IBM

Updating ServeRAID Firmware/BIOS with RDM 4.20

A White Paper

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1 Preface

This White Paper explains how to use IBM® Remote Deployment Manager (RDM) 4.20 (or a later RDM version) to update the firmware and BIOS on a ServeRAID adapter.

There are other ways to flash a ServeRAID adapter (e.g., with the ServeRAID Support CD, with the ServeRAID diskettes, with the UpdateXpress CD, etc.). But using RDM to do this from a remote console on many systems concurrently, without having to visit the systems, is a powerful and easy way to accomplish this task.

You can use this White Paper to learn how to do the following:

- Updating ServeRAID firmware to the specific level covered in this book.

In addition, this White Paper will help you learn some of the typical techniques that you can use to extend and customize RDM:

- Creating RDM custom tasks.

- Creating RDM custom images and using them in an RDM task.

- Using the RDM Command List Wizard to add an image to an RDM task.

- Generalizing the procedures described herein to other ServeRAID firmware levels.

One good use of the custom task described below is in an end-to-end deployment procedure (i.e., an RDM Script task that does all steps in deploying a system). For example, such a Script task might contain the following subtasks:

1. System Firmware Flash task – updates System BIOS and Integrated System Management Processor firmware.

2. Custom task to update the firmware and BIOS on a ServeRAID adapter (i.e., the task described in section 2 below).

3. Custom task to update disk-drive firmware (see section 1.3.2 below to obtain a white paper on how to do this).

4. Custom task to update Diagnostics (see section 1.3.2 below to obtain a white paper on how to do this).

5. Custom task to update network adapter firmware (see section 1.3.2 below to obtain a white paper on how to do this).

6. RAID Custom Configuration task.

7. Task to deploy the operating system and applications – one of these:

    - Windows Native Install task.

    - Windows Clone Install task.

    - Linux Native Install task.

8. Power Restore task.

9. CMOS Update task – modifies the CMOS/BIOS settings.

1.1 How this document is organized

Chapter 3 below contains a step-by-step procedure for how to create the Custom task that this document describes.

You can save time by extracting the entire task from an embedded file, and then importing it into your RDM server. Chapter 2 below contains this import procedure.

1.2 Who should read this White Paper

This White Paper is intended to help skilled RDM administrators to create deployment procedures and to understand the concepts involved. To effectively use this White Paper, you should already have an extensive knowledge of your Network environment, your RDM environment, and DOS batch files.

1.3 Further reference

In addition to this paper, there are various other sources of information that you can consult for RDM and for RDM Custom tasks.

1.3.1 Guides

The following product documentation is available for RDM:

- *Remote Deployment Manager 4.20 Users Reference* – The main reference manual for RDM

- *Remote Deployment Manager 4.20 Installation and Configuration Guide* – Describes the complete installation process of RDM

- *Remote Deployment Manager 4.20 Compatibility Guide* – Lists RDM-supported hardware and software

Check the IBM Web site at http://www-307.ibm.com/pc/support/site.wss/document.do?lndocid=MIGR-56662 to get the current versions of the above documents.

1.3.2 White papers

The various RDM white papers are available on the IBM Web site at http://www-307.ibm.com/pc/support/site.wss/document.do?lndocid=MIGR-53487.

1.3.3 Online help

In general, most RDM windows have online help available (except for some message windows or other windows where no help is applicable), either using a **Help** menu or a **Help** button.

1.3.4 Links

The following links are available for further information:

- Support is available for supported systems (IBM and non-IBM) through e-mail or fee-based telephone support. Telephone support is not available in all countries. For more information about the fee-based telephone support, go to http://www.ibm.com/support or http://service.software.ibm.com/supportline.html. For more information about e-mail support, refer to the RDM home page.

Important: Before using RDM 4.20, check the compatibility test results and browse the rest of the RDM Web site for additional information and tips concerning the installation and use of RDM.

2 Import a Task

Because RDM 4.20 (or later) has the ability to import a task, you can use the attached file (which contains an exported copy of the task created in section 3 below) to create your custom task.

2.1 Unzip the Attached File

1. Extract the attached self-extracting ZIP file, *RaidTask.EXE*, by right clicking on the paperclip icon and saving the file to disk.
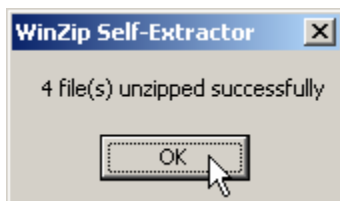
   Note: You may need Adobe Acrobat Reader 6.0.1 or later to be able to extract the file.
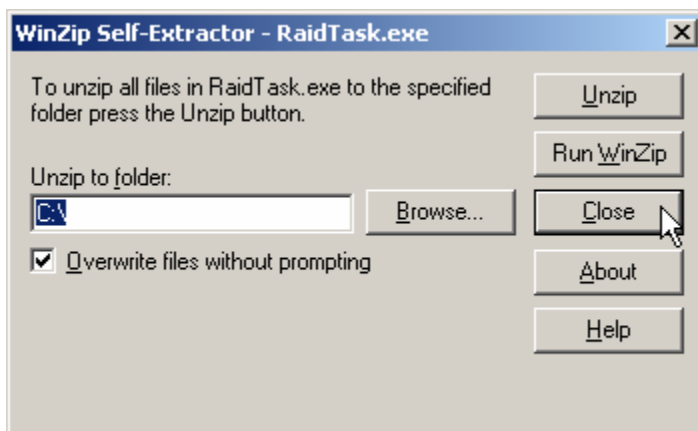
2. Run *RaidTask.EXE*.

3. Change the target folder name appropriately (e.g., to C:\), and then click the *Unzip* button.

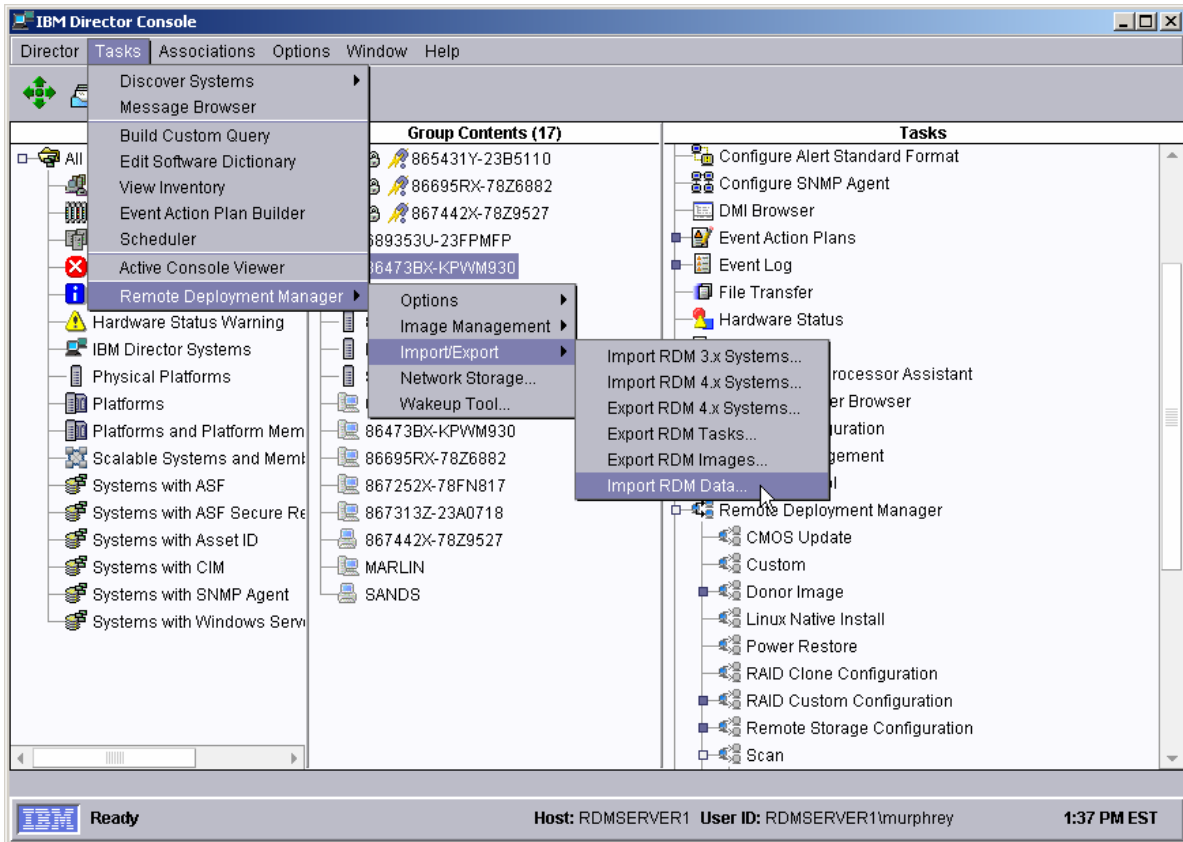4. Click the *OK* button when the unzip is complete.

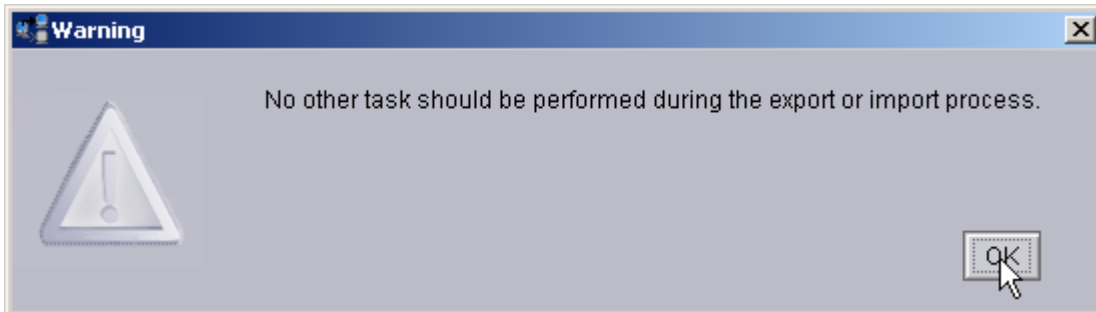5. Click the *Close* button to exit WinZip.
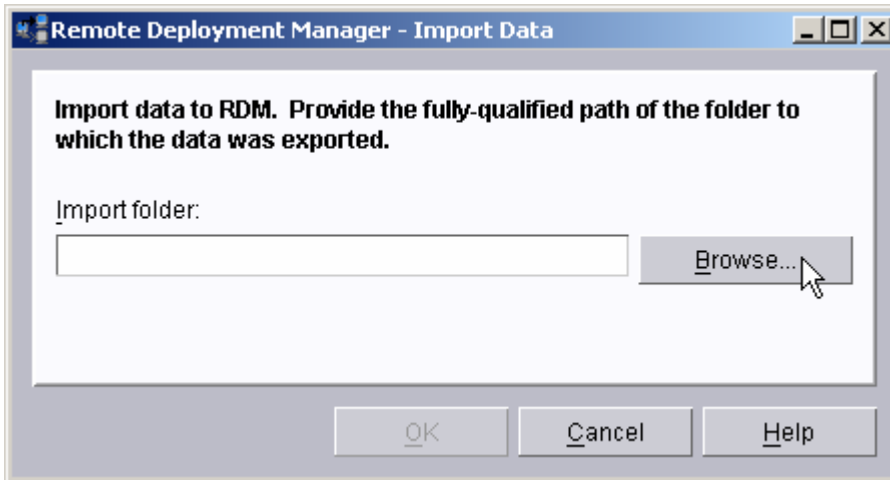
2.2 Import the Custom Task

6. From the Director console, select the **Tasks**, **Remote Deployment Manager**, **Import/Export,** and **Import RDM Data...** menus.
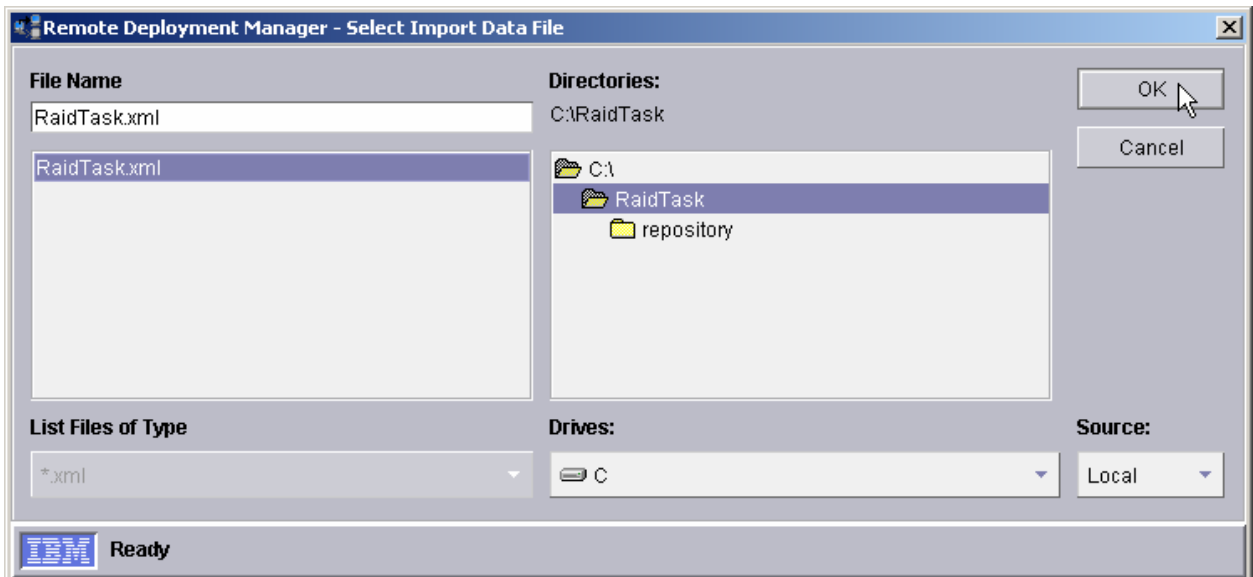

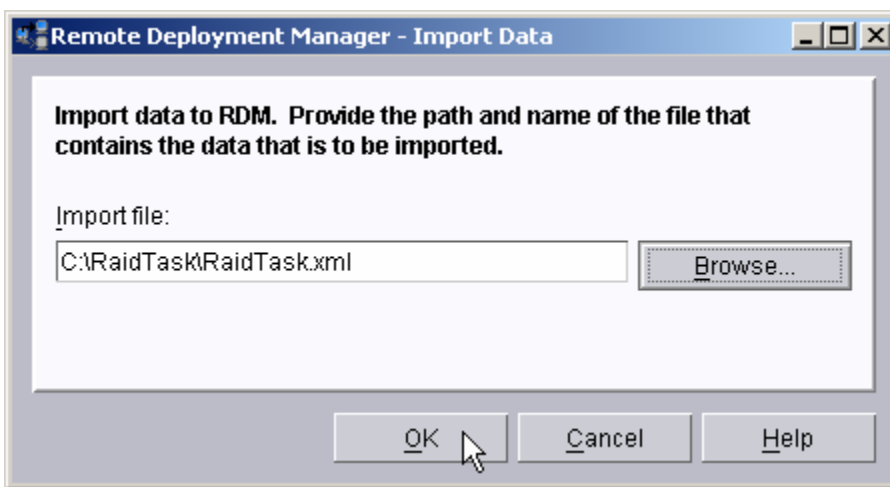7. Make sure that you are not running any other RDM tasks. Then click *OK* on the warning message.

8. Select the *Browse* button on the *Import Data* window.

9. Navigate to the *RaidTask* folder, select the *RaidTask.xml* file, and select the *OK* button.

10. Select the *OK* button on the *Import Data* window.

11. Select the OK button on the Progress Indicator message window.
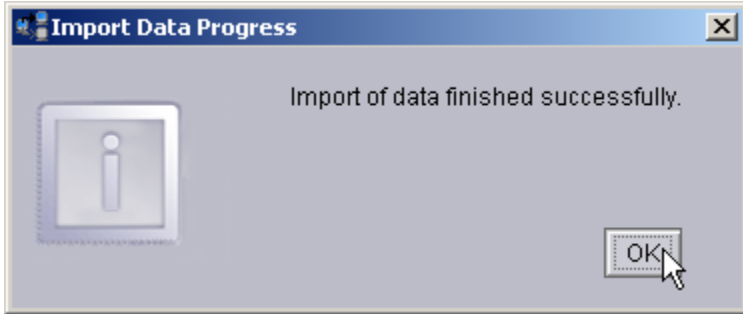
12. Expand the Custom template to validate that the new task is there.

13. Open the *Image Management* window to validate that the new image is there.

2.3 Test the new custom task

Follow the procedure in section 3.5 below to test the task.

3 Procedure

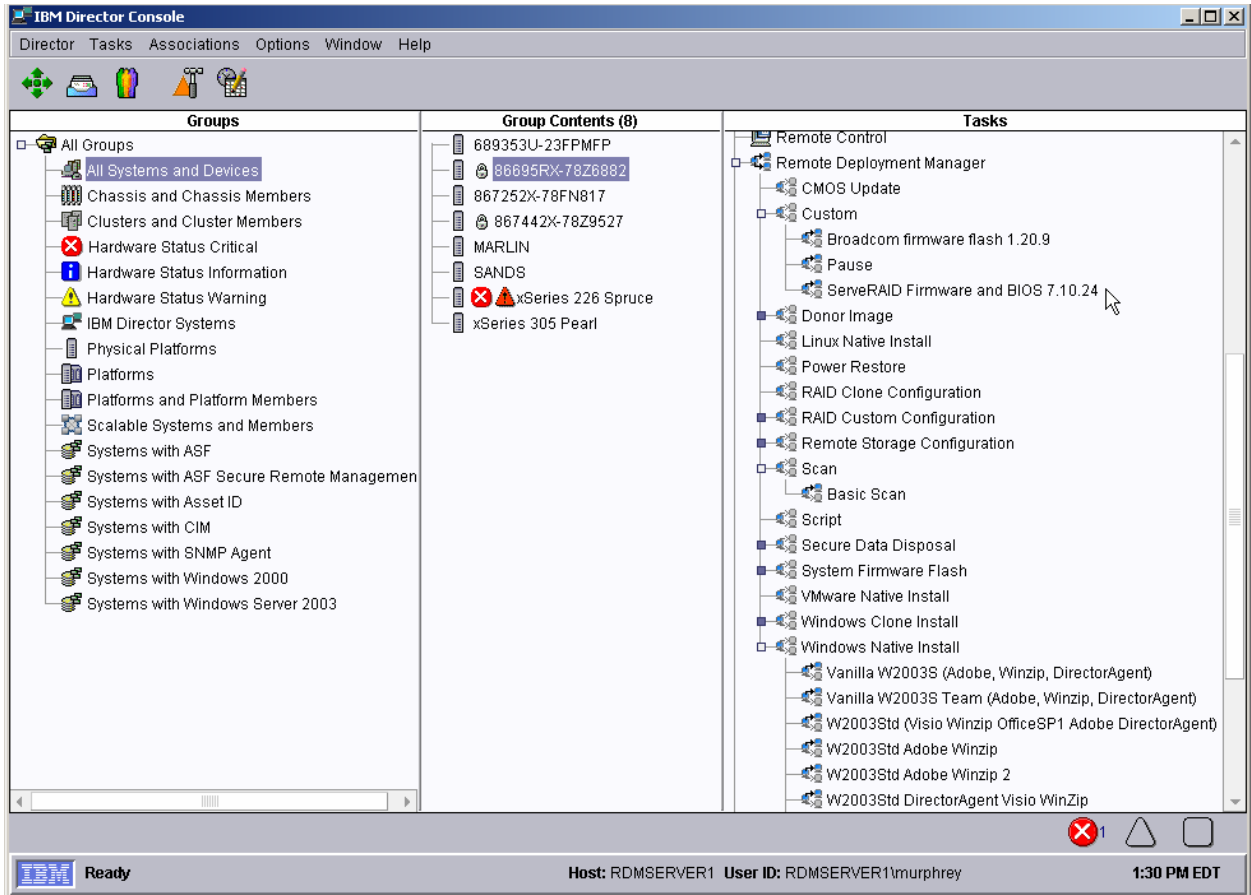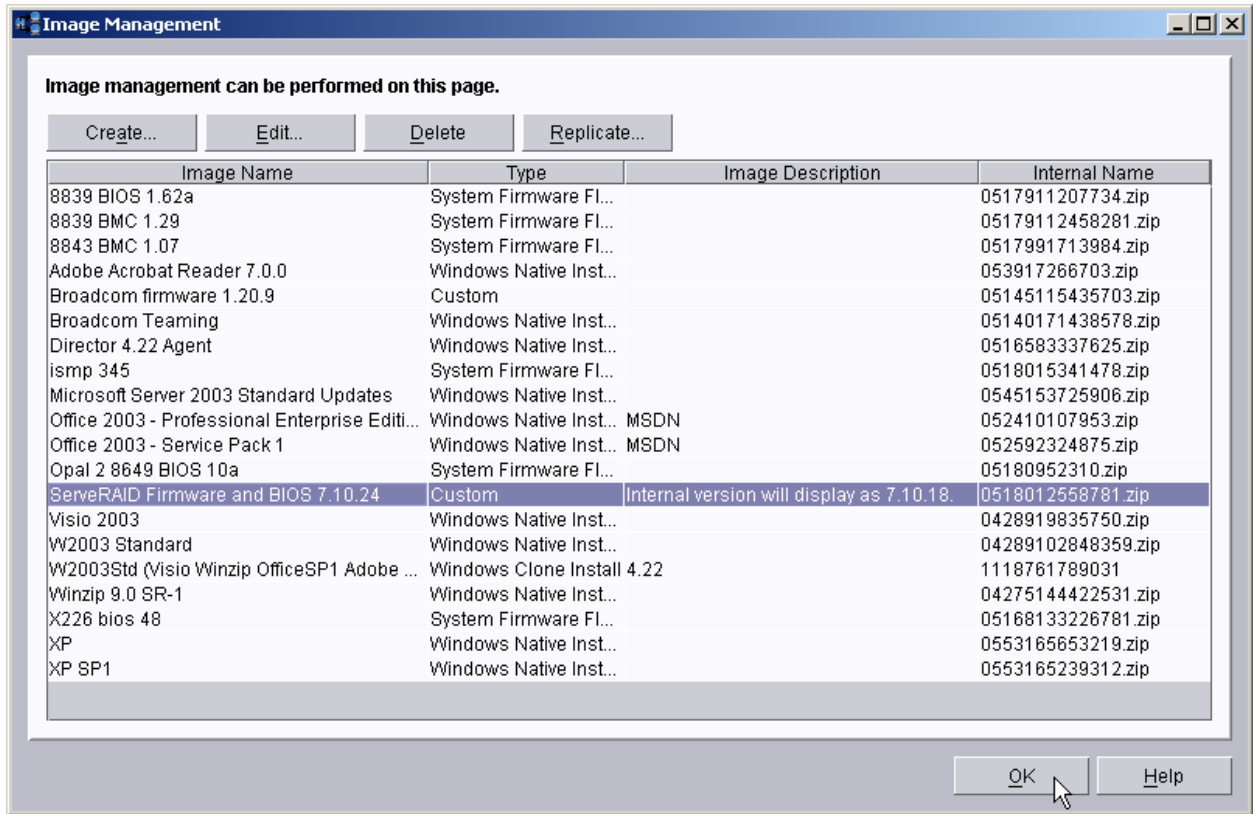The Custom task template is a general-purpose template that you use to create your own processes to run on a target system. Like most RDM tasks, it contains the following:

- A CommandList file containing the commands that are to be executed as part of the task.

- Executable programs and batch files that are to be executed as part of the task.

- An image file containing all the supporting files that are required by the commands.

This example creates a Custom flash task for an IBM or Adaptec® ServeRAID adapter. We used ServeRAID level 7.10.18 for this document. The procedure should also work for other firmware levels.

3.1 Extract the ServeRAID files to your computer

1. Obtain the appropriate flash diskette images from the appropriate ServeRAID Support CD or from the IBM Web site (http://www-3.ibm.com/pc/support/site.wss/).

2. Create the flash diskettes. The actual number of diskettes depends on the particular firmware level that you are using. In this example, there are 5 diskettes.

3.2 Create a custom image containing the ServeRAID files
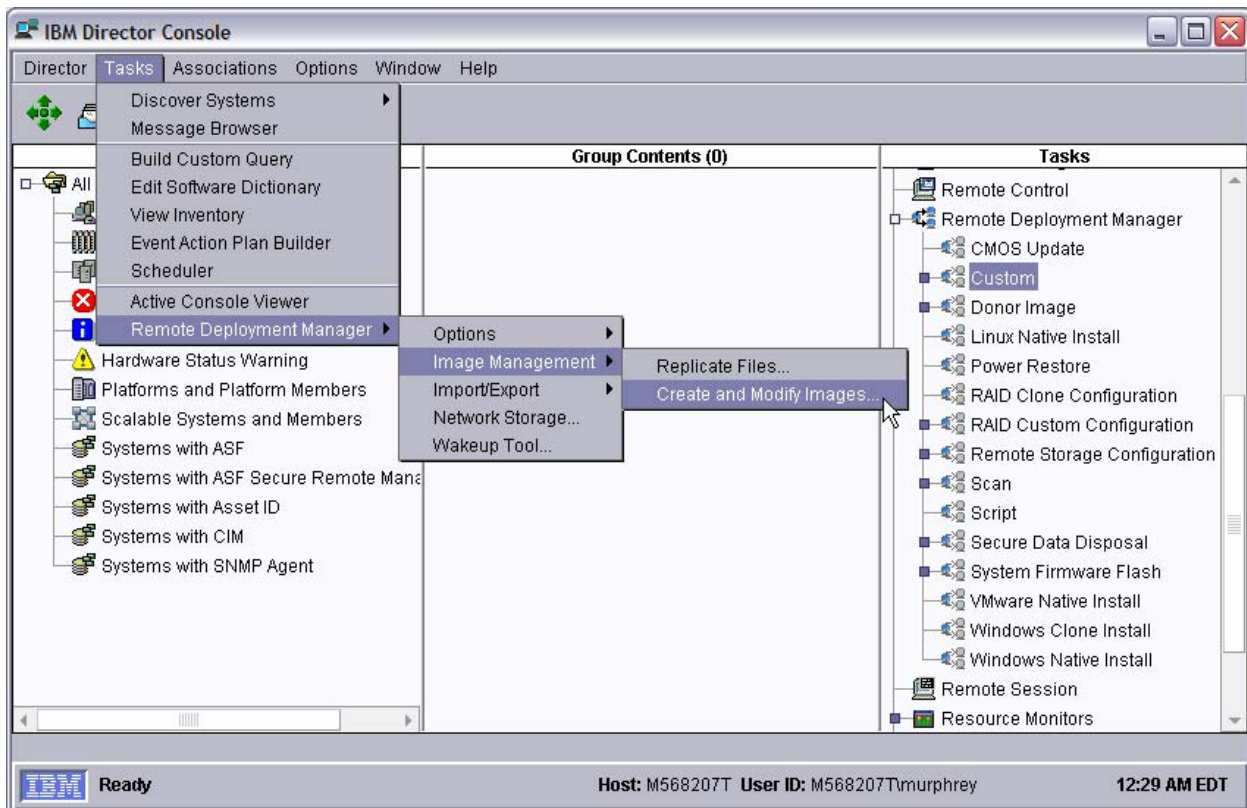
3. From the Director console, select the **Tasks**, Remote **Deployment Manager**, **Image Management…**, and **Create and Modify Images…** menus. This displays the Image Management

window, which lists all of the RDM images in the master repository. The picture below shows 2 previously created images.

In RDM, an *image* is a collection of data files used by a task.
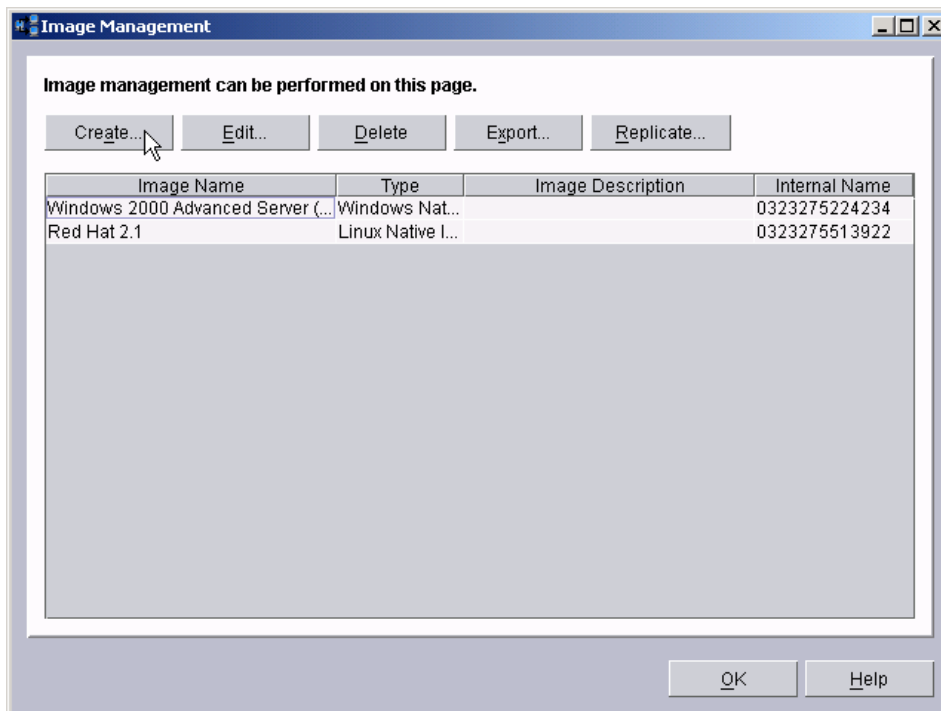
4. Select the **Create…** button, and expand the drop-down list to see the list of templates that can have associated images. RDM images are always related to a particular RDM template.
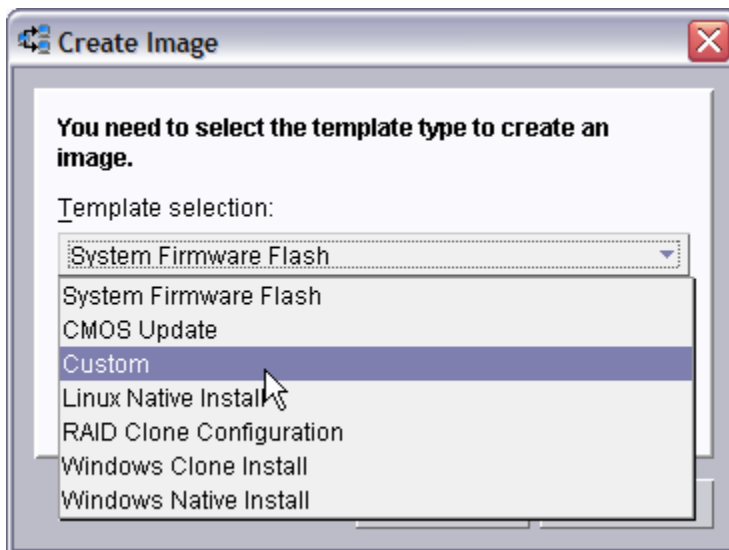
5. Select the **Custom** template from the drop-down list, and then select the **OK** button. This displays the *Create Custom Image* window.
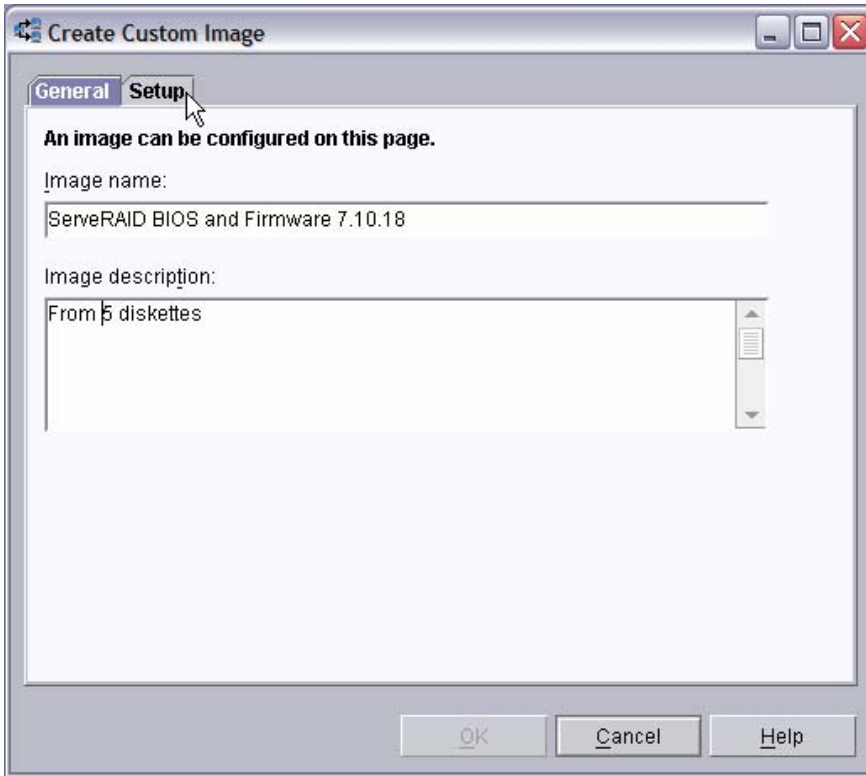
6. On the **General** tab, enter a name and (optionally) a description. Notice that we include the version number in the image name. This will make it easy to distinguish, later, if newer versions become available.
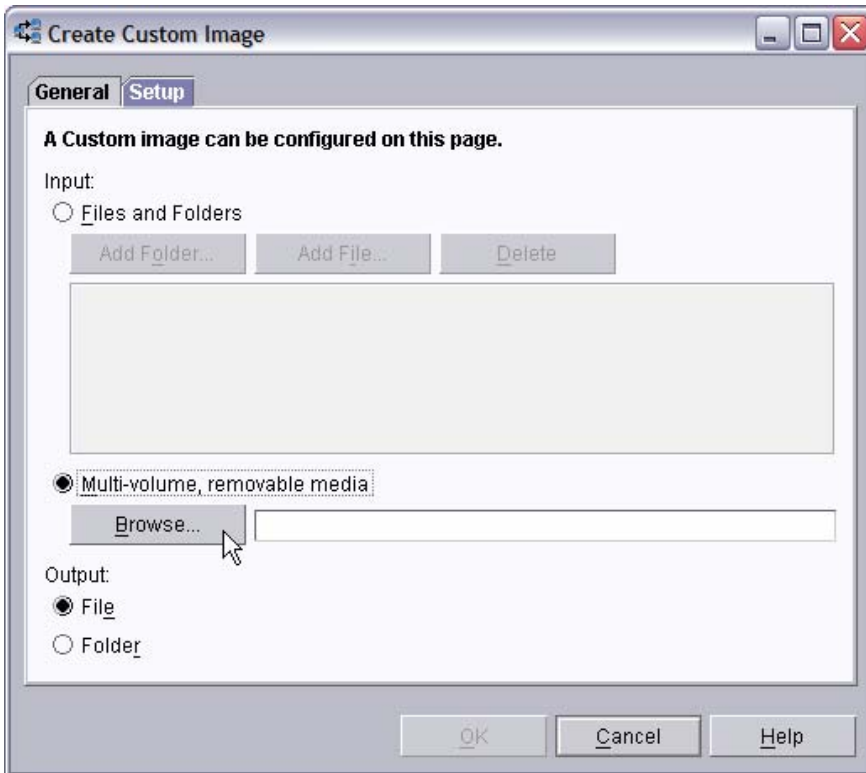
7. On the **Setup** tab, select the **Multi-volume, removable media** radio button, and then select the **Browse…** button. This displays a file dialog window.
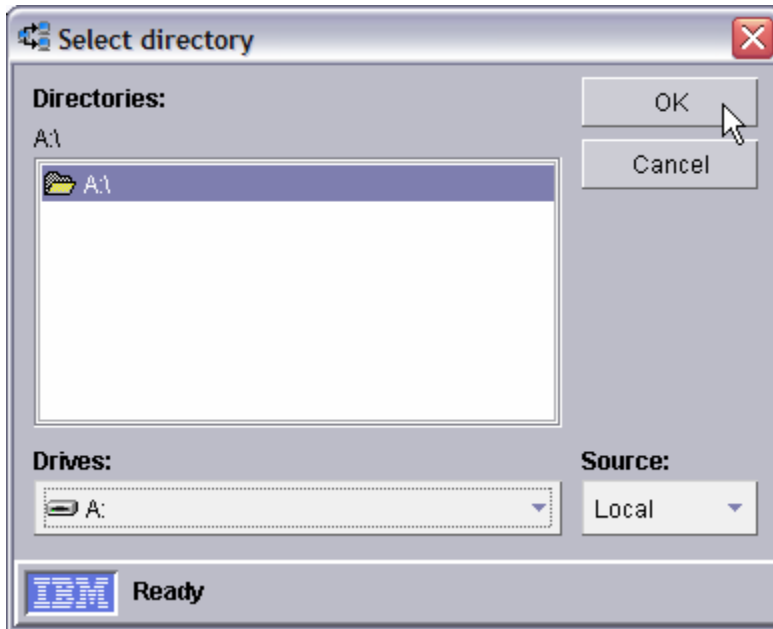
8. In the *Select Directory* window, Navigate to and select the A:\ directory. Then select the **OK** button.

9. Insert the first of the five diskettes in your drive, and select the **OK** button on the *Create Custom Image* window. RDM will copy the first diskette, displaying the *Task Image Creation Progress* window.
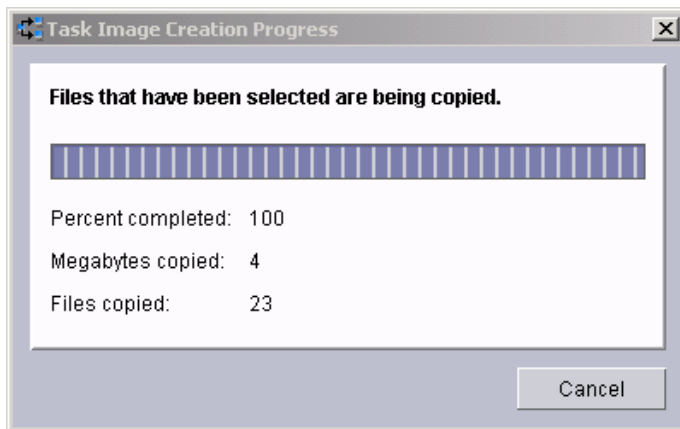
10. After copying the first diskette, RDM displays the following *Task Image Creation Progress* window. Continue inserting diskettes in your drive and selecting the **OK** button until you have copied all five diskettes. Then select the **Done** button to complete the image creation.
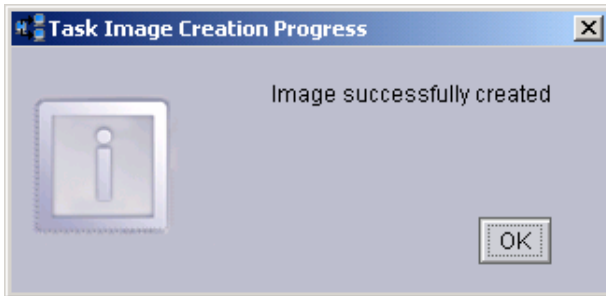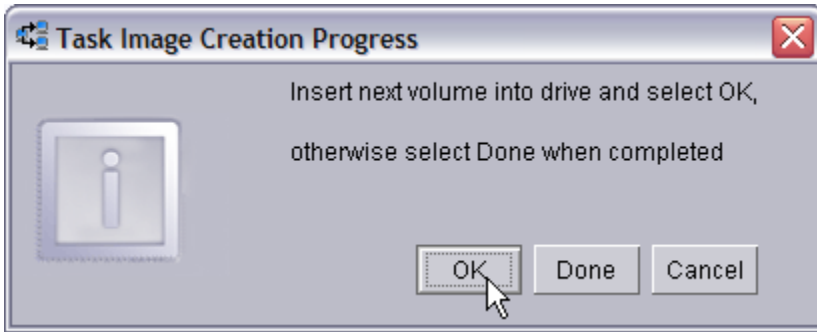
11. After the image creation is done, select the OK button on the Task Image Creation Progress window. The main Image Management window will now contain an entry for the new image.
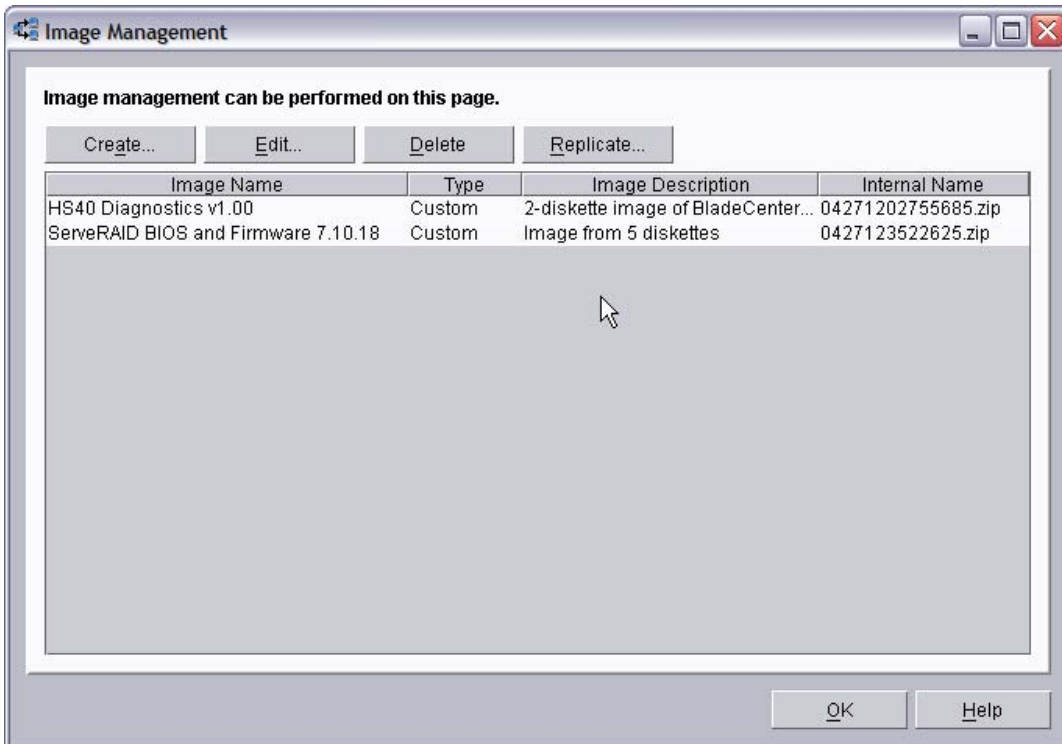
3.3 Create the Custom task that will deploy the ServeRAID BIOS and firmware
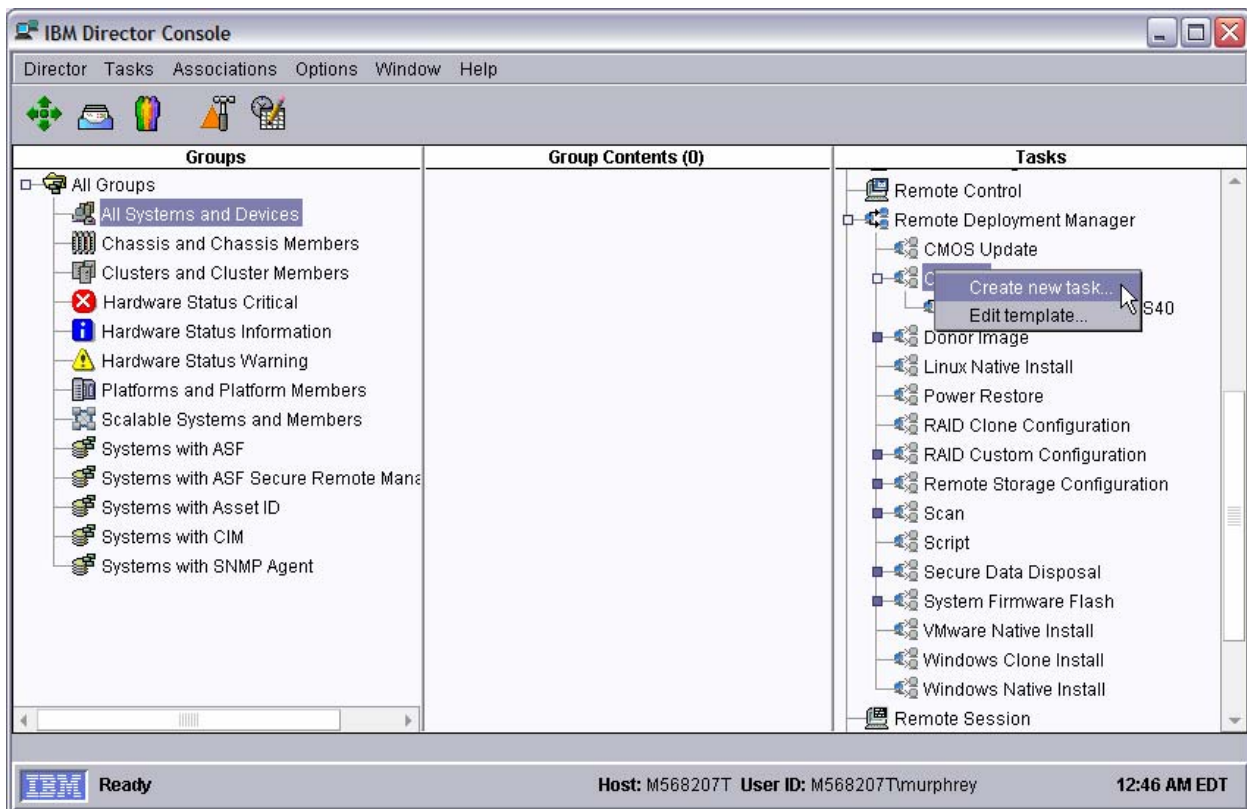
12. Expand **Remote Deployment Manger** in the Tasks pane of the Director console, and right-click **Custom**. The menu is displayed.

13. Click **Create new task…** on the menu to access the property pages. There are two pages:

- **General**: Contains basic information about the task.

- **Advanced**: Contains the command list, user parameters, and task folder name for the task.
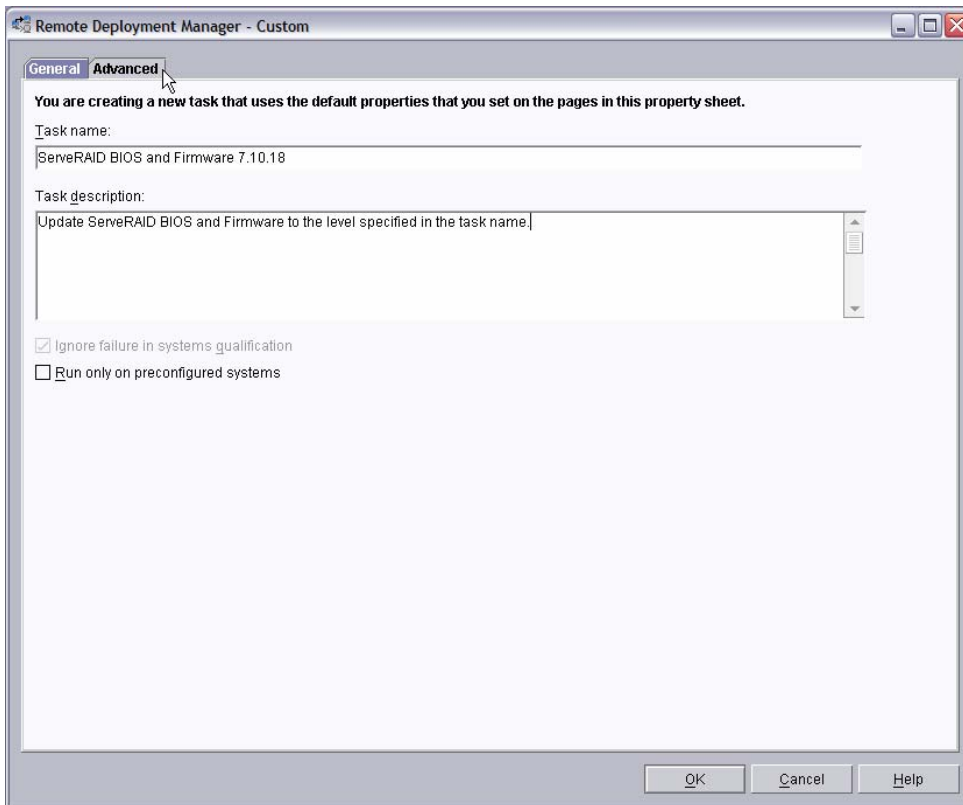
14. Enter the task information on the General page (e.g., name the task *ServeRAID BIOS and Firmware 7.10.18*). Notice that we include the version number in the task name. That's because the task is tied to a particular BIOS/firmware version. If, later, a new BIOS/firmware version becomes available, you will probably create a new task to deploy the newer version.

    The task description is optional.

15. Click the **Advanced** tab, and modify the command list this way:

```
; ****************************************************************
; * Remote Deployment Manager
; * (C) Copyright IBM Corp. 2004 All rights reserved.
; ****************************************************************
; * User-generated command list for the Custom task that can flash
; * ServeRAID BIOS and firmware.
; ****************************************************************
BOOTTYPE !LOADDOS /ENVIRONMENT/DOS71X
WAKE
!!SETENV
!%%RAMDSK%%
!mtftp get %%SERVER_IP%% template\%%TASKTEMPLATEID%%\%%TASKTOID%%\RAIDFW.BAT RAIDFW.BAT

!RAIDFW.BAT
UpdateAssetID
!!SHUTDOWN
END
```

    Note: The command list is a list of RDM and DOS commands that perform the Custom task. Refer to Appendix A, "Command list commands", in the *Remote Deployment Manager 4.20 User's Reference* for information on commands and syntax within a command list.
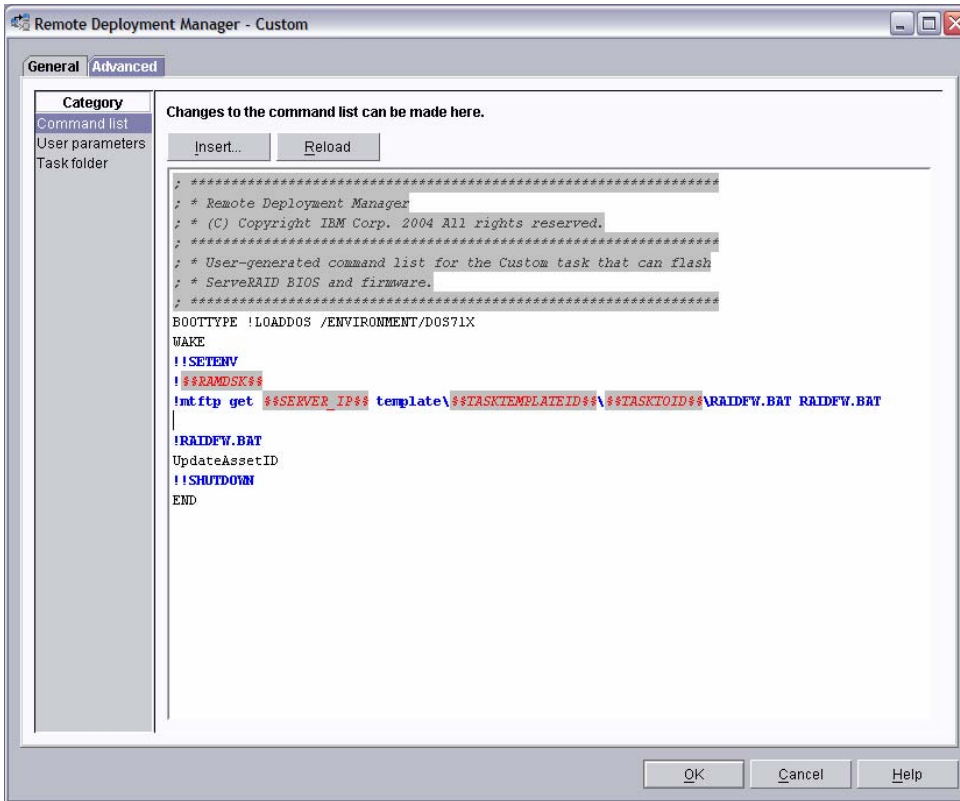
16. Place the cursor on the blank line (see the picture, above), and select the **Insert** button. The *Command List Editor Wizard* window appears.
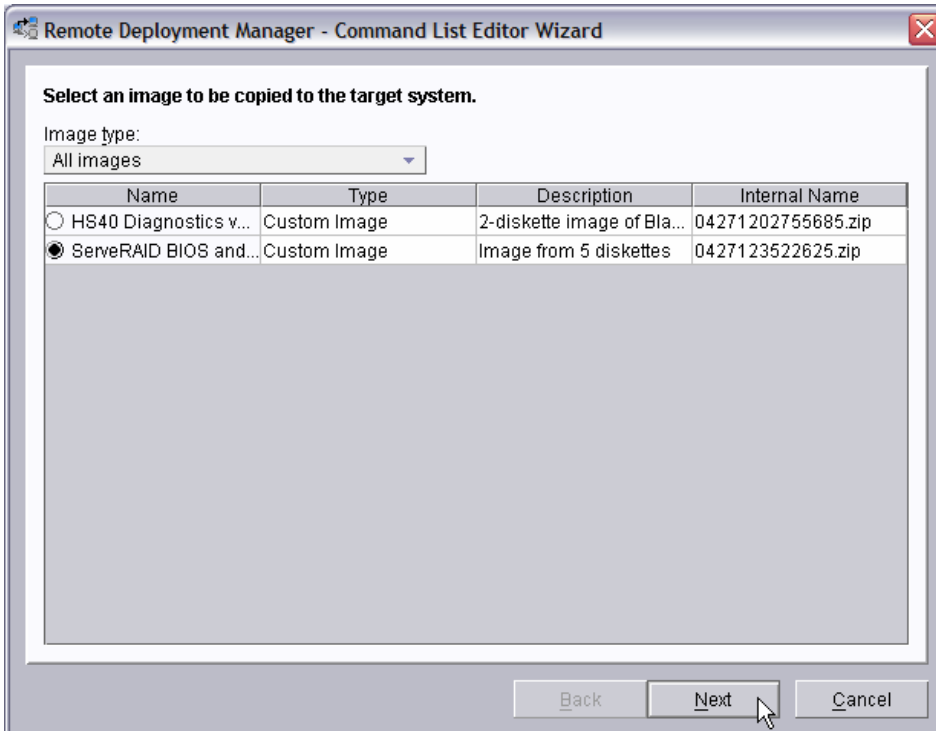
17. Select the custom image that you created in step 3.2 above, and then select the **Next** button.
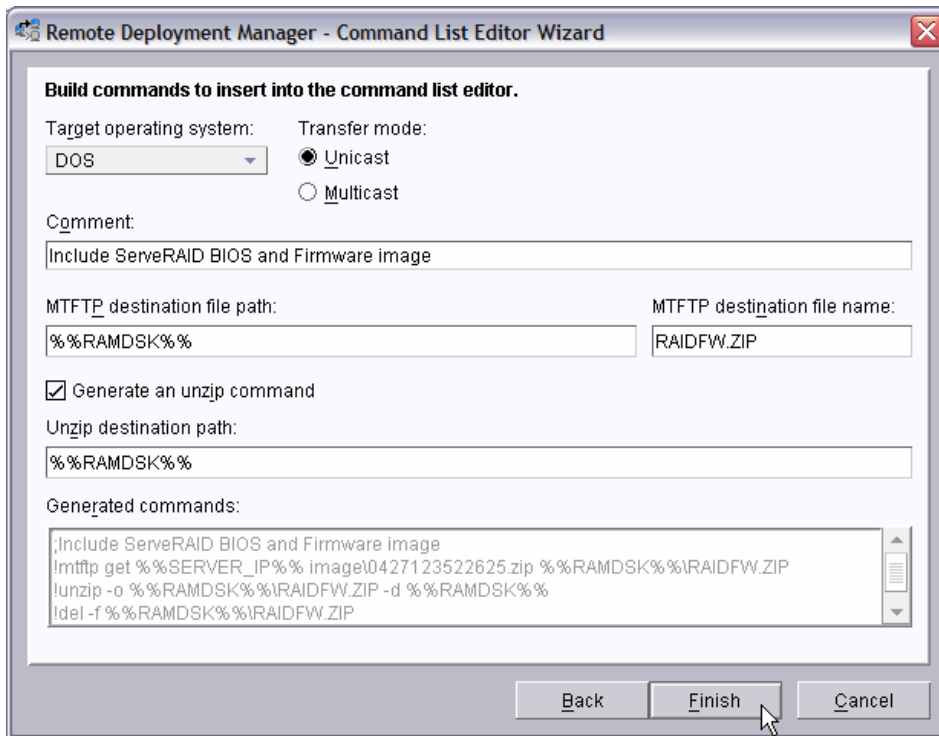
18. Enter the appropriate data to generate the correct commands to download and unzip the custom image you created in section 3.2 above.

    o   Select DOS as the target operating system.

    o   Leave the transfer mode as Unicast.

    o   Add an optional comment, if you like.

    o   Enter the path and name that you want the image file to have on the target system.

    o   Select the check box to generate an unzip command, and enter the path for the unzipped files.

19. Select the *Finish* button to add the generated commands to the command list
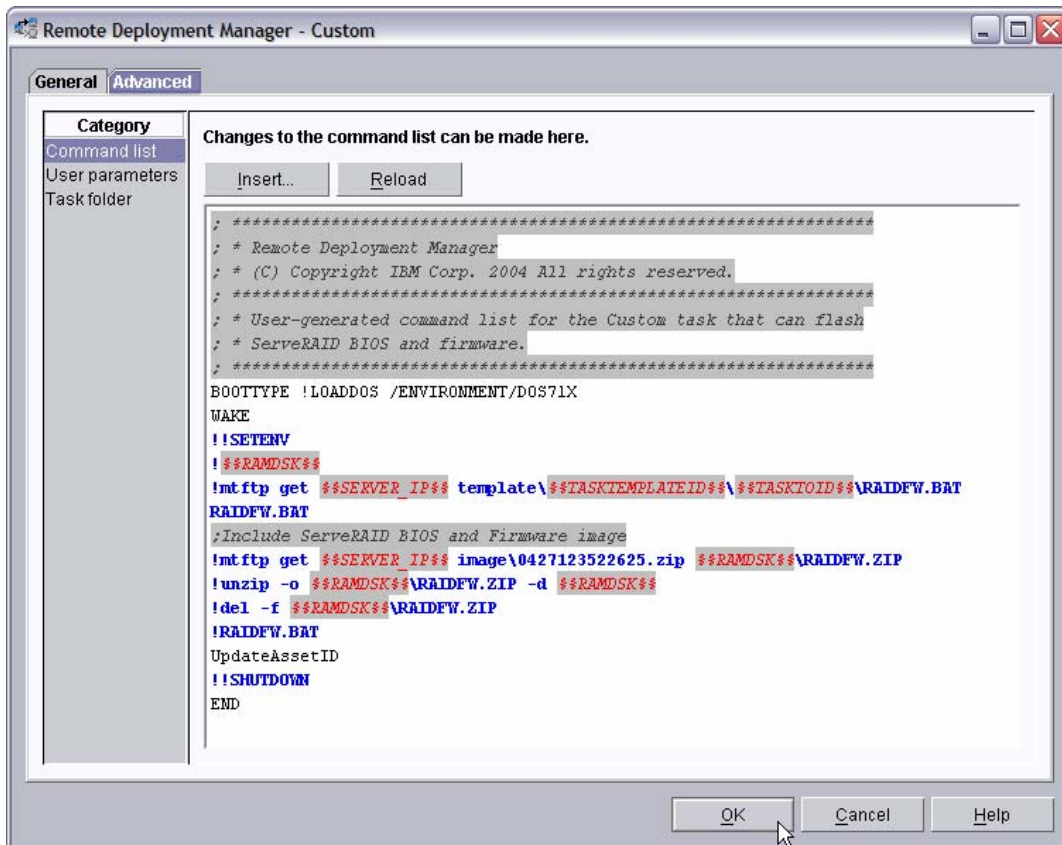
20. Click the **OK** button to create the task.

3.4 Create the batch file that will perform the flash operation

21. Edit the task you created in section 3.3 above by right clicking on the task and selecting **Edit task…** in the resulting menu.

22. Select the **Advanced** tab and then select the **Task Folder** category. Note the folder name (e.g., C:\Program Files\IBM\RDM\repository\template\3\527), which we will use below.
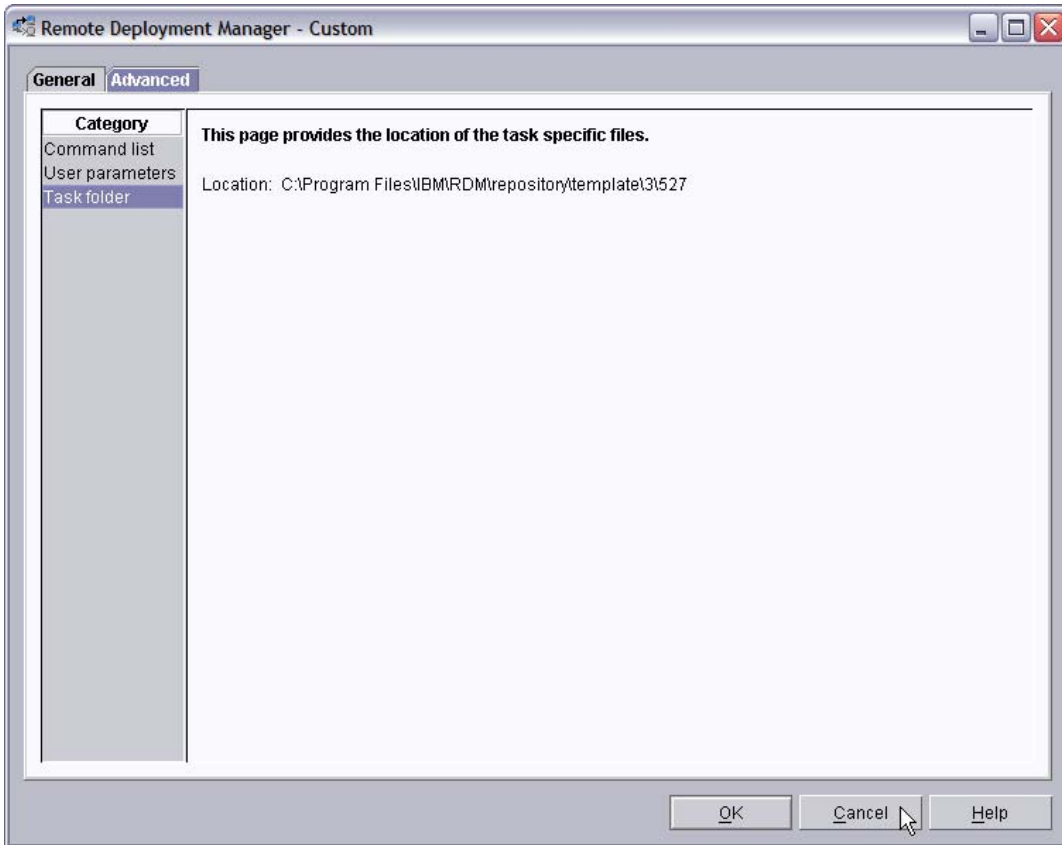
23. Right click on the paperclip icon below, and save the imbedded file to the task folder (e.g.,
C:\Program Files\IBM\RDM\repository\template\3\527\ RAIDFW.BAT). You can, instead, use
Notepad or your favorite editor to create the file. This file contains these statements:

```
REM *********************************************************
REM * Remote Deployment Manager
REM * (C) Copyright IBM Corp. 2004 All rights reserved.
REM *********************************************************
REM * Batch file that flashes ServeRAID BIOS and firmware.
REM * Used in an RDM Custom task.
REM *********************************************************
RDAGENT /L "Entering RAIDFW.BAT..."
RDAGENT /L "RAIDFW.BAT: running PINWHL.EXE..."
PINWHL
RDAGENT /L "RAIDFW.BAT: running FLASHMAN.EXE..."
flashman /MFG %RAMDSK%\raidfw.log /CD:%RAMDSK% /AUTO
if ERRORLEVEL 1 goto ERROR
goto END

:ERROR
set RDRASLEVEL=1
set RDSTATUS="RDMSWM001E RAID BIOS/firmware update failed - see %BOOTMAC%.custom.raidfw.log
        file in rdm temp directory"
mtftp put %SERVER_IP% %RAMDSK%\raidfw.log %BOOTMAC%.custom.raidfw.log

:END
RDAGENT /L "Exiting RAIDFW.BAT..."
```

Note: The "`set RDSTATUS="RDMSWM001E...`" line in this example is long and is shown wrapped onto 2
lines.

3.5 Test the new custom task

24. Power on a server (one that contains a ServeRAID adapter) in a way that forces a network boot. RDM will run its Scan task on the system and power it off. The system will appear in the middle pane of a Director console.
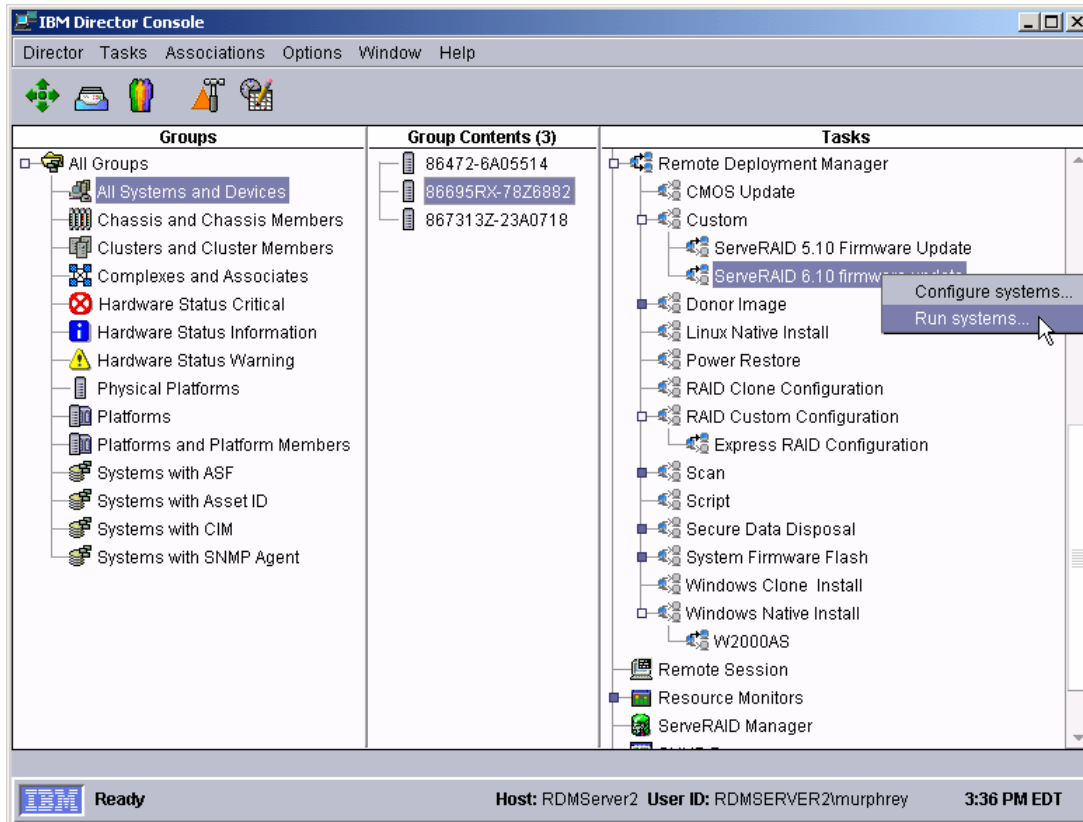
25. Drag the entry for that system and drop it on the new *ServeRAID BIOS and Firmware 7.10.18* task in the right pane. The menu appears. Click **Run systems…** in the menu. A message window appears.

    Note: You could, instead, drag the task and drop it on the system – the Director/RDM drag/drop operation works the same way in either direction.

    Although the usual way to run an RDM task is first to select **Configure systems…** (to enter parameter values) and then to select **Run systems…**, we omit the "configure" step, here. Since this task contains no configurable parameter values, we can go directly to scheduling the task.
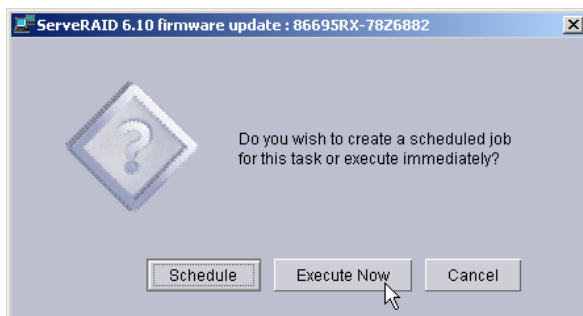
26. Click the **Execute now** button. The target system will wake up (i.e., automatically power itself on) and do a network boot.

27. Immediately after the Starting PC DOS… message appears on the system's monitor, press the F8 key. This allows you to step through all of the batch files statement-by-statement.

28. Press the "y" key to execute each statement in-turn. Observe each statement, and watch for any errors that may occur.

   Note: If an error occurs, debug it, fix it as appropriate (usually in one of the files you created or modified above), and then rerun the test.

   To rerun the test, you will usually need to do the following:

   a.   Power off the server with the power switch.

   b.   Right-click on the server in the middle pane.

   c.   Click the **Remote Deployment Manager** and the **Cancel Tasks** menu items.

   d.   Go back to step 25 above.
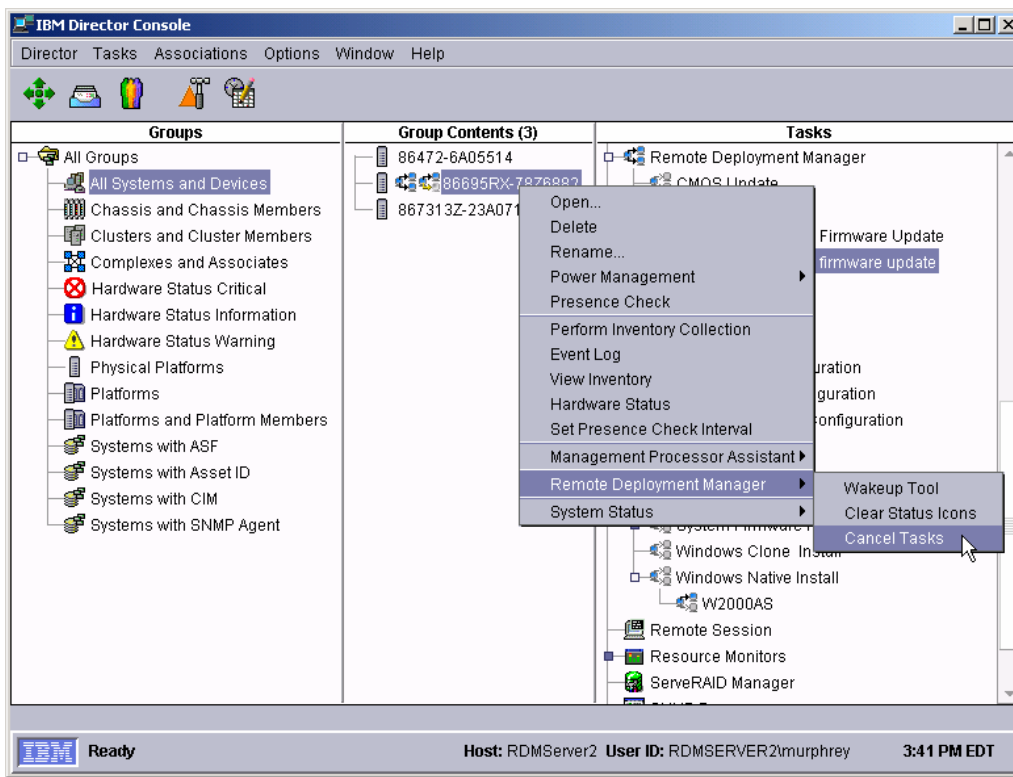
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5 Glossary

BAT file. A file that contains a batch program (that is, a set of commands).

bind. Associating one or more systems to a task. This causes all information to be verified (by one of the STC modules) and a resulting job to be scheduled to run.

console, or RDM Console. The group of programs that make up the user interface to RDM. RDM is client/server in nature so that the Console might run on any computer and not necessarily be running on the same computer as the RDM server or other RDM components. The RDM Console is actually an IBM Director Console on which the RDM Console component is installed.

image. An image is the software stored on a deployment server that is downloaded to a system during an operation. Images vary in size and in the type of software they provide to the system. The purpose and content of each image depends on the task to be accomplished, as well as the method used to download the image from the deployment server to the system. A *native* image is built off a product installation CD. A *clone* image is copied from a donor system.

job. An object managed by the scheduler and created by STC. A job is a binding of one task and one or more systems. A job can be scheduled to run once or to recur. Sometimes a job is called by a different name (Scheduled Task, Running Task), to emphasize some aspect of the job.

managed system. The IBM Director term for its system. Mentioned here only for clarity; the term *system* is preferred when referring to an RDM system.

preboot DOS agent. The preboot DOS agent is a DOS operating system with a communications stack that is booted from the network by the bootstrap agent. The preboot DOS agent performs actions on a system as directed by the RDM server.

Preboot eXecution Environment (PXE). PXE is an industry standard client/server interface that allows networked computers that are not yet loaded with an operating system to be configured and booted remotely. PXE is based on Dynamic Host Configuration Protocol (DHCP). Using the PXE protocol, clients can request configuration parameter values and startable images from the server.

The PXE process consists of the system initiating the protocol by broadcasting a DHCPREQUEST containing an extension that identifies the request as coming from a client that uses PXE. The server sends the client a list of boot servers that contain the operating systems available. The client then selects and discovers a boot server and receives the name of the executable file on the chosen boot server. The client downloads the file using Trivial File Transfer Protocol (TFTP) and executes it, which loads the operating system.

Redundant Array of Independent Disks (RAID). RAID is way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O operations can overlap in a balanced way, improving performance. Multiple disks increase the mean time between failure (MTBF) and storing data redundantly increases fault-tolerance.

system. An individual, target system being deployed or managed by RDM. In IBM Director terminology, an RDM system is always a platform managed object. These can represent any of the supported-by-RDM systems. They cannot represent an IBM Director object that RDM does not process, such as a chassis or an SNMP object.

task. An already defined and configured unit of work that is available to be applied to a system or a group (of systems). You create a task by clicking on the applicable task template from the RDM main console. RDM is installed with predefined tasks, such as data disposal and scan.

task template. A prototype of a specific kind of RDM task. This is a term used to describe the different kinds of tasks shown on the task pane in the main window of the RDM console. Each task template has its own characteristics and attributes. RDM comes with a set of task templates.

Wake on LAN. Technology developed by IBM that allows LAN administrators to remotely power up systems. The following components are essential for the Wake on LAN setup:

- Wake on LAN-enabled network interface card (NIC).

- Power supply that is Wake on LAN-enabled.

- Cable which connects NIC and power supply.

- Software that can send a magic packet to the system.

If the system has the first three of the previous components, the system is called a Wake on LAN-enabled system. Even though a system might be powered off, the NIC keeps receiving power from the system power supply to keep it alive. A network administrator sends a magic packet to the system through some software, for example, RDM or Netfinity IBM Director. The NIC on the system detects the magic packet and sends a signal to the power supply to turn it on. This process is also called *waking up the system*. Using RDM, this process can be scheduled for individual systems. The Wake on LAN feature and RDM together make it very easy for you to deploy software on individual systems on a scheduled basis.

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