



Using RDM 4.11 to Deploy BladeCenter 8839

A White Paper

June 23, 2004

IBM does not support deploying HS40 with RDM. This document describes some procedures that are provided “as is” and without formal support.

Note:

Before using this information and the product it supports, read the general information in “Notices,” on page 19.

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Preface

Important: There are some RDM functions that do not work on the model 8839 BladeCenter HS40 system, and using RDM with HS40 is not supported by IBM. In particular, the following do not work on HS40:

- *Get Donor* task when IDE RAID is configured to RAID 1 or to RAID 0 with spare.
- *Windows Clone Install* task when IDE RAID is configured to RAID 1 or to RAID 0 with spare.

It is possible to configure RDM to do some deployment tasks on HS40. This document describes how to do that configuration.

The model 8839 BladeCenter HS40 system uses firmware that is in different formats from other xSeries and BladeCenter systems. This means that special procedures are needed in order to use the RDM *System Firmware Flash* task for this system. It is also possible to flash some HS40 firmware by using RDM *Custom* tasks.

This White Paper explains how to use IBM® Remote Deployment Manager (RDM) 4.11 to deploy BladeCenter model 8839 systems. You can use this document to learn how to do the following:

- Update BladeCenter 8839 BIOS.
- Update BladeCenter 8839 BMC firmware.
- Update BladeCenter 8839 Diagnostics.
- 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.
- Create new RDM DOS system environments.

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.

Who should read this White Paper

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

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 4.11 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
- *Remote Deployment Manager 4.11 Additional Information* – Describes new features in RDM Updates 1, 2, and 3; includes corrections and enhancements to the RDM 4.11 documents

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:

- 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.

1 Procedure for updating BIOS

Although the 8839 blade BIOS update is contained on 2 diskettes, it is possible to customize RDM so that the *System Firmware Flash* task can update this system's BIOS. We will create a BIOS image in the normal way, and then we will do some manual manipulation to get all of the files into the image. Then the System Firmware Flash task will work as it does on other systems.

1.1 Acquire BIOS firmware files

1. Download the appropriate files.
2. Create the 2 BIOS diskettes.
3. If necessary, modify the internal label on the 1st diskette to the standard format that is used for single-diskette BIOS updates (e.g., SBJT32A for use with RDM 4.11 Update 3).

1.2 Create the BIOS image

4. Use RDM's Image Management function to create a BIOS image from the 1st diskette that you created in step 3.
5. Note the image file name (e.g., 1728374697) for use later.
6. Rename the image file by adding an extension of ZIP (e.g., 1728374697.ZIP).
7. Using any program that can modify ZIP files (e.g., WINZIP.EXE), add the large file from the 2nd diskette (its file extension is 002) to the ZIP file.
8. Using the same program, if HIMEM.SYS is present, delete it from the ZIP file.
9. Close the ZIP program.
10. Rename the image file by removing the ZIP extension (and the period). The file name should now be what it originally was (e.g., 1728374697).

1.3 Test the BIOS image

11. Run a System Firmware Flash task, such as the built-in *Deploy latest system firmware task*, to validate that the BIOS update works.

2 Procedure for updating BIOS and Diagnostics

The 8839 BIOS and Diagnostics firmware are updated with the same program (AFUIDOS.EXE). It is possible to create a custom task to update Diagnostics firmware (see section 4 below). However, it might be easier just to add the Diagnostics update to the same task that does the BIOS update.

2.1 Acquire Diagnostics firmware files

1. Download the appropriate files.
2. Create the 2 Diagnostics diskettes.

2.2 Create the BIOS image

3. Perform the steps shown in section 1 above to create and test the BIOS image.

2.3 Add Diagnostics files to the BIOS image

4. Rename the BIOS image file by adding an extension of ZIP (e.g., 1728374697.ZIP).
5. Using any program that can modify ZIP files (e.g., WINZIP.EXE), add the 2 large files from the Diagnostics diskettes (e.g., \$SBYDIAG.001 and \$SBYDIAG.002) to the ZIP file.
6. Using the same program, replace the LCREFLSH.BAT file in the ZIP file with the following:

```
REM This file is for use by IBM Remote Deployment Manager
COPY /B SBX44001.001+SBX44001.002
AFUIDOS /i:SBX44001.001
```

```
DEL SBX44001.001
DEL SBX44001.002
```

```
REM Flash the diagnostics:
COPY /B $SBYDIAG.001+$SBYDIAG.002
AFUIDOS /D:$SBYDIAG.001.
```

- That is, add the bold lines shown above to the LCREFLSH.BAT file.
7. Close the ZIP program.
 8. Rename the image file by removing the ZIP extension (and the period). The file name should now be what it originally was (e.g., 1728374697).

2.4 Test the BIOS image

9. Run a System Firmware Flash task, such as the built-in *Deploy latest system firmware task*, to validate that the BIOS and Diagnostics updates work.

3 Procedure for updating BMC firmware

The 8839 blade uses the term BMC for its on-board service processor. You can update the firmware for this device using an RDM *System Firmware Flash* task.

The 8839 blade BMC firmware is contained on 2 diskettes. It is possible to customize RDM so that the System Firmware Flash task can update this system's BMC firmware. We will create an Integrated System Management Processor image in the normal way, and then we will do some manual manipulation to get all of the files into the image. Then the System Firmware Flash task will work as it does on other systems.

3.1 Acquire BMC firmware files

1. Download the appropriate files.
2. Create the 2 BIOS diskettes.
3. If necessary, modify the internal label on the 1st diskette to the standard format that is used for single-diskette BIOS updates (e.g., BRMK17A).
4. If there is no LCREFLSH.BAT file on the 1st diskette, create one with the following command:

```
COPY A:\UPDATE.BAT A:\LCREFLSH.BAT
```

3.2 Create the BMC image

5. Use RDM's Image Management function to create an *Integrated System Management Processor* image from the diskette that you created in step 3.
6. Note the image file name (e.g., 1728374698) for use later.
7. Rename the image file by adding an extension of ZIP (e.g., 1728374698.ZIP).
8. Using any program that can modify ZIP files (e.g., WINZIP.EXE), add the large file from the 2nd diskette (its file extension is PKT) to the ZIP file.
9. Using the same program, if HIMEM.SYS is present, delete it from the ZIP file.
10. Rename the image file by removing the ZIP extension (and the period). The file name should now be what it originally was (e.g., 1728374698).

3.3 Test the BMC image

11. Run a System Firmware Flash task, such as the built-in *Deploy latest system firmware task*, to validate that the BMC firmware update works.

4 Procedure for updating Diagnostics

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.
- Parameters that can be used to personalize each system.
- RDM System Environments (usually IBM DOS 7.1) that are booted via the network.
- An RDM image that is used as input data for the task.

This example creates a Custom flash task for updating Diagnostics firmware on model 8839 BladeCenter blades.

4.1 Acquire Diagnostics firmware files

1. Download the appropriate files and create the 2 Diagnostics diskettes.
2. Create a single file from the 2 firmware files on the Diagnostics diskettes. Use the following commands in a command-prompt (CMD.EXE) window:

```
MD C:\DIAGIMG
COPY A:\$SBYDIAG.001 C:\
COPY A:\$SBYDIAG.002 C:\
COPY /B C:\$SBYDIAG.001 + C:\$SBYDIAG.002 C:\DIAGIMG\$SBYDIAG
DEL C:\$SBYDIAG.00*
COPY A:\AFUIDOS.EXE C:\DIAGIMG
```

4.2 Create a batch file that will do the flash update

3. Using your favorite editor (e.g., Notepad), create a file named C:\DIAGIMG\DIAGFW.BAT that contains the following statements:

```
ECHO Entering DIAGFW.BAT
SET RDSTATUS=RDMDFW000I
SET RDRASLEVEL=0

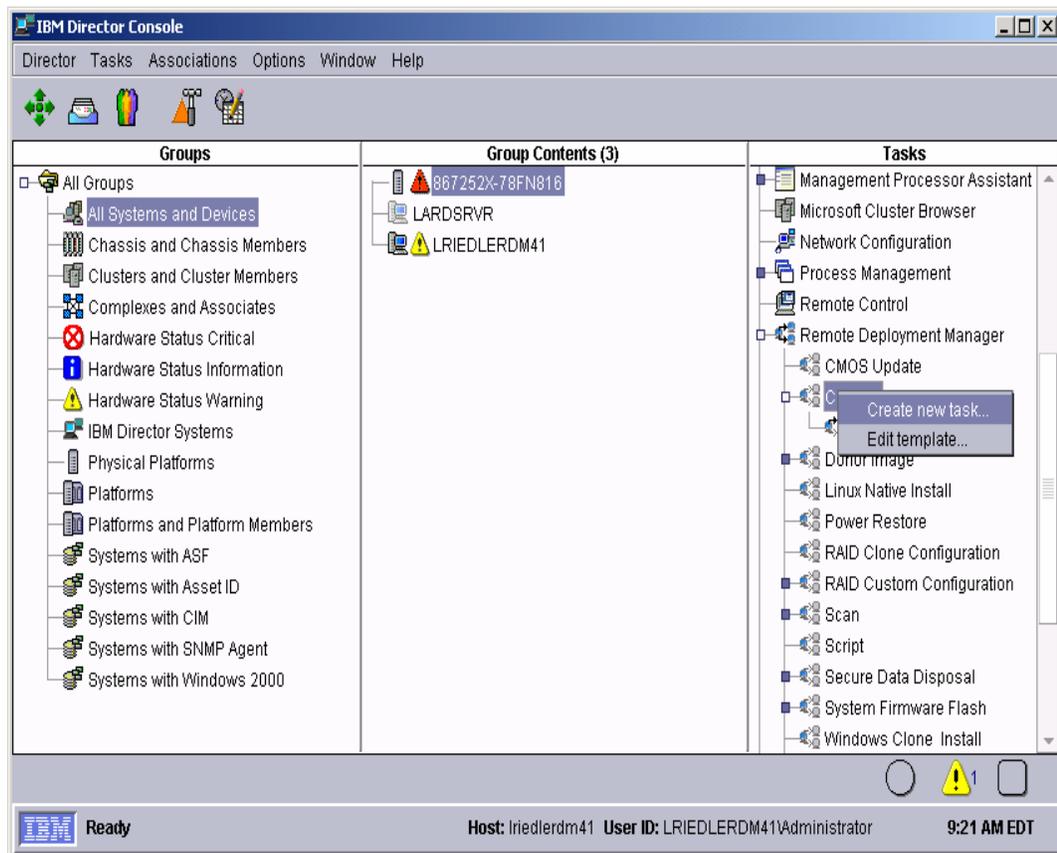
AFUIDOS /D:$SBYDIAG
IF ERRORLEVEL 1 GOTO FLSHERR
GOTO END

:FLSHERR
SET RDRASLEVEL=1
SET RDSTATUS=RDMDFW001E Bad return code from AFUIDOS.EXE flashing diagnostics.

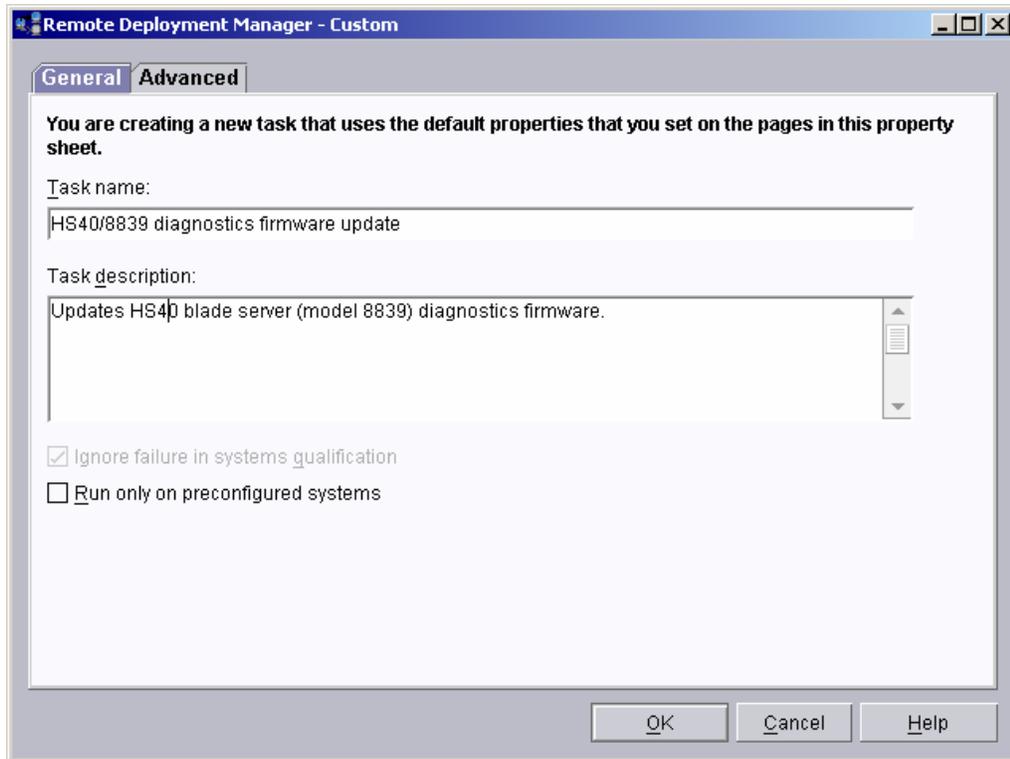
:END
ECHO Exiting DIAGFW.BAT
```



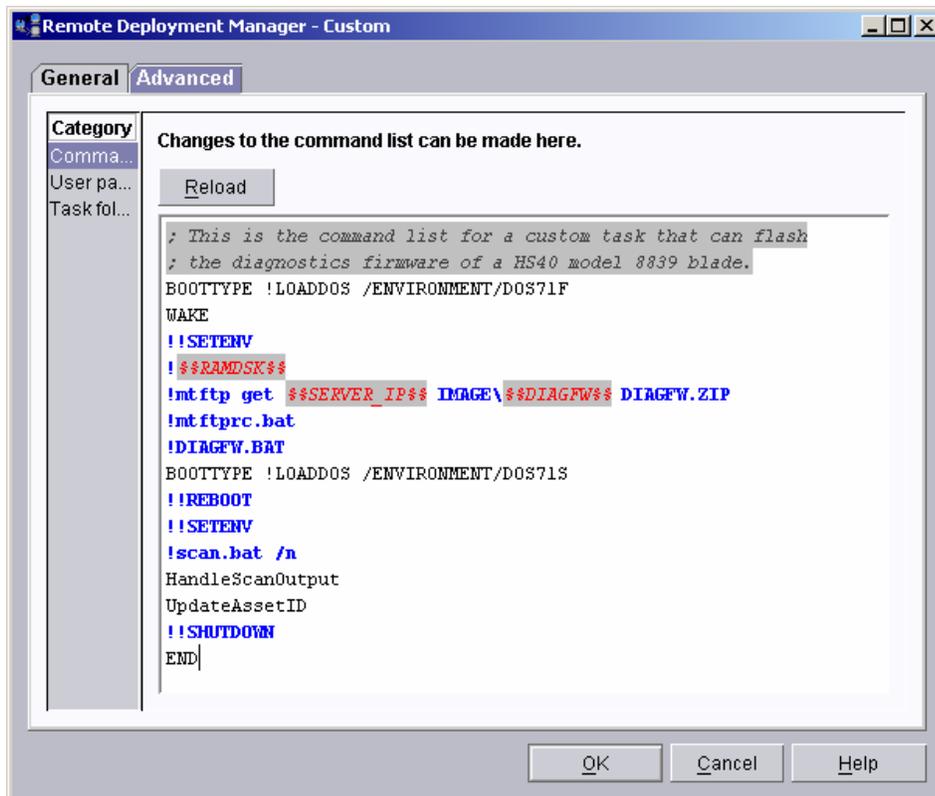
4.3 Create the Custom task that will deploy the firmware



4. Expand **Remote Deployment Manger** in the *Tasks* pane of the Director console, and right-click **Custom**. The menu is displayed.
5. 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.



6. Enter the task information on the General page (e.g., name the task *HS40/8839 diagnostics firmware update*, and enter an optional description of the task).



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

```
; This is the command list for a custom task that can flash
; the diagnostics firmware of a HS40 model 8839 blade.
BOOTTYPE !LOADDOS /ENVIRONMENT/DOS71F
WAKE
!!SETENV
!%RAMDSK%
!mftftp get %%SERVER_IP%% TEMPLATE\%%TASKTEMPLATEID%%\%%TASKTOID%%\AFUIDOS.EXE
AFUIDOS.EXE
!mftftp bat
!mftftp get %%SERVER_IP%% TEMPLATE\%%TASKTEMPLATEID%%\%%TASKTOID%%\$$BYDIAG $$BYDIAG
!mftftp bat
!mftftp get %%SERVER_IP%% TEMPLATE\%%TASKTEMPLATEID%%\%%TASKTOID%%\DIAGFW.BAT
DIAGFW.BAT
!mftftp bat
!DIAGFW.BAT
BOOTTYPE !LOADDOS /ENVIRONMENT/DOS71S
!!REBOOT
!!SETENV
!scan.bat /n
HandleScanOutput
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.

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

4.4 Copy files into the task folder

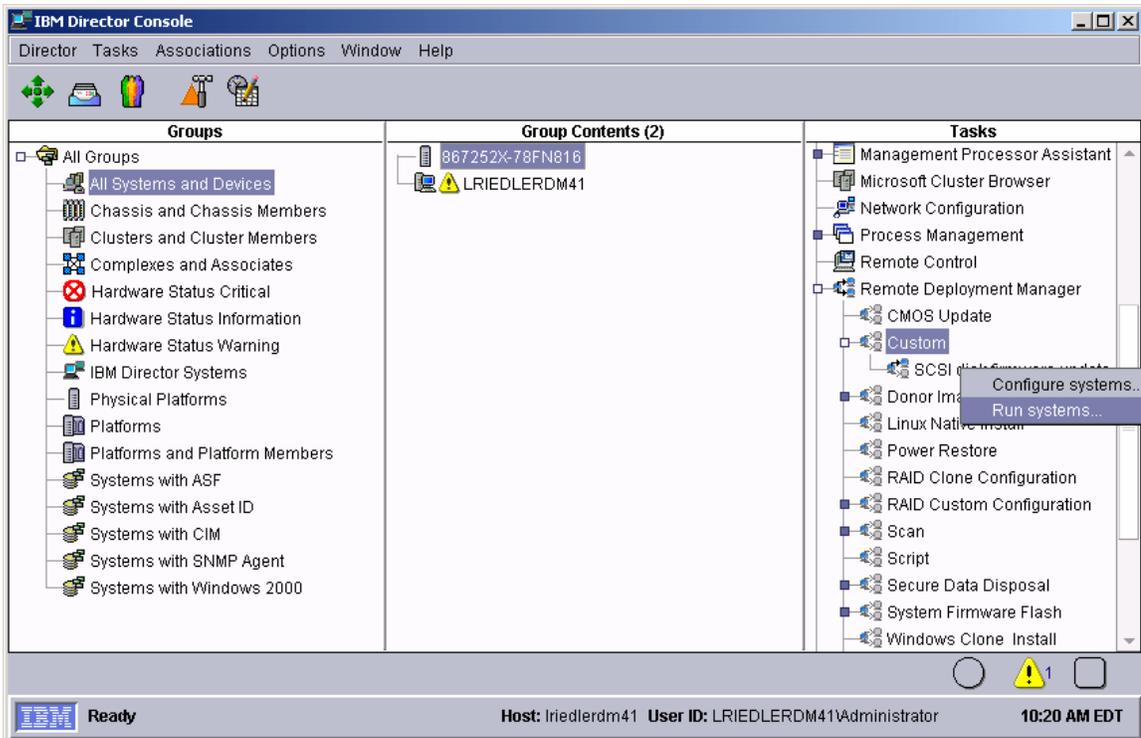
9. Edit the task you just created.
10. Select the **Advanced** tab.
11. Select the **Task folder** category. Make a note of the task folder name: c:\Program Files\IBM\RDM\repository\template\3\546
12. Copy the files that you created in step 2 into the task folder:

```
COPY C:\$$BYDIAG\* C:\Progra~1\IBM\RDM\repository\template\3\546
```

4.5 Test the new custom task

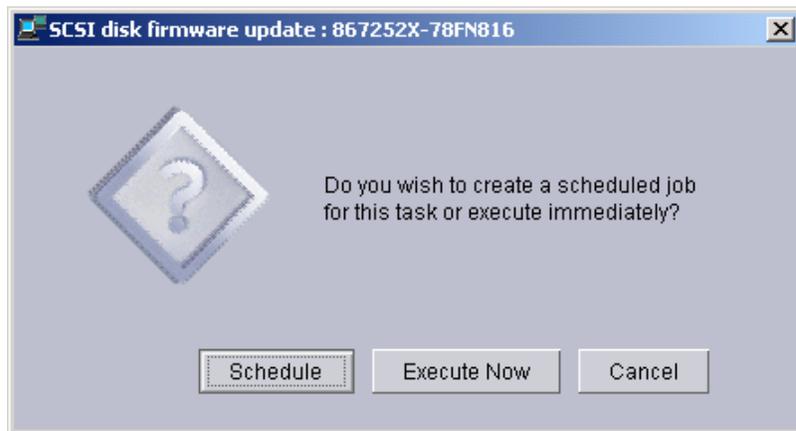
13. Power on a model 8839 BladeCenter server in a way that forces a network boot. RDM will run its Scan task on the system and power it off. The system will appear in the middle pane of a Director console.

Note: Skip this step if you have previously run an RDM Scan task on the system.



14. Drag the entry for that system and drop it on the new *8839 BIOS/Diagnostics 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.

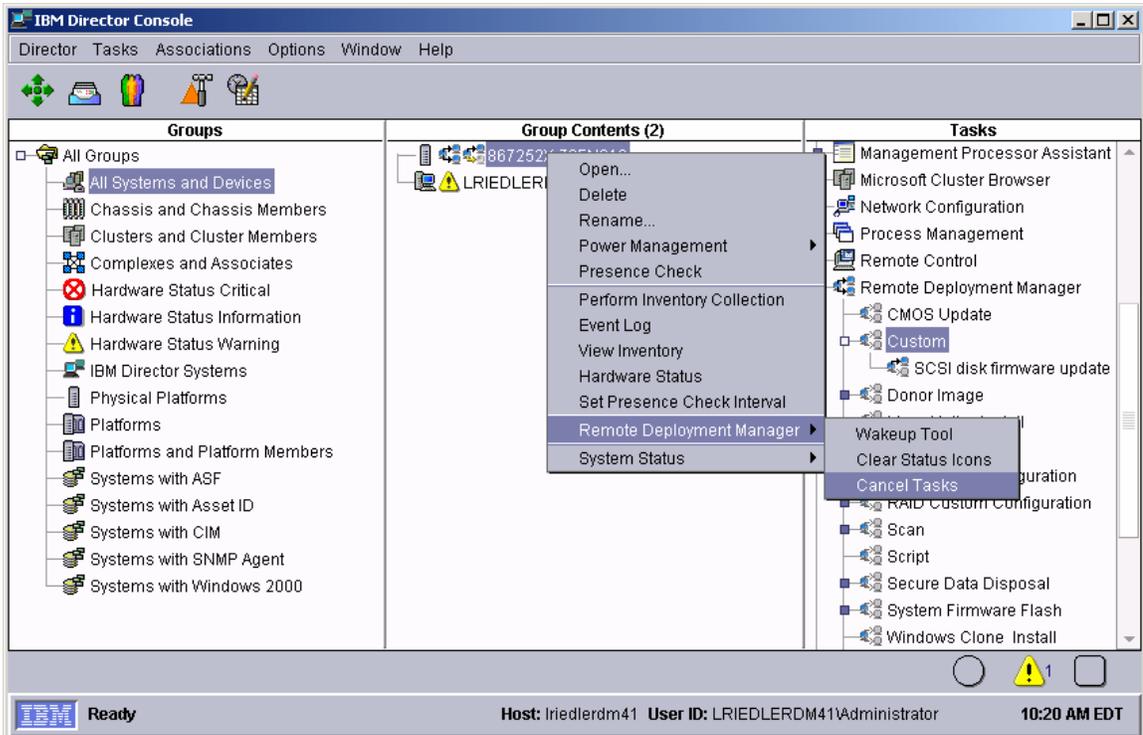


15. Click the **Execute now** button. The target system will wake up (i.e., automatically power itself on) and do a network boot.
16. Immediately after the Starting PC DOS... message appears on the system's monitor, press the F8 key. This allows you to step through all of the batch files and the CommandList file statement-by-statement.
17. 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 14 above.



5 Procedure for *Linux Native Install* tasks

There are a few differences in the 8839 hardware that affect how the *Linux Native Install* (LNI) task works. You can use a LNI task to deploy an 8839, if you modify your standard procedure slightly:

- The 8839 will incorrectly boot its hard drive instead of the RDM DOS71X System Environment at the end of the LNI task processing. You can manually force the 8839 to do a network boot so that it will complete the LNI task correctly.

Just use the steps described below to do LNI with the 8839.

Important: Because of the manual steps that the hardware limitations of the 8839 require, it is not possible to include a LNI task as part of an RDM Script task.

5.1 Create and run a Linux Native Install task

1. Do this in the normal way. Select one or more 8839 blades and run the task on them. The task will deploy Linux and reboot the systems to a point where they are waiting for a logon.

5.2 Force the Linux Native Install task to complete

2. Manually power off the systems.
3. In the RDM console, use the RDM Wake Tool to wake up all of the 8839 systems. The systems will wake up and boot to the network. They will quickly do the final handshake with the RDM server, and the task will be marked complete.

6 Procedure for *Windows Native Install* tasks

There are a few differences in the 8839 hardware that affect how the *Windows Native Install* (WNI) task works. You can use a WNI task to deploy an 8839, if you modify your standard procedure slightly:

- The network device drivers shipped in RDM do not support the 8839's network adapters. You can replace the older drivers and use existing or new Windows Native Install tasks to deploy the 8839.
- The 8839 will incorrectly boot its hard drive instead of the RDM DOS71C System Environment at the end of the WNI task processing. You can manually force the 8839 to do a network boot so that it will complete the WNI task correctly.

Just use the steps described below to do WNI with the 8839.

Important: Because of the manual steps that the hardware limitations of the 8839 require, it is not possible to include a WNI task as part of an RDM Script task.

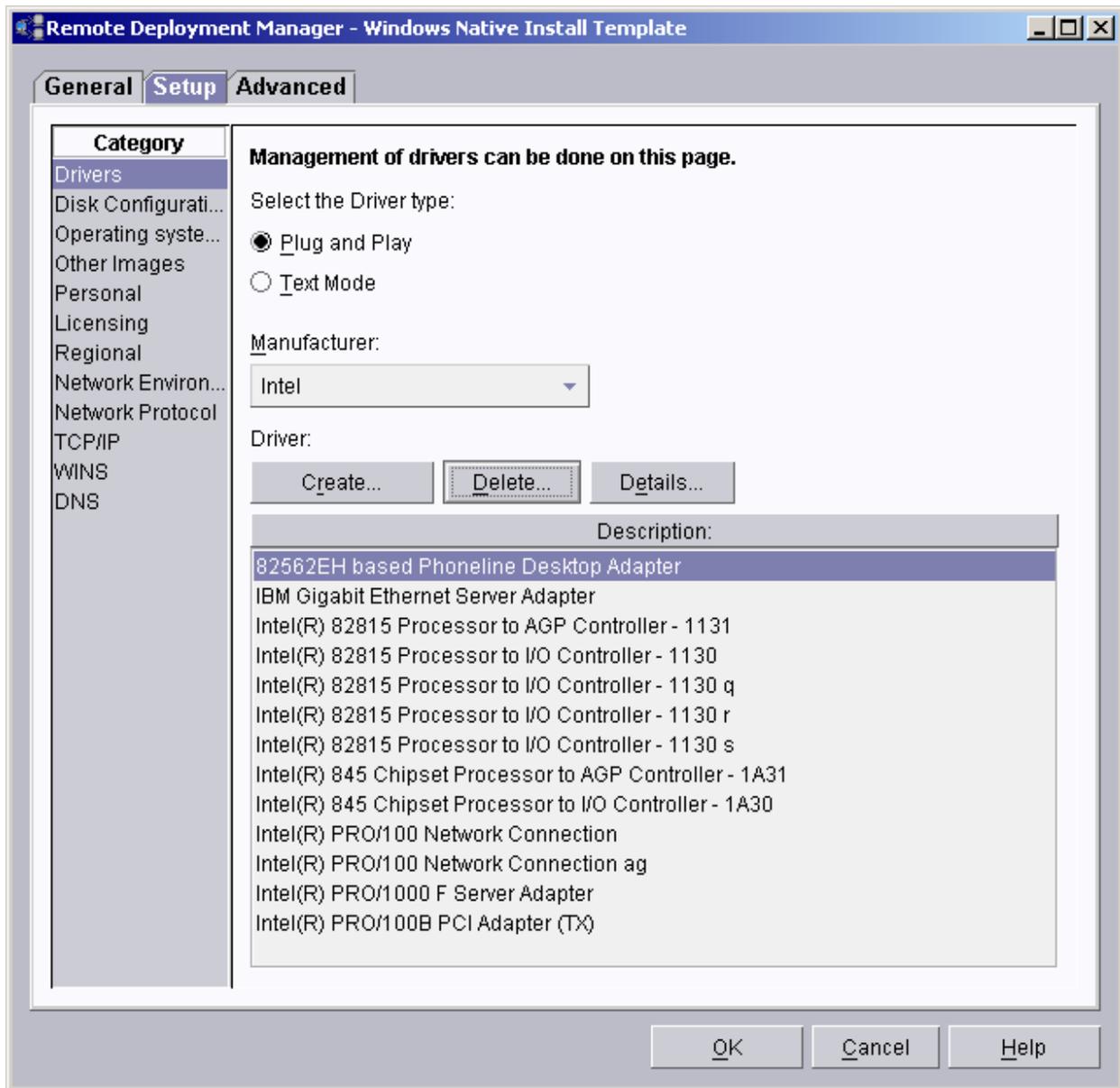
6.1 Acquire network device driver files

4. Download the appropriate files.
5. Create the CDs.

6.2 Delete old network device drivers

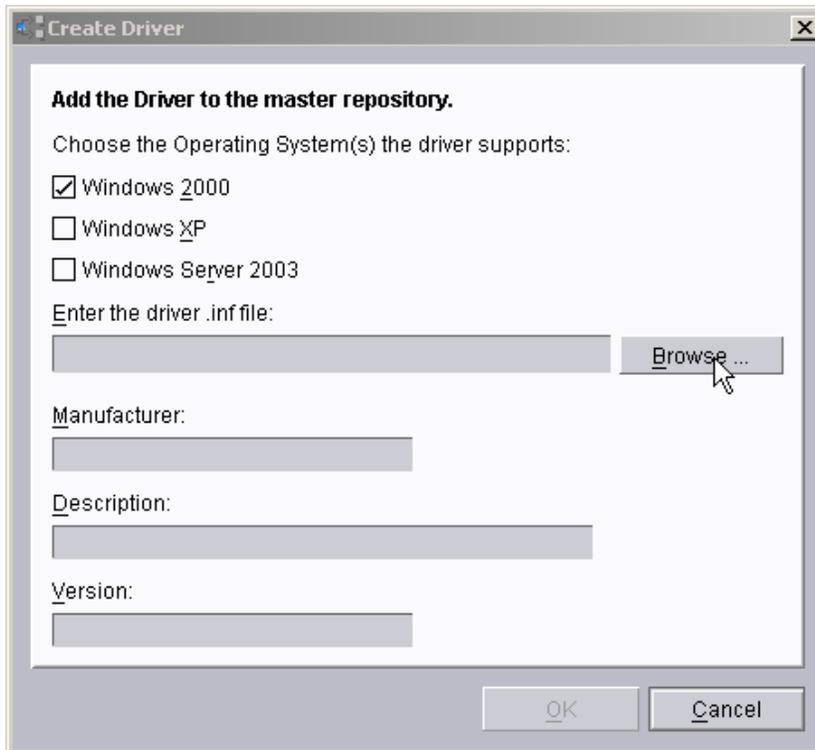
6. Edit the *Windows Native Install* template by right clicking on the template and selecting **Edit template...** from the drop-down menu.
7. Select the **Setup** tab.
8. From the Manufacturer drop-down list, select **Intel**.
9. Select each of the following *Plug and Play* drivers (you can only do one at a time) from the list, and then select the **Delete...** button. Then select the **Yes** button on the *Delete Driver* window.
 - Intel Pro/1000 Gigabit Server Adapter
 - IBM Netfinity Gigabit Ethernet SX Adapter

Each delete takes about a minute (or more) to complete. After the deletions are complete, the template window will look something like this:

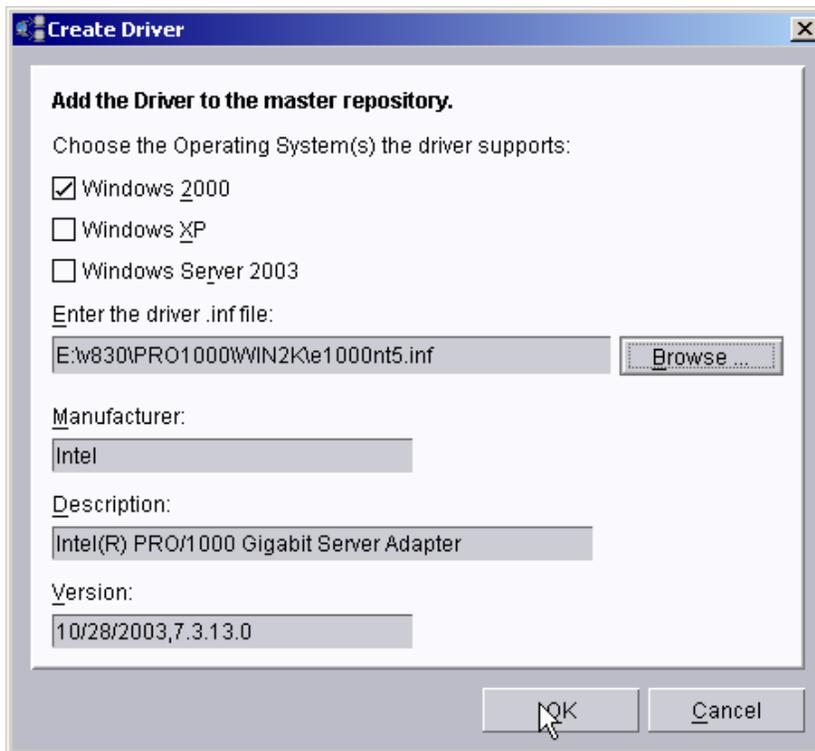


6.3 Add new network device drivers

10. Select the **Create...** button.
11. In the *Create Driver* window, check the **Windows 2000** box, and then select the **Browse...** button.

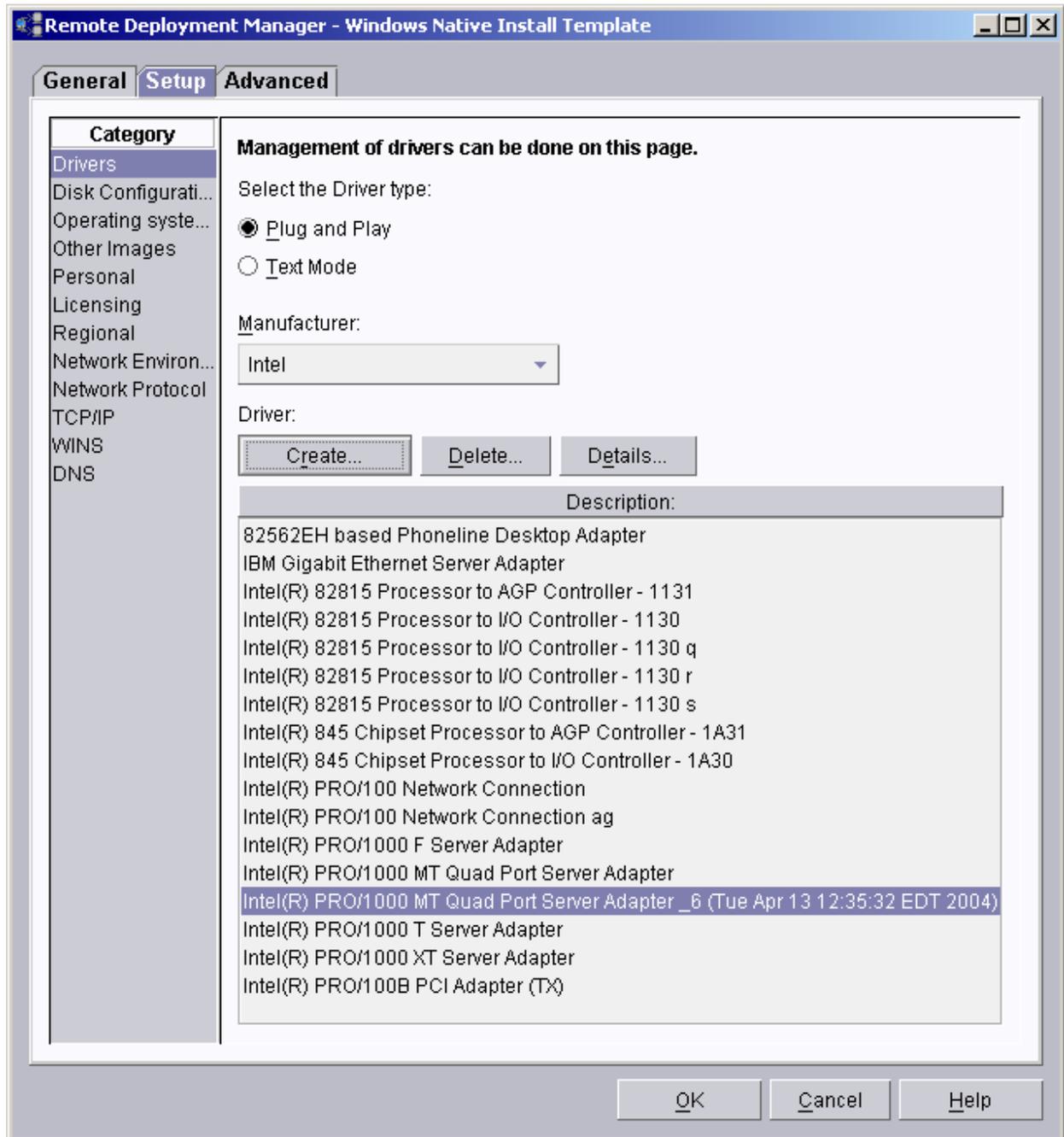


12. Navigate to the `v830\PRO1000\WIN2K\e1000nt5.inf` file on the CD you created in step 5, and then select the **OK** button.



13. When the driver import is complete, select the **OK** button on the *Driver Creation Progress* message box.

14. Repeat steps 10 through 13, selecting the `v830\PRO1000\WIN2K\e101dnt5.inf` file on the CD.
15. Repeat steps 10 through 13, checking both the **Windows XP** and the **Windows Server 2003** boxes and selecting the `v830\PRO1000\W803XP32\e1000325.inf` file on the CD.
16. Repeat steps 10 through 13, checking both the **Windows XP** and the **Windows Server 2003** boxes and selecting the `v830\PRO1000\W803XP32\e101d325.inf` file on the CD.



17. Select the **OK** button to close the *Windows Native Install Template* window.

6.4 Create and run the Windows Native Install task

18. Create the appropriate RDM images, using the *Image Management* window, in the normal way.
19. Create a WNI task in the normal way.
20. Run the WNI task on one or more 8839s. The task will not complete, because after Windows is completely installed, each 8839 system boots to its hard drive instead of to the network.

6.5 Force the Windows Native Install task to complete

21. Logon to each system, and power it off via the Windows *start* menu.
22. In the RDM console, use the RDM Wake Tool to wake up all of the 8839 systems. The systems will wake up and boot to the network. They will quickly do the final handshake with the RDM server, and the task will be marked complete.

7 Procedure for *Windows Clone Install* tasks

There are a few differences in the 8839 hardware that affect how the *Windows Clone Install* (WCI) task works. You can use a WCI task to deploy an 8839, if you modify your standard procedure slightly:

- The 8839 will incorrectly boot its hard drive instead of the RDM DOS71C System Environment at the end of the WCI task processing. You can manually force the 8839 to do a network boot so that it will complete the WCI task correctly.

Just use the steps described below to do WCI with the 8839.

Important: Because of the manual steps that the hardware limitations of the 8839 require, it is not possible to include a WNI task as part of an RDM Script task.

7.1 Build a donor system

1. Install the operating system and applications in the normal way.
2. Create a folder on the system's desktop that contains the files from the appropriate Microsoft Windows DEPLOY.CAB file.
3. Open the desktop folder you just created and run SYSPREP.EXE in the appropriate way. The system will power off.

7.2 Capture the donor image

4. Run the *Get Donor* task on the system, in the normal way.

7.3 Create and run the *Windows Clone Install* task

5. Create a WCI task that uses your donor image in the normal way.
6. Select one or more 8839 blades and run the task on them. The task will deploy Windows and reboot the systems to a point where they are waiting for a logon.

7.4 Force the *Windows Clone Install* task to complete

7. Logon to each system, and power it off via the Windows *start* menu.
8. In the RDM console, use the RDM Wake Tool to wake up all of the 8839 systems. The systems will wake up and boot to the network. They will quickly do the final handshake with the RDM server, and the task will be marked complete.

8 Known problems with 8839 blades

There are several known problems with the model 8839 blades that affect RDM's ability to deploy them.

8.1 Blade may not power off

The RDM code that successfully powers off all other xSeries and BladeCenter servers, as well as all other ThinkCentre, ThinkPad, IntelliStation, and Point of Sale systems (and most non-IBM systems), may not work on the 8839s.

This means that the 8839 reboots at the end of every RDM task. You will have to power off the blade manually (or with the Web interface to the BladeCenter chassis management module. It is important to power the blade off in a way that is not an "improper shutdown" (which would disable Wake on LAN).

The workaround is to update the BIOS and ISMP firmware to the current levels.

8.2 Blade won't boot to network after a warm reboot

The final reboot in Linux Native Install, Windows Native Install, and Windows Clone Install tasks is supposed to be a network boot. It should boot DOS and do a final handshake with the RDM server, so that the server can mark the task as complete. The 8839 blade may instead boot to the hard drive (Windows or Linux) at this point. The result will be that the blade will stop and wait for a user to logon. Eventually, the RDM task will time out and fail.

Once the task reaches that state, you can circumvent this problem with the following manual process on each blade:

1. Logon to each Windows system, and power it off via the Windows *start* menu. For Linux systems, just power them off manually with the white button.
2. In the RDM console, use the RDM Wake Tool to wake up all of the 8839 systems. The systems will wake up and boot to the network. They will quickly do the final handshake with the RDM server, and the task will be marked complete.

The workaround is to update the BIOS and ISMP firmware to the current levels.

8.3 Unclear when to press F1 or F12 key during POST

When you power on a blade and want to change the BIOS settings (via F1) or force a network boot (via F12), it is insufficient to press the appropriate key when the message that instructs you to do that appears. It's usually several seconds later when the system will accept such a key press.

The way to circumvent this is to press the desired key repeatedly as soon as the message appears. You can stop pressing the key when you see the message that indicates your key press was processed.

8.4 System firmware is not in the standard format

The system firmware (i.e., BIOS and BMC) is not in the standard format. Primarily This means that the RDM System Firmware Flash task is not applicable for model 8839 blades.

The workaround is to use modified or custom tasks, as described above, to update this firmware.

8.5 Error 88 capturing or cloning an IDE RAID drive

The Get Donor task fails when trying to capture an IDE RAID drive. If you step through the task (by pressing the F8 key on the HS40 when you see the "Starting PC DOS..." message, and then pressing the "y" key for each statement), you will see that the PowerQuest program fails immediately and generates error 88.

There is no workaround for this problem.

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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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