



Updating ServeRAID Firmware/BIOS with RDM 4.11

A White Paper

Note:

Before using this information and the product it supports, read the general information in “Notices,” on page 17.

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1 Preface

This White Paper explains how to use IBM® Remote Deployment Manager (RDM) 4.11 (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 hundreds of 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 levels 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.
- Creating RDM user parameters and using them in an RDM task.
- Creating new RDM DOS system environments.
- 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 below).
3. Custom task to update disk-drive firmware.
4. Custom task to update Diagnostics.
5. Custom task to update Remote Supervisor Adapter II firmware.
6. Custom task to update network adapter firmware.
7. RAID Custom Configuration task.
8. Task to deploy the operating system and applications – one of these:
 - Windows Native Install task.
 - Windows Clone Install task.
 - Linux Native Install task.
9. Power Restore task.
10. CMOS Update task – modifies the CMOS/BIOS settings.

1.1 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.

1.2 Further reference

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

Guides

The following product documentation is available for RDM:

- *Remote Deployment Manager 4.11 Getting Started* – Step-by-step examples of using several tasks
- *Remote Deployment Manager 4.11 Operations Guide* – The main reference manual for RDM
- *Remote Deployment Manager 4.11 Installation Guide* – Describes the complete installation process of RDM
- *Remote Deployment Manager 4.11 Compatibility and Configuration Guide* – Lists RDM-supported hardware and software

Online help

In general, every window has 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.

Links

The following links are available for further information:

- You can subscribe to the RDM Users Forum to discuss problems and solutions with fellow users. Go to <http://www7.pc.ibm.com/~UMS/>.
- 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 4.11, 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 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 6.10 for this document, but the procedure should also work for other firmware levels.

2.1 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 4 diskettes.
3. Copy all the files (except DOS files like IBMBIO.COM, IBMDOS.COM, CONFIG.SYS, AUTOEXEC.BAT, and perhaps documentation files like README.TXT) from the flash diskettes to a folder named, in this example, D:\RAID610\.

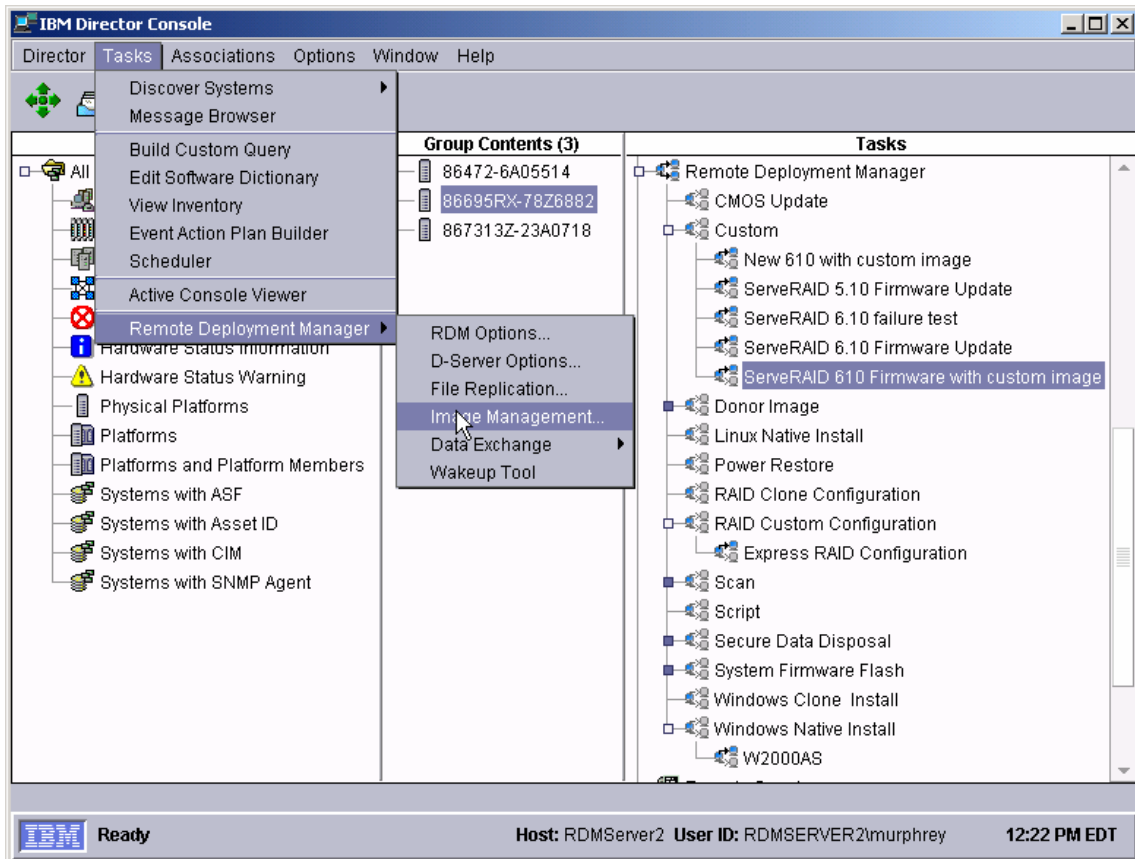
2.2 Create the batch file that will perform the flash operation

4. Create a D:\RAID610\RAIDFW.BAT file containing these statements:

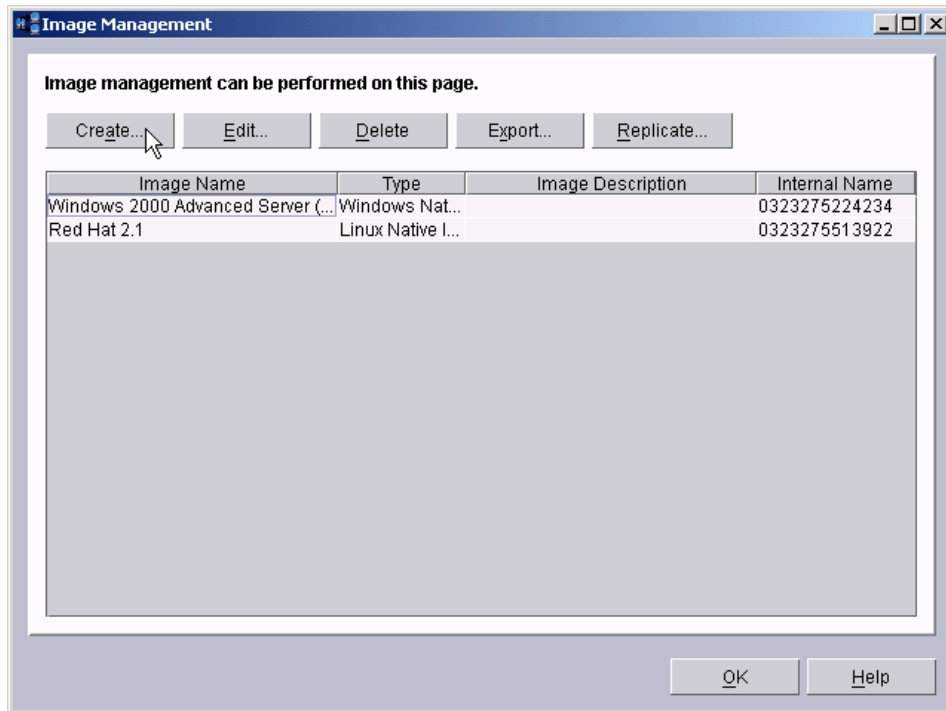
```
pinwhl
flashman /MFG %RAMDSK%\raidfw.log /CD:%RAMDSK% /AUTO
if ERRORLEVEL 1 goto ERROR
goto END
:ERROR
set RDRASLEVEL=1
set RDSTATUS="RDMSWM001E RAID BIOS/firmware update failed - see
%BOOTMAC%.custom.raidfw.log file in rdm temp directory"
mtftp put %SERVER_IP% %RAMDSK%\raidfw.log %BOOTMAC%.custom.raidfw.log
:END
```

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

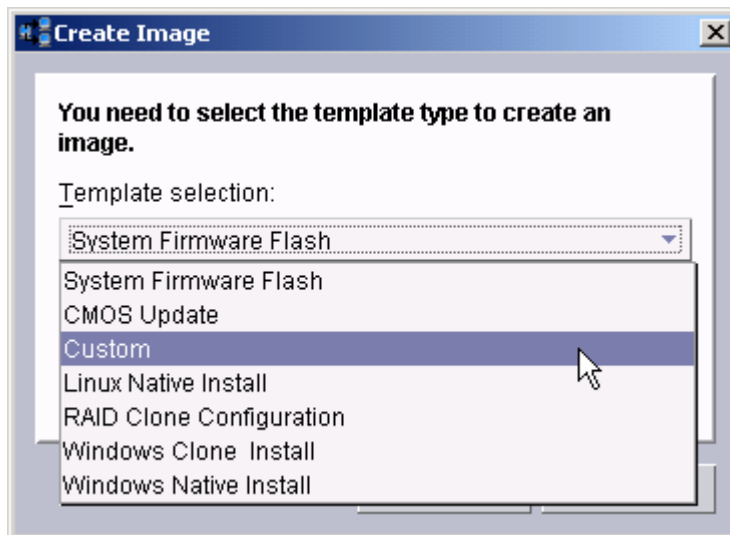
2.3 Create a ZIP-file image containing the ServeRAID files:



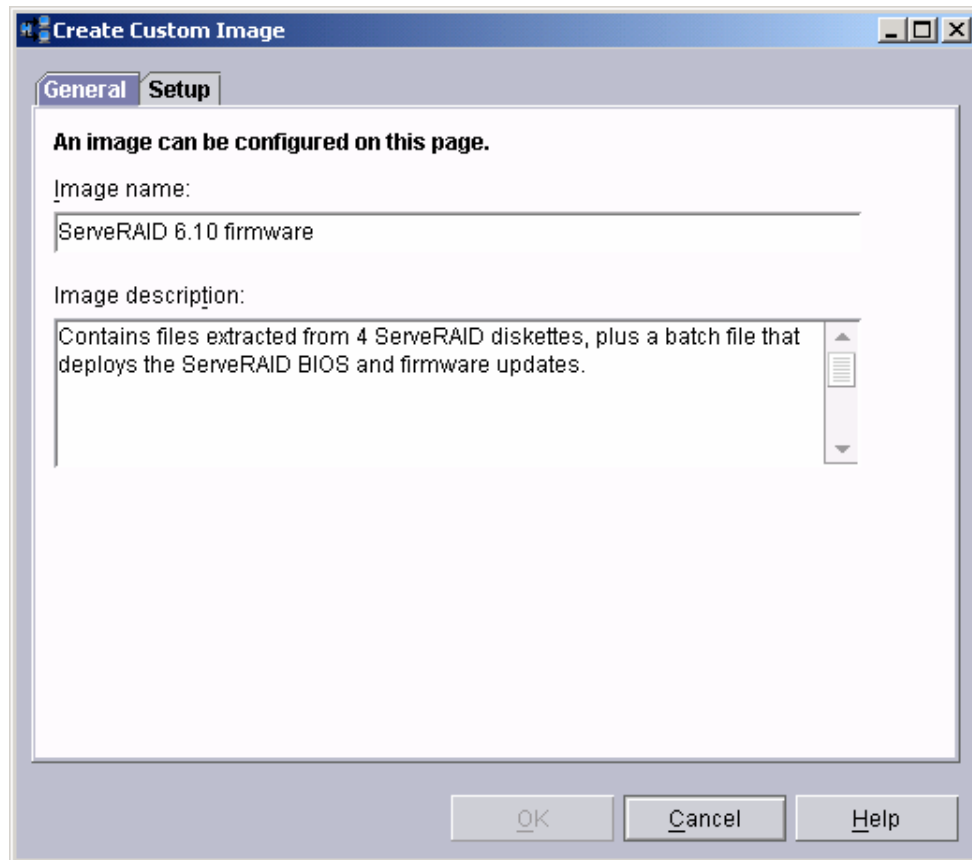
5. From the Director console, select the **Tasks**, **Remote Deployment Manager**, and **Image Management...** menus. This displays the Image Management window.



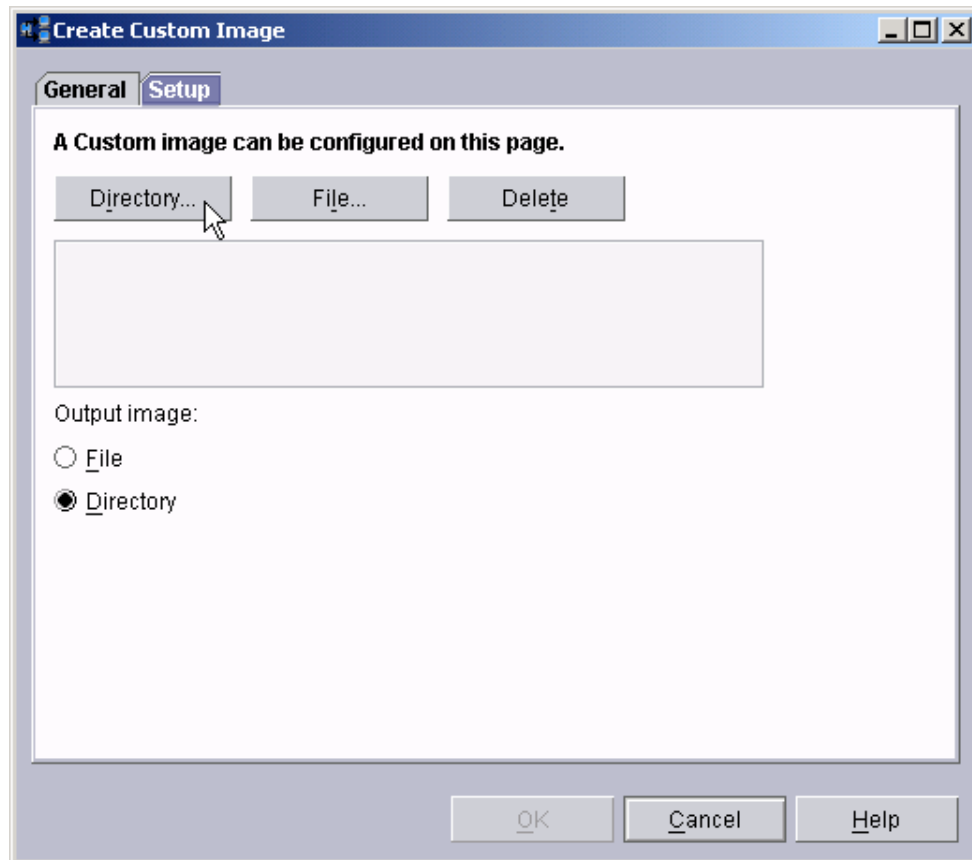
6. Select the **Create...** button.



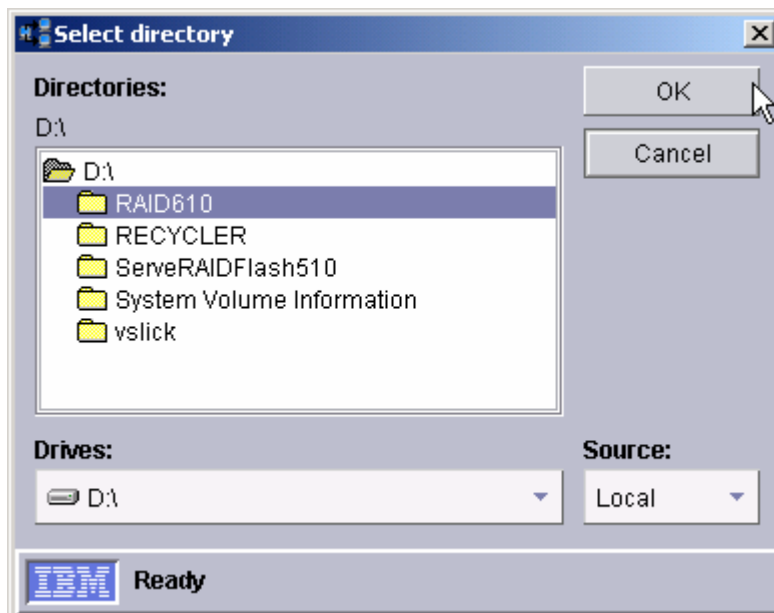
7. Select **Custom** from the drop-down list, and then select the **OK** button. This displays the Create Custom Image window.



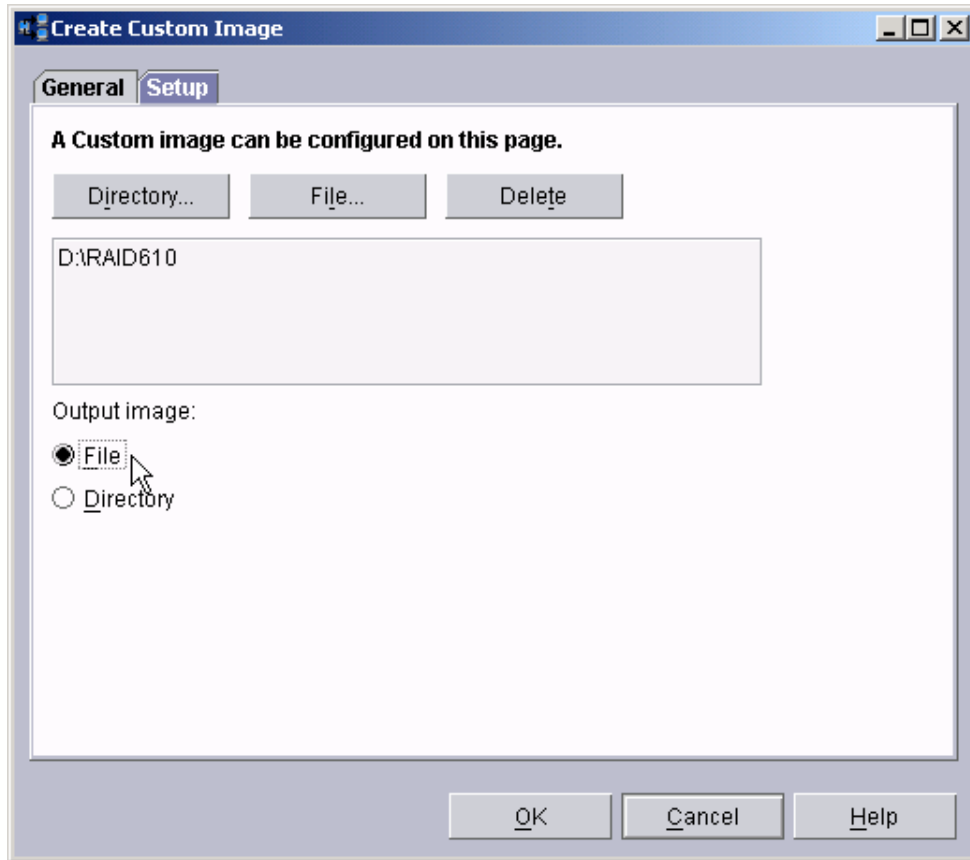
8. On the **General** tab, enter a name and (optionally) a description.



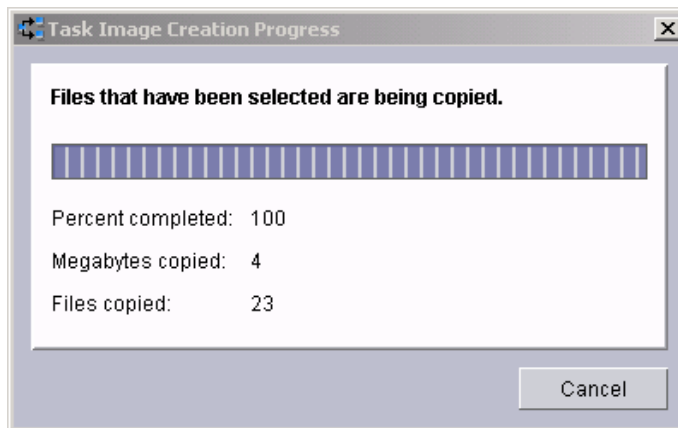
9. On the **Settings** tab, select the **Directory...** button. This displays a file dialog window.

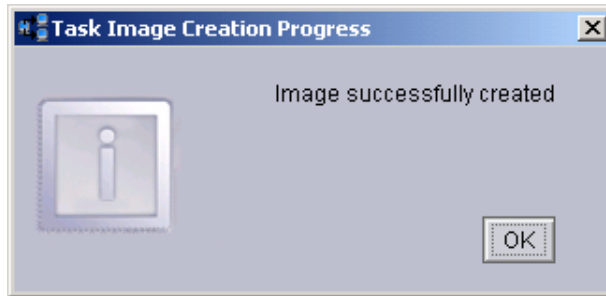


10. In the Select Directory window, Navigate to and select the D:\RAID610 directory. Then select the **OK** button.

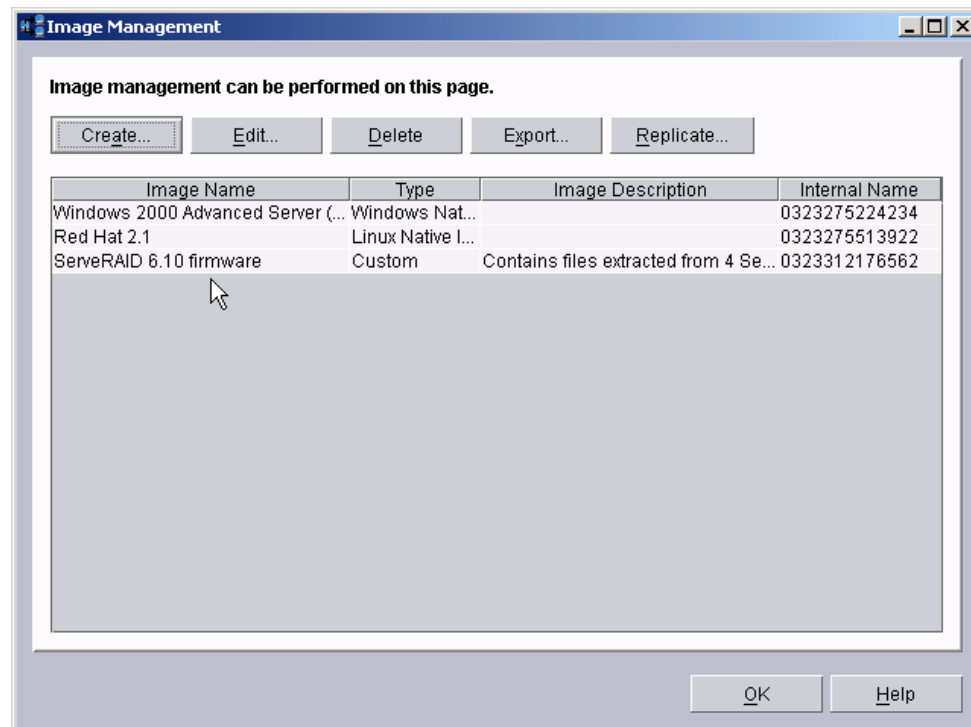


11. On the **Settings** tab, select the **File** radio button. This will cause RDM to create the image as a single ZIP file. Then select the **OK** button.



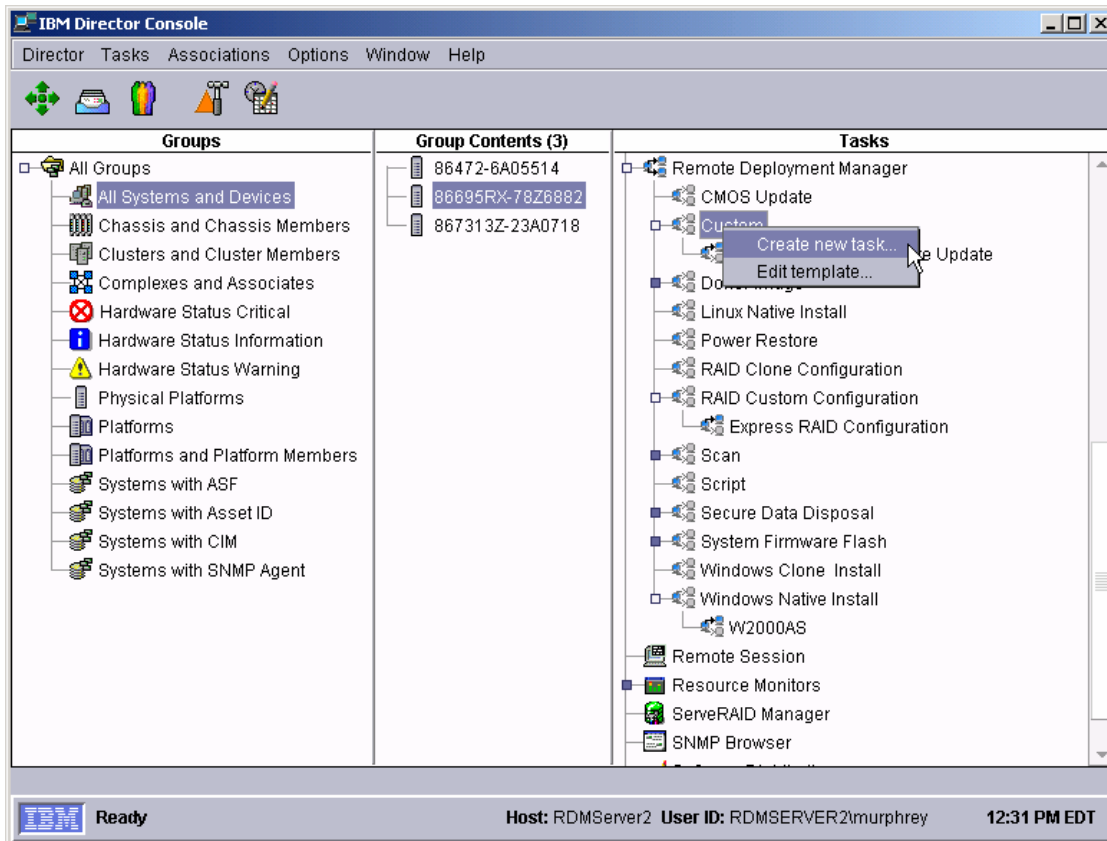


12. After the image creation is done, select the OK button on the Task Image Creation Progress window. The main Image Management window will now contain an entry for the new image.

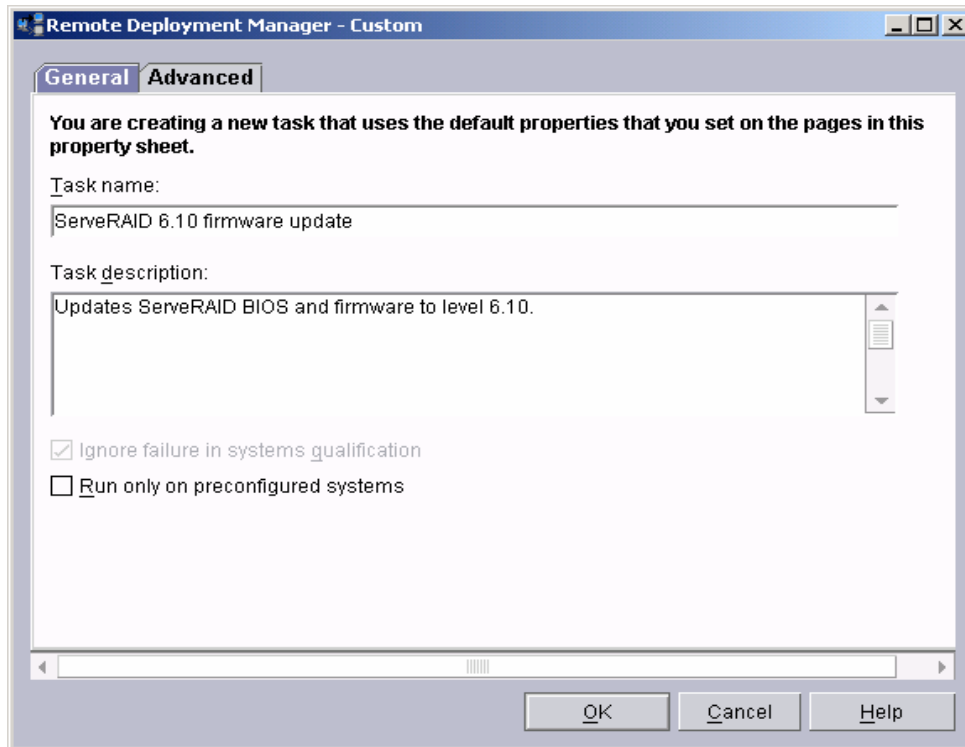


13. Note the internal name for the new image (0323312176562 in this example). You will need to use this name in a later step (see step 20 below).

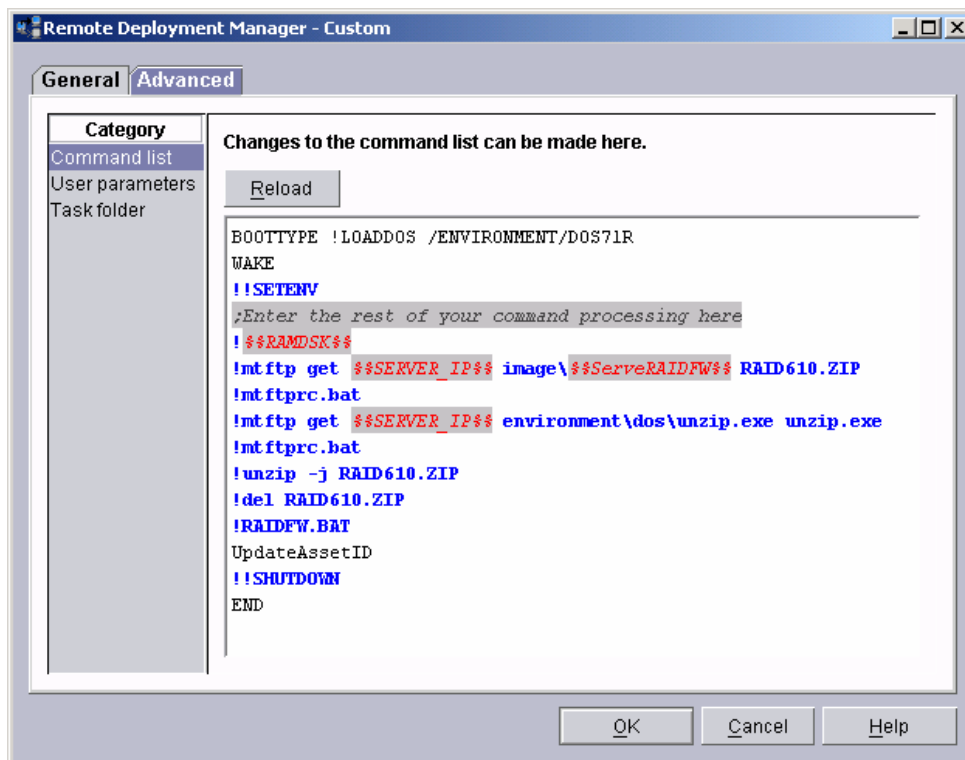
2.4 Create the Custom task that will deploy the ServeRAID firmware



14. Expand **Remote Deployment Manager** in the Tasks pane of the Director console, and right-click **Custom**. The menu is displayed.
15. 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.



16. Enter the task information on the General page (e.g., name the task *ServeRAID 6.10 firmware update*).



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

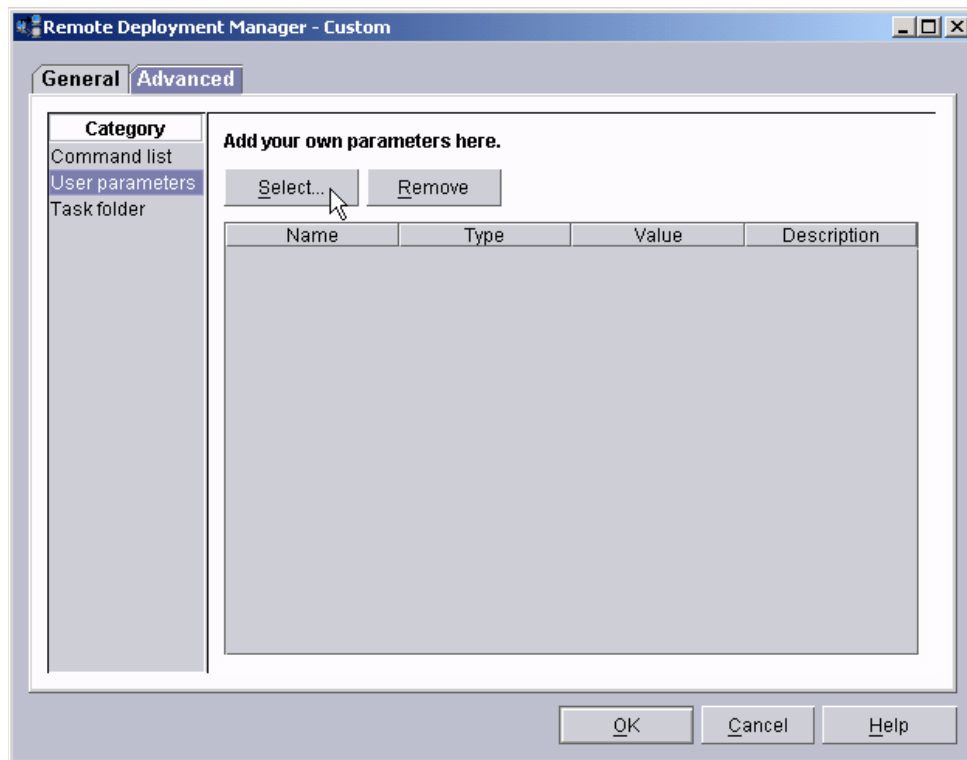
```
BOOTTYPE !LOADDOS /ENVIRONMENT/DOS71R
```

```

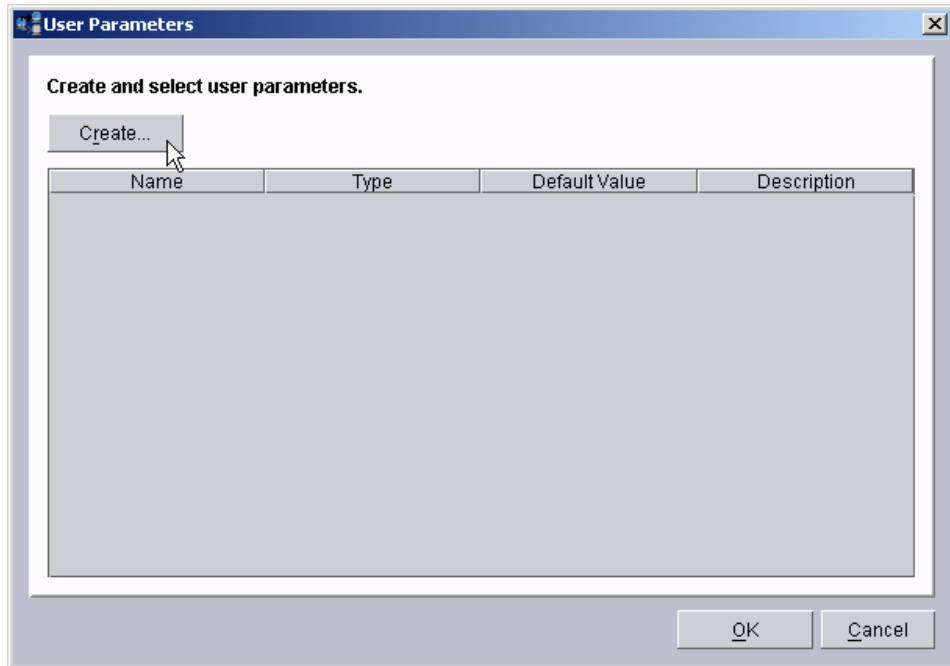
WAKE
!!SETENV
;Enter the rest of your command processing here
!%%RAMDSK%%
!mftftp get %%SERVER_IP%% image\%%ServeRAIDFW%% RAID610.ZIP
!mftftprc.bat
!mftftp get %%SERVER_IP%% environment\dos\unzip.exe unzip.exe
!mftftprc.bat
!unzip -j RAID610.ZIP
!del RAID610.ZIP
!RAIDFW.BAT
UpdateAssetID
!!SHUTDOWN
END

```

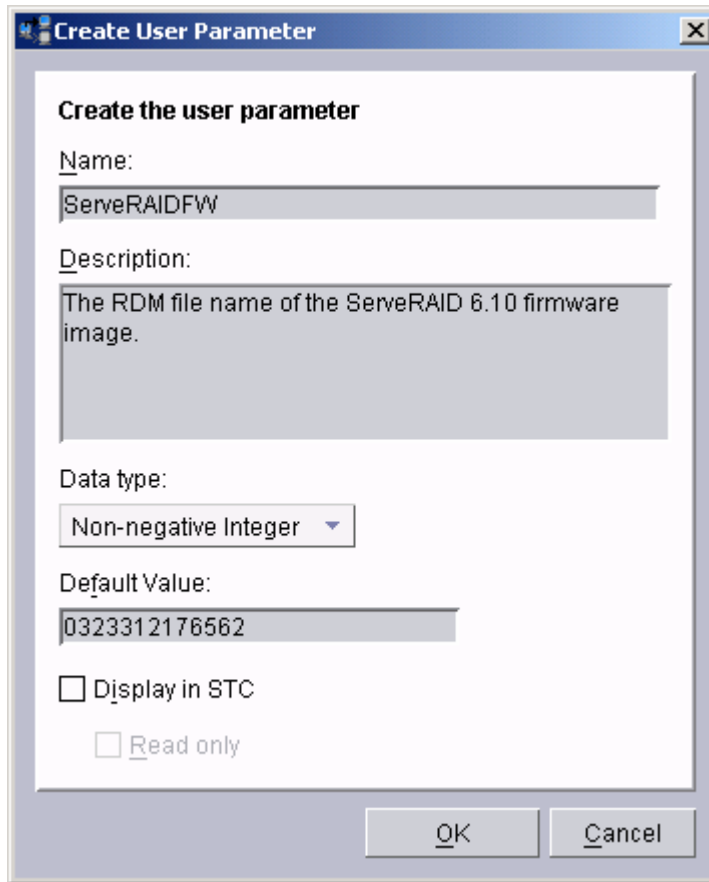
Note: The command list is a list of RDM and DOS commands that perform the Custom task. Refer to Appendix A, “Command list commands”, in the *Remote Deployment Manager 4.11 Operations Guide* for information on commands and syntax within a command list.



18. Select the **User parameters** category on the Advanced page. Then click the **Select...** button.

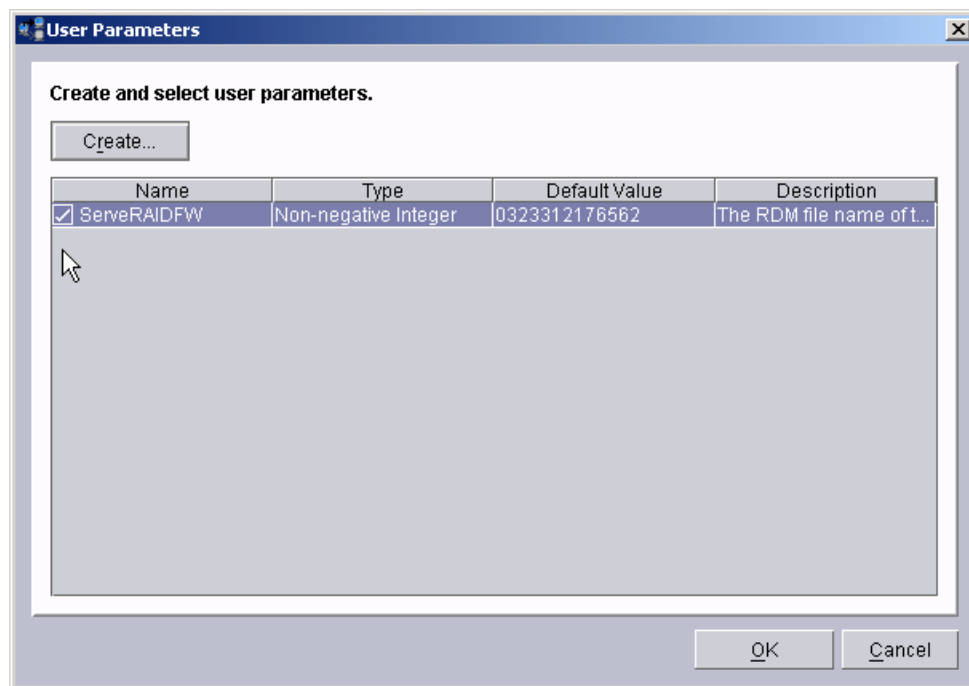


19. Select the **Create** button to display the Create User Parameter window.

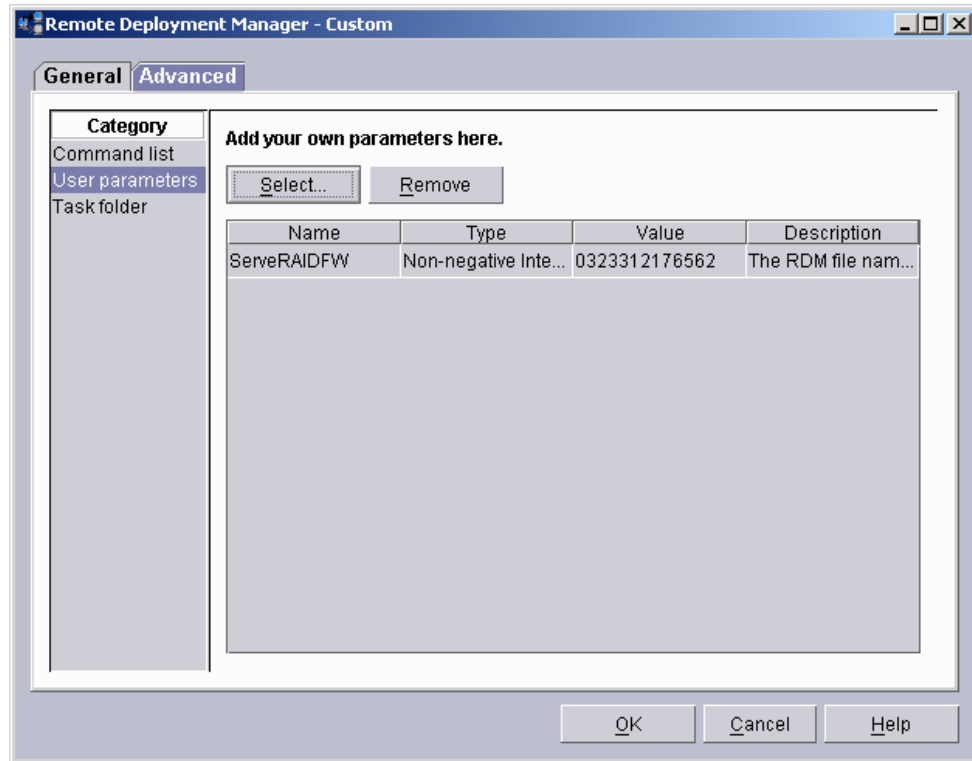


20. Enter all appropriate information. Then select **OK** to create the user parameter.

- **Name:** This name will be available on the target system as a DOS environment variable. It is used in the command list (see step 17 above) as the file name (in the RDM repository) of the ServeRAID image (see step 13 above).
- **Description:** This is an optional field to help document the use of this user parameter.
- **Data type:** Since the image file name is a number, we selected Non-negative Integer.
- **Default value:** This is the value that will be substituted when you use the user parameter in a command or DOS batch file. So if you use %%ServeRAIDFW%% in an RDM command list or %ServeRAIDFW% in a DOS batch file, they will be replaced by the default value 0323312176562 at run time.
- **Display in STC:** The custom task we are creating deploys a specific firmware level. Since that is not something we want to change at run time (i.e., the image is a function of the task, not of the system that the task will deploy), we won't put this user parameter into the System Task Configuration (STC) window. So we leave this box unchecked.
- **Read only:** This field is not applicable, since we chose not to display this user parameter in the STC window.



21. The User Parameters window now contains your new user parameter. Check the box (in the Name column) for this parameter. Then select the **OK** button.



22. Click the **OK** button to create the task.

2.5 Create the DOS System Environment that the task will use

The reason for creating a new DOS System Environment (instead of using DOS71F) is that none of the shipped environments has a big enough RAM drive to hold the files from 4 diskettes. If you later create other custom tasks with large amounts of data, you may reuse this environment with those custom tasks.

23. Using Windows Explorer, drag the <RDMInstallPath>\repository\local\env\71f directory to make a new directory named <RDMInstallPath>\repository\local\env\COPY of 71f.

24. Rename that directory to <RDMInstallPath>\repository\local\env\71r.

25. Using Notepad (or your favorite editor), modify the <RDMInstallPath>\repository\local\env\71r\config.sys file to look like this:

```

REM *****
REM * Remote Deployment Manager
REM * (C) Copyright IBM Corp. 1996, 2003 All rights reserved.
REM *****
REM * CONFIG.SYS file for the DOS71R DOS image.
REM * It contains HIMEM.SYS, and SWITCHES statements, but no
REM * EMM386.EXE statement. It is an IBM DOS 7.1 image used
REM * for RDM firmware update (e.g., ServeRAID flash) processing.
REM *****
DOS=HIGH,UMB
SWITCHES = /I
SHELL=A:\COMMAND.COM A:\ /E:1024 /P
DEVICE=A:\NET\PXUTIL.SYS -a A:\NET\PROTOCOL.INI
DEVICE=A:\DOS\HIMEM.SYS

```

```

DEVICE=A:\DOS\RAMDRIVE.SYS 16384 /E
LASTDRIVE=F
DEVICE=A:\NET\PROTMAN.DOS /I:A:\NET
DEVICE=A:\NET\NDIS.DOS
DEVICE=A:\NET\LCIPS.DOS

```

26. Using Notepad (or your favorite editor), modify the <RDMInstallPath>\repository\local\env\mkimages.bat file by adding the following statements immediately before the END statement:

```

echo .
echo . Making dos71R image
copy baseimg dos71R
bpdisk -d dos71R -i b
bpdisk -d dos71R -i o\r
bpdisk -d dos71R -i o\h
bpdisk -d dos71R -i 71R
move dos71R ..\..\repository\environment\dos71R

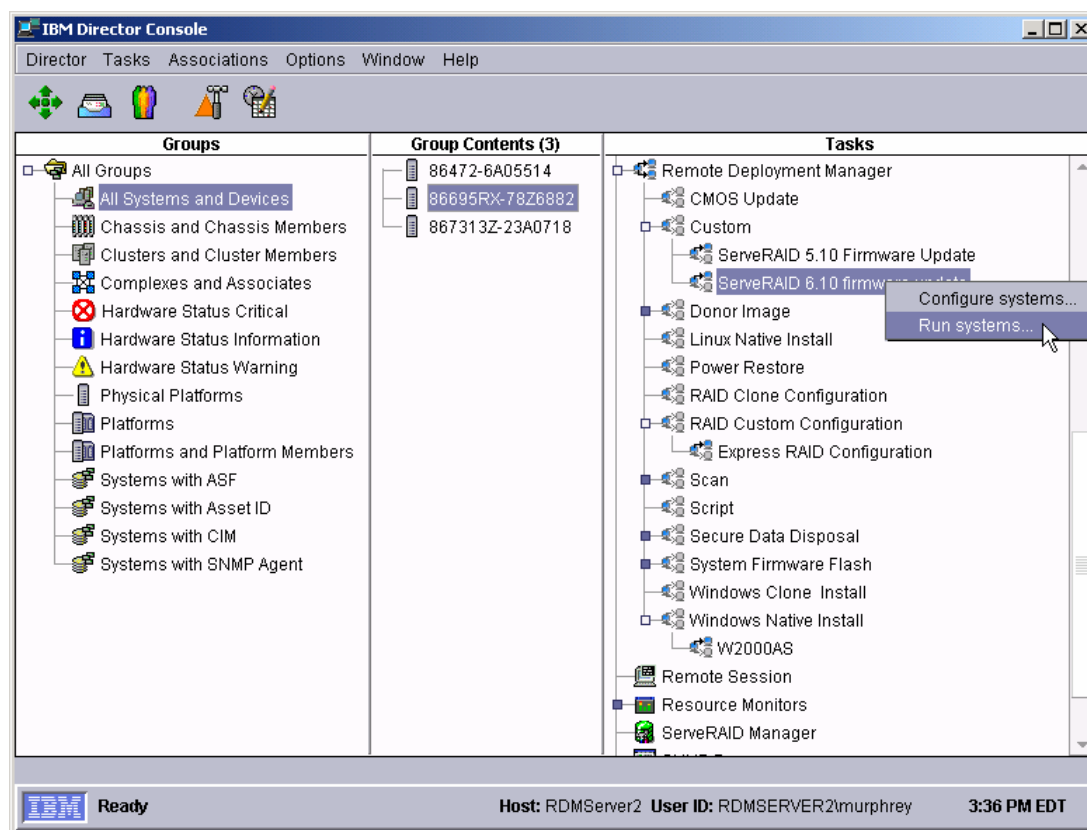
```

Note: DOS71R is the file name of the new DOS system environment. It is the name that is used in the task's command list (see step 17 above).

27. Execute the <RDMInstallPath>\repository\local\env\mkimages.bat file.

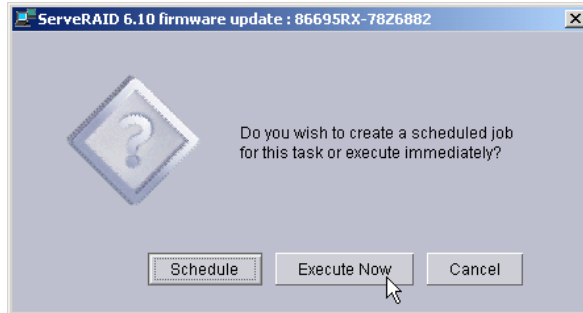
2.6 Test the new custom task

28. 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.



29. Drag the entry for that system and drop it on the new *ServeRAID 6.10 Firmware Update* 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.

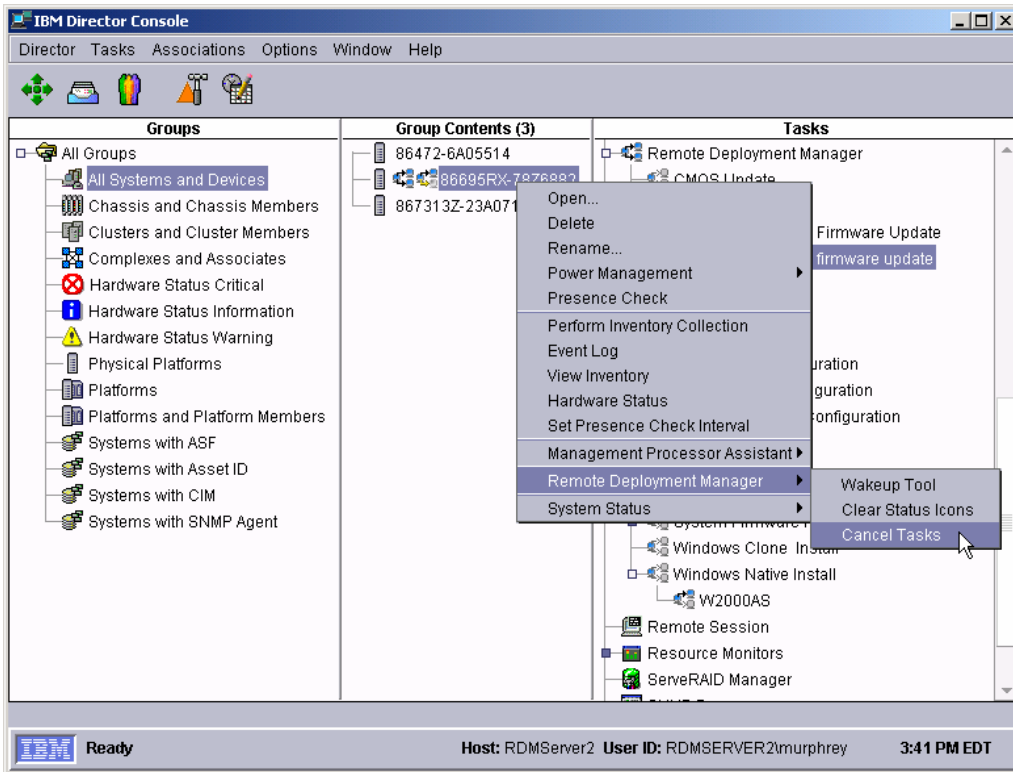


30. Click the **Execute now** button. The target system will wake up (i.e., automatically power itself on) and do a network boot.
31. Immediately after the Starting PC DOS... message appears on the system's monitor, press the F8 key. This allows you to step through all of the batch files statement-by-statement.
32. 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 29 above.



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4 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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