Updating Diagnostics Firmware with RDM 4.11

A White Paper

April 15, 2004

Note:

Before using this information and the product it supports, read the general information in “Notices,” on page 10.

© Copyright International Business Machines Corporation 2004. All rights reserved.

U.S. Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Contents iii

Preface v
Who should read this White Paper v
Further reference v
Guides v
White papers vi
Online help vi
Links vi

1 Procedure for updating BIOS and Diagnostics 1
1.1 Acquire Diagnostics and BIOS firmware files 1
1.2 Create the BIOS image 1
1.3 Add Diagnostics and batch files to the BIOS image 1
1.4 Create a new System Firmware Flash task 2
1.5 Test the BIOS image 3

2 Procedure for updating Diagnostics 4
2.1 Acquire Diagnostics firmware files 4
2.2 Create a batch file that will do the flash update 4
2.3 Create the Custom task that will deploy the firmware 5
2.4 Copy files into the task folder 7
2.5 Test the new custom task 7

Notices 10
Edition notice 10
Trademarks 11

Glossary 13

Copyright IBM Corp. 2004

Preface

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

- Update Diagnostics firmware on systems that use the FLASH2.EXE program to update their BIOS and Diagnostics.
- Modify RDM *System Firmware Flash* tasks.
- 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.

Note: To flash Diagnostics firmware on the model 8839 BladeCenter HS40 system, use the similar techniques that are described in the *Using RDM 4.11 to Deploy BladeCenter 8839* white paper. See the White papers section below to obtain RDM white papers.

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

Copyright IBM Corp. 2004

- *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

White papers

Some topics that are not covered in the Guides are described in white papers. You can find those on the public IBM Web site:

http://www-306.ibm.com/pc/support/site.wss/document.do?lndocid=MIGR-53487

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 and Diagnostics

On some systems, the BIOS and Diagnostics firmware are updated with the same program (e.g., FLASH2.EXE). It is possible to create a custom task to update Diagnostics firmware (see section 2 below). However, it might be easier just to add the Diagnostics update to the same task that does the BIOS update.

1.1 Acquire Diagnostics and BIOS firmware files

1. Download the appropriate files.
2. Create the Diagnostics and BIOS diskettes. There will be 1 or 2 diskettes for Diagnostics, and usually only 1 diskette for BIOS.

1.2 Create the BIOS image

3. Use RDM's *Image Management* window to create the BIOS image.

1.3 Add Diagnostics and batch 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 to the ZIP file.
6. If the BIOS image uses FLASH2.EXE, you should create an LCREFLSH.BAT file with the following statements:

```
REM ************************************************************************
REM * Remote Deployment Manager
REM * (C) Copyright IBM Corp. 2004 All rights reserved.
REM ************************************************************************
REM * User-generated file that causes the RDM System Firmware Flash task
REM * to update both Diagnostics and BIOS firmware using FLASH2.EXE.
REM ************************************************************************

REM Flash DIAGNOSTICS firmware
FLASH2.EXE /u /d
IF ERRORLEVEL 1 GOTO DIAGERR

REM Flash BIOS firmware
FLASH2 /U
IF ERRORLEVEL 1 GOTO BIOSERR

GOTO END

:DIAGERR
SET RDRASLEVEL=1
SET RDSTATUS="RDDIAG901E - DIAGNOSTICS firmware update failed - see
      %BOOTMAC%.SFF.DIAGFW.LOG file in RDM temp directory"
ECHO RDBIOS901E - DIAGNOSTICS firmware update failed. >> DIAG.LOG
MTFTP PUT %SERVER_IP% DIAG.LOG %BOOTMAC%.SFF.DIAGFW.LOG
GOTO SETERR
```

Copyright IBM Corp. 2004

```
:BIOSERR
SET RDRASLEVEL=1
SET RDSTATUS="RDBIOS902E - BIOS firmware update failed - see
      %BOOTMAC%.SFF.BIOSFW.LOG file in RDM temp directory"
ECHO RDBIOS902E - BIOS firmware update failed. >> BIOS.LOG
MTFTP PUT %SERVER_IP% BIOS.LOG %BOOTMAC%.SFF.BIOSFW.LOG
GOTO SETERR

:SETERR
REM This invalid-sysntax statement causes a nonzero ERRORLEVEL
REM (needed because BFLSH.BAT needs it, in case of failure):
MTFTP > NUL

:END
```

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.ZIP).

1.4 Create a new System Firmware Flash task

This step is optional. By modifying this task as described here, the BIOS and Diagnostic flash requires that the target system boot twice (while the built-in *Deploy latest system firmware task* will boot 3 times).

9. Create a new System Firmware Flash task in the normal way.
10. Select the image that you modified in section 1.3.
11. Change the CommandList file so that it looks like this:

```
; ****************************************************************
; * Remote Deployment Manager
; * (C) Copyright IBM Corp. 2004 All rights reserved.
; ****************************************************************
; * User-generated command list for the System Firmware Flash task.
; * Used to flash Diagnostics and BIOS, reboot, run Scan
.  It
; * assumes that the BIOS image contains an LCREFLSH.BAT file and
; * the Diagnostics firmware files.
; ****************************************************************
BOOTTYPE !LOADDOS /ENVIRONMENT/DOS71F
WAKE
!!SETENV
!CHKFLSH.BAT
!BFLSH.BAT BIOS
BOOTTYPE !LOADDOS /ENVIRONMENT/DOS71S
SHUTDOWN_AND_WAKE
!scan.bat  /n /b
HandleScanOutput
UpdateAssetID
!!SHUTDOWN
END
```

Note that this command list will not flash Integrated System Management Processor firmware (because the statements that do that have been removed).

12. Save the new task by selecting the **OK** button.

1.5 Test the BIOS image

13. Run a System Firmware Flash task, such as the task you created in section 1.4 or the built-in *Deploy latest system firmware task*, to validate that the BIOS and Diagnostics updates work.
14. 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.
15. 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 13 above.

Copyright IBM Corp. 2004

2 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.

2.1 Acquire Diagnostics firmware files

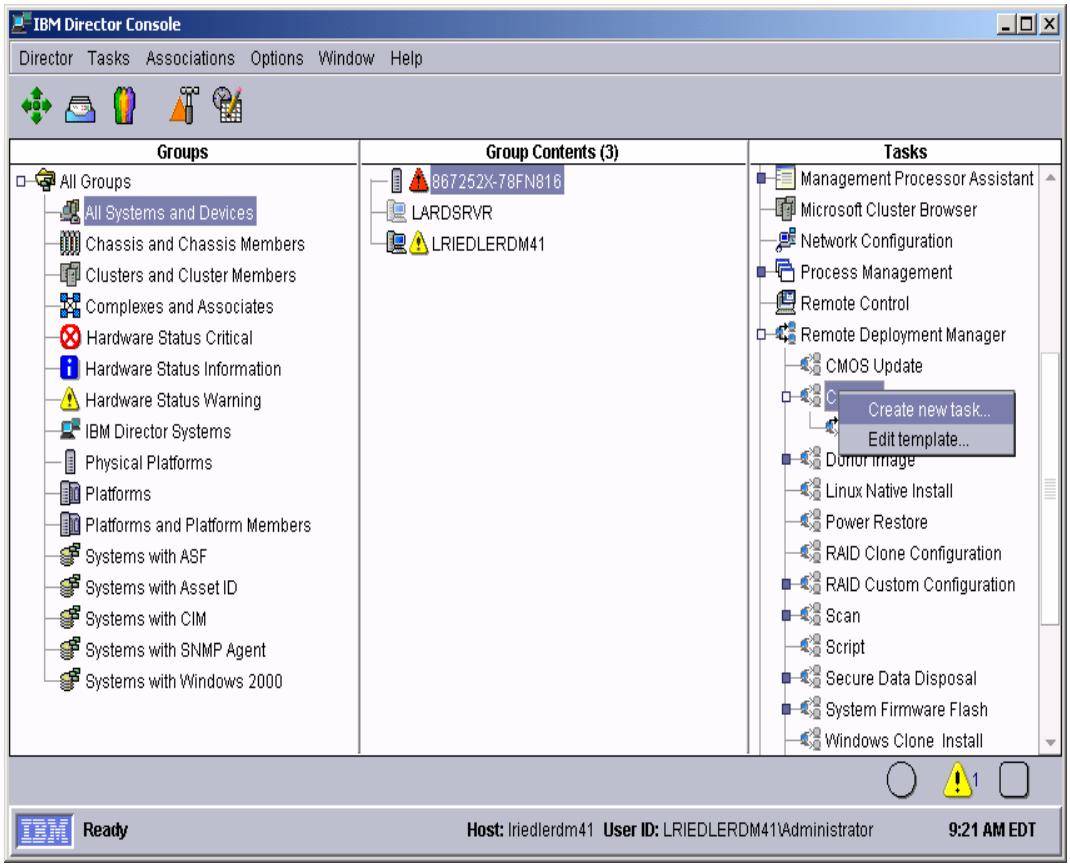
1. Download the appropriate files and create the 1 or 2 Diagnostics diskettes.

2.2 Create a batch file that will do the flash update

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

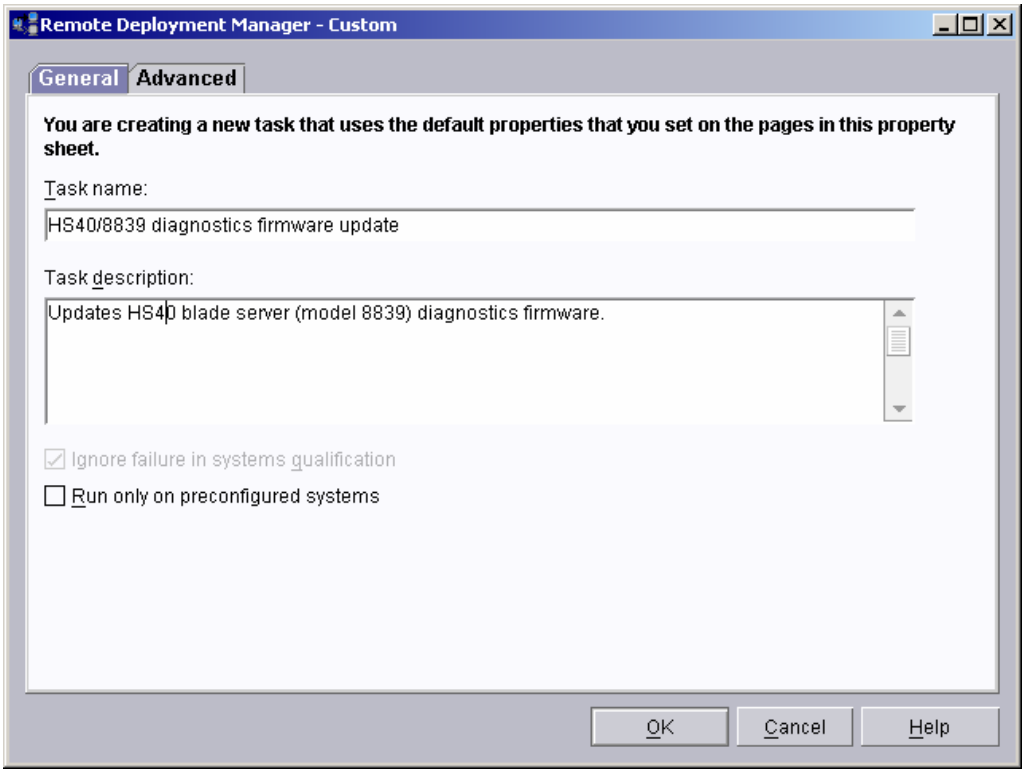
```
ECHO Entering DIAGFW.BAT
SET RDSTATUS=RDMDFW000I
SET RDRASLEVEL=0

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
```

2.3 Create the Custom task that will deploy the firmware

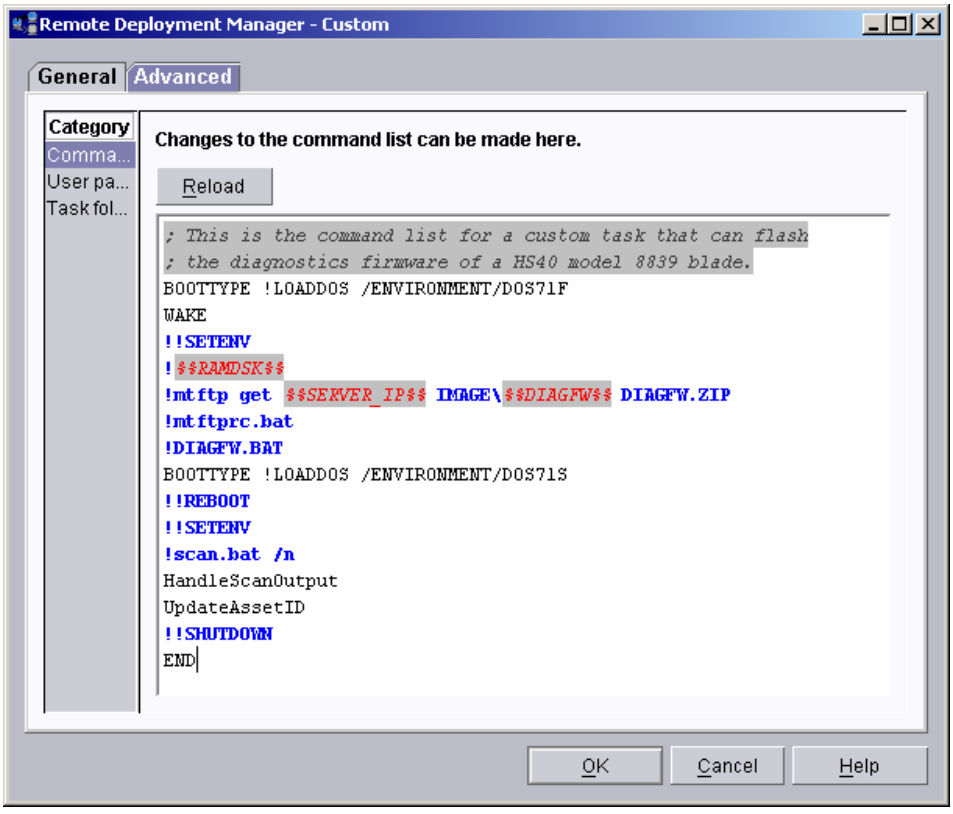


3. Expand **Remote Deployment Manger** in the *Tasks* pane of the Director console, and right-click **Custom**. The menu is displayed.
4. Click **Create new task…** on the menu to access the property pages. There are two pages:
   - **General**: Contains basic information about the task.
   - **Advanced**: Contains the command list, user parameters, and task folder name for the task.

Copyright IBM Corp. 2004



5. 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).



6. 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%%
!mtftp get %%SERVER_IP%% TEMPLATE\%%TASKTEMPLATEID%%\%%TASKTOID%%\AFUIDOS.EXE
       AFUIDOS.EXE
!mtftprc.bat
!mtftp get %%SERVER_IP%% TEMPLATE\%%TASKTEMPLATEID%%\%%TASKTOID%%\$SBYDIAG $SBYDIAG
!mtftprc.bat
!mtftp get %%SERVER_IP%% TEMPLATE\%%TASKTEMPLATEID%%\%%TASKTOID%%\DIAGFW.BAT
       DIAGFW.BAT
!mtftprc.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.

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

2.4 Copy files into the task folder

8. Edit the task you just created.
9. Select the **Advanced** tab.
10. Select the **Task folder** category. Make a note of the task folder name: c:\Program Files\IBM\RDM\repository\template\3\546
11. Copy the files that you created in step **Error! Reference source not found.** into the task folder:

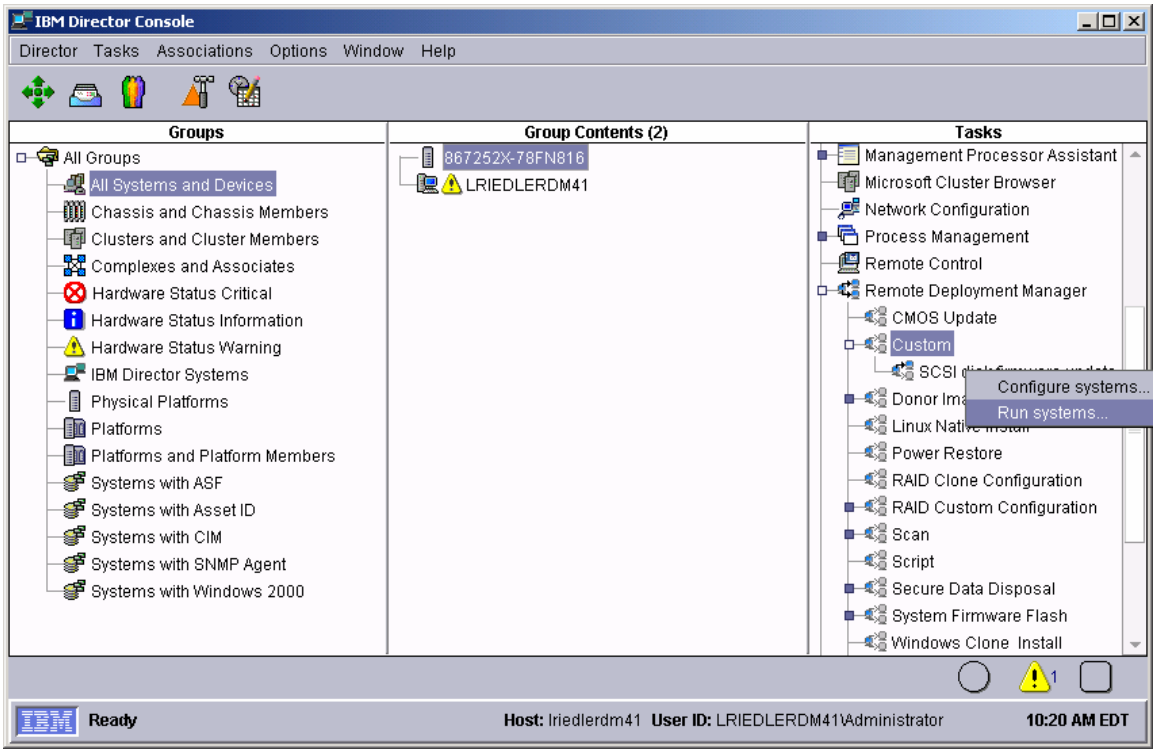
    ```
    COPY C:\$SBYDIAG\* C:\Progra~1\IBM\RDM\repository\template\3\546
    ```

2.5 Test the new custom task

12. 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.

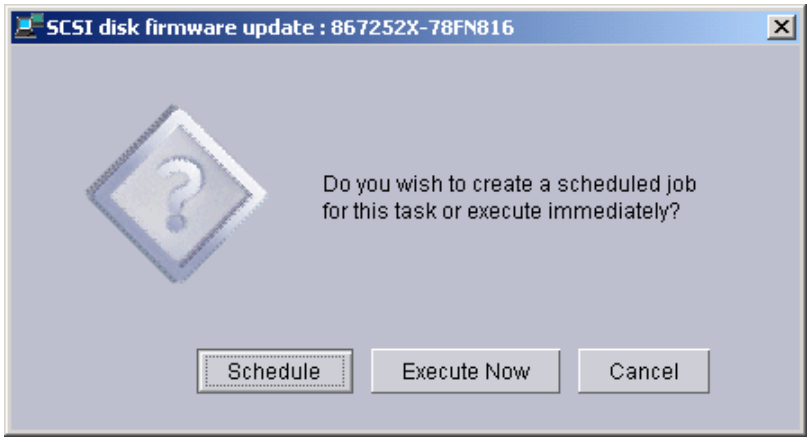
    Note: Skip this step if you have previously run an RDM Scan task on the system.

Copyright IBM Corp. 2004



13. 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.



14. Click the **Execute now** button. The target system will wake up (i.e., automatically power itself on) and do a network boot.
15. 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.
16. 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.

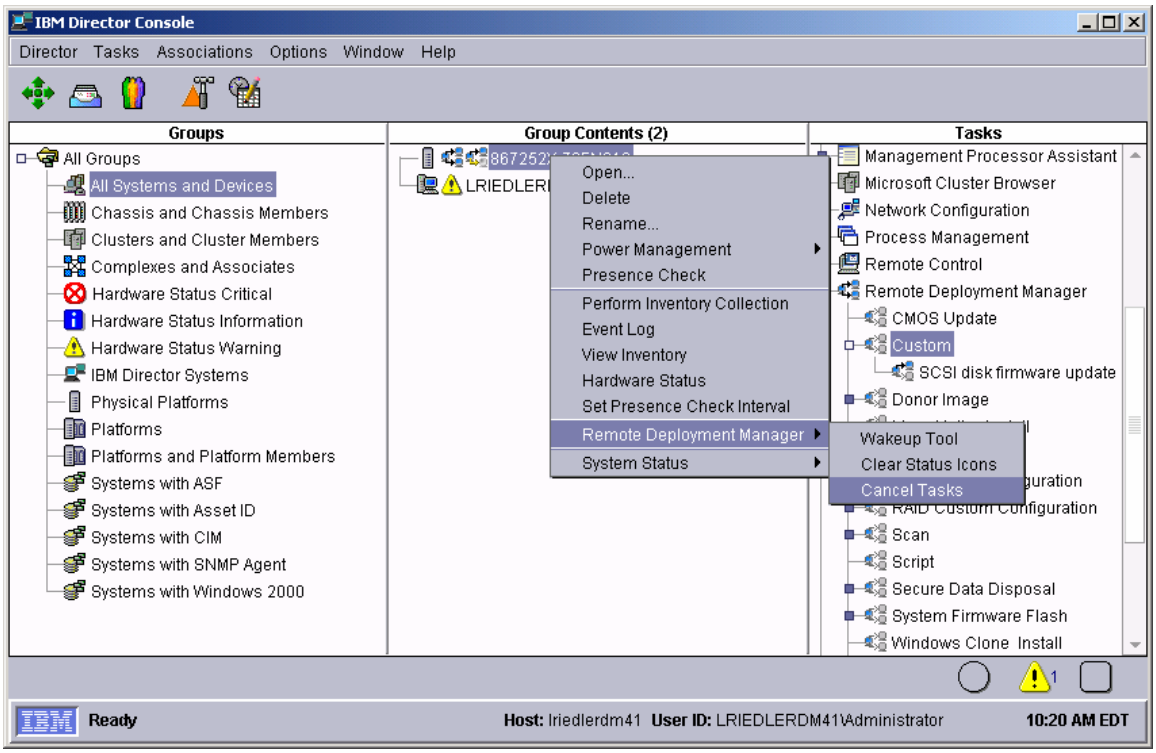
To rerun the test, you will usually need to do the following:

e. Power off the server with the power switch.

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

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

h. Go back to step 13 above.



Copyright IBM Corp. 2004

Notices

This information was developed for products and services offered in the U.S.A.

IBM might not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service might be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right might be used instead. However, it is the user responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM might have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement might not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM might make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

IBM might use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Some software might differ from its retail version (if available) and might not include all user manuals or all program functionality.

IBM makes no representations or warranties regarding third-party products or services.

Edition notice

© COPYRIGHT INTERNATIONAL BUSINESS MACHINES CORPORATION, 2003. All rights reserved.

Note to U.S. Government Users Restricted Rights — Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM

IBM (logo)

Asset ID

IntelliStation

LANClient Control Manager

Netfinity

ServeRAID

ThinkPad

Wake on LAN

xSeries

Adaptec is a trademark of Adaptec Inc. in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names might be trademarks or service marks of others.

Copyright IBM Corp. 2004

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

Copyright IBM Corp. 2004

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.

Printed in U.S.A.

Copyright IBM Corp. 2004