



# **Updating Fibre Channel Expansion Card BIOS with RDM 4.30**

## **A White Paper**

May 11, 2006

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# 1 Preface

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This White Paper explains how to use IBM® Remote Deployment Manager (RDM) 4.30 (or a later RDM version) to update the BIOS on Fibre Channel Expansion Cards in BladeCenter HS20 systems.

There are other ways to flash Diagnostics firmware (e.g., with the BIOS diskette, 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 the BIOS on Fibre Channel Expansion Cards in BladeCenter HS20 systems.

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.
- Use RDAGENT.EXE to display messages in the task log.

The tasks described in this paper accomplish their desired functions in a variety of ways. There are alternate techniques available for doing all of these functions. The intent is to illustrate various methods, as well as to describe a way to implement these particular functions.

This document contains embedded files. Just right click on the paperclip icon in order to extract the embedded files.

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. Customized System Firmware Flash task – updates System BIOS, Diagnostics, 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 network adapter firmware.
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 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 Guide* – The main reference manual for RDM
- *Remote Deployment Manager 4.30 Installation Guide* – Describes the complete installation process of RDM
- *Remote Deployment Manager 4.30 Compatibility and Configuration Guide* – Lists RDM-supported hardware and software

Check the IBM Web site at <http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=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?Indocid=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.

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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.

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## 1.3 Change history

- May 11, 2006 – Updated for RDM 4.30. Using firmware version 1.47.

## 2 Procedure

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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. An IBM DOS 7.1 system environment that is the operating system, booted from the network, under which the task runs on the target system.
- b. A CommandList file containing the commands that are to be executed as part of the task.
- c. Executable programs and batch files that are to be executed as part of the task.
- d. An image file that contains all the supporting files that are required by the commands.
- e. A user parameter whose value is passed to the target system and used when the task runs.

This example creates a Custom flash task for flashing Fibre Channel Expansion Card BIOS.

### 2.1 Acquire the network-adapter firmware files

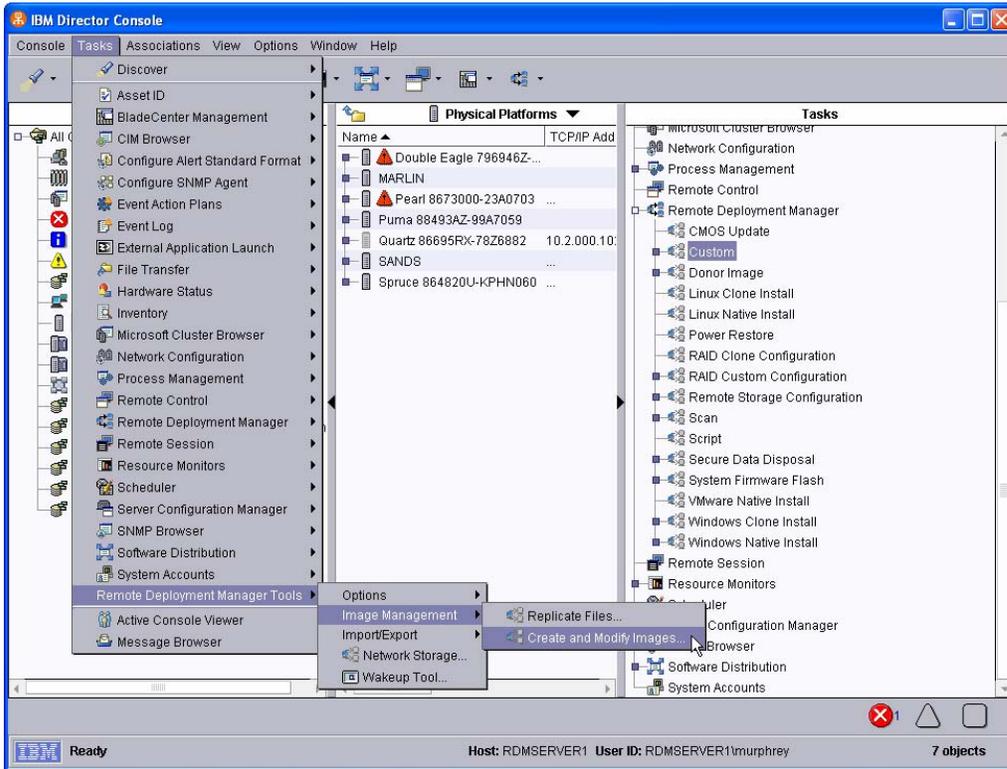
1. Download and create the firmware-update diskette. The firmware used to create this white paper was version 1.47, located at the following web site:

<http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-54796>

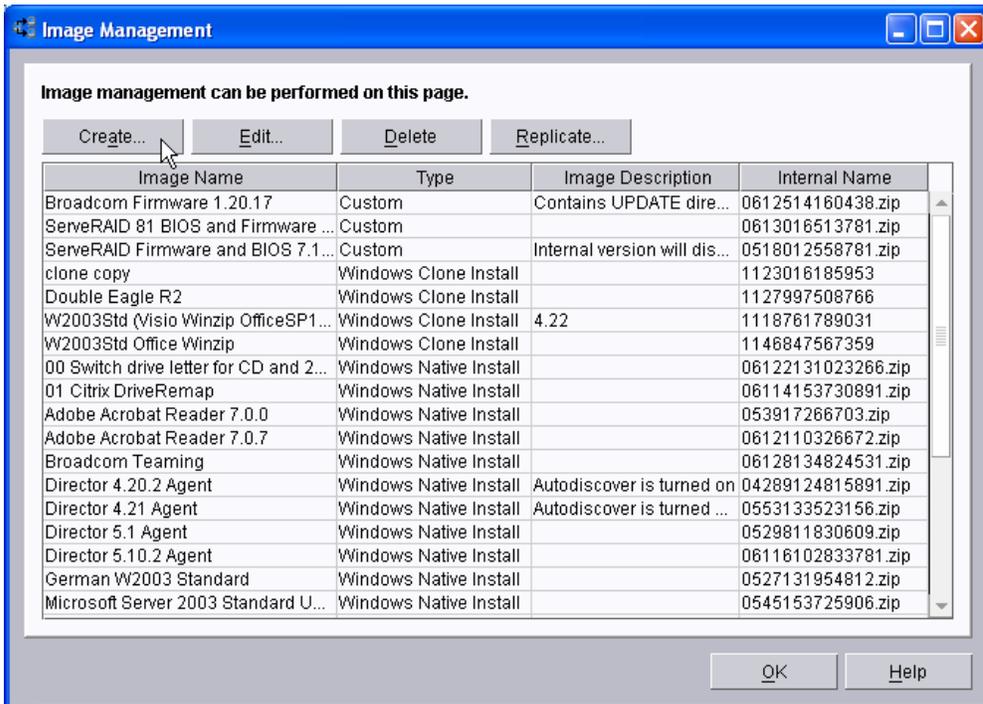
We used file qla2300-2310-234xbiosv147.zip.

2. Unzip this file to a new directory. We used the E:\Hardware\Fibre Channel Expansion Card BIOS\1.47\unzipped directory.

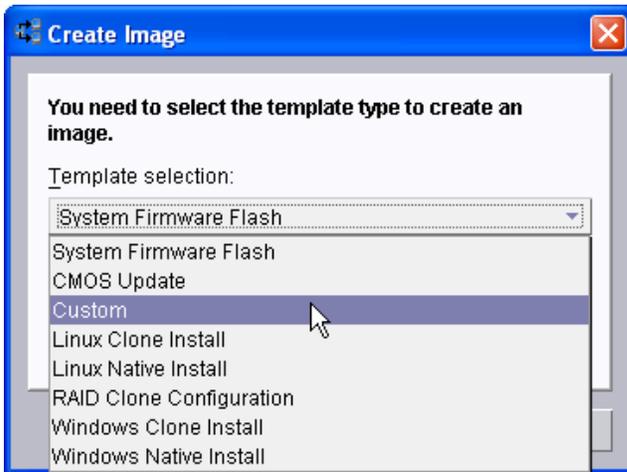
## 2.2 Create an image containing the firmware-update files



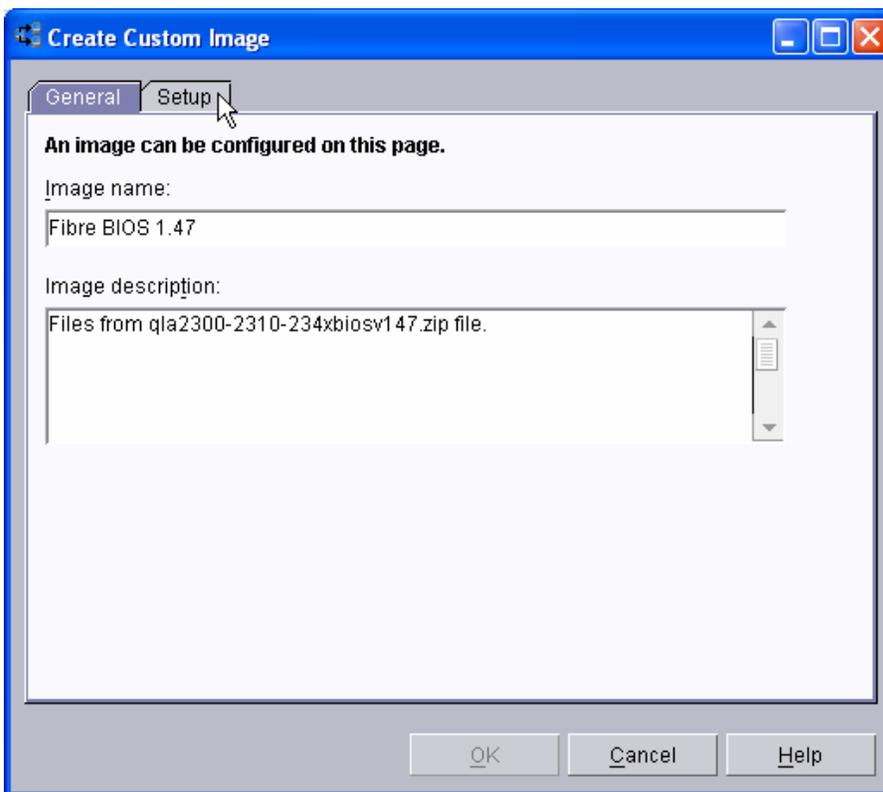
- From the Director console, select the **Tasks, Remote Deployment Manager, Image Management,** and **Create and Modify Images...** menus. This displays the *Image Management* window.



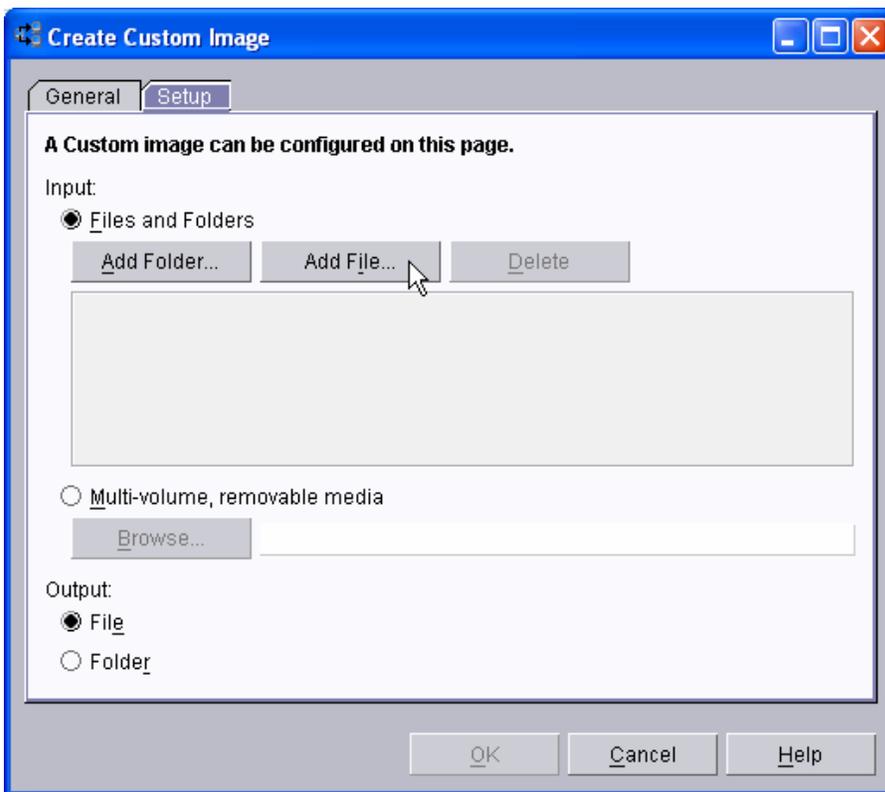
4. Select the **Create...** button. This displays the *Create Image* window.



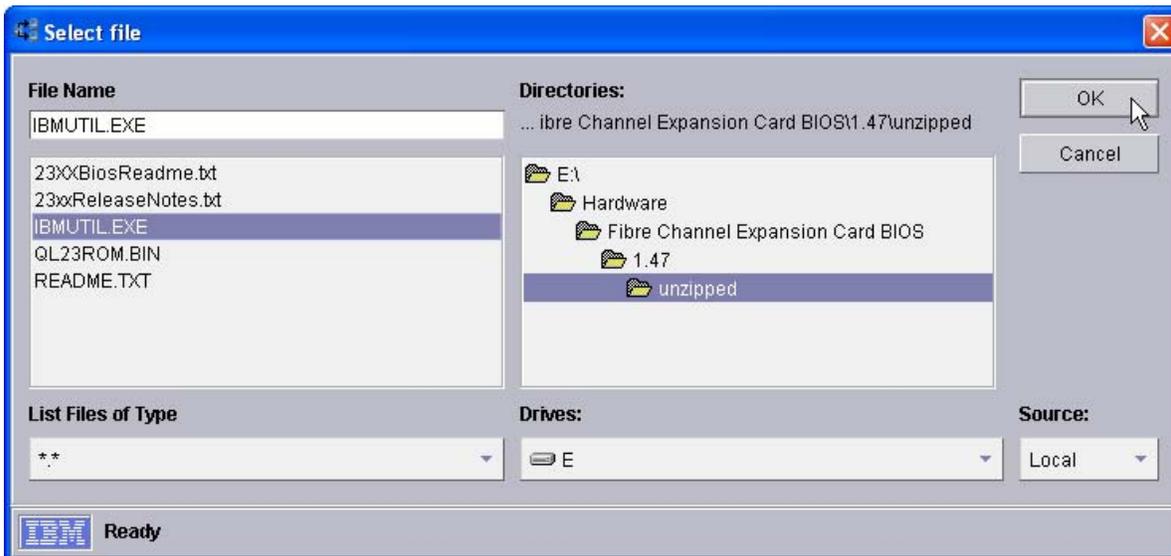
5. Select **Custom** from the drop-down list, and then select the **OK** button. This displays the *Create Custom Image* window. On the **General** tab, enter a name and (optionally) a description.



- 6. Select the **Setup** tab, and then select the **File...** button.



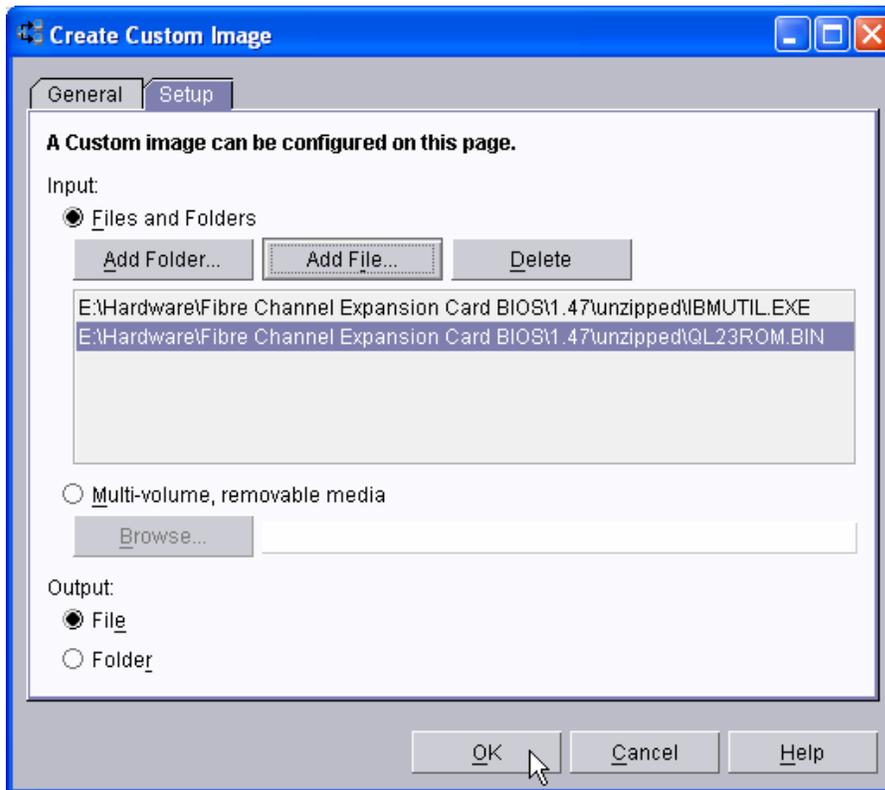
- 7. This displays a file dialog window named *Select File*. Navigate to and select IBMUTIL.EXE file (or whatever EXE file is there, such as FLASUTIL.EXE), and then select the **OK** button.



8. Repeat step 7 above, adding the QL23ROM.BIN (or whatever BIN file is there), and any files like NVRAM23.DAT and NVRAM23.DEF to the list.

**Important:** The actual files you add depend on the particular flash version. Different versions may contain different files.

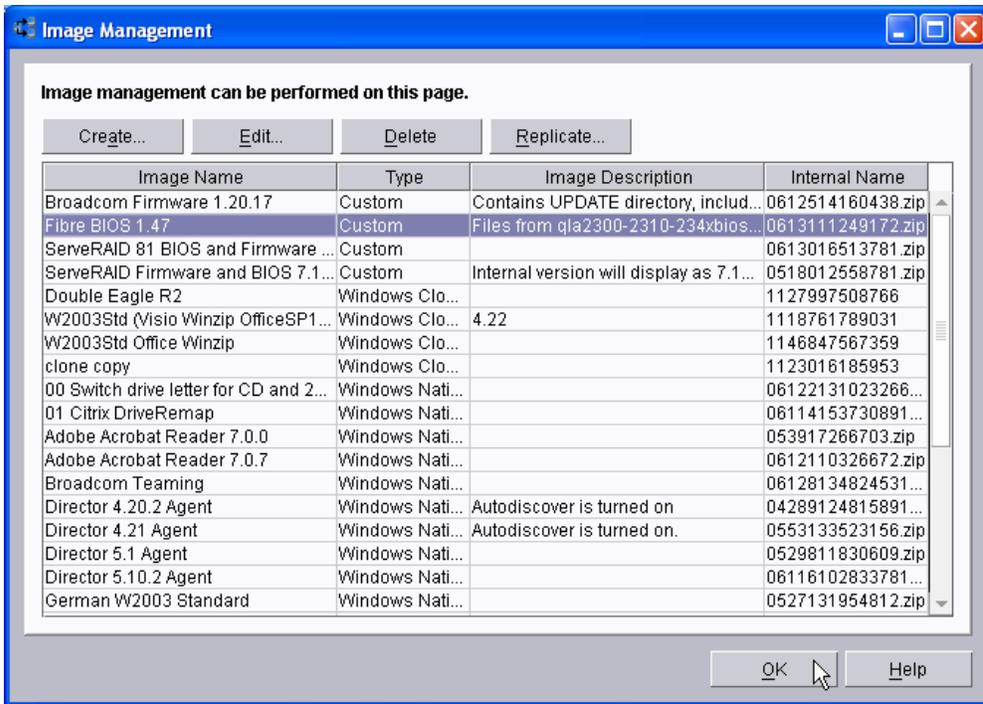
9. On the **Setup** page of the *Create Custom Image* window, select the **File** radio button. This will cause RDM to create the image as a single ZIP file. Then select the **OK** button.



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

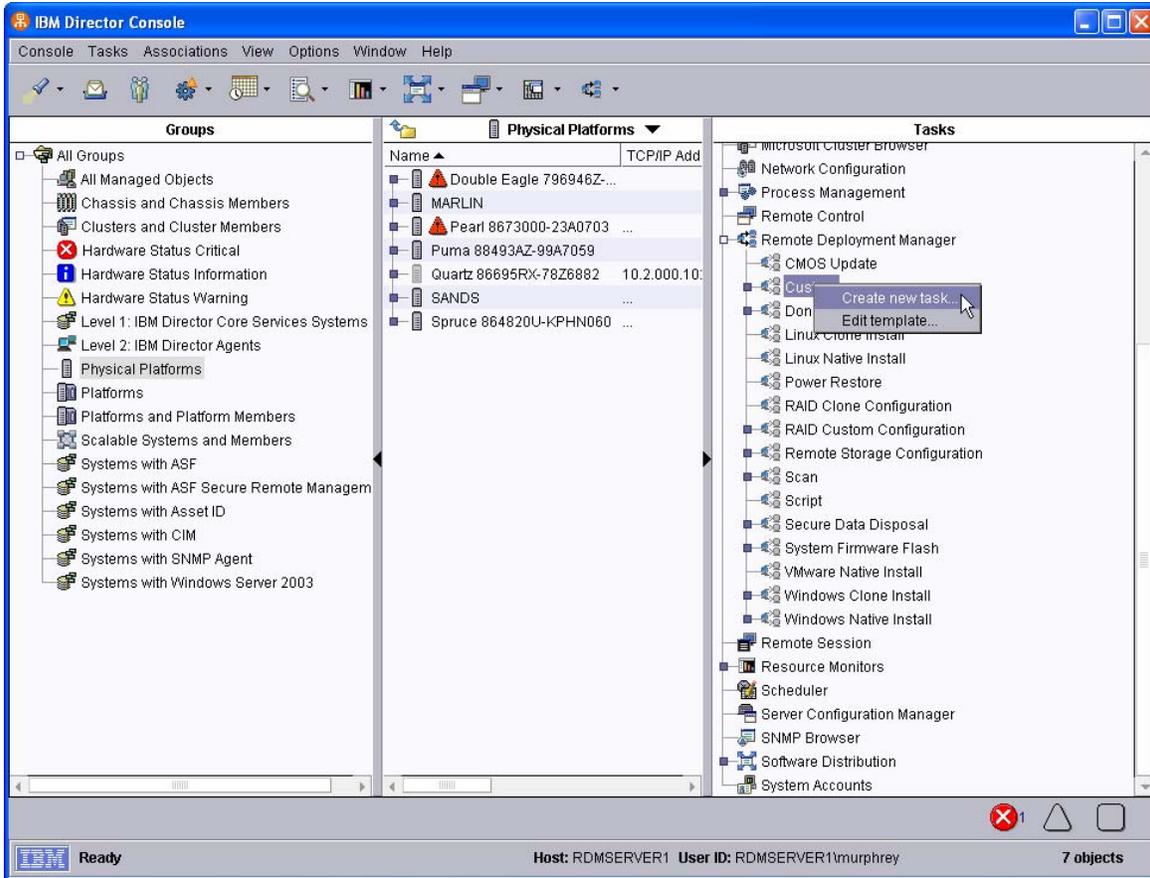


11. After the image creation is done, select the **OK** button on the *Task Image Creation Progress* window. The main *Image Management* window will now contain an entry for the new image.



12. Select the **OK** button to close the *Image Management* window.

## 2.3 Create the Custom task that will deploy the Fibre BIOS

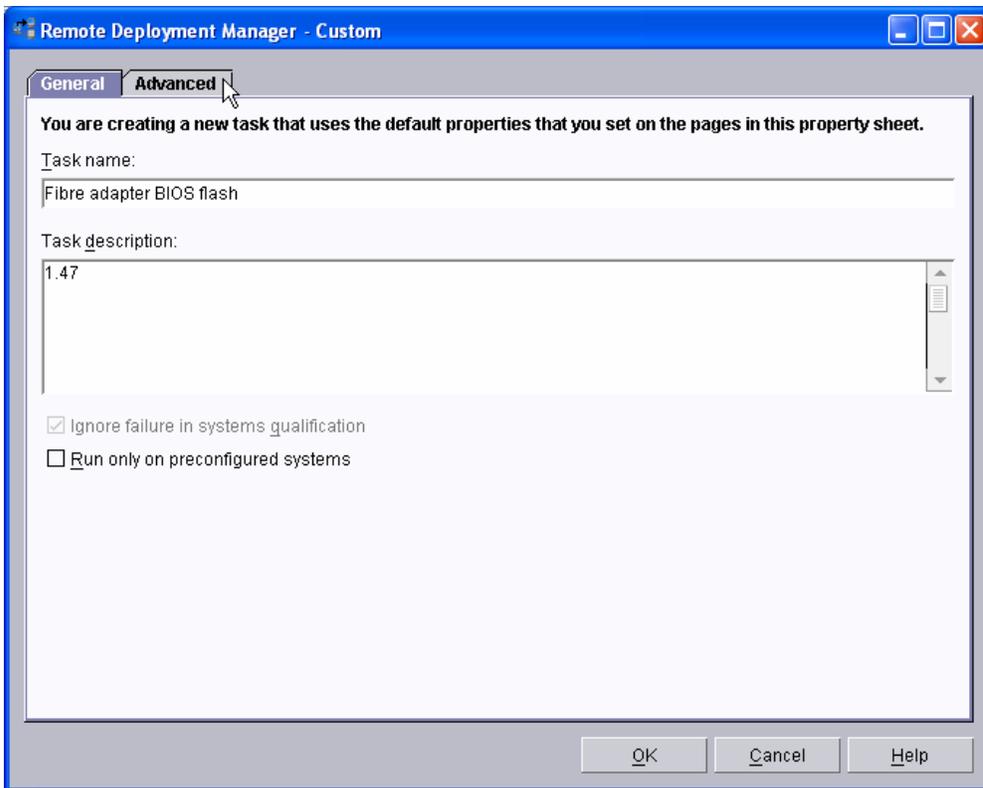


13. Expand **Remote Deployment Manger** in the *Tasks* pane of the Director console, and right-click **Custom**. The menu is displayed.

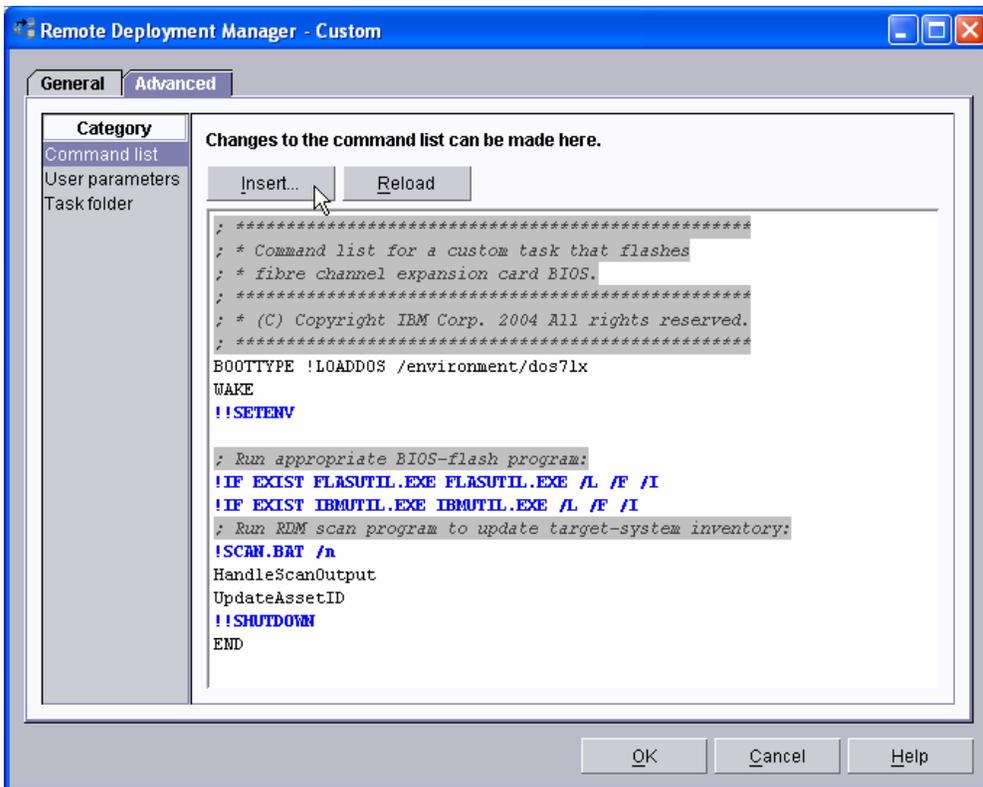
14. Click **Create new task...** on the menu to access the property pages. There are two pages:

- **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 *Fibre adapter BIOS flash* and enter an appropriate task description).



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



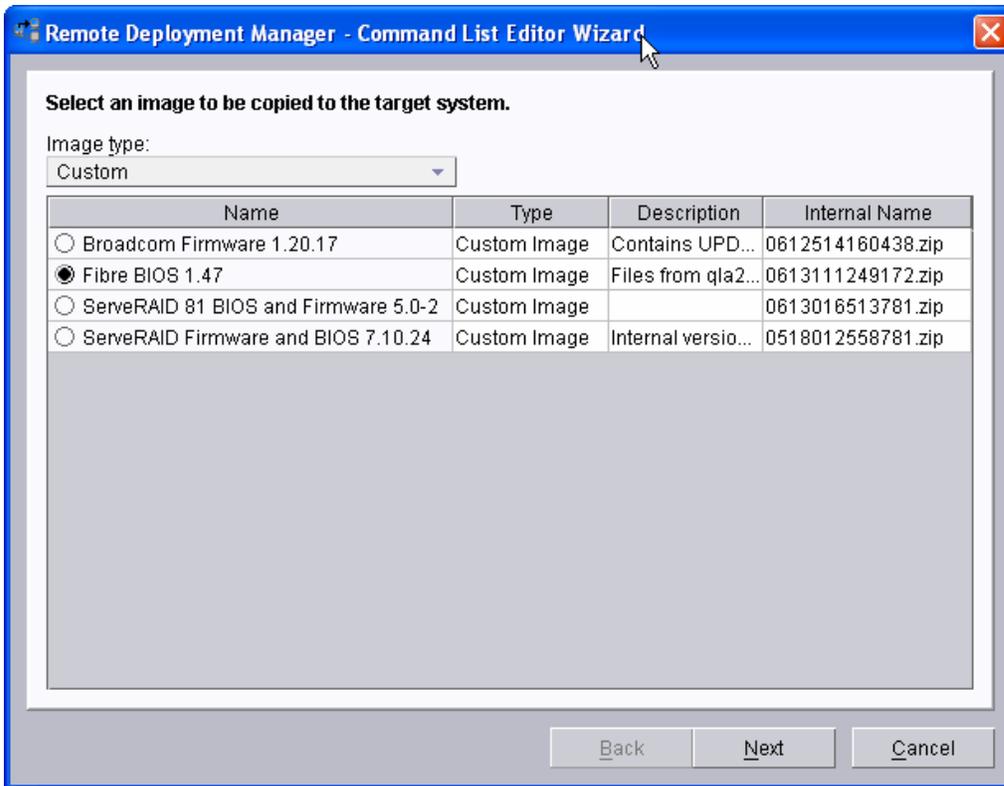
```
; *****  
; * Command list for a custom task that flashes  
; * fibre channel expansion card BIOS.  
; *****  
; * (C) Copyright IBM Corp. 2004, 2006. All rights reserved.  
; *****  
BOOTTYPE !LOADDOS /environment/dos71x  
WAKE  
!!SETENV  
  
; Run appropriate BIOS-flash program:  
!IF EXIST FLASUTIL.EXE FLASUTIL.EXE /L /F /I  
!IF EXIST IBMUTIL.EXE IBMUTIL.EXE /L /F /I  
; Run RDM scan program to update target-system inventory:  
!SCAN.BAT /n  
HandleScanOutput  
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.

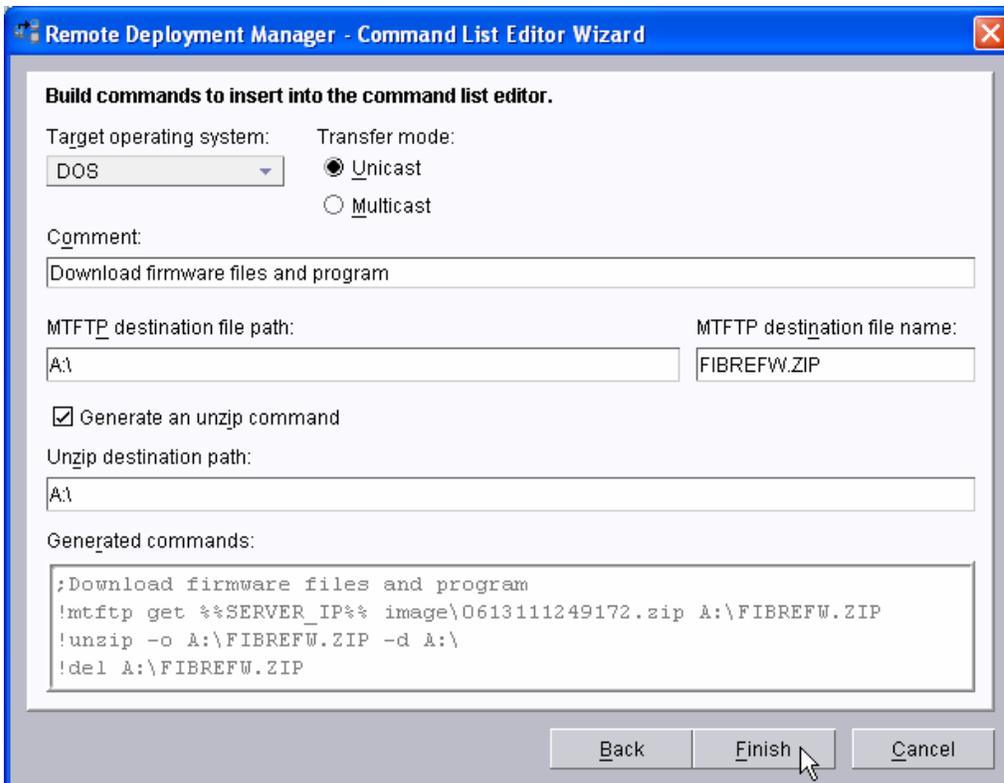
Because different fibre flash versions (e.g., the older 1.35 and 1.38 versions) use different flash programs, we made the logic in the command list handle either program. The task logic will automatically check the return code of each “single-bang” command (i.e., each command preceded by a single “!” character) and return an error whenever the DOS ERRORLEVEL is nonzero.

**Important:** For a different flash version, the appropriate command-line parameters may be different. You should read the flash documentation to determine the actual command. For example, if there is no NVRAM\*. \* file on the flash diskette (i.e., as in version 1.47), then you would not use the /L parameter.

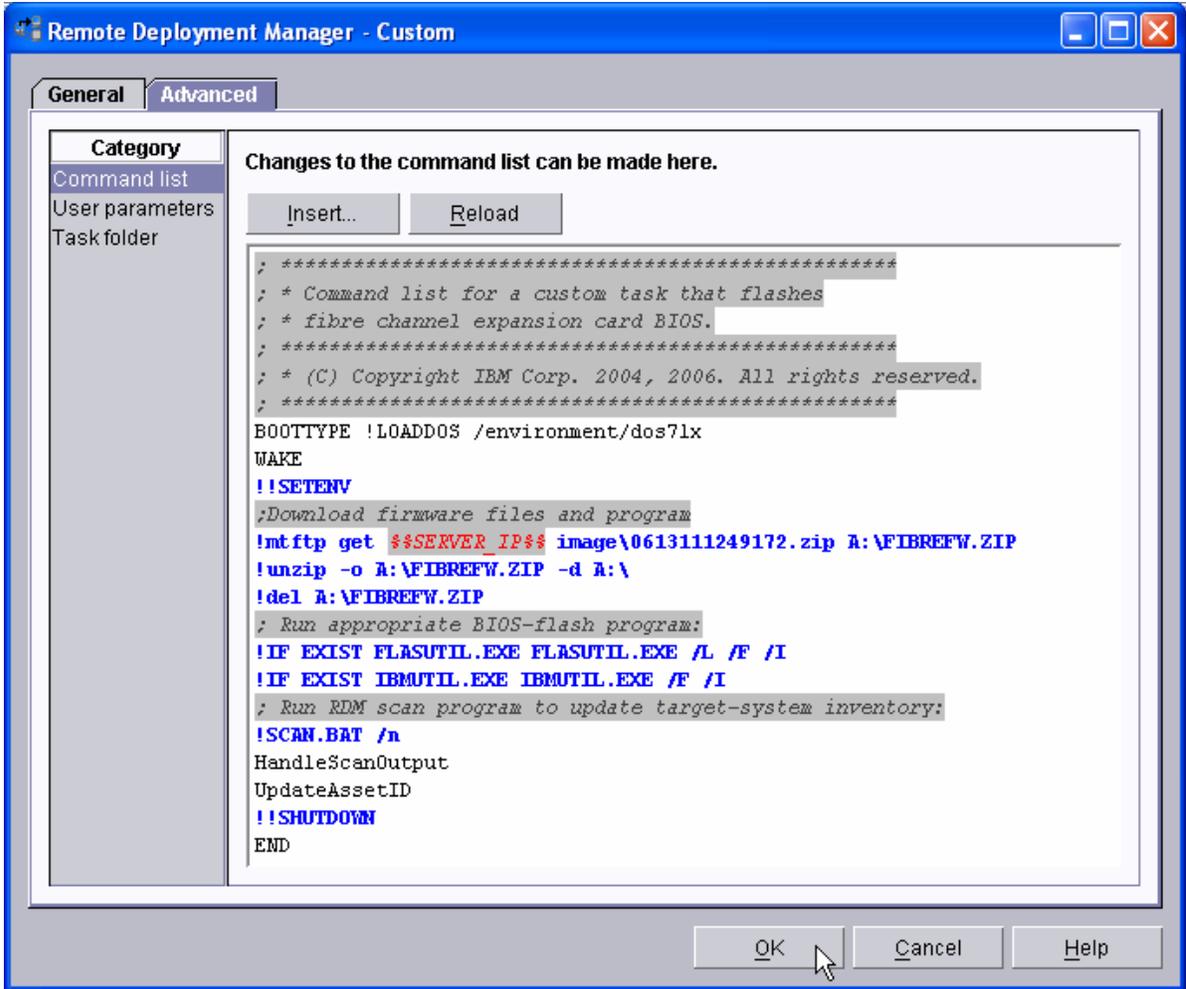
16. Place the cursor on the blank line (see the picture above), and select the **Insert** button. The *Command List Editor Wizard* window appears.



17. Select the custom image that you created in section 2.2 above, and then select the **Next** button.



18. Enter the appropriate data to generate the correct commands to download and unzip the custom image:
  - 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.

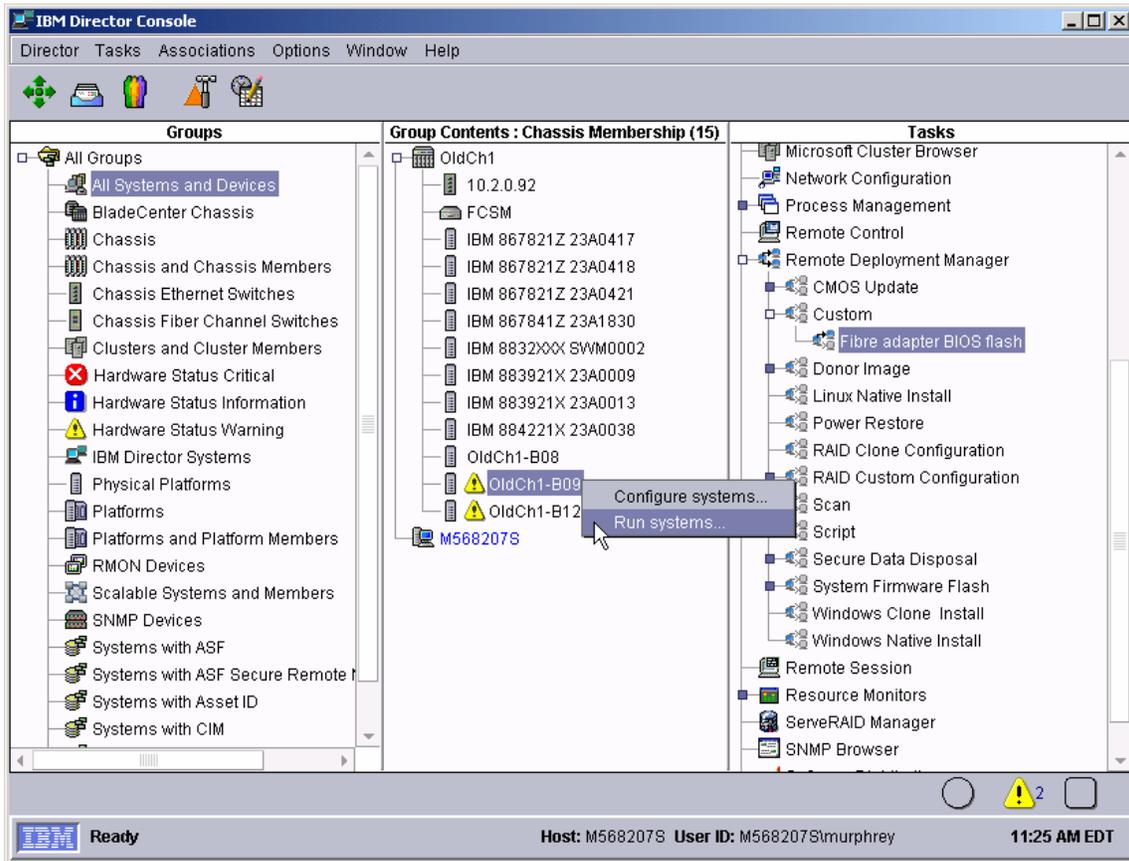


20. Select **OK** to create the task.

## 2.4 Test the new custom task

21. Drag the *Fibre adapter BIOS flash* task (from the *Tasks* pane) and drop it onto an entry for an HS20, HS40, or LS20 blade (e.g., model 8850, 8843, 8839, 8832 or 8678) system in the *Group Contents* pane. The menu appears. Click **Run systems ...** in the menu. (Because we only have one configurable parameter (FIBREFW – the name of the Fibre BIOS image) available, and its correct value is the default for this task, we do not need to select **Configure systems...** for the initial testing.) A message window appears.

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



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

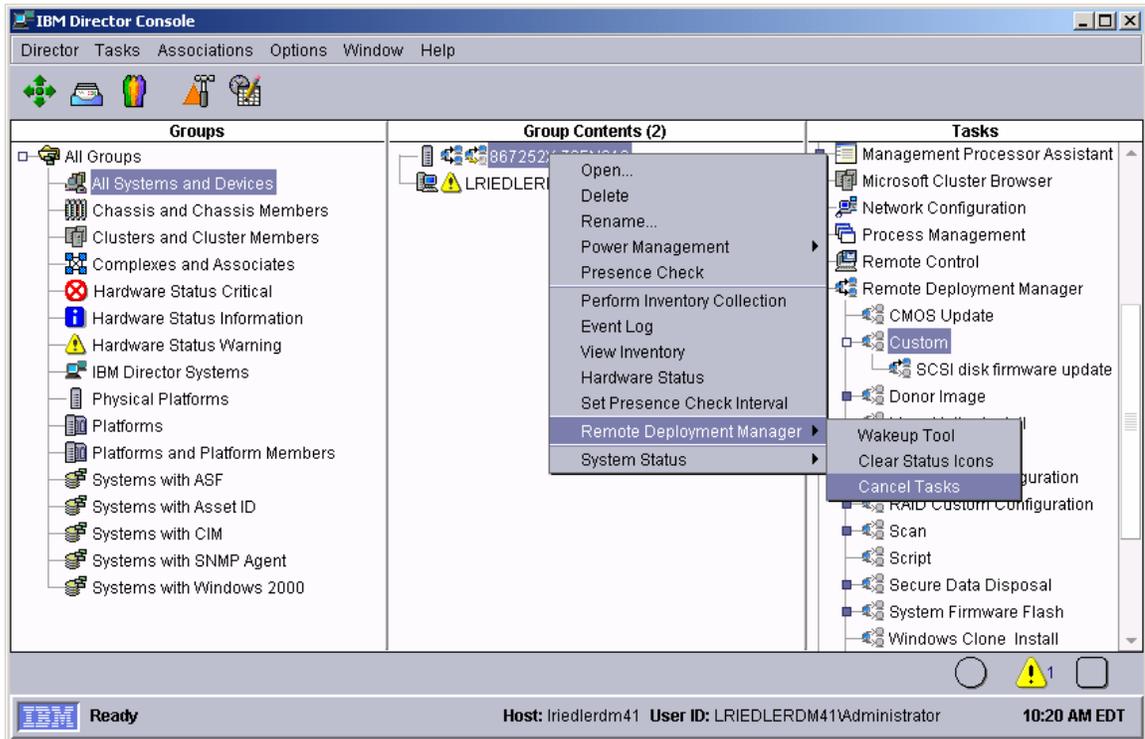


23. Immediately after the *Starting PC DOS...* message appears on the target system's monitor, press the F8 key. This allows you to step through all of the batch files statement-by-statement.
24. Press the "y" key to execute each statement in-turn. Observe each statement, and watch for any errors that 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 21 above.



25. 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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## 4 Glossary

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**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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