Remove** to delete the highlighted task from the **Selected Tasks** group box.

7. Click **OK** to create the task. The new task is displayed under Script in the Tasks pane of IBM Director Console.



---

## Chapter 18. Secure Data Disposal

You can use the Secure Data Disposal template to create tasks designed to remove (scrub) data from the drives on target systems. All drives and partitions that are accessible by the BIOS on the target system can be scrubbed.

Before you run a Secure Data Disposal task, consider the following items:

- The first fibre drive on a system is accessible by the BIOS. You can use a Secure Data Disposal task to scrub that drive. Other fibre drives are not accessible by the BIOS, and cannot be scrubbed using a Secure Data Disposal task.
- There might be sectors of a drive that are not accessible by the BIOS on a target system. This might occur if there are damaged sectors on a drive that have been remapped by the drive controller. This task does not erase these sectors.
- It is a best practice to configure all drives on a target system to non-RAID before you run a Secure Data Disposal task.
- The command list for a Secure Data Disposal task contains three areas of commented-out commands and instructions. If RAID drives are present, uncomment the areas applicable to your RAID controller type. For target systems that contain older ServeRAID controllers (4\*,5i,6i,6m,7k), each logical drive is configured as RAID 0 and factory defaults are set. For LSI 1020/1030/1064 controllers default configuration is set. For newer ServeRAID controllers, 7t,7e,8e,8i, and IDE RAID, the RAID configuration can be deleted by uncommenting the applicable line. For all RAID controllers, the last section of commented-out commands should be uncommented to allow for a re-scan as configuration has changed.

The Secure Data Disposal template uses a notebook window to gather the scrub information and create a task. The following built-in tasks are installed with RDM:

- Level-1 Limited Partition Removal
- Level-2 1-Overwrite Security
- Level-3 4-Overwrite DOD Security
- Level-4 7-Overwrite DOD Security

All of these built-in tasks scrub all drives, and write the scrub signature on all drives. A scrub signature is an indicator of the level of data disposal completed on the system. If you prefer to use a task that does not write the scrub signature (in other words, to leave the drives containing all zeros), complete the following steps:

1. Make copies of the built-in task you wish to use.
2. Change the "!SCRUB.BAT" statement in its command list to:

```
!SCRUB.BAT /S:NO
```

**Note:** The equal sign (=) character cannot be used in a task's command list. For this reason, the SCRUB3.EXE program accepts its parameters with either an equal sign character or a colon (;) character. In other words, these two syntax phrases are interpreted identically by SCRUB3.EXE:

```
/S:NO
```

```
/S=NO
```

This allows you to enter SCRUB3.EXE parameters as parameters on the !SCRUB.BAT statement in the command list. SCRUB.BAT uses those parameters verbatim when it runs SCRUB3.EXE.

---

## Level-1 Limited Partition Removal task

The Level-1 Limited Partition Removal task is a built-in task that overwrites the master boot record, the first 100 sectors of each partition, and the last two sectors of all of the drives and partitions that are accessible to the system BIOS. The pattern used for the overwrite operation is 0x0000.

This disposal method is intended to make files inaccessible to normal file-system-based tools. The disposal algorithm for this task corresponds to the /L=1 parameter for SCRUB3.EXE.

---

## Level-2 1-Overwrite Security

The Level-2 1-Overwrite Security task is a built-in task that overwrites every sector on the on all of the drives and partitions that are accessible to the system BIOS. The pattern used for the overwrite operation is 0x0000. This disposal method is intended to make data inaccessible by any software technique. The disposal algorithm for this task corresponds to the /L=2 parameter for SCRUB3.EXE.

---

## Level-3 4-Overwrite DOD Security

The Level-3 4-Overwrite DOD Security task is a built-in task that overwrites every sector on all of the drives and partitions that are accessible to the system BIOS on the target system. A Secure disposal overwrites every sector on the applicable drives that are installed on the system four times with the following two-byte patterns (in this order):

1. A random pattern
2. The bit-wise complement of the first random pattern
3. A different random pattern
4. A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. The disposal algorithm for this task corresponds to the /L=3 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

---

## Level-4 7-Overwrite DOD Security

The Level-4 7-Overwrite DOD Security task is a built-in task that overwrites every sector on all of the drives and partitions that are accessible to the system BIOS on the target system. A secure disposal overwrites every sector on the applicable drives that are installed on the system seven times with the following two-byte patterns (in this order):

1. A random pattern
2. The bit-wise complement of the first random pattern
3. A different random pattern
4. The bit-wise complement of the second random pattern
5. A third random pattern
6. The bit-wise complement of the third random pattern
7. A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. The disposal algorithm for this task corresponds to the /L=4 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

---

## Creating a Secure Data Disposal task

Complete the following steps to create a Secure Data Disposal task:

1. In the Tasks pane, expand the **Remote Deployment Manager** task.
2. Right-click **Secure Data Disposal** → **Create new task**. The Secure Data Disposal window opens.

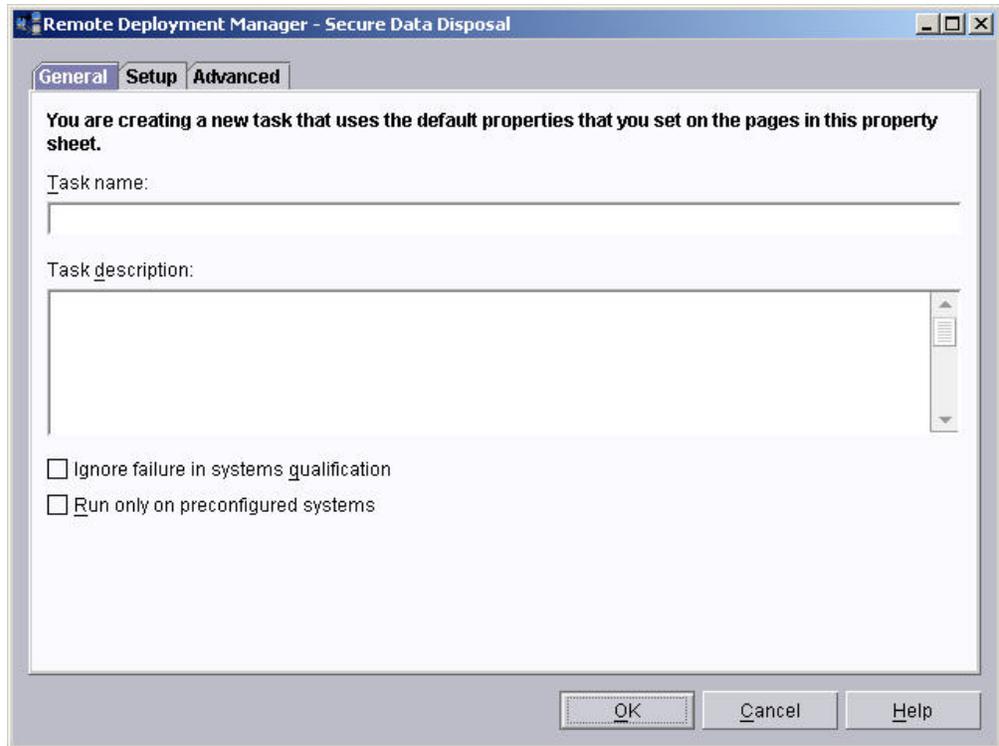


Figure 123. Secure Data Disposal window

3. On the General page, set the basic properties for the task:
  - a. In the **Task name** field, type a unique name for the task.
  - b. (Optional) In the **Task description** field, type a description of the task.
  - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.

**Note:** The STC settings for Secure Data Disposal tasks are read-only. As a result, the status of the **Run only on preconfigured systems** check box does not affect the result of the task.

4. Configure the disposal settings:
  - a. Click the **Setup** tab. The Setup page is displayed.

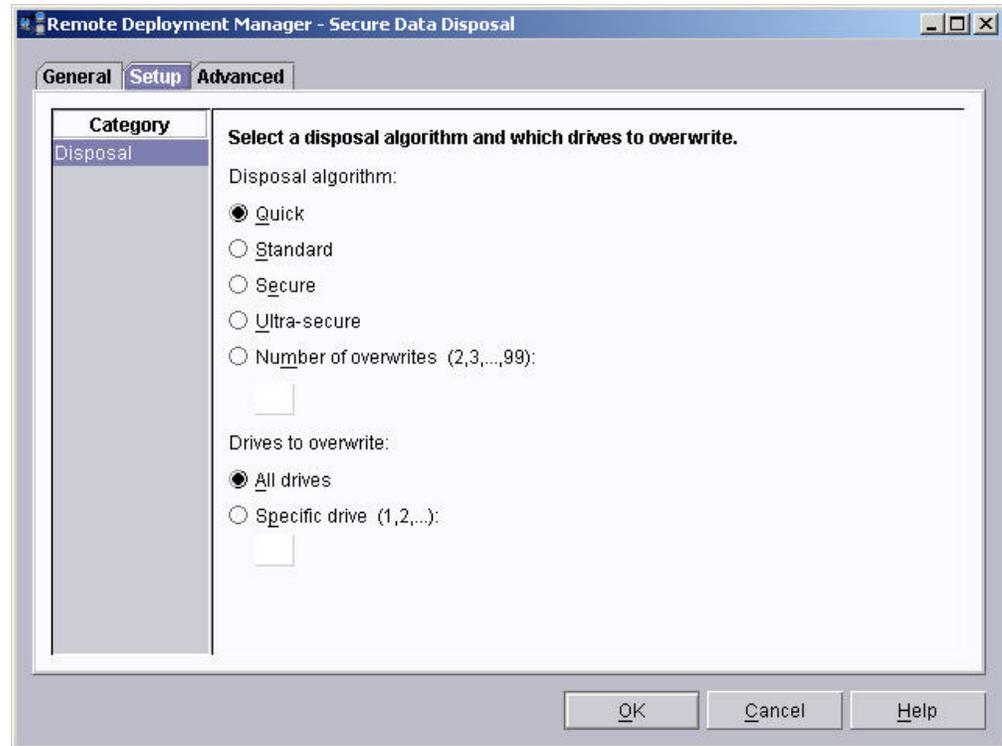


Figure 124. Secure Data Disposal window: Setup page

- b. Select one of the following options to indicate the disposal algorithm to be used:

**Quick** Overwrites the master boot record, the first 100 sectors of each partition, and the last two sectors on the applicable drives that are installed on the target system. The pattern used for the overwrite operation is 0x0000.

This disposal method is intended to make files inaccessible to normal file-system-based tools. This disposal algorithm corresponds to the /L=1 parameter for SCRUB3.EXE.

**Standard**

Overwrites every sector on the applicable drives that are installed on the target system. The pattern used for the overwrite operation is 0x0000.

This disposal method is intended to make data inaccessible by any software technique. This disposal algorithm corresponds to the /L=2 parameter for SCRUB3.EXE.

**Secure**

Overwrites every sector on the applicable drives that are installed on the system four times with the following patterns (in this order):

- 1) A random pattern
- 2) The bit-wise complement of the first random pattern
- 3) A different random pattern
- 4) A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. This disposal algorithm corresponds to the /L=3 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

#### **Ultra-secure**

Overwrites every sector on the applicable drives that are installed on the system seven times with the following patterns (in this order):

- 1) A random pattern
- 2) The bit-wise complement of the first random pattern
- 3) A different random pattern
- 4) The bit-wise complement of the second random pattern
- 5) A third random pattern
- 6) The bit-wise complement of the third random pattern
- 7) A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. This disposal algorithm corresponds to the /L=4 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

#### **Number of overwrites**

Overwrites every sector on the applicable drives that are installed on the target system *N* times, where *N* is a number that you specify. RDM uses a different random pattern for each overwrite until it reaches the last (*N*th) overwrite. The last overwrite uses a 0x0000 pattern. For example, if you type 4 in the number field, RDM overwrites the applicable drives four times in the following patterns (in this order):

- 1) A random pattern
- 2) A second random pattern
- 3) A third random pattern
- 4) A 0x0000 pattern

In the number field, type a number (2-99) to specify the number of times that you want to overwrite the drives.

- c. Select one of the following options to indicate which drives to are to be overwritten:

#### **All drives**

Overwrites all of the drives and partitions that are accessible to the system BIOS. This option corresponds to the /D=ALL parameter for SCRUB3.EXE.

#### **Specific drive**

Overwrites the drive that you specify in the entry field. Drive numbering starts at 1, not 0. This option corresponds to the /D=<n> parameter for SCRUB3.EXE.

5. Click **OK** to create the task. The new task appears in the Tasks pane under Secure Data Disposal. Right-click on the task to edit, copy, or delete it.

---

## Chapter 19. System Firmware Flash

You can use the System Firmware Flash template to create a System Firmware Flash task to update the firmware on target systems that support RDM.

**Note:** This task can be used to deploy firmware only to IBM systems. To deploy firmware to non-IBM systems, you must create a Custom task. For information about how to create a Custom task, see “Creating a Custom task” on page 73.

You can use the System Firmware Flash template to create and name a System Firmware Flash task. You then configure the task by associating one or more firmware images with it. After the task is created, you can run it by dragging it to the target systems that are displayed in IBM Director Console, or you can use IBM Director Scheduler to run the task at a later time. When you run the task, RDM validates the selected firmware images with the selected target systems and updates each system by using the applicable firmware. When a task contains multiple firmware images that have the same product code, RDM uses the firmware image that has the latest BIOS level. RDM does not update systems for which it does not have firmware.

This chapter provides the procedures that you must complete in the following order to create and then run a System Firmware Flash task:

1. Create a firmware update diskette.
2. Create a System Firmware Flash image in RDM.
3. Create a System Firmware Flash task.
4. Run the System Firmware Flash task.

---

### Deploy latest system firmware task

The Deploy latest system firmware task is a built-in task. If there is any firmware in the repository that is applicable to the target system, this task updates the target system with the latest version that is in the repository. If there is no firmware in the repository that is applicable to the target system, this task fails with a qualification error.

---

### Creating a firmware update diskette

When you create a System Firmware Flash task, you also must create a firmware image for the task to use.

Firmware updates from IBM are available from IBM support Web sites or on disks that come with IBM products. BIOS and firmware updates are distributed as self-extracting executable (.exe) files that are used to create update (flash) diskettes. If you already have a firmware diskette or source file that you want to use to create a System Firmware Flash task, you can use the diskette or source file with Image Management option to create a firmware image. For information about creating a firmware image by using the Image Management option, see “Creating a System Firmware Flash image in RDM” on page 202.

Complete the following steps to create a firmware update diskette:

1. Navigate to the Web site that provides the firmware download for which you want to create a firmware update diskette.

2. Download the self-extracting file to a directory.
3. Create a bootable update diskette from the self-extracting file, using the procedure appropriate for the update. Some updates use an executable file that creates the bootable diskette automatically, while others require user input for the diskette creation. In other cases, an IMG file is provided that must be used as input to a utility program that creates the diskette.
4. At the command prompt of the directory where the executable file is located, type the name of the self-extracting file and press Enter. The firmware image is saved to the diskette. Some firmware images might require multiple diskettes. When prompted, insert the additional diskette to complete the firmware image.

After you have created a firmware image and saved it to one or more diskettes, use RDM Image Management to import the firmware image to the RDM repository.

---

## Creating a System Firmware Flash image in RDM

You can use the Image Management option to create a System Firmware Flash image in RDM. You can then create a System Firmware Flash task that uses the image that you create.

If you are creating an image from diskettes that use a label format different from the standard label format, you must edit the file `FirmwareLabel.properties`, located in the `local` directory under the RDM installation directory. This file allows RDM to recognize diskette formats and use the diskettes correctly. The syntax for adding additional diskette formats to the file is detailed in the file.

Complete the following steps to use the Image Management option to create firmware image in RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

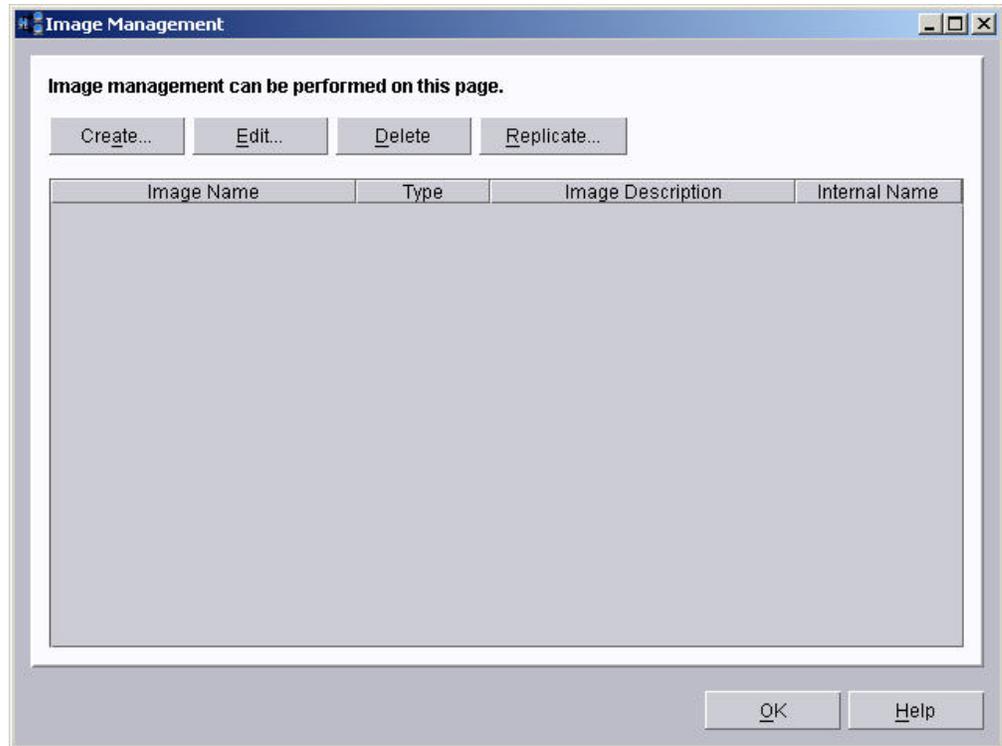


Figure 125. Image Management window

2. Click **Create**. The Create Image window opens.

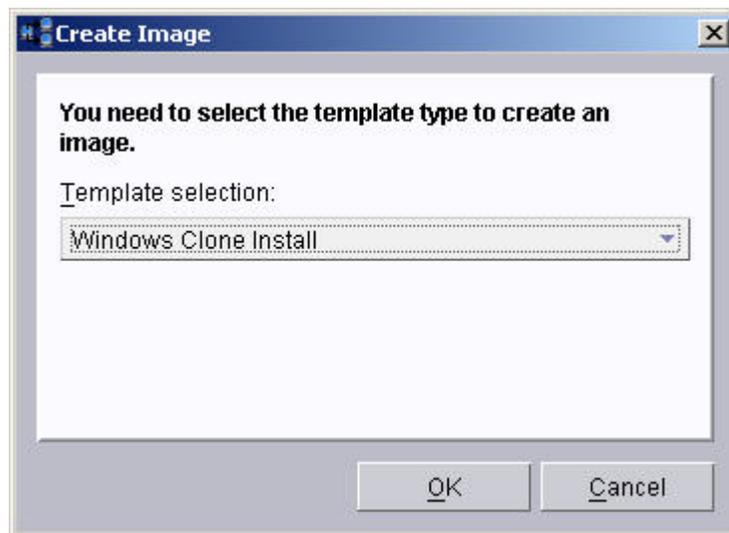


Figure 126. Create Image window

3. In the **Template selection** field, select **System Firmware Flash**; then, click **OK**. The Create System Firmware Flash Image window opens, and the General page is displayed.

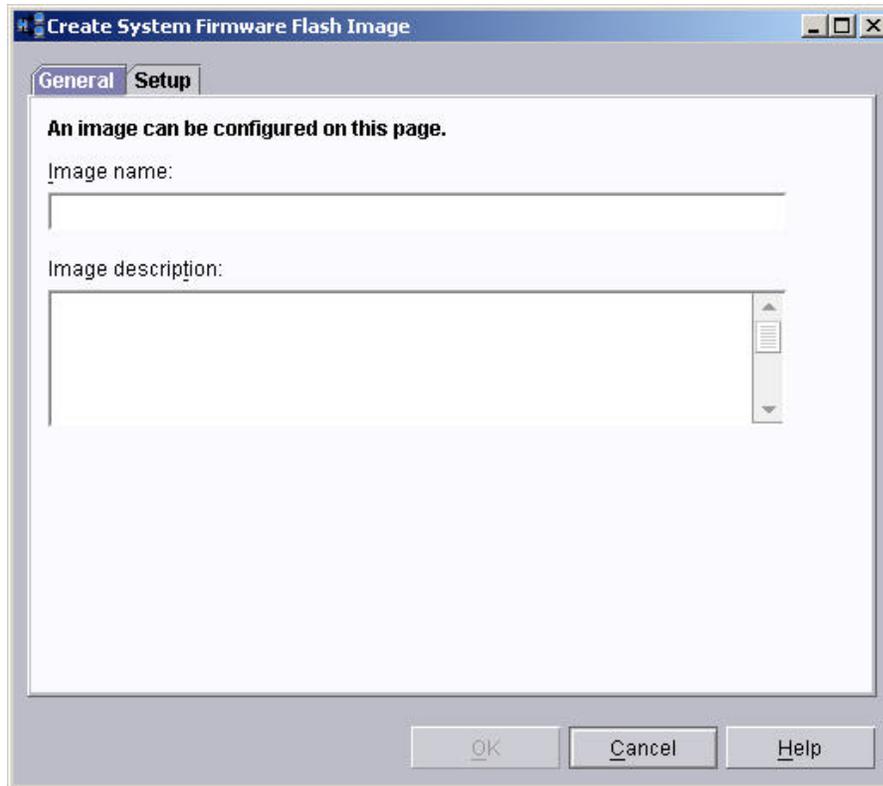


Figure 127. Create System Firmware Flash Image window: General page

4. In the **Image name** field, type a name for the firmware image. Later, when you create a task, you can associate the firmware image with the task by using the image name.
5. (Optional) In the **Image description** field, type a brief description of the firmware image.
6. Click **Setup**. The "Setup" page is displayed.

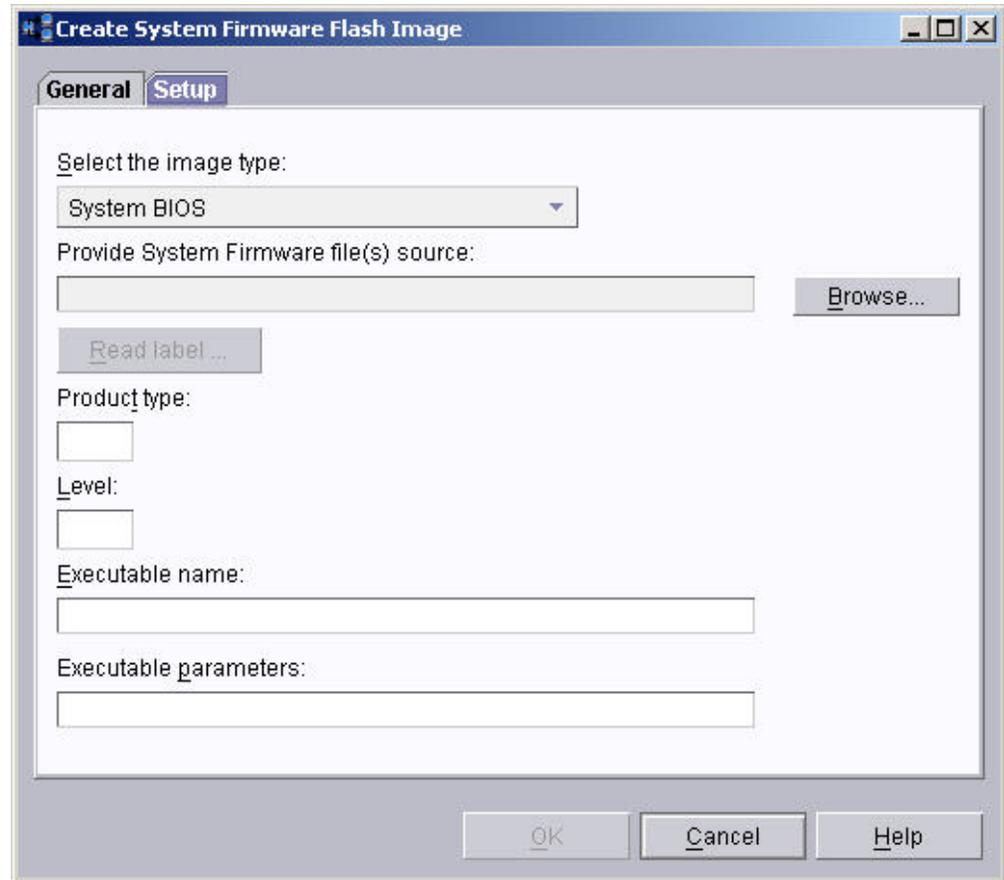


Figure 128. Create System Firmware Flash Image window: Setup page

7. In the **Select the image type** field, select one of the following types of firmware images:

**System BIOS**

You can create a System BIOS image to update the BIOS code for an IBM system.

**Embedded Controller**

You can create an Embedded Controller image to update the embedded controller program only for an IBM ThinkPad mobile computer.

**On-board Service Processor (BMC, ISMP)**

You can create an On-board Service Processor image to update the code only for a service processor that ships on an IBM server system. You cannot use this option to update the code for adapters that you add to a system.

**Note:** If the firmware image type you select does not match the image, RDM may complete the image creation without detecting the error, but your image will not work. You must then delete the incorrect image and create it again, using the correct firmware image type option.

8. Select the source for the System Firmware Flash image. You can read the image from a diskette or create an image from a directory on your hard drive.

**Note:**

The diskette label name may read "JT" where the hard drive directory name reads "E1". This is acceptable and does not indicate any difference in content between the images.

In other words, as long as the files in the hard drive directory and on the diskette are the same, then creating a BIOS image from a diskette with the label name:

QAJT33A

is equivalent to creating the image from this directory:

C:\TEMP\QAE133A

- a. (Optional) To read the image from a diskette, insert the diskette that contains the firmware image into the diskette drive.
- b. Click **Browse**. The "Select directory" window opens.

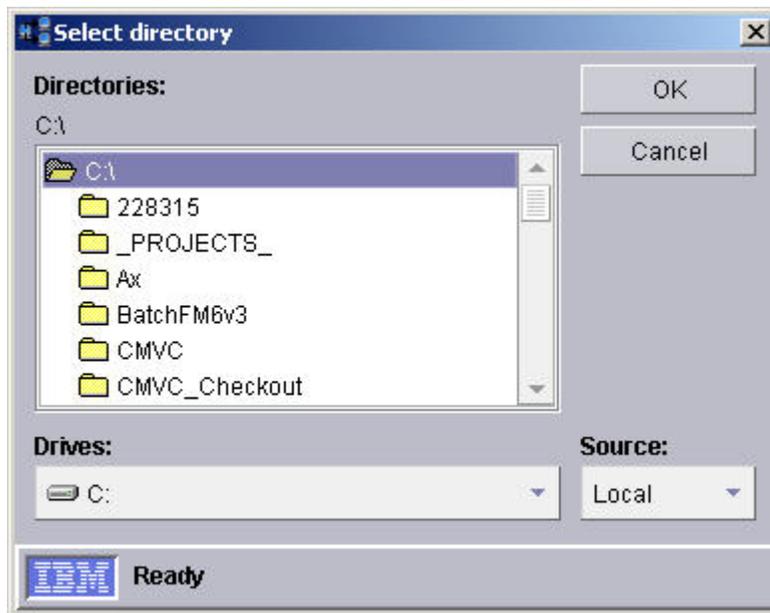


Figure 129. "Select directory" window

- c. In the **Source** field, select the system where the image is located. You can choose between the local system or the RDM server.  
**Note:** If the local system is the RDM server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.
  - d. In the **Drive** field, select the drive letter where the file is saved, or navigate to the directory (whose name must be the build string of the firmware) that contains the files you want in the image.
  - e. Click **OK**.
9. Click **Read label**. If the source is a firmware diskette, RDM reads the diskette label and populates the remaining fields. If RDM cannot identify the firmware information, you are prompted to enter the required information.

**Note:** When the firmware is later deployed to a target system, the default commands for the firmware are run. You can override these commands by using the **Executable name** and **Executable parameters** fields.

10. Click **OK**. The Task Image Creation Progress window opens and the image is created. If the firmware is contained on multiple diskettes, RDM prompts you automatically for additional disks as applicable.

**Note:** Sometimes a new firmware release causes a size increase that changes the usual distribution format from one diskette to two or more diskettes. In this instance, the image builder will not prompt you for an additional diskette. To bypass this problem, complete the following steps:

- a. Create a subdirectory in the hard drive, and name the directory with the firmware build number.
- b. Copy the contents of both diskettes to that directory.
- c. Create the image using the directory as the file source.

After you create a firmware image in RDM, you can associate the firmware image with one or more System Firmware Flash tasks. You also can create a CMOS Update task that uses the image. For information about how to create a CMOS Update task, see “Creating a CMOS Update task” on page 67.

---

## Creating a System Firmware Flash task

After you create a firmware image in RDM, you can create a System Firmware Flash task that uses the image. You can select specific System Firmware Flash images that are to be used in the task.

Complete the following steps to create a System Firmware Flash task:

1. In the Tasks pane, expand the **Remote Deployment Manager** task tree. The RDM tasks are displayed.
2. Right-click **System Firmware Flash** in the task pane and click **Create new task**. The System Firmware Flash window opens.

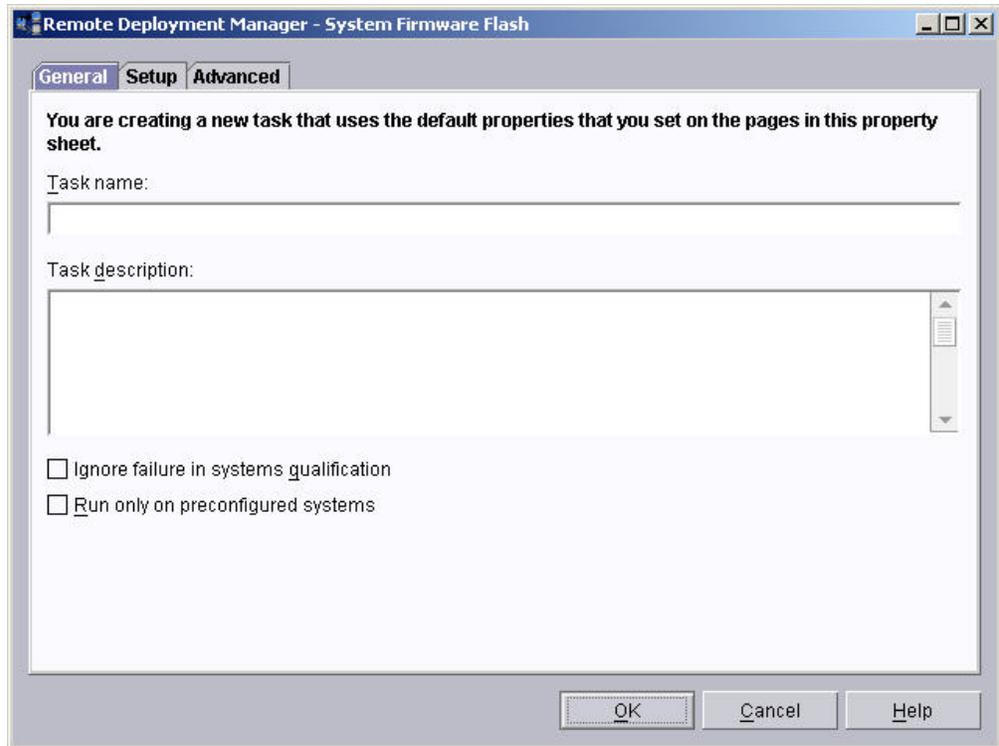


Figure 130. Remote Deployment Manager - System Firmware Flash window: General page

3. Complete the fields on the General page:
  - a. In the **Task name** field, type a name for the task.
  - b. In the **Task description** field, type a brief description for the task.
  - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values that are stored in the RDM database.
4. Complete the fields on the Setup page:

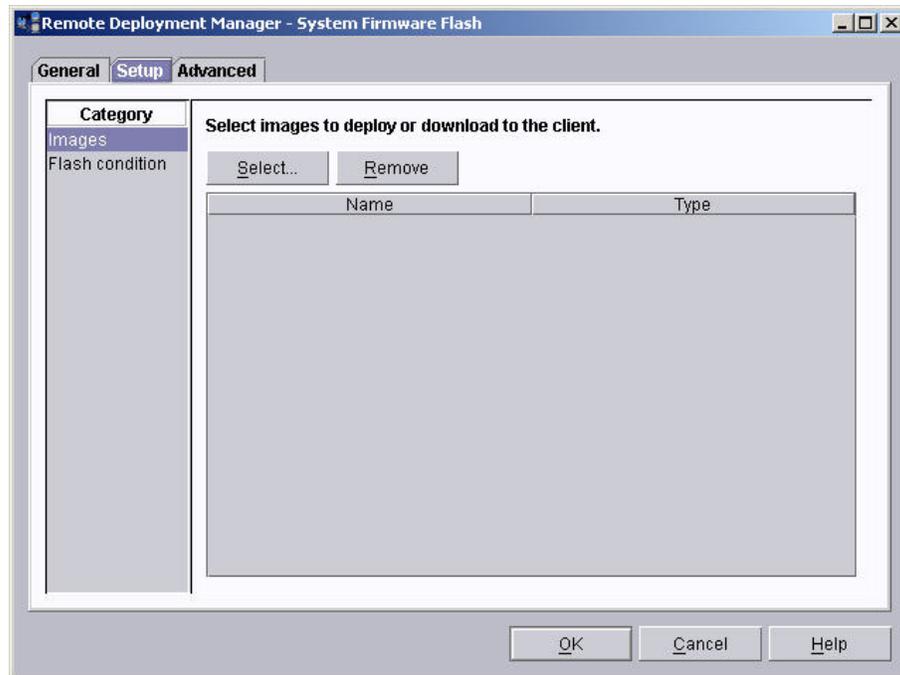


Figure 131. Remote Deployment Manager - System Firmware Flash window: Setup page

- a. Click the **Setup** tab. The Setup page is displayed.
- b. From the **Category** list, select **Images**; then, click **Select**. The Image Selection window opens.

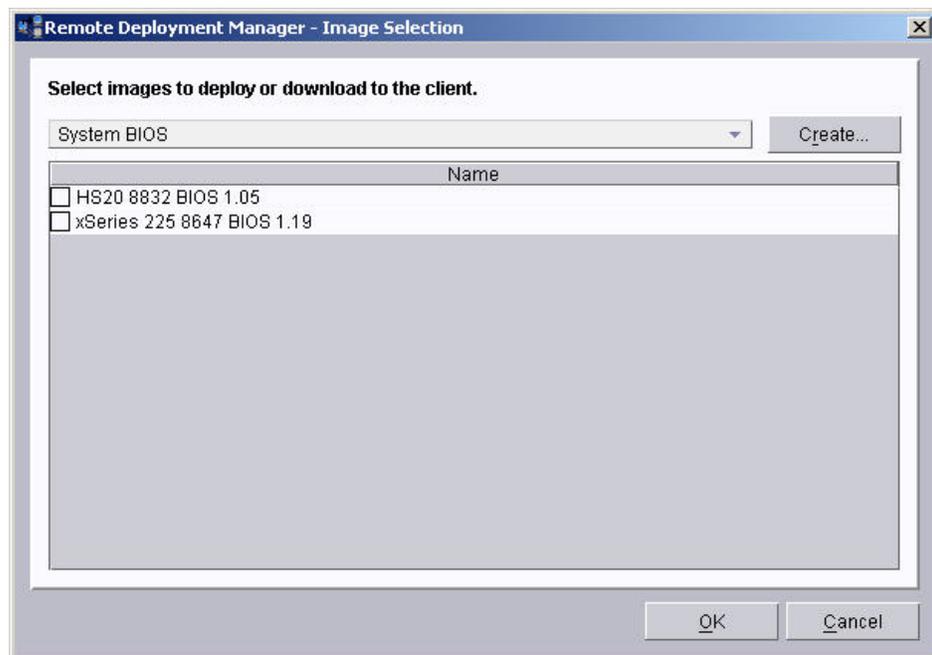


Figure 132. Image Selection window

- c. From the drop-down list, select the type of firmware that you want to use with the task. The Image Selection window displays the applicable firmware images that are in the RDM repository.

- d. From the **Name** list, select the check box for each firmware image that you want to use; then, click **OK**. The Setup page displays the selected firmware images.

**Notes:**

- 1) If the firmware image that you want to use is not already in the repository, you can click **Create** to add it.
  - 2) To remove an image from the list, select the image (within the list) that you want to remove; then, click **Remove**. The image is removed from the task; however, it is still available in the RDM repository. If you want to delete the image from the repository, you can use the Image Management option. For information about deleting an image from RDM, see “Deleting an image” on page 36.
- e. From the **Category** list, select **Flash condition**; then, use one of the following procedures:
    - Select **Always flash** to always flash the target system that uses the task, regardless of what firmware version is on the target system.
    - Select **Flash only if different from current version** to flash the target system only if the firmware image that is used by the task is a different version from the firmware version on the target system.
5. Click **OK** to create the task. The task is displayed in the Tasks pane under the **System Firmware Flash** task.

---

## Running a System Firmware Flash task

Complete the following steps to run a System Firmware Flash task:

1. From IBM Director Console, expand the **Remote Deployment Manager** task tree. The RDM tasks are displayed.
2. Expand the **System Firmware Flash** task tree. The System Firmware Flash tasks are displayed.
3. Drag the applicable System Firmware Flash task to the target system or group that you want to update. The BIOS build level of the target system is part of the information that is collected during the scan process.

**Note:** System Firmware Flash tasks do not contain any values that require configuration; however, you can select **Configure systems** to display the firmware information for the selected target systems.

When you deploy firmware to a target system, one of the images that is used by the System Firmware Flash task must correspond to the BIOS build level of the target system.

---

## Chapter 20. VMware Native Install

You can use the VMware Native Install template in RDM to create a task that remotely installs VMware ESX Server 2.5 (or later) on a target system.

The VMware Native Install template uses a wizard to gather the installation information and create a task.

Typically, RDM tasks that are used to deploy an operating system use an operating system image from the RDM repository. A VMware Native Install task, however, does not require an RDM image that you create with the RDM Image Management window. Before you create a VMware Native Install task, you must save the VMware installation files to a supported file server (HTTP, FTP, or NFS) in your network. The VMware Native Install task that you create uses the VMware installation files to deploy VMware Server. When you run a VMware Native Install task, the target system connects to the file server to install VMware Server. Make sure that the target system to which you plan to deploy VMware Server meets the system requirements for the VMware software. For information about VMware system requirements and installation, see the documentation that comes with your VMware software.

**Note:** It is a good practice to use the `RDM\repository` directory as the source directory for your file server, so that your VMware installation files are in the same location as your RDM images. Their function is similar to that of RDM's operating-system images, and although it isn't a requirement to make your VMware installation files a formal RDM image, it is a best practice to do so. To make your VMware installation files a formal RDM image, create a custom image using the root of the VMware CD as the source of the image files.

This chapter provides the procedures that you must complete in the following order to create a VMware Native Install task and deploy VMware ESX Server to a target system:

1. Copy the VMware installation image to an accessible network directory.
2. Create a VMware Native Install task.
3. (Optional) Configure the systems.
4. Run the VMware Native Install task.

---

### Copying a VMware installation image to a network

Before you can use RDM to deploy VMware ESX Server, you must copy the VMware installation files to a file server that can be accessed by the target system.

If applicable, make sure that you make note of the user name and password that are required to connect to the file server. If they are required, you must provide them when you create the VMware Native Install task.

## Creating a VMware Native Install task

After you copy the VMware installation files to a file server, you can create a VMware Native Install task to deploy the image.

Complete the following steps to create an VMware Native Install task:

1. In the Tasks pane, expand the **Remote Deployment Manager** task.
2. Right-click **VMware Native Install**. The VMware Native Install task menu is displayed.
3. Click **Create new task**. The VMware Native Install window opens.

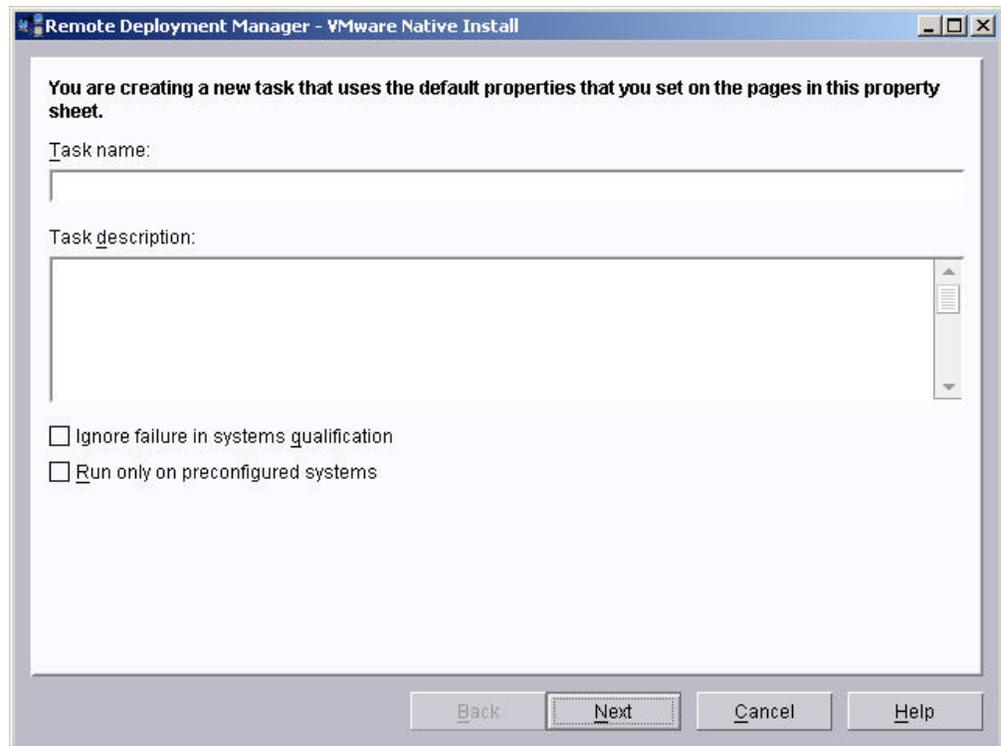


Figure 133. VMware Native Install task: "You are creating a new task" window

4. Provide the basic information for the task:
  - a. In the **Task name** field, type a descriptive name to identify the task.
  - b. (Optional) In the **Task description** field, type a brief description of the task.
  - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values that are stored in the RDM database.
  - e. Click **Next**. The VMware version selection window is displayed. Select the desired VMware version.
  - f. Click **Next**. The License Agreement for the version of VMware you selected is displayed.
5. Read the license agreement and select the **I accept the terms** check box; then, click **Next**. The Installation Configuration window is displayed.

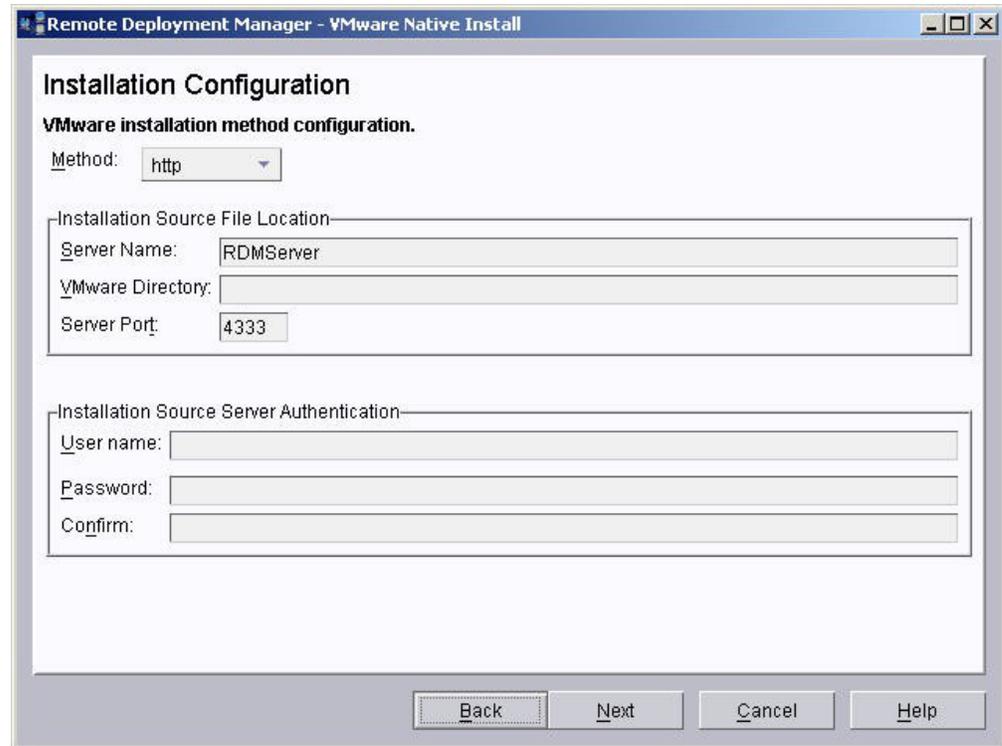


Figure 134. VMware Native Install task: Installation Configuration window

6. Select the installation image:
  - a. In the **Method** field, select the VMware installation method.
    - HTTP** Select Hypertext Transfer Protocol (HTTP) if the VMware installation files have been saved to the directory on a Web server.
    - FTP** Select File Transfer Protocol (FTP) if the VMware installation files have been saved to the directory on a FTP server.
    - NFS** Select Network File System (NFS) if the VMware installation files have been saved to the directory on a network file system.
  - b. In the **Server Name** field, type the name or the IP address of the server where the VMware installation files are saved. The server name can be a maximum of 255 characters long.
  - c. In the **VMware Directory** field, type the name of the directory containing the VMware installation files on the file server. For example, if the installation files reside in the /vmware\_251 directory on file server file.server.com, which is accessible via http://file.server.com/vmware\_251 (if using an HTTP server), then you would enter:  
/vmware\_251
  - d. (Optional) In the **Server Port** field, type the server port number for the file server. The server port number must be between 1 and 65535. If you specify nothing, RDM uses the default port number (NFS-2049, FTP-21, HTTP-80) without including the port number in its command. If you specify a value, then RDM uses that port number within its command (even if you specify the default port number.)
  - e. In the **User name** field, type the user name that is required to access the server on which the VMware installation files are saved. The user name can be a maximum of 255 characters long.

- f. In the **Password** field, type the password that is required to access the server on which the VMware installation files are saved.
- g. Click **Next**. The Partition Configuration window is displayed.

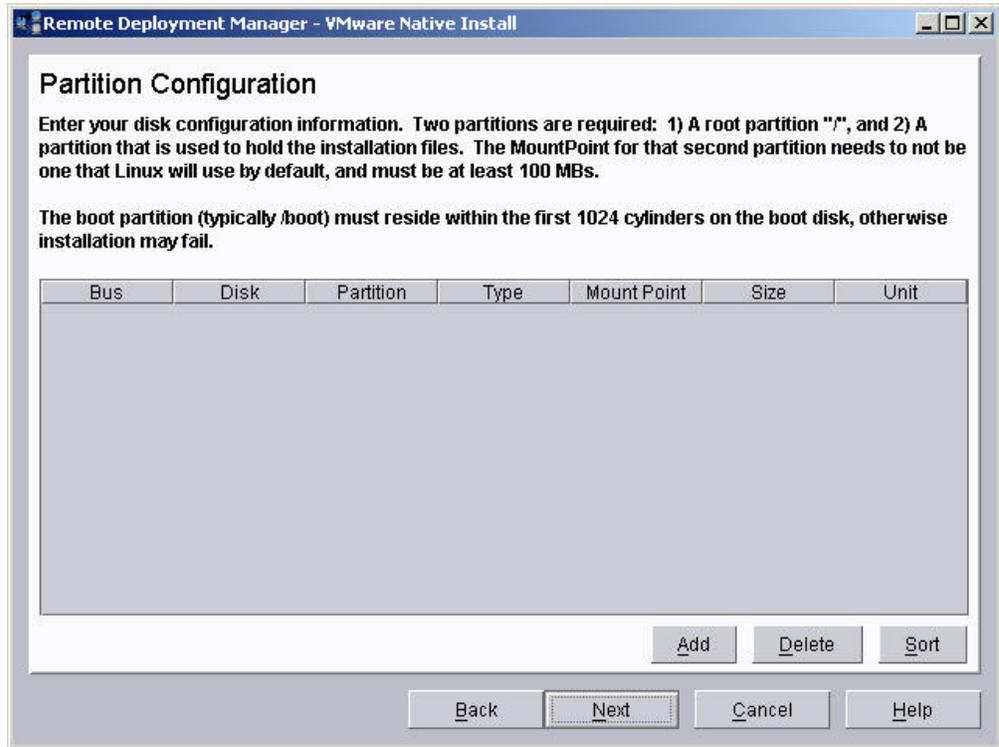


Figure 135. VMware Native Install task: Partition Configuration window

7. Configure the partitions.

**Note:** VMware requires three partitions, described below:

- A boot partition (/boot) which must be the first partition on the disk and be at least 50 MB in size.
- A root partition (/).
- A partition that is used to hold the installation files. The mount point for this partition must not be one that Linux will use by default, and must be at least 100 MB in size.

For more information about these partition requirements, see the documentation that comes with VMware ESX Server.

- a. Click **Add** to add a partition. The “Enter the data for the new partition” window opens.

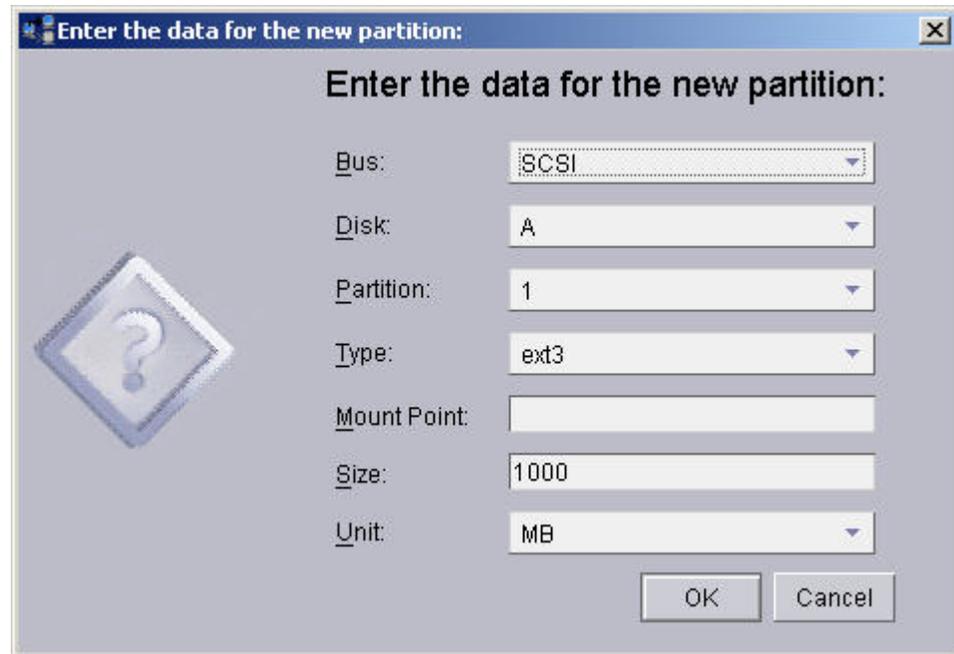


Figure 136. “Enter the data for the new partition” window

- b. In the **Bus** field, select whether the hard disk drive is connected to a SCSI or IDE bus.
- c. In the **Disk** field, select the drive letter of the hard disk drive to which you want to add the partition.
- d. In the **Partition** field, select the partition number for the partition. Partitions 1 through 4 are primary partitions. Partitions 5 and up are extended partitions.
- e. In the **Type** field, select the type of file system for the partition.
- f. In the **Mount Point** field, type the mount point for the selected partition.
- g. In the **Size** field, type the size, in megabytes (MB) or as a percentage of the total size remaining, depending on the specified unit.
- h. In the **Unit** field, select the unit of measure for the size of the partition. Select **MB** to allocate a size in megabytes, or **% Rem** to allocate a size as a percentage of the unallocated disk space. % rem allocations cannot exceed 100% for the primary partitions (1 through 4). % rem allocations for the extended partitions (5 through 16) must not exceed 100%.
- i. Click **OK**.

**Note:** To sort the partitions in ascending order according to the disk letter and partition number, click **Sort**.

- j. Repeat steps 7a-7i for each partition that you want to create.
- k. Click **Next**. The TCP/IP Setup Information window opens.

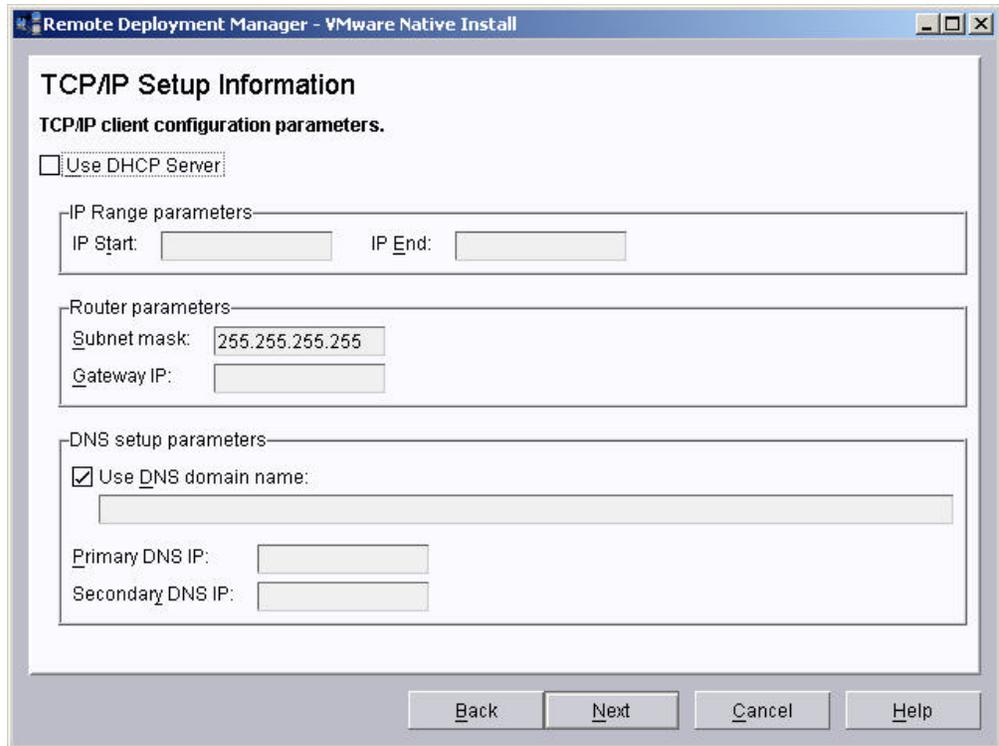


Figure 137. VMware Native Install task: TCP/IP Setup Information window, with Use DHCP Server check box cleared

8. Set up the TCP/IP information.

**Note:** Typically, you will configure other NICs later, under VMware (in other words, after RDM has completed its deployment).

- a. Clear the **Use DHCP Server** check box to configure the TCP/IP settings.
- b. In the **IP Range parameters** fields, type the starting and ending IP addresses to indicate the range of IP addresses that can be used for the target system.
- c. In the **Subnet Mask** field, type the subnet mask that is to be used by the target system.
- d. In the **Gateway IP** field, type the IP address for the gateway that is to be used by the target system.
- e. To configure the target system to use a DNS domain name, select the **Use DNS domain name** check box; then, type the domain name in the field.
- f. To provide the IP address for the primary DNS, in the **Primary DNS IP** field, type the IP address.
- g. To provide the IP address for the secondary DNS, in the **Secondary DNS IP** field, type the IP address.
- h. Click **Next**. The Miscellaneous window opens.

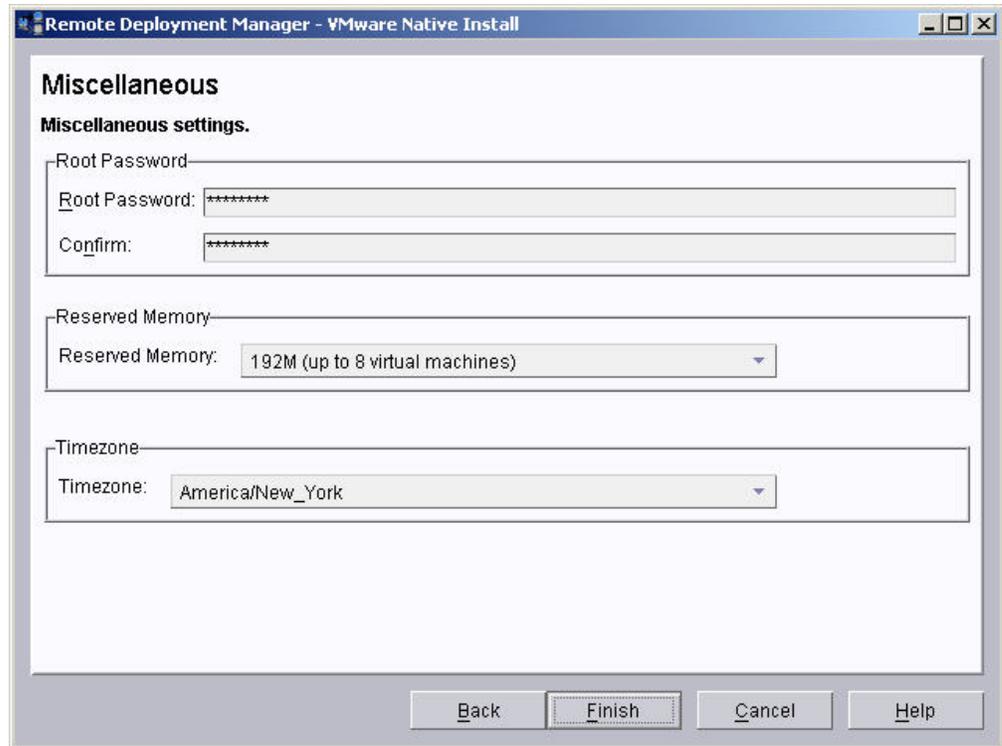


Figure 138. VMware Native Install task: Miscellaneous window

9. Configure the miscellaneous settings:
  - a. In the **Root Password** field, type the password for the root account that is to be used on the target system. The root password can be a maximum of 64 characters long.
  - b. In the **Reserved Memory** field, select the one of the following memory options that is to be used on the target system:
    - 192M (up to 8 virtual machines)
    - 272M (up to 16 virtual machines)
    - 384M (up to 32 virtual machines)
    - 512M (up to 64 virtual machines)
    - 800M (max reserved memory)
  - c. In the **Timezone** field, select the time zone.
  - d. Click **Finish**. The VMware task is displayed in the IBM Director Console Tasks pane.

---

## Configuring a target system

Before you run a VMware Native Install task against a group of target systems, you can configure the systems. Typically, you use the **Configure systems** option from the IBM Director Console menu to add system-specific information to the applicable systems, such as a serial number or a password. When you create a VMware task, the serial information, which is unique for each system, is not requested by RDM. However, you can enter system-specific information remotely by using the **Configure systems** option before you run the task. You also can modify other system-specific information such as root password and regional settings.

Complete the following steps to configure the VMware task for a specific system:

1. From IBM Director Console, expand **Remote Deployment Manager** in the Tasks pane.
2. Expand **VMware Native Install**.
3. Drag the VMware Native Install task onto the target system or systems. The **Task** menu is displayed.
4. Click **Configure systems**. The System/Task Configuration window opens.

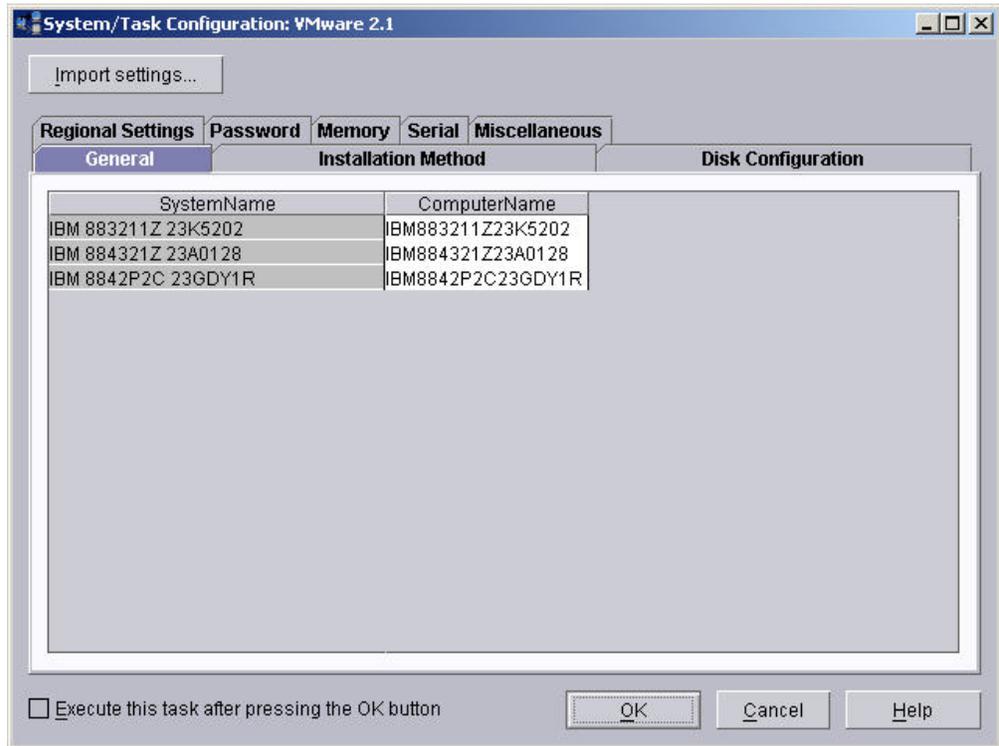


Figure 139. System/Task Configuration window

5. Configure the serial numbers for a target system:
  - a. Click the **Serial** tab. The Serial page is displayed.

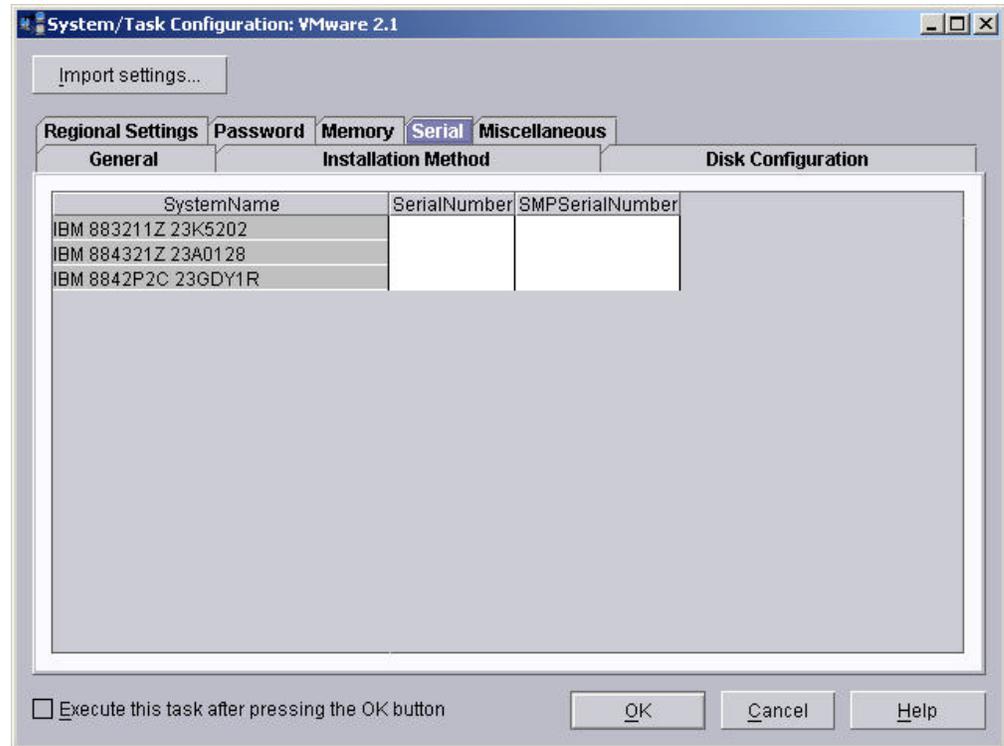


Figure 140. System/Task Configuration window: Serial page

- b. In the **Serial Number** field, type the serial number that was provided with your VMware software. You must configure a serial number for each system.
- c. In the **SMP Serial Number** field, type the symmetric multiprocessing (SMP) serial number for the target system. This serial number is required if you want to install VMware Virtual SMP for ESX Server on the target system.
6. Update the other configuration information as applicable.
7. Click **OK**.

## Running a VMware task

**Note:** If the target system contains multiple network adapters, you may need to configure its primary startup sequence to have "network" before "hard drive". Otherwise, the task may not complete properly on those systems.

Complete the following steps to use a VMware Native Install task to install VMware on a target system:

1. From IBM Director Console, expand **Remote Deployment Manager** in the Tasks pane.
2. Expand **VMware Native Install**. The VMware Native Install tasks are displayed.
3. Drag the VMware Native Install task that you want to run onto the target system. The **Task** menu is displayed.
4. Click **Run systems**. A confirmation window opens.

**Note:** This assumes that you have previously configured the systems, as described in the section above.

5. Click **Execute Now**.



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## Chapter 21. Windows Clone Install

You can use the Windows Clone Install template to create tasks that use a clone image to install Windows on target systems. You select the image from a list of Windows clone images that have already been created. The same image can be downloaded to multiple systems.

The clone installation image contains the operating system and applications designed to meet the requirements of a specific end user, department, or group of end users that perform similar tasks. The image consists of an exact bit-by-bit copy of a donor system. See “Creating a donor image” on page 87 for more information.

**Note:** If RDM is installed on a Linux system, you cannot use the Donor Image, Windows Clone Install, Linux Clone Install, or Power Restore templates or their tasks. RDM must be installed on a Windows system in order to use these templates and tasks.

The Windows Clone Install template uses a wizard to gather the configuration information and create tasks.

This chapter provides the procedures that you must complete in the following order to create a Windows Clone Install task and run it on a target system:

1. Create a Windows Clone Install image.
2. Create a Windows Clone Install task.
3. (Optional) Configure the target systems.
4. Run the Windows Clone Install task.

For more information on the task flow of creating a Windows Clone Install task and installing applications as part of the Windows Clone Install task, see *Using RDM to Deploy Applications* at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-53487>.

---

### Creating a Windows Clone Install image

Before you can run a Windows Clone Install task, you must create an installation image.

**Note:** In most cases, you will use the Get Donor task to create an image. Use this procedure only if you are importing existing Windows clone images.

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

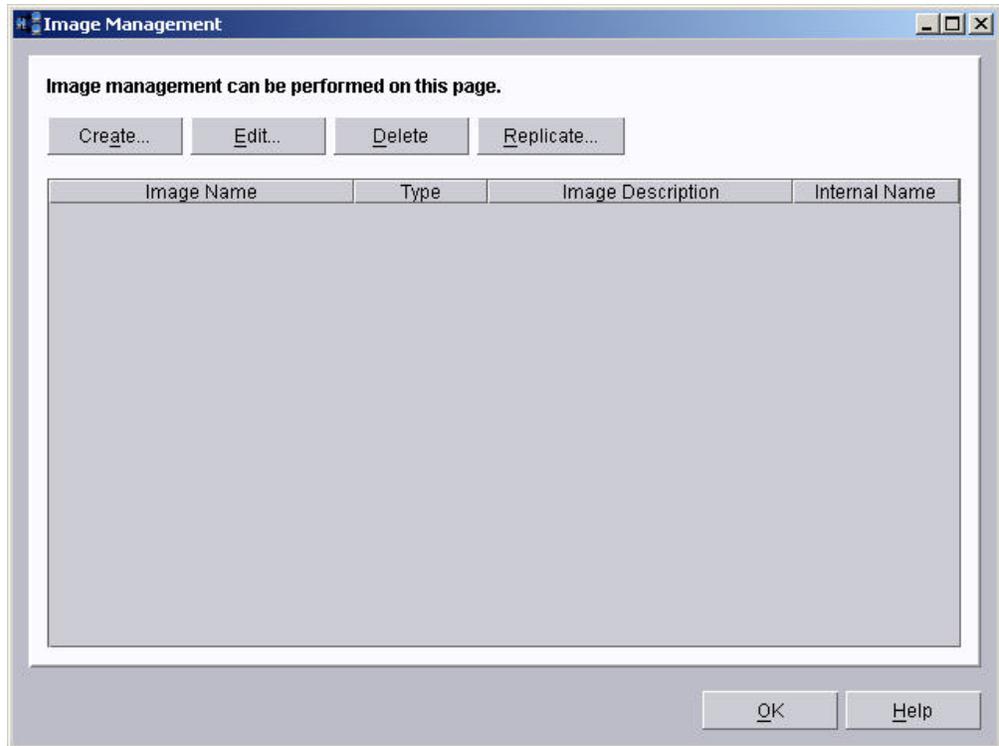


Figure 141. Image Management window

2. Click **Create**. The Create Image window opens.

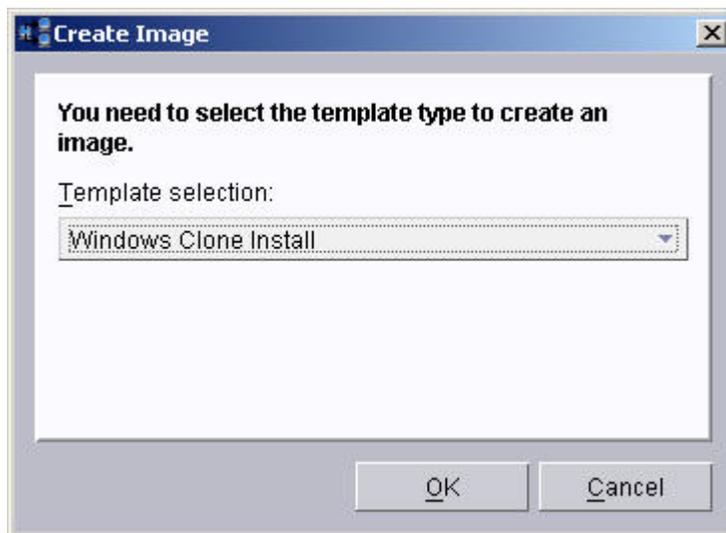


Figure 142. Create Image window

3. In the **Template Selection** field, select **Windows Clone Install**.
4. Click **OK**. The Create Windows Clone Install Image window opens.

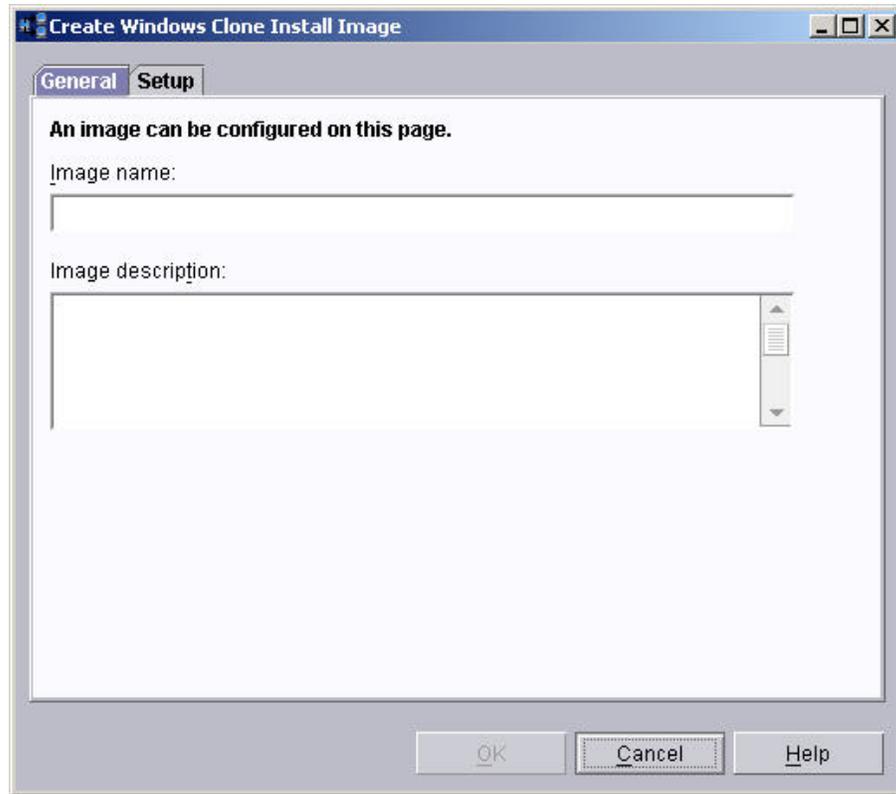


Figure 143. Create Windows Clone Install Image window: General page

5. On the General page, complete the following steps to provide the basic information for the task:
  - a. In the **Image name** field, type a descriptive name to identify the image.
  - b. (Optional) In the **Image description** field, type a brief description of the image.
6. Click the **Setup** tab. The Setup page of the Create Windows Clone Install Image window is displayed.

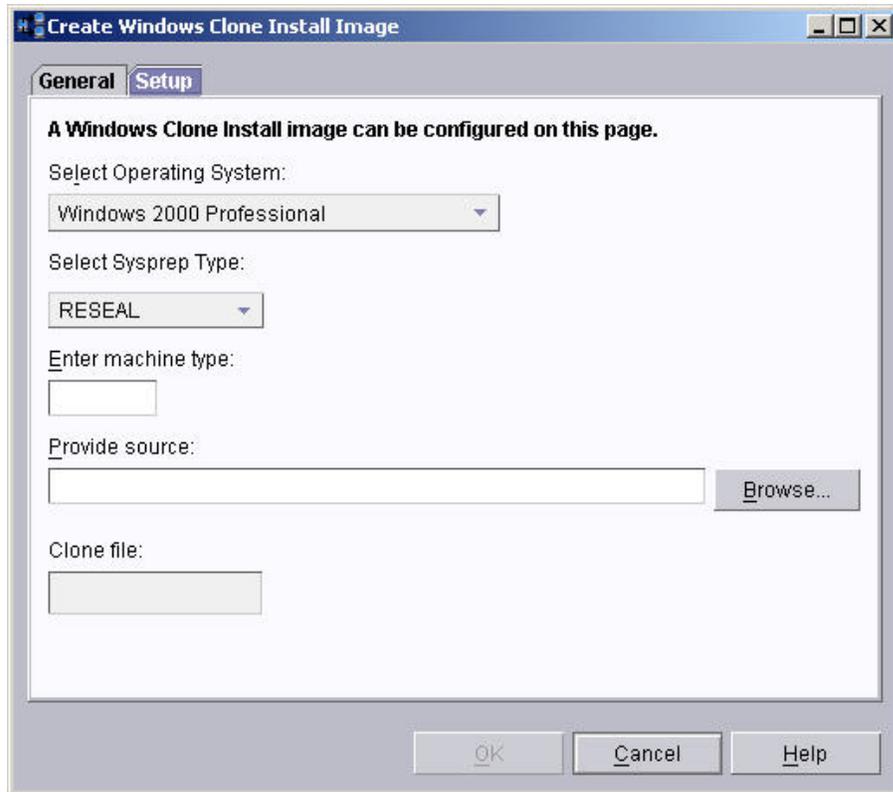


Figure 144. Create Windows Clone Install Image window: Setup page

7. In the **Select Operating System** field, click to select the operating system of the image.
8. In the **Select Sysprep Type** field, click to select the sysprep type.
 

**Note:** For information on the Reseal and Factory sysprep options, see “RDM-supported options in Sysprep version 2.0” on page 343.
9. In the **Enter machine type** field, type the four-digit machine type number of the target system.
10. Click **Browse** to locate and select the Windows Clone Install source file, named clone.pqi. RDM will automatically include that file and any files that go with it (clone.002, clone.003 and so on.)
11. Click **OK**.

---

## Creating a Windows Clone Install task

Complete the following steps to create a Windows Clone Install task:

1. Right-click **Windows Clone Install**. The Windows Clone Install task menu is displayed.
2. Click **Create new task**. The Windows Clone Install window opens.

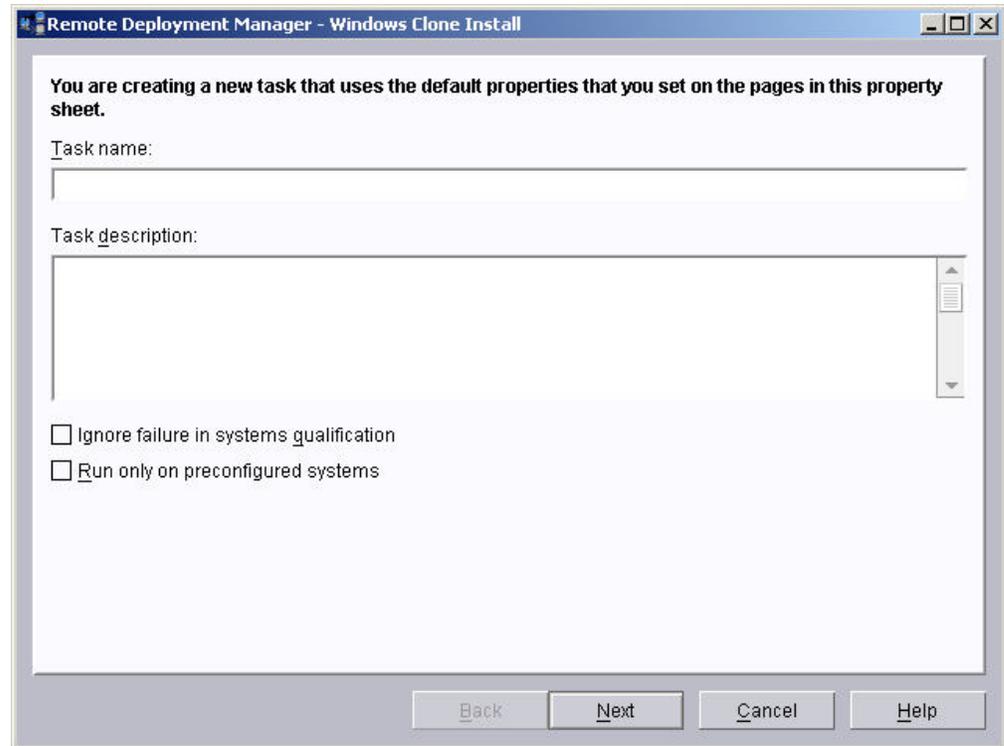


Figure 145. Windows Clone Install task: “You are creating a new task” window

3. Provide the basic information for the task:
  - a. In the **Task name** field, type a descriptive name to identify the task.
  - b. (Optional) In the **Task description** field, type a brief description of the task.
  - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
4. Click **Next**. The “Select images” window is displayed.

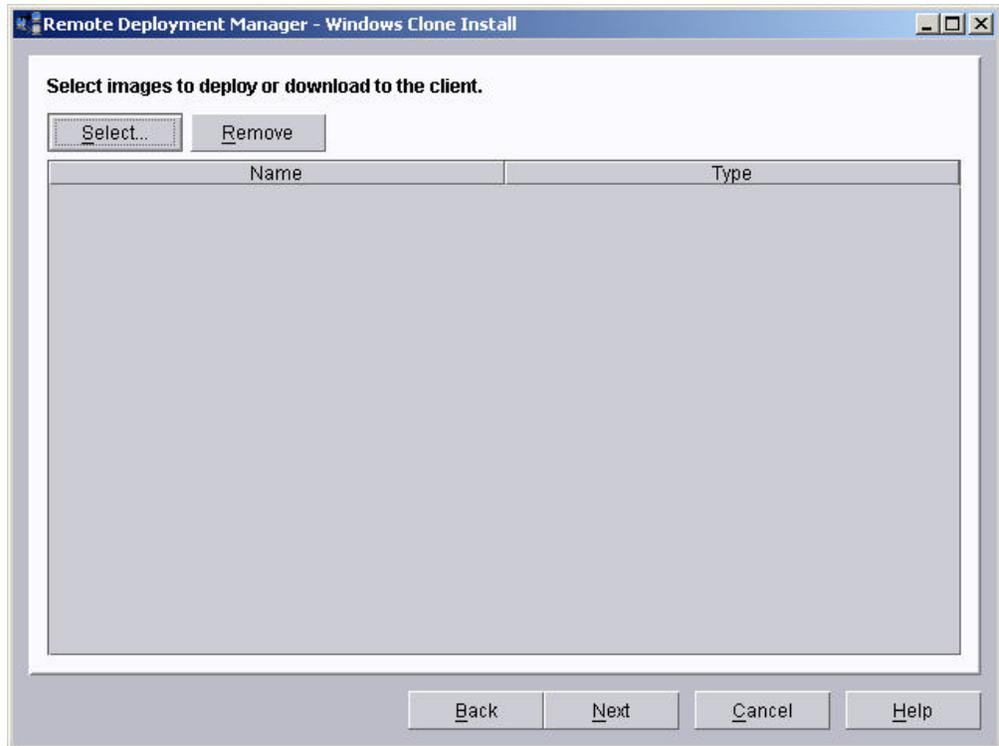


Figure 146. Windows Clone Install task: “Select images” window

5. Select the image:
  - a. Click **Select**. The “Image selection” window is displayed.

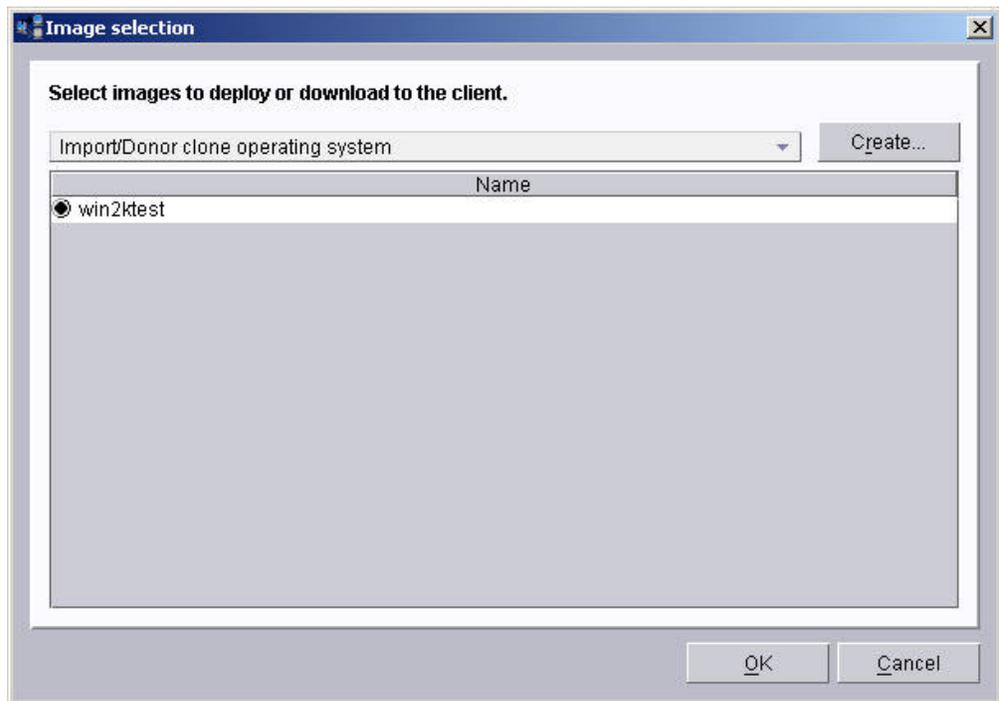


Figure 147. “Image selection” window

- b. From the list of images, click the image to be used.

- c. Click **OK**. The “Image selection” window closes.
6. In the “Select images” window, click **Next**. The “Personal information” window is displayed.

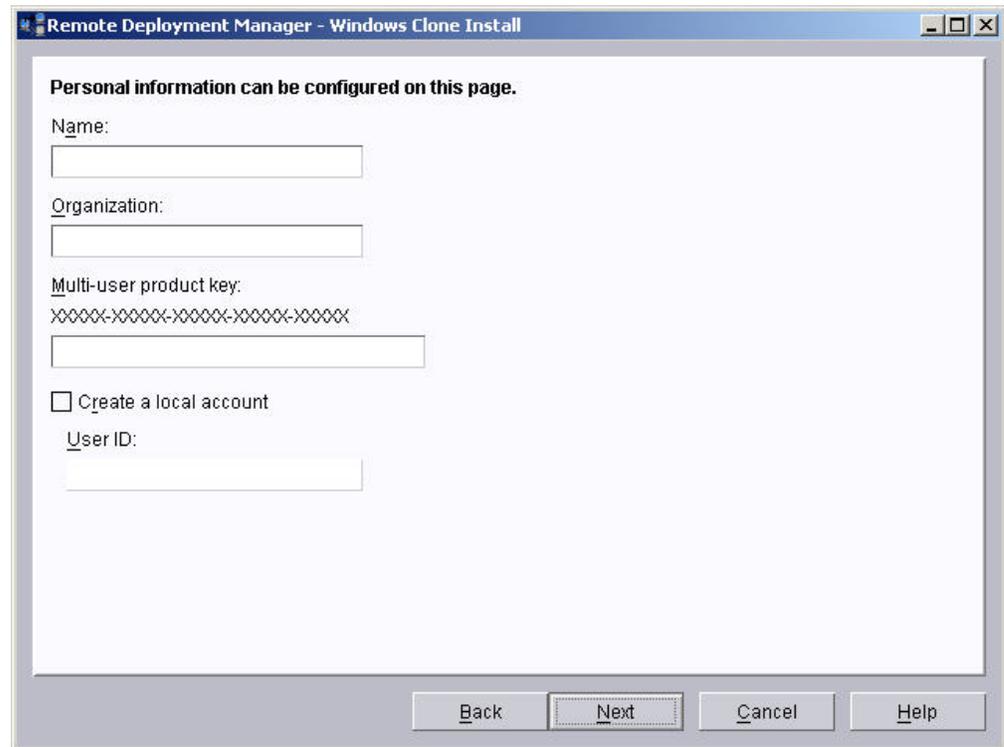


Figure 148. Windows Clone Install task: “Personal information” window

7. Specify the personal information:
  - a. In the **Name** field, type the name of the registered user of the system, for example, John Doe.
  - b. In the **Organization** field, type the company name for the system being deployed, for example, IBM Corporation.
  - c. In the **Multi-user product key** field, type the Certificate of Authorization for the Windows operating system being deployed. The CD key format has a length of 29 characters, formatted in five 5-character alphanumeric tokens separated by hyphens.
  - d. (Optional) Select the **Create a local account** check box if you want to create a local user on the system being deployed. Then, in the **User ID** field, type the name of the user account.

**Note:** **Name** and **Organization** are typically fields whose values are constant. It is a best practice to edit the Windows Clone Install template and enter your values there. Then, whenever you create a new task, these fields will contain your values as defaults.

8. Click **Next**. The Password window opens.

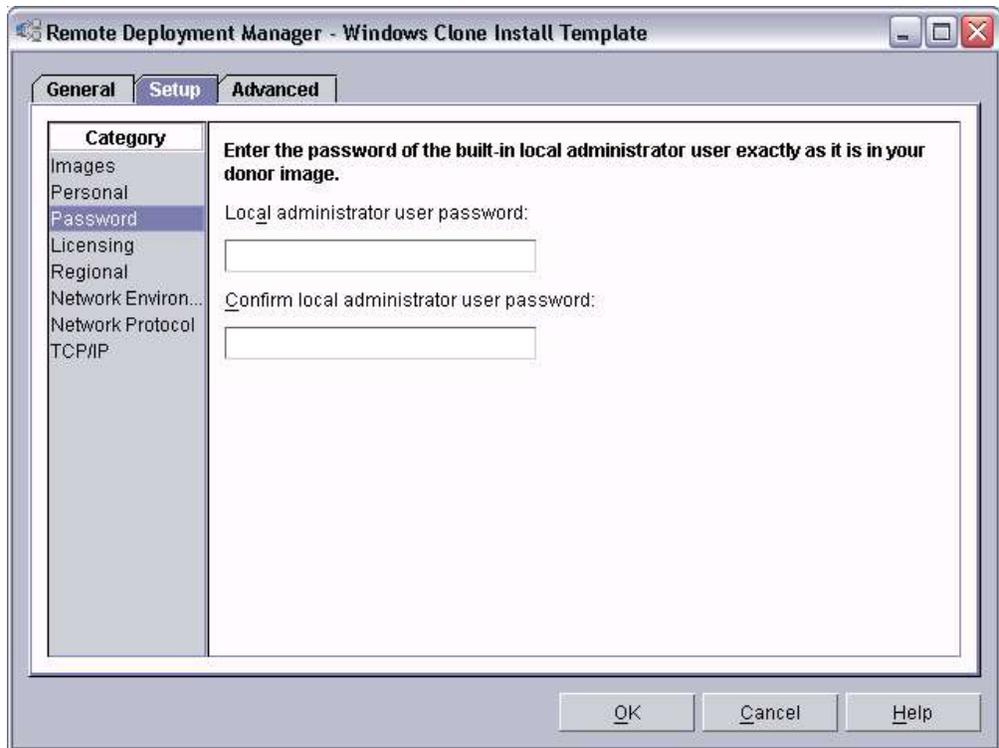


Figure 149. Windows Clone Install task: Password window

9. Enter the password information:
  - a. In the **Local administrator user password** field, type the password for the administrator account on the target system.
  - b. In the **Confirm local administrator user password** field, retype the password for the administrator account on the target system.for the administrator account on the target system.
10. Click **Next**. The "Regional information" window is displayed.

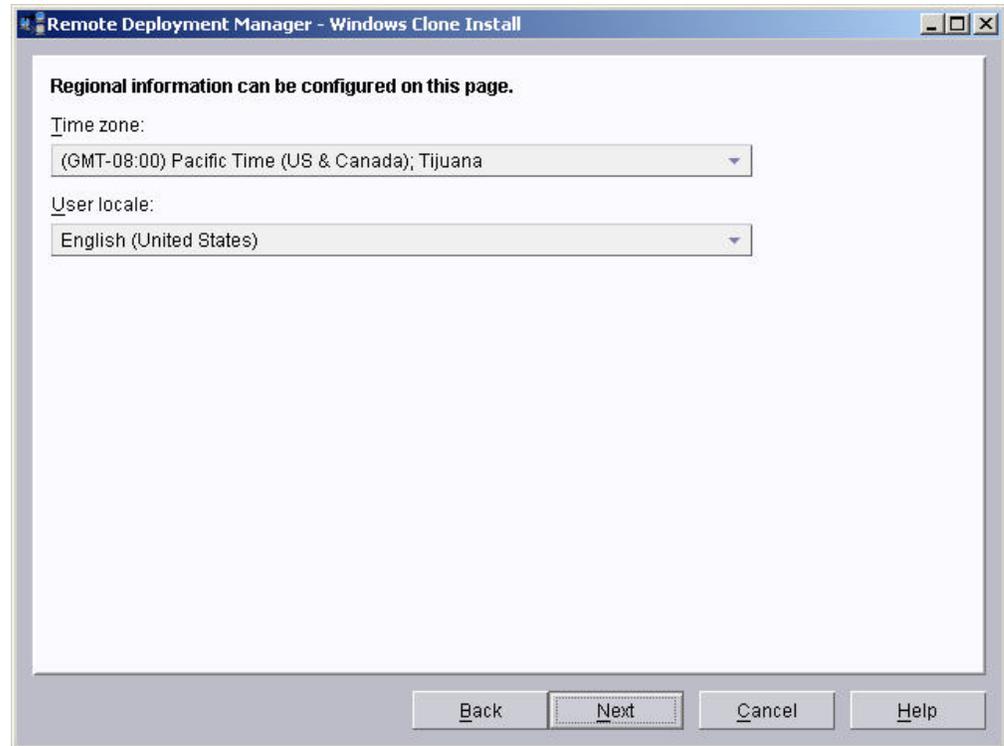


Figure 150. Windows Clone Install task: “Regional information” window

11. Configure the regional settings:
  - a. In the **Time zone** field, select the time zone.
  - b. In the **User locale** field, select the language to display.

**Note:** Regional settings are typically fields whose values are constant. It is a best practice to edit the Windows Clone Install template and enter your values there. Then, whenever you create a new task, these fields will contain your values as defaults.

12. Click **Next**. The “Network environment” window is displayed.

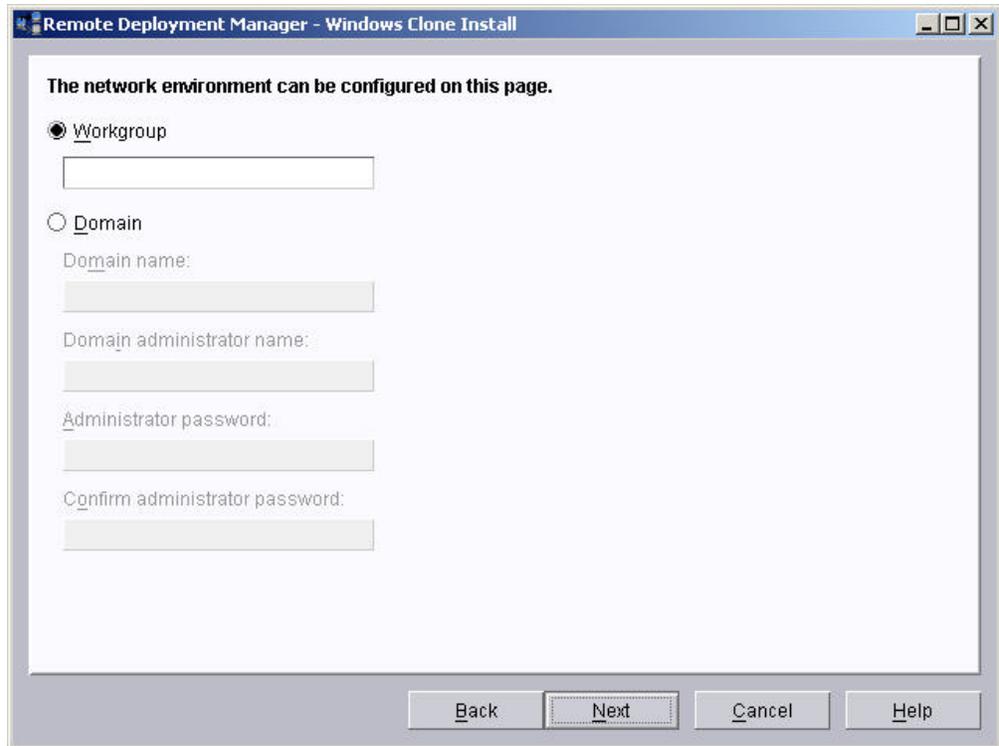


Figure 151. Windows Clone Install task: “Network environment” window

13. Configure the network environment:
  - a. By default, the **Workgroup** check box is selected, which configures the target system to automatically be configured using a workgroup. Type the workgroup name in the **Workgroup** field.
  - b. (Optional) Select the **Domain** check box to configure the domain for the target system. Type the domain name, the domain administrator name, and the domain administrator password in the applicable fields.

**Note:** Network environment settings are typically fields whose values are constant. It is a best practice to edit the Windows Clone Install template and enter your values there. Then, whenever you create a new task, these fields will contain your values as defaults.
14. Click **Next**. The “Network protocols” window is displayed.

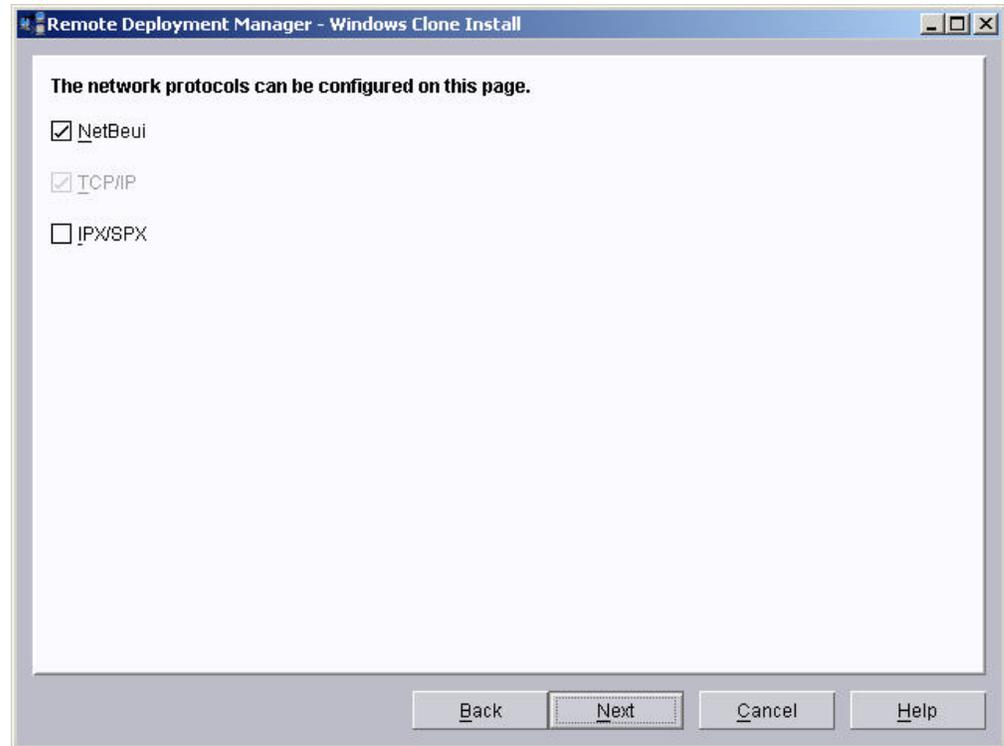


Figure 152. Windows Clone Install task: "Network protocols" window

**Note:** Network protocols are typically fields whose values are constant. It is a best practice to edit the Windows Clone Install template and enter your values there. Then, whenever you create a new task, these fields will contain your values as defaults.

15. Select the check box for the protocols to be configured on the target system.
16. Click **Next**. The TCP/IP window is displayed.

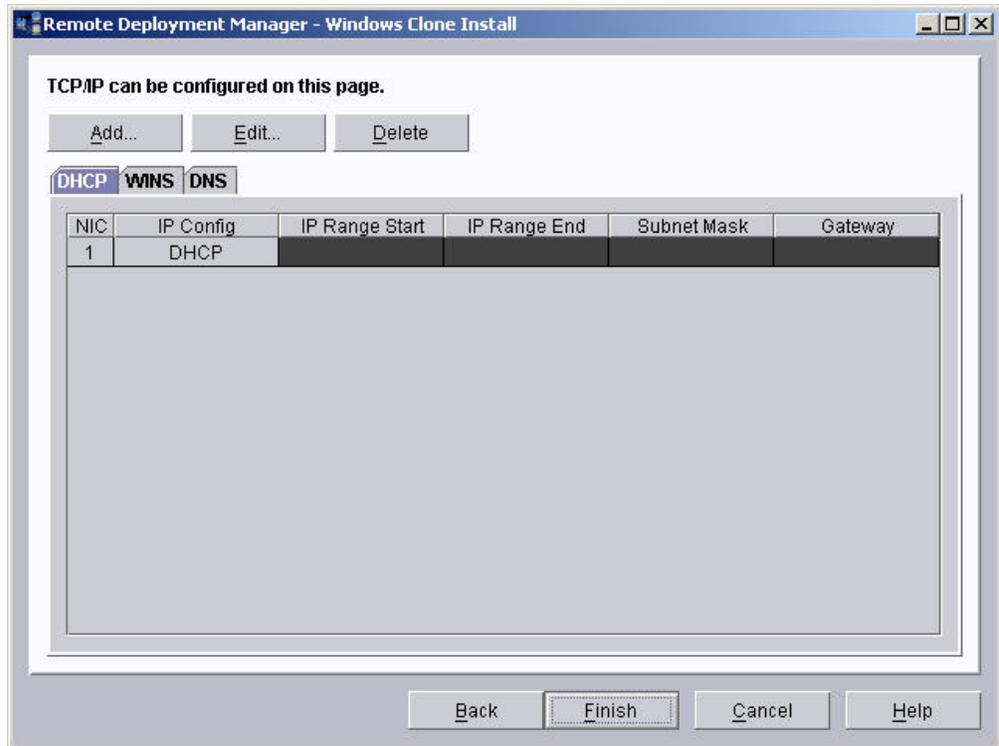


Figure 153. Windows Clone Install task: TCP/IP window

17. On the DHCP page, select the first network adapter, then click **Edit**. The Edit Adapter window is displayed.

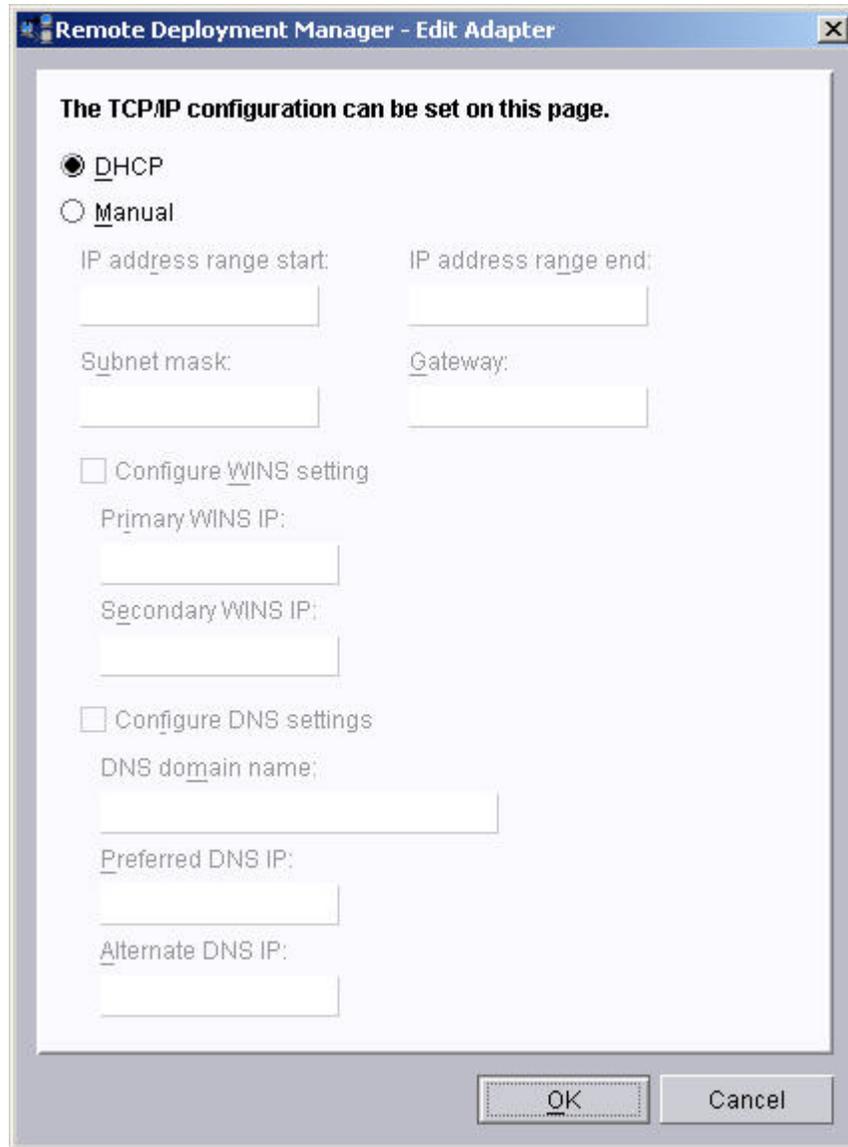


Figure 154. Edit Adapter window

18. By default, **DHCP** is selected, which configures the target system to automatically be configured using a DHCP server. To manually configure DHCP, click **Manual** and go to step 19. Otherwise, go to step 22 on page 234.
19. Configure the DHCP settings:
  - a. (Optional) In the **IP address range start** field, type the IP address of the start of the IP address range.
 

**Note:** Unless you have a specific requirement to use a range, it is a best practice not to use IP address ranges here. In most cases, you should leave them blank.
  - b. (Optional) In the **IP address range end** field, type the IP address of the end of the IP address range.
  - c. In the **Subnet mask** field, type the subnet mask.
  - d. In the **Gateway** field, type the IP address of the gateway server.
20. (Optional) Configure the WINS settings:

- a. Select the **Configure WINS setting** check box.
  - b. In the **Primary WINS IP** field, type the primary WINS server IP address.
  - c. In the **Secondary WINS IP** field, type the secondary WINS server IP address.
21. (Optional) Configure the DNS settings:
    - a. Select the **Configure DNS setting** check box.
    - b. In the **DNS domain name** field, type the domain name.
    - c. In the **Preferred DNS IP** field, type the primary DNS server IP address.
    - d. (Optional) In the **Alternate DNS IP** field, type the alternate DNS server IP address.
  22. Click **OK**. The Edit Adapter window closes.
  23. Click **Finish**.

**Note:** When deploying the following tasks to an IntelliStation MPro system with a SAS HostRAID controller, it is recommended that you increase the timeout value (the number of minutes that the server waits for a system response before generating a fail event) to 720, due to possible slow execution of these tasks:

- Windows Clone Install
- Windows Native Install
- Power Restore

For example, to increase the timeout to 400<sup>®</sup> minutes, create the task, then enter the following into the command list:

```
TIMEOUT 400
```

When you create a task, it is added to the Tasks pane under **Windows Clone Install**. Right-click on the task to edit, copy or delete it.

---

## Running the Windows Clone Install task

Complete the following steps to use a Windows Clone Install task to install Windows on a target system:

1. Expand **Windows Clone Install**. The Windows Clone Install tasks are displayed.
2. Drag the Windows Clone Install task onto the target system. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 5, “Configuring systems and tasks,” on page 41.
5. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then click **OK**. Otherwise, go to step 6.
6. Click **OK**.
7. After the task is completed, log on to the target system using a user account with administrator privileges so that the Windows Clone Install task cleanup script can run.

### Notes:

1. If the video settings of the installation image are not valid for the graphics device of the target system, Windows Setup changes the video settings to the closest match for the graphics device of the target system.

2. If the assigned computer name is not valid, RDM changes the computer name using the following rules:
  - Remove spaces and characters that are not valid from the computer name. The following characters are not valid: `~!@#\$%^&\*()=+[]\|;:'",<>/?. For example, *pear frsh* would be changed to *pearrfrsh*.
  - Truncate from the end to make the computer name no longer than 63 characters.
  - Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
  - Add *\_1*, *\_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.
3. The Windows Clone Install task might fail if a sysprep directory already exists in the root directory. If you have a directory *C:\sysprep* and the WCI task fails, try running the WCI task again.

---

## Modifying the Windows Clone Install answer file

The answer2.txt file is the RDM version of Sysprep.inf. Sysprep files are used to configure a captured image to run on a device. Sysprep.inf files supply personalized information that replaces device specific information in the image that is being deployed, like the computer name. You can make changes to the answer2.txt file if appropriate.

Complete the following steps to modify the answer file used with a Windows Clone Install task:

1. Right-click the Windows Clone Install task and click **Edit template**. The Windows Clone Install window opens.
2. Select the **Advanced** tab.
3. Select **Task folder**. Note the location of the task folder, then click **Cancel**.
4. Locate the answer2.txt file. This file is located in the task folder on the RDM Server. Open the file in an ASCII text editor and make the changes.
5. Save the modified answer file.

If you make changes to the answer file and later edit the task notebook, your changes will be overwritten unless you select the **Keep task folder answer file as is** check box.

Complete the following steps to specify whether or not the task answer file is changed when you complete your notebook edits:

1. Right-click **Windows Clone Install**. The Windows Clone Install task menu is displayed.
2. Click **Edit template**. The Windows Clone Install window opens.
3. Click **Advanced**. The Advanced page is displayed.
4. In the Category pane, click **Miscellaneous**. The Miscellaneous page is displayed.

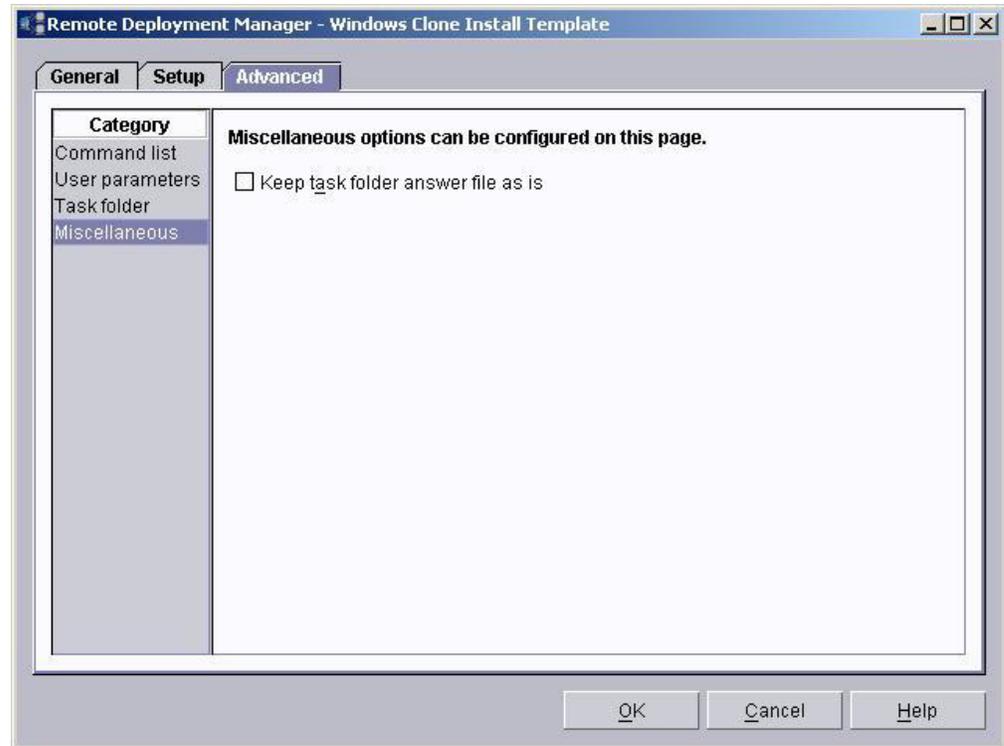


Figure 155. Windows Clone Install Template window: Advanced page

5. Select or clear the **Keep task folder answer file as is** check box.  
If this check box is selected, the task folder answer file remains as it was before you edited the notebook. Any modifications made to the file before editing the notebook will not be overwritten.  
If this check box is cleared, the task folder answer file is rewritten using the values displayed during your editing of the notebook.
6. Click **OK**.



---

## Chapter 22. Windows Native Install

You can use the Windows Native Install template to create tasks that install Windows and applications on target systems. The Windows Native Install template uses a wizard to gather the configuration information and create tasks.

This chapter provides information about the following operations:

- Creating a Windows Native Install image
- Creating a Windows Native Install task
- Running a Windows Native Install task

**Note:** When you edit a Windows Native Install task, some files in the task folder will be regenerated. Any manual changes you have made to these files may be lost, although RDM will preserve as manually edited data as possible. Listed below are the files in the task folder that will be regenerated, and what specific sections of these files will be regenerated (as RDM tries to preserve your manual changes elsewhere in the files):

- `answer2.txt`: In `answer2.txt`, RDM only regenerates data that is referenced by the data saved or collected from the WNI notebook.
- `commandlist`: In `commandlist`, only the code section between protect marker and unprotect marker will be regenerated.
- `taskenv.bat`: The `taskenv.bat` file will be regenerated completely.

For more information on the task flow of creating a Windows Native Install task and installing applications as part of the Windows Native Install task, see *Using RDM to Deploy Applications* at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-53487>.

---

### Creating a Windows Native Install image

You can use the Image Management option to create a Windows Native Install image. A Windows Native Install image can be one of the following items:

- Windows operating system
- Service pack
- Desktop wallpaper
- Application

**Notes:**

1. In RDM 4.30, images of Software Delivery Assistant and System Migration Assistant files will no longer be supported.
2. A Windows Native Install image has a maximum size of 2 GB.

Complete the following steps to create a Windows Native Install image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager Tools** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

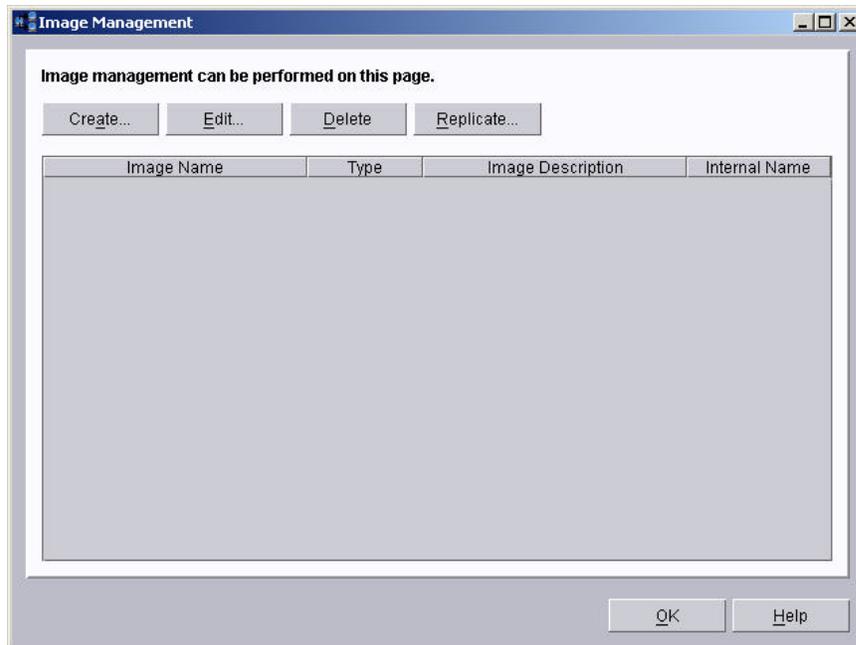


Figure 156. Image Management window

2. Click **Create**. The Create Image window opens.

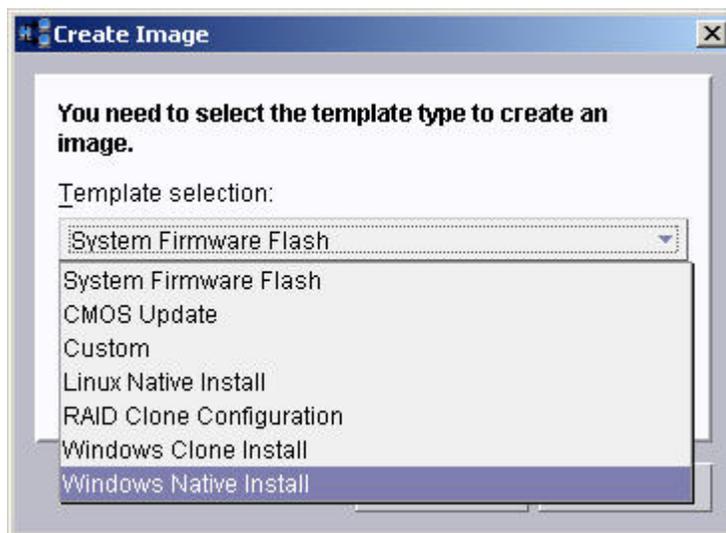


Figure 157. Create Image window

3. In the **Template selection** field, select **Windows Native Install**; then, click **OK**. The Create Windows Native Install Image window opens and the General page is displayed.

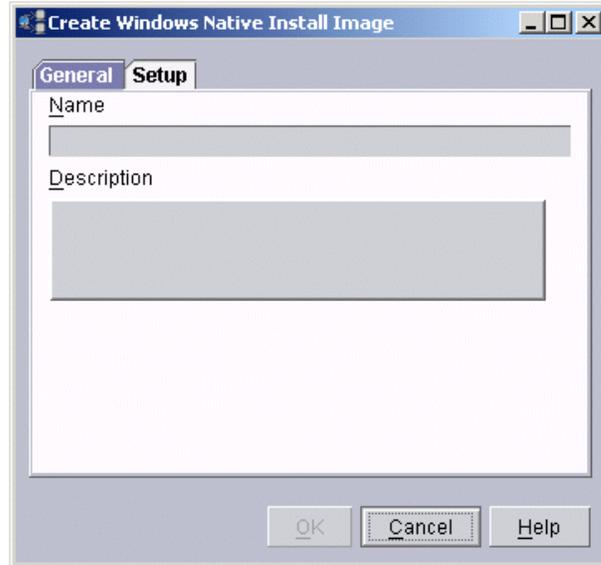


Figure 158. Create Windows Native Install Image window: General page

4. Specify information about the image:
  - a. In the **Name** field, type a name for the image
  - b. (Optional) In the **Description** field, type a brief description of the image.
5. Click **Setup**. The Setup page is displayed.

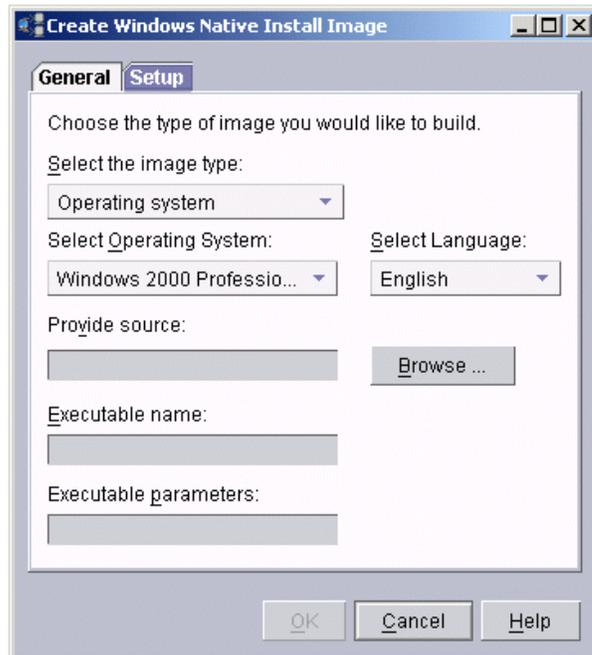


Figure 159. Create Windows Native Install window: Setup page

6. In the **Select the image type** field, select the type of image that you want to create.

**Notes:**

- a. In RDM 4.30, images of Software Delivery Assistant and System Migration Assistant files will no longer be supported.
- b. Wallpaper can be deployed to the local administrator of the target system only.

| <b>If you selected</b> | <b>Go to</b> |
|------------------------|--------------|
| Operating system       | Step 7       |
| Service pack           | Step 8       |
| Desktop wallpaper file | Step 9       |
| Application            | Step 9       |

- 7. Create an operating-system image:
  - a. In the **Select Operating System** field, select the applicable Windows operating system.
  - b. In the **Select Language** field, select the applicable language.
  - c. Insert the Windows Installation CD into the CD drive.

**Note:** If the Windows installation files are saved to a drive that is accessible from the RDM console that you use to create the image, you do not have to insert the installation CD into the CD drive.

- d. Click **Browse** and navigate to the Windows WINNT.EXE file (for 32-bit Windows) and WINNT32.exe for 64-bit Windows. By default, the WINNT.EXE and WINNT32.EXE files are located in the \I386 directory.
  - e. Click **OK**. Go to step 10 on page 243.
- 8. Create a service pack image:
  - a. In the **Enter Service Pack** field, type the service pack number.
  - b. Click **Browse** and navigate to the Windows UPDATE.EXE file.
  - c. Click **OK**. Go to step 10 on page 243.
- 9. Create a desktop wallpaper image or an application image:

- a. In the **Provide source** field, type the fully qualified name of the directory that contains the application install files. Alternately, click **Browse** and navigate to the applicable file.

**Notes:**

- 1) For a desktop wallpaper image, the source file must be the executable file that installs the application. For an application image, the source file must be the applicable installation file.
  - 2) If you create an application image that is based on a batch file, the last command in the batch file must be an exit command; otherwise, the Windows Native Install task will never be completed.
- b. In the **Executable name** field, type the name of the file that installs the application. Alternately, click File and navigate to the applicable file.
- c. In the **Executable parameters** field, type the command-line parameters that you need. Consult the application's documentation for the syntax of its unattended install capability. Precede any parameter that is a file name with:  
%APPDIR%\
- d. Click **OK**. Go to step 10 on page 243.

10. Click **OK**. The Task Image Creation Progress window opens and the progress of the operation is displayed.
11. If prompted, insert the applicable volume into the CD drive; then, click **OK**.
12. When finished, click **OK**.

---

## Creating a Windows Native Install task

Complete the following steps to create a Windows Native Install task:

1. Right-click **Windows Native Install**; then, click **Create new task**. The Windows Native Install window opens.
2. Provide the basic information for the task:
  - a. In the **Task** name field, type a descriptive name to identify the task.
  - b. In the **Task description** field, type a brief description of the task.
  - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
  - d. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
  - e. Click **Next**. The “Select an operating system image” window opens.

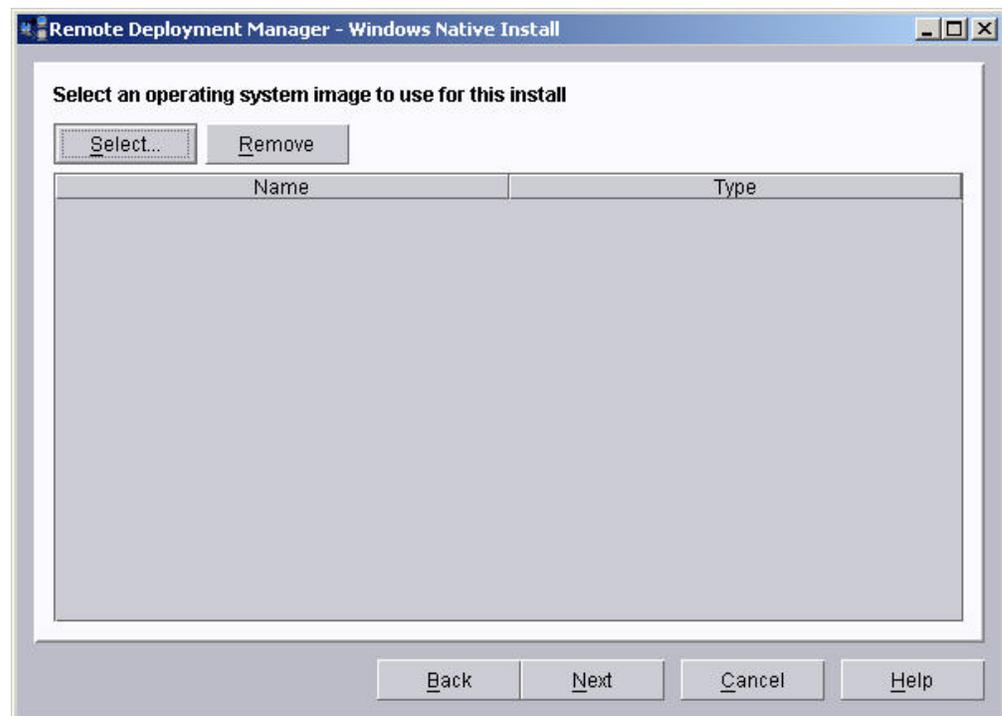


Figure 160. Windows Native Install task: “Select an operating system image” window

3. Select the Windows Native Install image:
  - a. Click **Select**. The “Image selection” window opens.

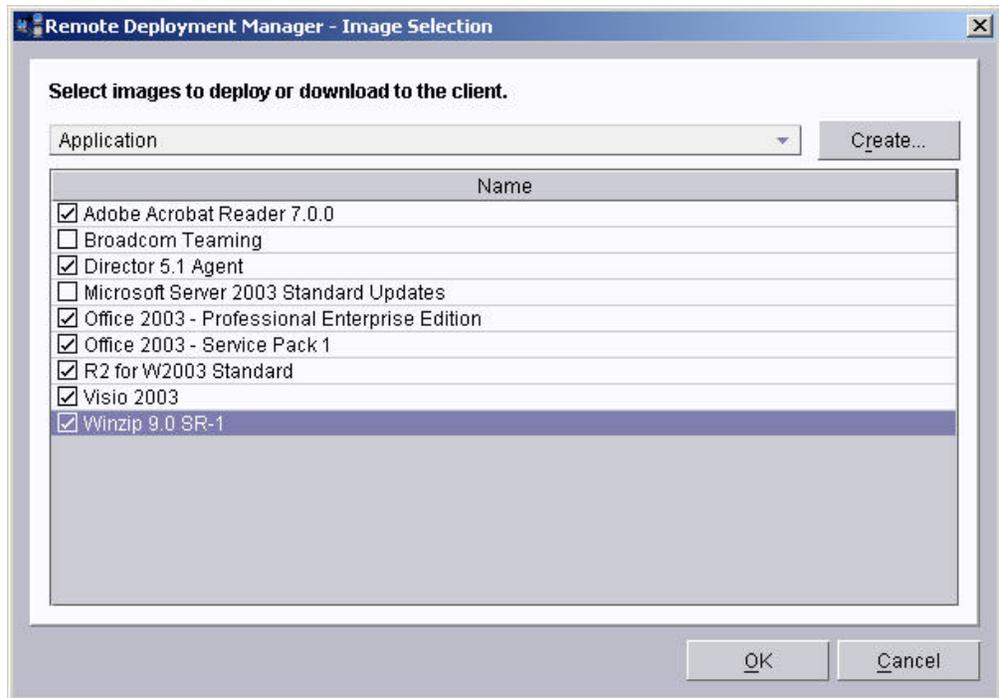


Figure 161. "Image selection" window

- b. Select the Windows Native Install image that you want to use.

**Note:** If you have not already created the Windows Native Install image, click **Create** to create the image. See "Creating a Windows Native Install image" on page 239 for more information.

- c. Click **OK**. The "Select an operating system image" window reopens, and the selected image is displayed.

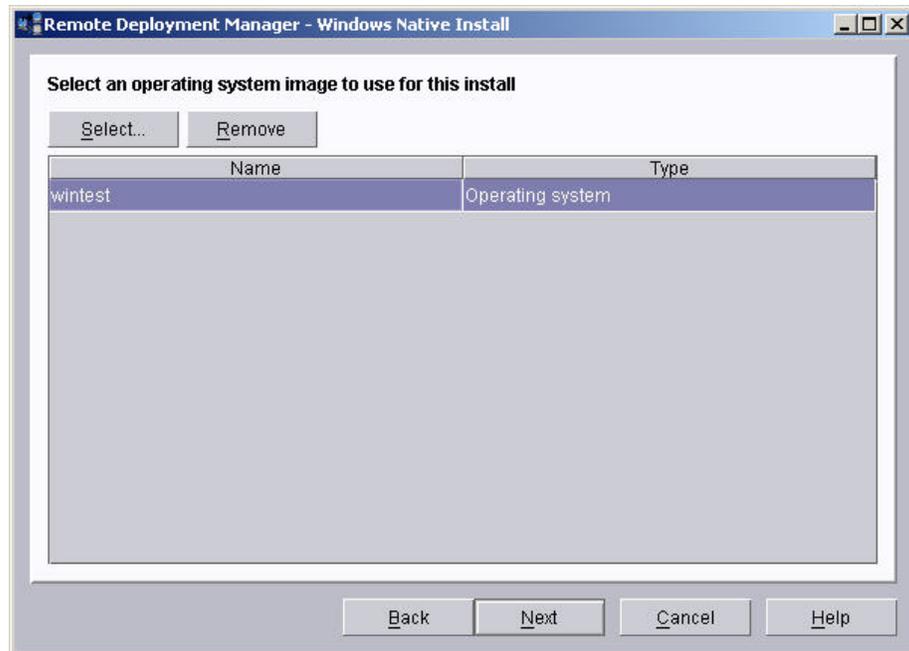


Figure 162. Windows Native Install task: “Select an operating system image” window

4. Click **Next**. The “Select images of other types” window opens.
5. (Optional) Add additional images, such as applications, service packs or desktop wallpaper, to the task:
  - a. Click **Select**. The “Image selection” window opens.

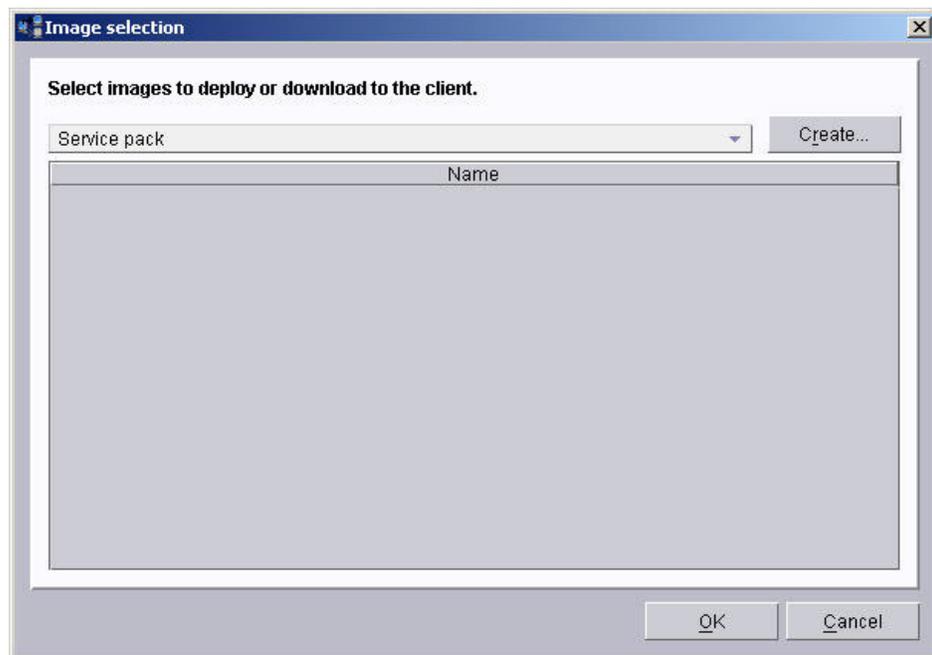


Figure 163. “Image selection” window

- b. In the drop-down list (above the **Name** field), select the image type.
- c. Select all of the image files that you want to use.

- d. Repeat steps 5b through 5c on page 245 until you have selected all the images for the task; then, click **OK**.
6. Click **Next**. The Partitions window opens.

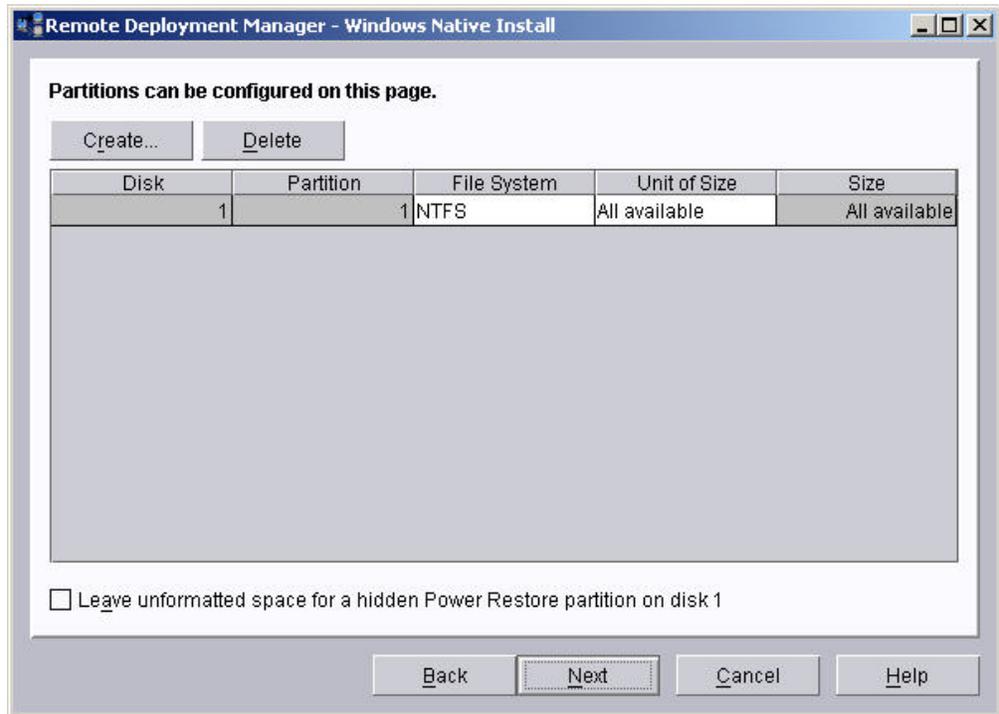


Figure 164. Windows Native Install task: Partitions window

7. The template's default settings for the partition are displayed. If you want to accept the default settings, go to step 9 on page 247. Otherwise, continue to step 8.
8. Configure the partitions:
  - a. Click **Add**. The Create Partition window opens.

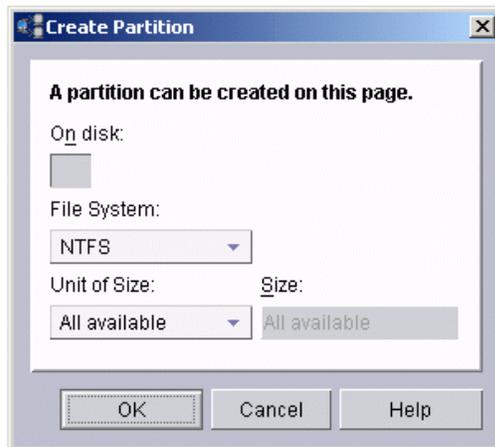


Figure 165. Create Partition window

- b. In the **On disk** field, type the disk number on which you want the partition to be created.

**Note:** The first disk is number 1. Letters are not valid.

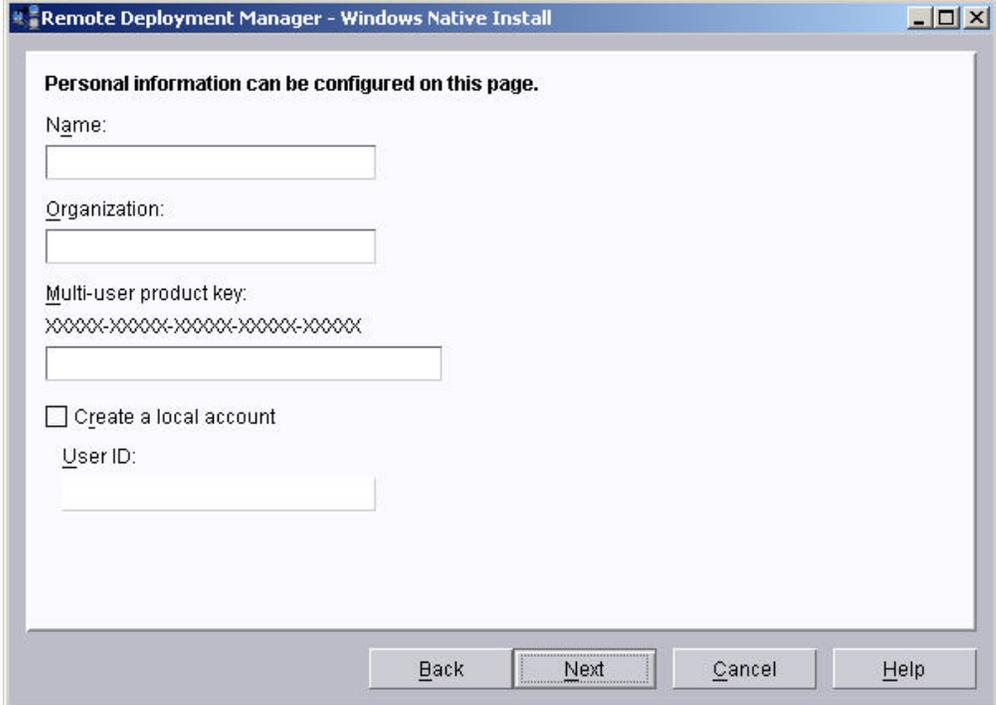
- c. In the **File System** field, select the file system type.
- d. In the **Unit of Size** field, select the unit of measure for the size of the partition. Select **MB** for Megabyte, or **All available** for percentage remaining.

**Note:** Only one partition can be defined as All available on a disk.

- e. (Optional) In the **Size** field, type the size in megabytes (MB) or as a percentage of the total size remaining, depending on the specified unit.
  - f. Click **OK**. The new partition is displayed in the Partition Configuration window.
  - g. Repeat step 8 on page 246 until you have configured all partitions.
9. (Optional) Select **Leave unformatted space for a hidden Power Restore partition on disk 1** to reserve unformatted space for a power restore partition on the drive that will contain the primary (boot) partition. The unformatted partition created by selecting this check box is equal to the size of partition 1 of this disk (disk 1).

**Note:** Use the Power Restore task to create the actual Power Restore backup.

10. Click **Next**. The “Personal information” window opens.



Remote Deployment Manager - Windows Native Install

Personal information can be configured on this page.

Name:

Organization:

Multi-user product key:  
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Create a local account

User ID:

Back Next Cancel Help

Figure 166. Windows Native Install task: “Personal information” window

11. Specify the personal information:
  - a. In the **Name** field, type the name of the registered user of the system, for example, John Doe.
  - b. In the **Organization** field, type the company name, for example, IBM Corporation.

- c. In the **Multi-user product key** field, type the certificate of authorization for the Windows operating system. The CD key is 29 characters in length, formatted in five 5-character alphanumeric tokens separated by hyphens.
- d. (Optional) Select **Create a local account** if you want to create a local user (a member of the Windows Users group) on the target system. Then, in the **User ID** field, type the name of the user account.

**Note:** **Name** and **Organization** are typically fields whose values are constant. It is a best practice to edit the Windows Clone Install template and enter your values there. Then, whenever you create a new task, these fields will contain your values as defaults.

12. Click **Next**. The Password window opens.

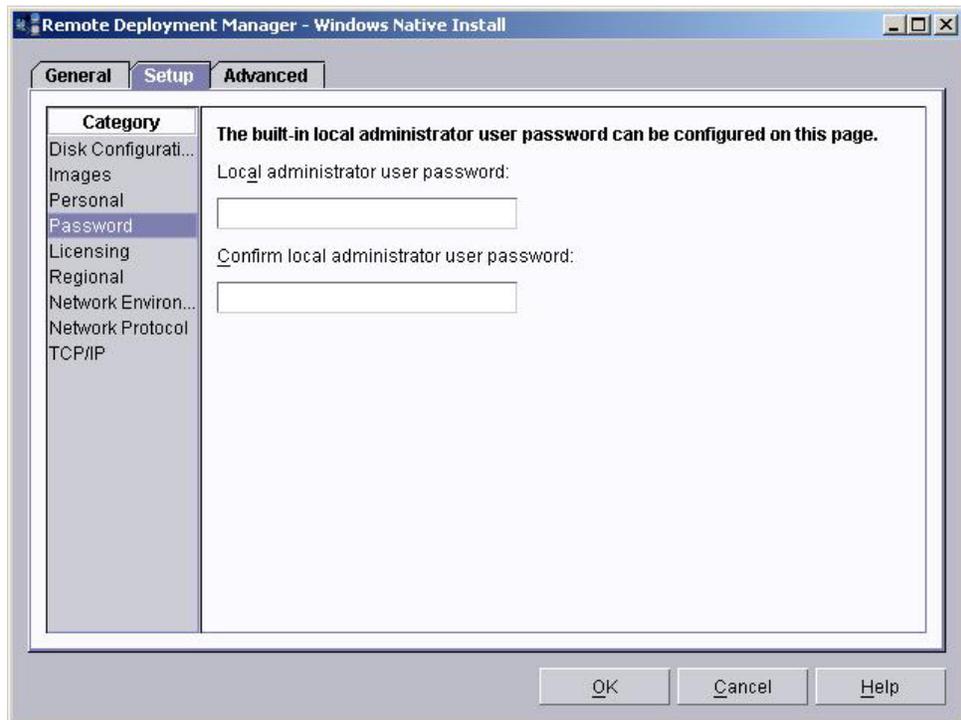


Figure 167. Windows Native Install task: Password window

13. Enter the password information:
  - a. In the **Local administrator user password** field, type the password for the administrator account on the target system.
  - b. In the **Confirm local administrator user password** field, retype the password for the administrator account on the target system.
14. Click **Next**. The Licensing window opens.

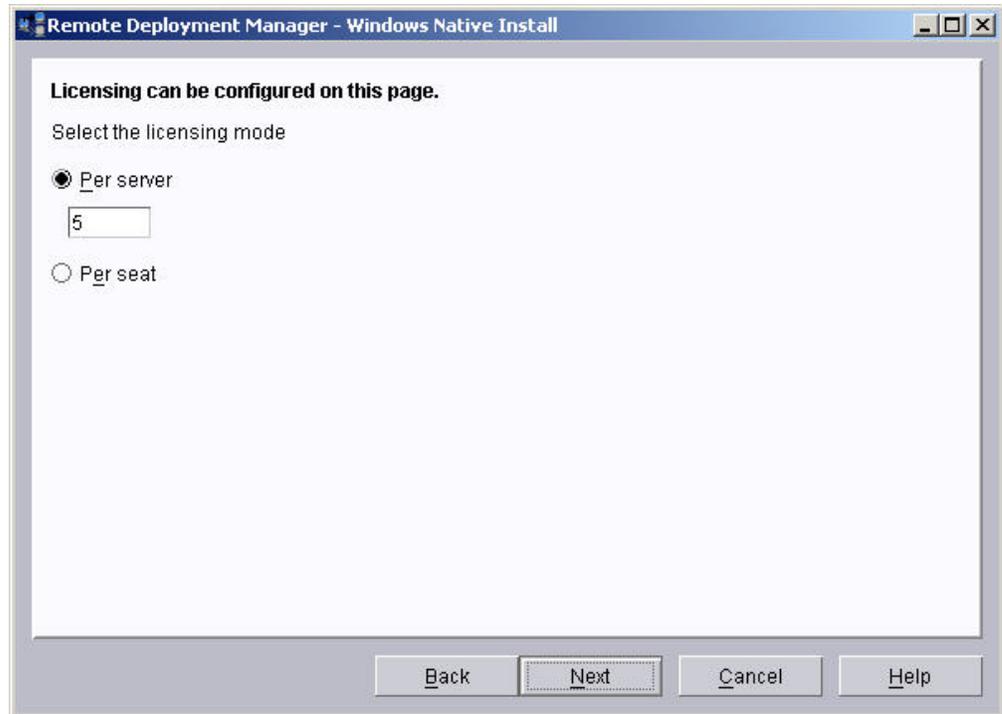


Figure 168. Windows Native Install task: Licensing window

15. Select the licensing mode. If you select **Per Server**, specify the number of licenses.
16. Click **Next**. The “Regional information” window opens.

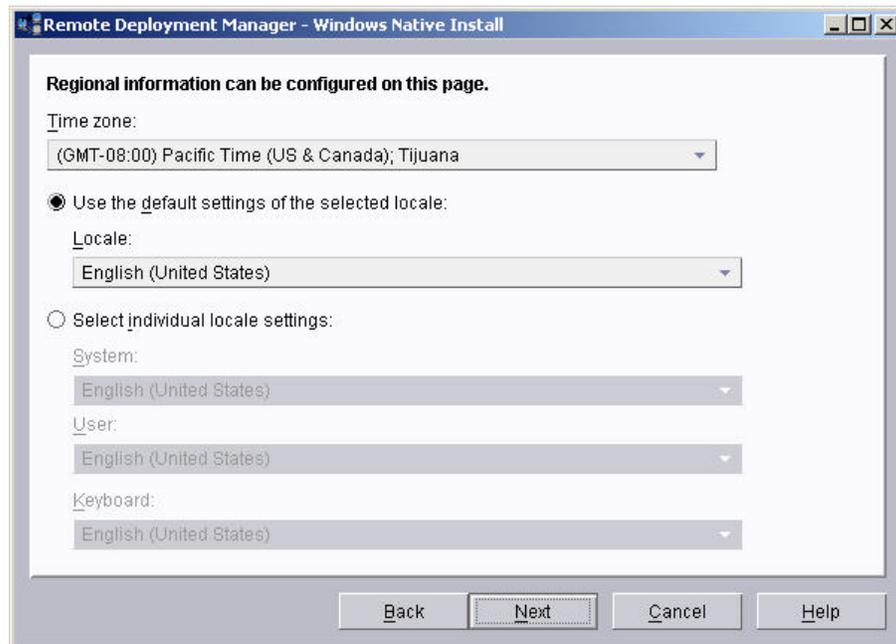


Figure 169. Windows Native Install task: “Regional information” window

17. Configure the regional information:
  - a. In the **Time Zone** field, select the time zone.

- b. In the **User locale** field, select one of the radio buttons. Then select the languages you want from the drop-down lists that are enabled.
18. Click **Next**. The “Network environment” window opens.

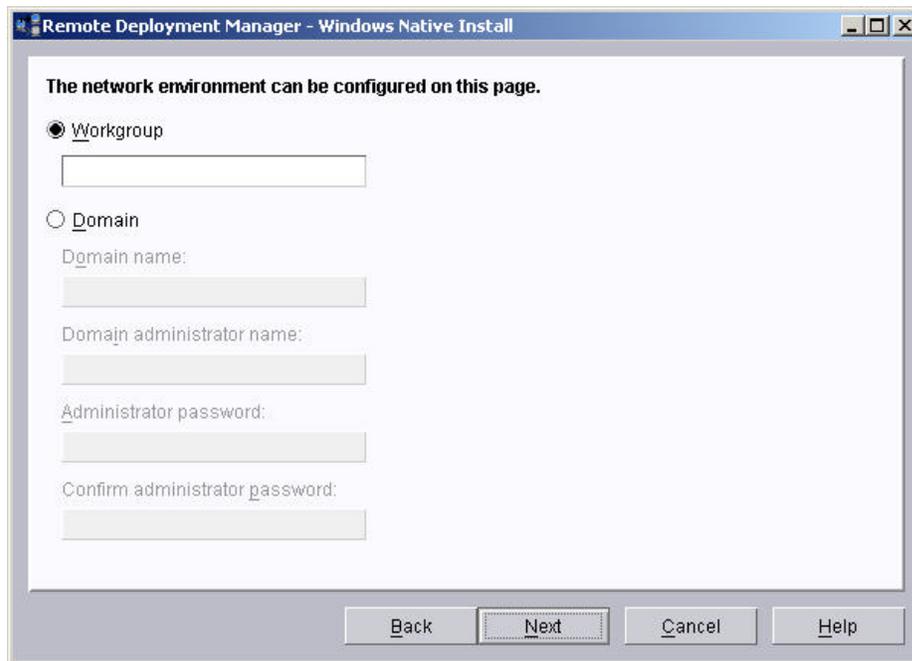


Figure 170. Windows Native Install task: “Network environment” window

19. Select either **Workgroup** or **Domain**.
- If you select **Workgroup**, type the workgroup name in the field below it.
  - If you select **Domain**, type the domain name, the domain administrator name, and the domain administrator password in the applicable fields.
20. Click **Next**. The “Network protocols” window opens.

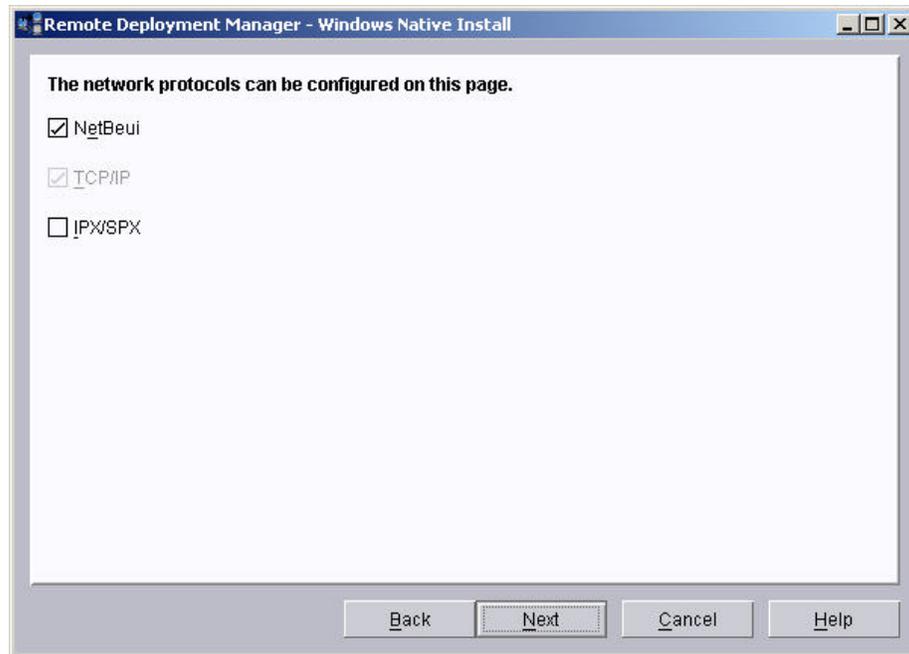


Figure 171. Windows Native Install task: “Network protocols” window

21. Select the network protocols.
22. Click **Next**. The TCP/IP window opens and the TCP/IP configuration page is displayed. From this window, you can configure one or more network adapters (NICs).” .

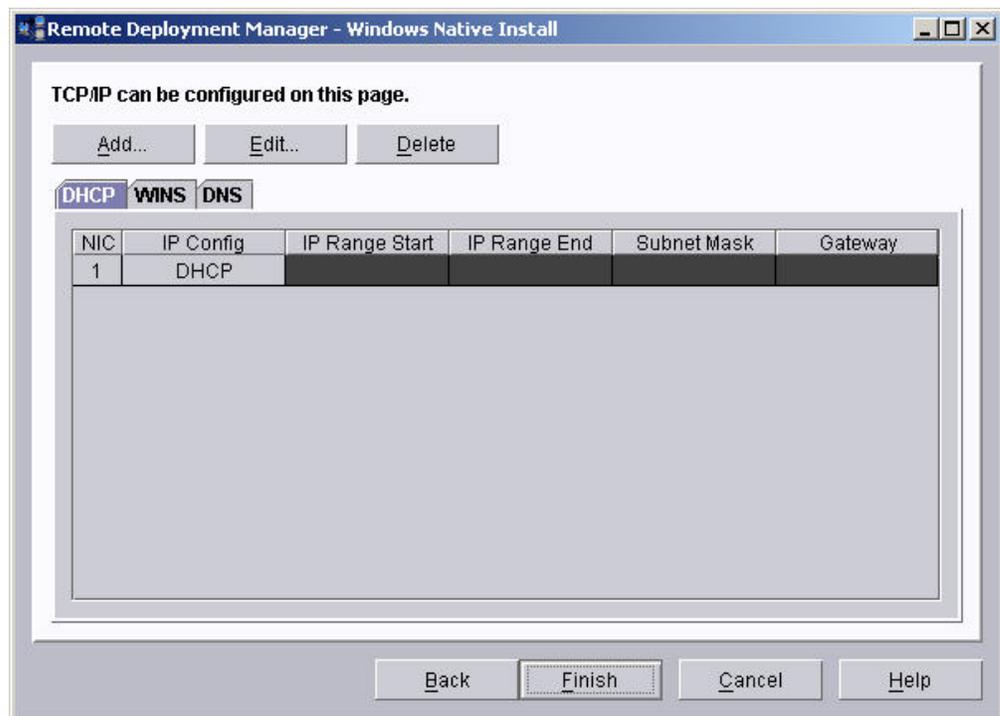


Figure 172. Windows Native Install task: TCP/IP window

23. To change the first NIC's configuration, select it from the list and then select the Edit button. To add another NIC to the list, select the Add button. The Edit Adapter window opens.

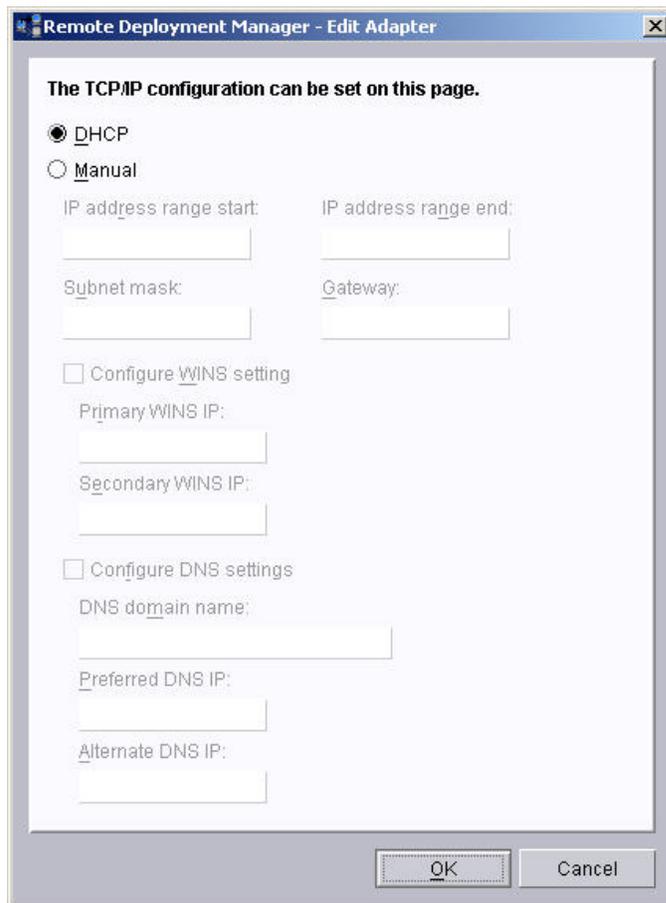


Figure 173. Edit Adapter window

24. By default, **DHCP** is selected. This specifies that the target system is automatically configured using a DHCP server. To accept the default setting, go to step 28 on page 253. Otherwise, continue to step 25.
25. (Optional) Manually configure the TCP/IP settings:
- In the **IP address range start** field, type the IP address of the start of the IP address range.  
  
**Note:** Unless you have a specific requirement to use a range, it is a best practice not to use IP address ranges here. In most cases, you should leave them blank.
  - In the **IP address range end** field, type the IP address of the end of the IP address range.
  - In the **Subnet mask** field, type the subnet mask.
  - In the **Gateway** field, type the IP address of the gateway server.
26. (Optional) Manually configure the WINS settings:
- Select the **Configure WINS setting** check box.
  - In the **Primary WINS IP** field, type the IP address of the primary WINS server.

- c. In the **Secondary WINS IP** field, type the IP address of the secondary WINS server.
27. (Optional) Manually configure the DNS settings:
  - a. Select the **Configure DNS setting** check box.
  - b. In the **DNS domain name** field, type the domain name.
  - c. In the **Preferred DNS IP** field, type the primary IP address of the DNS server.
  - d. (Optional) In the **Alternate DNS IP** field, type the IP address of the alternate DNS server.
28. Click **OK**.
29. Click **Finish**. The new task is displayed in the Tasks pane under the Windows Native Install task.

**Note:** When deploying the following tasks to an IntelliStation MPro system with a SAS HostRAID controller, it is recommended that you increase the timeout value (the number of minutes that the server waits for a system response before generating a fail event) to 720, due to possible slow execution of these tasks:

- Windows Clone Install
- Windows Native Install
- Power Restore

For example, to increase the timeout to 400 minutes, create the task, then enter the following into the command list:

```
TIMEOUT 400
```

---

## Creating a Windows Native Install task that installs IBM Director Agent

Complete the following steps to create a Windows Native Install task that installs IBM Director Agent:

1. Copy the IBM Director Agent installation files from the IBM Director CD to an accessible drive.
2. Open the diragent.rsp file in an ASCII text editor. This file is in the director\agent\windows\i386 directory for IBM Director version 4.22 or earlier, and in the director\agent\windows\i386\FILES directory for version 5.10 or later.
3. Modify and save the diragent.rsp file. The file follows the Windows INI file format and is fully commented.

**Note:** The diragent.rsp file must contain the following line:

```
RebootIfRequired = N
```

If the RebootIfRequired flag is set to Y, the Windows Native Install task will fail.

4. Create a Windows Native Install image of type Application that uses the IBM Director Agent installation files as the source.

**Note:** For IBM Director Agent 5.10, select dir5.10\_agent\_windows.exe. For IBM Director Agent version 4.22 or earlier, select ibmsetup.exe.

In the **Executable parameters** field, type the following command:

```
/s /a silent rsp=%appdir%\diragent.rsp waitforme
```

**Note:** For IBM Director version 4.22 and earlier, enter `silent waitforme` as the executable parameter.

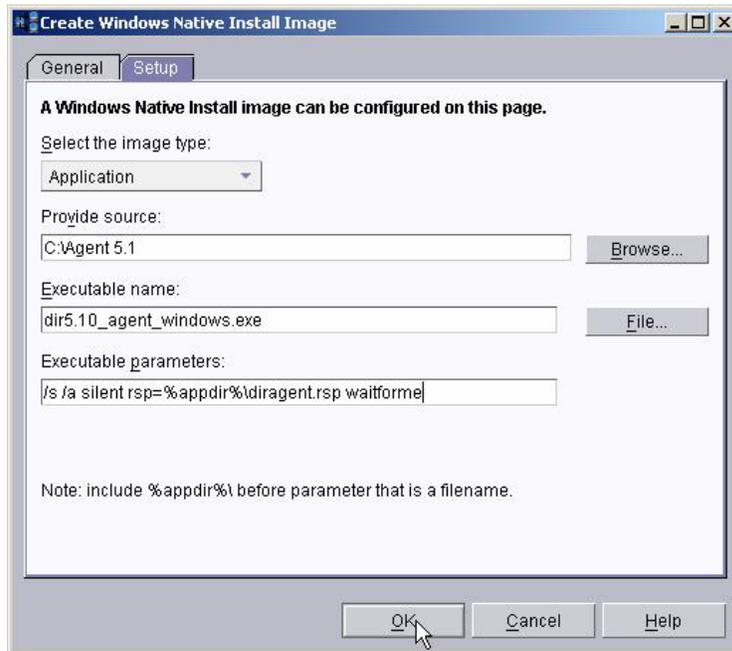


Figure 174. Create Windows Native Install Image window

5. Create a Windows Native Install task that uses the newly-created image.

**Note:** (Windows XP with Service Pack 2 target systems only) By default, the Windows XP Service Pack 2 firewall blocks Internet Control Message Protocol (ICMP), which IBM Director Server uses to communicate with IBM Director Agent. The Windows XP Service Pack 2 firewall must be configured to permit ICMP traffic, or IBM Director Agent cannot communicate with IBM Director Server.

---

## Creating a Windows Native Install task that installs Windows Server 2003 R2

Complete the following steps to create a Windows Native Install task that installs Microsoft Windows Server 2003 R2:

1. Copy the Windows Server 2003 R2 installation files (the R2 folder) from the Windows Server 2003 CD to a local directory.
2. Create a batch file which contains the following code:

```
setup2.exe /q /a /p:R2_Product_Key
exit
```

where `R2_Product_Key` is the product key for Windows Server 2003 R2.
3. Save the batch file into the local directory where you copied the R2 installation files.
4. Create a Windows Native Install image that uses the created batch file as the source.
5. To deploy the image, create a Windows Native Install task, and select the image as an application.

**Note:** The operating system image used MUST BE compatible with the Windows Server 2003 R2 installation CD.

---

## Running a Windows Native Install task

### Notes:

1. If your target system will boot from a SAN or install anything on a SAN, you must configure the LUNs before running any RDM task that installs operating systems, including Windows Native Install.
2. For SANs running on Windows, you can use a multipath connection with your SAN only if you are using a FASTT storage server. For all other SANs, it is your responsibility to ensure that the connection to the SAN is single path, not multipath.

Complete the following steps to run a Windows Native Install task:

1. Expand the **Windows Native Install** task. The Windows Native Install tasks are displayed.
2. Drag the Windows Native Install task onto the target system. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 5, "Configuring systems and tasks," on page 41.

To run the task immediately, select the **Execute this task after pressing the OK button** check box.

5. Click **OK**.
6. After the task is completed, log on to the target system using a user account with administrator privileges. This enables the Windows Native Install task cleanup script to run.
7. Verify the result of the task, by checking that all of these elements were installed and configured properly:
  - Device drivers
  - Windows components
  - Applications

**Note:** If the assigned computer name is not valid, RDM changes the computer name using the following rules:

- Remove spaces and characters that are not valid from the computer name. The following characters are not valid: `~!@#\$%^&\*()=+[[]{} \ |;: ", <>/?.

For example, *pear rfrsh* would be changed to *pearrfrsh*.

- Truncate from the end to make the computer name no longer than 63 characters.
- Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
- Add *\_1*, *\_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.

---

## Editing the Windows Native Install template

This section contains information about the following topics:

- Working with device drivers
- Specifying whether the installation directory is deleted from the target system
- Setting the template defaults

### Working with device drivers

RDM stores device drivers in the RDM repository. By editing the Windows Native Install task template, you can perform the following operations:

- View information about a device driver
- Add a device driver to the master repository
- Remove a device driver from the master repository

**Note:** You must import any required device drivers from *UpdateXpress*, *ServerGuide*, or another source.

### Viewing device driver information

Complete the following steps to view information about a device driver:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install Template window opens and the General page is displayed.

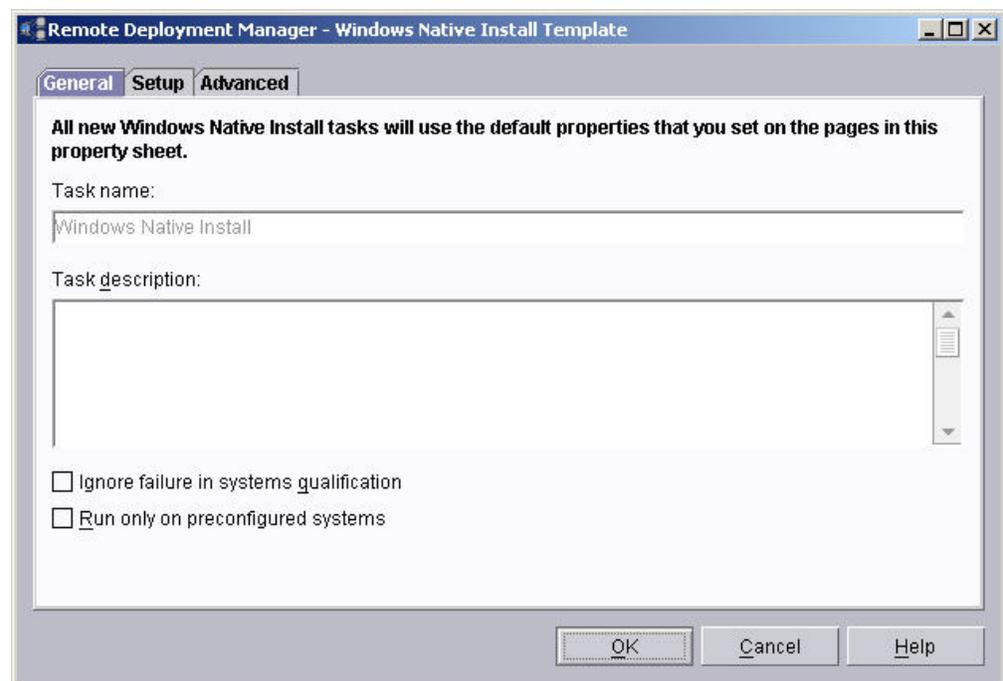


Figure 175. Windows Native Install Template window: General page

3. Click **Setup**. The Setup page is displayed.
4. In the Category pane, click **Drivers**. The Drivers pane is displayed.

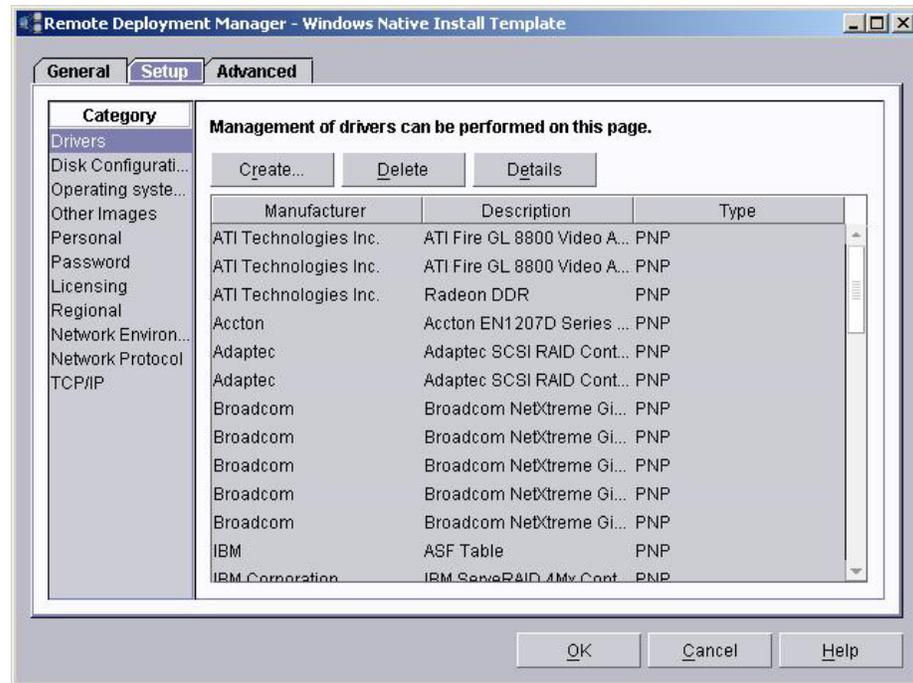


Figure 176. Windows Native Install Template window: Setup page with driver information displayed

**Note:** In RDM 4.30, both Plug and Play (PNP) and Text Mode (Textmode) drivers are displayed in the same window. You can find a specific driver by sorting the columns in the group box. Click on the appropriate field heading to sort by one of the following attributes:

- Manufacturer
- Description
- Type

5. Select the device driver and click **Details**. The Driver Details window opens.



Figure 177. Driver Details window

## Adding a driver to the master repository

### Notes:

1. RDM 4.30 provides new driver creation functionality. Specifically, you can import:
  - 64-bit (x64) drivers
  - Drivers from the ServerGuide installation CD (version 7.3 or later)
  - Drivers from the UpdateXpress installation CD (version 4.01 or later)
  - 32-bit drivers
  - Drivers from a CD, diskette, or hard drive
  - Multiple drivers from multiple sources, using a manually-created driver tree
2. If you add or delete a device driver, make sure that you replicate all changed driver-repository files to all remote deployment servers before you use any Windows Native Install tasks. To determine which files to replicate, look in the `\RDM\repository\drivers` directory. Replicate all files whose **Date Modified** value has changed.

Complete the following steps to add a device driver to the master repository:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install Template window opens and the General page is displayed.
3. Click **Setup**. The Setup is displayed.
4. In the Category pane, click **Drivers**. The Drivers pane is displayed.

**Note:** In RDM 4.30, both Plug and Play (PNP) and Text Mode (Textmode) drivers are displayed in the same window. You can find a specific driver by sorting the columns in the group box. Click on the appropriate field heading to sort by one of the following attributes:

- Manufacturer
  - Description
  - Type
5. Click **Create**. The "Create new driver(s)" window is displayed. Determine the method of driver creation you want to use, and follow the appropriate instructions in Table 10.

Table 10.

| Type of drivers you want to import | Applicable steps to import drivers  |
|------------------------------------|---|
| Single Plug and Play driver        | <p>Click <b>Browse</b> and navigate to the directory containing the INF file, then click <b>OK</b>. When the Create Driver window opens, select the applicable check boxes to specify the operating systems that the device driver supports:</p> <ul style="list-style-type: none"> <li>• W2K (Windows 2000)</li> <li>• 2K3 (Windows 2003)</li> <li>• XP (Windows XP)</li> <li>• x64 (Windows X64)</li> </ul> <p><b>Note:</b> For single Plug and Play drivers, RDM does not select supported operating systems automatically.</p>  |
| Single Text Mode driver            | <p>Click <b>Browse</b> and navigate to the location of the TXTSETUP.OEM file, then click <b>OK</b>. When the Create Driver window opens, select the applicable check boxes to specify the operating systems that the device driver supports:</p> <ul style="list-style-type: none"> <li>• W2K (Windows 2000)</li> <li>• 2K3 (Windows 2003)</li> <li>• XP (Windows XP)</li> <li>• x64 (Windows X64)</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. For single Text Mode drivers, RDM does not select supported operating systems automatically.</li> <li>2. By default the driver is applied to all machines in the network. To apply the driver only to specific machine types, enter the machine type in the <b>Model</b> field of the Create Driver window. To specify multiple machine types, separate the entries with a space.</li> </ol>   |
| All drivers on a ServerGuide CD    | <ol style="list-style-type: none"> <li>1. Click <b>Browse</b> and navigate to the drive letter for the CD drive, then click <b>OK</b>.</li> <li>2. There will be a long pause while RDM processes the ServerGuide CD, then the Create Drivers window opens, displaying a list of all of the drivers on the CD. You can add all of the drivers, or you can deselect any drivers that you don't want to import. <ul style="list-style-type: none"> <li><b>Note:</b> The operating systems will be preselected for each driver. You should deselect any OS options that you do not want to import.</li> </ul> </li> <li>3. Click <b>OK</b> to import the drivers that you have selected.</li> <li>4. After another long pause, a window displays the progress of the installation of the text mode drivers. When it completes, click <b>OK</b>, and a new window lists whether each text mode driver was or was not imported.</li> <li>5. Click <b>OK</b>. This process then repeats for the Plug and Play drivers.</li> </ol> |

Table 10. (continued)

| Type of drivers you want to import                      | Applicable steps to import drivers  |
|---|---|
| <p>All drivers UpdateXpress CD (i.e., CD 1 or CD 3)</p> | <ol style="list-style-type: none"> <li>1. Before editing the Windows Native Install template, unpack the drivers from the UpdateXpress CD using the UNPACKUX.EXE utility. This utility is located in the RDM\bin directory. Unpackux.exe must be run on a Windows system. To unpack the files, use the command:<br/> <code>UNPACKUX.EXE H:\ E:\UXDIR</code> <p>Where <i>H:</i> is the CD-ROM drive containing the UpdateXpress CD and <i>E:\UXDIR</i> is the directory to which you want to unpack the drivers. <i>E:\UXDIR</i> must be accessible to the RDM console.</p> <p>Drivers for non-blade systems are located on UpdateXpress CD1, and for blade systems on CD3. To unpack all UpdateXpress drivers, you must use UNPACKUX on both CD1 and CD3.</p> </li> <li>2. In the Create New Drivers panel, click <b>Browse</b> and navigate to the <i>E:\UXDIR</i> directory, then click <b>OK</b>.</li> <li>3. There will be a long pause while RDM processes the directory tree, then the Create Drivers window opens, displaying a list of all of the drivers on the CD. You can add all of the drivers, or you can deselect any drivers that you do not want to import.<br/> <b>Note:</b> The operating systems will be preselected for each driver. You should deselect any OS options that you do not want to import.</li> <li>4. Click <b>OK</b> to import the drivers that you have selected.</li> <li>5. After another long pause, a window displays the progress of the installation of the text mode drivers.</li> <li>6. This process then repeats for the Plug and Play drivers. When it completes, click <b>OK</b>, and a new window lists any drivers that were not imported, and the reason they were not imported.</li> </ol> |

Table 10. (continued)

| Type of drivers you want to import                           | Applicable steps to import drivers   |
|--|--|
| <p>Multiple drivers using a manually-created driver tree</p> | <p><b>Note:</b> Before attempting to add drivers using this method, you must create the following directory tree and place the drivers in the corresponding directory for the operating system each driver supports. The directory structure should look like the following:</p> <pre> ... \Drivers\ ... \Drivers\w2000drv ... \Drivers\w2003drv ... \Drivers\xpdrv ... \Drivers\w3x64drv ... \Drivers\mos </pre> <p>where /Drivers is the root directory, and /w2000drv contains Windows 2000 drivers, /w2003drv contains Windows 2003 drivers, and /xpdrv contains Windows XP drivers. The /w3x64drv directory contains drivers that are used for both Windows XP and Windows 2003 64-bit editions. The /mos (missing operating system) directory is used for drivers that do not have a specified operating system, but will select the operating system when imported.</p> <p>Create subdirectories to contain to contain each driver. For example, if you have more than one SAS driver, you must put each driver in a separate directory under the appropriate operating system. For example, the \Drivers\w2003drv\sas1 directory would contain your first SAS driver for Windows 2003 and \Drivers\w2003drv\sas2 would contain the second SAS driver for Windows 2003, and so on.</p> <ol style="list-style-type: none"> <li>1. Click <b>Browse</b> and navigate to the location of the /Drivers directory, then click <b>OK</b>.</li> <li>2. There will be a long pause while RDM processes the drivers, then the Create Drivers window opens, displaying a list of all of the drivers in the directory. You can add all of the drivers, or you can deselect any drivers that you don't want to import. <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>a. The operating systems will be preselected for each driver. You should deselect any OS options that you do not want to import.</li> <li>b. By default the driver is applied to all machines in the network. To apply the driver only to specific machine types, enter the machine type in the <b>Model</b> field of the Create Driver window. To specify multiple machine types, separate the entries with a space.</li> </ol> <p><b>Note:</b></p> </li> <li>3. Click <b>OK</b> to import the drivers that you have selected.</li> <li>4. After another long pause, a window displays the progress of the installation of the text mode drivers. When it completes, click <b>OK</b>, and a new window lists whether each text mode driver was or was not imported.</li> <li>5. Click <b>OK</b>. This process then repeats for the Plug and Play drivers.</li> </ol> |

## Deleting a device driver

Complete the following steps to delete a device driver from the master repository:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install Template window opens and the General page is displayed.
3. Click **Setup**. The Setup page is displayed.
4. In the Category pane, click **Drivers**. The Drivers pane is displayed.

**Note:** In RDM 4.30, both Plug and Play (PNP) and Text Mode (Textmode) drivers are displayed in the same window. You can find a specific driver by sorting the columns in the group box. Click on the appropriate field heading to sort by one of the following attributes:

- Manufacturer
- Description
- Type

5. Select the device driver and click **Delete**. The Delete Driver window opens.



Figure 178. Delete Driver window

6. Click **Yes**. The device driver is deleted from the master repository.

## Deleting the operating-system installation directory from a target system

When a Windows Native Install task is run on a target system, RDM copies the i386 directory from the repository to the target system. RDM then uses that i386 directory to install Windows on the target system. You can choose whether to have the i386 directory deleted during the post-installation cleanup process.

Complete the following steps to specify whether or not the operating-system installation directory is deleted from the target system:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.

2. Click **Edit template**. The Windows Native Install window opens.
3. Click **Advanced**. The Advanced page is displayed.
4. In the Category pane, click **Miscellaneous**. The Miscellaneous page is displayed.

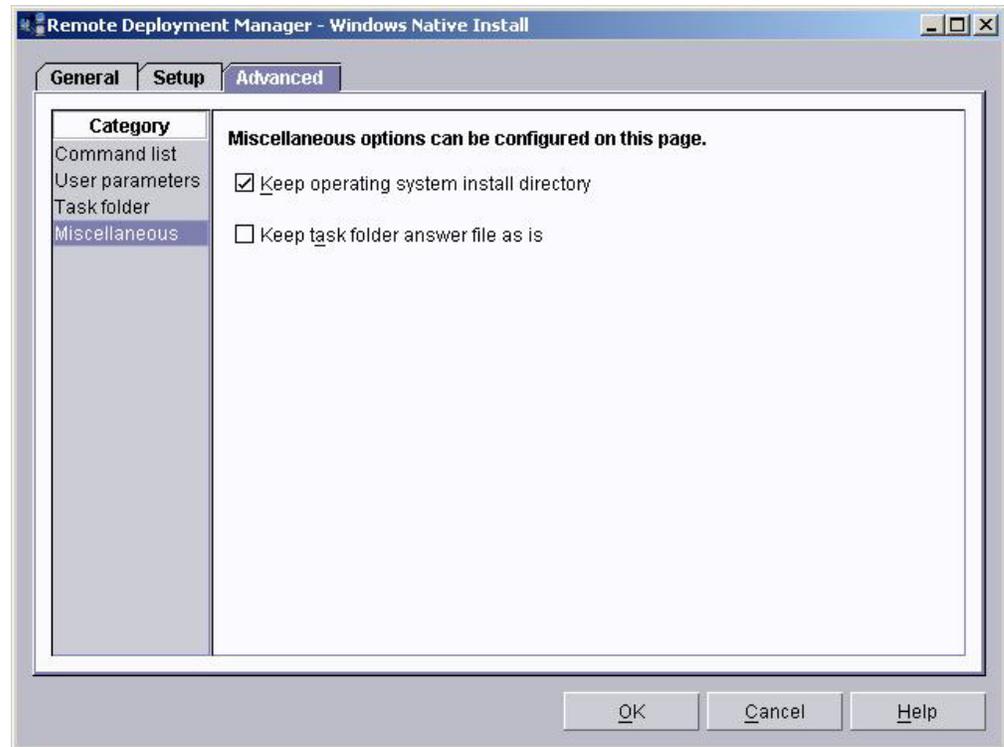


Figure 179. Windows Native Install Template window: Advanced page

5. Select or clear the **Keep operating system install directory** check box.
6. Click **OK**.

## Modifying the task answer file

When you edit the notebook, the task folder answer file is rewritten using the values displayed when you made your changes unless you select the **Keep task folder answer file as is** check box.

Complete the following steps to specify whether or not the task answer file is changed when you complete your notebook edits:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install window opens.
3. Click **Advanced**. The Advanced page is displayed.
4. In the Category pane, click **Miscellaneous**. The Miscellaneous page is displayed.

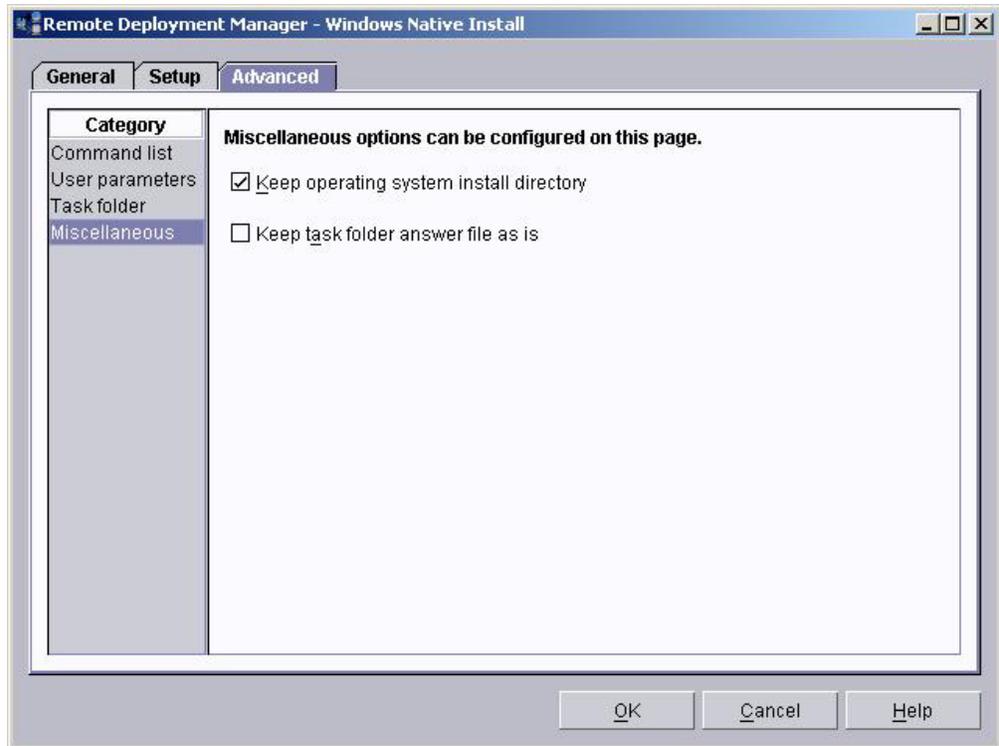


Figure 180. Windows Native Install Template window: Advanced page

5. Select or clear the **Keep task folder answer file as is** check box.  
If this check box is selected, the task folder answer file remains as it was before you edited the notebook. Any modifications made to the file before editing the notebook will not be overwritten.  
If this check box is cleared, the task folder answer file is rewritten using the values displayed during your editing of the notebook.
6. Click **OK**.

---

## Part 4. Additional RDM information



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## Chapter 23. Advanced mkimages.bat usage

You can build custom DOS system environments by copying and editing the `mkimages.bat` file. You can also create a startable (bootable) DOS 7.1 diskette and run an RDM utility from the diskette.

---

### Building custom DOS system environments using `mkimages.bat`

RDM provides DOS 7.1 for its DOS system environments. DOS 7.1 is a modified version of IBM DOS 7.0 (also known as IBM DOS 2000) that is compatible with the FAT32 file system.

RDM provides the following DOS system environments:

- `dos71s`
- `dos71x`
- `dos71p`
- `dos71f`
- `dos71n`

Different kinds of RDM tasks require different DOS configurations. If you have an RDM task that requires a different DOS configuration, you can create your own DOS system environments, or modify the DOS system environments that are included with RDM. RDM uses `rdm\local\env\mkimages.bat` to build its DOS system environments. The `mkimages.bat` file uses the `bmimage32.exe` program to build a DOS system environments. For information, see “`bmimage32.exe`” on page 289.

**Note:** RDM is meant to be highly extendable and customizable. When customizing, you can choose to create your own objects or to customize RDM’s built-in objects. If you do the latter (which is often easier), then a future RDM update will probably overwrite your changes. In this case, you should document and backup all of your customization, so that you can redo it (and retest it) after updating RDM.

If you want to use the RDM DOS `RDAGENT` in your Command List or `Autoexec.bat` file, complete the following steps:

1. Find the `mkimages.bat` file in the `RDM_installation\local\env\` directory, where `RDM_installation` is the directory where RDM is installed.
2. Copy the `mkimages.bat` file as `mymkimages.bat`.
3. Add the following code to your section of the `mkimages.bat` file.

```
Copy baseimg myDos
bmimage32 -d myDos -i b
bmimage32 -d myDos -i mypgms
Move myDos ..\...\repository\environment\myDos
```

**Note:** The line

```
Move myDos ..\...\repository\environment\myDos
```

should be the last line of your section.

4. (Optional) To use the DOS Extended Memory Manager in your DOS system environment, add the following code to your `mymkimages.bat` file:

```
bmimage32 -d myDos -i o\e\dos
```

5. (Optional) To use the RDM random access memory (RAM) Drive in your DOS system environment, add the following code to your mymkimages.bat file:  
`bmimage32 -d myDos -i o\r\dos`
6. (Optional) To use the RDM High Memory support in your DOS system environment, add the following code to your mymkimages.bat file:  
`bmimage32 -d myDos -i o\h\dos`

7. (Optional) To use the DOS 7.1 formatting utilities in your DOS system environment, add the following code to your mymkimages.bat file:  
`bmimage32 -d myDos -i o\i\dos`
8. (Optional) To use the RDM Windows Install Utilities in your DOS system environment, add the following code to your mymkimages.bat file:  
`bmimage32 -d myDos -i o\i\dos`
9. Save mymkimages.bat.

**Note:** Make sure that you run the mymkimages.bat file again after every change you make.

---

## Building DOS diskettes for use with RDM

You can create a startable (bootable) DOS 7.1 diskette with RDM utilities and run an RDM utility from the diskette. Complete the following steps to create a startable (bootable) DOS 7.1 diskette:

1. Complete the following steps to format a 1.44-MB diskette with a blank label using the RDM DOS 7.1 format.com utility:
  - a. On an RDM Remote D-Server installed on Windows, open a command prompt window.
  - b. Type the following command:  
`cd "c:\Program Files\IBM\RDM\local\env\o\i\dos\"`
  - c. Type the following command:  
`format a: /U /`
2. Complete the following steps to extract the core files from the BASEIMG file onto the diskette:
  - a. Type the following command:  
`cd "c:\Program Files\IBM\RDM\local\env"`
  - b. Type the following command:  
`bmimage32 -d baseimg -O IBMBIO.COM,A:\IBMBIO.COM`
  - c. Type the following command:  
`bmimage32 -d baseimg -O IBMDOS.COM,A:\IBMDOS.COM`
  - d. Type the following command:  
`bmimage32 -d baseimg -O COMMAND.COM,A:\COMMAND.COM`
3. Copy any files or RDM utilities that you need onto the diskette.



---

## Chapter 24. Command-list commands

This chapter provides information about the commands that are used in command lists.

**Note:** You can use a semicolon (;) at the beginning of a line to make that line a comment. Comments are not processed and are not displayed in the task execution history.

---

### Server commands

A server command runs a built-in RDM function on the RDM server. A server command does not begin with an exclamation point. Server commands include the ones that are listed in Table 11 and can also be commands that are specific to the task driver that was implemented when the task driver was created.

### Server command syntax

To pass a parameter to the RDM Server, enclose the parameter in percentage signs for example %var1%:

Table 11. Server commands

| Command         | Syntax and explanation   |
|-----------------|--|
| <b>BOOTTYPE</b> | <p><b>Syntax:</b></p> <pre>BOOTTYPE !BOOTLOCAL<br/>BOOTTYPE !LOADDOS   !LOADBOOTSTRAP <i>bootimagefile</i></pre> <p>where <i>bootimagefile</i> is the name of the boot image file.</p> <p><b>What it does:</b> Specifies the type of DOS or Linux boot image file that is to be loaded into the RAM on a target system. This command precedes a WAKE or SHUTDOWN_AND_WAKE command.</p> <p><b>Note:</b> !BOOTLOCAL does not boot DOS or Linux remotely. It only boots the hard drive (and therefore whatever operating system is installed on the hard drive.)</p>                |
| <b>END</b>      | <p><b>Syntax:</b></p> <pre>END</pre> <p>The END command has no parameters.</p> <p><b>What it does:</b> Ends the command list, usually the last command in a task. This command can be use for all tasks. RDM will not process any commands after the END command. If the END command is omitted from a task list, RDM stops interpreting commands after it processes the last command in the task list.</p> <p>This should be the last command in all command lists. Some tasks, such as Windows Native Install, will never complete a command list if END is not specified.</p> |

Table 11. Server commands (continued)

| Command                             | Syntax and explanation   |
|-------------------------------------|--|
| <p><b>SETLUNHOSTTYPEIFFIBRE</b></p> | <p><b>Syntax:</b><br/>           SETLUNHOSTTYPEIFFIBRE <i>ADTstatus</i> "<i>HostPortTypeString</i>"</p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>ADTstatus</i> is one of the following strings:               <ul style="list-style-type: none"> <li>– ADT_ENABLED</li> <li>– ADT_DISABLED</li> </ul> </li> </ul> <p>If you issue the ADT_ENABLED parameter and the firmware does not support ADT, for the <i>HostPortTypeString</i> specified, the parameter is changed to ADT_DISABLED. The converse is also true, if you issue the ADT_DISABLED parameter and the firmware does support ADT, for the <i>HostPortTypeString</i> specified, the parameter is changed to ADT_ENABLED.</p> <ul style="list-style-type: none"> <li>• <i>HostPortTypeString</i> specifies an operating system for the port. This parameter can be repeated and can contain different attributes of a specific operating system. To determine the possible values you can use for the <i>HostPortTypeString</i>, from a DOS or Linux command prompt type:<br/>           SMcli x.x.x.x -c "show storagesubsystem profile;"</li> </ul> <p>where <i>x.x.x.x</i> is the IP address of the FAS<i>T</i> storage server</p> <p><b>What it does:</b> This command combines the parameters (<i>ADTstatus</i> and <i>HostPortTypeString</i>) into a search parameter. The command queries the list of supported host-type ports for a match with the search parameter, and then sets the host-port type on the FAS<i>T</i> storage server. The host-port types vary by firmware level.</p> |
| <p><b>SUBTASK</b></p>               | <p><b>Syntax:</b><br/>           SUBTASK "<i>subtaskname</i>"</p> <p>where <i>subtaskname</i> is the name of the subtask you want to run. It must be surrounded by double quotes.</p> <p><b>What it does:</b> Appends and runs the specified task. Normally only used by the Script Task Command List, but it could be incorporated into a modified command list for any task.</p> <p><b>Note:</b> You cannot use subtask to run the task that the subtask is in.</p>  |
| <p><b>SHUTDOWN_AND_WAKE</b></p>     | <p><b>Syntax:</b><br/>           SHUTDOWN_AND_WAKE</p> <p>The SHUTDOWN_AND_WAKE command has no parameters.</p> <p><b>What it does:</b> Shuts down a system and then wakes it up again. This command is used with the CMOS and BIOS tasks on systems that must be turned off after a flash update and before a Scan task is run.</p>  |

Table 11. Server commands (continued)

| Command        | Syntax and explanation   |
|----------------|--|
| <b>TIMEOUT</b> | <p><b>Syntax:</b><br/> TIMEOUT <i>time</i></p> <p>where <i>time</i> is the number of minutes.</p> <p><b>What it does:</b> Changes the time that the server will wait for the target system to send its next request for work. In other words, each command after the TIMEOUT command has its own block of <i>time</i> minutes before it times out. You can use multiple TIMEOUT commands in a command list.</p> <p>TIMEOUT is used to override the default timeout value from the RDM Server -&gt; Options panel. Therefore, TIMEOUT only affects the task; it does not change the system-wide default timeout value.</p>  |
| <b>WAKE</b>    | <p><b>Syntax:</b><br/> WAKE</p> <p>The WAKE command has no parameters.</p> <p><b>What it does:</b> Powers on a target system. A BOOTTYPE command should precede a WAKE command, but you can include one or more commands after the BOOTTYPE command and before the WAKE command. If WAKE is the first command, a BOOTTYPE command must immediately follow it.</p> <p>RDM's internal wake logic is as follows:</p> <ol style="list-style-type: none"> <li>1. RDM first attempts to power on the system via its service processor (if the system has a service processor and if that service processor supports the functions that RDM uses). If necessary, it will change the primary boot sequence to have "network first" in order to force the system to PXE boot (at the end of the task, it will change the boot sequence to its original configuration).</li> <li>2. It then attempts to power on the system via Wake on LAN<sup>®</sup> (by sending a Magic Packet to its network adapter).</li> </ol> <p>Regardless of which way the system powers on, the task works identically.</p> <p><b>Note:</b> Issuing the WAKE command to a large number of systems can result in a delay of up to several minutes while the systems wake.</p> |

## Server command examples

In the following example, the server command BOOTTYPE sets DOS71C as the running environment after the next restart of the server.

```
BOOTTYPE !LOADDOS /environment/dos71c
```

In the following example, the server command BOOTTYPE sets bstrap.0 as the bootstrap environment after the next restart of the server.

```
BOOTTYPE !LOADBOOTSTRAP bstrap.0
```

In the following example, the server command BOOTTYPE sets the server to restart from the local hard disk after the next restart of the server.

```
BOOTTYPE !BOOTLOCAL
```

In the following example, the server command SUBTASK calls a separate task named IntelliStation MPro Bios.

```
SUBTASK Intellistation MPro Bios
```

In the following example, the server command TIMEOUT causes the server to wait for 8 minutes for the target system to send its next request for work before marking the task as failed, instead of using the default value (usually 120 minutes) set in the RDM Server Options panel.

```
TIMEOUT 8
```

In the following example, the server command TIMEOUT causes the server to wait for %var1% minutes for the target system to send its next request for work before marking the task as failed.

```
TIMEOUT %var1%
```

In the following example, there is a 6.10.06.00 firmware table with a list of all the host-port types that are supported. The table is followed by several SETLUNHOSTTYPEIFFIBRE command examples.

*Table 12. List of host-port types for the 6.10.06.00 firmware table*

| INDEX | ADT STATUS | HOST-PORT OS  |
|-------|------------|---|
| 0     | Disabled   | Windows NT® Non-Clustered (SP5 or higher)             |
| 1     | Disabled   | Windows NT Clustered (SP5 or higher)                  |
| 2     | Disabled   | Windows 2000/Server 2003 Non-Clustered                |
| 3     | Disabled   | Windows 2000/Server 2003 Clustered                    |
| 4     | Enabled    | NetWare-IBMSAN  |
| 5     | Enabled    | Linux   |
| 6     | Disabled   | AIX®  |
| 7     | Enabled    | HP-UX   |
| 8     | Disabled   | Solaris   |
| 9     | Enabled    | Windows 2000/Server 2003 Non-Clustered (supports DMP) |
| 10    | Disabled   | Irix  |
| 11    | Enabled    | NetWare Failover                                      |
| 12    | Enabled    | IBM TS SAN VCE  |
| 13    | Disabled   | LNXCCL  |
| 14    | Enabled    | Solaris (with Veritas DMP)                            |
| 15    | Enabled    | Windows 2000/Server 2003 Clustered (supports DMP)     |

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and selects index 12 from the table and sets the host-port type to IBM TS SAN VCE with ADT Enabled.

```
SETLUNHOSTTYPEIFFIBRE ADT_ENABLED "IBM TS SAN VCE"
```

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and selects index 14 from the table and sets the host-port type to Solaris (with Veritas DMP) with ADT Enabled.

```
SETLUNHOSTTYPEIFFIBRE ADT_ENABLED "Solaris" "DMP"
```

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and has two selections that match, index 9 and index 15. Both indexes have ADT Enabled, Windows and 2003 parameters. In this situation the command will select the first index it receives a match on, which is

index 9. The command sets the host-port type to Windows 2000/Server 2003 Non-Clustered (supports DMP) with ADT Enabled.

```
SETLUNHOSTTYPEIFFIBRE ADT_ENABLED "Windows" "2003"
```

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and selects index 5 from the table and sets the host-port type to Linux with ADT Enabled.

**Note:** Since the firmware supports ADT for Linux this command changed the ADT setting from ADT\_DISABLED to ADT\_ENABLED.

```
SETLUNHOSTTYPEIFFIBRE ADT_DISABLED "Linux"
```

## Target-system commands

A target-system command begins with a single exclamation point and runs in the system environment. RDM runs the actual command (everything to the right of the exclamation point) verbatim on the target system. You can use any DOS, Windows, or Linux command as a target-system command.

## Target-system syntax

To pass a parameter to the target system, enclose the parameter in double percent signs, for example `%%var1%%`.

Table 13. Target-system commands

| Command         | What it does  | Syntax  |
|-----------------|---|---|
| <b>!MTFTP</b>   | Performs MTFTP commands.  | <pre>!MTFTP GET PUT %%server_ip%% source_path destination_path [optional_parameters]</pre> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>server_ip</i> is the IP address of the MTFTP server.</li> <li>• <i>source_path</i> is the path and file name of the destination file.</li> <li>• <i>destination_path</i> is the path of the destination file.</li> <li>• <i>optional_parameters</i> control whether to use multicast, amount of logging output, and so on.</li> </ul> <p>(VMware and Linux systems only) The <i>destination_path</i> for an !MTFTP command in the command list for a VMware Native Install or a Linux Native Install task is relative to the install drive. To download the file relative to the root of the target system, make sure that you specify the path using <code>/rootfs</code> at the beginning.</p> |
| <b>!SLEEP</b>   | Causes the system to sleep for the specified time, with the time in seconds.                                    | <pre>!SLEEP time_in_seconds</pre> <p>where <i>time_in_seconds</i> is the number of seconds you want the system to sleep.</p>  |
| <b>!UNZIP</b>   | Unzips files to current directory. For information about the unzip utility, see “unzip.exe” on page 332.        | <pre>!UNZIP zipfile_name</pre> <p>where <i>zipfile_name</i> is the name of the zipped file.</p>   |
| <b>!command</b> | Runs <i>command</i> on a target system. You can use any command that is valid in the target system environment. | <pre>!command</pre> <p>where <i>command</i> is any valid executable command (that is, a sequence of tokens) that returns zero when it is successful. If the command returns a nonzero value, RDM will fail the task immediately.</p>  |

## Target-system command examples

In the following example, the target-system command SLEEP causes the target system to pause for 10 seconds.

```
!sleep 10
```

In the following example, the target-system command UNZIP uncompresses the file filename.

```
!unzip filename.zip
```

In the following example of a Windows command, RDM runs myBatchFile.bat on the target system:

```
!myBatchFile.bat
```

In the following example of a DOS command with a parameter, RDM runs MYLOGIC.BAT %VAR1% on the target system. Note that RDM removes the outer % symbols before running the command. DOS will substitute the value of the VAR1 environment variable when it runs the command.

```
!MYLOGIC.BAT %%VAR1%%
```

---

## RDAGENT commands

An RDAGENT command begins with two exclamation points and runs in the target system environment. It is a built-in RDM function that the RDAGENT.EXE program knows how to do.

## RDAGENT syntax

Table 14. RDAGENT commands

| Command         | What it does   | Syntax   |
|-----------------|--|--|
| <b>!!REBOOT</b> | <p>Restarts a system (that is, does a warm reboot). When the system restarts, it loads the environment that was specified in the last BOOTTYPE command. After the environment is loaded, RDM processes any commands that follow the !!REBOOT command in the task list.</p> <p>If you want a task to reboot the target system at the end of a task (the default is for the task to power off the target system), use one of the following procedures:</p> <ul style="list-style-type: none"><li>• Replace the !!SHUTDOWN command with !!REBOOT.</li><li>• Place the !!REBOOT command in front of the END command.</li><li>• Substitute the !!REBOOT command for the END command.</li></ul> <p>If you want to do this for a Script task, make the change only in the Script task. Do not modify its subordinate tasks.</p> <p>RDM will not process a !!REBOOT command that follows a !!SHUTDOWN command.</p> | <p>!!REBOOT</p> <p>The REBOOT command takes no parameters.</p> |

Table 14. RDAGENT commands (continued)

| Command           | What it does   | Syntax   |
|-------------------|--|--|
| <b>!!SETENV</b>   | <p>Sets task-specific environment variables on the target system. The result of this command is that RDM runs several statements of the form SET ENVNAME=VALUE on the target system. Then other commands and files can use a token of the form %ENVNAME% to reference the value of the environment variable.</p> <p>After this command is run, the following parameters are available from the command list on the target system:</p> <ul style="list-style-type: none"> <li>• <i>MachineType</i><br/>A four-character string indicating the machine type of the target system.</li> <li>• <i>MachineModel</i><br/>A three-character string indicating the machine model number of the target system.</li> </ul> <p>Typically, use !!SETENV as the first RDM command after the target system boots. So !!SETENV usually is the next statement after a !!REBOOT or a SHUTDOWN_AND_WAKE statement.</p> | <p>!!SETENV</p> <p>The SETENV command takes no parameters.</p>     |
| <b>!!SHUTDOWN</b> | <p>Turns off a system after a task is completed. RDM does not process any commands that follow the !!SHUTDOWN command in a task list. If the !!SHUTDOWN command is not specified, RDM runs the !!SHUTDOWN command after processing all the commands in a task list.</p> <p>To change the default behavior and restart the system after a task is completed, use the !!REBOOT command. If you create a Script task that calls other tasks, change the !!REBOOT or !!SHUTDOWN command only for the Script task that you are editing. Do not modify the subordinate tasks.</p>  | <p>!!SHUTDOWN</p> <p>The SHUTDOWN command takes no parameters.</p> |

## RDAGENT command examples

In the following example, the RDAGENT command reboot causes the target system to reboot.

```
!!REBOOT
```

In the following example, the RDAGENT command shutdown causes the target system to shut down.

```
!!SHUTDOWN
```

In the following example, the RDAGENT command SETENV sets the environment variables for the target-system session by using the parameters included in the task.

```
!!SETENV
```



---

## Chapter 25. Utilities

The command-line syntax in this document uses the following conventions:

- Commands are shown in lowercase letters.

`dsconfig`

- Optional commands or variables are enclosed in brackets.

`dsconfig [/q]`

- Variables are shown in italics and explained immediately afterward.

`lccustom File1`

where *File1* is the fully qualified name of the text file that you want to modify.

- When you must type one of two or more alternative parameters, the parameters are separated by vertical bars.

`rdagent /r [/d] | /g=File | /l Message | /e | /fs`

---

### DOS utilities

This section describes IBM DOS 7.0 and 7.1 utilities. Some of the DOS 7.0 utilities described were changed for DOS 7.1.

RDM uses the following DOS utilities:

- `bmgr.exe`
- `command.com`
- `dynaload.com`
- `emm386.exe`
- `fdisk.com`
- `fdisk32.exe`
- `format.com`
- `format32.com`
- `fsid.com`
- `ibmbio.com`
- `ibmdos.com`
- `mem.exe`
- `ndis.dos`
- `netbind.com`
- `protman.exe`
- `smartdrv.exe`

**Note:** For any of these utilities that are not described below, please refer to your IBM DOS or IBM DOS LAN Manager documentation for more information.

## bmgr.exe

You can use this utility to modify the boot code on a hard disk drive so that before the operating system starts, you are prompted to press a key (usually F11) to force the system to boot from the `ibm_service` partition.

The `bmgr` utility uses the following syntax:

```
bmgr [/r]
```

where `/r` is an optional parameter that specifies that the boot manager code is to be uninstalled from the target hard drive.

## dynaload.com

You can use the `dynaload` utility in a batch file to load a device driver dynamically after the system starts. RDM automatically uses the `dynaload` utility to load ServeRAID device drivers (when needed) to download the RAID configuration to the ServeRAID adapter. The `dynaload` utility is part of DOS. For information about using the `dynaload` utility to load other device drivers, see your DOS documentation.

## fdisk.com

You can use the `fdisk` command to perform the following tasks:

- Partition a hard disk with FAT16 partitions
- Prepare a hard disk for formatting

### Notes:

1. Before partitioning a hard disk, you can use the `scrub3.exe` utility to delete the master boot record and reset the hard disk to a known state.
2. If you use RDM to create FAT16 partitions for use under DOS (in a Custom task, for example), your system can have only 1 or 2 DOS drives. You can create more partitions, but no more than two can be primary or logical DOS drives.
3. The version of the `fdisk` utility that is provided with RDM can be used with command-line arguments or a response file. Using command-line arguments provides more flexibility and can provide standardized partition sizes regardless of the hard disk capacity.

### Syntax

The `fdisk` command uses the following syntax:

```
fdisk [drive] [/status]  
fdisk drive [/pri:size] [/ext:size] [/log:size] [/mbr]
```

where *drive* identifies the hard disk drive and *size* is the size of the partition or logical drive, in MB. The `fdisk` command numbers the first physical hard disk drive as 1 and the second physical drive as 2.

The following table contains information about the fdisk optional parameters.

Table 15. fdisk optional parameters

| Command          | What it does  | Syntax  |
|------------------|---|---|
| <b>/pri:size</b> | Creates a primary DOS partition. Limit 1 per physical hard drive. The maximum size using FAT16 is 2 GB, and using FAT32 is 2000 GB. | <code>fdisk drive /pri:size</code>  |
| <b>/ext:size</b> | Creates an extended DOS partition. Limit 1 per physical hard drive.   | <code>fdisk drive /ext:size</code>  |
| <b>/log:size</b> | Creates a logical drive on the extended DOS partition. Limit 23 per extended partition.   | <code>fdisk drive /log:size</code>  |
| <b>/mbr</b>      | Writes a new master boot record of the primary drive.   | <code>fdisk drive /mbr</code>   |
| <b>/status</b>   | Displays an overview of the hard disk drive partition information.  | <code>fdisk [drive] /status</code><br><br>where <i>[drive]</i> is an optional parameter that specifies the hard disk drive. If <i>[drive]</i> is not specified, an overview of the hard disk drive partition information for all hard disk drives on the server is displayed. |

## Examples of using the fdisk command

The following table contains examples of using the fdisk command.

Table 16. Examples of using the fdisk command

| Command                          | What it does   |
|----------------------------------|--|
| <code>fdisk 1 /delete:all</code> | Deletes all partitions on drive 1                                    |
| <code>fdisk 1 /pri:3500</code>   | Creates a 3500 MB primary partition on drive 1                       |
| <code>fdisk 1 /ext:4000</code>   | Creates a 4000 MB extended partition on drive 1                      |
| <code>fdisk 1 /log:2000</code>   | Creates a 2000 MB logical drive in the extended partition on drive 1 |

## Using fdisk command-line arguments

You can use fdisk command-line arguments in RDM batch files as an alternative to creating binary response files.

DOS can work with a maximum of two partitions: one primary and one extended. The maximum primary partition size that is recognized by DOS is 2048 MB. The maximum extended partition size is 8064 MB. The largest logical drive that can be contained within the extended partition is 2048 MB, but you can have multiple logical drives. When you use the fdisk command, if you specify a partition size that is larger than the amount of available disk space, a partition that uses whatever amount of disk space is available will be created. Therefore, a system environment that includes the `/ext:8064` parameter can be used on any system, regardless of the hard disk capacity.

## Examples of using fdisk command-line arguments

The following table contains examples of using fdisk command-line arguments in system environments, which should be typed on one line (ignoring line breaks due to the table's column width.)

Table 17. Examples of using fdisk command-line arguments

| Batch file   | What it does   |
|--|--|
| <code>fdisk 1 /pri:2048 /ext:2048 /log:2048</code>                                   | Creates the following partitions on a 5 GB hard disk: <ul style="list-style-type: none"><li>• 2 GB primary partition</li><li>• 2 GB extended partition that contains a 2 GB logical partition.</li><li>• 1 GB unused</li></ul>   |
| <code>fdisk 1 /pri:2048 /ext:3076 /log:2048</code><br><code>fdisk 1 /log:1024</code> | Creates the following partitions on a 5 GB hard disk: <ul style="list-style-type: none"><li>• 2 GB primary partition</li><li>• 3 GB extended partition that contains two logical drives: a 2 GB drive and a 1 GB drive</li></ul> |

## Using fdisk response files

To create a response file, perform the fdisk procedure and record every keystroke that you make. Then, use an ASCII text editor to create a binary file that contains the ASCII codes for the keystrokes. (Enter is decimal 13, hex 0D; Esc is decimal 27, hex 1B.) Be sure to include the final keystroke (Enter) to restart the system.

You can create a response file by modifying one of the existing response files. For example, complete the following steps to modify lc5050fd.dat to create a response file that creates one or more partitions of a fixed size:

1. Create a copy of lc5050fd.dat with a new name. Be sure to keep the .dat extension.
2. Open the file in an ASCII text editor. Not all the characters are readable.
3. In the fourth response, change 50 to any number from 1 through 100 to specify the percentage of the hard disk space that is to be used for the primary partition. Do not change any other characters.
4. Save the file.

## fdisk32.exe

You can use the fdisk32 utility to create hard disk drive partitions larger than 2048 MB.

After the partition table is changed, you must restart the system for the change to take effect. You can then use the following command to prepare the partition for use:

```
FORMAT32 C:
```

Typically, you can provide the required keyboard input to the fdisk32.exe command in the redirected file:

```
%LCCMPATH%\FDISK32 < LCFDISK.DAT
```

## Syntax

The fdisk32 utility uses the following syntax:

```
fdisk32 [drive] [/status]
fdisk32 drive [/pri:size] [/ext:size] [/log:size] [/mbr]
```

where *drive* identifies the hard disk drive and *size* is the size of the partition or logical drive, in MB.

The following table contains information about the fdisk32 optional parameters.

Table 18. fdisk32 optional parameters

| Function         | What it does  | Syntax   |
|------------------|---|--|
| <b>/pri:size</b> | Creates a primary DOS partition. Limit 1 per physical hard drive. The maximum size using FAT16 is 2 GB, and using FAT32 is 2000 GB. | fdisk32 drive /pri:size  |
| <b>/ext:size</b> | Creates an extended DOS partition. Limit 1 per physical hard drive.   | fdisk32 drive /ext:size  |
| <b>/log:size</b> | Creates a logical drive on the extended DOS partition. Limit 23 per extended partition.   | fdisk32 drive /log:size  |
| <b>/mbr</b>      | Writes a new master boot record of the primary drive.   | fdisk32 drive /mbr   |
| <b>/status</b>   | Displays an overview of the hard disk drive partition information.  | fdisk32 [drive] /status<br><br>where [drive] is an optional parameter that specifies the hard disk drive. If [drive] is not specified, an overview of the hard disk drive partition information for all hard disk drives on the server is displayed. |

## Example of using the fdisk32 utility

The following table contains an example of using the fdisk32 utility.

Table 19. Example of using the fdisk32 utility

| Command             | What it does                                   |
|---------------------|--|
| fdisk32 1 /pri:4096 | Creates a 4096 MB primary partition on drive 1 |

## format.com

You can use the format command to prepare a disk partition for use with DOS.

**Important:** The format command prompts you to define a volume label; however, RDM will not create a startable partition if a volume label is defined.

Typically, you can provide the required keyboard input to the format.com command in the redirected file:

```
FORMAT %TARGET% < FORMAT.DAT
```

## Syntax

The format command uses the following syntax:

```
format drive: [/V[:label]] [/Q] [/U] [/F:size] [/B | /S] [/C]
```

where *drive* is the drive letter of the hard disk drive.

For information about the syntax that is used for format, see your DOS documentation.

The following table contains information about the functions of the format command.

Table 20. format optional parameters

| Function  | What it does   | Syntax                                      |
|---|--|---|
| <b>Volume</b>   | Assigns a volume label to the DOS drive  | format <i>drive</i> : /v: <i>label</i>      |
| <b>Quick format</b>                                       | Deletes the FAT and the root directory of a previously formatted hard disk but does not scan the hard disk for bad areas | format <i>drive</i> : [/q]                  |
| <b>Unconditional format</b>                               | Performs an unconditional format   | format <i>drive</i> : [/u]                  |
| <b>Diskette size</b>                                      | Specifies the size of the diskette that is being formatted   | format <i>drive</i> : [/f: <i>size</i> ]    |
| <b>Space for system files</b>                             | Allocates space on the formatted disk for system files   | format <i>drive</i> : [/b]                  |
| <b>Copy system files</b>                                  | Copies system files to the formatted disk  | format <i>drive</i> : [/s]                  |
| <b>Tracks per side</b>                                    | Specifies the number of tracks per disk side   | format <i>drive</i> : [/t: <i>tracks</i> ]  |
| <b>Sectors per track</b>                                  | Specifies the number of sectors per track  | format <i>drive</i> : [/n: <i>sectors</i> ] |
| <b>Format eight sectors per track</b>                     | Formats eight sectors per track  | format <i>drive</i> : [/8]                  |
| <b>Revert to less conservative handling of bad blocks</b> | Reverts to less conservative handling of bad blocks  | format <i>drive</i> : [/c]                  |

## Example of using the format command

Issuing the following command line prepares the primary partition on a drive:

```
format c:
```

This is the standard DOS format command.

## Using the format.dat response file

RDM provides a response file, format.dat, that you can use to run the format command unattended to create DOS FAT16 tracks and sectors in a specified partition.

The format.dat file produces the following responses.

```
y ENTER          Format an existing partition
ENTER           No volume label is assigned
```

Do not create variations of this response file.

## format32.com

You can use the format32 command to prepare a FAT32 disk partition for use with DOS. Use the format32 command to format FAT32 partitions only, that is, partitions that were created through the fdisk32.exe utility.

**Important:** The FORMAT command prompts the user to define a volume label as a part of its process. RDM will not create a startable partition if a volume label is named.

You can use the format command to define areas of the hard disk that can receive and store data.

Typically, you can provide the required keyboard input to the format32.com command in the redirected file:

```
FORMAT32 %TARGET% < FORMAT.DAT
```

## Syntax

The format32 command uses the following syntax:

```
format32 drive: [/v:label] [/q] [/autotest]
```

where *drive* is the drive letter of the hard disk drive.

The following table contains information about the functions of the format32 command.

Table 21. format32 optional parameters

| Function            | What it does   | Syntax                      |
|---------------------|--|-----------------------------|
| <b>Volume</b>       | Assigns a volume label to the DOS drive  | format32 drive: /v:label    |
| <b>Quick format</b> | Deletes the file allocation table (FAT) and the root directory of a previously formatted hard disk but does not scan the hard disk for bad areas | format32 drive: [/q]        |
| <b>No prompt</b>    | Formats the partitions without prompting for input   | format32 drive: [/autotest] |

## Example of using the format32 command

Issuing the following command does a quick format of drive C and sets the volume label of the partition to win2000 without being prompted to do so:

```
format32 /v:win2000 c: /q /autotest
```

## fsid.com

You can use the fsid command to return an error code that identifies the file system or partition type of the specified drive or partition.

The fsid command uses the following syntax:

```
fsid /d=x /p=y
```

where *x* is the drive number (from 0 through the number of drives in the system) and *y* is the partition number (from 0 through 3).

The following return values are possible:

|            |  |
|------------|--|
| <b>0</b>   | Unidentified partition type            |
| <b>1</b>   | FAT12                                  |
| <b>4</b>   | FAT16                                  |
| <b>5</b>   | Extended partition                     |
| <b>6</b>   | BIGDOS FAT16                           |
| <b>7</b>   | NTFS                                   |
| <b>11</b>  | FAT32                                  |
| <b>12</b>  | FAT32 (Int 13 Ext)                     |
| <b>14</b>  | BIGDOS FAT16 (Int 13 Ext)              |
| <b>15</b>  | Extended Partition (Int 13 Ext)        |
| <b>17</b>  | Hidden FAT12                           |
| <b>18</b>  | EISA partition                         |
| <b>20</b>  | Hidden FAT16                           |
| <b>21</b>  | Hidden extended partition              |
| <b>22</b>  | Hidden BIGDOS FAT16                    |
| <b>23</b>  | Hidden NTFS                            |
| <b>27</b>  | Hidden FAT32                           |
| <b>28</b>  | Hidden FAT32 (Int 13 Ext)              |
| <b>30</b>  | Hidden BIGDOS FAT16 (Int 13 Ext)       |
| <b>31</b>  | Hidden Extended Partition (Int 13 Ext) |
| <b>66</b>  | Dynamic disk volume                    |
| <b>130</b> | Linux swap file                        |
| <b>131</b> | Linux Ext 2                            |
| <b>134</b> | Legacy FT FAT16                        |
| <b>135</b> | Legacy FT NTFS                         |

- 139 Legacy FT FAT32
- 140 Legacy FT FAT32 (Int 13 Ext)
- 999 Unrecognized partition type

## mem.exe

You can use the mem utility to list the amount of used and free memory in the system. It is provided in the DOS system environment for use as a debugging tool. For information about mem.exe, see the DOS documentation.

## ndis.dos

This is RDM's Universal Network Driver Interface (UNDI) DOS network driver. Traditionally, network adapters (NICs) have had custom interfaces and custom drivers (each NIC had a driver for each operating system on each platform architecture). UNDI provides a way to use the same device driver, regardless of which NIC you are using, when doing a PXE boot. RDM uses this driver in all of its DOS system environments.

---

## Miscellaneous utilities

RDM uses the following miscellaneous utilities:

- bpdisk.exe
- bmimage32.exe
- idewc.exe
- ipmitool.exe
- tool.exe

## bpdisk.exe

**Note:** The bpdisk utility has been replaced by the bmimage32 utility in RDM 4.30. The bpdisk utility is still available, but it is recommended that you use the bmimage32 utility instead. For more information about the bmimage32 utility, see "bmimage32.exe" on page 289.

You can use the bpdisk utility to create or modify a boot image without using a diskette. In Windows, it is in the \local\env directory.

You can use the bpdisk utility to perform the following tasks:

- Insert or extract single files or complete subdirectories from a boot image
- Create optimized boot images that allocate only the actual storage space that is occupied by the included files
- Create boot images in all common DOS diskette formats, including 1.2 MB, 1.44 MB, and 2.88 MB formats
- Write DOS batch files that create or update multiple boot images

The bpdisk command uses the following syntax:

```
bpdisk -d file [-v] [-D] | -t file | -f dsize,bsec | -e | -I dst[,src] | -i  
dir | -O src[,dst] | -o dir | -m dir | -p dsize
```

where -d *file* is the file name of the boot image (an existing image or an image that should be created).

The following table contains information about the bpdisk optional parameters.

Table 22. bpdisk optional parameters

| Command                     | What it does  | Syntax  |
|-----------------------------|---|---|
| <b>-v</b>                   | Gives more technical information about bpdisk operations. It can be used together with other options or alone.  | bpdisk -d <i>file</i> -v  |
| <b>-D</b>                   | Shows a recursive directory listing of all files in the boot image identified by the -d option.   | bpdisk -d <i>file</i> -D  |
| <b>-t <i>file</i></b>       | Displays the contents of a file in the boot image defined by the -d option.   | bpdisk -d <i>file</i> -t <i>file</i>  |
| <b>-f <i>dsize,bsec</i></b> | Formats a new boot image. The name of the boot image is defined with the -d option or by the environment variable bpdisk. If the boot image already exists, it will not be overwritten. | bpdisk -d <i>file</i> -f <i>dsize,bsec</i><br>where: <ul style="list-style-type: none"> <li>• <i>dsize</i> is the format of the boot image (320, 360, 640, 720, 1200, 1440, or 2880). Initially, BPDISK will not allocate the space needed for the complete boot image; it will do this later, when files are copied into the boot image.</li> <li>• <i>bsec</i> points to a file or drive which holds the boot sector and the system files for the boot image.</li> <li>• The 2 arguments must be separated by a comma.</li> </ul> |
| <b>-e</b>                   | Delete a file from the boot image.  | bpdisk -d <i>file</i> -e <i>file</i>  |
| <b>-l <i>dst[,src]</i></b>  | Copies a file into an existing boot image.  | bpdisk -d <i>file</i> -l <i>dst[,src]</i><br>where: <ul style="list-style-type: none"> <li>• <i>dst</i> is the name of the file in the boot image.</li> <li>• <i>src</i> is the name of the file that is the name of the file to be copied.</li> <li>• If <i>src</i> is omitted, then the name of the <i>dst</i> file, with the directory path removed, is used; in this case, the source file must be in the current directory.</li> </ul>   |
| <b>-i <i>dir</i></b>        | Copies all files (recursively) from directory <i>dir</i> into the boot image.   | bpdisk -d <i>file</i> -i <i>dir</i><br>where <i>dir</i> is the name of the directory. To specify the current directory, use a period (.).   |

Table 22. bpdisk optional parameters (continued)

| Command                    | What it does   | Syntax  |
|----------------------------|--|---|
| <b>-O <i>src[,dst]</i></b> | Copies a file out of the boot image. It copies file <i>src</i> from the boot image to file <i>dst</i> .  | <code>bpdisk -d file -O <i>src[,dst]</i></code><br><br>where file <i>src</i> is copied from the boot image to file <i>dst</i> .                     |
| <b>-o <i>dir</i></b>       | Copies all files (recursively) from the boot image to the specified directory.   | <code>bpdisk -d file -o <i>dir</i></code><br><br>where <i>dir</i> is the name of the directory. To specify the current directory, use a period (.). |
| <b>-m <i>dir</i></b>       | Creates a new subdirectory in the boot image.  | <code>bpdisk -d file -m <i>dir</i></code><br><br>where <i>dir</i> is the name of the new subdirectory.  |
| <b>-p <i>dsize</i></b>     | Enlarges an existing boot image by a specified number of kilobytes. Additional space might be required in a boot image if a program writes files into the image. | <code>bpdisk -d file -p <i>dsize</i></code><br><br>where the image is enlarged by <i>dsize</i> kilobytes.   |

## bmimage32.exe

**Note:** The bmimage32 utility replaces the bpdisk utility in RDM 4.30. The bpdisk utility is still available, but it is recommended that you use the bmimage32 utility instead. For more information about the bpdisk utility, see “bpdisk.exe” on page 287.

You can use the bmimage32 utility to create or modify a boot image without using a diskette. In Windows, it is in the \local\env directory.

You can use the bmimage32 utility to perform the following tasks:

- Insert or extract single files or complete subdirectories from a boot image
- Create optimized boot images that allocate only the actual storage space that is occupied by the included files
- Create boot images in all common DOS diskette formats, including 1.2 MB, 1.44 MB, and 2.88 MB formats
- Write DOS batch files that create or update multiple boot images

The bmimage32 command uses the following syntax:

```
bmimage32 -d file [-v] [-D] | -t file | -f dsize,bsec | -e | -I dst[,src] |
-i dir | -O src[,dst] | -o dir | -m dir | -p dsize
```

where `-d file` is the file name of the boot image (an existing image or an image that should be created).

The following table contains information about the `bmimage32` optional parameters.

Table 23. `bmimage32` optional parameters

| Command                     | What it does  | Syntax  |
|-----------------------------|---|---|
| <b>-v</b>                   | Gives more technical information about <code>bmimage32</code> operations. It can be used together with other options or alone.  | <code>bmimage32 -d file -v</code>   |
| <b>-D</b>                   | Shows a recursive directory listing of all files in the boot image identified by the <code>-d</code> option.  | <code>bmimage32 -d file -D</code>   |
| <b>-t file</b>              | Displays the contents of a file in the boot image defined by the <code>-d</code> option.  | <code>bmimage32 -d file-t file</code>   |
| <b>-f <i>dsize,bsec</i></b> | Formats a new boot image. The name of the boot image is defined with the <code>-d</code> option or by the environment variable <code>bmimage32</code> . If the boot image already exists, it will not be overwritten. | <code>bmimage32 -d file-f <i>dsize,bsec</i></code><br>where: <ul style="list-style-type: none"> <li><i>dsize</i> is the format of the boot image (320, 360, 640, 720, 1200, 1440, or 2880). Initially, <code>bmimage32</code> will not allocate the space needed for the complete boot image; it will do this later, when files are copied into the boot image.</li> <li><i>bsec</i> points to a file or drive which holds the boot sector and the system files for the boot image.</li> <li>The 2 arguments must be separated by a comma.</li> </ul> |
| <b>-e</b>                   | Delete a file from the boot image.  | <code>bmimage32 -d file-e file</code>   |
| <b>-l <i>dst[,src]</i></b>  | Copies a file into an existing boot image.  | <code>bmimage32 -d file -l <i>dst[,src]</i></code><br>where: <ul style="list-style-type: none"> <li><i>dst</i> is the name of the file in the boot image.</li> <li><i>src</i> is the name of the file that is the name of the file to be copied.</li> <li>If <i>src</i> is omitted, then the name of the <i>dst</i> file, with the directory path removed, is used; in this case, the source file must be in the current directory.</li> </ul>  |
| <b>-i <i>dir</i></b>        | Copies all files (recursively) from directory <i>dir</i> into the boot image.   | <code>bmimage32 -d file -i <i>dir</i></code><br>where <i>dir</i> is the name of the directory. To specify the current directory, use a period (.).  |

Table 23. *bmimage32* optional parameters (continued)

| Command                    | What it does   | Syntax   |
|----------------------------|--|--|
| <b>-O <i>src[,dst]</i></b> | Copies a file out of the boot image. It copies file <i>src</i> from the boot image to file <i>dst</i> .  | <code>bmimage32 -d file -O <i>src[,dst]</i></code><br>where file <i>src</i> is copied from the boot image to file <i>dst</i> .                     |
| <b>-o <i>dir</i></b>       | Copies all files (recursively) from the boot image to the specified directory.   | <code>bmimage32 -d file -o <i>dir</i></code><br>where <i>dir</i> is the name of the directory. To specify the current directory, use a period (.). |
| <b>-m <i>dir</i></b>       | Creates a new subdirectory in the boot image.  | <code>bmimage32 -d file -m <i>dir</i></code><br>where <i>dir</i> is the name of the new subdirectory.  |
| <b>-p <i>dsize</i></b>     | Enlarges an existing boot image by a specified number of kilobytes. Additional space might be required in a boot image if a program writes files into the image. | <code>bmimage32 -d file -p <i>dsize</i></code><br>where the image is enlarged by <i>dsize</i> kilobytes.   |

## idewc.exe

You can use this utility to enable write-caching on IDE drives on BladeCenter blade servers. RDM uses it in its DOS71N system environment. DOS71N and DOS71X are identical, except for the use of `idewc.exe`. RDM uses DOS71N for BladeCenter type 8678 and 8832 blades.

The `idewc` utility uses the following syntax:

```
idewc
```

## ipmitool.exe

The `ipmitool` utility is a DOS-based utility used by RDM to obtain BMC levels from various client servers.

## tool.exe

The `tool` utility is a DOS-based utility used by RDM to obtain BMC levels from various client servers.

---

## Power restore utilities

This section contains information about the following utilities:

- `createpr.com`
- `getramd.exe`
- `macsubst.exe`
- `parttool.exe`
- `pr.exe`
- `prerr.exe`
- `prsource.exe`
- `reboot.com`

- [seterror.com](http://seterror.com)

## createpr.com

You can use the `createpr` command during the installation of a Power Restore partition to create a batch file, `fdisk.bat`, that contains the configuration values for the primary partition. Depending on the task, either `fdisk32.com` or `pqimgctr.exe` uses the batch file to create a primary partition. The `createpr` command always returns 0.

The `createpr` command uses the following syntax:

```
createpr [/a | /b | /c | /size]
```

where:

- `/a` specifies that all unpartitioned hard disk space is to be used.
- `/b` specifies that only hard disk space equal to the size of the boot partition is to be used.
- `/c` specifies that hard disk space equal to the combined total that is used by the other partitions on the boot drive is to be used .
- `/size` is the amount of hard disk space, in MB, that is to be used.

## getramd.exe

You can use the `getramd` utility to search the available disk drives and determine which drive is the RAM drive. The numeric value that is returned (1 through 24) corresponds to the drive letters (c through z), where c is drive 1 and z is drive 24. A returned value of 0 (zero) indicates that no RAM drive was identified.

The `getramd` utility uses the following syntax:

```
getramd
```

## macsubst.exe

You can use the `macsubst` utility to replace all the instances of `%MAC_ADDRESS_n%` in a text file with the actual MAC address of the *n*th NIC in a target system. This utility returns 0 if it is completed successfully or 1 if it generates an error.

The `macsubst` utility uses the following syntax:

```
macsubst filename
```

where *filename* is the fully qualified name of the text file, for example, `c:\temp\answer.txt`. You must use 8.3 notation for the name of the text file.

## parttool.com

You can use the parttool utility to configure and retrieve the partition information from the partition table in the master boot record on a system. You also can use the parttool command to work with the power restore information sector. The parttool utility returns 0 if the operation is completed successfully or 999 if the operation is not completed successfully.

The following table contains information about parttool commands and their syntax.

Table 24. parttool commands and syntax

| Command   | What it does   | Syntax   |
|-----------|--|--|
| <b>/?</b> | Lists the syntax for the utility. In addition, the codes that are associated with the partition types are displayed. | parttool /?  |
| <b>/d</b> | Lists the partition information for the master boot record, such as type and size.                                   | parttool /Drive /d [/v]<br>where:<br><ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>/v</i> enables verbose logging.</li> </ul>   |
| <b>/h</b> | Hides the specified partition when the hard disk drive information is displayed in DOS.                              | parttool /Drive /h <i>Partition</i> [/v]<br>where:<br><ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Partition</i> specifies the partition that is hidden: <ul style="list-style-type: none"> <li>– <b><i>ff</i></b> specifies the first partition.</li> <li>– <b><i>ll</i></b> specifies the last partition.</li> <li>– <b><i>la</i></b> specifies all partitions.</li> <li>– <b><i>lNumber</i></b> is the partition number (0-3).</li> </ul> </li> <li>• <i>/v</i> enables verbose logging.</li> </ul>   |
| <b>/u</b> | Unhides the specified partition when the hard disk drive information is displayed in DOS.                            | parttool /Drive /u <i>Partition</i> [/v]<br>where:<br><ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Partition</i> specifies the partition that is unhidden: <ul style="list-style-type: none"> <li>– <b><i>ff</i></b> specifies the first partition.</li> <li>– <b><i>ll</i></b> specifies the last partition.</li> <li>– <b><i>la</i></b> specifies all partitions.</li> <li>– <b><i>lNumber</i></b> is the partition number (0-3).</li> </ul> </li> <li>• <i>/v</i> enables verbose logging.</li> </ul> |
| <b>/w</b> | Swaps the partition numbers of the two partitions.   | parttool /Drive /w <i>Partition1 Partition2</i> [/v]<br>where:<br><ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Partition1</i> and <i>Partition2</i> are partition numbers (0-3).</li> <li>• <i>/v</i> enables verbose logging.</li> </ul>  |

Table 24. *parttool* commands and syntax (continued)

| Command   | What it does   | Syntax  |
|-----------|--|---|
| <b>/a</b> | Sets the bootable partition on a hard disk drive.  | <p><code>parttool /Drive /a Partition [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Partition</i> is the number (0-3) of the partition that you want to configure as the active (bootable) partition.</li> <li>• <i>/v</i> enables verbose logging.</li> </ul>   |
| <b>/g</b> | Retrieves the type of the specified partition. By default, the type is returned as the error code.   | <p><code>parttool /Drive /g Partition [/f] [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Partition</i> is the number (0-3) of the partition of which you want to retrieve the type.</li> <li>• <i>/f</i> creates a <code>part_env.bat</code> file and saves the type of the specified partition to the <code>partition_Partition</code> variable.</li> <li>• <i>/v</i> enables verbose logging.</li> </ul>   |
| <b>/s</b> | Sets the partition type for a specified partition.<br><b>Attention:</b> This command might cause the operating system to identify the partition as usable but damaged. | <p><code>parttool /Drive /s Partition# PartitionType [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Partition#</i> is the partition number (0-3).</li> <li>• <i>PartitionType</i> is an integer that specifies the partition type.</li> <li>• <i>/v</i> enables verbose logging.</li> </ul>   |
| <b>/m</b> | Performs a power restore operation on the master boot record. You either can copy or replace the master boot record.   | <p><code>parttool /Drive /m Operation [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Operation</i> indicates the type of operation to be performed on the master boot record: <ul style="list-style-type: none"> <li>– <b>/b</b> specifies copy</li> <li>– <b>/r</b> specifies replace</li> </ul> </li> <li>• <i>/v</i> enables verbose logging.</li> </ul>   |
| <b>/p</b> | Updates the power restore information sector.  | <p><code>parttool /Drive /p Flag [Comments] [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Flag</i> indicates the type of flag that is saved to the power restore information sector: <ul style="list-style-type: none"> <li>– <b>/a</b> specifies that image A exists</li> <li>– <b>/b</b> specifies that image B exists</li> </ul> </li> <li>• <i>Comments</i> is a string. If the string includes spaces, you must surround it with quotation marks ("").</li> <li>• <i>/v</i> enables verbose logging.</li> </ul> |

Table 24. *parttool* commands and syntax (continued)

| Command   | What it does   | Syntax   |
|-----------|--|--|
| <b>/p</b> | Updates the power restore information sector.  | <p><code>parttool /Drive /p Operation [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Operation</i> indicates the type of operation that is performed on the power restore information sector: <ul style="list-style-type: none"> <li>– <b>/d</b> specifies that the contents of the power restore information sector are displayed</li> <li>– <b>/f</b> specifies that the power restore information sector is flushed.</li> <li>– <b>/m</b> specifies that a flag is saved to the power restore information sector, indicating that IBM Boot Manager is installed</li> <li>– <b>/n</b> specifies that a flag is saved to the power restore information sector, indicating that IBM Boot Manager is not installed</li> </ul> </li> <li>• <b>/v</b> enables verbose logging.</li> </ul>   |
| <b>/c</b> | <p>Retrieves information about the power restore sector.</p> <p>If not otherwise noted, the command returns 1 if the specified condition is true, and it returns 0 (zero) if the specified condition is false.</p> | <p><code>parttool /Drive /c Condition [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>Drive</i> is the drive number.</li> <li>• <i>Condition</i> is one of the following: <ul style="list-style-type: none"> <li>– <b>/3</b> specifies that the third entry in the master boot record is defined.</li> <li>– <b>/f</b> specifies that the third entry in the master boot record is a FAT32 partition.</li> <li>– <b>/h</b> specifies that the third entry in the master boot record is a hidden FAT32 partition.</li> <li>– <b>/i</b> specifies that the drive letter for the power restore partition is returned. The numeric value that is returned (1 through 24) corresponds to the drive letter (c through z, where c is drive 1 and z is drive 24). A returned value of 999 indicates that the drive letter could not be retrieved.</li> <li>– <b>/p m n s s</b> specifies the version level of IBM Boot Manager for Power Restore that is installed, where <i>m</i> is the major version number, <i>n</i> is the minor version number, and <i>ss</i> is the sub-minor version number.</li> <li>– <b>/r</b> specifies whether Rapid Restore partitions are defined.</li> </ul> </li> <li>• <b>/v</b> enables verbose logging.</li> </ul> |

## pr.exe

The power restore utility (pr) is used to perform the following operations:

- Back up or restore the master boot record
- Generate the commands that run the Symantec ImageCenter engine and back up or restore the boot partition

Depending on whether it is run as part of an RDM task or from the command line, pr operates differently.

### RDM task

It runs silently. Information specified through the RDM task is translated into the batch file and the ImageCenter script file

### Command line

It runs with a GUI. User-specified information is used to create the batch file and the ImageCenter script file.

When run from the command line, pr also can be used to generate detailed information about the partition table.

### Syntax

The pr utility uses one of the following syntax statements:

1. pr /i | /p | /v

where:

- /i specifies that pr is run in interactive mode.
- /p specifies that pr is run in interactive mode, but the user cannot save to the A image file.
- /v specifies that detailed partition table information is displayed.

2. pr *MasterBootRecord* *BootPartition* *Image*

where:

- *Mode* is one of the following strings:
  - /s specifies that a save operation is performed. The pr program runs in silent mode.
  - /r specifies that a restore operation is performed. The pr program runs in silent mode.
- *MasterBootRecord* indicates whether the operation is performed on the master boot record. It is one of the following strings:
  - /y specifies yes.
  - /n specifies no.
- *BootPartition* indicates whether the operation is performed on the boot partition: /
  - y specifies yes.
  - /n specifies no. If the *Image* parameter is issued, it is ignored.
- *Image* indicates which of the two images is used:
  - /a specifies the A image file.
  - /b specifies the B image file.
  - /o specifies the older image file.
  - /n specifies the newer image file.

## prerr.com

The prerr utility is used by the Get Donor, Power Restore, and Windows Clone Install tasks. It retrieves the Symantec ImageCenter error codes and convert them to RDM error codes. The corresponding messages are then displayed in IBM Director Console. The prerr command returns 0 if it is completed successfully. It returns 1 if it is not completed successfully.

The prerr command uses the following syntax:

```
prerr Mode Image [Comments]
```

where:

- *Mode* is one of the following strings:
  - **s** specifies that the utility runs in scripted mode.
  - **i** specifies that the utility runs in interactive mode. If an occur occurs, a PAUSE statement is appended to the pr\_err.bat file.
- *Image* is one of the following strings:
  - **a** specifies image A
  - **b** specifies image B
- *Comments* is a string.

## prsource.exe

The prsource.exe file is a self-extracting zipped file that contains several utility programs. While a Power Restore partition is being installed or a Power Restore operation is running, MTFTP can copy the prsource.exe file instead of copying the individual files, resulting in faster performance.

## reboot.com

You can use this command to restart a system that is running DOS.

The reboot command uses the following syntax:

```
reboot
```

There are no command line parameters.

## seterror.com

You can use this command to set the error level.

The seterror command uses the following syntax:

```
seterror /n
```

where *n* is 0 or a positive integer from 1 through 32767.

---

## RAID configuration utilities

This section describes the RAID configuration utilities provided by RDM:

- acu.exe
- acuahci.exe
- acuichv.exe
- acusas.exe
- acusashr.exe
- acusiv.exe
- cfg1030.exe
- cfggen.exe
- hypercfg.exe
- ipssendl.exe
- raidchk.exe
- raidcfg.exe
- raidsel.exe
- tamcheq.exe

### acu.exe

You can use the acu utility to configure a ServeRAID-7t controller. You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

#### Syntax

The acu utility uses the following syntax:

*acu command parameters*

Table 25 contains information about the acu commands and parameters.

Table 25. acu commands and parameters

| Command   | What it does   | Syntax  |
|-----------|--|---|
| <b>/P</b> | Creates containers and configures channel settings using information stored in a file. | <i>acu /P filename</i><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the acu command searches for the file in the local directory. You can optionally provide the file extension .ccu. |
| <b>/R</b> | Saves the container and channel configuration settings for the controller to a file.   | <i>acu /R filename</i><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension .mlc.                        |
| <b>/C</b> | Specifies an optional controller ID for systems that have more than one controller ID. | <i>acu /C ID</i><br>where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.   |

For more information, see the documentation that comes with the server or RAID controller.

## acuahci.exe

You can use the acuahci.exe utility to configure a ServeRAID-8e (Adaptec HostRAID) for SAS controller. You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

### Syntax

The acuahci utility uses the following syntax:

*acuahci command parameters*

Table 25 on page 299 contains information about the acuahci commands and parameters.

Table 26. acuahci commands and parameters

| Command   | What it does   | Syntax  |
|-----------|--|---|
| <b>/P</b> | Creates containers and configures channel settings using information stored in a file. | <i>acuahci /P filename</i><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the acu command searches for the file in the local directory. You can optionally provide the file extension .ccu. |
| <b>/R</b> | Saves the container and channel configuration settings for the controller to a file.   | <i>acuahci /R filename</i><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension .mlc.                        |
| <b>/C</b> | Specifies an optional controller ID for systems that have more than one controller ID. | <i>acuahci /C ID</i><br><br>where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.   |

For more information, see the documentation that comes with the server or RAID controller.

## acuichv.exe

You can use the acuichv utility to configure a ServeRAID-7e (Adaptec HostRAID) for SATA controller (except for IntelliStation). You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

### Syntax

The acuichv utility uses the following syntax:

*acuichv command parameters*

Table 27 on page 301 contains information about the acuichv commands and parameters.

Table 27. *acuichv* commands and parameters

| Command   | What it does   | Syntax  |
|-----------|--|---|
| <b>/P</b> | Creates containers and configures channel settings using information stored in a file. | <code>acuichv /P filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the acu command searches for the file in the local directory. You can optionally provide the file extension <code>.ccu</code> . |
| <b>/R</b> | Saves the container and channel configuration settings for the controller to a file.   | <code>acuichv /R filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.mlc</code> .                        |
| <b>/C</b> | Specifies an optional controller ID for systems that have more than one controller ID. | <code>acuichv /C ID</code><br><br>where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.   |

For more information, see the documentation that comes with the server or RAID controller.

## acusas.exe

You can use the `acusas.exe` utility to configure the ServeRAID-8i SAS controller, ServeRAID 8-k SAS controller, or the ServeRAID 8k-l SAS controller. You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

### Syntax

The `acusas` utility uses the following syntax:

*acusas command parameters*

Table 25 on page 299 contains information about the `acusas` commands and parameters.

Table 28. *acusas* commands and parameters

| Command   | What it does   | Syntax   |
|-----------|--|--|
| <b>/P</b> | Creates containers and configures channel settings using information stored in a file. | <code>acusas /P filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the acu command searches for the file in the local directory. You can optionally provide the file extension <code>.ccu</code> . |
| <b>/R</b> | Saves the container and channel configuration settings for the controller to a file.   | <code>acusas /R filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.mlc</code> .                        |
| <b>/C</b> | Specifies an optional controller ID for systems that have more than one controller ID. | <code>acusas /C ID</code><br><br>where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.   |

For more information, see the documentation that comes with the server or RAID controller.

## acusashr.exe

You can use the `acusashr.exe` utility to configure a ServeRAID-8e (Adaptec HostRAID) for SAS controller. You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

### Syntax

The `acusashr` utility uses the following syntax:

`acusashr command parameters`

Table 25 on page 299 contains information about the `acusashr` commands and parameters.

Table 29. `acusashr` commands and parameters

| Command   | What it does   | Syntax  |
|-----------|--|---|
| <b>/P</b> | Creates containers and configures channel settings using information stored in a file. | <code>acusashr /P filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <code>acu</code> command searches for the file in the local directory. You can optionally provide the file extension <code>.ccu</code> . |
| <b>/R</b> | Saves the container and channel configuration settings for the controller to a file.   | <code>acusashr /R filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.mlc</code> .                                     |
| <b>/C</b> | Specifies an optional controller ID for systems that have more than one controller ID. | <code>acusashr /C ID</code><br><br>where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.  |

For more information, see the documentation that comes with the server or RAID controller.

## acusiv.exe

You can use the `acusiv.exe` utility to configure a ServeRAID-7e (Adaptec HostRAID) for SATA controller (for IntelliStation only). You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

### Syntax

The `acusiv` utility uses the following syntax:

`acuahci command parameters`

Table 25 on page 299 contains information about the `acusiv` commands and parameters.

Table 30. *acusiv* commands and parameters

| Command   | What it does   | Syntax  |
|-----------|--|---|
| <b>/P</b> | Creates containers and configures channel settings using information stored in a file. | <code>acusiv /P filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <i>acu</i> command searches for the file in the local directory. You can optionally provide the file extension <code>.ccu</code> . |
| <b>/R</b> | Saves the container and channel configuration settings for the controller to a file.   | <code>acusiv /R filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.mlc</code> .                               |
| <b>/C</b> | Specifies an optional controller ID for systems that have more than one controller ID. | <code>acusiv /C ID</code><br><br>where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.  |

For more information, see the documentation that comes with the server or RAID controller.

## cfg1030.exe

You can use the `cfg1030` utility to configure an integrated SCSI controller with RAID capabilities (an LSI1030 or LSI1020 controller). You can perform the following tasks:

- Create a logical drive and assign it RAID level-1
- Back up the configuration settings to a file
- Generate information about the controller and its RAID configuration
- Create a hot-spare drive
- Restore a controller to the factory-default settings

### Syntax

The `cfg1030` utility uses the following syntax:

`cfg1030 command parameters`

Table 31 contains information about the `cfg1030` commands and parameters.

Table 31. *cfg1030* commands and parameters

| Command       | What it does   | Syntax   |
|---------------|--|--|
| <b>backup</b> | Saves the configuration settings for the controller to a file. | <code>cfg1030 backup controller filename [qsync]</code><br><br>where <ul style="list-style-type: none"> <li>• <i>controller</i> is the number of the SCSI controller.</li> <li>• <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory.</li> <li>• <code>[qsync]</code> is an optional parameter that specifies that the logical drive is quick synchronized. The first 32 KB of the physical drives in the logical drive are cleared to 0.</li> </ul> <p><b>Important:</b> When you use the backup command in a file that is used by the RAID Clone Configuration task, use the <code>qsync</code> parameter to prevent a full synchronization. A full synchronization can be significantly longer than a quick synchronization.</p> |

Table 31. *cfg1030* commands and parameters (continued)

| Command          | What it does  | Syntax  |
|------------------|---|---|
| <b>create</b>    | Creates a logical drive.  | <p><code>cfg1030 create <i>controller</i> logicaldrive newarray <i>size</i> 1 {1 <i>drive</i>} [qsync]</code></p> <p>where</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the number of the SCSI controller. An LSI1030 controller will have two controller numbers (1 and 2) associated with it.</li> <li>• <i>size</i> is one of the following values: <ul style="list-style-type: none"> <li>– The size of the logical drive in MB</li> <li>– <b>MAX</b> specifies that you want to use all available space in the array</li> </ul> </li> <li>• {1 <i>drive</i>} is a repeatable parameter that specifies the hard disk drives included in the logical drive. The channel number is always 1, and <i>drive</i> is the SCSI ID of the hard disk drive.</li> <li>• [qsync] is an optional parameter that specifies that the logical drive is quick synchronized. The first 32 KB of the physical drives in the logical drive are cleared to 0.</li> </ul> <p><b>Important:</b> When you use the create command in a file that is used by the RAID Clone Configuration task, use the qsync parameter to prevent a full synchronization. A full synchronization can be significantly longer than a quick synchronization.</p> |
| <b>getconfig</b> | Lists information about the controller. This information includes controller type, firmware version, BIOS version, logical drive information, and physical drive information. | <p><code>cfg1030 getconfig <i>controller</i> [<i>option</i>]</code></p> <p>where</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the number of the SCSI controller.</li> <li>• [<i>option</i>] is an optional parameter that specifies the information that is returned, and <i>option</i> is one of the following values: <ul style="list-style-type: none"> <li>– <b>AD</b> specifies the controller information</li> <li>– <b>LD</b> specifies the logical drive information</li> <li>– <b>PD</b> specifies the physical drive information</li> <li>– <b>ALL</b> specifies all information</li> </ul> </li> </ul> <p>If <i>option</i> is not specified, by default the getconfig command returns all information.</p>  |
| <b>restore</b>   | Configures a controller using information and settings stored in a file.  | <p><code>cfg1030 restore <i>controller</i> <i>filename</i></code></p> <p>where</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the number of the SCSI controller.</li> <li>• <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <i>cfg1030</i> command searches for the file in the local directory.</li> </ul>  |
| <b>setconfig</b> | Deletes logical drives and restores a controller to the factory-default settings.   | <p><code>cfg1030 setconfig <i>controller</i> default</code></p> <p>where <i>controller</i> is the number of the SCSI controller.</p>  |
| <b>setstate</b>  | Creates a hot-spare drive.  | <p><code>cfg1030 setstate <i>controller</i> <i>drive</i> hsp</code></p> <p>where</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the number of the SCSI controller.</li> <li>• <i>drive</i> is the SCSI ID of the hard disk drive.</li> </ul>   |

## Examples of using the cfg1030 utility

Table 32 contains examples of using the cfg1030 utility.

Table 32. Examples of using the cfg1030 utility

| Command   | What it does  |
|---|---|
| <pre>cfg1030 create 1 logicaldrive newarray max 1 1 0 1 1 qsync</pre> <p>(The command must be typed all on one line.)</p> | <p>Performs the following actions:</p> <ul style="list-style-type: none"> <li>• Creates a new array and logical drive using controller 1</li> <li>• Uses all the available space in the array for the logical drive</li> <li>• Assigns the logical drive RAID level-1</li> <li>• Uses the physical drives at channel 1, SCSI ID 0 and SCSI ID 1</li> <li>• Specifies that a quick synchronization is performed, preventing a time-intensive full synchronization of the physical drives.</li> </ul> |
| <pre>cfg1030 setstate 1 0 1 HSP</pre>   | <p>Designates the physical drive at channel 0, SCSI ID 1 as a hot spare drive for controller 1.</p>   |

## cfggen.exe

You can use the cfggen utility to configure an LSI1064 controller.

### Syntax

The cfggen utility uses the following syntax:

*cfggen command parameters*

Table 31 on page 303 contains information about the cfg1030 commands and parameters.

Table 33. cfg1030 commands and parameters

| Command       | What it does             | Syntax   |
|---------------|--------------------------|--|
| <b>create</b> | Creates a logical drive. | <pre>cfggen controller create vol_id size {scsi_id} [qsync] [noprompt]</pre> <p>where</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the number of the SCSI controller. For cfggen.exe, this number is always 0.</li> <li>• <i>vol_id</i> is one of the following values: <ul style="list-style-type: none"> <li>– IM (mirror, raid level 1)</li> <li>– IS (stripe, raid level 0)</li> <li>– IME (raid level 1E)</li> </ul> </li> <li>• <i>size</i> is one of the following values: <ul style="list-style-type: none"> <li>– The size of the logical drive in MB</li> <li>– <b>MAX</b> specifies that you want to use all available space in the array</li> </ul> </li> <li>• <i>{scsi_id}</i> is always either 0 or 1.</li> <li>• [qsync] is an optional parameter that specifies that the logical drive is quick synchronized. The first 32 KB of the physical drives in the logical drive are cleared to 0.</li> </ul> <p><b>Important:</b> When you use the create command in a file that is used by the RAID Clone Configuration task, use the qsync parameter to prevent a full synchronization. A full synchronization can be significantly longer than a quick synchronization.</p> |

Table 33. *cfg1030* commands and parameters (continued)

| Command        | What it does             | Syntax  |
|----------------|--------------------------|---|
| <b>display</b> | Lists the configuration. | <code>cfggen controller</code><br><br>where <ul style="list-style-type: none"> <li><i>controller</i> is the number of the SCSI controller. For <code>cfggen.exe</code>, this number is always 0.</li> </ul> |

## hypercfg.exe

You can use the `hypercfg` utility to configure an IDEal RAID controller. You can perform the following tasks:

- Create a logical drive and assign it RAID level-1 or RAID level-0
- List the configuration of hard disk drives attached to an IDEal RAID controller and write the information to a file
- List BIOS information for the IDEal RAID controller
- Create a logical drive using configuration information that is stored in a file

### Syntax

The `hypercfg` utility uses the following syntax:

`hypercfg command parameter`

Table 34 contains information about the `hypercfg` commands and parameters.

Table 34. *hypercfg* commands and parameters

| Command          | What it does   | Syntax  |
|------------------|--|---|
| configuration    | Creates a logical drive and assigns it a RAID level.   | <code>hypercfg configuration</code><br><br>where <i>configuration</i> is one of the following commands: <ul style="list-style-type: none"> <li>• <b>/AM</b> assigns the logical drive RAID level-1.</li> <li>• <b>/ASStripeSize</b> assigns the logical drive RAID level-0 and stripes data across the logical drive in blocks of <i>StripeSize</i>. <i>StripeSize</i> is one of the following values, in KB: 32, 64, 128, 256, 512, 1024, 2048, 4096.</li> </ul> |
| <b>@filename</b> | Creates a logical drive using configuration information stored in a file.  | <code>hypercfg @FileName</code><br><br>where <i>FileName</i> is a fully qualified file name.  |
| <b>/l</b>        | Shows the configuration for the hard disk drives attached to the IDEal RAID controller. It also can write the information to a file. | <code>hypercfg /l [/filename]</code><br><br>where <i>[/filename]</i> is an optional parameter that specifies that the information be written to a file, and <i>filename</i> is a fully qualified file name.   |
| <b>/s</b>        | Performs operations without waiting for input.   | <code>hypercfg /s</code>  |
| <b>/v</b>        | Shows the BIOS information for the IDEal RAID controller.  | <code>hypercfg /v</code>  |

### Examples of using the hypercfg utility

Table 35 on page 307 includes examples of using the `hypercfg` utility.

Table 35. Examples of using the hypercfg utility

| Command                       | What it does  |
|-------------------------------|---|
| hypercfg /AM                  | Creates a logical drive and assigns it RAID level-1.  |
| hypercfg /AS64                | Creates a logical drive and assigns it RAID level-0. Stripes data across the drives in 64 KB blocks.  |
| hypercfg /l                   | Lists information for the two physical drives attached to the IDEal RAID controller.  |
| hypercfg /l /fhypercfg.cfg /s | Lists the information for the two physical drives attached to the IDEal RAID controller; then, without waiting for input, writes the data to the hypercfg.cfg file. |
| hypercfg /@hypercfg.cfg       | Configures a logical drive using the information stored in the hypercfg.cfg file.   |

For more information, see the *IBM BladeCenter HS20 - LSI IDEal RAID User's Guide*. It can be downloaded from <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-52750>.

## ipssendl.exe

You can use the ipssendl utility to configure an IBM ServeRAID controller. You can perform the following tasks:

- Back up controller information
- Create logical drives and assign RAID levels
- List information about a controller, logical drive, or physical drive
- Restore a controller configuration from a file or diskette
- Reset a controller to the factory-default settings

### Notes:

1. RDM 4.30 includes ipssendl, version 7.10.17. It is a best practice to upgrade ServeRAID BIOS code and firmware to version 7.10.17 before using the ipssendl command. However, the ipssendl command will work with ServeRAID BIOS code and firmware later than version 4.84.
2. The ipssendl command supports IBM ServeRAID controllers, version 4 and later.
3. You must load the ServeRAID device driver for DOS (ipsraspi.sys) on the target system before using ipssendl. This device driver is on the *IBM ServeRAID drivers for DOS* diskette. The diskette also includes a sample config.sys that shows how to install the device driver. See "Creating a DOS-startable diskette" on page 138 for more information.

### Syntax

The ipssendl utility uses the following syntax:

```
ipssendl command parameters
```

Table 36 on page 308 contains information about ipssendl commands and parameters.

Table 36. ipssendl commands and parameters

| Command          | What it does  | Syntax   |
|------------------|---|--|
| <b>backup</b>    | Saves information concerning a controller configuration to a diskette or physical drive. This information includes BIOS settings, array and logical drive definitions, and cluster parameters.  | ipssendl backup <i>controller filename</i> [noprompt]<br><br>where:<br><ul style="list-style-type: none"> <li><i>controller</i> is the ServeRAID controller number (1-12).</li> <li><i>filename</i> is a fully qualified file name.</li> <li>noprompt is an optional parameter that overrides the user prompt.</li> </ul>  |
| <b>create</b>    | Creates logical drives on either an existing or a new array. To define a new array, type the channel and SCSI ID of the physical drives.<br><b>Note:</b> You cannot create RAID level-00, level-10, level-1E0, and level-50 logical drives with this function.<br><br>After the logical drive is created, a quick initialization is done. The quick initialization process initializes the first 1024 sectors of the logical drive.<br><br>If you assign the logical drive RAID level-5 RAID level-5E and the ServeRAID controller supports auto-synchronization, the logical drive is automatically synchronized in the background. If the controller does not support the auto-synchronization feature, you can use the IPSSENDL synch function to synchronize the RAID level-5, RAID level-5E, or RAID level-5EE logical drives. After synchronization, the logical drives are available for storing data. | ipssendl create <i>controller logicaldrive options size raidlevel [channel sid]</i> [noprompt]<br><br>where:<br><ul style="list-style-type: none"> <li><i>controller</i> is the ServeRAID controller number (1-12).</li> <li><i>options</i> is one of the following values:               <ul style="list-style-type: none"> <li><b>NEWARRAY</b> specifies that you are creating a new array and logical drive</li> <li><b>ARRAYID</b> is the array ID (A-H) of an existing array</li> </ul> </li> <li><i>size</i> is one of the following values:               <ul style="list-style-type: none"> <li>The size, in MB, of the logical drive</li> <li><b>MAX</b> indicates that you want to use all available space in the array</li> </ul> </li> <li><i>raidlevel</i> is the RAID level for the logical drive (0, 1, 1E, 5, or 5E).</li> <li>If you specify NEWARRAY, <i>channel sid</i> is the channel number for the device (1-4), and <i>sid</i> is the SCSI ID for the device (0-15). You can specify as many as 16 physical drives.</li> <li>noprompt is an optional parameter that overrides the user prompt.</li> </ul> |
| <b>getconfig</b> | Lists information about a controller, logical drive, or physical drive. This information potentially includes (but is not limited to) the following items: <ul style="list-style-type: none"> <li>Controller type</li> <li>BIOS code, boot block, device driver, and firmware versions</li> <li>Logical drive status, RAID level, and size</li> <li>Physical drive type, SCSI ID, presence of Predictive Failure Analysis® (PFA)</li> <li>Physical drive state</li> </ul>   | ipssendl getconfig <i>controller options</i><br><br>where:<br><ul style="list-style-type: none"> <li><i>controller</i> is the ServeRAID controller number (1-12).</li> <li><i>options</i> is one of the following values:               <ul style="list-style-type: none"> <li><b>AD</b> specifies the controller information.</li> <li><b>LD</b> specifies the logical drive information.</li> <li><b>PD</b> specifies the physical device information.</li> <li><b>AL</b> specifies all information. This is the default option.</li> </ul> </li> </ul>  |
| <b>restore</b>   | Loads a configuration file from a file stored on a diskette or hard disk drive. This information overwrites the existing configuration information and BIOS settings stored on a ServeRAID controller.  | ipssendl restore <i>controller filename</i> [noprompt]<br><br>where:<br><ul style="list-style-type: none"> <li><i>controller</i> is the ServeRAID controller number (1-12).</li> <li><i>filename</i> is a fully qualified file name.</li> <li>noprompt is an optional parameter that overrides the user prompt.</li> </ul>   |

Table 36. *ipssendl* commands and parameters (continued)

| Command          | What it does   | Syntax   |
|------------------|--|--|
| <b>setconfig</b> | Modifies the controller configuration. You can restore the configuration to the factory-default settings, or you can copy the configuration from the attached physical drives. | <p><code>ipssendl setconfig controller <i>option</i> [noprompt]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the ServeRAID controller number (1-12).</li> <li>• <i>option</i> is one of the following values: <ul style="list-style-type: none"> <li>– <b>DEFAULT</b> restores the controller to the factory-default settings. All logical drives are deleted.</li> <li>– <b>IMPORTDRIVE</b> imports the configuration from the attached physical drives.</li> </ul> </li> <li>• <code>noprompt</code> is an optional parameter that overrides the user prompt.</li> </ul>   |
| <b>setstate</b>  | Changes the state of a physical drive.   | <p><code>ipssendl setstate controller channel <i>scsi_id</i> <i>new_state</i></code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>controller</i> is the ServeRAID controller number (1-12).</li> <li>• <i>channel</i> is the channel number of the physical drive (1-4).</li> <li>• <i>scsi_id</i> is the SCSI ID number of the physical drive (0-15).</li> <li>• <i>new_state</i> is one of the following values: <ul style="list-style-type: none"> <li>– <b>EMP</b> (empty)</li> <li>– <b>RDY</b> (ready)</li> <li>– <b>HSP</b> (hot spare)</li> <li>– <b>SHS</b> (standby hot spare)</li> <li>– <b>DDD</b> (defunct disk drive)</li> <li>– <b>DHS</b> (defunct hot spare)</li> <li>– <b>RBL</b> (rebuild)</li> <li>– <b>SBY</b> (standby)</li> <li>– <b>ONL</b> (online)</li> </ul> </li> </ul> |

## Examples of using the ipssendl utility

Table 37 contains examples of using the ipssendl utility.

Table 37. Examples of using the ipssendl utility

| Command  | What it does   |
|--|--|
| ipssendl create 1 logicaldrive newarray max 5 1 0 1 1 1 2 1 3 1 4 noprompt<br><br>(The command must be typed all on one line.) | Uses controller 1 to create a new array with a RAID level-5 logical drive. The array uses the drives on channel 1 at SCSI ID 0, 1, 2, 3, and 4. The logical drive uses all the available space in the array. |
| ipssendl backup 1 c:\myraid.cfg  | Saves the configuration information for controller 1 to the myraid.cfg file, located in the root directory of drive C.   |
| ipssendl restore 1 c:\myraid.cfg   | Restores the configuration information from the myraid.cfg file to controller 1.   |
| ipssendl setconfig 1 default   | Restores controller 1 to the factory-default settings.   |

## raidcfg.exe

The raidcfg utility is used by the Scan task. It scans a target system and determines whether an RDM-supported RAID controller is installed. If such a controller is present, raidcfg.exe calls the applicable utility to retrieve the configuration information for the RAID controller. It then logs the output to the raid.cfg file.

## raidchk.exe

The raidchk utility is used to detect the presence of a RAID controller.

## raidsel.exe

You can use the raidsel utility to configure a ServeRAID-7e (Adaptec HostRAID) for SCSI controller. You can perform the following tasks:

- Create a logical drive and assign it either RAID level-0 or RAID level-1
- Back up the configuration settings to a file
- Generate information about the controller and its RAID configuration
- Create a hot-spare drive
- Restore a controller to the factory-default settings

### Syntax

The raidsel utility uses the following syntax:

`raidsel command parameters`

Table 38 contains information about the raidsel commands and parameters.

Table 38. raidsel commands and parameters

| Command   | What it does  | Syntax  |
|-----------|---|---|
| <b>-a</b> | Specifies the type of build action to perform on the array. | <code>raidsel -a <i>action</i> [autofix]</code><br><br>where <ul style="list-style-type: none"> <li>• <i>action</i> is one of the following build actions:               <ul style="list-style-type: none"> <li>– <b>build</b> specifies the build operation</li> <li>– <b>rebuild</b> specifies the rebuild operation</li> <li>– <b>verify</b> specifies the verify operation</li> </ul> <p><b>Note:</b> The verify parameter is applicable for the optimal state only.</p> </li> <li>• autofix turns on the autofix function during a verify operation</li> </ul> |

Table 38. *raidset* commands and parameters (continued)

| Command         | What it does  | Syntax   |
|-----------------|---|--|
| <b>-B</b>       | Marks or unmarks a startable (bootable) drive.  | <code>raidset -B +drive   -drive</code><br>where <i>drive</i> is the drive ID.   |
| <b>-b</b>       | Specifies a bus or channel on which to operate.   | <code>raidset -b ID</code><br>where <i>ID</i> is the bus or channel ID.<br><b>Note:</b> If you do not specify a value for <i>ID</i> , the default is 0.  |
| <b>-D</b>       | Deletes an array or logical drive, or all arrays.   | <code>raidset -D ID   all</code><br>where <i>ID</i> is the array or logical drive ID.  |
| <b>-d</b>       | Specifies a controller on which to operate.   | <code>raidset -d ID</code><br>where <i>ID</i> is the controller ID.<br><b>Note:</b> If you do not specify a value for <i>ID</i> , the default is 0.  |
| <b>-delinfo</b> | Specifies the delete information option when deleting RAID-level 1 logical drives.                      | <code>raidset -delinfo drive</code><br>where <i>drive</i> is one of the following options: <ul style="list-style-type: none"> <li>• <i>pri</i>, which specifies the primary drive</li> <li>• <i>sec</i>, which specifies the secondary drive</li> <li>• <i>all</i>, which specifies both primary and secondary drives</li> <li>• <i>none</i>, which specifies no drives</li> </ul> <b>Note:</b> If you do not specify a value for <i>drive</i> , the default is none.            |
| <b>-F</b>       | Forces the creation of an array. Typically this is used when a partition table is detected.             | <code>raidset -F</code>  |
| <b>-g</b>       | Specifies device IDs.<br><b>Note:</b> Use this command in conjunction with the <code>-l</code> command. | <code>raidset -g {ID}</code><br>where <i>ID</i> is the device ID.  |
| <b>-L</b>       | Lists information for the specified type.   | <code>raidset -L type</code><br>where <i>type</i> is one of the following types: <ul style="list-style-type: none"> <li>• <i>controller</i>, which specifies the controller information</li> <li>• <i>physical</i>, which specifies the physical drive information</li> <li>• <i>logical</i>, which specifies the logical drive information</li> <li>• <i>raid</i>, which specifies the raid level information</li> <li>• <i>all</i>, which specifies all information</li> </ul> |
| <b>-l</b>       | Specifies the RAID level to create in the configuration.  | <code>raidset -l level name</code><br>where <ul style="list-style-type: none"> <li>• <i>level</i> is one of the following RAID levels: <ul style="list-style-type: none"> <li>– 0</li> <li>– 1</li> <li>– 10</li> </ul> </li> <li>• <i>name</i> is an optional name</li> </ul>   |
| <b>load</b>     | Configures a controller using information and settings stored in a file.                                | <code>raidset load filename</code><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <i>raidset</i> command searches for the file in the local directory.   |

Table 38. *raidset* commands and parameters (continued)

| Command      | What it does   | Syntax  |
|--------------|--|---|
| <b>loadB</b> | Configures an array using information and settings stored in a file.                                 | <code>raidset loadB filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <i>raidset</i> command searches for the file in the local directory.   |
| <b>-p</b>    | Specifies a driver background task priority.   | <code>raidset -p priority</code><br><br>where <i>priority</i> is one of the following priorities: <ul style="list-style-type: none"> <li>• high</li> <li>• medium</li> <li>• low</li> </ul> <b>Note:</b> If you do not specify a value for <i>priority</i> , the default is medium. |
| <b>-q</b>    | Specifies quiet mode.  | <code>raidset -q</code>   |
| <b>-S</b>    | Adds or deletes a spare drive to an array.   | <code>raidset -S +ID   -ID</code><br><br>where <i>ID</i> is the spare drive ID.   |
| <b>save</b>  | Saves the configuration settings for the controller to a file.                                       | <code>raidset save filename</code><br><br>where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.xml</code> .                      |
| <b>-Z</b>    | Wipes out the meta data and partition table on one or all physical drives on the current channel.    | <code>raidset -Z ID   all</code><br><br>where <i>ID</i> is the physical drive ID.   |
| <b>-z</b>    | Specifies the required stripe-unit size when creating a RAID-level 0 or RAID-level 10 logical drive. | <code>raidset -z size</code><br><br>where <i>size</i> is one of the following stripe-unit sizes: <ul style="list-style-type: none"> <li>• 16 KB</li> <li>• 32 KB</li> <li>• 64 KB</li> </ul> <b>Note:</b> If you do not specify a value for <i>size</i> , the default is 64 KB.     |

For more information, see the documentation that comes with the server or RAID controller.

## tamcheq.exe

The *tamcheq* utility is used to translate RAID configuration information internal to the RAID Custom Configuration task. If the *tamcheq* utility is invoked with a parameter, the parameter (a string) is added to the task log using *rdagent*.

---

## RDM utilities

RDM uses the following RDM utilities:

- aiaread.exe
- aiawrite.exe
- bootini.com
- bstrap.0 and lccm.1
- cleanup.exe
- deditd.exe
- getvol.exe
- lccustom.exe
- lccm.1 and bstrap.0
- lcips.dos
- lcreboot.exe
- makepqs.com
- mergeini.exe
- mtftp.exe
- poweroff.com
- prepdsks.exe
- ramdisk2.exe
- rave.exe
- redirect.exe
- rdagent.exe
- scan.exe
- scrub3.exe
- sleep.exe
- treboot.exe
- tshudwn.exe
- unpackux.exe
- unzip.exe

## aiaread.exe

You can use the aiaread utility to read the contents of the Asset Information Area (AIA) of the Radio Frequency Identification (RFID) chip. The chip is battery-maintained and contains system-specific asset information. The aiaread utility runs in DOS only.

### Syntax

The aiaread utility uses the following syntax:

```
aiaread group [field] [/f=file] [/a] [/s] [/x] [/p=prefix]
```

where:

- *group* is one of the following strings:
  - leasedata
  - networkconnection
  - ownerdata
  - preloadprofile
  - userassetdata
  - USERDEVICE
- *field* is the group-specific field. See Table 39 for more information. By default, all fields are read.
- /f=*file* specifies the file where the output information is written (the output file), and *file* is the fully qualified name of the output file. By default, the output information is written to stdout.
- /a specifies that the output information is appended to the output file. By default, the output file is overwritten.
- /s specifies that the output information is formatted as SET statements, for example, SET *field* = *value*. By default, the output information has a *field* = *value* format.
- /x specifies that the following fields are excluded:
  - Fields that have zero values
  - Fields that do not have values, for example, fields that contain null strings.
- /p specifies that the word **prefix** is prepended to the name of each field

The following table lists the fields for the AIA utilities, aiaread.exe and aiawrite.exe.

Table 39. Fields for the AIA utilities

| Group     | Fields   |
|-----------|--|
| leasedata | <ul style="list-style-type: none"><li>• lease_amount</li><li>• lease_end_date</li><li>• lease_start_date</li><li>• lease_term</li><li>• lessor</li></ul> |

Table 39. Fields for the AIA utilities (continued)

| Group             | Fields  |
|-------------------|---|
| networkconnection | <ul style="list-style-type: none"> <li>• gateway</li> <li>• ipaddress<math>N</math></li> <li>• loginname</li> <li>• numics</li> <li>• systemname</li> <li>• subnetmask<math>N</math></li> </ul> <p>where <math>N</math> is an integer greater or equal to one, and <math>N</math> is less than or equal to the value of the numics field. By default, it is set to one.</p> |
| ownerdata         | <ul style="list-style-type: none"> <li>• department</li> <li>• location</li> <li>• phone_number</li> <li>• ownername</li> <li>• ownerposition</li> </ul>  |
| preloadprofile    | <ul style="list-style-type: none"> <li>• image</li> <li>• imagedate</li> </ul>  |
| userassetdata     | <ul style="list-style-type: none"> <li>• asset_number</li> <li>• last_inventoried</li> <li>• purchase_date</li> <li>• warranty_duration</li> <li>• warranty_end</li> </ul>  |
| USERDEVICE        | <p>These fields (maximum of five) are user-defined.</p> <p><b>Note:</b> These fields are case-sensitive.</p>  |

### Examples of using the aiaread utility

The following table contains examples of using the aiaread utility.

Table 40. Example of using the aiaread utility

| Command           | What it does   |
|-------------------|--|
| aiaread ownerdata | <p>Displays the values of all the ownerdata fields. For example, the following information might be displayed:</p> <pre>OWNERNAME=jim smith DEPARTMENT=219 LOCATION=Room 315 PHONE_NUMBER=3765 OWNERPOSITION=Manager</pre> <p>The information is written to the default output file, stdout.</p> |

Table 40. Example of using the aiaread utility (continued)

| Command                           | What it does  |
|-----------------------------------|---|
| aiaread ownerdata /f c:\owner.bat | Creates a batch file, owner.bat, that contains the following information:<br>SET OWNERNAME=jim smith<br>SET DEPARTMENT=219<br>SET LOCATION=Room 315<br>SET PHONE_NUMBER=3765<br>SET OWNERPOSITION=Manager |

## aiawrite.exe

You can use the aiawrite utility to write data to the AIA of the Radio Frequency Identification (RFID) chip. The chip is battery-maintained and contains system-specific asset information. This program runs in DOS only.

### Syntax

The aiawrite utility uses the following syntax:

```
aiawrite group {field=value} | /f=file
```

where:

- *group* is one of the following strings:
  - leasedata
  - networkconnection
  - ownerdata
  - preloadprofile
  - userassetdata
  - USERDEVICE
- *field=value* is a repeatable statement. Separate *field=value* pairs with a comma (,). Consider the following information:
  - *field* is the group-specific field. See Table 39 on page 314 for more information.
  - *value* is string or numeric value assigned to the field. If *value* is a string that contains a space, you must surround the string with quotation marks ("").
- */f=file* is an optional parameter that specifies that the information is input from a file (an input file), and *file* is the fully qualified name of the input file. The input file contains *field=value* pairs, and each pair must be listed on a separate line.

**Note:** If the AIA is uninitialized (the factory-default state), you can initialize it by issuing the following command:

```
aiawrite group
```

This accomplishes the following operations:

- Sets all fields that take strings to null values
- Set all fields that take dates or numbers to 00000000 (eight zeros).

### Example of using the aiawrite utility

Issuing the following command writes South to the area field of the userdevice group:

```
aiawrite userdevice area=South
```

## bootini.com

You can use the bootini command to modify the boot.ini file to ensure that it is pointing to the first partition on the drive.

On a donor system, the boot partition might possibly be other than the first partition on the drive, and the boot.ini file points to that partition. If an image is captured from the donor system and deployed to a target system, the image is placed on the first partition. This might cause the target system to fail to boot, because the boot.ini file is pointing to the wrong partition.

The bootini command uses the following syntax:

```
bootini
```

## cleanup.exe

You can use the cleanup utility to remove installation files.

The cleanup utility uses the following syntax:

```
cleanup
```

## deditd.exe

You can use the deditd utility to replace, insert, or append strings within text files.

### Syntax

The deditd utility uses the following syntax:

```
deditd Option [Frequency] TargetFile [String1] String2
```

where:

- *Option* is one of the following strings:
  - **/ia** specifies that *String2* is inserted after *String1*.
  - **/ib** specifies that *String2* is inserted before *String1*.
  - **/ila** specifies that *String2* is inserted on the line after *String1*.
  - **/ilb** specifies that *String2* is inserted on the line before *String1*.
  - **/r** specifies that *String1* is replaced with *String2*.
  - **/ae** specifies that *String2* is appended to a line at the end of the text file.
  - **/as** specifies that *String2* is appended to a line at the start of the text file.
- *Frequency* is an optional parameter that specifies the number of time the deditd operation is performed. It is one of the following strings:
  - **/n=number**, where *number* is an integer
  - **/n0** specifies that the deditd operation should be repeated as many times as there are occurrences of *String1*.

If *Frequency* is not specified, by default, the deditd operation is performed once.

- *TargetFile* is the fully qualified name of the text file.
- *String1* is an optional parameter that specifies a string in the text file.
- *String2* specifies the string that is added to the text file.

### Example of using the deditd utility

Issuing the following command replaces the first five occurrences of **loadhigh** with **load** in the file c:\autoexec.bat:

```
deditd /r /n5 c:\autoexec.bat loadhigh load
```

## dsconfig.exe

You can use the dsconfig utility to configure RDM Deployment Server (D-Server) options on either the RDM server or remote deployment servers. This utility runs on Windows only. It automatically runs as part of the RDM Server or RDM Deployment Server (D-Server) installation process.

The dsconfig utility uses the following syntax:

```
dsconfig [/q]
```

where /q causes the utility to run silently.

See the *IBM Remote Deployment Manager 4.30 Installation and Configuration Guide* for more information.

## getvol.exe

You can use the getvol utility to create a file, deleteme.txt, in the temp directory. The deleteme.txt file contains a single record that is the volume label of the diskette that is in diskette drive A. If there is no diskette in the drive, the deleteme.txt file is not created. If the deleteme.txt file already exists, it is overwritten.

The getvol utility uses the following syntax:

```
getvol
```

## lccustom.exe

You can use the lccustom utility to replace the DOS environment variables in a text file with specific values. This utility substitutes the values that are supplied by the RDM system and profile parameter pages; it also can substitute the values used in SET statements in a specified text file.

### Syntax

The lccustom utility uses the following syntax:

```
lccustom File1 [File2] [VariableFile] [/v]
```

where:

- *File1* is the fully qualified name of the text file that you want to modify.
- *File2* is the fully qualified name of the modified text file. If this parameter is not issued, *File1* is overwritten.
- *VariableFile* is the fully qualified name of a file that sets the values for the DOS environment variables.
- /v specifies that verbose logging is enabled.

Consider the following information:

- The DOS environment variables must be enclosed in percentage signs (%).
- A value that is set in *VariableFile* takes precedence over a value for the same variable that is set in the DOS command-line environment.
- Environment variables specified in *VariableFile* can have a null value. For example, if *VariableFile* contains the following statement, all instances of %UserName% would be removed entirely from the text file against which you ran the lccustom utility:  
SET UserName =
- The lccustom utility does not use the current directory for work files, so it can be run from a read-only directory.
- The lccustom utility modifies one line at a time. The maximum line length is 8 KB. Lines that are longer than 8 KB might not be fully converted.

### Example of using lccustom.exe

For example, consider files that contain the following statements:

#### unattend.txt

```
OrgName = "%COMPANY%"  
Computername = "%CNAME%"  
ProductID = %PRODUCTID%"  
JoinDomain = %DOMAIN%"  
NetworkAddress = %CADDRESS%"
```

#### rdm\_xp.bat

```
SET COMPANY=IBM  
SET PRODUCTID=AG94949-87243  
SET DOMAIN=AMD0012
```

When you run the following command, the DOS environment variables in the unattend.txt file are replaced by the values specified in the rdm\_xp.bat file:

```
lccustom c:\unattend.txt c:\answer2.txt c:\temp\rdm_xp.bat
```

The modified answer file is written to c:\answer2.txt, which contains the following text:

```
OrgName = IBM  
Computername = SYS10  
ProductID = AG94949-87243  
JoinDomain = AMD0012  
NetworkAddress = 006094A5BBBB
```

The values of environment variables CNAME and CADDRESS were present in the DOS command-line environment.

## lccm.1 and bstrap.0

The lccm.1 and bstrap.0 utilities are bootstrap programs that are loaded and run on the target system. They communicate with RDM Deployment Server to download and run the system environment.

The following informational messages might be displayed on the target system monitor:

```
IBM Bootstrap Loader 2.1 (RDM v4.30)
(C) Copyright IBM Corp. 1999,2004 All Rights Reserved.
Copyright (C) 1997,1999 Intel Corporation.
Contacting RDM D-Server
Booting RDM System Environment "environment/dos71x" from RAM disk ...
Performing local boot ...
Loading second bootstrap
Receive Reboot command ...
Receive Shutdown command ...
Reboot in 3 seconds ...
```

The following error or warning messages might be displayed on the target system monitor.

```
RDB00T000I Bootstrap starts up successfully
RDB00T001W No D server IP found. Default to DHCP server.
RDB00T002W No udp ports defined. Default to
RDB00T003E !PXE structure is invalid
RDB00T004E PXENV+ structure is invalid
RDB00T005E Get cached packet failed
RDB00T006E Could not get pointer to original packet storage
RDB00T007E No response from server.
RDB00T008E Received invalid message type (Sig/Dtype/Opcode)
RDB00T009E Message XID not match
RDB00T010E Unknown work type received
RDB00T011E Unknown work option received
RDB00T012E Not support floppy image larger than 2880KB
RDB00T013E Not enough extended memory
RDB00T014E Could not download boot image
RDB00T015E ENV RAMdisk image corrupted
RDB00T016E Cannot update 40:13
RDB00T017E Cannot remove undi code
RDB00T018E Could not open UDP connection
RDB00T019E UDP write failed.
RDB00T020E PXE-E79: NBP is too big to fit in free base memory.
RDB00T021E Failed to send DHCP Release
RDB00T022E PXE-E81: Invalid DHCP option format.
RDB00T023E Transferring control to RAMdisk image failed.
RDB00T024E Restart to new bootstrap failed.
RDB00T025E Failed to read hard disk boot sector
```

The following messages are displayed by bstrap.0 only.

```
Invalid DHCP option format
Bad or missing discovery server list. #1
Bad or missing multicast discover address #1
Bad or missing discovery server list #2
Bad or missing multicast discover address #2
Bad or missing PXE menu and/or prompt information. #1
Bad or missing PXE menu and/or prompt information. #2
No MAN_INFO or OS_INFO options found
Press <Space> for Configuration Services or <Esc> or <Ctrl-C> to cancel
Press <Esc> to cancel network boot
No services selected
Network boot canceled by keystroke
Network Boot Menu
Key Description
Esc    Cancel network boot
Press key to select desired network boot (1", 2", Space", ESC)
Network boot canceled by keystroke
```

## lcips.dos

The lcips file is the DOS IP stack that is used on target systems to which images are deployed. The following informational text might be displayed on the target system:

```
IBM DOS Multicast UDP/IP Stack v1.0 (RDM v4.30)
Copyright IBM Corp. 2003 All Rights Reserved.
```

The lcips file contains the following messages:

```
RDIPST001E The protocol manager could not be opened."
RDIPST002E The protocol manager would not accept a request."
RDIPST003E The protocol manager would not supply a configuration image."
RDIPST004E The protocol manager would not accept module registration."
RDIPST005E No MAC driver bindings were specified in PROTOCOL.INI"
RDIPST006E System Resources are not available to hold the current parameter
configuration in PROTOCOL.INI.
RDIPST007I Driver will not fit in UMB, loading low."
RDIPST008I Chaining multiple LAN drivers."
RDIPST009E Address error correcting 386 processor."
RDIPST010E Too many MAC driver binds specified in PROTOCOL.INI"
RDIPST011E An unrecognized keyword was found in PROTOCOL.INI:"
RDIPST012E A value is required for keyword in PROTOCOL.INI."
RDIPST013E The value specified for a keyword is not valid."
RDIPST014E The value specified for a keyword is not within the allowed range."
RDIPST015E A duplicate keyword was found in PROTOCOL.INI."
RDIPST016E Section for this Driver missing in PROTOCOL.INI."
RDIPST017E Error loading - Press F1 to continue."
```

## lcreboot.exe

You can use the lcreboot utility to restart a system from within Windows.

The lcreboot utility uses the following syntax:

```
lcreboot
```

## makepqs.com

The makepqs utility is used by the Get Donor task. This utility creates a Symantec ImageCenter script, **pqstore.com**, that is used to capture the boot partition on a target system.

The makepqs utility uses the following syntax:

```
makepqs
```

## mergeini.exe

You can use the mergeini utility to merge two INI or INF files together.

The mergeini utility uses the following syntax:

```
mergeini file1 file2
```

where the contents of *file1* are merged with the contents of *file2* and the results are written to *file2*.

## mtftp.exe

You can use the mtftp utility to transfer files between a target system and an RDM Deployment Server (D-Server). You run this utility on the target system.

When an mtftp command is run, a mtftprc.bat is created. If the mtftp command runs successfully, the file is empty. If the mtftp command does not run successfully, the mtftprc file contains statements to set the rdstatus and rdraslevel environment variables to the applicable failure codes. Running the mtftprc.bat file transfers the mtftp error log to the RDM/log directory on the RDM D-Server.

The mtftp utility uses the following syntax:

```
mtftp Action DServerIP [Port] Source Destination [Options] -i[TargetIP]
```

where:

- *Action* is one of the following commands:
  - **get** specifies that the file is transferred from the RDM D-Server to the target system.
  - **put** specifies that the file is transferred from the target system to the RDM D-Server. This parameter is supported only for unicast transmissions.
- *DServerIP* is the IP address of the MTFTP service.
- *Port* is the port number on which the MTFTP service listens. By default, the port number is assumed to be either 1759 (multicast) or 69 (unicast).
- *Source* is the path and file name of the file to be transferred.
  - For a **get** command, the file is transferred from the RDM repository, and the path you specify must be relative to the repository directory RDM\repository. For example, if you specify *Source* as TEMPLATE\14\693\MYFILE.TXT, that file must be in RDM\repository\TEMPLATE\14\693\MYFILE.TXT on the RDM D-Server.
  - For a **put** command, the file is transferred from the target system, and there is no restriction on what you specify for *Source*. For example, if you specify *Source* as MYFILE.TXT, that file must be in the current directory.
- *Destination* is the path and file name of the file after it is transferred. Its file name does not have to be the same name as the *Source* file name.

- For a **get** command, the file is transferred to the target system, and there is no restriction on what you specify for *Destination*. For example, if you specify *Destination* as MYFILE.TXT, that file will be written in the current directory.
- For a **put** command, the file is transferred to the RDM\log directory if its extension (in *Destination*) is LOG; a file with any other extension is transferred to the RDM\temp directory.
- *Options* is one or more of the following parameters:
  - **-aN** specifies that every *N*th packet is acknowledged, and *N* is a multiple of 2. If this parameter is not issued, by default every packet is acknowledged.
  - **-bBlockSize** specifies the size of the data packet used in get operations, and *BlockSize* is a multiple of 512. The maximum size is 8192. If this parameter is not specified, the default packet size of 2560 is used.
  - **-m** specifies that MTFTP is used.
  - **-lListen** specifies the client listen value, and *Listen* is the number of seconds. By default, the current client listen value is used.
  - **-tDelay** specifies client delay value, and *Delay* is the number of seconds. By default, the current client delay value is used.
  - **-v** specifies that the progress of the transfer operation is displayed in detail.
  - **-d** specifies that detailed information useful for program debugging is displayed.
  - **-r** specifies that the file is replicated from the master repository to the remote repository without transmission to the target system.
- **-iTargetIP** specifies NIC on the target system, and *TargetIP* is the IP address of the target system.

**Note:** The **-iTargetIP** parameter is not supported for the DOS version of mtftp.

## poweroff.com

You can use this command to turn off the system.

The poweroff command uses the following syntax:

```
poweroff
```

## prepdsks.exe

You can use this utility to generate batch files that partition and format the hard disks.

## ramdisk2.exe

You can use this utility to determine the drive letters of all RAM drives. It sets an environment variable, RAMDSK, to the first RAM drive letter followed by a colon, then outputs the value of RAMDSK to the screen. It also sets RAMDSK1 to the same value as RAMDSK. If there are more RAM drives, it uses RAMDSK2, RAMDSK3, and so on to contain their drive letters.

### Syntax

The ramdisk2 utility uses the following syntax:

```
ramdisk2
```

## Example of using the ramdisk2 utility

Assume that the system on which the ramdisk2 command is run has two partitions on its hard drive, which are the C: and D: drives. When the ramdisk2 command is issued on that system, the drive letter returned to the screen will be E, indicating that E: is the RAM drive. If the system had 2 RAM drives, then the screen output would be:

```
RAMDSK1=E:  
RAMDSK2=F:
```

## rave.exe

The rave utility is used only as part of Power Restore, when it converts the hidden partition from the old format to the new format. This program, the older Rapid Restore program from LCCM 3.0 and earlier versions, comes with RDM (unchanged from LCCM 3.0).

## rdagent.exe

The rdagent utility is used on target systems to which images are deployed. It is used for communication with RDM Deployment Server. It typically is run by RDM files, such as autoexec.bat, to loop through and run the task commands. It also is used by batch files or command-list files to display messages in the task execution history.

### Syntax

The rdagent utility uses the following syntax:

```
rdagent /r [/d] | /g=File | /L Message | /e | /FS
```

where

- /r specifies that rdagent requests work from RDM Server.
- /d is an optional parameter that specifies that detailed information that might be helpful for program debugging is displayed.
- /g=File specifies that rdagent requests work from RDM Server. The work is saved to the specified file. File is the fully qualified name of the file. If the file name contains spaces, enclose it in quotation marks ("").
- /L Message specifies that rdagent sends the specified message to RDM Server; it then is written to the IBM Director task log. Message is a string. If the string includes spaces, enclose the string in quotation marks (""). To view the message in the IBM Director task log, set the detail level to high.
- /e sets the local default environment variables.
- /FS forces the target system to shut down.

### Messages

The following informational messages might be displayed on the system monitor.

```
RDAGENT Contacting server ... (N)  
RDAGENT Notifying server ... (N)  
RDAGENT Received shutdown command.  
RDAGENT Received reboot command.  
RDAGENT Received command file.  
RDAGENT Received set env command.  
RDAGENT Received ack  
RDAGENT Received nack
```

where N is an integer that specifies the number of times rdagent has attempted to contact or notify RDM Server.

The following error or warning messages might be displayed on the system monitor.

```
RDAGEN001E Error parsing arguments
RDAGEN002E File not found: %s
RDAGEN003E Sending invalid opcode (%04xh)
RDAGEN004E Failed to open file to write: %s
RDAGEN005E PXE interrupt 1A failed or bad PXE struct
RDAGEN006E Failed to get communication info
RDAGEN007E Failed to get DHCP packet\n
RDAGEN008E Failed to bind with IP stack, RC=%04xh
RDAGEN009E Error setting filter, RC: %04xh
RDAGEN010E Transmit Error, RC=%04xh
RDAGEN011E No buffers available
RDAGEN012E Failed to unbind from IP stack, RC=%04xh
RDAGEN013E Receive invalid message type
RDAGEN014E Receive invalid work type
RDAGEN015W Receive invalid work option
RDAGEN016E No response from server.
RDAGEN017E SETENV data has wrong format
RDAGEN020E Socket open error
RDAGEN021E Socket bind error
RDAGEN022E Socket connect error
RDAGEN023E Socket select error
RDAGEN024E Socket send error
RDAGEN025E Socket recv error
RDAGEN026E Socket setsockopt error
RDAGEN027E Init Socket DLL error
RDAGEN028E Syntax/Usage error.
RDAGEN029E Force shutdown due to an error in batch file.
```

## redirect.exe

The redirect utility redirects stderr output to the same destination as the stdout output. As stdout output is directed to a specified file, the redirect utility also sends the stderr output to that file.

### Syntax

The redirect utility uses the following syntax:

```
redirect executable >destfile
```

where *executable* is a DOS command or executable file name (whose stderr output is being redirected), and *destfile* is the specified destination file for both the stderr and stdout output.

### Example of using the redirect utility

Issuing the following command redirects all stderr and stdout output to the file raidcstm.log.

```
redirect raidcustom.bat >raidcstm.log
```

## scan.exe

The scan utility collects hardware information about the system to which images are being deployed. It runs in DOS.

The scan utility generates the following text output:

```
System Scan v1.0 (RDM v4.30)
```

The scan utility generates the following messages.

```
RDSCAN000I Scan succeeded.
RDSCAN001E Failed to set locale.
RDSCAN002E Memory allocation failed
RDSCAN003E Failed to open file for output
RDSCAN004E Non-IBM system detected
RDSCAN005I Default scan running
RDSCAN006E Invalid input data file format
RDSCAN007E Failed to retrieve system info
RDSCAN008E Failed to retrieve Bios info
RDSCAN009E Failed to retrieve ECU info
RDSCAN010E Failed to retrieve processor info
RDSCAN011E Failed to retrieve memory info
RDSCAN012E Failed to retrieve hard disk info
RDSCAN013E Failed to retrieve PCI info
RDSCAN014E Failed to retrieve nic info
RDSCAN015E Failed to retrieve Raid info
RDSCAN020E Failed to update AID (input might be too large).
RDSCAN021E General scan error
RDSCAN022I Detected same BIOS version
RDSCAN023I Detected different BIOS version
```

## scrub3.exe

The scrub3 utility is used by the Secure Data Disposal task. It runs in DOS and permanently erases all of the data on one or more drives.

**Attention:** Because this utility erases data from disks, use caution when running scrub3.exe, whether from a bootable diskette or from an RDM task. You cannot recover data if you make a mistake.

You can use the scrub3.exe utility to erase data from the following types of drives:

- A Fibre Channel drive that is the boot drive
- Physical drives that are not connected to a RAID controller
- RAID logical drives

**Attention:** The scrub3 utility is only going to erase data from the portion of the RAID drives that is part of the logical drive.

You cannot use the scrub3 utility to erase data from the following drives:

- Physical drives attached to a RAID controller that are not configured as logical drives
- A Fibre Channel drive that is not the boot drive

### Syntax

The scrub3 utility uses the following syntax:

```
scrub3 [/?] | [[/q=no] [/s=no] {/d=drive|/d=all} {/L=level|/w=writes} [b=no]]
```

The following table contains information about scrub3 parameters.

**Note:** You can use a colon (:) instead of equal sign (=) when specifying any SCRUB3.EXE parameter. For example, /d=all and /d:a11 are equivalent.

Table 41. scrub3 parameters

| Parameter  | What it does  |
|--|---|
| /q=no  | Displays the maximum number of messages. It is intended for “in the field” debugging only. Do not use this parameter unless it is necessary. If you use this parameter, use it in the leftmost position in the command.   |
| /s=no  | Specifies that the scrub signature is not to be written to the disks that are being erased.   |
| /b=no  | Causes the program not to check whether its boot drive is C: or higher. It overrides the default, which is not to allow scrub3.exe to run when the boot drive is any drive other than A: or B:. It is useful when you want to run from a bootable CD or a bootable service partition. |
| /d= <i>drive</i><br>where <i>drive</i> is the drive number<br>of the drive that is to be erased.<br>/d=a11 | Erases only the installed drive ( <i>drive</i> ) on the system or erases all drives. The /d parameter is required and has no default value.   |

Table 41. scrub3 parameters (continued)

| Parameter   | What it does  |
|---|---|
| <p><i>/L=level</i></p> <p>where <i>level</i> is a number (1, 2, 3, or 4) that specifies the security level of the disposal operation.</p> | <p><b>/L=1</b> Limited security. The first 63 sectors on the drive (including the master boot record), the last two sectors on the drive, and the first 100 sectors on each partition are overwritten with a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with this pattern). This operation is very fast. The drive will not be usable through standard I/O methods. However, this operation is not secure: it leaves most of the partitions on the drive unchanged.</p> <p><b>/L=2</b> Medium security. All sectors on the drive are overwritten one time with a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with this pattern). This operation is relatively slow and involves many write operations. Actual speed depends on the size and speed of the target drives.</p> <p><b>/L=3</b> DOD-compliant security. All sectors on the drive are overwritten four times with the following patterns (in this order): a random pattern, the bit-wise complement of that random pattern, a different random pattern, and a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with these patterns). This operation is quite slow, and it takes four times as long as an /l=2 operation.</p> <p><b>/L=4</b> DOD-compliant security. All sectors on the drive are overwritten seven times with the following patterns (in this order): a random pattern, the bit-wise complement of that random pattern (three times, each with a different random pattern), and a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with these patterns). This operation is quite slow, and it takes seven times as long as an /l=2 operation.</p> <p>You are required to provide a value for either the /l parameter or the /w parameter. The /l parameter has no default value.</p> |
| <p><i>/w=writes</i></p> <p>where <i>writes</i> is an integer greater than 1 and less than 100.</p>  | <p>Specifies the number of times (<i>writes</i>) that each sector is overwritten with a random pattern plus a final write with a 0x0000 pattern. Either the /w parameter or the /L parameter is required. The /w parameter has no default value.</p>  |
| <p><i>/?</i></p>  | <p>Displays a description of the syntax that is used for the scrub3 utility. If you run scrub3.exe with no parameters, the same output is displayed. The /? parameter causes all other parameters to be ignored.</p>  |

### Examples of using the scrub3 utility

The following table contains examples of using the scrub3 utility.

Table 42. Examples of using the scrub3 utility

| Example                | What it does  |
|------------------------|---|
| scrub3 /L=1 /D=ALL     | Overwrites the master boot record, the first 100 sectors of each partition, and the last two sectors on each drive in the system. The pattern used for the write operation is 0x0000. None of the data on any of the drives can be accessed with standard methods. However, most of the data on these drives can be read successfully by a program that uses low-level BIOS read functions.   |
| scrub3 /q=no /d=2 /L=2 | Overwrites each sector on drive 2 with a pattern of 0x0000. None of the other drives in the system is changed. Debugging messages are displayed in the command window (that is, on stdout), along with all the standard messages that this program produces.  |
| scrub3 /d=all /L=3     | Overwrites each byte on each sector of each drive in the system four times. None of the data on any of the drives is recoverable. This is not the normal way to run scrub3.exe. It takes an extremely long time to run. However, overwriting four times provides good protection from attempts to recover data with specialized sensitive electronic equipment.   |
| scrub3 /d=all /L=2     | <p>Uses an 0x00 pattern to overwrite each byte on each sector of each drive in the system. None of the data on any of the drives is recoverable. This example is the typical way to run scrub3.exe.</p> <p>The drives are modified according to the parameters that the user specified on the command line. By default (you can override with the <b>/s=no</b> command-line parameter), a small partition is created on each scrubbed disk. It contains a brief summary of the scrub3.exe processing that was done. If you boot the system to this partition, the summary is displayed on the system's monitor. The signature can include:</p> <ul style="list-style-type: none"> <li>• The utility and version used</li> <li>• Command executed</li> <li>• Date and time of execution</li> <li>• Return code(s)</li> </ul> |
| scrub3 /d=1 /w=3       | Overwrites each sector of the first drive 3 times. The first and second overwrites are with repeating random 2-byte patterns; the final overwrite is with all 0x00s. Lastly, it creates the scrub signature partition.  |

The following figures show an example of scrub3 output and a scrub3 signature.

```

IBM Secure Data Disposal Utility v2.0 <RDM v4.20>
Licensed Materials - Property of IBM
(C) Copyright IBM Corp. 1999, 2004 All Rights Reserved.

RDMCM003I Execution started at: Friday, July 02, 2004 14:56:35

Number of (physical or RAID logical) drives found: 2

Processing drive 1
Overwriting each sector with repeating hexadecimal pattern: 0000
0%                               50%                               100%
-----
Friday, July 02, 2004 15:10:01 Elapsed time (minutes): 13.4

Processing drive 2
Overwriting each sector with repeating hexadecimal pattern: 0000
0%                               50%                               100%
-----
Friday, July 02, 2004 15:23:55 Elapsed time (minutes): 27.3

Writing signature on scrubbed drives.

Processing drive 1
Processing drive 2

IBM Secure Data Disposal Utility
Return code ..... 0
Execution Complete.

```

Figure 181. Example of scrub3.exe output

```

IBM Secure Data Disposal Utility 2.0
IBM Remote Deployment Manager 4.20
Date and time of execution ... 9/20/2004 00:24:45
Command executed ..... A:\SCRUB3.EXE /l=1 /d=all
Return code ..... 0

```

Figure 182. scrub3 signature

## scrub3 messages

The following table lists messages for the scrub3 utility.

Table 43.

| Code      | Message   |
|-----------|---|
| RDMDD001E | Buffer allocation of size " << iSize << " failed.   |
| RDMDD002E | Failure overwriting partition.  |
| RDMDD004E | Null pointer passed to internal function.   |
| RDMDD005E | Failure in Interrupt 13 function call.  |
| RDMDD006E | Failure reading sector " << ulSec. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)                          |
| RDMDD007E | Start sector plus number of sectors is too large.   |
| RDMDD008W | Failure initializing progress indicator.  |
| RDMDD009E | Unable to allocate buffer for disk write.   |
| RDMDD010E | Cannot write sector at LBA " << szSec << "; error code is " (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.) |
| RDMDD011W | Failure displaying progress indicator.  |
| RDMDD012E | This program must be run after booting from an A: or B: drive.  |
| RDMDD013I | Boot drive number (1=a:, 2=b:, ...):  |

Table 43. (continued)

| Code      | Message  |
|-----------|--|
| RDMDD014E | Error from BIOS call.  |
| RDMDD017I | Command-line parameter.  |
| RDMDD018E | Invalid command-line parameter. (Correct the error and run the program again.)   |
| RDMDD019I | Hard drive to be erased.   |
| RDMDD020I | Total sectors on hard drive:   |
| RDMDD021E | Required parameter missing: (Correct the error and run the program again.)   |
| RDMDD039E | Failure creating MBR object.   |
| RDMDD040E | Failure creating SCRUBB_DISK object.   |
| RDMDD041E | Bad return code from pCurrentDisk->IsValid   |
| RDMDD042E | Failure creating array of SCRUBB_DISK objects.   |
| RDMDD043E | Error in level-1 disk writing. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)                           |
| RDMDD044E | Failure reading hard drive; terminating erase operation. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.) |
| RDMDD045E | Target drive is not a local, physical drive.   |
| RDMCM901E | Unable to write to disk drive. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)                           |
| RDMCM902E | The BIOS call to get physical drive parameters was not successful.   |
| RDMCM903E | DOS error number: (Look up the DOS error in the DOS documentation and debug the problem.)  |
| RDMCM904E | Number of read errors: (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)                                   |
| RDMCM905E | Number of write errors: (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)                                  |
| RDMCM906E | Unable to write to disk drive. Error code: (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)               |
| RDMCM999E | Internal error in function " << szFunc << "; file name is " << szFile << "; line number is " << szLine << ".   |
| RDMCM001I | Null return code from setlocale function call.   |
| RDMCM002I | Locale used by this program:   |
| RDMCM003I | Execution started at:  |
| RDMCM004I | Execution completed at:  |
| RDMCM005W | Time functions not working on this system.   |
| RDMCM017I | Command-line parameter:  |
| RDMCM023E | Error in command-line parameter: (Correct the error and run the program again.)  |
| RDMCM011E | Return code from int86x function:  |

## sleep.exe

You can use the sleep utility to halt processing for a specified number of seconds.

The sleep utility uses the following syntax:

```
sleep seconds
```

where *seconds* is the number of seconds that processing is to be halted.

## treboot.exe

You can use this utility to restart the system.

The treboot utility uses the following syntax:

```
treboot
```

## tshudwn.exe

You can use the tshudwn utility to shut down the system.

The tshudwn utility uses the following syntax:

```
tshudwn
```

## unpackux.exe

You can use this utility to expand the drivers packaged on an UpdateXpress CD for use by RDM. It is located in the \rdm\bin directory.

Unpackux.exe uses the following syntax:

```
UnpackUX.exe source_drive:\ destination_directory [/v]
```

where:

*source\_drive*

is the source drive where the UpdateXpress CD is located.

*destination\_directory*

is the destination directory to which the files will be unpacked.

**/v** specifies the verbose mode. This parameter is optional.

**Note:** UnpackUX.exe works only on Windows operating systems.

## unzip.exe

You can use this utility to unzip a ZIP file.

The unzip utility uses the following syntax:

```
unzip file
```

where *file* is the name of the file that you want to unzip. To see a full list of all unzip parameters, type the following command from a command prompt: `unzip -?`

---

## Symantec utilities

RDM uses the following Symantec utilities:

- pqaccd.exe
- pqimgctr.exe
- pqquery.exe

For more information about the Symantec utilities, see the *Symantec Deploy Toolkit 2.6 User's Guide*, located in one of the following directories if you installed RDM in the default location:

---

|                    |                               |
|--------------------|-------------------------------|
| <b>For Linux</b>   | /opt/IBM/RDM/docs             |
| <b>For Windows</b> | d:\Program Files\IBM\RDM\docs |

---

where *d* is the drive letter of the hard disk.

Further information is also available at <http://www.symantec.com>.

### pqaccd.exe

You can use the pqaccd utility to perform basic file operations (such as dir and copy) on drives and partitions that are not normally visible to DOS. RDM uses this utility to copy modified files (for example, the setup.inf file) to a folder on a system that has received a cloned Windows or Linux image. That file directs the mini-installation process that customizes the installation for a user.

### pqimgctr.exe

You can use the pqimgctr utility to create image files or to back up one or more partitions. This utility is used by the Windows Clone Install task, the Linux Clone Install task, the Get Donor task, the Put Donor task, and the Power Restore task.

### pqquery.exe

The pqquery utility is a DOS/Windows command line program that returns disk and partition information in environment variables. It is used by cloning tasks to retrieve partition and disk information.



## Chapter 26. Solving RDM problems

This table lists some of the RDM problem symptoms and suggested actions. Additional solutions to RDM problems are documented in the RDM White Papers on the IBM Web site. For information about how to access RDM resources on the IBM Web site, see “Getting help and information from the World Wide Web” on page 374.

Table 44. Solving RDM problems

| Symptom   | Suggested Action  |
|---|---|
| Qualification error stating the data is not available   | <p>If an error in qualification reports that data is not available in a native managed object (NMO), the database might not be populated. This can occur in the following situations:</p> <ol style="list-style-type: none"> <li>1. Perform an IBM Director Discovery which will create new NMOs.</li> <li>2. Drag one of the NMOs to an RDM task and click <b>Run systems</b>.</li> </ol> <p>Because the IBM Director database update is still in progress (in the background), the error occurs. Typically, wait a short time (30 to 60 seconds) before using a new NMO for an RDM task.</p>  |
| Disk reading or writing errors  | <p>Sometimes hard-disk or RAID-adapter manufacturers provide firmware updates to correct reported problems. You should check the Web sites of your system, RAID adapter, and disk manufacturers to see if an update is available.</p> <p>In some cases, you can create an RDM Custom task to deploy the firmware update, depending on the particular update program capabilities and memory-usage constraints.</p>  |
| You do not know what level of RDM that you are running  | <p>In IBM Director Console, click <b>Help → Product Information</b>. The IBM Director Product Information window opens. Scroll down to IBM Remote Deployment Manager. The product version and build number are listed in the Version column.</p>  |
| Target systems do not wake up   | <p>RDM powers on a target system using one of the following methods:</p> <ul style="list-style-type: none"> <li>• Sending a packet to the MAC address of the target system, using a subnet-directed broadcast.</li> <li>• Using the IBM Director Management Processor Assistant task to communicate with a service processor or the BladeCenter Assistant task to communicate with a management module. The target system hardware must support this functionality.</li> </ul> <p>If this problem occurs on all target systems, configure the network to forward subnet-directed broadcast packets on all routers between the RDM D-Server to the target system.</p> <p>If this problem occurs on one target system only, the system might have been improperly shutdown. Disconnect the power cables from the system and reconnect them.</p> |
| <p>If a target system is connected to a port that has the filtering and drop all options turned on, the following errors might occur:</p> <p>RDBOOT019E UDP write Failed<br/>RDBOOT007E No Response from server</p> | <p>The filtering and drop all options introduce delays into the Address Resolution Protocol (ARP) process on a switch.</p> <p>If these errors occur, do not use any options that introduce delays into the ARP process.</p>   |

Table 44. Solving RDM problems (continued)

| Symptom   | Suggested Action   |
|---|--|
| Cannot change RAID configuration.   | <p>If you try to change your RAID configuration with any RAID Clone or RAID Custom task and receive the message, "You cannot change the configuration. A rebuild, logical drive migration, RAID compression/decompression or RAID-5EE compaction/expansion is in progress.", the following workarounds are available:</p> <ol style="list-style-type: none"> <li>1. If you have physical access to the system, type Ctrl+I to restore the factory-default settings.</li> <li>2. If you have physical access to the system, pull another one of the drives in the array being compressed, rebuilt, or migrated.</li> <li>3. Use ipssendl to set one of the drives in the array as dead, either by running ipssendl at the system or creating an RDM custom task and running it remotely.</li> <li>4. Wait until the compression, migration, or rebuild has completed, and then rerun the Express task.</li> </ol> |
| (Linux only) When creating a system firmware image, the USB floppy drive is not mounted.  | <p>Make sure the mtools package is installed on the system that you are using. Also, make sure that the mdir command can list the contents of the drive. For information on installing and configuring mtools, see the documentation that came with your Linux distribution.</p>   |
| Installation of IBM Boot Manager was interrupted, and the system cannot restart.  | <p>If the installation of IBM Boot Manager on a local system is interrupted, it might leave the computer in a non-startable state. Complete the following steps to repair the computer:</p> <ol style="list-style-type: none"> <li>1. Start the PC with a DOS boot diskette.</li> <li>2. Replace the DOS boot diskette with the IBM Boot Manager Installation diskette.</li> <li>3. From the DOS prompt, run the following commands:<br/>HIDEPART A U HIDEPART L H</li> <li>4. Remove the IBM Boot Manager Installation diskette and restart the PC.</li> </ol>  |
| Installation of Power Restore was interrupted, and the system cannot restart.   | <p>If the installation of Power Restore on a local system is interrupted, it might leave the computer in a non-startable state. Follow these steps to repair the computer:</p> <ol style="list-style-type: none"> <li>1. Start the PC with a DOS boot diskette.</li> <li>2. Replace the DOS boot diskette with the Power Restore Installation diskette.</li> <li>3. From the DOS prompt, run the following commands:<br/>HIDEPART A U HIDEPART L H</li> <li>4. Remove the Power Restore Installation diskette and restart the PC.</li> </ol>   |
| Error exporting systems.  | <p>If you export a systems database, and use spaces in the file name or path name, you will get an error message. RDM does not allow the use of spaces. Try again without spaces.</p>  |
| <p>If you edit the following files in a Linux text editor, the new line characters are not present.</p> <p><b>Note:</b> If you open a file in Notepad on the Windows operating system, all of the text in a file is displayed on one line.</p> <ul style="list-style-type: none"> <li>• Files that are zipped into a DOS image using mkimages.bat</li> <li>• Files that are transferred to the target system using mftfp in DOS mode</li> </ul> | <p>After editing a file using a Linux text editor, use the unix2dos program to add the new line characters to the file.</p>  |

Table 44. Solving RDM problems (continued)

| Symptom  | Suggested Action  |
|--|---|
| <p>Invalid product ID error is displayed on the target system when you run a Windows Native Install task against it.</p> | <p>This error might occur when you have changed the product key that is saved to the Windows Native Install task but have not cleared the STC information for the target system, which contains an value for the product key that is not valid.</p> <p>When a task is initially configured for a specific target system, the STC values are permanently saved to RDM and are used each time that task is run against that system. RDM continues to use the saved STC values until you change them. You cannot change these by modifying the default values that are used by the task or the template. To change the values for the target system you must either clear the values by using the Unconfigure System option or edit them in the STC window.</p> <p>Complete the following steps to unconfigure the target system for the task and run the task:</p> <ol style="list-style-type: none"> <li>1. Drag the Windows Native Install task onto the target system, and then click <b>Configure systems</b>.</li> <li>2. In the STC window, right-click on the target system, and then click <b>Unconfigure System</b>. The STC data for the selected task is deleted from the RDM database.</li> <li>3. Close the STC window.</li> <li>4. Drag the Windows Native Install task onto the target system, and then click <b>Run</b>.</li> </ol> |
| <p>The RDM task is no longer displayed in the IBM Director Console Tasks pane.</p>                                       | <p>IBM Director Server was reset without reinstalling RDM. See “Resetting IBM Director Server” on page 339 for more information.</p>  |
| <p>The RDM Bootstrap Loader does not run, and you receive a PXE-E55 error.</p>   | <p>The RDM D-Server might be configured incorrectly. This could happen if you change the IP address of your RDM D-Server without reconfiguring the D-Server. You must configure the D-Server.</p> <p>Open the D-Server Options window using the Director Console Tasks...Remote Deployment Manager...D-Server Options... menu. On the Connections page, make sure that the D-Server IP Address and Subnet Mask are correct. On the Subnets page, make sure that the Subnet IP and Subnet Mask fields are correct. Then click <b>OK</b> to exit.</p>   |
| <p>The RDM Bootstrap Loader does not run and you receive a PXE-E74 error.</p>  | <p>This error is the result a known conflict between Broadcom network adapters and DHCP option 43, Vendor Specific Information. Check to see if you have option 43, Vendor Specific Information, configured.</p> <p>You should remove option 43 and run a test to see if it resolves this problem. If it does, you should determine why you have option 43 configured, and whether or not it is possible to remove that option permanently. If it is not possible to remove that option, then you will not be able to use RDM to manage or deploy systems with Broadcom network adapters on that subnet.</p>  |

Table 44. Solving RDM problems (continued)

| Symptom  | Suggested Action   |
|--|--|
| <p>The target system does not get a DHCP IP address and you receive a PXE-E53 error.</p> | <p>This is usually caused by a network problem. Some possible causes are:</p> <ul style="list-style-type: none"> <li>• The network connection between the DHCP server and the target system may be physically disconnected.                     <p>For example, when the BladeCenter Cisco IGESM is not configured properly for RDM use. In the default configuration of the switch, the external ports are all set to trunk the VLANs out to an upstream CISCO switch. If you plug a network device configured as your RDM server directly into one of the external ports the port will automatically switch to an access port and put itself in VLAN 1. Because the other blades are in VLAN 2 by default, the blades are unable to connect to your external device.</p> <p>The solution to this problem is to update the IGESM firmware to the latest level (e.g., version AY4 or later).</p> <p>The firmware is available at: <a href="http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-58132">http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-58132</a>.</p> <p>The release notes are available at <a href="http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-58031">http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-58031</a></p> </li> <li>• The network adapter might be timing out the PXE process before the transaction completes.</li> <li>• The system may be on a subnet that is unknown to RDM. Access the D-Server options window via the Tasks, Remote Deployment Manager, and D-Server Options... menus in the RDM console. Select <b>Add Subnet...</b> button and configure the new subnet.</li> <li>• There might be conflicting DHCP servers on the network. For example, if subnet A is served by a DHCP server that is on the RDM D-Server, and subnet B is served by another DHCP server, then systems on subnet B will never get a PXE IP address. To resolve the problem, remove one of the DHCP servers from the configuration and configure the other DHCP server to serve both subnets.                     <p><b>Note:</b> If you remove the DHCP server from the RDM D-Server, then you must also change the line LocalDhcpServer=yes to LocalDhcpServer=no in the C:\Program Files\IBM\RDM\local\DSERVER.INI file. Then reboot your server.</p> </li> <li>• BOOTP/DHCP forwarding might not be configured properly on your network. For RDM to work properly, you must enable BOOTP/DHCP forwarding on the path from every RDM target system to both the DHCP server and the RDM Deployment Server. For example, if your target systems can get a DHCP IP address when they are running Windows or Linux, but they cannot get a DHCP IP address when they do a PXE network boot, it usually means that you have not configured BOOTP/DHCP forwarding to your RDM Deployment Server.                     <p><b>Note:</b> If you use Cisco switches, configuring BOOTP/DHCP forwarding is equivalent to configuring an IP helper address.</p> </li> <li>• Spanning Tree Protocol might be enabled on switch ports to which target systems are cabled. The following intermittent failures are symptomatic of this problem:                     <ul style="list-style-type: none"> <li>– Network adapters time out before getting an IP address</li> <li>– TFTP commands time out</li> </ul> </li> </ul> |

---

## Resetting IBM Director Server

**Attention:** The following procedure removes all IBM Director and RDM data. The procedure cannot be undone.

The `twgreset` command resets the following features of IBM Director Server:

- Persistent storage
- The database tables

Use this command only if the persistent data or the database tables have been corrupted. Complete the following steps to reset IBM Director Server:

1. On the RDM server, type the following commands:  

```
net stop twgipc
twgreset
```
2. Type the following command to stop the RDM D-Server:  

```
net stop dserver
```
3. Delete the `\Program Files\IBM\Director\database\RDM` directory.
4. Type the following command to restart the IBM Director Server:  

```
net start twgipc
```
5. Type the following command to restart the RDM D-Server:  

```
net start dserver
```
6. On each remote deployment server, type the following commands:  

```
net stop dserver
net start dserver
```
7. On each remote deployment server, enable RDM Deployment Server with the user interface.

---

## Fibre channel multipathing considerations

High availability fibre channel installations typically present multiple paths from a fibre HBA to a storage server. In normal operation, these paths are managed by the operating system's device drivers. During installation tasks however, these drivers are not yet installed, which will cause the installation to fail. This problem exists whether you use RDM for installation tasks or not. Under ordinary circumstances you would have to physically remove all but one of the paths between the HBA and the server prior to the operating system installation.

Under certain circumstances, however, RDM 4.30 can correct the problem logically by modifying the switch zones to logically remove all but one path between the RDM client and the storage server using the `IsolateServerIfFibre` command from the Command List. After the installation, RDM will restore the original zone paths using the `UnisolateServerIfFibre` command.

For RDM to perform this task automatically, the following conditions must exist:

1. The storage server must be a FASTT device.
2. You must have entered your BladeCenter Fibre switches and FASTT storage servers using the RDM Network Storage tool.
3. Zoning must be enabled in your switches.



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## Part 5. Appendixes



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## Appendix A. Additional cloning procedures using Sysprep

This appendix provides information for using the Sysprep utilities to prepare a donor system before you run the Get Donor task. Before performing any of the steps in this chapter, make sure you also read the *Microsoft Windows Corporate Deployment Tools User's Guide* (Deploy.chm).

Running Sysprep on a donor system accomplishes the following tasks:

- Generates unique security identifiers (SIDs) when the donor image is distributed to a target system.
- Runs the Windows Mini-Setup wizard the first time that the target system is started. The Mini-Setup wizard is a subset of the Windows Setup process; it provides prompts for user-specific information, configures operating-system settings, and detects new hardware. You can automate the Mini-Setup wizard by including an answer file (sysprep.inf) in the directory where the Sysprep utilities are located. By default, the directory is *d:\sysprep*, where *d* is the drive letter of the hard disk drive.

---

### RDM-supported options in Sysprep version 2.0

RDM supports the following features in Sysprep version 2.0 or later:

#### Mass storage support

The `-bmsd` parameter and [BuildMassStorageSection] section in the `sysprep.inf` file instructs Sysprep to build a list of device drivers for mass storage controllers. This eliminates the need to manually edit the `sysprep.inf` file as outlined in the Sysprep version 1.1 documentation.

**Note:** The version of Sysprep that comes with Windows XP does not support the `-bmsd` parameter. You can, however, run the version of Sysprep that comes with Windows Server 2003 on a Windows XP installation, and use this new parameter.

#### Factory mode

The `-factory` parameter prepares a donor system that will start in a network-enabled state *before* the Windows Mini-Setup wizard runs. This enables you to update device drivers, run Plug and Play enumeration, install applications, or make configuration changes before the target system is delivered to the end user. The `winbom.ini` file is the answer file for the factory-mode process.

#### Reseal support

The `-reseal` parameter clears the event viewer logs and prepares the target system for delivery to the end user. You must use the `-reseal` parameter after you perform tasks in factory mode.

**Clean** The `-clean` parameter removes unused mass storage device drivers and phantom Plug and Play device drivers from the Windows registry and device manager. This parameter is usually called from the `cmdlines.txt` (`pqcmdln.txt` in RDM) file.

Sysprep version 2.0 is supported on Windows XP and Windows Server 2003 only. If the donor system is running Windows 2000, you must use Sysprep version 1.x.

#### Notes:

1. Sysprep version 1.x does not support Factory mode.

2. Sysprep version 1.x does support Mass storage support, but does not support the `-bmsd` parameter or the `[BuildMassStorageSection]` section in the `sysprep.inf` file.

---

## Using Sysprep version 2.0 in factory mode

This section describes how to use factory mode in Sysprep version 2.0 with RDM 4.30. You can use Sysprep in factory mode to add device drivers or applications, run custom commands, and customize INI files for an image before running the Sysprep Mini-Setup wizard.

Complete the following steps to create a Windows Clone Install task that uses a donor image created using Sysprep factory mode.

1. Create a donor system:
  - a. Install the operating system and applications on the donor system.
  - b. Create a directory on the donor system to contain the Sysprep files from the `deploy.cab` file on the Microsoft Windows CD.
  - c. (Optional) Copy Plug and Play driver files to the donor system. See “Adding Plug and Play drivers to a Windows Clone Install task” on page 345 for more information.
  - d. (Optional) Copy application files to the donor system. See “Adding applications to a Windows Clone Install task” on page 346 for more information.
  - e. (Optional) Configure and copy base configuration files to the donor system:
    - 1) Copy `oobeinfo.ini` to the `%windir%\system32\oobe` directory.
    - 2) Copy `oeminfo.ini` to the `%windir%\system32` directory.
    - 3) Copy `ocm.txt` to the location where the `sysprep.inf` `[GuiRunOnce]` command will call `sysocmgr` (typically `c:\ocm.txt`).
  - f. Run Sysprep in Factory mode on the donor system to prepare the system to start (boot) in a factory session. During a factory session, you can add device drivers and applications before using the Mini-Setup wizard. When the operation is completed, Sysprep shuts down the donor system.
2. Run a Get Donor task on the donor system to create an image of the system boot partition. Make sure to select Sysprep type **Factory** in the Get Donor System Task Configuration window.
3. Create a Windows Clone Install task that uses the new image you just created; then, complete the following optional steps as required:
  - a. (Optional) Create custom task parameters to use with the `winbom.ini` file:
    - 1) Right-click the new Windows Clone Install task and click **Edit task**. The task notebook opens.
    - 2) Click the **Advanced** tab. The Advanced page is displayed.
    - 3) Select the **User Parameter** option in the Category pane.
    - 4) Click **Select** in the right pane. You can use an existing parameter or create a new task parameter.
    - 5) Select the **Show in STC** check box; then, click **OK** to add the task parameter to the task.
  - b. (Optional) Go to the task folder of the new Windows Clone Install task that you created and edit the `winbom.ini` file to add device driver and application deployment information:
    - Map Plug and Play driver paths to the `winbom.ini` answer file
    - Map application configuration paths and commands to `winbom.ini`

- Configure other configuration files, as required, using winbom.ini and the Sysprep 2.0 documentation
  - Add RDM parameters to the winbom.ini file, as applicable. For example, for the Autologon task parameter you might add the following value:  
AutoLogon=%AutoLogon%
4. Configure a set of systems for the new Windows Clone Install task. Provide applicable values in the System Task Configuration window for system-unique parameters:
    - a. Drag the systems to the task; then, select the task.
    - b. Make sure that all user parameters are properly configured.
  5. Run the Windows Clone Install task on the set of systems.

After the Windows Clone Install task deploys the PQI image to the target system, the system starts in factory mode and performs the installation and configuration tasks that are specified in the winbom.ini file.

**Attention:** You can interfere with the expected operation of an unattended Windows Clone Install task in factory mode if the winbom.ini file is not configured correctly. Verify the following settings:

- Autologon must be correct
- ResealMode must be correct (for example, ResealMode=Mini)
- Reseal option must be correct (for example, Reseal=Reboot)

For information about configuring the winbom.ini file, see the *Microsoft Windows Corporate Deployment Tools User's Guide* (Deploy.chm).

## Adding Plug and Play drivers to a Windows Clone Install task

Complete the following steps to add Plug and Play drivers to a Windows Clone Install task.

1. Create a directory for each Plug and Play driver on the donor system.

**Note:** By default, the root directory for driver directories is *d:\drv*, where *d* is the drive letter of the hard disk drive. Each driver is put in its own directory derived from that root.

2. Copy all required files (for example, DLL, CAT, INF, SYS, and INI files) for each Plug and Play driver to the applicable directory.

**Note:** If the device driver installation uses EXE files, you must add the applicable information to the [GuiRunOnce] section of the sysprep.inf file and the [OEMRunOnce] section of the winbom.ini file.

3. Run Sysprep in either reseal or factory mode.

**Notes:**

- a. For reseal mode, use the -pnp option on the command line. If you are running Sysprep version 2.0, you can select the -pnp option from the Sysprep graphical user interface.
  - b. For factory mode, select **Factory Mode** and the **PnP** check box.
4. Run the built-in Get Donor task provided by RDM to capture the donor image. If you ran Sysprep in reseal mode, go to step 5. If you ran Sysprep in factory mode, go to step 6 on page 346.
  5. Configure the answer file for reseal mode and deploy the image:
    - a. Create a Windows Clone Install task, using the image created in step 4.

- b. Right-click the new Windows Clone Install task; then, click **Edit Task**. The task notebook opens.
- c. Click the **Advanced** tab. The Advanced page is displayed.
- d. Select **Task Folder** to view the location of the task folder in the main pane.
- e. Click **OK**.
- f. Navigate to the task folder for the new task, and open the answer2.txt file in an ASCII text editor.
- g. Uncomment or add the following line in the Unattended section of the answer2.txt file:
 

```
OemPnPDriversPath
```

Then, add the path to each Plug and Play driver on the donor system to this line. For example:

```
OemPnPDriversPath=drv\net;drv\video
```

**Note:** Windows automatically adds %Systemroot% to each path.

- h. Save and close the answer2.txt file.
  - i. Run the Windows Clone Install task on the client systems. The Plug and Play drivers are installed by the Windows Mini-Setup wizard.
6. Configure the answer file for factory mode and deploy the image:
    - a. Create a Windows Clone Install task using the image created in step 4 on page 345.
    - b. Right-click the new Windows Clone Install task; then, click **Edit Task**. The task notebook opens.
    - c. Select the **Advanced** tab. The Advanced page is displayed.
    - d. Select **Task Folder** to view the location of the task folder in the main pane.
    - e. Click **OK**.
    - f. Navigate to the task folder for the new task and open the winbom.ini file in an ASCII text editor.
    - g. Uncomment or add the following line in the PnPDriverUpdate section of the winbom.ini file:
 

```
DevicePath
```

Then, add the path to each Plug and Play driver on the donor system to this line. For example:

```
DevicePath=net; video
```

**Note:** The path indicated by the TargetRoot parameter is added automatically to each path. Make sure that the combination of TargetRoot and DevicePath settings map to the correct directory on the donor image (for example, TargetRoot=c:\drv).

- h. Save and close the winbom.ini file.
- i. Run the Windows Clone Install task on the client systems. The Plug and Play drivers are installed during the Windows factory session.

## Adding applications to a Windows Clone Install task

For information about adding applications to a Windows Clone Install task, see the RDM white paper: *Using RDM to Deploy Applications and Windows* at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-53487>.

---

## Supporting multiple mass storage devices

This section describes how to configure `sysprep.inf` to include support for more than one mass storage device. This procedure enables RDM to deploy a common image to client systems that have different types of mass storage devices.

The procedures in this section are written as if all mass storage devices used in the deployment process have been connected to the donor system at some time, or Microsoft CAB files containing the device drivers are available. If a mass storage controller uses a different device driver than what is provided by Windows, you must follow the Sysprep documentation in order to include support for the controller.

### Preparing the donor system

Install the device driver for each mass storage device you must support on the donor system. This might require that you temporarily connect the mass storage device to the donor system. If more than one mass storage device uses the same device driver, you only have to connect one device to the donor system.

For information about configuring a `sysprep.inf` file, see the *Microsoft Windows Corporate Deployment Tools User's Guide* (Deploy.chm).

After preparing the donor system, go to the following applicable sections:

- Adding SysPrepMassStorage for Windows 2000 on page 347
- Adding SysPrepMassStorage for Windows XP and Windows Server 2003 on page 348
- Adding SysPrepMassStorage with the `-bmsd` parameter on page 349

### Adding SysPrepMassStorage for Windows 2000

Complete the following steps to add multiple mass storage device support for Windows 2000.

**Note:** This procedure requires Sysprep version 1.1, which you can obtain from the Microsoft Web site.

1. Extract the Sysprep files to any directory on the donor system (for example, `c:\sysprep_update`).
2. Change to the tools directory and run the `pnpids.exe` program on the folder that contains the INF files for your mass storage devices. For example:

```
pnpids.exe c:\winnt\inf\scsi.inf >scsi.txt
```

**Note:** If you do not specify an INF file, all INF files in the directory are processed. For example:

```
pnpids.exe c:\myInfs\ >myInfs.txt
```

Use the output file to merge with the `sysprep.inf` file later in this procedure. Some common INF files that are used to create hardware IDs are: `Machine.inf`, `Scsi.inf`, `Pnp SCSI.inf`, and `Mshdc.inf`.

3. Create a new text file named `sysprep.inf`.
4. Open this new `sysprep.inf` file and create a `[SysPrepMassStorage]` section.
5. Copy the output from the `pnpids.exe` program output file to the `sysprep.inf` file under the `[SysPrepMassStorage]` section. For example:

```
;Install IBM ServeRAID Adapter PCI\VEN_1014&DEV_002E="%systemroot%\inf\scsi.inf"
```

6. (Optional) Find the INF file in the %windir%\inf directory that corresponds to each mass storage device; then, reference the PCI\Vendor ID to the INF file in sysprep.inf.

For example, to install an IBM ServeRAID -5i controller on a system that was deployed with a donor image containing support for an IBM ServeRAID-4Mx controller, you must add the following text to the [SysPrepMassStorage] section of the sysprep.inf file:

```
;ServeRAID 5i controller  
PCI\VEN_1014&DEV_01BD&SUBSYS_02591014="C:\winnt\inf\oemscs01.inf"
```

**Note:** The INF file might have a different name, depending on the operating system and hardware configuration.

7. Save and close this new sysprep.inf file; then, copy the file to the same directory as the Sysprep program on the donor system.
8. Run Sysprep with the new sysprep.inf file on the donor system. Make sure that the system shuts down after Sysprep completes.
9. On the RDM server, uncomment the sysprep -clean command in the pqcmdln.txt file (located in the rdmpath\local\env\71c\custimg\ directory). Make sure that the path to the Sysprep program matches the path on the donor system.

**Note:** Installing an upgrade to RDM may overwrite customizations you have made to RDM batch or command files.

10. Run mkimages.bat from the RDMinstalldirRDMinstalldir\local\env directory.
11. Configure and run the Get Donor task on the donor system.

## Adding SysPrepMassStorage for Windows XP and Windows Server 2003

Complete the following steps to add multiple mass storage device support for Windows XP and Windows Server 2003.

**Note:** This procedure requires sysprep.exe and accompanying files from the support\deployment\deploy.cab directory on the Windows operating-system CD.

1. Extract files to any directory on the donor system (for example, c:\sysprep).
2. Create a new text file named sysprep.inf.
3. In the sysprep.inf file, create a [SysPrepMassStorage] section.
4. Create a [SysPrep] section and add the following line to this section:  
BuildMassStorageSection=Yes  
When you run Sysprep, Plug and Play information that is found in the following INF files is used to create hardware IDs: Machine.inf, Scsi.inf, Pnp SCSI.inf, and Mshdc.inf.
5. Save and close the sysprep.inf file; then, copy the file to the same directory as the Sysprep program on the donor system.
6. Run Sysprep in reseat mode with the new sysprep.inf file on the donor system. The [SysPrepMassStorage] section of the sysprep.inf file is updated automatically. Make sure that the system shuts down after Sysprep completes.
7. On the RDM server, uncomment the sysprep -clean command in the pqcmdln.txt file (located in the rdmpath\local\env\71c\custimg\ directory). Make sure that the path to the Sysprep program matches the path on the donor system.

8. Run mkimages.bat from the RDMinstalldir\local\env directory.
9. Configure and run the Get Donor task on the donor system.

## Adding SysPrepMassStorage with the -bmsd parameter

**Note:** This procedure requires sysprep.exe and accompanying files from the support\deployment\deploy.cab directory on the Windows operating-system CD.

For Windows XP, you must download the latest release of Sysprep version 2.0 from the Microsoft Web site.

Complete the following steps to add multiple mass storage device support with the -bmsd parameter:

1. Extract files to any directory on the donor system (for example, c:\sysprep).
2. Create a new text file named sysprep.inf that contains an empty [SysPrepMassStorage] section.
3. Save and close the sysprep.inf file; then, copy the file to the same directory as the Sysprep program on the donor system.
4. From a command prompt on the donor system, type the following command and press Enter:

```
sysprep.exe -bmsd
```

The [SysPrepMassStorage] section of the sysprep.inf file is updated automatically. You can delete any entries that are not required for your configuration.

5. Run Sysprep in reseal mode with the new sysprep.inf file on the donor system. The [SysPrepMassStorage] section of the sysprep.inf file is updated automatically. Make sure that the system shuts down after Sysprep completes.
6. On the RDM server, uncomment the sysprep -clean command in the pqcmdln.txt file (located in the rdmPath\local\env\71c\custimg\ directory). Make sure that the path to the Sysprep program matches the path on the donor system.
7. Run mkimages.bat from the RDMinstalldir\local\env directory.
8. Configure and run the Get Donor task on the donor system.

---

## Cloning systems that have IBM Director Agent installed

You can create a Windows Clone Install task that is based on a donor image created from a donor system on which IBM Director Agent is installed. However, to make sure that the IBM Director Agent files and registry entries are unique for each target system, you must create or modify specific files and save them to the Windows Clone Install task folder before running the task. Table 45 lists the files and what they do.

*Table 45. Files that are used by a Windows Clone Install task that deploys IBM Director Agent*

| File       | What it does   |
|------------|--|
| da-fix.bat | This batch file is run on the target system after Windows and IBM Director Agent is installed. It adjusts the Windows registry settings, configures the network driver for IBM Director Agent, and (if Web-based Access is installed) names the Web server daemon. Finally, it deletes the files that it has called. |
| diragt.bat | This batch file is called by the command list for the Windows Clone Install task; it copies the files from the RDM task folder to the target system.   |

Table 45. Files that are used by a Windows Clone Install task that deploys IBM Director Agent (continued)

| File         | What it does   |
|--------------|--|
| dirrest.reg  | This file is called by da-fix.bat; it modifies the Windows registry settings.  |
| diragent.rsp | This file is called by da-fix.bat; it configures the network driver for IBM Director Agent.  |
| httpd.conf   | (If Web-based Access is installed only) This file is called by da-fix.bat; it is renamed httpd.conf and saved to the managed system. |
| pqcmdln.txt  | This file calls the da-fix.bat file  |

Complete the following steps to create a Windows Clone Install task that deploys IBM Director Agent:

1. Select a donor system.

**Notes:**

- a. The donor system must be part of a workgroup; it cannot be part of a domain, a cluster services server, or a certificate services server.
  - b. Either the built-in administrator password must be blank or you must add the password to the answer2.txt file in the task folder for the Windows Clone Install task that you create in step 6 on page 351.
2. If necessary, install and configure applications on the donor system:
    - a. Log on to the donor system using an operating system account that has administrator privileges.
    - b. Install and configure any applications that you want the donor image to contain.
  3. If the donor system has Web-based Access installed, prepare Web-based Access for cloning:
    - a. Make sure that Web-based Access is initialized and running properly. For more information, see the IBM Director documentation.
    - b. Copy the httpd.conf file to a temporary location on the RDM server. If you installed IBM Director Agent in the default location, this file is located in the following directory:  
`d:\Program Files\IBM\Director\websrv\conf`  
  
 where *d* is the drive letter of the hard disk drive.

4. Run the Sysprep utility on the donor system:
  - a. Copy the sysprep.exe and setupcl.exe utilities to the donor system. These utilities are located in the support\deployment\deploy.cab directory on the Microsoft Windows CD. You can also download the CD from the Microsoft Web site at <http://www.microsoft.com>.
  - b. To run Sysprep, from a command prompt, type the following command and press Enter:  
`d:\Path\sysprep`

where *d*: is the drive letter of the hard disk drive and *Path* is the path of the directory where you copied the sysprep.exe and setupcl.exe utilities.

- c. When prompted, click **OK**.  
 If the donor system is running Windows 2000, Sysprep completes and the donor system shuts down.  
 If the donor system is running Windows XP or Windows Server 2003, the System Preparation Tool window opens. In the **Flags** group box, select the

**MiniSetup** check box; in the **Shutdown** field, select **Shutdown**. Click **Reseal** or **Factory**. Sysprep completes and the donor system shuts down.

If the donor system is a mobile computer (laptop) and fails to shut down automatically, manually power off the system when a blue screen and cursor is displayed.

5. Run the Get Donor task against the donor system. A donor image is created.
6. Create a Windows Clone Install task:
  - a. Use the donor image that you created in step 5 to create a Windows Clone Install task. Note the location of the task folder.
  - b. Modify the command list so that it includes the following text:

```

;This is command list for clone Full deployment task
BOOTTYPE !LOADDOS /environment/dos71c
WAKE
TIMEOUT 240
!!SETENV
SetLunHostTypeIfFibre ADT_Enabled "Windows" "Non-Clustered"
!deploy\deploy.bat
!custimg\setUser.bat
!!SETENV
!custimg\custimg.bat
!mtftp get %%SERVER_IP%% template\%%TASKTEMPLATEID%\%%TASKOID%\diragt.bat diragt.bat
!diragt.bat
BOOTTYPE !BOOTLOCAL
!!REBOOT
BOOTTYPE !LOADDOS /environment/dos71c
!!REBOOT
UpdateAssetID
!!SHUTDOWN
END

```

**Note:** The commands that you must add are highlighted in boldface.

7. Using an ASCII editor, create the following files and save them to the task folder for the Windows Clone Install task that you created in step 6:
  - da-fix.bat
  - diragent.rsp
  - diragt.bat
  - dirrest.reg

Table 46 lists information about these files and their content.

Table 46. Files and their content

| File name  | File content  |
|------------|---|
| da-fix.bat | <pre> TITLE DA-FIX.BAT RDM processing... regedit /s c:\predirag.reg del "c:\program files\ibm\director\data\twgmach.id" /F del "c:\program files\ibm\director\data\netdrvr.ini" /F cd \ cd "program files\ibm\director\bin\" twgipccf.exe /r:c:\diragent.rsp <b>REM This line is only needed if Web-based Access is installed</b> <b>move /Y "c:\httpd.con" "c:\program files\ibm\director\websrv\conf\httpd.conf"</b> REM Post-installation registry edit regedit /s c:\DirRest.reg REM Cleanup del c:\diragent.rsp del c:\httpd.con del c:\predirag.reg del c:\dirrest.reg del c:\da-fix.bat </pre> <p><b>Note:</b> The lines highlighted in boldface are required only if the donor image contains Web-based Access.</p> |

Table 46. Files and their content (continued)

| File name    | File content   |
|--------------|--|
| diragent.rsp | <pre>[Agent]=Y Driver.TCPIP=1 WakeOnLan=1 ;AddKnownServerAddress=TCPIP::XXXX.XXXX.XXXX.XXXX</pre> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. This enables all TCPIP drivers and the Wake on LAN feature. You also can configure other options; for more information, see the diragent.rsp file located on the <i>IBM Director CD</i>. This file is fully-commented and located in the director\agent\windows\i386 directory.</li> <li>2. To ensure that the system will be automatically discovered by IBM Director Server, uncomment the AddKnownServerAddress statement and substitute the IP address of the RDM server for XXXX.XXXX.XXXX.XXXX. (IBM Director Server must be configured to automatically add new systems that contact it.)</li> </ol>   |
| diragt.bat   | <pre>mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\da-fix.bat a:\da-fix.bat if errorlevel 1 goto MTFTPERR SET STATUS="Copying da-fix.bat" PQAccD /copy a:\da-fix.bat 1:\da-fix.bat if errorlevel 1 goto FAIL2  mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\diragent.rsp a:\diragent.rsp if errorlevel 1 goto MTFTPERR SET STATUS="Copying diragent.rsp" PQAccD /copy a:\diragent.rsp 1:\diragent.rsp if errorlevel 1 goto FAIL2  mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\dirrest.reg a:\dirrest.reg if errorlevel 1 goto MTFTPERR SET STATUS="Copying dirrest.reg" PQAccD /copy a:\dirrest.reg 1:\dirrest.reg if errorlevel 1 goto FAIL2  mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\predirag.reg a:\predirag.reg if errorlevel 1 goto MTFTPERR SET STATUS="Copying predirag.reg" PQAccD /copy a:\predirag.reg 1:\predirag.reg if errorlevel 1 goto FAIL2  mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\pqcmdln.txt a:\pqcmdln.txt if errorlevel 1 goto MTFTPERR SET STATUS="Copying pqcmdln.txt to cmdlines.txt" PQAccD /copy a:\pqcmdln.txt 1:\sysprep\i386\%OEM%\cmdlines.txt if errorlevel 1 goto FAIL2  REM These next 5 lines are only needed if Web-based Access is installed REM mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\httpd.con a:\httpd.con REM if errorlevel 1 goto MTFTPERR REM lccustom a:\httpd.con REM PQAccD /copy a:\httpd.con 1:\httpd.con REM if errorlevel 1 goto FAIL2 REM httpd.con will later be renamed to httpd.conf goto END  :MTFTPERR CALL MTFTPERR.BAT @ECHO Failure %STATUS% GOTO END  :FAIL2 SET RDRASLEVEL=1 SET RDSTATUS="RDMSWM234E Failure %STATUS%" @ECHO Failure %STATUS%  :END</pre> <p><b>Note:</b> If you want to use Web-based access with RDM, make sure that you uncomment the mtftp, lccustom, and PDAccD command lines in the Web-based access section.</p> |

Table 46. Files and their content (continued)

| File name    | File content   |
|--------------|--|
| dirrest.reg  | Windows Registry Editor Version 5.00<br>[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\TWGIPC]<br>"Start"=dword:00000002<br><br>[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\DirWbs]<br>"Start"=dword:00000002<br><br><b>Note:</b> The lines highlighted in boldface are required only if the donor image contains Web-based Access. |
| predirag.reg | Windows Registry Editor Version 5.00<br>[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\TWGIPC]<br>"Start"=dword:00000003<br><br>[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\DirWbs]<br>"Start"=dword:00000003<br><br>[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\ComputerName\ComputerName]<br>"TWGMachineID"=hex:         |

8. Modify the following files and save them to the task folder for the task that you created in step 6:
  - (If the donor image contains Web-based Access only.) httpd.conf
  - pqcmdln.txt

Table 47 lists information about the files, their locations, and the content that you must change.

**Note:** Be sure to rename httpd.conf to httpd.con.

Table 47. Files, their location, and the content that must be changed

| File name   | File location   | File content   |
|-------------|---|--|
| httpd.conf  | This file is located in the temporary directory to which you saved the file in step 3b on page 350.<br><b>Note:</b> On the RDM server, this file is named httpd.con. On the target system this file is named httpd.conf.  | define DirectorAgentServerName %COMPUTERNAME%<br><br><b>Note:</b> The change you must make is highlighted in boldface. The line is located in the "Configuration Parameters" section at the beginning of the file. |
| pqcmdln.txt | If you installed RDM Server in the default location, the file is located in the following directory:<br>d:\Program Files\IBM\RDM\local\env\71c\custimg<br><br>where d: is the drive letter of the hard disk drive.<br><b>Note:</b> The pqcmdln.txt file is later renamed to cmdlines.txt. | [Commands]<br>"c:\sysprep\getdir.exe"<br>"c:\autoBoot.bat"<br><b>"c:\da-fix.bat"</b><br>;"c:\sysprep\sysprep.exe -clean"<br><br><b>Note:</b> The line you must add is highlighted in boldface.                     |

When you run the Windows Clone Install task against a target system, the IBM Director Agent files and registry entries are unique.

## Using IBM Director to remotely run Sysprep on a managed system

Complete the following steps to remotely run Sysprep on a managed system:

1. Install IBM Director Agent on the managed system. You can use a Windows Native Install task to install an operating system and IBM Director Agent to do this.

Make sure to restart the system after IBM Director Agent is installed.

2. If you have not scanned the managed system with RDM already, run a Scan task on the system or complete the following steps to use IBM Director to discover it.

From IBM Director Console, click **Tasks** → **Discover Systems** → **IBM Director Systems**. After a few seconds, all systems with IBM Director Agent installed are displayed in the Group Contents pane. The system might be shown more than once if RDM has scanned the system previously.

You can differentiate RDM-scanned systems from IBM Director-discovered systems by the appearance of the icons. See the IBM Director documentation for more information.

3. Copy the Sysprep utilities to a directory on either the RDM server or an RDM console. These utilities are located in the support\deployment\deploy.cab directory on the Microsoft Windows CD. You can also download them from the Microsoft Web site at <http://www.microsoft.com>.
4. Transfer the utilities to the managed system:
  - a. From the Tasks pane, drag the **File Transfer** task onto the managed system. The File Transfer window opens.
  - b. From the Source File System pane, drag the directory that contains the utilities onto the c:\ drive in the Target File System pane. The progress of the File Transfer task is displayed.
5. Create a process task that will run Sysprep:
  - a. In the Tasks pane, expand the **Process Management** task.
  - b. Double-click the Process Tasks subtask. The Process Task window opens.
  - c. In the **Command** field, type the applicable Sysprep command.
  - d. Click **File** → **Save As**. The Save As window opens.
  - e. Type a name and click **OK**. The new process task is displayed under **Process Tasks** in IBM Director Console.
6. Run the process task:
  - a. Drag the process task that you created in step 5 onto the managed system in the Group Contents pane. The Process Task window opens.
  - b. Click **Execute Now**. The Execution History window opens and the progress of the task is displayed. The managed system shuts down automatically.

---

## Appendix B. Creating custom system environments

RDM tasks involve running a DOS system environment on the target system. When RDM is installed, several system environments are built.

You can create custom system environments to meet the needs of a particular environment. For example, you might want to run a task against a target system that contains a NIC that requires a special memory allocation during startup.

To change a default system environment, you first create a custom system environment. Then, you modify the system environment substitution file (bootEnvir.sub). The next time you run a task, the alternate system environments that are specified in the system environment substitution file are used.

---

### Creating a custom system environment

If you need a system environment that does not come with RDM, you must create a custom system environment. You can do so by copying and renaming, then modifying, an existing system environment.

Complete the following steps to create a custom system environment:

1. Create a new directory in one of the following locations on the RDM server:

|                |               |
|----------------|---------------|
| <b>Linux</b>   | RDM/local/env |
| <b>Windows</b> | RDM\local\env |

2. Copy all supporting files (including the autoexec.bat and config.sys files) and DOS device drivers to the directory that you created in step 1.
3. Copy the mkimages.bat file that is in the ..\RDM\local\env directory and rename it.
4. Using an ASCII text editor, open the new batch file that you created in step 3 and add the following lines of code:

```
cp baseimg CustomSysEnviron
bmimage32 -d CustomSysEnviron -i NewDirectory
Move CustomSysEnviron ..\..\repository\environment\CustomSysEnviron
```

where *CustomSysEnviron* is the name of the custom system environment, and *NewDirectory* is the directory that you created in step 1.

5. Run the modified batch file. A new system environment is created in the RDM\repository\local\env directory.

To modify the command list for the RDM task, replace the BOOTTYPE command with the following text:

```
BOOTTYPE !LOADDOS /environment/CustomSysEnviron
```

where *CustomSysEnviron* is the name of the custom environment. This instructs RDM to load the custom system environment to the target system when the task is next run.

---

## Modifying the system environment substitution file

To change the default system environment for a particular target system, modify the system environment substitution (bootEnvir.sub) file in the ..\RDM\local\env directory. The next time you run a task, the data from the modified bootEnvir.sub file is used.

**Note:** Be careful when you modify the bootEnvir.sub file. Since this file is referenced whenever a task is run, be sure to rigorously specify criteria in order to precisely target specific systems. For example, if the only criteria that you specify is a machine type, the alternate system environment will be used for *every* system with that machine type and the specified default system environment.

## Syntax

Each line in the bootEnvir.sub file defines one or more rules for substituting an alternate system environment for a default system environment. It uses the following syntax:

```
ModelID::PCIid=DefaultSysEnviron::SubstituteSysEnviron
```

where:

- *ModelID* is either
  - the four-digit machine type number
  - the machine type and model combination
  - the POS string of POS target systems
  - 0 selects all systems
- *PCIid* is either the manufacturer ID for the PCI adapter or 0 (all PCI adapters).
- *DefaultSysEnviron* is the default system environment.
- *SubstituteSysEnviron* is the alternate system environment.

Blank lines in this file are ignored. Use a hash (#) to comment out a line.

**Note:** Each instance of *ModelID::PCIid* must be unique. To specify more than one system environment substitution for an instance of *ModelID::PCIid*, separate the instances of *DefaultSysEnviron::SubstituteSysEnviron* with a semicolon (;).

## Sample bootEnvir.sub file

The following figure contains the contents of the bootEnvir.sub file that comes with RDM 4.20.3.

```

# *****
# * Remote Deployment Manager
# * (C) Copyright IBM Corp. 2003, 2004 All rights reserved.
# *****
#
# Please see Appendix B of the Operations Guide for
# instructions on how to use this file.
#####
##
##           The data lines begin here
#####
#POS Systems
SurePOS 300::0=dos71f::dos71p
IBM SureOne::0=dos71f::dos71p
4694::0=dos71f::dos71p
4800::0=dos71f::dos71p
8835::0=dos71f::dos71p
4810::0=dos71f::dos71p

```

Figure 183. System environment substitution file (bootEnvir.sub file)

## Examples of modifying the bootEnvir.sub file

The following table contains examples of substituting an alternate system environment for the default system environment.

Table 48. Examples of modifying the system environment substitution file (bootEnvir.sub)

| Line   | What it does   |
|--|--|
| 0::80861229=dos70::dos71j                    | Specifies that when the following set of criteria is true, the system environment dos71j is substituted for the default system environment: <ul style="list-style-type: none"> <li>• PCI adapter ID = 80861229</li> <li>• Default system environment = dos70</li> </ul>  |
| 4696::0=dos71s::dos71j                       | Specifies that when the following set of criteria is true, the system environment dos71j is substituted for the default system environment: <ul style="list-style-type: none"> <li>• Machine type = 4696</li> <li>• Default system environment = dos71s</li> </ul>   |
| 4696::80861129=dos71s::dos71j                | Specifies that when the following set of criteria is true, the system environment dos71j is substituted for the default system environment: <ul style="list-style-type: none"> <li>• Machine type = 4696</li> <li>• PCI adapter ID = 80861129</li> <li>• Default system environment = dos71s</li> </ul>  |
| 8550::0=dos7s::dos71s;dos7s1test::dos7s2test | Specifies the following system environment substitutions for systems with machine type 8550: <ul style="list-style-type: none"> <li>• When the default system environment is dos7s, the system environment dos71s is substituted.</li> <li>• When the default system environment is dos7s1test, the system environment dos7s2test is substituted.</li> </ul> |



---

## Appendix C. RDM data and files

This appendix contains information about RDM data and the RDM directory structure.

---

### Types of data

There are two primary types of RDM data:

- Data that fits a row/column model. Such data is stored in the RDM database. Entries in the database are used for searching and filtering operations; they can reference the images and files that are stored in the repository.
- Images and files, which are stored in the repository.

---

### RDM directory structure

If you install RDM Server in the default location, the following root directory is created:

---

|                    |                          |
|--------------------|--------------------------|
| <b>For Linux</b>   | /opt/IBM/RDM             |
| <b>For Windows</b> | d:\Program Files\IBM\RDM |

---

where *d* is the drive letter of the hard disk.

The root directory contains several subdirectories. The following table contains information about these subdirectories and what they contain.

Table 49. RDM subdirectories and their contents

| Subdirectory           | What it contains   |
|------------------------|--|
| <b>bin</b>             | <ul style="list-style-type: none"><li>• “Server-side” executable files that are not stored in the following directories:<ul style="list-style-type: none"><li>– (Windows) Program Files\IBM\Director</li><li>– (Linux) /opt/IBM/director</li></ul></li><li>• Java™ Runtime Environment (JRE) that is used for remote installations of RDM Deployment Server (D-Server)</li></ul> |
| <b>docs</b>            | RDM documentation  |
| <b>license</b>         | License agreements for RDM   |
| <b>local</b>           | RDM user-configurable properties files   |
| <b>localdrvimport</b>  | Driver files imported by the user  |
| <b>localenv</b>        | Files and applications that are used to build DOS system environments  |
| <b>localhttp</b>       | HTTP communication between the RDM server and remote deployment servers  |
| <b>localw32drivers</b> | Windows device drivers that are copied to the target system when a Windows Native Install task is run  |
| <b>localwnihives</b>   | Files that are used to modify the Microsoft <b>hivesft</b> files in the Windows Registry   |
| <b>log</b>             | RDM log files  |

Table 49. RDM subdirectories and their contents (continued)

| Subdirectory                                   | What it contains   |
|--|--|
| <b>repository</b>                              | Repository. The repository is the base directory on the local system that an mfttp command from a remote system is permitted to "get" files from.  |
| <b>repository\environment</b>                  | System environments  |
| <b>repository\image</b>                        | Images   |
| <b>repository\template</b>                     | RDM task template folders  |
| <b>repository\template\<i>n1</i></b>           | Specific RDM task template folders, where <i>n1</i> is one of the following numerals: <ul style="list-style-type: none"> <li>• 1 = System Firmware Flash</li> <li>• 2 = CMOS Update</li> <li>• 3 = Custom</li> <li>• 4 = Donor Image</li> <li>• 5 = Linux Native Install</li> <li>• 7 = Power Restore</li> <li>• 8 = RAID Custom Configuration</li> <li>• 9 = Scan</li> <li>• 10 = Script</li> <li>• 11 = Secure Data Disposal</li> <li>• 13 = Windows Clone Install</li> <li>• 14 = Windows Native Install</li> <li>• 16 = RAID Clone Configuration</li> <li>• 17 = Remote Storage Configuration</li> <li>• 18 = VMware Native Install</li> </ul> |
| <b>repository\template\<i>n1</i>/<i>n2</i></b> | Files that are used by a specific RDM task, where <i>n2</i> is a numeral   |
| <b>temp</b>                                    | Files that are used by the Scan task, including the scan.out file, which RDM Server uses to create or update the IBM Director physical platform managed object (PPMO) that represents the target system. The temp directory is also the location that mfttp from another system copies files onto the local system with a "put" command, except files that have the LOG extension will be copied to the log directory, where RDM log files are located.  |

Several RDM files are installed in IBM Director subdirectories. If IBM Director Server is installed in the default location, the following root directories are created:

|                    |                               |
|--------------------|-------------------------------|
| <b>For Linux</b>   | /opt/IBM/Director             |
| <b>For Windows</b> | d:\Program Files\IBM\Director |

where *d* is the drive letter of the hard disk.

The following table contains information about the IBM Director subdirectories and the RDM-related content that they contain.

Table 50. IBM Director subdirectories containing RDM-related content

| <b>Subdirectory</b> | <b>What it contains</b>   |
|---------------------|---|
| <b>database\RDM</b> | RDM database files  |
| <b>classes</b>      | JAR files for RDM and IBM Director  |
| <b>classes\doc</b>  | HTML help files for RDM and IBM Director                                    |
| <b>classfix</b>     | CLASS files for RDM and IBM Director post-ship fixes                        |
| <b>data</b>         | The reset.rdm file, which can be deleted to remove all RDM tasks and images |



## Appendix D. Linux directories

The following table contains the Linux directories that you should not use as mount points:

Table 51. Linux directories

|                                |                          |                               |
|--------------------------------|--------------------------|-------------------------------|
| /                              | /bin                     | /boot                         |
| /boot/grub                     | /boot/lost+found         | /dev                          |
| /dev/ataraid                   | /dev/cciss               | /dev/compaq                   |
| /dev/cpu                       | /dev/cpu/0               | /dev/cpu/1                    |
| /dev/cpu/10                    | /dev/cpu/11              | /dev/cpu/12                   |
| /dev/cpu/13                    | /dev/cpu/14              | /dev/cpu/15                   |
| /dev/cpu/2                     | /dev/cpu/3               | /dev/cpu/4                    |
| /dev/cpu/5                     | /dev/cpu/6               | /dev/cpu/7                    |
| /dev/cpu/8                     | /dev/cpu/9               | /dev/dri                      |
| /dev/i2o                       | /dev/ida                 | /dev/inet                     |
| /dev/input                     | /dev/logicalco           | /dev/logicalco/bci            |
| /dev/logicalco/dci1300         | /dev/pts                 | /dev/raw                      |
| /dev/rd                        | /dev/shm                 | /dev/usb                      |
| /dev/video                     | /etc                     | /etc/CORBA                    |
| /etc/CORBA/servers             | /etc/X11                 | /etc/X11/applnk               |
| /etc/X11/fs                    | /etc/X11/fvwm2           | /etc/X11/lbproxy              |
| /etc/X11/proxymngr             | /etc/X11/rstart          | /etc/X11/serverconfig         |
| /etc/X11/starthere             | /etc/X11/sysconfig       | /etc/X11/twm                  |
| /etc/X11/xdm                   | /etc/X11/xinit           | /etc/X11/xserver              |
| /etc/X11/xsm                   | /etc/aep                 | /etc/chemist                  |
| /etc/chemist/namespace         | /etc/chemist/switchboard | /etc/alternatives             |
| /etc/atalk                     | /etc/atalk/nls           | /etc/cipe                     |
| /etc/cipe/pk                   | /etc/cron.d              | /etc/cron.daily               |
| /etc/cron.hourly               | /etc/cron.monthly        | /etc/cron.weekly              |
| /etc/cups                      | /etc/default             | /etc/dhpc                     |
| /etc/gconf                     | /etc/gconf/1             | /etc/gconf/gconf.xml.defaults |
| /etc/gconf/gconf.xml.mandatory | /etc/gconf/schemas       | /etc/gnome                    |
| /etc/gnome/fonts               | /etc/gnome/panel-config  | /etc/gtk                      |
| /etc/gtk-2.0                   | /etc/hotplug             | /etc/hotplug/pci              |
| /etc/hotplug/usb               | /etc/httpd               | /etc/httpd/conf               |
| /etc/iproute2                  | /etc/isdn                | /etc/joe                      |
| /etc/locale                    | /etc/locale/cs           | /etc/locale/da                |
| /etc/locale/de                 | /etc/locale/es           | /etc/locale/eu_ES             |
| /etc/locale/fi                 | /etc/locale/fr           | /etc/locale/gl                |
| /etc/locale/hu                 | /etc/locale/id           | /etc/locale/is                |
| /etc/locale/it                 | /etc/locale/ja           | /etc/locale/ko                |

Table 51. Linux directories (continued)

|                             |                                 |                             |
|-----------------------------|---------------------------------|-----------------------------|
| /etc/locale/nn              | /etc/locale/no                  | /etc/locale/pl              |
| /etc/locale/pt              | /etc/locale/pt_BR               | /etc/locale/ro              |
| /etc/locale/ru              | /etc/locale/sk                  | /etc/locale/sl              |
| /etc/locale/sr              | /etc/locale/sv                  | /etc/locale/tr              |
| /etc/locale/uk              | /etc/locale/wa                  | /etc/locale/zh              |
| /etc/locale/zh_CN.GB2312    | /etc/locale/zh_TW               | /etc/locale/zh_TW.Big5      |
| /etc/log.d                  | /etc/log.d/conf                 | /etc/log.d/scripts          |
| /etc/logrotate.d            | /etc/mail                       | /etc/mail/spamassassin      |
| /etc/makedev.d              | /etc/mgetty+sendfax             | /etc/midi                   |
| /etc/network                | /etc/nmh                        | /etc/ntp                    |
| /etc/oaf                    | /etc/openldap                   | /etc/opt                    |
| /etc/pam.d                  | /etc/pango                      | /etc/ppp                    |
| /etc/ppp/peers              | /etc/profile.d                  | /etc/rc.d                   |
| /etc/rc.d/init.d            | /etc/rc.d/rc0.d                 | /etc/rc.d/rc1.d             |
| /etc/rc.d/rc2.d             | /etc/rc.d/rc3.d                 | /etc/rc.d/rc4.d             |
| /etc/rc.d/rc5.d             | /etc/rc.d/rc6.d                 | /etc/redhat-lsb             |
| /etc/rpm                    | /etc/samba                      | /etc/security               |
| /etc/security/console.apps  | /etc/sgml                       | /etc/skel                   |
| /etc/smrsh                  | /etc/sound                      | /etc/sound/events           |
| /etc/ssh                    | /etc/sysconfig                  | /etc/sysconfig/apm-scripts  |
| /etc/sysconfig/console      | /etc/sysconfig/network-scripts  | /etc/sysconfig/networking   |
| /etc/sysconfig/rhn          | /etc/tripwire                   | /etc/ups                    |
| /etc/vfs                    | /etc/vfs/modules                | /etc/w3m                    |
| /etc/xinetd.d               | /etc/xml                        | /home                       |
| /initrd                     | /lib                            | /lib/i686                   |
| /lib/iptables               | /lib/kbd                        | /lib/kbd/consolefonts       |
| /lib/kbd/consoletrans       | /lib/kbd/keymaps                | /lib/kbd/unidata            |
| /lib/kbd/videomodes         | /lib/lsb                        | /lib/modules                |
| /lib/modules/2.4.18-10      | /lib/modules/2.4.18-3           | /lib/modules/2.4.18-4       |
| /lib/modules/2.4.18-5       | /lib/security                   | /lib/security/pam_filter    |
| /lost+found                 | /misc                           | /mnt                        |
| /mnt/floppy                 | /opt                            | /proc                       |
| /root                       | /root/dhccpc                    | /root/dhccpcd.rpmsave       |
| /sbin                       | /tmp                            | /usr                        |
| /usr/X11R6                  | /usr/X11R6/bin                  | /usr/X11R6/include          |
| /usr/X11R6/lib              | /usr/X11R6/man                  | /usr/X11R6/share            |
| /usr/bin                    | /usr/bin/X11                    | /usr/dict                   |
| /usr/doc                    | /usr/doc/enlightenment-0.16.5   | /usr/doc/fnlib-0.5          |
| /usr/etc                    | /usr/games                      | /usr/i386-glibc21-linux     |
| /usr/i386-glibc21-linux/bin | /usr/i386-glibc21-linux/include | /usr/i386-glibc21-linux/lib |
| /usr/include                | /usr/include/GL                 | /usr/include/arpa           |

Table 51. Linux directories (continued)

|                        |                          |                        |
|------------------------|--------------------------|------------------------|
| /usr/include/asm       | /usr/include/atk-1.0     | /usr/include/bits      |
| /usr/include/freetype1 | /usr/include/freetype2   | /usr/include/g++-2     |
| /usr/include/g++-3     | /usr/include/gimp-print  | /usr/include/glib-1.2  |
| /usr/include/glib-2.0  | /usr/include/gnu         | /usr/include/gtk-1.2   |
| /usr/include/gtk-2.0   | /usr/include/gtkgl       | /usr/include/linux     |
| /usr/include/mysql     | /usr/include/net         | /usr/include/netash    |
| /usr/include/netatalk  | /usr/include/netax25     | /usr/include/neteconet |
| /usr/include/netinet   | /usr/include/netipx      | /usr/include/netpacket |
| /usr/include/netrom    | /usr/include/netrose     | /usr/include/nfs       |
| /usr/include/openssl   | /usr/include/pango-1.0   | /usr/include/pcap      |
| /usr/include/protocols | /usr/include/pwdb        | /usr/include/rpc       |
| /usr/include/rpcsvc    | /usr/include/scsi        | /usr/include/sigc++    |
| /usr/include/sp        | /usr/include/sys         | /usr/kerberos          |
| /usr/kerberos/lib      | /usr/kerberos/share      | /usr/lib               |
| /usr/lib/GConf         | /usr/lib/Omni            | /usr/lib/X11           |
| /usr/lib/alchemy       | /usr/lib/ao              | /usr/lib/apache        |
| /usr/lib/aspell        | /usr/lib/autofs          | /usr/lib/bash          |
| /usr/lib/bcc           | /usr/lib/bonobo          | /usr/lib/cups          |
| /usr/lib/dateconfig    | /usr/lib/desktop-links   | /usr/lib/exmh-2.4      |
| /usr/lib/games         | /usr/lib/gcc-lib         | /usr/lib/gconv         |
| /usr/lib/gdk-pixbuf    | /usr/lib/gedit           | /usr/lib/glib          |
| /usr/lib/glib-2.0      | /usr/lib/gnome-pilot     | /usr/lib/gnupg         |
| /usr/lib/gtk-2.0       | /usr/lib/guppi           | /usr/lib/ical          |
| /usr/lib/isdn          | /usr/lib/kde2-compat     | /usr/lib/kde3          |
| /usr/lib/libuser       | /usr/lib/licq            | /usr/lib/locale        |
| /usr/lib/lvsb          | /usr/lib/mc              | /usr/lib/mcop          |
| /usr/lib/metamail      | /usr/lib/mgetty+sendfax  | /usr/lib/mozilla       |
| /usr/lib/mysql         | /usr/lib/netscape        | /usr/lib/nmh           |
| /usr/lib/pango         | /usr/lib/perl5           | /usr/lib/pgsql         |
| /usr/lib/pilot-link    | /usr/lib/pkgconfig       | /usr/lib/pppd          |
| /usr/lib/python1.5     | /usr/lib/python2.2       | /usr/lib/qt-2.3.1      |
| /usr/lib/qt-3.0.3      | /usr/lib/rar             | /usr/lib/rpm           |
| /usr/lib/rpmdb         | /usr/lib/sasl            | /usr/lib/sigc++        |
| /usr/lib/tcl8.3        | /usr/lib/tix8.2          | /usr/lib/tk8.3         |
| /usr/lib/vfs           | /usr/lib/w3m             | /usr/lib/x3270         |
| /usr/lib/xawtv         | /usr/lib/xemacs          | /usr/lib/xemacs-21.4.6 |
| /usr/lib/xmms          | /usr/lib/yp              | /usr/lib/zsh           |
| /usr/libexec           | /usr/libexec/awk         | /usr/libexec/emacs     |
| /usr/libexec/filters   | /usr/libexec/openssh     | /usr/libexec/rep       |
| /usr/libexec/sawfish   | /usr/libexec/xtraceroute | /usr/local             |
| /usr/local/bin         | /usr/local/doc           | /usr/local/etc         |

Table 51. Linux directories (continued)

|                                 |                          |                                  |
|---------------------------------|--------------------------|----------------------------------|
| /usr/local/games                | /usr/local/include       | /usr/local/lib                   |
| /usr/local/libexec              | /usr/local/sbin          | /usr/local/share                 |
| /usr/local/src                  | /usr/man                 | /usr/man/man1                    |
| /usr/sbin                       | /usr/share               | /usr/share/VFlib                 |
| /usr/share/aclocal              | /usr/share/aclocal-1.4   | /usr/share/applets               |
| /usr/share/application-registry | /usr/share/apps          | /usr/share/aspell                |
| /usr/share/aumix                | /usr/share/authconfig    | /usr/share/autoconf              |
| /usr/share/automake             | /usr/share/autostart     | /usr/share/awk                   |
| /usr/share/bonobo               | /usr/share/cdrdao        | /usr/share/config                |
| /usr/share/control-center       | /usr/hare/cups           | /usr/share/cvs                   |
| /usr/share/dateconfig           | /usr/share/dict          | /usr/share/doc                   |
| /usr/share/emacs                | /usr/share/empty         | /usr/share/enlightenment         |
| /usr/share/epic                 | /usr/share/etable        | /usr/share/fnlib_fonts           |
| /usr/share/fonts                | /usr/share/foomatic      | /usr/share/gal                   |
| /usr/share/games                | /usr/share/gedit         | /usr/share/ghostscript           |
| /usr/share/gimp-print           | /usr/share/glib-2.0      | /usr/share/gnome                 |
| /usr/share/gnome-about          | /usr/share/gnome-pilot   | /usr/share/gnome-print           |
| /usr/share/gnome-terminal       | /usr/share/gnome-upgrade | /usr/share/gnupg                 |
| /usr/share/groff                | /usr/share/grub          | /usr/share/gtk-2.0               |
| /usr/share/gtk-doc              | /usr/share/gtkhtml       | /usr/share/guile                 |
| /usr/share/guppi                | /usr/share/hwbrowser     | /usr/share/hwdata                |
| /usr/share/i18n                 | /usr/share/icons         | /usr/share/idl                   |
| /usr/share/info                 | /usr/share/intltool      | /usr/share/jed                   |
| /usr/share/kontrol-panel        | /usr/share/ksconfig      | /usr/share/libtool               |
| /usr/share/licq                 | /usr/share/locale        | /usr/share/magicdev              |
| /usr/share/man                  | /usr/share/mime-info     | /usr/share/mimelnk               |
| /usr/share/misc                 | /usr/share/mpage         | /usr/share/mysql                 |
| /usr/share/nmap                 | /usr/share/oaf           | /usr/share/omf                   |
| /usr/share/openldap             | /usr/share/pgsql         | /usr/share/pixmaps               |
| /usr/share/printconf            | /usr/share/pspell        | /usr/share/redhat-config-network |
| /usr/share/redhat-config-users  | /usr/share/rep           | /usr/share/rhn                   |
| /usr/share/samba                | /usr/share/sawfish       | /usr/share/screen                |
| /usr/share/scrollkeeper         | /usr/share/sendmail-cf   | /usr/share/serviceconf           |
| /usr/share/services             | /usr/share/servicetypes  | /usr/share/sgml                  |
| /usr/share/sndconfig            | /usr/share/snmp          | /usr/share/sounds                |
| /usr/share/spamassassin         | /usr/share/ssl           | /usr/share/tabset                |
| /usr/share/terminfo             | /usr/share/themes        | /usr/share/type-convert          |
| /usr/share/umb-scheme           | /usr/share/usermode      | /usr/share/vim                   |
| /usr/share/vnc                  | /usr/share/w3m           | /usr/share/xemacs-21.4.6         |
| /usr/share/xmms                 | /usr/share/xtraceroute   | /usr/share/zoneinfo              |
| /usr/share/zsh                  | /usr/src                 | /usr/src/redhat                  |

Table 51. Linux directories (continued)

|                      |                       |                       |
|----------------------|-----------------------|-----------------------|
| /usr/tmp             | /var                  | /var/cache            |
| /var/cache/alchemy   | /var/cache/foomatic   | /var/cache/httpd      |
| /var/cache/man       | /var/db               | /var/ftp              |
| /var/ftp/bin         | /var/ftp/etc          | /var/ftp/lib          |
| /var/ftp/pub         | /var/jabberd          | /var/jabberd/dialback |
| /var/jabberd/dnsrv   | /var/jabberd/jabberd  | /var/jabberd/jsm      |
| /var/jabberd/pthsock | /var/jabberd/spool    | /var/jabberd/xdm_file |
| /var/lib             | /var/lib/alternatives | /var/lib/games        |
| /var/lib/misc        | /var/lib/mysql        | /var/lib/nfs          |
| /var/lib/pgsql       | /var/lib/rpm          | /var/lib/scrollkeeper |
| /var/lib/slocate     | /var/lib/tripwire     | /var/lib/ups          |
| /var/lib/xdm         | /var/lib/xkb          | /var/local            |
| /var/lock            | /var/lock/subsys      | /var/lock/xemacs      |
| /var/log             | /var/log/httpd        | /var/log/vbox         |
| /var/mail            | /var/named            | /var/nis              |
| /var/opt             | /var/preserve         | /var/run              |
| /var/run/console     | /var/run/mysqld       | /var/run/named        |
| /var/run/netreport   | /var/run/radvd        | /var/spool            |
| /var/spool/anacron   | /var/spool/at         | /var/spool/cron       |
| /var/spool/fax       | /var/spool/lpd        | /var/spool/mail       |
| /var/spool/mqueue    | /var/spool/rwho       | /var/spool/up2date    |
| /var/spool/vbox      | /var/spool/voice      | /var/tmp              |
| /var/www             | /var/www/cgi-bin      | /var/www/html         |
| /var/www/icons       | /var/www/nut-cgi-bin  | /var/yp               |
| /var/yp/binding      | /var/yp/masters       | /var/yp/yp            |



---

## Appendix E. Terminology summary and abbreviation list

This appendix provides a summary of Remote Deployment Manager (RDM) terminology and a list of abbreviations that are used in the following RDM publications:

- *Remote Deployment Manager 4.30 Installation and Configuration Guide*
- *Remote Deployment Manager 4.30 User's Reference*

---

### RDM terminology summary

The following terminology is used in the RDM publications.

A *system* is a server, workstation, desktop computer, mobile computer (laptop), or point-of-sale system.

The *RDM software* has three components:

- RDM Server
- RDM Console
- RDM Deployment Server (D-Server)

The hardware in an RDM environment is referred to in the following ways:

- An *RDM server* is a server on which both IBM Director and RDM Server is installed. It also contains an RDM console and the RDM master deployment server.
- An *RDM console* is a system on which both IBM Director Console and RDM Console are installed.
- A *remote deployment server* is a system on which RDM Deployment Server is installed. This system should be in a different subnet than the RDM server. RDM Console can be installed on this system also.
- A *target system* is a system on which an RDM task is run.

---

### Abbreviations

The following table lists abbreviations that are used in the RDM publications.

Table 52. Abbreviations used in IBM Director

| Abbreviation | Definition   |
|--------------|--|
| <b>A</b>     |  |
| AIA          | asset information area                             |
| ARP          | Address Resolution Protocol                        |
| ASCII        | American Standard Code for Information Interchange |
| <b>B</b>     |  |
| BIOS         | basic input/output system                          |
| BOOTP        | Bootstrap Protocol                                 |
| <b>C</b>     |  |
| CD           | compact disc                                       |
| CD-R         | compact disc–recordable                            |
| CD-R/W       | compact disc–read write                            |

Table 52. Abbreviations used in IBM Director (continued)

| <b>Abbreviation</b> | <b>Definition</b>                                    |
|---------------------|--|
| CD-ROM              | compact disc–read-only memory                        |
| CMOS                | complementary metal oxide semiconductor              |
| <b>D</b>            |  |
| DBCS                | double-byte character set                            |
| DCC                 | Direct Client Connection                             |
| DHCP                | Dynamic Host Configuration Protocol                  |
| DOS                 | disk operating system                                |
| DNS                 | domain name system                                   |
| DVD                 | digital video disc                                   |
| <b>E</b>            |  |
| EEPROM              | electrically erasable programmable read-only memory  |
| <b>F</b>            |  |
| FAStT               | Fibre Array Storage Technology                       |
| FAT                 | file allocation table                                |
| FTP                 | File Transfer Protocol                               |
| <b>G</b>            |  |
| GB                  | gigabyte   |
| Gb                  | gigabit  |
| GRUB                | Grand Unified Boot Loader                            |
| GUI                 | graphical user interface                             |
| <b>H</b>            |  |
| HAL                 | hardware abstraction layer                           |
| HBA                 | host bus adapter                                     |
| HTTP                | Hypertext Transfer Protocol                          |
| <b>I</b>            |  |
| IBM                 | International Business Machines Corporation          |
| ICMP                | Internet Control Message Protocol                    |
| ID                  | identifier   |
| IDE                 | integrated drive electronics (?)                     |
| IGMP                | Internet Group Message Protocol                      |
| IMAP                | Internet Message Access Protocol                     |
| IP                  | Internet Protocol                                    |
| IPX/SPX             | Internet Package Exchange/Sequenced Package Exchange |
| IRC                 | Internet Relay Chat                                  |
| IRC DCC             | Internet Relay Chat Direct Client Connection         |
| IRQ                 | interrupt request                                    |
| ISP                 | Internet service provider                            |
| <b>J</b>            |  |
| JRE                 | Java™ Runtime Environment                            |

Table 52. Abbreviations used in IBM Director (continued)

| Abbreviation | Definition                               |
|--------------|--|
| <b>K</b>     |  |
| KB           | kilobyte                                 |
| KBps         | kilobytes per second                     |
| Kb           | kilobits                                 |
| Kbps         | kilobits per second                      |
| <b>L</b>     |  |
| LAN          | local area network                       |
| LCCM         | LANClient Control Manager                |
| LDAP         | Lightweight Directory Access Protocol    |
| LILO         | Linux Loader                             |
| LUN          | logical unit number                      |
| <b>M</b>     |  |
| MAC          | media access control                     |
| MB           | megabyte                                 |
| MBps         | megabytes per second                     |
| Mb           | megabit                                  |
| Mbps         | megabits per second                      |
| MD5          | message digest 5                         |
| MTFTP        | Multicast Trivial File Transfer Protocol |
| <b>N</b>     |  |
| NetBEUI      | NetBIOS Extended User Interface          |
| NetBIOS      | network basic input/output system        |
| NFS          | network file system                      |
| NIS          | network information service              |
| NIC          | network interface card                   |
| NMO          | native managed object                    |
| NTFS         | Windows NT <sup>®</sup> 4.0 file system  |
| <b>P</b>     |  |
| PC           | personal computer                        |
| PC-DOS       | personal computer–disk operating system  |
| PDF          | Portable Document Format                 |
| PFA          | Predictive Failure Analysis              |
| POP3         | Post Office Protocol, version 3          |
| PXE          | Preboot Execution Environment            |
| <b>R</b>     |  |
| RAID         | redundant array of independent disks     |
| RAM          | random access memory                     |
| RDM          | IBM Remote Deployment Manager            |
| RFID         | radio frequency identification           |
| RPM          | Red Hat Package Manager                  |

Table 52. Abbreviations used in IBM Director (continued)

| Abbreviation | Definition                                      |
|--------------|---|
| <b>S</b>     |   |
| SAN          | storage area network                            |
| SATA         | serial advanced technology attachment           |
| SCSI         | small computer system interface                 |
| SDA          | IBM Software Delivery Assistant                 |
| SID          | security identifier                             |
| SMA          | IBM System Migration Assistant                  |
| SMB          | server message block                            |
| SMBIOS       | System Management BIOS                          |
| SMP          | symmetric multiprocessing                       |
| SMTP         | Simple Mail Transfer Protocol                   |
| SSH          | Secure Shell                                    |
| STC          | System/Task Configuration                       |
| STP          | Spanning Tree Protocol                          |
| <b>T</b>     |   |
| TCP/IP       | Transmission Control Protocol/Internet Protocol |
| TFTP         | Trivial File Transfer Protocol                  |
| <b>U</b>     |   |
| UDP          | User Datagram Protocol                          |
| UUID         | universal unique identifier                     |
| <b>W</b>     |   |
| WAN          | wide area network                               |
| WfM          | Wired for Management                            |
| WINS         | Windows Internet Naming Service                 |

---

## Appendix F. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your IBM BladeCenter, IBM System x, or IBM IntelliStation system, and whom to call for service, if it is necessary.

---

### Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools for BladeCenter and IBM System x systems is in the *Problem Determination Service Guide* on the IBM *xSeries Documentation* CD. Information about diagnostic tools for IntelliStation is in the *IntelliStation Hardware Maintenance Manual* at the IBM Support Web site.
- Go to the IBM Support Web site at <http://www.ibm.com/support/us> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most BladeCenter, IBM System x, and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

---

### Using the documentation

Information about your IBM BladeCenter, IBM System x, or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/support/us> and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

---

## Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM BladeCenter information is <http://www.ibm.com/servers/eserver/support/bladecenter/>. The address for IBM System x information is <http://www.ibm.com/servers/eserver/support/xseries/index.html>. The address for IBM IntelliStation information is <http://www.ibm.com/servers/intellistation/pro/already.html>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/support/us>.

---

## Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with System x servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to <http://www.ibm.com/services/us/its/pdf/remotesupportxseries.pdf>.

For more information about Support Line and other IBM services, go to <http://www.ibm.com/services/us/index.wss>, or go to <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

---

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