Updating Broadcom Network Adapter Firmware with RDM 4.30

A White Paper

May 5, 2006

Notes:

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Before using this information and the product it supports, read the general information in “Notices,” on page 29.

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1 Preface

This White Paper explains how to use IBM® Remote Deployment Manager (RDM) 4.30 or later to update the firmware on Broadcom® network adapters (either on-board or plug-in adapters) in a client system. You can use this document to learn how to do the following:

- Update network-adapter firmware.
- Create RDM custom tasks.
- Create RDM custom images and use them in an RDM task.
- Create RDM user parameters and use them in an RDM task.

This document provides 2 methods to create the custom task:

- Explicitly, using the step-by-step procedure in section 3 below.
- Importing from an attached file, using the procedure in section 2 below.

These methods are equivalent. Importing is much faster and less error-prone. We used RDM 4.30 to create the attached files.

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 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 4.30 Users Reference* – The main reference manual for RDM
- *Remote Deployment Manager 4.30 Installation and Configuration Guide* – Describes the complete installation process of RDM
- *Remote Deployment Manager 4.30 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-50575 to get the current versions of the above documents.

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.

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.

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 4.30, 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 to import a Task

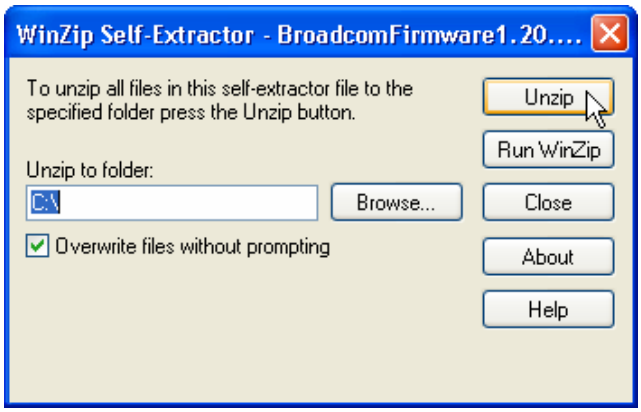
Because RDM 4.30 (or later) has the ability to import a task, you can use the attached file (which contains an exported copy of the task created in section 3 below) to create your custom task.

2.1 Unzip the Attached File

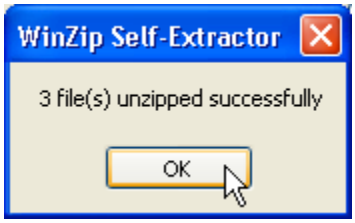
1. Extract the attached self-extracting ZIP file, *BroadcomFirmware1.20.17.EXE*, by right clicking on the paperclip icon and saving the file to disk.

   Note: You may need Adobe Acrobat Reader 6.0.1 or later to be able to extract the file. If you are using Adobe Acrobat Reader 7.0 or later, you may need to modify your Windows Registry to be able to extract the file. See http://www.adobe.com/support/techdocs/328671.html and http://www.adobe.com/support/techdocs/328671.html for configuration instructions.

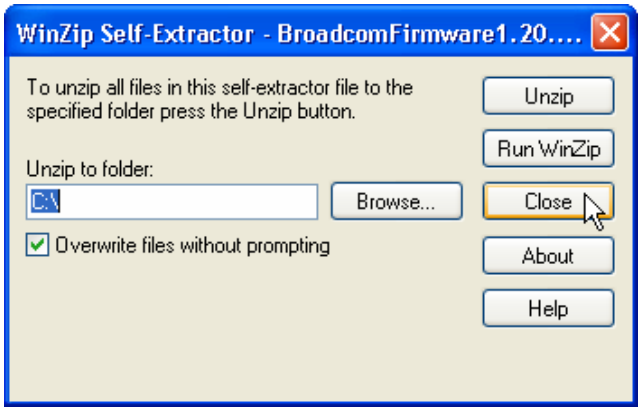
2. Run *BroadcomFirmware1.20.17.EXE*.
3. Change the target folder name to C:\, and then click the *Unzip* button.



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

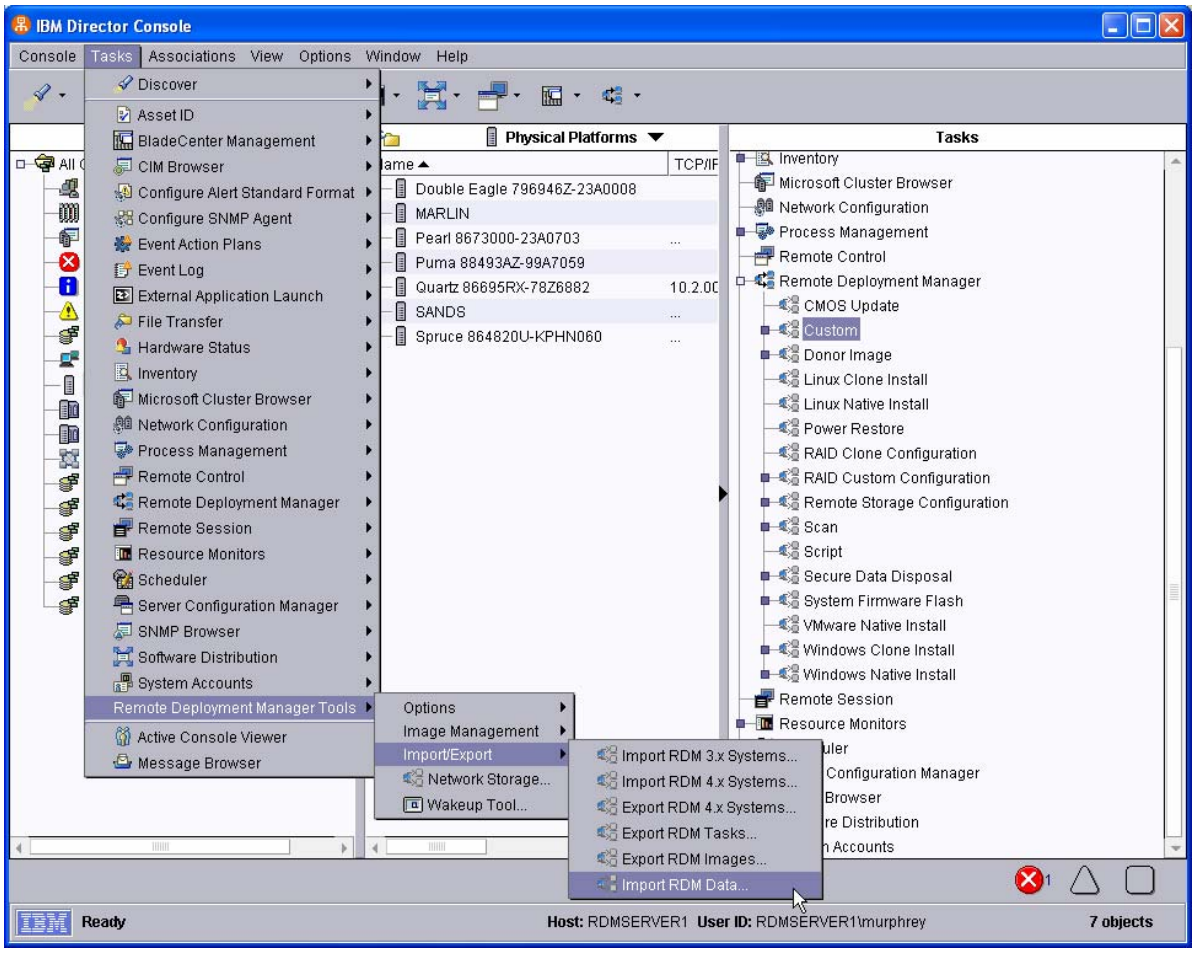


5. Click the *Close* button to exit WinZip.

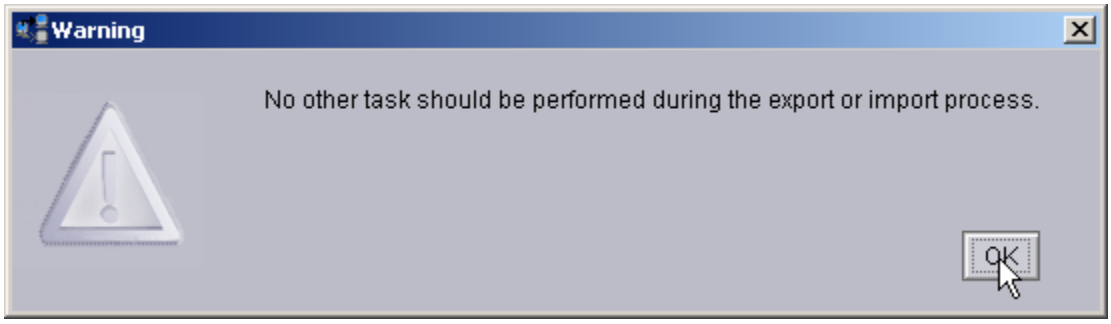


2.2 Import the Custom Task

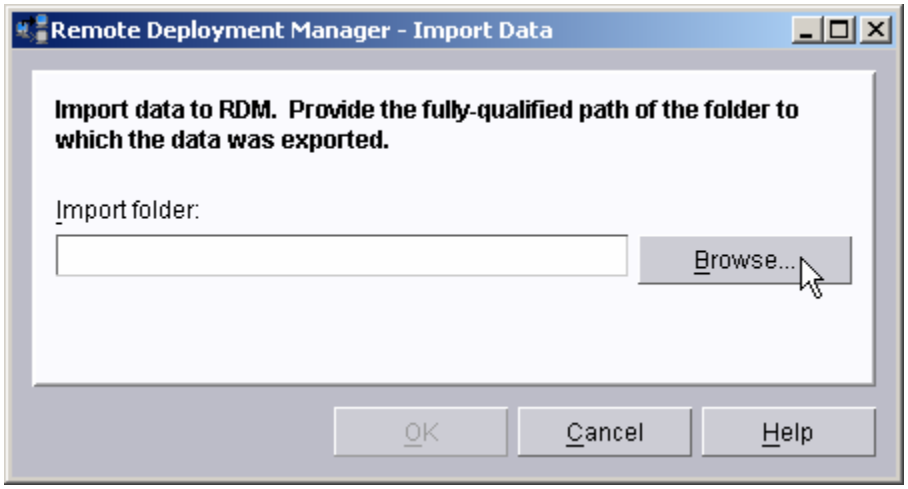
6. From the Director console, select the **Tasks**, **Remote Deployment Manager**, **Import/Export,** and **Import RDM Data...** menus.



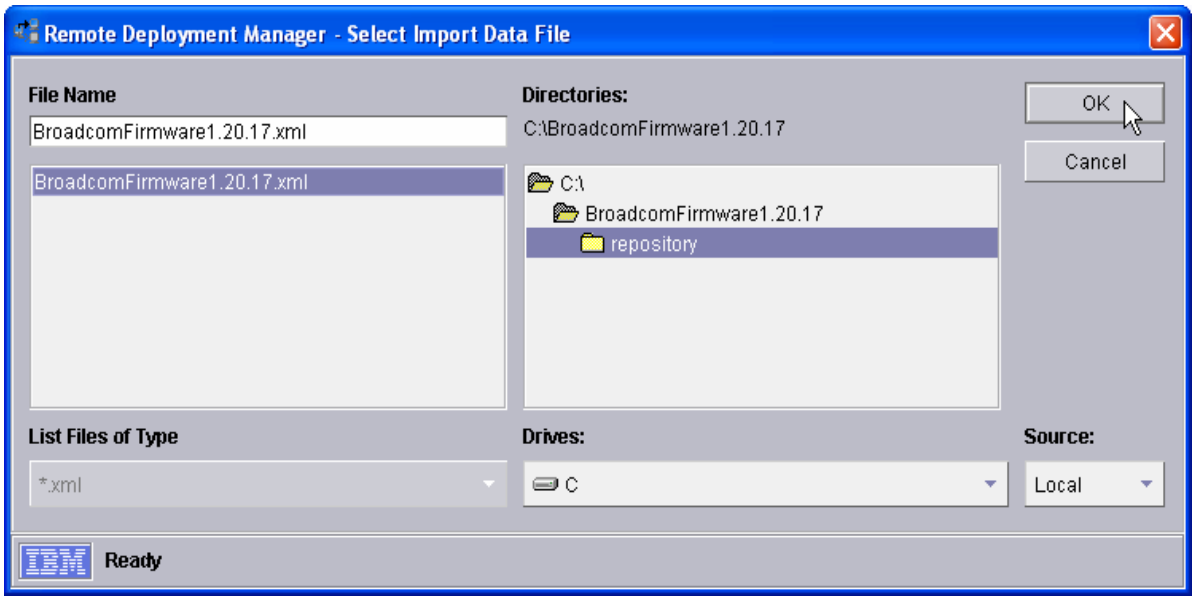
7. Make sure that you are not running any other RDM tasks. Then click *OK* on the warning message.



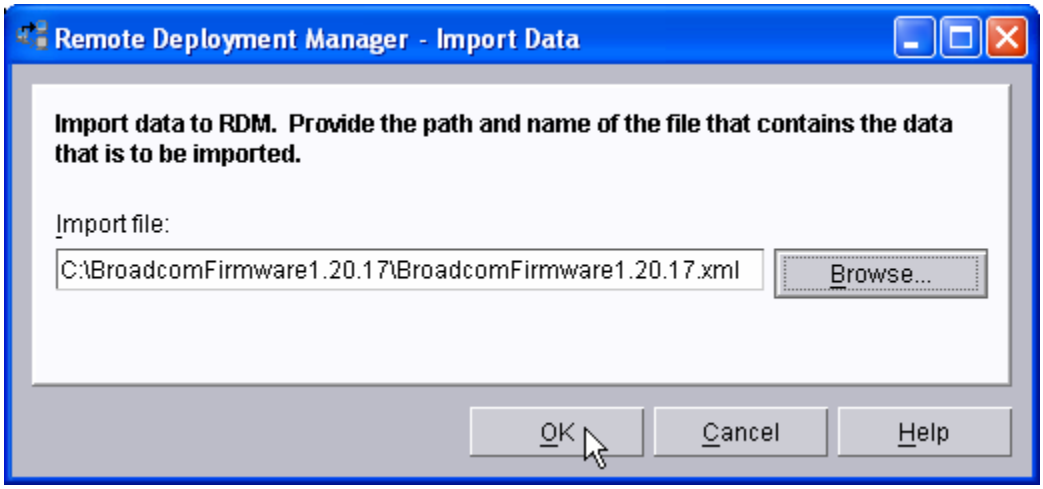
8. Select the *Browse* button on the *Import Data* window.



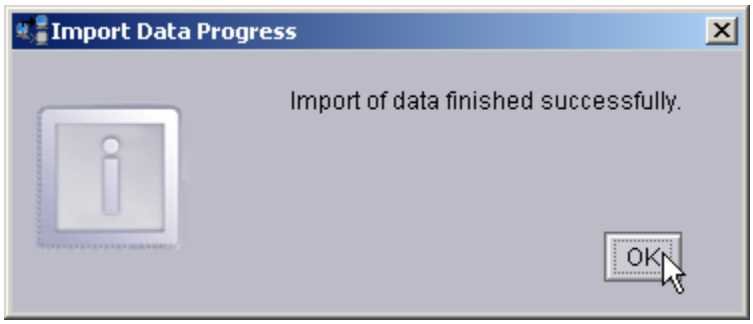
9. Navigate to the *BroadcomFirmware1.20.17* folder, select the *BroadcomFirmware1.20.17.xml* file, and then select the *OK* button.



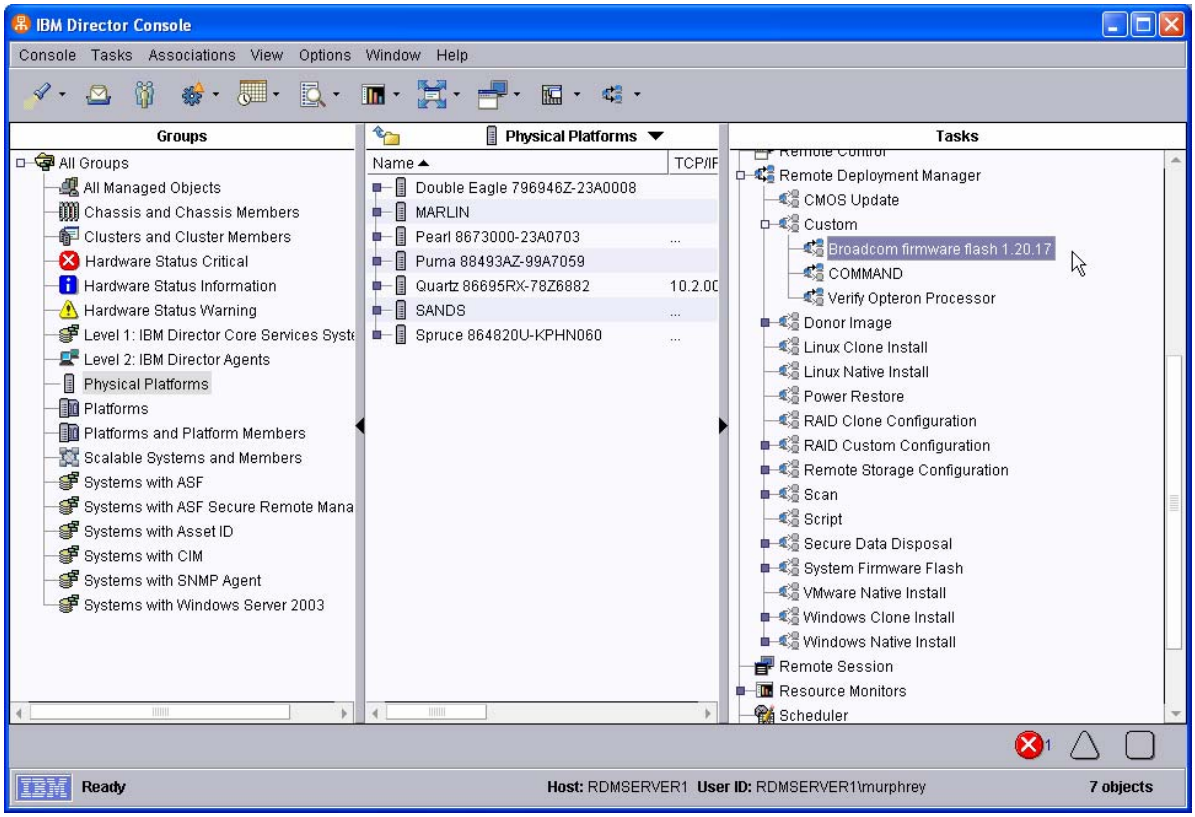
10. Select the *OK* button on the *Import Data* window.



11. Select the OK button on the Progress Indicator message window.



12. Expand the Custom template to validate that the new task is there.



3 Procedure to create a task manually

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 commands that are to be executed as part of the task.
- An image file that contains all the supporting files that are required by the commands.

This example creates a Custom flash task for Broadcom network-adapter firmware.

Note: If you want to import the actual task used in the creation of this document, follow the procedure in section 2 above.

3.1 Acquire the network-adapter firmware files

1. Download the firmware-update package and create the firmware-update diskette. The firmware used to create this section of the white paper was version 1.20.7, which is no longer current. The procedure and files remain valid for the current version. The current version of the firmware is 1.20.17, located at the following web site:

   http://www-306.ibm.com/pc/support/site.wss/document.do?lndocid=MIGR-53693

2. Run the executable, ibm_sw_sgtk_2006-04-19a_anyos_i386.exe, which will unzip the files to a directory.
3. Run the self-extracting executable, SelfExtract_v120_17.EXE, to create the diskette.
4. Insert the diskette in your diskette drive, and run the following command:

   ```
   A:\BIN.EXE –d –o C:\ >NULL
   ```

   This will create the C:\UPDATE directory, which you will use in the next steps.

   Note: Previous versions of this document used the following command:

   ```
   A:\BIN.EXE –d –o C:\UPDATE >NULL
   ```

   The current version of BIN.EXE creates the UPDATE directory automatically. If you use the older command, it will create the C:\UPDATE\UPDATE directory.

3.2 Modify the UPDATE.BAT file

5. Open your favorite text editor (e.g., NOTEPAD.EXE) to modify file C:\UPDATE\UPDATE.BAT.
6. Add a “-all” parameter to every statement that runs b57diag (shown in **bold** in the example below). This disconnects the network adapter from the network and enables the adapter to allow b57diag to update the firmware. Note that this parameter is positional; it must be the first parameter on the command.
7. Add error-handling statements after label “:nofile” (shown in **bold** in the example below). These statements cause the task to fail and the appropriate error message to be displayed in the task’s execution history.
8. Add error-handling statements after label “:syntax” (shown in **bold** in the example below). These statements cause the task to fail and the appropriate error message to be displayed in the task’s execution history.

9. Add a statement “IF EXIST A:\NET\TREBOOT.EXE A:\NET\TREBOOT.EXE” after label “:done” (shown in **bold** in the example below). This forces the system to reboot immediately after B57DIAG.EXE updates the firmware. It is necessary, in order to prevent the task from hanging because the system’s network connection is no longer in effect.

Note that UPDATE.BAT contains no RDM error handling to report problems that occur while the flash program, b57diag.exe, is running. That is because at that point, the network adapter is disconnected from the network, so there is no way to communicate with the RDM server. The only way to detect such an error is to watch the target system’s monitor to observe any error messages.

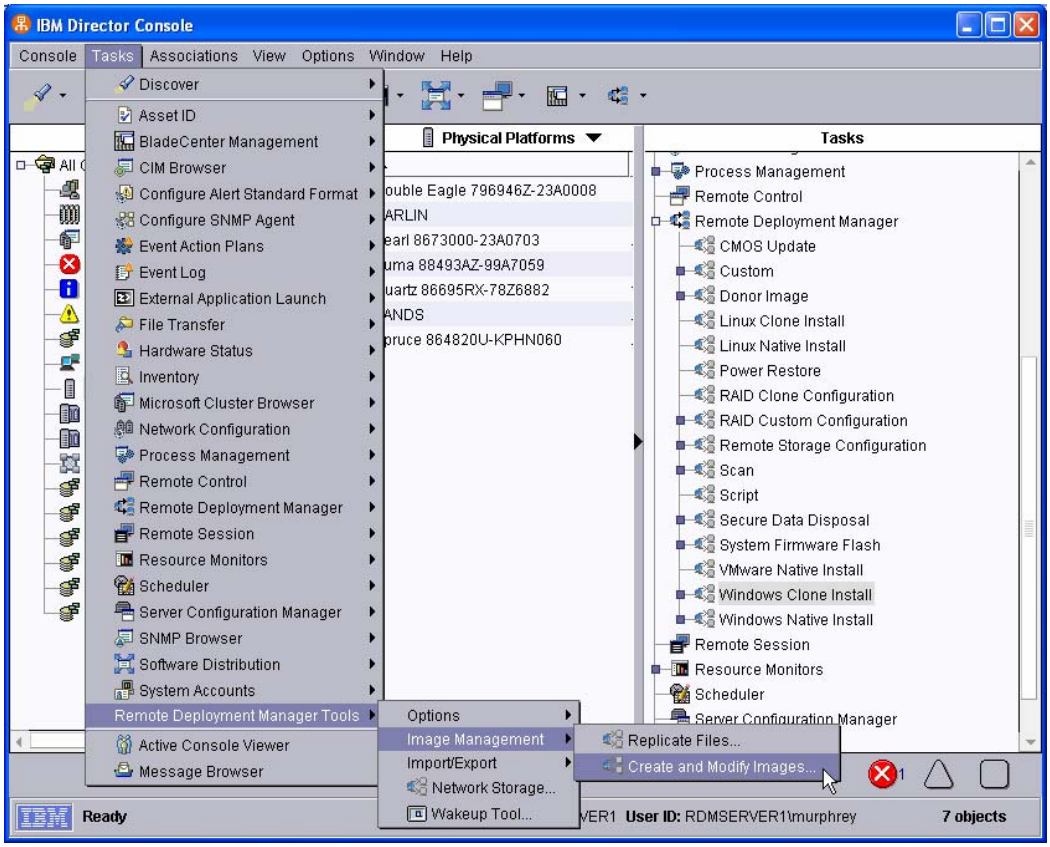
```
@echo off
echo Loading files...

if ".%1"=="." goto syntax
if ".%1"==".?" goto syntax

REM the following MTM share a bin file with a another product
if ".%1"==".8485" goto 5721IPMI
if ".%1"==".8490" goto 5721IPMI
if ".%1"==".8491" goto 5721IPMI
if ".%1"==".8837" goto 5721IPMI
if ".%1"==".8840" goto 5721IPMI
if ".%1"==".8841" goto 5721IPMI
if ".%1"==".8849" goto 5721IPMI

if ".%1"==".8648" goto 5721ASF
if ".%1"==".6218" goto 5721ASF
if ".%1"==".6223" goto 5721ASF
if ".%1"==".6225" goto 5721ASF
if ".%1"==".6227" goto 5721ASF
if ".%1"==".6228" goto 5721ASF

if ".%1"==".7981" goto selectSoL
if ".%1"==".8832" goto selectSoL
if ".%1"==".8843" goto selectSoL
if ".%1"==".8850" goto selectSoL

if ".%1"==".8864" goto 8863
if ".%1"==".8865" goto 8863
if ".%1"==".8872" goto 8863
if ".%1"==".8874" goto 8863

if ".%1"==".8862" goto 8861
if ".%1"==".8649" goto 8647
if ".%1"==".8848" goto 8835
if ".%1"==".6217" goto 6224


set binfile=%1\%1.bin
set params=-updatesecfg -updateasfcfg
goto update

REM the 6224 and 6217 use the same file
:6224
set binfile=6224\6224.bin
set params=-updatesecfg -updateasfcfg
goto update

REM the 8863, 8864, 8865, 8872, 8874 use the same file
:8863
set binfile=8863\8863.bin
set params=-updatesecfg -updateasfcfg
goto update

REM 8835 and 8848 use same file
:8835
set binfile=8835\8835.bin
set params=-updatesecfg -updateasfcfg
goto update
```

```
REM 8861 and 8862 use same file
:8861
set binfile=8861\8861.bin
set params=-updatesecfg -updateasfcfg
goto update

REM 8647 and 8649 use same file
:8647
set binfile=8647\8647.bin
set params=-updatesecfg -updateasfcfg
goto update

REM the 8837, 8840 and 8841 use the same file
:5721IPMI
set binfile=BCM5721\IPMI0.BIN
set params=-updatesecfg
goto update

REM the 8648, 6223, 6225, 6227 and 6228 use the same file
:5721ASF
set binfile=BCM5721\ASF0.BIN
set params=-updatesecfg -updateasfcfg
goto update


:selectSoL
REM *** selectSoL - BEGIN
REM Prompt user for SoL configure options and flash accordingly.
CLS
TYPE %1\info.txt
echo.
CP /C01Q /N /T0,10 Select an option (Q to Quit):
IF ERRORLEVEL 3 GOTO DONE
IF ERRORLEVEL 2 GOTO DEVICE1
IF ERRORLEVEL 1 GOTO DEVICE0

:DEVICE0
SET SoLDev=0
goto PrgSoL

:DEVICE1
SET SoLDev=1
goto PrgSoL

:PrgSoL
ECHO Flashing %1%SoLDev%.BIN  Broadcom Firmware and Configuring SOL for Device %SoLDev%
set binfile=%1\%1%SoLDev%.BIN
set params=-updatesecfg -updateasfcfg
goto update
REM *** selectSoL - END

REM************* BEGIN UPDATE *****************
:update
if NOT EXIST %binfile% goto nofile
copy %binfile% eep.bin > NULL
if NOT EXIST eep.bin goto noeep
if ".%2"=="." goto noparams
call bcomtool.exe eep.bin %2 %3 %4 %5 %6
if errorlevel 1 goto failed
:noparams
call b57diag -all -firmall eep.bin %params%
goto done
REM **************** END UPDATE ****************

:nofile
echo The ethernet firmware for the %1 was not found.
REM Added and modified the following to identify the error under RDM:
SET RDSTATUS=BCOMERR01E The ethernet firmware for the %1 was not found.
SLEEP 10
goto end
```

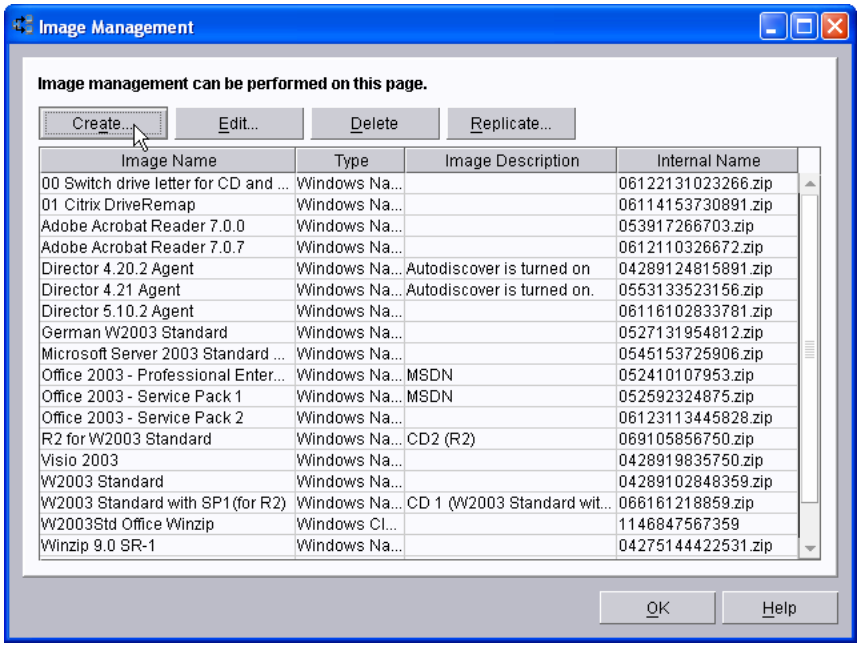
```
:noeep
echo Failed to create temporary binary file.
goto end


:syntax
cls
echo Use UPDATE.BAT to update the firmware. Usage is as follows:
echo.
echo    UPDATE DEVICE
echo.
echo where DEVICE is the 4 digit machine type or 7 character
echo part number of the device to be updated.
echo.
echo Example: To update the ethernet firmware of and IBM 8832
echo          you would type:
echo.
echo    UPDATE 8832
echo.
echo Type LIST for a list of products that can be updated with this
echo diskette. Type HELP to view this screen again.
echo.
REM Added the following to identify the error under RDM:
SET RDSTATUS=BCOMERR02E The command syntax was wrong: UPDATE %1 %2 %3 %4 %5 %6 %7 %8 %9
SLEEP 10
goto end

:aborted
echo Update aborted.
goto end

:failed
REM bcomtool.exe failed to execute correctly. bcomtool.exe should have provided error
message.
goto end

:done
echo.
echo Restart your computer.
REM Added the following to force reboot under RDM:
SLEEP 10
IF EXIST A:\NET\TREBOOT.EXE TREBOOT.EXE

:end
if EXIST eep.bin del eep.bin
if EXIST NULL del NULL
```

Note: If you want to enable Serial over LAN (SoL) on Device1 (the default is Device 0) you will need to customize this file. Please consult the SoL documentation for instructions.

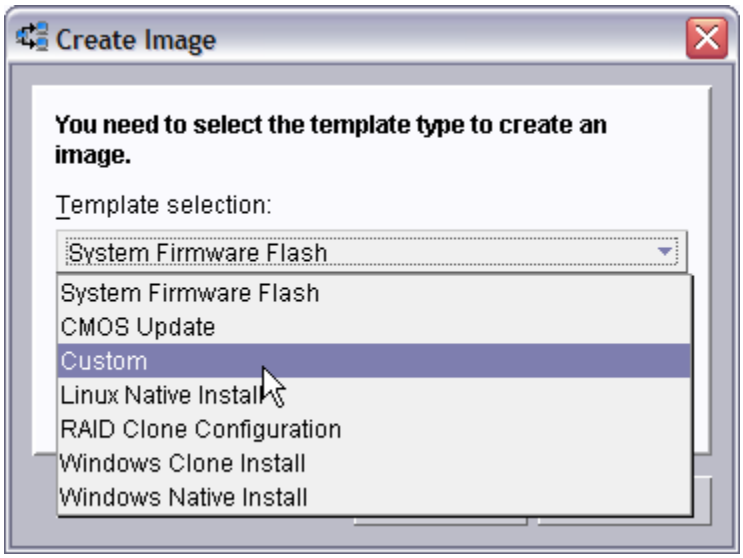
3.3 Create an image containing the firmware-update files



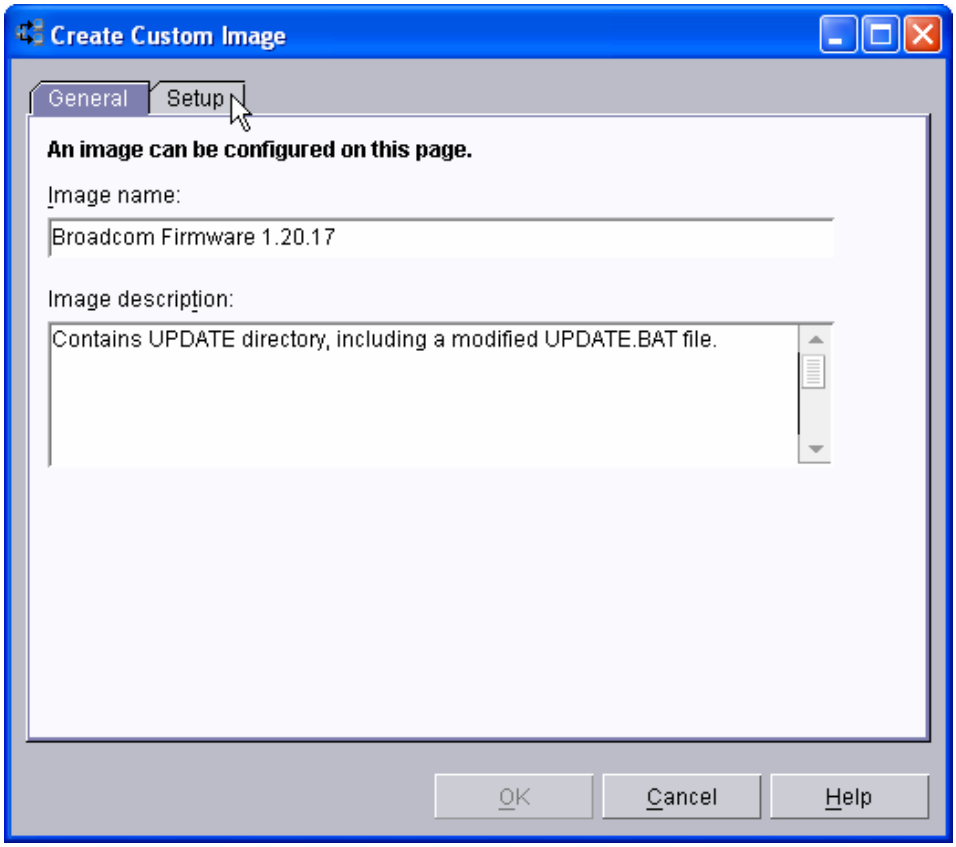
10. From the Director console, select the **Tasks**, **Remote Deployment Manager**, **Image Management…**, and **Create and Modify Images...** menus. This displays the *Image Management* window.



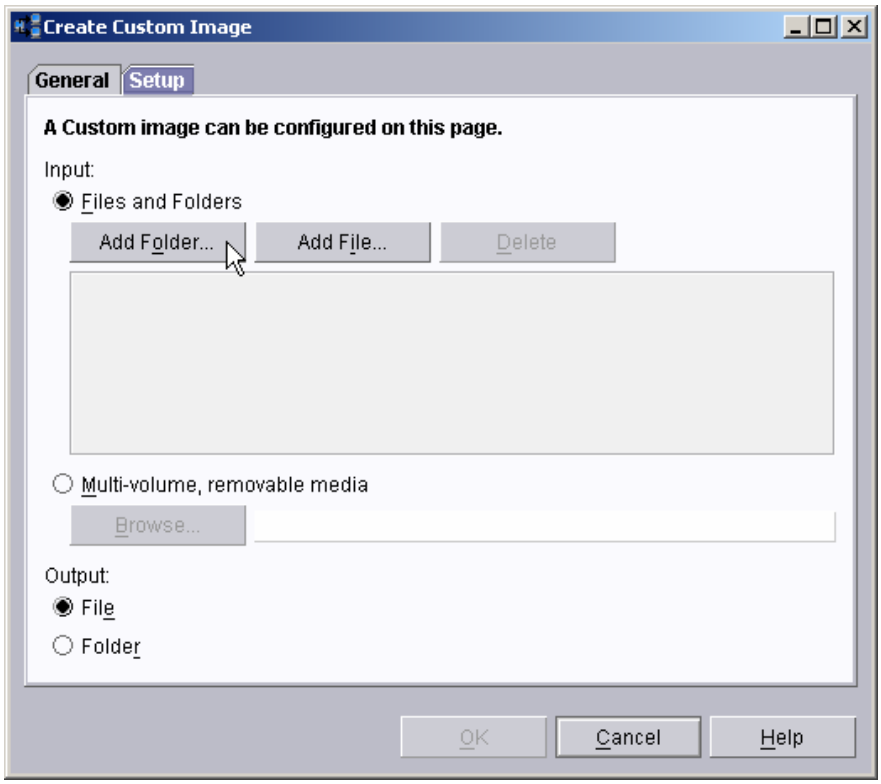
11. Select the **Create…** button. This displays the *Create Image* window.



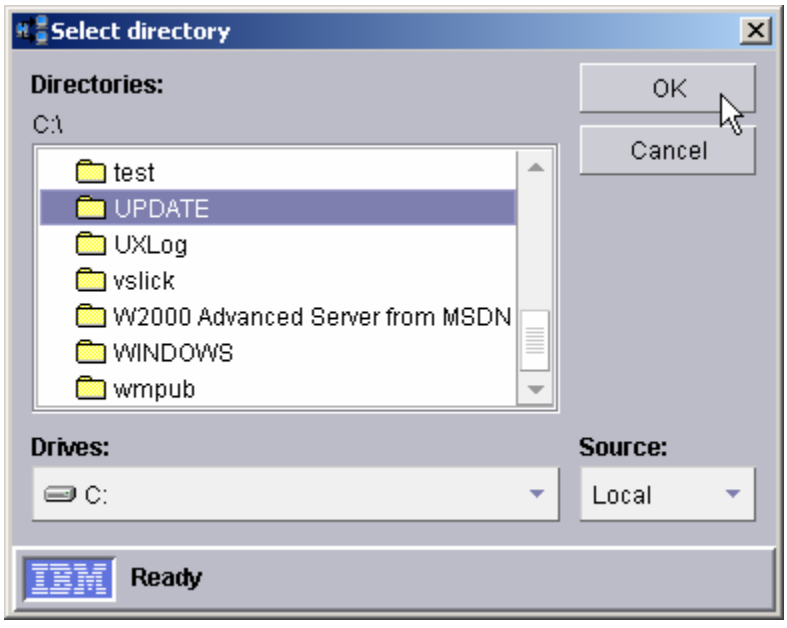
12. Select **Custom** from the drop-down list, and then select the **OK** button. This displays the *Create Custom Image* window. On the **General** tab, enter a name and (optionally) a description.



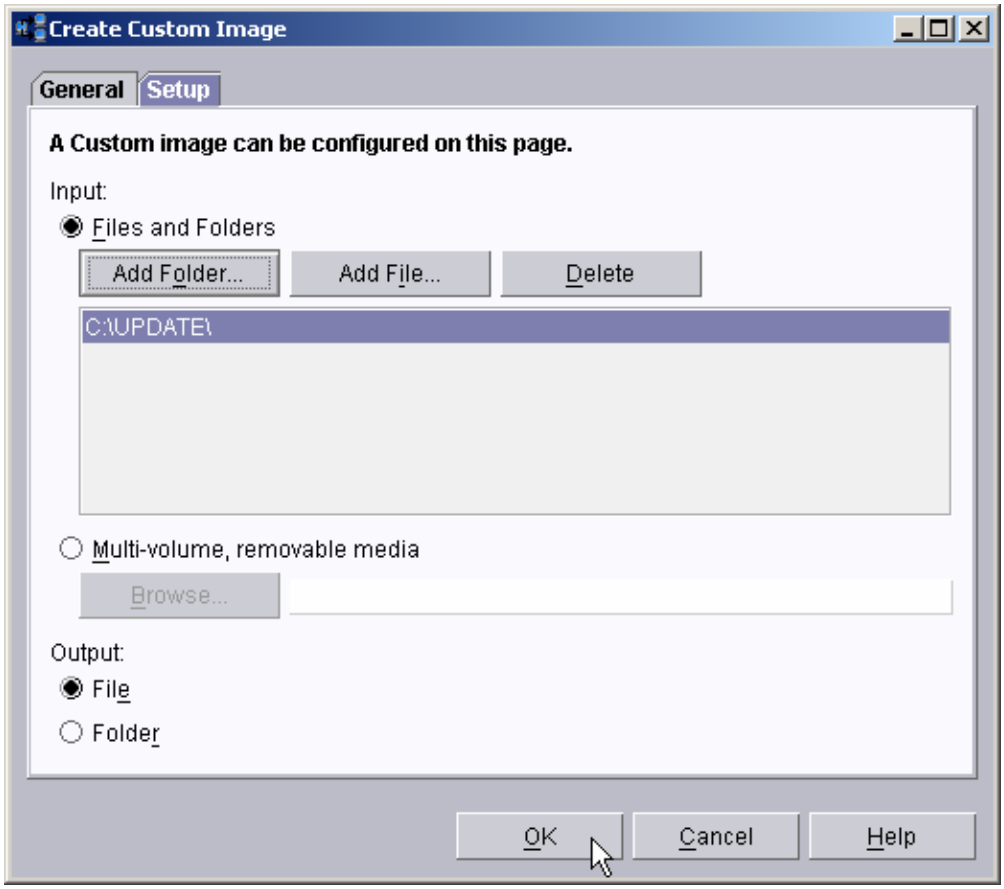
13. Select the **Setup** tab, and then select the **Add Folder…** button.



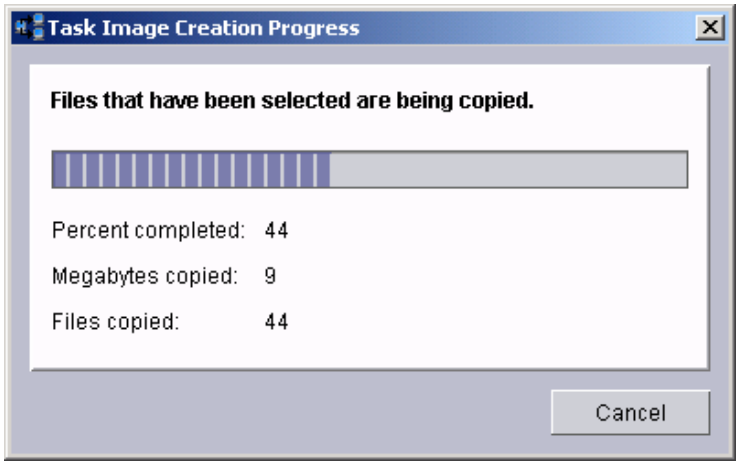
14. This displays a file dialog window named *Select Directory*. Navigate to and select the *C:\update* directory. Then select the **OK** button.



15. On the **Setup** page of the *Create Custom Image* window, select the **File** radio button. This will cause RDM to create the image as a single ZIP file. Then select the **OK** button.



16. The *Task Image Creation Progress* window displays.



17. When the copying is complete, a message window displays.

18. 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.

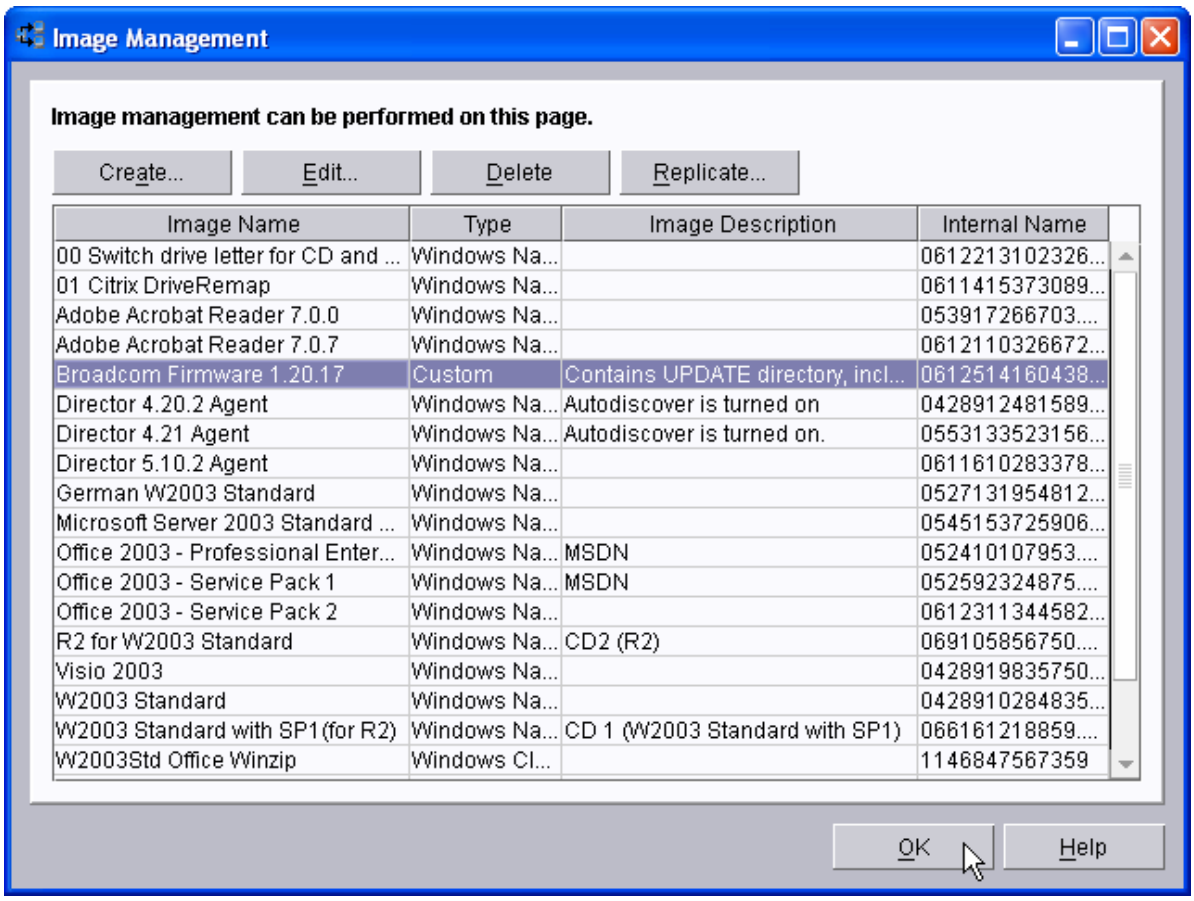
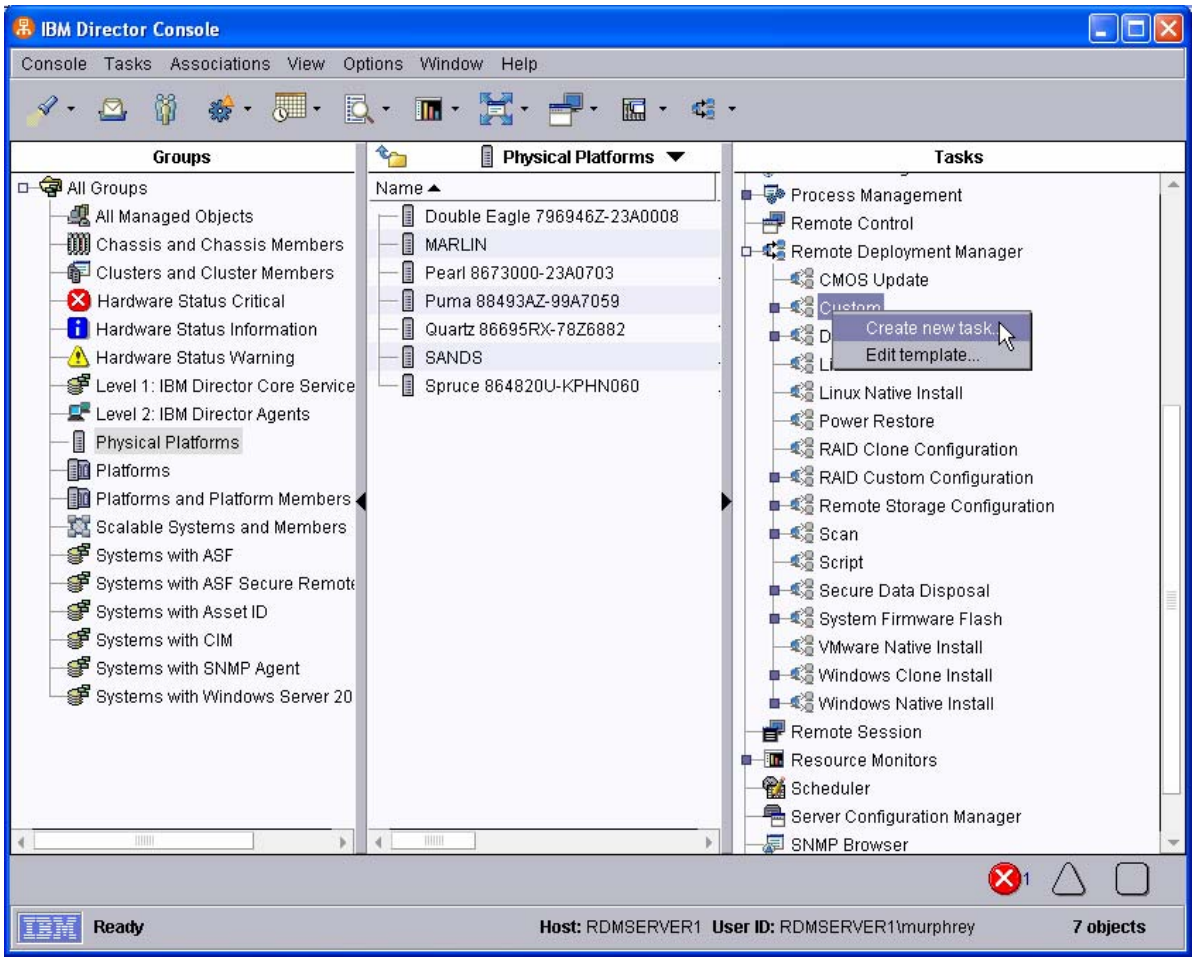


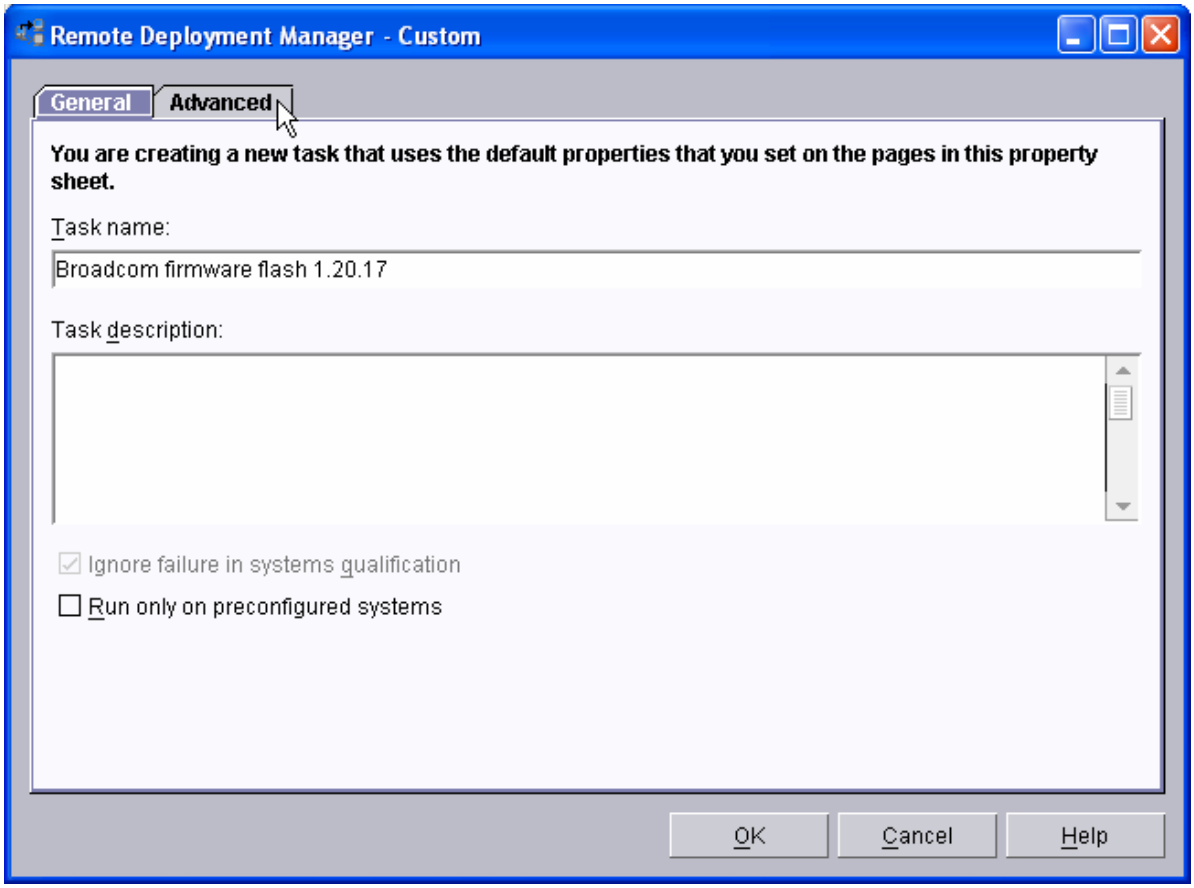
Image Name	Type	Image Description	Internal Name
00 Switch drive letter for CD and ...	Windows Na...		0612213102326...
01 Citrix DriveRemap	Windows Na...		0611415373089...
Adobe Acrobat Reader 7.0.0	Windows Na...		053917266703....
Adobe Acrobat Reader 7.0.7	Windows Na...		0612110326672...
Broadcom Firmware 1.20.17	Custom	Contains UPDATE directory, incl...	0612514160438...
Director 4.20.2 Agent	Windows Na...	Autodiscover is turned on	0428912481589...
Director 4.21 Agent	Windows Na...	Autodiscover is turned on.	0553133523156...
Director 5.10.2 Agent	Windows Na...		0611610283378...
German W2003 Standard	Windows Na...		0527131954812...
Microsoft Server 2003 Standard ...	Windows Na...		0545153725906...
Office 2003 - Professional Enter...	Windows Na...	MSDN	052410107953....
Office 2003 - Service Pack 1	Windows Na...	MSDN	052592324875....
Office 2003 - Service Pack 2	Windows Na...		0612311344582...
R2 for W2003 Standard	Windows Na...	CD2 (R2)	069105856750....
Visio 2003	Windows Na...		0428919835750...
W2003 Standard	Windows Na...		0428910284835...
W2003 Standard with SP1(for R2)	Windows Na...	CD 1 (W2003 Standard with SP1)	066161218859....
W2003Std Office Winzip	Windows Cl...		1146847567359

3.4 Create the Custom task that will deploy the Broadcom firmware



19. Expand **Remote Deployment Manger** in the *Tasks* pane of the Director console, and right-click **Custom**. The menu is displayed.
20. 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.

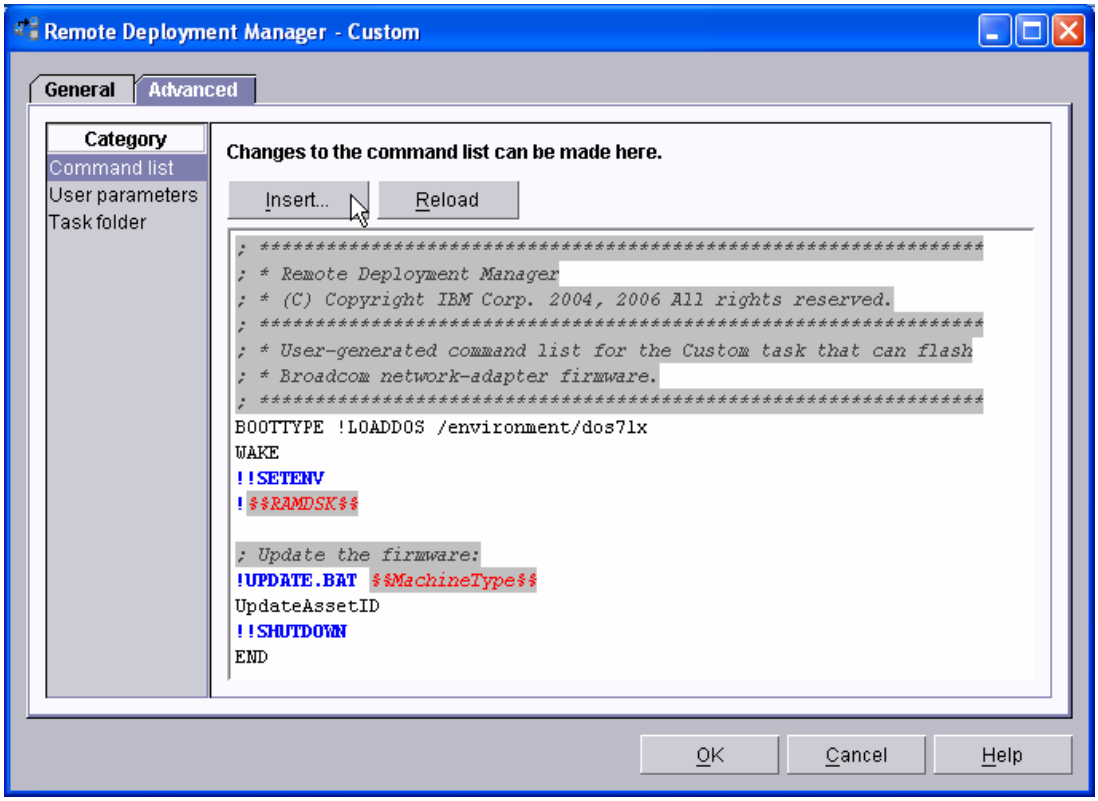
    Enter the task information on the *General* page (e.g., name the task *Broadcom Firmware Flash* and enter an appropriate task description).



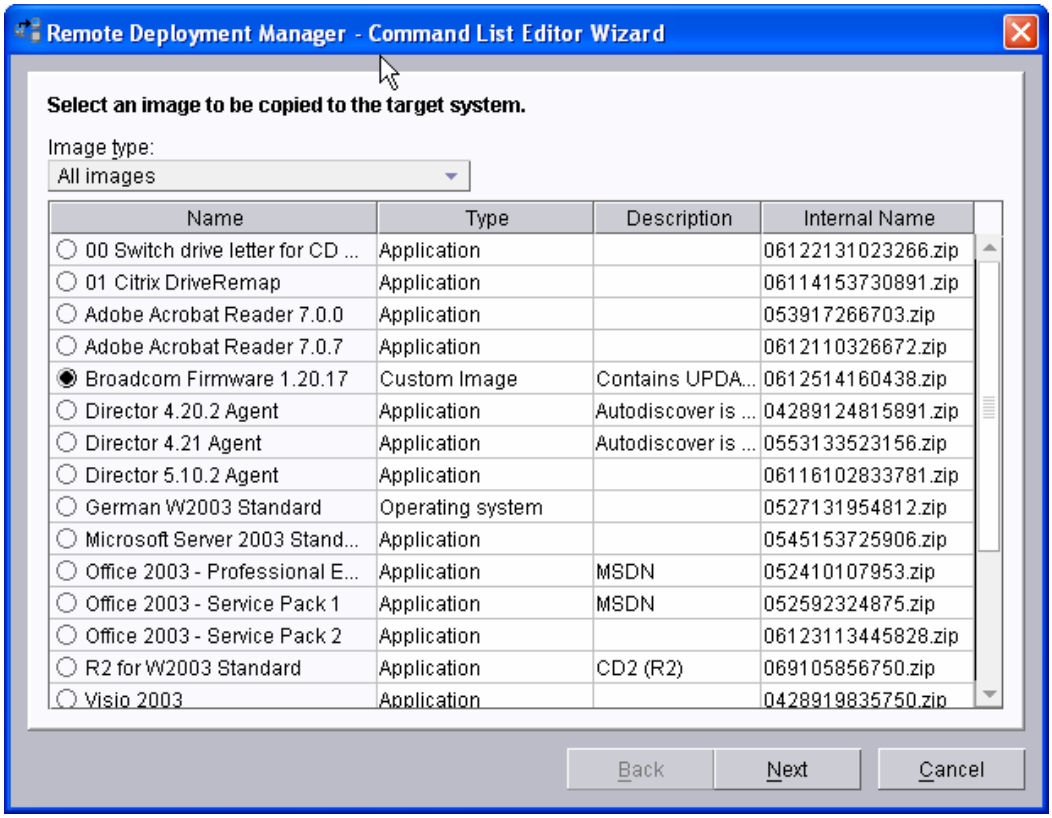
21. Click the **Advanced** tab, and modify the command list this way:

```
; ******************************************************************
; * Remote Deployment Manager
; * (C) Copyright IBM Corp. 2004, 2006 All rights reserved.
; ******************************************************************
; * User-generated command list for the Custom task that can flash
; * Broadcom network-adapter firmware.
; ******************************************************************
BOOTTYPE !LOADDOS /environment/dos71x
WAKE
!!SETENV
!%%RAMDSK%%

; Update the firmware:
!UPDATE.BAT %%MachineType%%
UpdateAssetID
!!SHUTDOWN
END
```

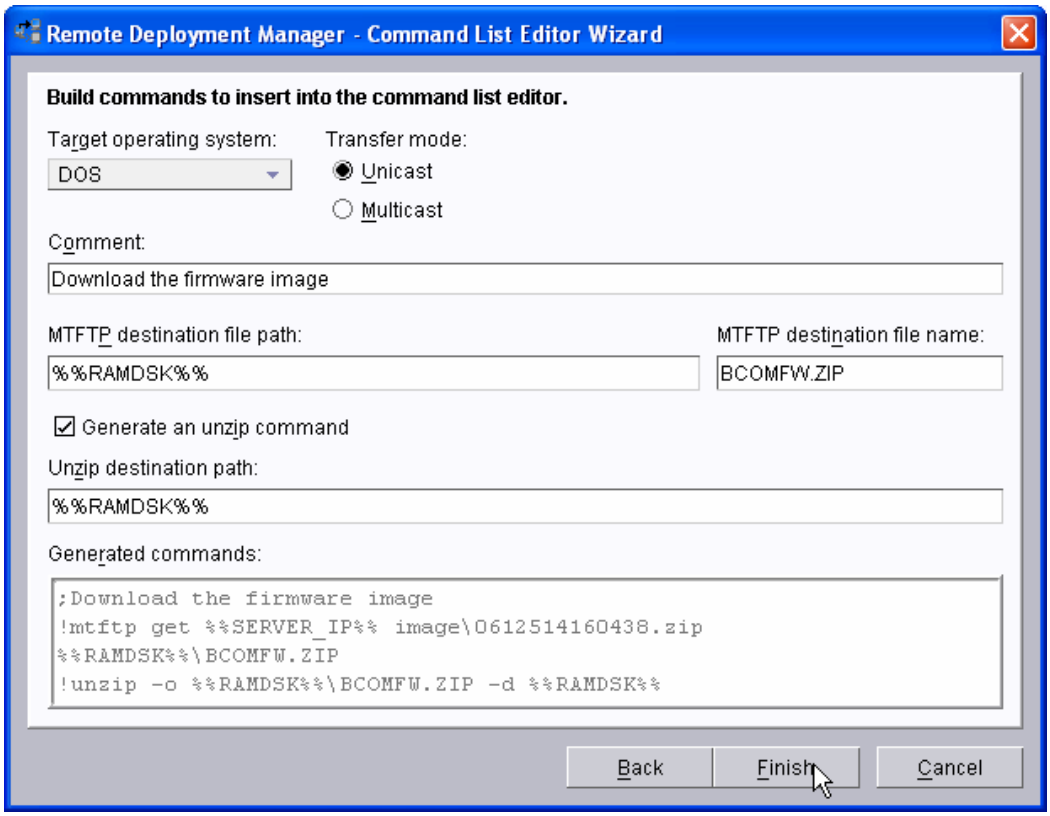
The command list is a list of RDM and DOS commands that perform the Custom task. Refer to Appendix A, “Command list commands”, in the *Remote Deployment Manager 4.30 User’s Reference* for information on commands and syntax within a command list.



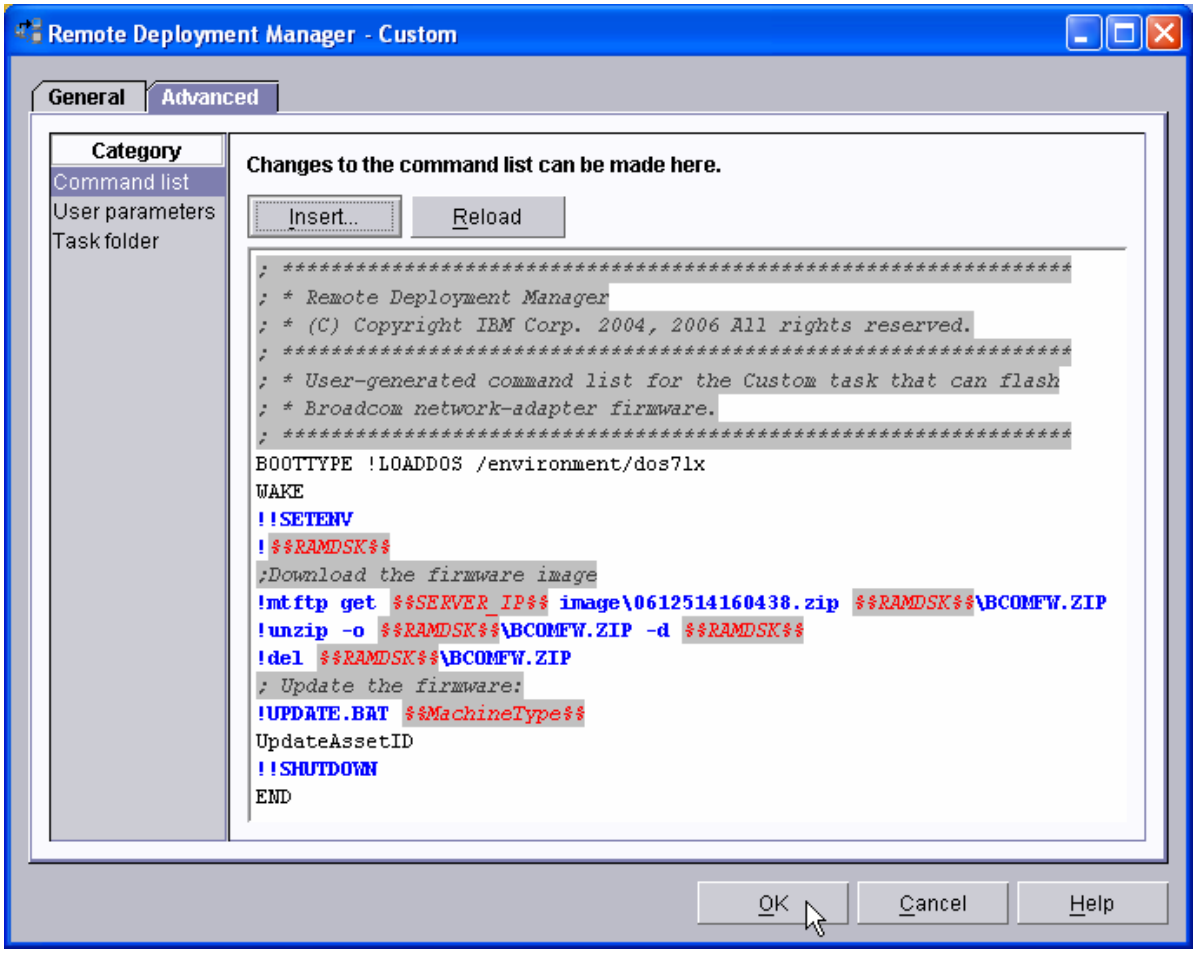
22. Place the cursor on the blank line (see the picture above), and select the **Insert** button. The *Command List Editor Wizard* window appears.



23. Select the custom image that you created in section 3.3 above, and then select the **Next** button.

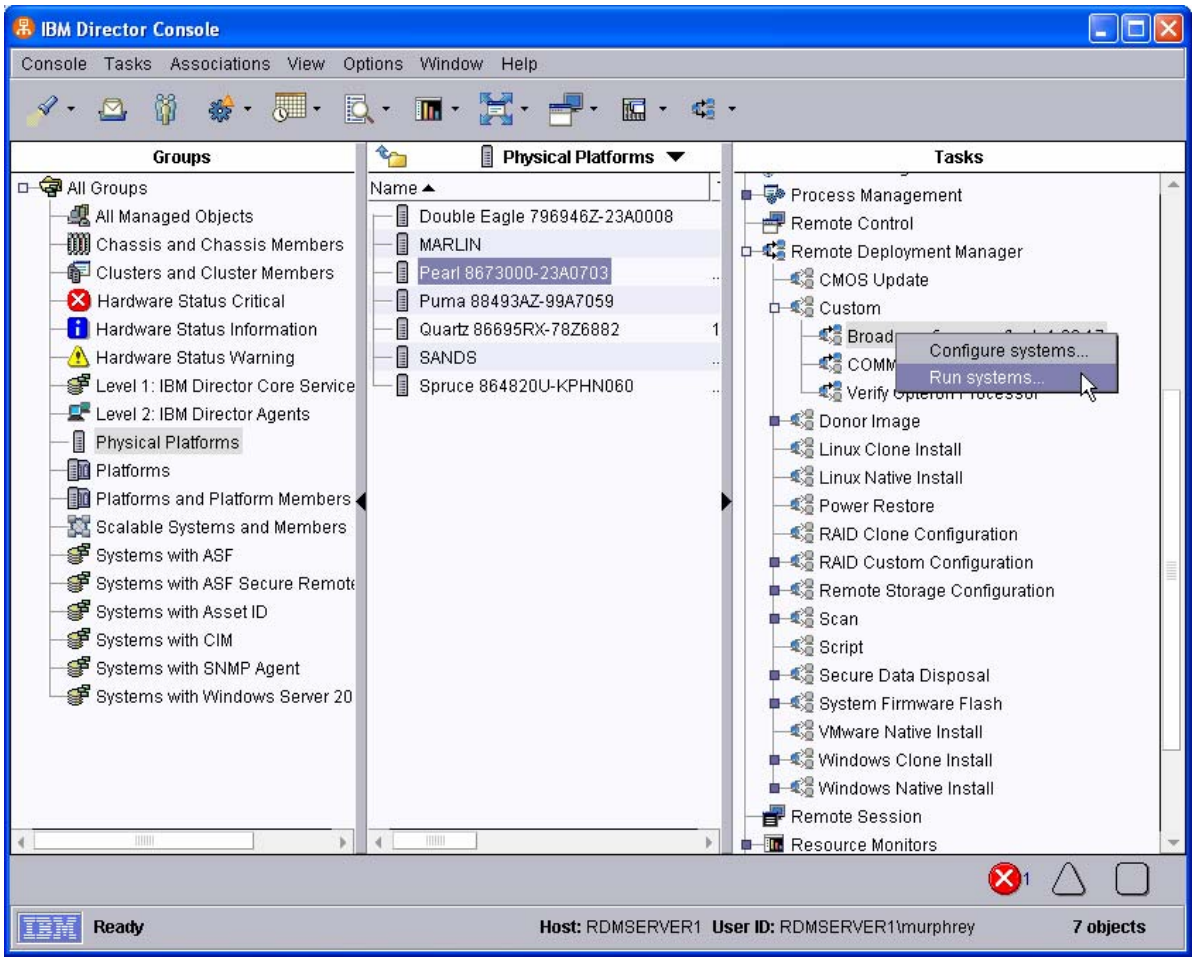


24. Enter the appropriate data to generate the correct commands to download and unzip the custom image you created in section 0 above:
    - Select DOS as the target operating system.
    - Leave the transfer mode as Unicast.
    - Add an optional comment, if you like.
    - Enter the path and name that you want the image file to have on the target system.
    - Select the check box to generate an unzip command, and enter the path for the unzipped files.
25. Select the *Finish* button to add the generated commands to the command list.

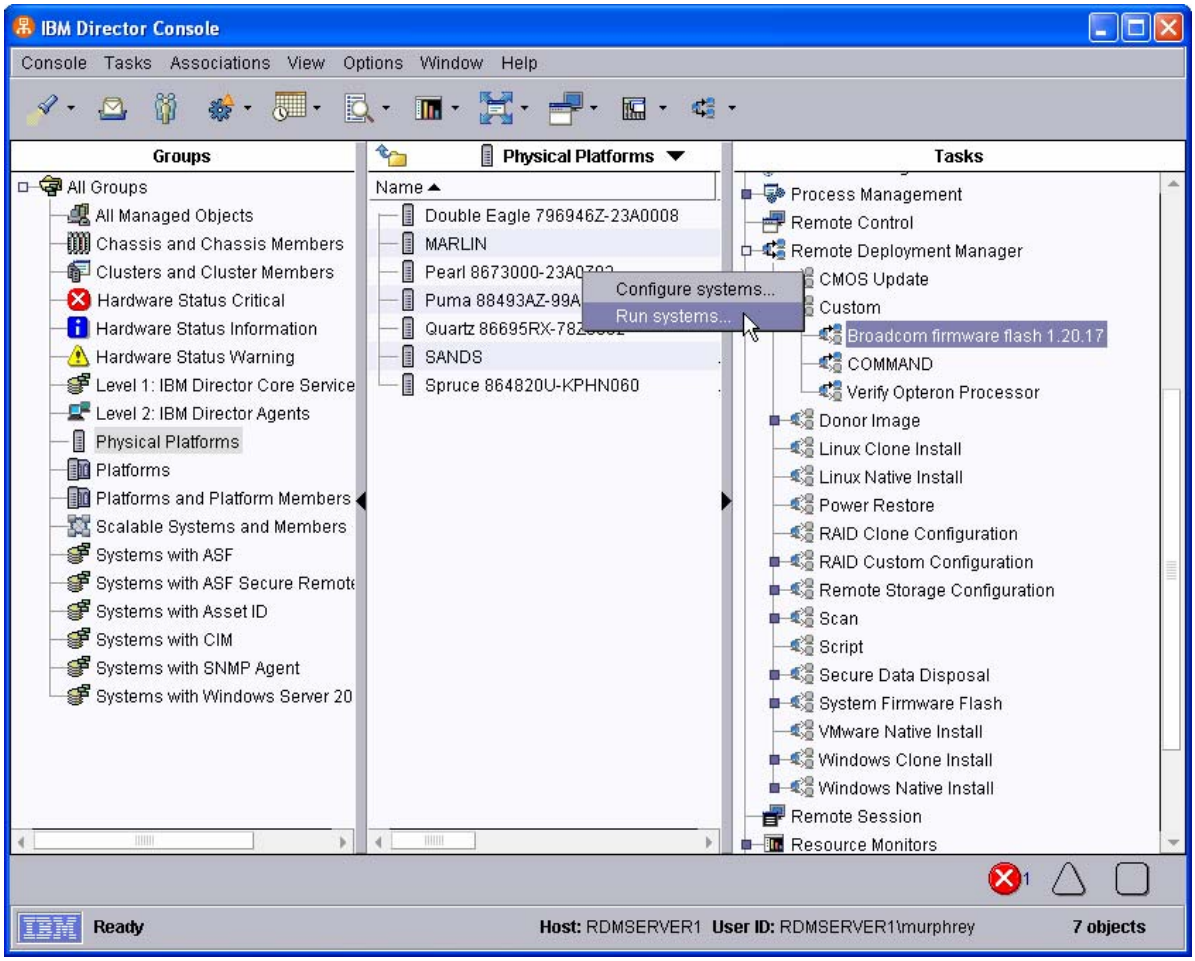

Remote Deployment Manager - Custom
General
Advanced
Category
Command list
User parameters
Task folder
Changes to the command list can be made here.
Insert...
Reload
; **
; * Remote Deployment Manager
; * (C) Copyright IBM Corp. 2004, 2006 All rights reserved.
; **
; * User-generated command list for the Custom task that can flash
; * Broadcom network-adapter firmware.
; **
BOOTTYPE !LOADDOS /environment/dos7lx
WAKE
!!SETENV
!$$RAMDSK$$
;Download the firmware image
!mtftp get $$SERVER_IP$$ image\0612514160438.zip $$RAMDSK$$\BCOMFW.ZIP
!unzip -o $$RAMDSK$$\BCOMFW.ZIP -d $$RAMDSK$$
!del $$RAMDSK$$\BCOMFW.ZIP
; Update the firmware:
!UPDATE.BAT $$MachineType$$
UpdateAssetID
!!SHUTDOWN
END
OK
Cancel
Help

3.5 Test the new custom task

1. Drag an entry for a target system and drop it on the new *Broadcom Firmware Flash* task in the right pane. The menu appears. Click **Run systems …** in the menu. A message window appears. Because there are no parameters to configure for this task, we do not need to select **Configure systems...** for the initial testing.



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.



2. Click the **Execute now** button. The target system will wake up (i.e., automatically power itself on) and do a network boot.

3. 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.

4. 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.

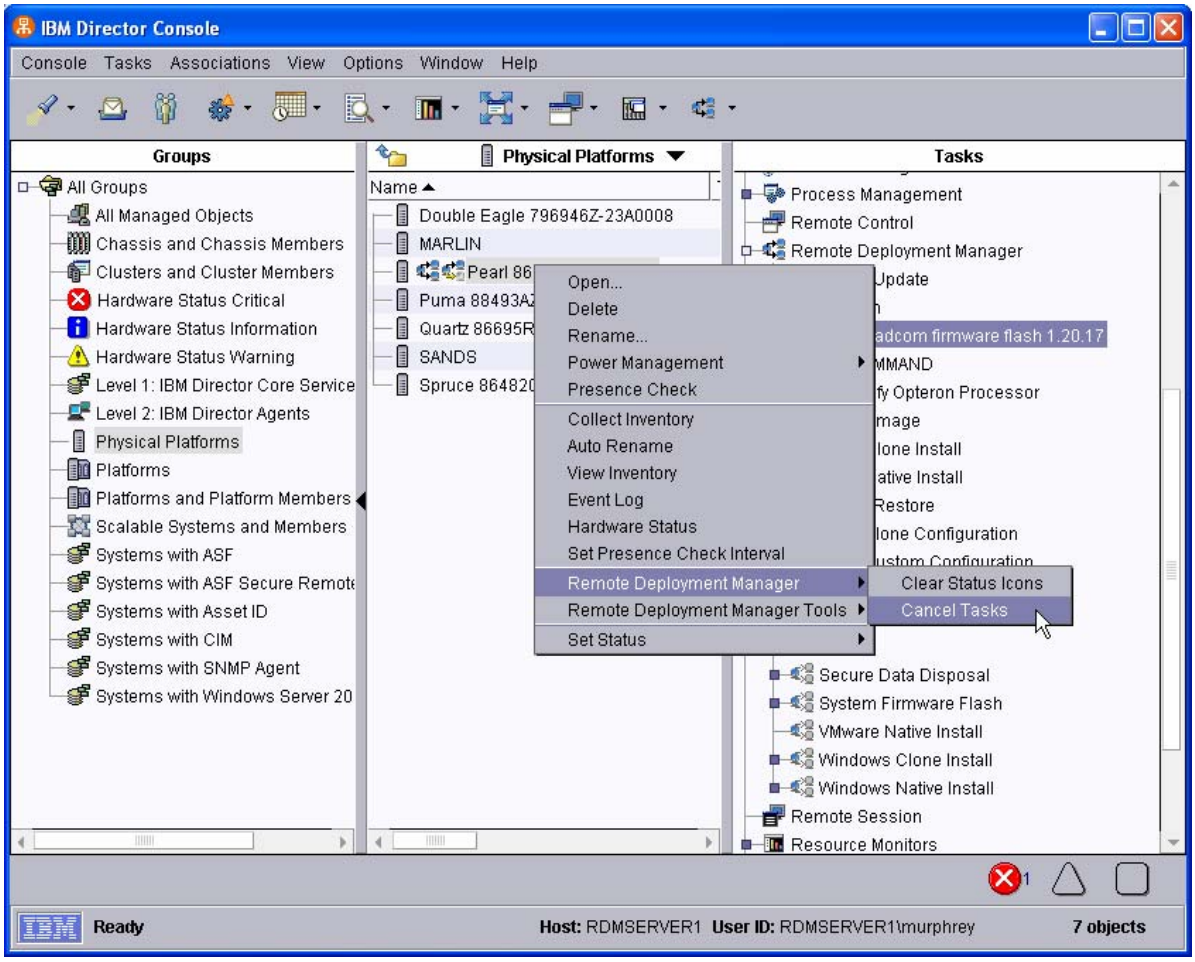
To rerun the test, you will usually need to do the following:

a. Power off the server with the power switch.

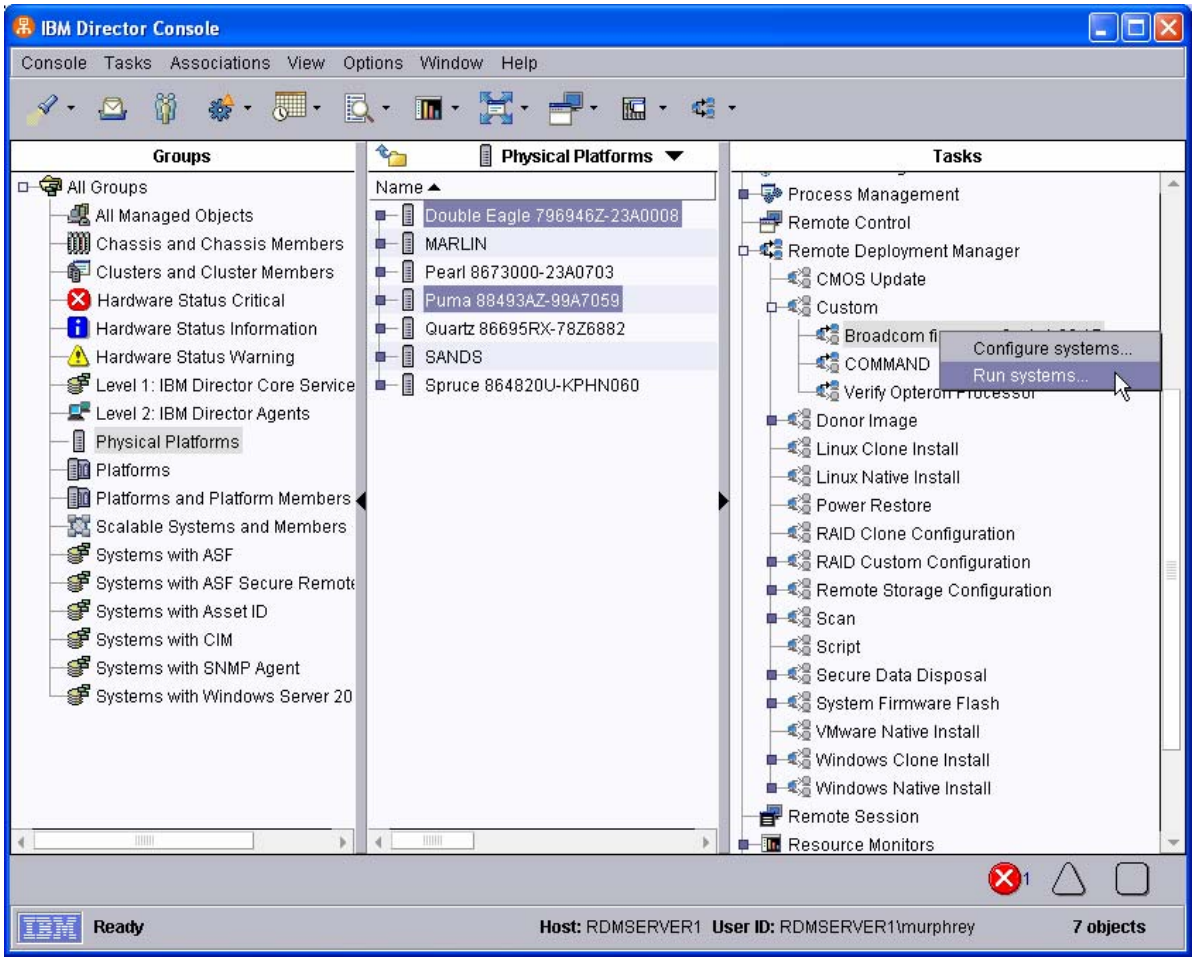
b. Right-click on the server in the middle pane.

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

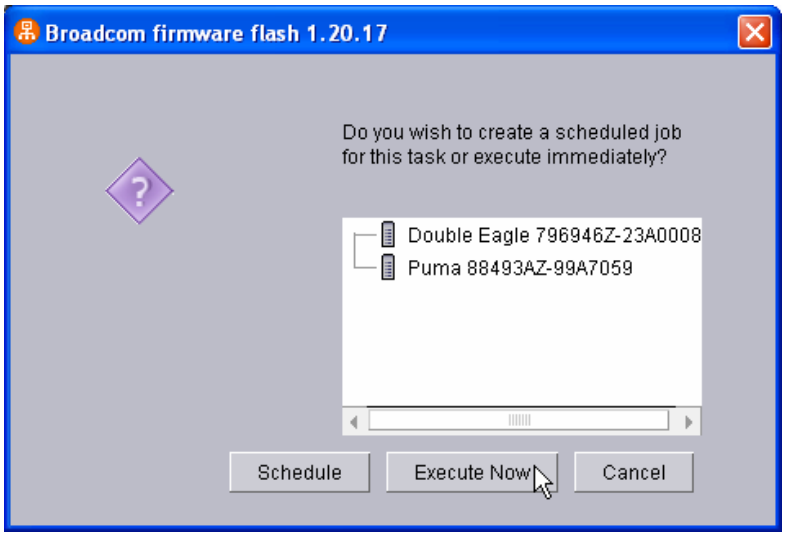
d. Go back to step 1 above.



5. Select several systems and drop them on the new *Broadcom Firmware Flash* task in the right pane. The menu appears. Click **Run systems...** in the menu.



6. Click the **Execute now** button. The target systems will wake up (i.e., automatically power themselves on) and do a network boot.



7. You should observe one of the systems to make sure that the firmware flashes properly. When the task is complete, the systems will automatically power off.

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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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