

IBM Remote Deployment Manager 4.20



User's Reference

IBM Remote Deployment Manager 4.20



User's Reference

Note:

Before using this information and the product it supports, read the general information in Appendix G, "Notices," on page 369.

Third Edition (October 2004)

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

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

Contents

Figures	xi
About this document	xv
How this document is organized	xv
Notices that are used in this document	xvi
RDM documentation	xvi
RDM resources on the World Wide Web	xvii

Part 1. Introducing Remote Deployment Manager 1

Chapter 1. Introducing Remote Deployment Manager	3
RDM environment and terminology	3
RDM components	3
RDM Server	3
RDM Console	4
RDM Deployment Server (D-Server)	4
How RDM works	4
Chapter 2. IBM Director Console and RDM tasks	7
IBM Director Console	7
RDM menu items	8
RDM task templates	9
Images	10
Applying tasks to target systems	11
Status icons	11

Part 2. Understanding RDM tasks 13

Chapter 3. Working with RDM templates	15
Task templates	15
Predefined tasks	16
Creating a task	16
Default parameter values	17
Task properties	17
General properties	18
Setup	19
Advanced properties - Command list	19
Advanced properties - User parameters	22
Advanced properties - Task folder	27
Chapter 4. Using Image Management	29
Starting Image Management	29
Creating an image	30
Modifying an image	35
Deleting an image	38
Replicating an image	39
Chapter 5. Configuring RDM	41
Configuring RDM Server	41
Adding a remote deployment server to RDM	43
Configuring RDM Deployment Server (D-Server)	45
Enabling a remote deployment server	47

Enabling multicast	47
Configuring the network settings	48
Configuring the multicast settings	48
Configuring the MTFTP settings	49
Configuring the replication settings	49
Configuring which subnets are served	51
Restarting RDM Deployment Server (D-Server)	54
Deleting a remote deployment server from RDM	54
Changing the IP address of a remote deployment server	55
Changing the IP address of a remote deployment server on Linux	56
Changing the IP address of a remote deployment server on Windows	56
Chapter 6. Configuring systems and tasks.	59
System/Task Configuration	59
Importing STC settings	61
Creating a CSV file	61
Importing STC data from a CSV file	61
Target system qualification	63
Chapter 7. Importing and exporting	67
Importing and exporting RDM system data.	67
Exporting RDM system data	68
Saving system data to a CSV file	69
Importing RDM system data	70
Importing and exporting RDM tasks	71
Exporting RDM tasks	71
Importing RDM tasks.	73
Importing and exporting RDM images	74
Exporting RDM images	74
Importing RDM images	75
Importing data	75

Part 3. Running RDM tasks. **77**

Chapter 8. CMOS Update	79
Preparing the donor system	80
Saving the BIOS settings to a CMS file	80
Creating a CMOS Update image	81
Creating a CMOS Update task	85
Running a CMOS Update task	89
Using the lccmos.bat file	90
Chapter 9. Custom	91
Creating a Custom task.	91
Creating a Custom task to deploy a donor image	93
Creating a Custom task to capture BIOS settings (CMOS configuration)	95
Chapter 10. Donor Image (Get Donor)	99
Preparing the donor system.	100
Installing and configuring applications	100
Running Sysprep	100
Creating a donor image	102
Using the Get Donor task	102
Using the Image Management option and a PQI file.	105
Upgrading to DeployCenter version 5.5	107

Chapter 11. Linux Native Install.	111
Creating an operating-system image	112
Creating an IBM Director Agent image	115
Creating a Linux application installation image	118
Creating a Linux Native Install task	121
Creating a customized Linux Native Install operating-system image	135
Running a Linux Native Install task	136
Configuring X Windows for systems with a Remote Supervisor Adapter II	137
Chapter 12. Power Restore	139
Operational guidelines.	139
Running Power Restore as an RDM task.	140
Creating a Power Restore task using RDM	140
Running Power Restore locally on the target system	142
Using a startable disk to run Power Restore.	142
Using IBM Boot Manager to run Power Restore	143
Creating a Power Restore task locally on the target system	145
Removing the Power Restore partition and IBM Boot Manager.	147
Removing the Power Restore partition.	147
Removing IBM Boot Manager for Power Restore	147
Chapter 13. RAID Clone Configuration	149
Creating a RAID configuration file	149
Creating a DOS-startable diskette	150
Creating a configuration backup file	151
Creating a configuration command file	152
Creating a RAID Clone Configuration image.	154
Creating a RAID Clone Configuration task	158
Chapter 14. RAID Custom Configuration	161
Express RAID Configuration task.	161
Creating a RAID Custom Configuration task.	162
Chapter 15. Remote Storage Configuration	169
Supported devices	169
Network storage configuration examples	170
Network storage devices and switches.	172
Adding a network storage device	173
Adding a switch	174
Configuring remote storage	176
Modifying the SSPTSetting.xml file	177
Creating an Allocate LUN task.	178
Configuring a system on a user-created Allocate LUN task	181
Configuring a system on a predefined task	182
Configure Fibre HBA Boot Settings	182
Delete Mapping	183
Delete Mapping and LUNs	184
Get Profile	185
Put Profile	186
Configuring remote storage tasks for dual boot.	187
Chapter 16. Scan	191
Basic Scan task	191
Creating a Scan task	192
Configuring the renaming algorithm	198
Working with user prompts	198

Removing a user prompt from a Scan task or template.	199
Editing or deleting a user prompt.	200
Working with user prompt responses	203
Chapter 17. Script	205
Qualification considerations	205
Task selection	206
Chapter 18. Secure Data Disposal	209
Level-1 Limited Partition Removal task.	209
Level-2 1-Overwrite Security	209
Level-3 4-Overwrite DOD Security	210
Level-4 7-Overwrite DOD Security	210
Creating a Secure Data Disposal task	211
Chapter 19. System Firmware Flash	215
Deploy latest system firmware task	215
Creating a firmware update diskette.	215
Creating a System Firmware Flash image in RDM	216
Creating a System Firmware Flash task	220
Running a System Firmware Flash task	222
Chapter 20. VMware Native Install	223
Copying a VMware installation image to a network	223
Creating a VMware Native Install task	223
Configuring a target system.	230
Running a VMware task	232
Chapter 21. Windows Clone Install	233
Creating a Windows Clone Install image	234
Creating a Windows Clone Install task.	237
Running the Windows Clone Install task	245
Modifying the Windows Clone Install answer file	246
Chapter 22. Windows Native Install	247
Creating a Windows Native Install image	247
Creating a Windows Native Install task	251
Creating a Windows Native Install task that installs IBM Director Agent.	262
Running a Windows Native Install task.	263
Editing the Windows Native Install template	263
Working with device drivers.	263
Deleting the operating-system installation directory from a target system	268

Part 4. Additional RDM information 271

Chapter 23. Advanced mkimages.bat usage	273
Building custom DOS system environments using mkimages.bat	273
Building DOS diskettes for use with RDM.	274
Chapter 24. Command-list commands	275
Server commands	275
Server command syntax	275
Server command examples	277
Target-system commands	279
Target-system syntax	279
Target-system command examples	280

RdAgent commands	280
RdAgent syntax	280
RdAgent command examples	281
Chapter 25. Utilities	283
DOS utilities	283
bmgr.exe	284
dynaload.com	284
fdisk.com	284
fdisk32.exe	286
format.com	287
format32.com	289
fsid.com	290
mem.exe	291
Miscellaneous utilities	291
bpdisk.exe	291
idewc.exe	293
Power restore utilities	293
createpr.com	294
getramd.exe	294
macsubst.exe	294
parttool.com	295
pr.exe	298
prerr.com	299
prsource.exe	299
reboot.com	299
seterror.com	299
RAID configuration utilities	300
cfg1030.exe	300
hypercfg.exe	302
ipssendl.exe	303
raidset.exe	306
acu.exe	308
acuichsv.exe	309
RDM utilities	310
aiaread.exe	311
aiawrite.exe	313
appsinst.exe	314
bootini.com	314
cleanup.exe	314
deditd.exe	314
dsconfig.exe	315
getvol.exe	315
lccustom.exe	315
lccm.1 and bstrap.0.	317
lcips.dos	318
lcreboot.exe	318
makepqs.com	319
mergeini.exe	319
mftftp.exe	319
poweroff.com	320
prepdsk.exe	320
raidcfg.exe	320
ramdisk2.exe	320
rave.exe	321
rdagent.exe.	321

redirect.exe	322
scan.exe	323
scrub3.exe	323
sleep.exe	329
treboot.exe	329
tshudwn.exe	329
unzip.exe	329
Symantec utilities	330
pqaccd.exe	330
pqidplyz.exe	330
Chapter 26. Solving RDM problems	331
Resetting IBM Director Server	334

Part 5. Appendixes 335

Appendix A. Additional cloning procedures using Sysprep	337
RDM-supported options in Sysprep version 2.0	337
Using Sysprep version 2.0 in factory mode	338
Adding Plug and Play drivers to a Windows Clone Install task	339
Adding applications to a Windows Clone Install task.	341
Supporting multiple mass storage devices	342
Preparing the donor system.	342
Adding SysPrepMassStorage for Windows 2000	342
Adding SysPrepMassStorage for Windows XP and Windows Server 2003	343
Adding SysPrepMassStorage with the -bmsd parameter	344
Cloning systems that have IBM Director Agent installed	345
Using IBM Director to remotely run Sysprep on a managed system	349
Appendix B. Creating custom system environments	351
Creating a custom system environment	351
Modifying the system environment substitution file	352
Syntax	352
Sample bootEnvir.sub file	353
Examples of modifying the bootEnvir.sub file	353
Appendix C. RDM data and files	355
Types of data	355
RDM directory structure	355
Appendix D. Linux directories	357
Appendix E. Terminology summary and abbreviation list	363
RDM terminology summary	363
Abbreviations	363
Appendix F. Getting help and technical assistance	367
Before you call	367
Using the documentation.	367
Getting help and information from the World Wide Web	368
Software service and support	368
Appendix G. Notices	369
Edition notice	370
Trademarks.	370

Index 371

Figures

1. IBM Director Console window	7
2. RDM menu options	8
3. RDM tasks displayed in IBM Director Console	9
4. RDM task templates	15
5. Predefined RDM tasks	16
6. General page example.	18
7. Advanced page: "Command list" pane	19
8. Command List Editor wizard, window one.	20
9. Command List Editor wizard, window two.	21
10. Advanced page: "User parameters" pane	22
11. User Parameters window	23
12. Create User Parameter window	24
13. User Parameters window when editing or deleting a user parameter	26
14. Advanced page: "Task folder" pane	27
15. Image Management window.	29
16. Image Management window.	30
17. Create Image window	31
18. Create System Firmware Flash Image window: General page	32
19. Create System Firmware Flash Image window: Setup page	33
20. "Select directory" window	34
21. Task Image Creation Progress window	34
22. Image Management window.	35
23. General properties	36
24. Image Properties page.	37
25. Image Management window.	38
26. Image Management window.	39
27. Replicate Images window.	40
28. RDM Options window: Server page	41
29. RDM Options window: System page.	43
30. Deployment Server Management Options window.	44
31. Add D-Server window	44
32. Deployment Server Management Options window.	46
33. Deployment Server Management Options window: Replication page	50
34. Remote Deployment Management Options window: Subnets page	52
35. Add Subnet window.	53
36. Subnet Management window	53
37. Deployment Server Management Options window.	55
38. Delete Confirmation window.	55
39. RDM D-Server Configuration window	57
40. VMware task: System/Task Configuration window	60
41. Context menu	61
42. "Locate the file to be imported" window	62
43. System Qualification Errors window	63
44. Export Systems window	68
45. Export File window	69
46. "Export warning" message	72
47. Export Tasks window	72
48. Select Export Location window.	73
49. Image Management window.	81
50. Create Image window	82
51. Create CMOS Update Image window: General page.	83
52. Create CMOS Update Image window: Setup page	84
53. "Locate the CMOS donor file" window	85

54. CMOS Update window: General page	86
55. CMOS Update window: Setup page	87
56. Image Selection window	88
57. CMOS Update window: Setup page: Password category	89
58. Custom window: General page.	91
59. Custom window: Advanced page	92
60. Custom window: General page	93
61. Custom window: Advanced page	94
62. System/Task Configuration: Get Donor window	103
63. Get Donor (Built-in) window	104
64. Image Management window	105
65. Create Image window	106
66. Create Windows Clone Install Image window	106
67. Create Windows Clone Install Image window: Setup page	107
68. Image Management window	112
69. Create Image window	113
70. Create Linux Native Install Image window: General page.	113
71. Create Linux Native Install Image window: Setup page	114
72. Image Management window	115
73. Create Image window	116
74. Create Linux Native Install Image window: General page.	116
75. Create Linux Native Install Image window: Setup page	117
76. Image Management window	118
77. Create Image window	119
78. Create Linux Native Install Image window: General page.	119
79. Create Linux Native Install Image window: Setup page	120
80. Linux Native Install task: "You are creating a new task" window	121
81. "Image selection" window	122
82. Linux Native Install task: "Select images" window	123
83. Linux Native Install task: Partition Configuration window	124
84. "Enter the data for the new partition" window	125
85. Linux Native Install task: Boot Loader Configuration window	126
86. Linux Native Install task: Regional Parameter Setup window	127
87. Linux Native Install task: TCP/IP Setup Information window, with Use DHCP Server check box cleared	128
88. Linux Native Install task: Password Authentication window	129
89. Linux Native Install task: Group Packages Selection window	130
90. Linux Native Install task: Firewall Configuration window	131
91. Linux Native Install task: X Windows Setup window, with Skip X Windows Configuration check box cleared	134
92. Power Restore Operations category	141
93. Power Restore <i>GUI-based</i> user interface	145
94. Power Restore text-based user interface	146
95. Image Management window	155
96. Create Image window	155
97. Create RAID Clone Configuration Image window: General page	156
98. Create RAID Clone Configuration Image window: Setup page	157
99. "Locate the RAID clone file" window	157
100. RAID Clone Configuration window	158
101. RAID Clone Configuration window: Setup page	159
102. Image Selection window.	159
103. IBM Director Console Tasks pane: RAID Clone Configuration task	160
104. RAID Custom Configuration window	162
105. General Controller Information window	163
106. Array Information window	164
107. Logical Drive Information window	166

108. IBM Director Console Tasks pane: RAID Custom Configuration task	167
109. Basic network storage configuration	170
110. Network storage configuration with external Fibre Channel switch and stand-alone server	171
111. Network storage configuration with Remote Deployment Server	172
112. Network Storage Configuration window: Storage page	173
113. Add Storage window	174
114. Network Storage Configuration window: Switches page	175
115. Add Switch window	175
116. Remote Storage Configuration: Configuring LUNs	179
117. Create LUN window	180
118. "System/Task Configuration: allocate 10GB boot lun" window	181
119. Remote Storage Configuration: Five predefined tasks	182
120. System/Task Configuration: Configure HBA Boot Settings	183
121. System/Task Configuration: Delete Mapping	184
122. System/Task Configuration: Delete Mapping and LUNs	185
123. System/Task Configuration: Get Profile	186
124. System/Task Configuration: Put Profile	187
125. Configuring remote storage for dual-boot operating systems	188
126. Scan task: General page	192
127. Setup page	193
128. User Prompts window	194
129. Create User Prompt window	194
130. User Prompts window	195
131. Setup page with selected prompts	196
132. Naming page.	197
133. Created Scan task in Scan tree	198
134. Scan template: General page.	199
135. Scan template: Setup page	200
136. Scan template: General page.	201
137. Scan template: Setup page	202
138. Scan template: User Prompts window.	203
139. Script window: General tab	206
140. Task Selection category for Script	207
141. Secure Data Disposal window	211
142. Secure Data Disposal window: Setup page.	212
143. Image Management window	216
144. Create Image window	217
145. Create System Firmware Flash Image window: General page	217
146. Create System Firmware Flash Image window: Setup page.	218
147. "Select directory" window	219
148. Remote Deployment Manager - System Firmware Flash window: General page	220
149. Remote Deployment Manager - System Firmware Flash window: Setup page	221
150. Image Selection window.	221
151. VMware Native Install task: "You are creating a new task" window	224
152. VMware Native Install task: VMware License Agreement window.	225
153. VMware Native Install task: Installation Configuration window	226
154. VMware Native Install task: Partition Configuration window	227
155. "Enter the data for the new partition" window	228
156. VMware Native Install task: TCP/IP Setup Information window, with Use DHCP Server check box cleared	229
157. VMware Native Install task: Miscellaneous window	230
158. System/Task Configuration window.	231
159. System/Task Configuration window: Serial page	232
160. Image Management window	234
161. Create Image window	235
162. Create Windows Clone Install Image window: General page	235

163. Create Windows Clone Install Image window: Setup page	236
164. Windows Clone Install task: "You are creating a new task" window	237
165. Windows Clone Install task: "Select images" window	238
166. "Image selection" window	238
167. Windows Clone Install task: "Personal information" window	239
168. Windows Clone Install task: "Regional information" window	240
169. Windows Clone Install task: "Network environment" window	241
170. Windows Clone Install task: "Network protocols" window	242
171. Windows Clone Install task: TCP/IP window	243
172. Edit Adapter window	244
173. Image Management window	248
174. Create Image window	248
175. Create Windows Native Install Image window: General page	249
176. Create Windows Native Install window: Setup page	249
177. Windows Native Install task: "Select an operating system image" window	251
178. "Image selection" window	252
179. Windows Native Install task: "Select an operating system image" window	253
180. "Image selection" window	253
181. Windows Native Install task: Partitions window	254
182. Create Partition window	254
183. Windows Native Install task: "Personal information" window.	255
184. Windows Native Install task: Licensing window	256
185. Windows Native Install task: "Regional information" window.	257
186. Windows Native Install task: "Network environment" window	258
187. Windows Native Install task: "Network protocols" window	259
188. Windows Native Install task: TCP/IP window	260
189. Edit Adapter window	261
190. Windows Native Install Template window: General page	264
191. Windows Native Install Template window: Setup page with driver information displayed	264
192. Driver Details window	265
193. Create Driver window, Plug and Play device drivers	266
194. Create Driver window, Text-mode device drivers	267
195. Delete Driver window	268
196. Windows Native Install Template window: Advanced page	269
197. Example of scrub3.exe output	327
198. scrub3 signature	327
199. System environment substitution file (bootEnvir.sub file)	353

About this document

This document provides information about using IBM® Remote Deployment Manager (RDM) 4.20. RDM provides administrators with centralized control of systems from a remote console. With RDM, you can perform the following tasks:

- Administer servers, workstations, desktop computers, point-of-sale systems, and mobile computers that are connected to the local area network (LAN) or wide area network (WAN)
- Deploy operating systems, applications, BIOS code and other system firmware
- Back up and restore operations for the primary partition
- Maintain systems

How this document is organized

Chapter 1, “Introducing Remote Deployment Manager,” on page 3 contains an overview of Remote Deployment Manager, including its components and features.

Chapter 2, “IBM Director Console and RDM tasks,” on page 7 contains information about IBM Director and RDM elements, including IBM Director Console, RDM menu items, RDM task templates, and images.

Chapter 3, “Working with RDM templates,” on page 15 contains information about creating RDM tasks, using RDM templates, and working with property sheets.

Chapter 4, “Using Image Management,” on page 29 contains information about saving, deleting, replicating, importing, and exporting an image.

Chapter 5, “Configuring RDM,” on page 41 contains information about configuring RDM Server options and Deployment Server options, and adding a Deployment Server to the network.

Chapter 6, “Configuring systems and tasks,” on page 59 contains information about configuring target systems and tasks. This chapter also provides information about the the System/Task Configuration (STC) window.

Chapter 7, “Importing and exporting,” on page 67 contains information about importing and exporting RDM system data, RDM tasks, RDM images, and data.

Chapter 8, “CMOS Update,” on page 79 through Chapter 22, “Windows Native Install,” on page 247 describe the RDM tasks that you can create and customize. Each chapter in this part discusses a different task, and the chapters are alphabetically by the task name.

Chapter 25, “Utilities,” on page 283 describes the utilities that RDM provides when it is installed. The information includes DOS, Symantec, RAID configuration, RDM, and other utilities.

Chapter 24, “Command-list commands,” on page 275 describes the RDM command-list commands. You can use these commands to customize the RDM task scripts.

Chapter 26, “Solving RDM problems,” on page 331 lists solutions to problems that you might encounter with RDM.

Appendix A, “Additional cloning procedures using Sysprep,” on page 337 contains procedures for using Sysprep version 2.0 to clone Microsoft® Windows® systems.

Appendix B, “Creating custom system environments,” on page 351 contains information about system environments that are used for Windows and Linux®.

Appendix C, “RDM data and files,” on page 355 contains information about how RDM stores its data.

Appendix D, “Linux directories,” on page 357 provides a list of Linux operating-system directories that you must avoid as mountpoints.

Appendix E, “Terminology summary and abbreviation list,” on page 363 contains a summary of RDM terminology and a list of abbreviations used in the RDM documentation.

Appendix F, “Getting help and technical assistance,” on page 367 contains information about accessing IBM Support Web sites for help and technical assistance.

Appendix G, “Notices,” on page 369 contains product notices and trademarks.

Notices that are used in this document

This document contains the following notices that highlight key information:

- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or difficult situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

RDM documentation

The following documents are available in Portable Document Format (PDF) from the IBM Remote Deployment Manager 4.20 Web site at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-56662>:

- *IBM Remote Deployment Manager 4.20 Installation Guide*
Third Edition, October 2004 (rdm420_installconfig_guide.pdf)
- *IBM Remote Deployment Manager 4.20 User's Reference*
Third Edition, October 2004 (rdm420_userref_guide.pdf)
- *IBM Remote Deployment Manager 4.20 Compatibility and Configuration Guide*
Sixth Edition, October 2004 (rdm420_compat_guide.pdf)

Note: Check this Web page regularly for new or updated RDM documentation.

The *IBM Remote Deployment Manager 4.20 Compatibility and Configuration Guide* lists hardware that IBM has tested with RDM.

You also can download RDM white papers from http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/rdm.html. The white papers include a troubleshooting guide and provide additional information about using RDM.

For planning purposes, the following IBM Director documents are available in Portable Document Format (PDF) from the IBM Director 4.20 Web site at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-55606>:

- *IBM Director 4.20 Installation and Configuration Guide* Third Edition, July 2004 (dir4.20_docs_install.pdf)
- *IBM Director 4.20 Systems Management Guide* Third Edition, July 2004 (dir4.20_docs_sysmgt.pdf)

In addition, the following IBM Redbooks™ documents might be of interest:

- *IBM eServer BladeCenter Systems Management with IBM Director V4.1 and Remote Deployment Manager V4.1* (REDP-3776)
- *Implementing Systems Management Solutions using IBM Director* (SG24-6188)

You can download these documents from the IBM Redbooks Web site at <http://www.ibm.com/redbooks/>.

Note: Be sure to note the date of documents and to determine the level of RDM software to which the Redbooks documents refer.

RDM resources on the World Wide Web

The following Web pages provide resources for understanding, using, and troubleshooting RDM and other deployment and systems-management tools.

IBM Remote Deployment Manager page

http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/rdm.html

This Web page provides an overview of IBM Remote Deployment Manager. From this Web page, you can download the latest RDM documentation and white papers. The white papers provide a troubleshooting guide and information about using RDM.

IBM ServerGuide page

http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/serverguide.html

This Web page provides an overview of the IBM ServerGuide™ program.

IBM ServerGuide Scripting Toolkit page

http://www.ibm.com/servers/eserver/xseries/systems_management/sgstk.html

This Web page provides an overview of IBM ServerGuide Scripting Toolkit and links to the latest version of the toolkit for download.

IBM UpdateXpress page

http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/xpress.html

This Web page provides an overview of IBM UpdateXpress. It also contains links to pages from which you can download UpdateXpress, order an UpdateXpress CD, or purchase a subscription to UpdateXpress updates.

IBM ServerProven page

<http://www.ibm.com/pc/us/compat/index.html>

The ServerProven® Web page provides information about xSeries®, BladeCenter™, and IntelliStation® hardware compatibility with IBM systems-management tools.

IBM Support page

<http://www.ibm.com/pc/support/>

This is the IBM Support Web site for IBM hardware and systems-management software.

IBM Systems Management Software: Download/Registration page

http://www.ibm.com/pc/us/eserver/xseries/systems_management/dwnl.html

Use this Web page to download IBM systems-management software, including IBM Director.

IBM xSeries Systems Management page

http://www.ibm.com/pc/ww/eserver/xseries/systems_management/index.html

This Web page presents an overview of IBM systems management and IBM Director. Click **IBM Director** for the latest information and documentation.

Part 1. Introducing Remote Deployment Manager

Chapter 1. Introducing Remote Deployment Manager

IBM Remote Deployment Manager (RDM) is a flexible and powerful tool that you can use to remotely perform configuration, deployment, and retirement operations on both IBM and non-IBM systems. You can use RDM to perform the following tasks:

- Update system firmware
- Modify configuration settings
- Install operating systems and applications
- Back up and recover primary partitions
- Securely erase data from disks

RDM is an IBM Director extension. RDM integrates seamlessly with IBM Director; you can use the same administrative console to perform both deployment and management tasks.

RDM environment and terminology

A *system* is a server, workstation, desktop computer, mobile computer (laptop), or point-of-sale system.

The systems in an RDM environment are referred to in the following ways:

- A *management server* is a server on which both IBM Director Server and RDM Server are installed.
- A *management console* is a system on which both IBM Director Console and RDM Console are installed.
- A *remote deployment server* is a system on which RDM Deployment Server is installed. This system must be in a different subnet than the management server. RDM Console can be installed on this system also.
- A *target system* is a system against which an RDM task is run.

RDM components

The RDM software has three components:

- RDM Server
- RDM Console
- RDM Deployment Server (also known as D-Server)

RDM Server

RDM Server is the main component of Remote Deployment Manager. It contains the application logic, monitors the status of RDM tasks, and stores data both in the IBM Director database and in its own database.

RDM Server must be installed on the management server. When you install RDM Server, RDM Console and RDM Deployment Server are installed automatically also.

RDM Console

RDM Console is the graphical user interface (GUI) component of Remote Deployment Manager. RDM Console must be installed on any management console from which a system administrator will remotely access the management server and perform RDM tasks.

RDM Deployment Server (D-Server)

RDM Deployment Server (also known as D-Server) handles communication between RDM Server and target systems. Using Multicast Trivial File Transfer Protocol (MTFTP) and Trivial File Transfer Protocol (TFTP), it also delivers commands, data files, and applications to target systems.

The instance of RDM Deployment Server that is installed on the management server contains the *master repository*, which is the collection of files that RDM uses to run tasks on target systems. These files can include system environments, images, utilities, and batch files.

The instance of RDM Deployment Server that is installed on a remote deployment server contains a *remote repository*.

The following table lists information about the services that RDM Deployment Server contains.

Table 1. RDM Deployment Server (D-Server) services

Service name	What it does
RDM D-Server service	Relays communication between RDM Server and the target systems.
PowerQuest Unicast Image Server	Transfers PowerQuest-formatted images between RDM Deployment Server and target systems. These images are used with the Get Donor, Power Restore, and Windows Clone Install tasks.

How RDM works

RDM uses Wired for Management (WfM) standards, including the Preboot Execution Environment (PXE), to perform tasks on target systems.

RDM automatically listens on the local area network (LAN) for new PXE-enabled systems that start (boot) from the network. When RDM discovers a PXE-enabled system that does not have an entry in the IBM Director database, it runs the default scan task on the system. The task queries the system for basic hardware information and stores the data in the IBM Director database. RDM then assigns a default name to the system, in the form *MachinetypeMachinemodel-Serialnumber*, and an object that represents the new system is displayed in IBM Director Console. You now can run RDM tasks on the target system.

The following steps occur when you run a task on a target system:

1. RDM Deployment Server sends a wake-up packet to the target system. This packet contains the media access control (MAC) address of the network interface card (NIC) that is present in the target system; if the NIC supports Wake on LAN[®], it can power-on the system.
2. The target system powers-on and starts (boots) from the network. It then broadcasts a DHCPDISCOVER message. It receives an IP address from the Dynamic Host Configuration Protocol (DHCP) service and the fully qualified name of an RDM bootstrap loader program from RDM Deployment Server.
3. The target system downloads and runs the RDM bootstrap loader program. The RDM bootstrap loader program sends a message to RDM Deployment Server, asking for instructions, and RDM Deployment Server relays the message to RDM Server.
4. RDM Server sends the fully qualified name of a system environment to the target system.
5. The RDM bootstrap loader program creates a virtual diskette drive A in memory, downloads the system environment from the RDM repository, and then installs that system environment on the target system.
6. The RDM bootstrap loader program downloads the system environment from the RDM repository and installs it on virtual diskette drive A of the target system.
7. The target system starts (boots) from the virtual diskette drive A. The rdagent program starts automatically. This program sets standard environment variables that are used by all RDM tasks.
8. The rdagent program then runs in a loop, requesting a command from the task command list, running the command, and reporting the success of the operation to RDM Server. The task is completed when the final command is run.

Chapter 2. IBM Director Console and RDM tasks

This chapter provides information about the following IBM Director and RDM elements:

- IBM Director Console
- RDM menu items
- RDM task templates
- Images
- Applying tasks to target systems

IBM Director Console

IBM Director Console is the GUI that provides access to IBM Director Server and RDM Server. When you add RDM to your IBM Director environment, the RDM tasks and menu items are added to IBM Director Console.

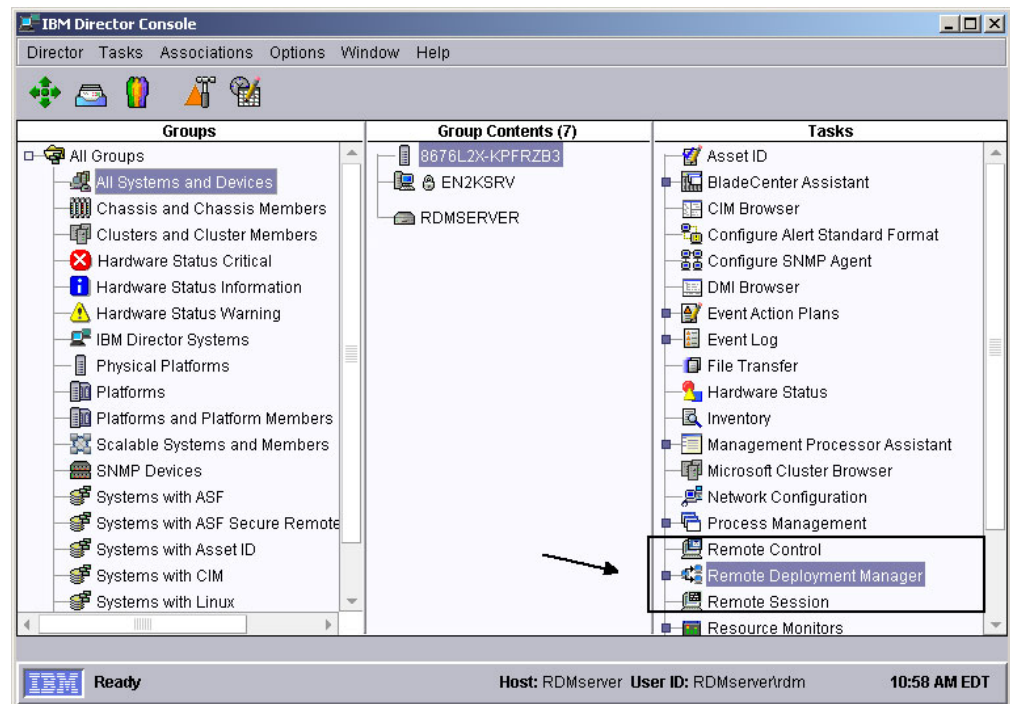


Figure 1. IBM Director Console window

For more information, see Chapter 3, "Understanding IBM Director Console," in the *IBM Director 4.20 Systems Management Guide*.

RDM menu items

When you click **Tasks** → **Remote Deployment Manager**, an RDM-specific menu is displayed.

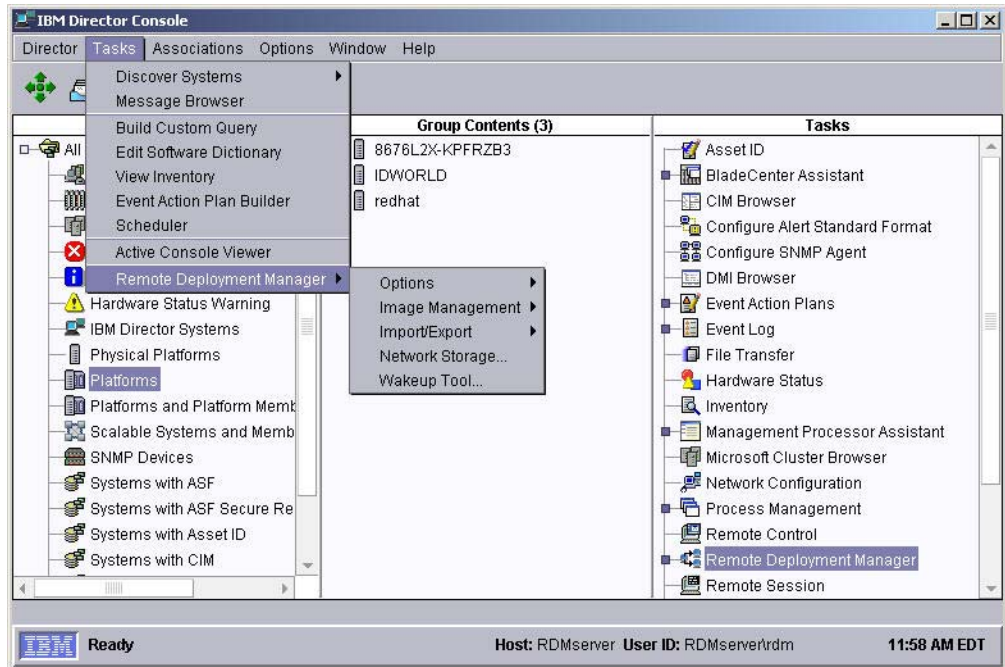


Figure 2. RDM menu options

The menu contains the following items:

Options

Enables you to modify RDM Server and RDM Deployment Server (D-Server) options

Image Management

Enables you to create and modify images, as well as specify images that you want to replicate to remote repositories

Import/Export

Enables you to import and export images, system data, and tasks

Network Storage

Enables you to add Fibre Array Storage Technology (FAST) storage servers and BladeCenter Fibre Channel switch modules to the RDM database

Wakeup Tool

Enables you to set parameters for the Wakeup Tool

RDM task templates

When you expand Remote Deployment Manager in the Tasks pane, the RDM task templates are displayed. A *template* is a prototype of a specific RDM task.

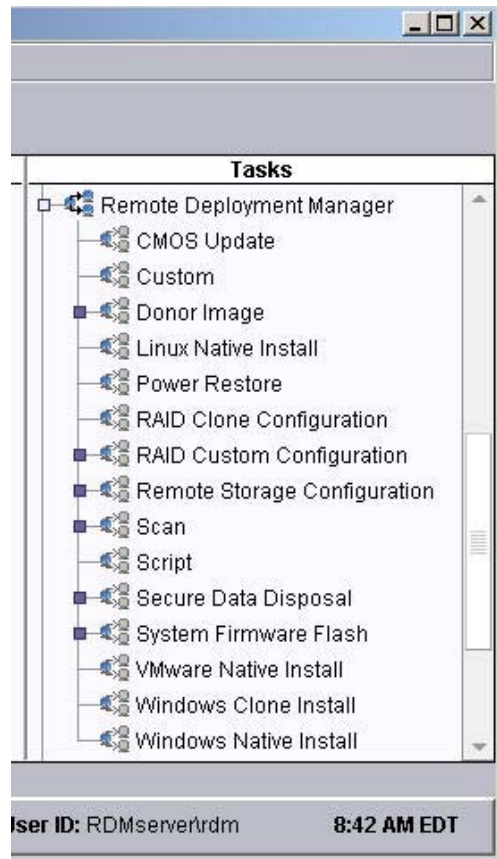


Figure 3. RDM tasks displayed in IBM Director Console

The task templates enable you to create tasks that perform the following operations:

CMOS Update

Configure BIOS settings that are saved to the complimentary metal oxide semiconductor (CMOS) chip

Custom

Perform a user-defined operation

Donor Image

Create an image of a system that is running Windows

Linux Native Install

Install a supported Linux® distribution

Power Restore

Back up or restore either the boot partition or master boot record

RAID Clone Configuration

Configure a redundant array of independent disks (RAID) adapter using a configuration file

RAID Custom Configuration

Configure a RAID adapter using custom settings

Remote Storage Configuration

Configure remote storage devices

Scan Obtain hardware information about a system

Script Run a sequence of RDM tasks

Secure Data Disposal

Securely erase the hard disks of a target system, in preparation for disposing of or reassigning the computer

System Firmware Flash

Update firmware

VMware Native Install

Install VMware Server ESX

Windows Clone Install

Install a supported version of Windows using an image cloned from another system

Windows Native Install

Install a supported version of Windows using Microsoft installation files

For more information, see the task-template-specific chapters, Chapter 8 through Chapter 22.

Images

Most RDM tasks are based on images. An *image* is a file or collection of files that are used when a task is run. Some tasks use multiple images, for example, a CMOS Update task requires both a system firmware image and the corresponding CMOS update image.

You create images either by using the Image Management option or by running a task, such as the Get Donor or Get Host Profile task. When you create an image, RDM saves the files that make up the image to the RDM repository and the metadata about the image to the RDM database. You then can create an RDM task that uses the applicable image or images.

The following list contains examples of RDM images:

- A ZIP file that contains the i386 directory from a Windows 2000 installation CD. Using this image, you can create a Windows Native Install task designed to deploy Windows 2000 to target systems.
- A ZIP file that contains the files from a BIOS update diskette. Using this image, you can create a System Firmware Flash task that can be used to update the BIOS code on target systems.
- A CMS file that contains the BIOS configuration settings from a donor system. Using this image, you can create a CMOS Update task that can be used to update the BIOS settings that are saved to the CMOS chip on target systems.
- A PowerQuest-formatted set of files that is a copy of the boot partition of a donor system running Windows. You can use this image to create a Windows Clone Install task that can be used to deploy Windows to target systems.

For information about creating images, see Chapter 4, "Using Image Management," on page 29.

Applying tasks to target systems

After a task has been created, it can be applied to a system or a group. From IBM Director Console, you can apply a task to a target system or group in either of the following ways:

- Drag the task onto the object that represents the system or group
- Drag the object that represents the target system or group onto the task icon

After performing the drag-and-drop operation, you are prompted to either configure the selected systems for the task or to run Scheduler.





You also can run RDM tasks by using DIRCMD (the IBM Director command-line interface), the BladeCenter Deployment wizard, or by creating an event action plan designed to run an RDM task when a specific event occurs. See the *IBM Director 4.20 Systems Management Guide* for more information.

Status icons

Status icons appear next to the target systems that are represented in the Group Contents pane. These icons provide information about the status of RDM tasks that are being run on the target systems.

The following table shows the RDM status icons and describes their meanings.

Table 2. RDM status icons

Icon	What it means
	Connect This icon is displayed when the task or command-list processing is running on the management server.
	Running task This icon is displayed when an RDM task is running on the target system.
	Waiting This icon is displayed when a target system has been assigned a task, but the system has not yet powered on. The icon is cleared once the target system connects to RDM Server.
	Error This icon is displayed when an error occurred during an RDM task.

To clear a status icon, right-click on a system in the Group Contents pane; then, click **Remote Deployment Manager** → **Clear Status Icons**.

Part 2. Understanding RDM tasks

Chapter 3. Working with RDM templates

This chapter provides information about task templates and creating tasks.

Task templates

Each RDM task is based on a template. Figure 4 shows the set of templates that RDM provides.

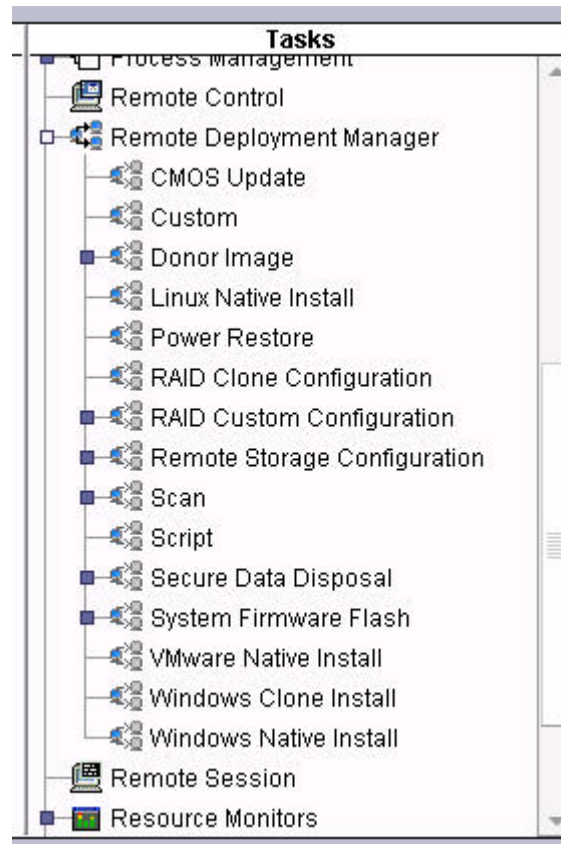


Figure 4. RDM task templates

Predefined tasks

RDM provides some predefined tasks. When you expand certain templates, the predefined tasks are displayed (see Figure 5).

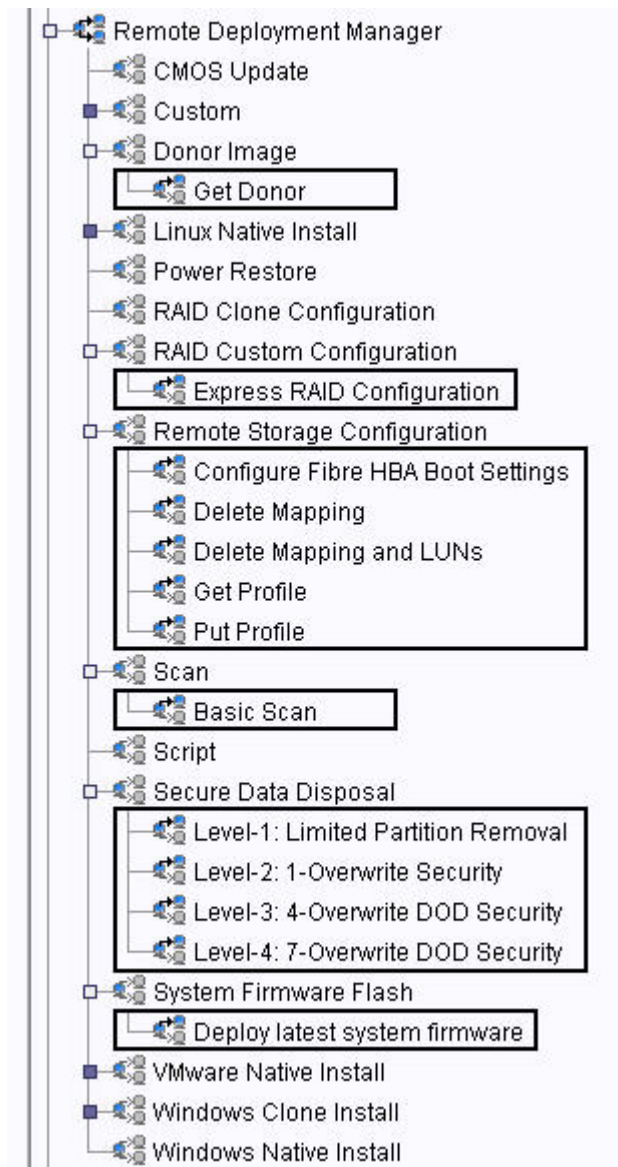


Figure 5. Predefined RDM tasks

Creating a task

To create a task, right-click a task template and then click **Create new task**. Either a template notebook opens or task creation wizard starts. When you provide values and click **OK**, the data is validated, ensuring that you create a usable task. When you are finished, the task is displayed in the Tasks pane under the template that you used to create the task.

After you create a task, you can edit the task properties without affecting its template. To change task properties, right-click a task and then click **Edit task**. The task notebook opens. You also can use **Edit task** to view the collected information, properties, and default parameter values that are associated with a task.

Default parameter values

Each template has *default parameter values*. The values specified by a template are applied to any task that is created from that specific template. If you change the template, the changes are reflected in any task that you create after that template was changed. Tasks that are created from the template before it was changed are unaffected.

When you create a task from a template, you can provide additional parameter values or change the default parameter values. For example, you can create a Windows Native Install task that specifies a particular multi-user product key or the name of a department.

The default parameter values are displayed in *property sheets*. Depending on the template that you use to create a task, the property sheet is accessed either through a template notebook or a task creation wizard. A *template notebook* is a window that displays a notebook with tabs for different groups of properties.

To change template properties, right-click a template and then click **Edit template**. The template notebook opens. You also can use **Edit template** to view the collected information, properties, and default parameter values that are associated with a template.

Task properties

Most task templates provide the following property groups:

- General
- Setup
- Advanced: Command list
- Advanced: User parameters
- Advanced: Task folder

These property groups are explained in the following sections.

Note: Within property sheets, a hot key (shortcut key) is supported where an underlined letter in a field label or command is displayed. Press Alt and the underlined letter to move to that field, select a check box, or run that command.

General properties

The general properties are displayed on the General page.

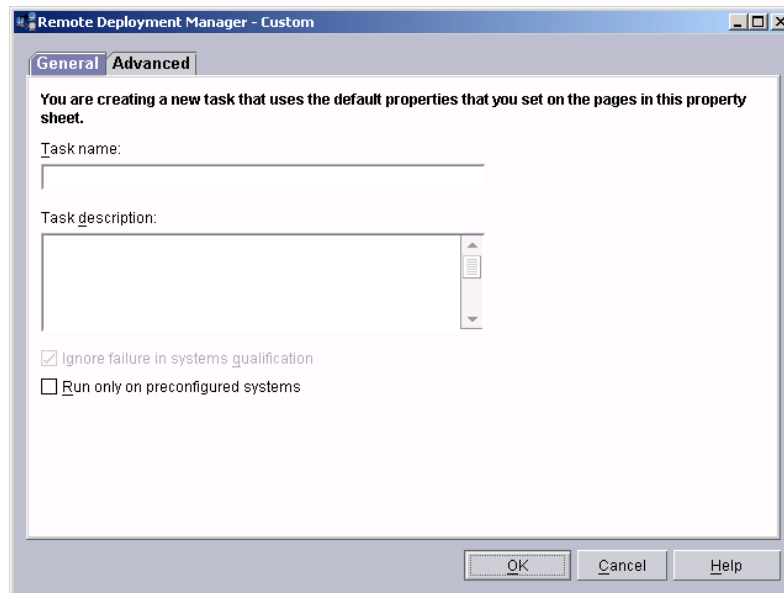


Figure 6. General page example

The General page provides the following entry fields and options:

Task name

Type a task name. The name must be unique among the other tasks in RDM. You cannot modify this field if you are editing the template properties.

Task description

(Optional) Type a description of the task in this field.

Ignore failure in systems qualification

Select this option to force the task to run on target systems that fail system qualification. Target systems that fail system qualification are reported in an exception list.

Note: Running tasks on unqualified systems can lead to run-time errors, undefined results, or task failure.

Run only on preconfigured systems

Select this option to validate preconfiguration when the task is run. Preconfigured systems are those that already have their system or task parameter values in the database.

Setup

Click the **Setup** tab to open the Setup page. The Setup page contains template-specific fields. For information about a specific setup page, see the template-specific chapter in Part 3.

Advanced properties - Command list

Click the **Advanced** tab to open the Advanced page. In the left pane, click **Command list**; the command list is displayed in the right pane. The *command list* contains the commands that are run when you invoke a task.

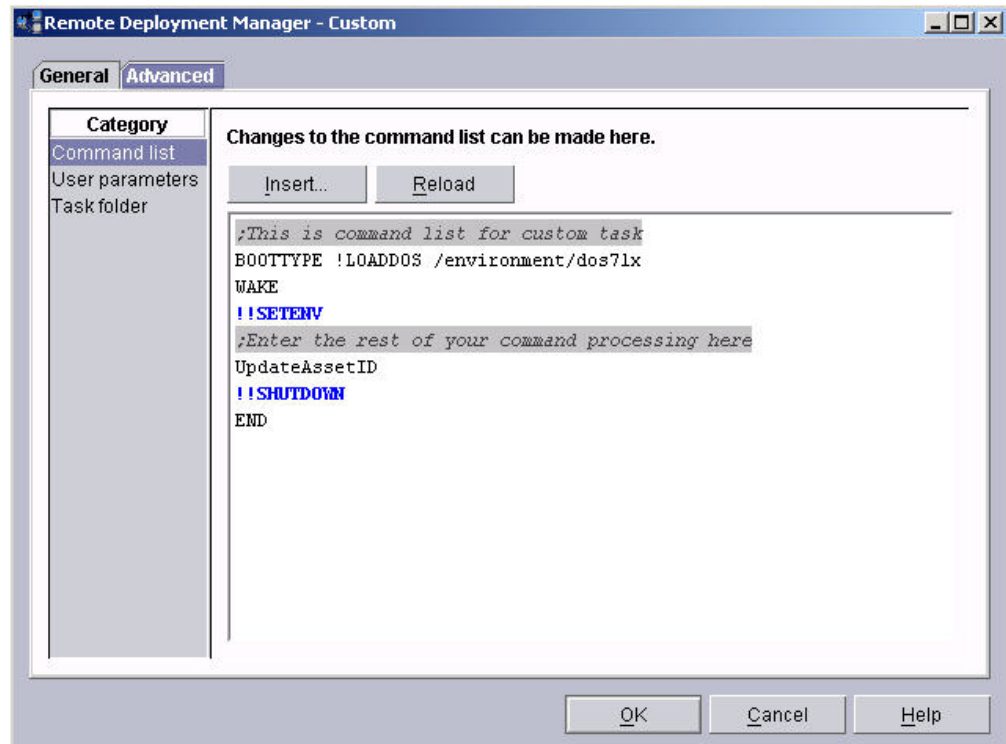


Figure 7. Advanced page: “Command list” pane

Click in the “Command list” pane to add, edit, or delete commands. For information about RDM command-list commands, see Chapter 24, “Command-list commands,” on page 275.

You also can use the Command List Editor wizard to select an image to be used with the task. RDM then generates the applicable command-list syntax and inserts it into the command list.

Complete the following steps to use the Command List Editor wizard:

1. Click in the right pane where you want to insert a command, and then click **Insert**. The Command List Editor wizard starts.

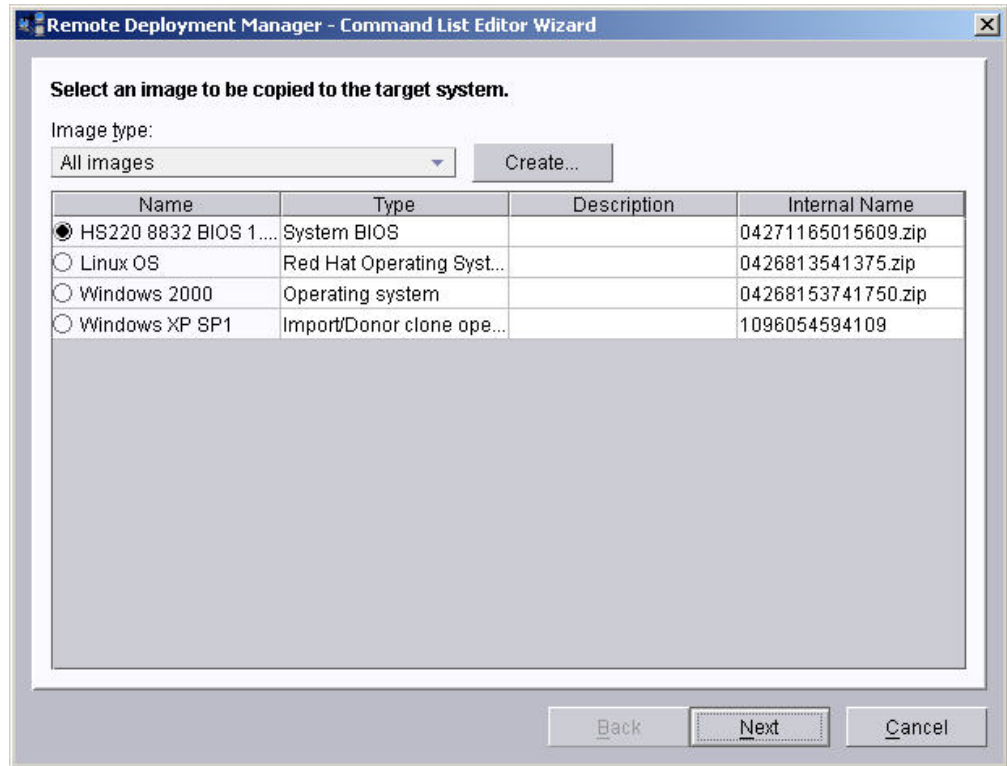


Figure 8. Command List Editor wizard, window one

2. Select the image, and then click **Next**. The second Command List Editor window opens.

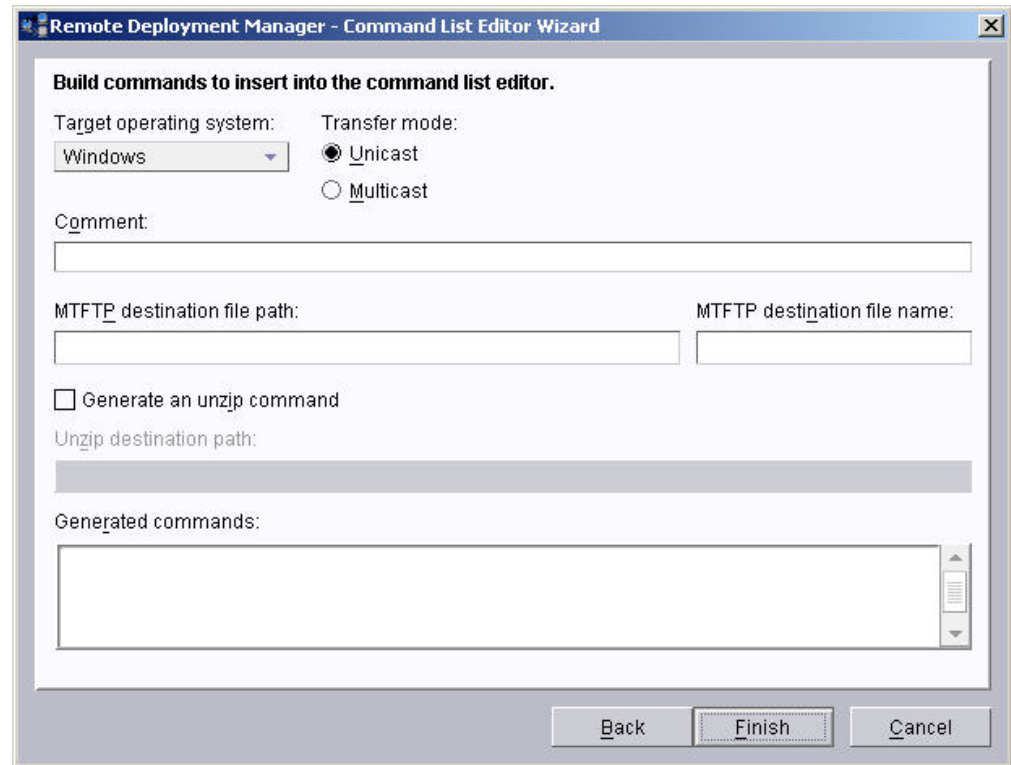


Figure 9. Command List Editor wizard, window two

3. Specify information about the image:
 - a. Click **Unicast** or **Multicast** to select how the image is sent to the target system.
 - b. In the **Target operating system** field, select the operating system that is running on the target system.
 - c. (Optional) In the **Comment** field, type a brief description about the image.
 - d. In the **MTFTP destination file path** field, type the path of the file that is created on the target system.
 - e. In the **MTFTP destination file name** field, type the name of the file that is created on the target system.
 - f. (Optional) Select the **Generate an unzip command** check box to specify that the image be unzipped on the target system. In the **Unzip destination path** field, type the path where the unzipped files are to be extracted. If you select this option, RDM deletes the zipped file that was downloaded to the MTFTP destination file path after the contents of the file are unzipped.

In the **Generated command** field, the command is displayed.
4. Click **Finish**. The Advanced page reopens and the modified command list is displayed.

To save the image, click **OK**. Click **Reload** to restore the command list to the last-saved version.

Advanced properties - User parameters

Click the **Advanced** tab to open the Advanced page. In the left pane, click **User parameters**; user parameters are displayed in the right pane.

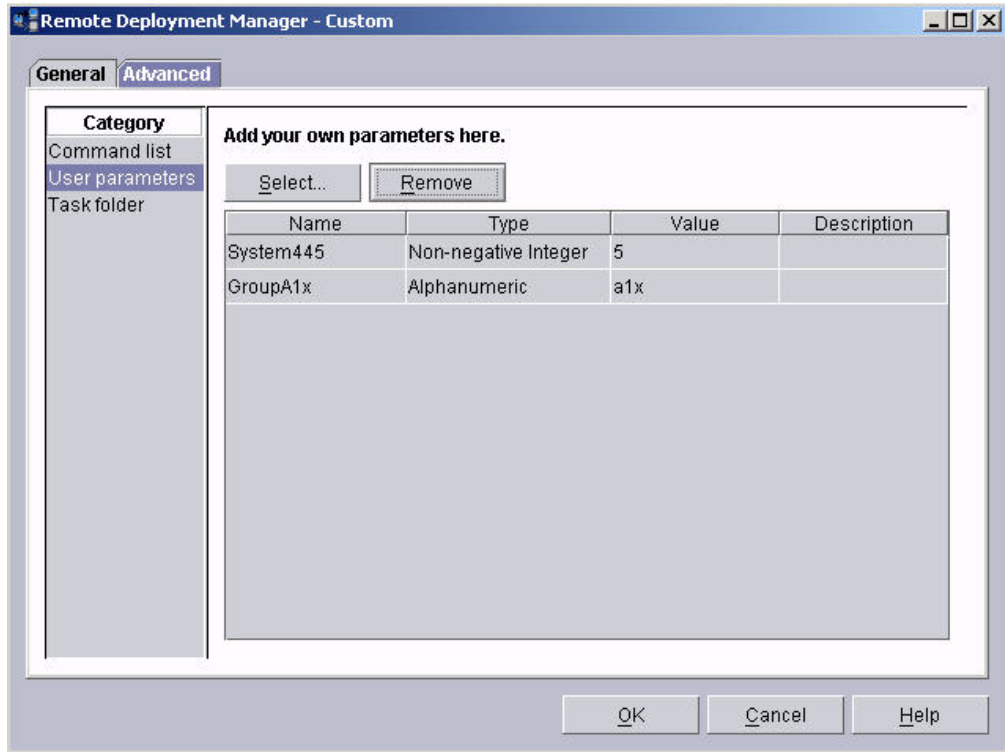


Figure 10. Advanced page: "User parameters" pane

Click **Select**. The User Parameters window opens.

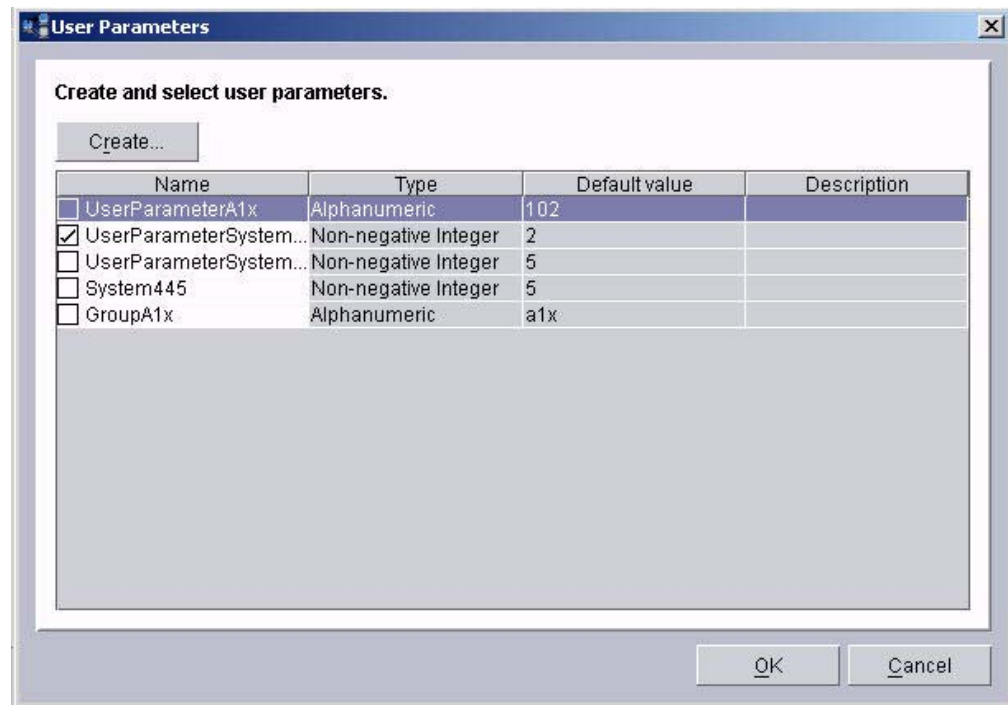


Figure 11. User Parameters window

Select the applicable check boxes of the user parameters that you want to use. If the list is empty, the template does not have any user parameters associated; however, you can create user parameters. For information about user parameters, see “Creating a user parameter.”

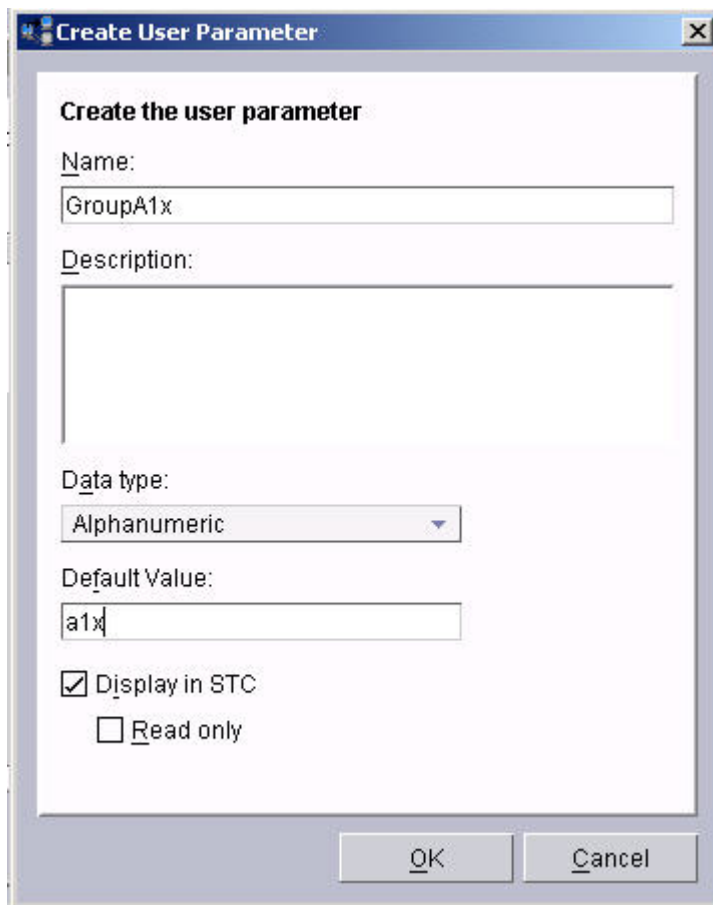
Click **Remove** to remove a selected user parameter from the list.

Creating a user parameter

Complete the following steps to create a user parameter:

1. In the “User parameters” pane, click **Select**. The User Parameters window opens (see Figure 11).

2. Click **Create**. The Create User Parameter window opens.



Create the user parameter

Name:
GroupA1x

Description:

Data type:
Alphanumeric

Default Value:
a1x

Display in STC
 Read only

OK Cancel

Figure 12. Create User Parameter window

3. Specify the values for the user parameter:
 - a. In the **Name** field, type a name. The user parameter name can be up to 32 characters in length; it can include alphanumeric characters, hyphens (-), and underscores (_) only.
 - b. (Optional) In the **Description** field, type a brief description.

- c. In the **Data Type** field, select one of the following data types:

Non-negative integer

A whole number greater than zero

Alphanumeric

A string of alphanumeric characters

String

A string

Director Inventory

The value of a selected IBM Director inventory item

Note: RDM appends .0 to the user parameter name when the first value is returned from the RDM database. If multiple values are returned for a given user parameter, RDM appends .1 to the user parameter name of the second value, .2 to the user parameter name of the third value, and so on.

- d. In the **Default Value** field, type or select the default value for the user parameter.

Notes:

- 1) If you selected **Director Inventory** as the data type, the **Default Value** field is filled in with IBM Director inventory items. When the task is qualified, the value of the IBM Director inventory item is retrieved from the IBM Director database, and the value is associated with the specified user parameter.
 - 2) If you selected **Non-negative integer**, **Alphanumeric**, or **String** as the data type, the value that you enter in the **Default Value** field must not exceed 255 characters.
- e. (Optional) Select the **Display in STC** check box to add the user parameter to the STC window. User parameters that are displayed in the STC window can be modified on a per-system basis. Selecting this check box enables the **Read only** check box.
- f. Select the **Read only** check box to make sure that the user parameter value cannot be modified from the STC window.
4. Click **OK**. The user parameter now is displayed in the User Parameters window.

Editing or deleting a user parameter

You can edit or delete a user parameter only when you are working with a template property sheet. You can delete a user parameter only if it is not used by any existing tasks.

Complete the following steps to edit or delete a user parameter:

1. In the “User parameters” pane, click **Select**. The User Parameters window opens.

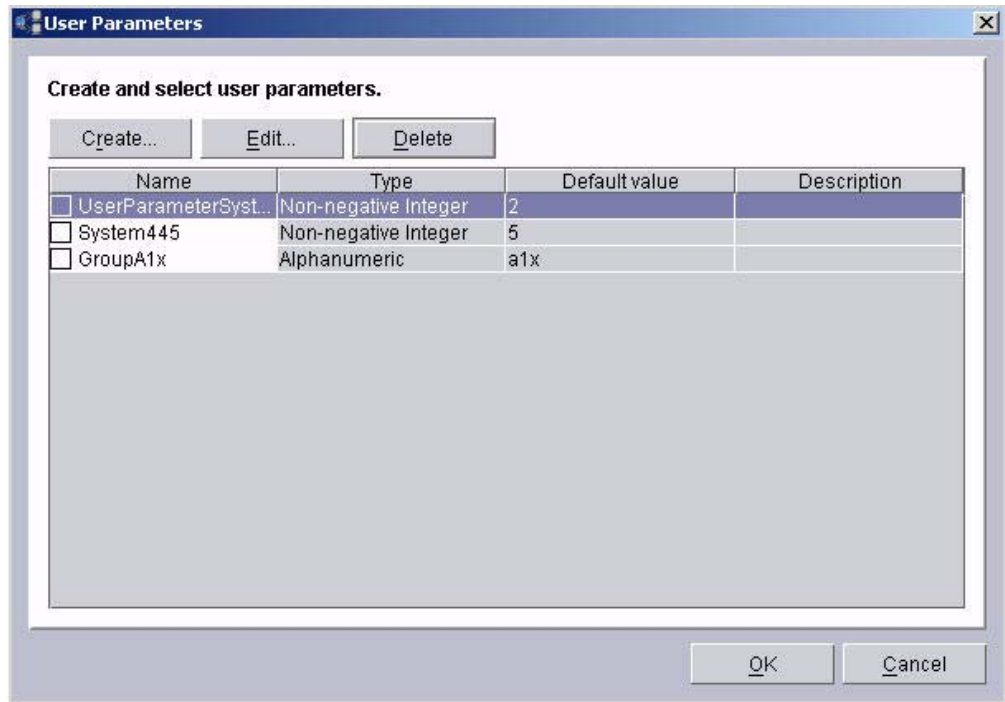


Figure 13. User Parameters window when editing or deleting a user parameter

Note: If you are working with a task, the User Parameters window displays the **Create** button. If you are working with a template, the User Parameters window also displays an **Edit** and **Delete** button.

2. From the list of user parameters, select the user parameter that you want to edit or delete.
3. Click **Delete** to delete the user parameter, or click **Edit** to open the Edit User Parameter window.
4. Make the applicable changes to the parameter. The changes that you make do not affect the tasks that currently use the parameter; however, the changes that you make are used by any new tasks that you create that use the parameter.

Advanced properties - Task folder

Click the **Advanced** tab to open the Advanced page. In the left pane, click **Task folder**; the fully-qualified path of directory that contains the command-list file is displayed in the right pane.

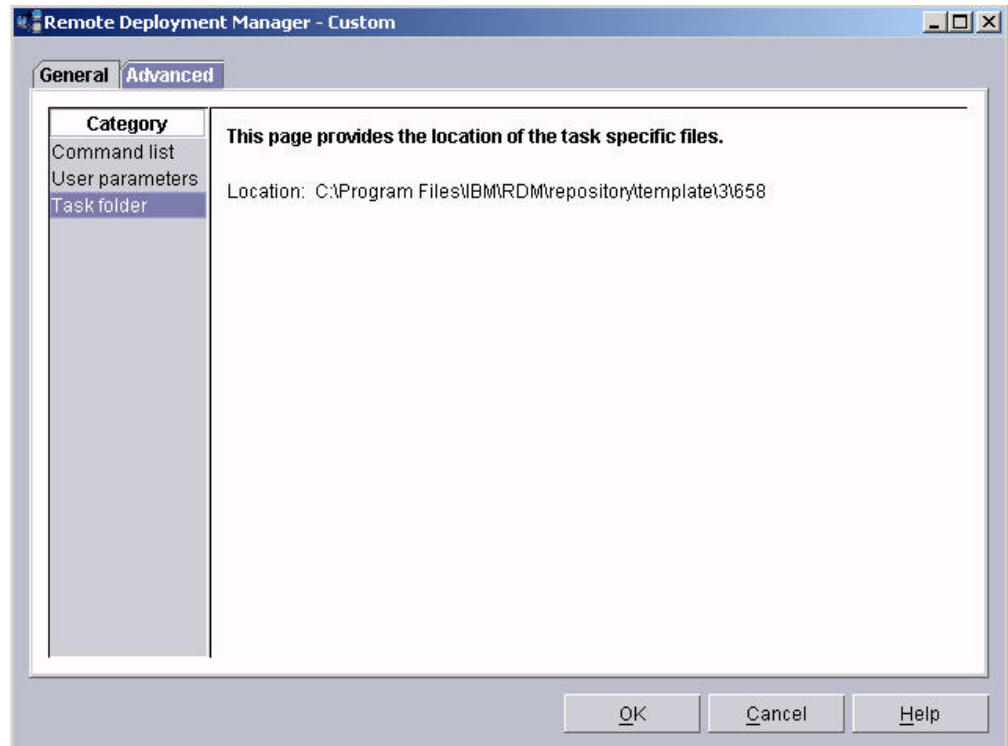


Figure 14. Advanced page: "Task folder" pane

Chapter 4. Using Image Management

You can use the Image Management option to perform the following tasks:

- Create an image
- Modify an image
- Delete an image
- Replicate an image

Starting Image Management

To start Image Management, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

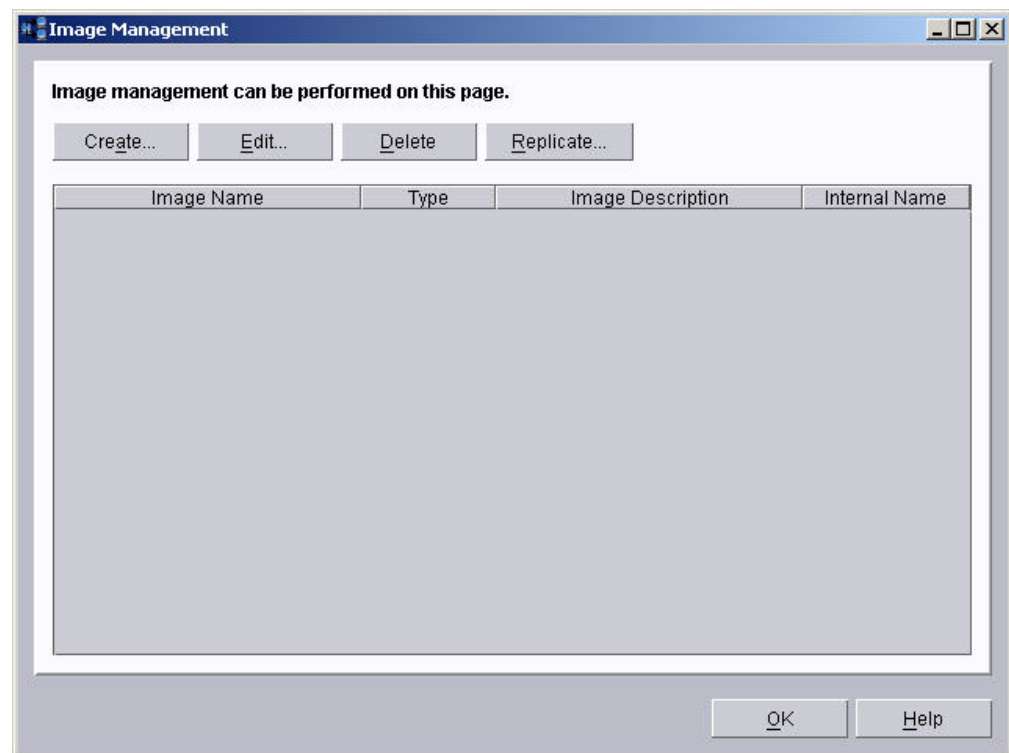


Figure 15. Image Management window

You also can access the Image Management option from task creation wizards, task property sheets, and template property sheets.

Creating an image

When you create an image, RDM copies the files and directories that you specify and saves those files and directories into an image file with a unique file name. In most cases, the image file is a ZIP file.

RDM automatically names the image file. You can use the Image Management option to assign a meaningful name and description to the image. However, in the RDM repository, the image file retains the file name that was automatically generated by RDM.

Complete the following steps to create an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

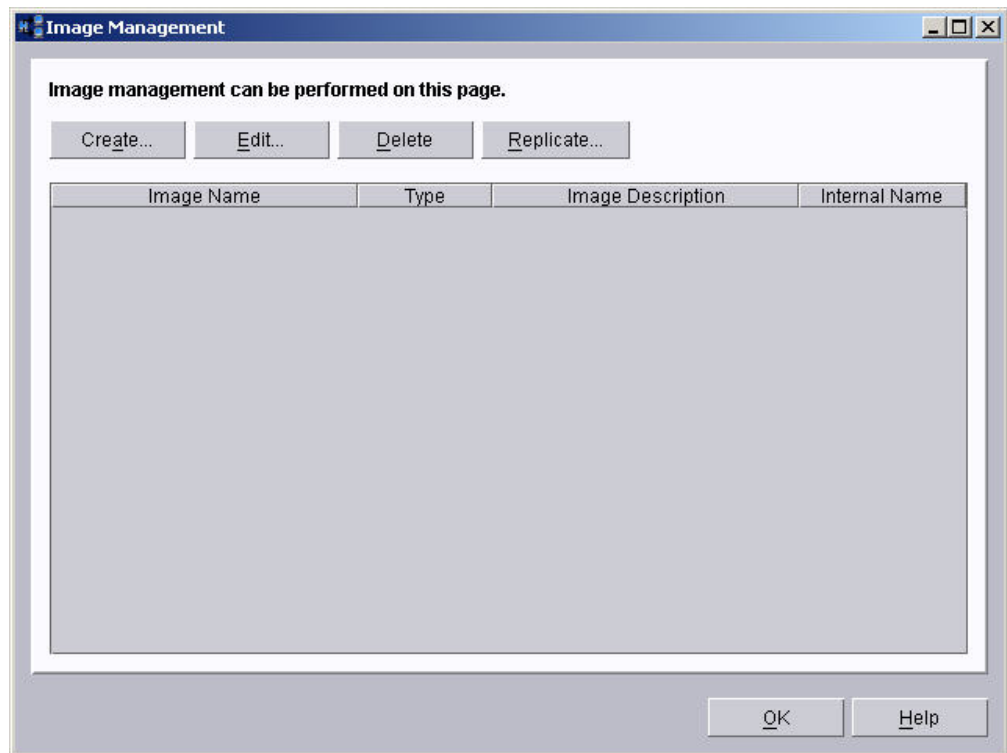


Figure 16. Image Management window

2. Click **Create**. The Create Image window opens.

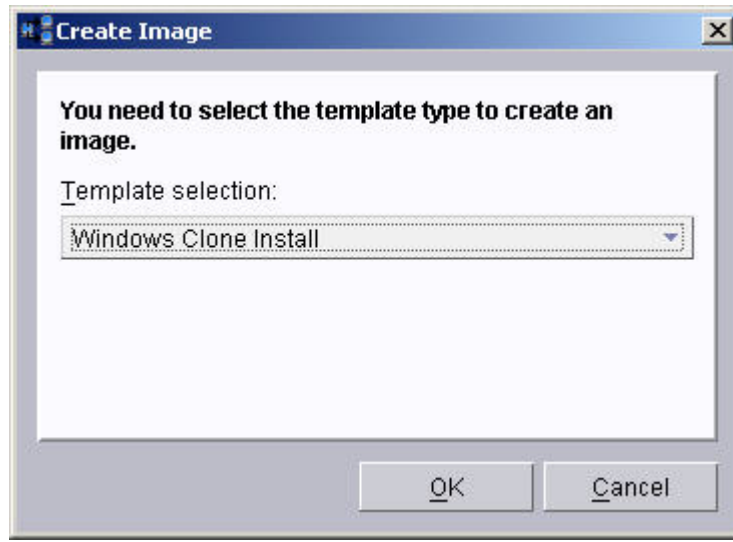


Figure 17. Create Image window

3. In the **Template selection** field, select one of the following types of images.
- System Firmware Flash
 - CMOS Update
 - Custom
 - Linux Native Install
 - RAID Clone Configuration
 - Windows Clone Install
 - Windows Native Install

For information about using a specific type of image, see Part 3.

4. Click **OK**. The applicable window opens and the General page is displayed.

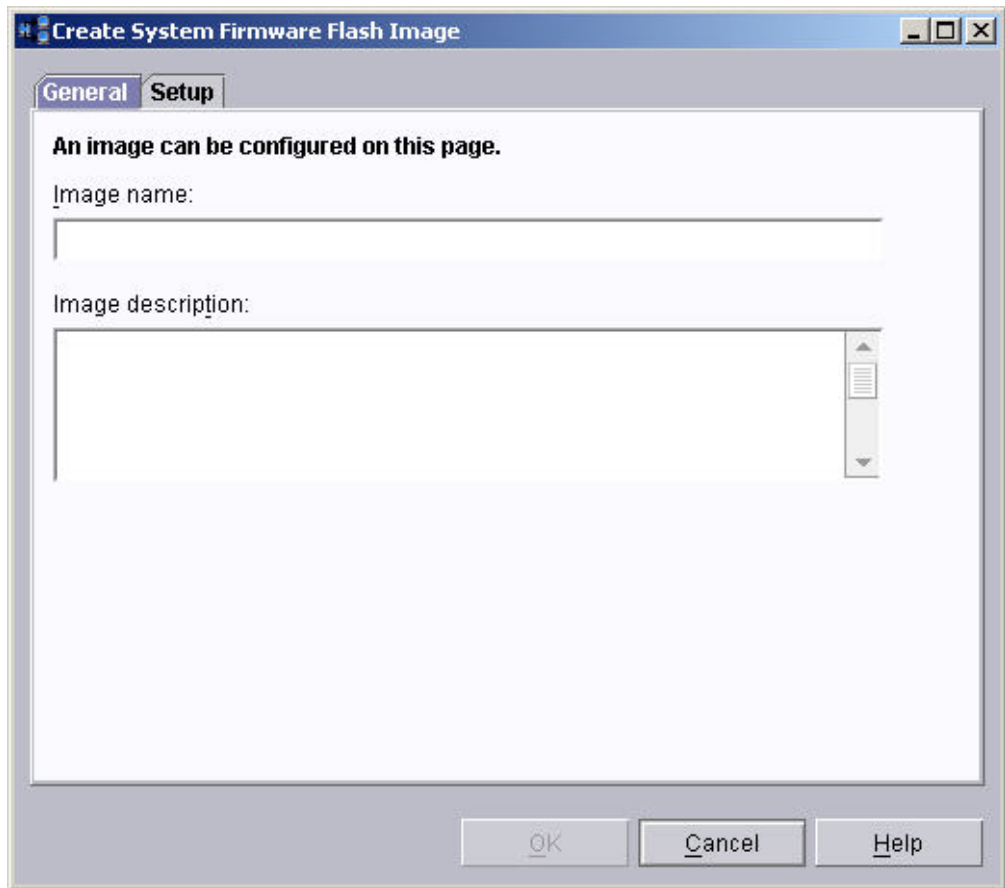


Figure 18. Create System Firmware Flash Image window: General page

5. Set the properties for the image:
 - a. In the **Image name** field, type a name for the image. When you create a task, this name is displayed in the list of images.
 - b. (Optional) In the **Image description** field, type a brief description of the image. The image description can be a maximum of 255 characters long.

6. Click **Setup**. The Setup page is displayed.

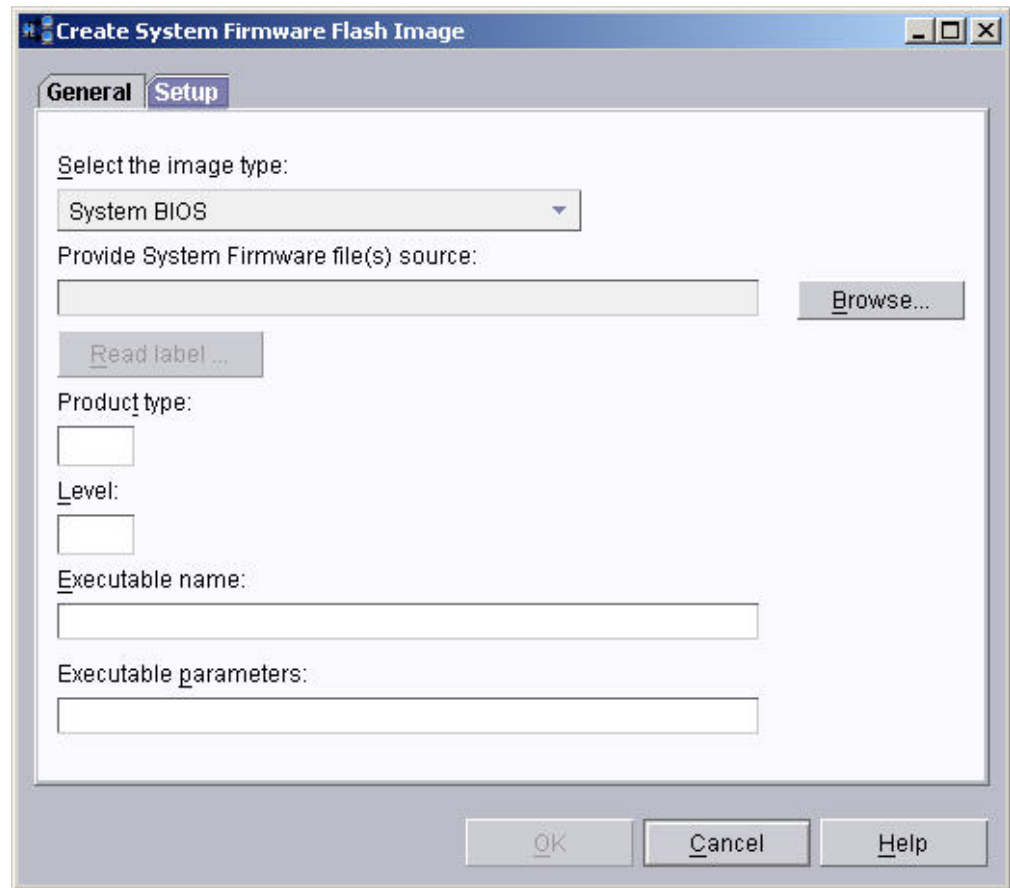


Figure 19. Create System Firmware Flash Image window: Setup page

Note: The Setup page is different for each type of task. See the task-specific chapters in Part 3 for more information.

7. Complete the applicable fields. To specify the files that are used to build the image, click **Browse**. The “Select directory” window opens.

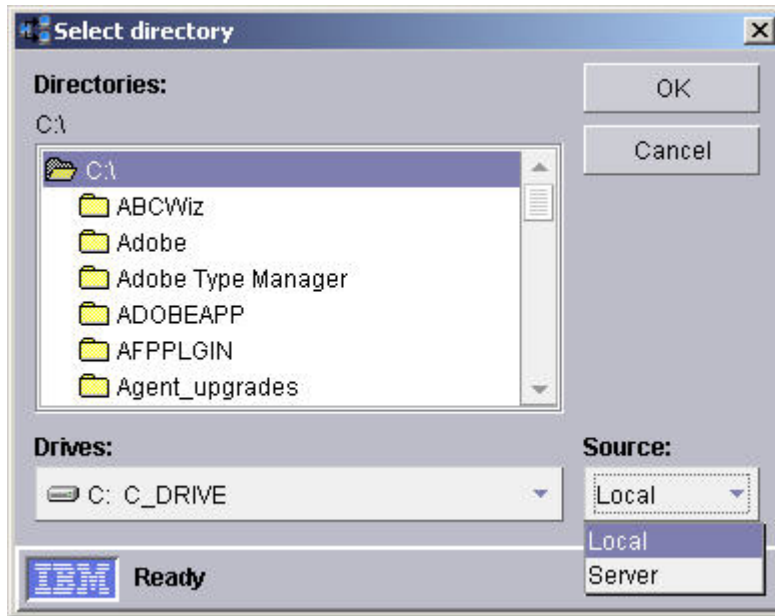


Figure 20. “Select directory” window

8. Specify the source files for the image:
 - a. In the **Source** field, select the system where the source files are located. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.
 - b. Navigate to the source files and select them.
9. Click **OK**. The Task Image Creation Progress window opens.

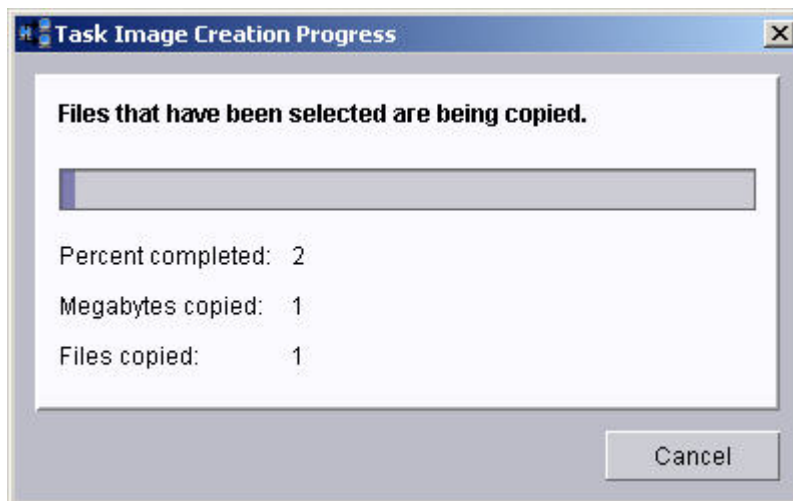


Figure 21. Task Image Creation Progress window

The image is created. The files that are used to build the image are saved to the master repository.

10. Click **OK**.

Modifying an image

Important:

1. You cannot modify the content of an image. If you want to modify the content of an image, you must delete and then recreate the image.
2. To modify an image, use only the Image Management option. If you use a command-line interface or an application to modify files or directories in an RDM repository, RDM tasks that use the image might fail.

You can use the Image Management option to modify properties that are associated with an image, such as the image name, image description, and executable-file parameters.

Complete the following steps to modify the properties that are associated with an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

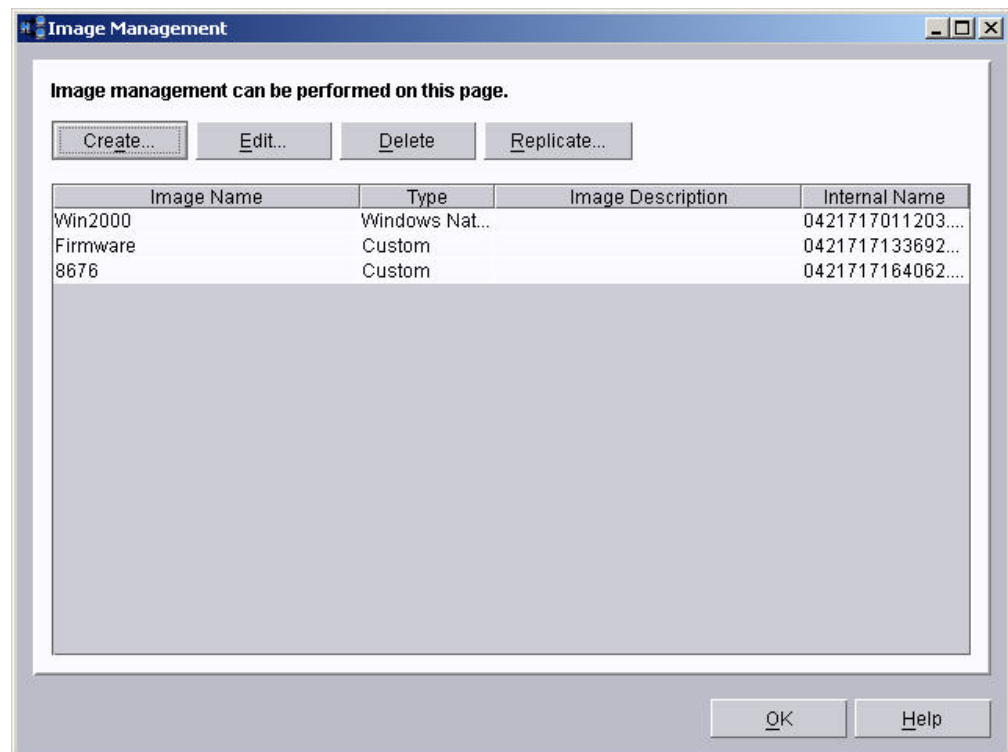


Figure 22. Image Management window

2. From the list of images, click the image that you want to modify.

3. Click **Edit**. The applicable window opens and the General page is displayed.

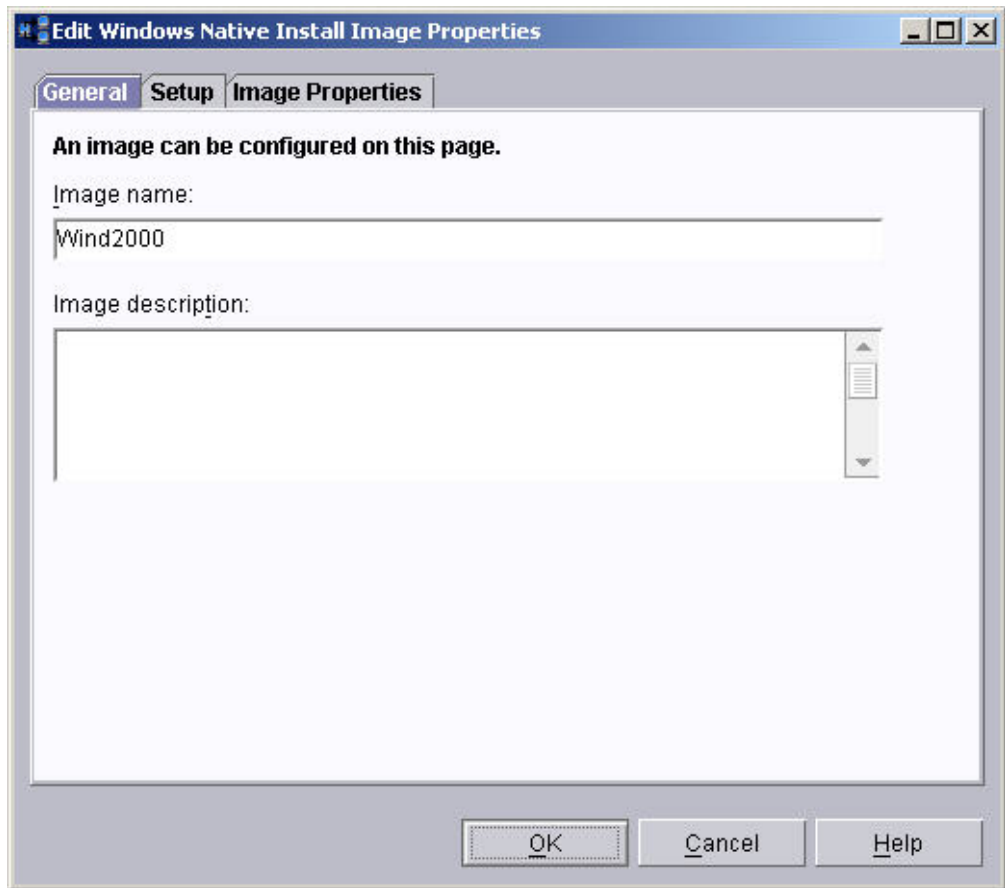


Figure 23. General properties

4. On the General and Setup pages, edit the image properties that you want to modify. Read-only attributes, such as the internal name and size, are displayed on the Image Properties page.

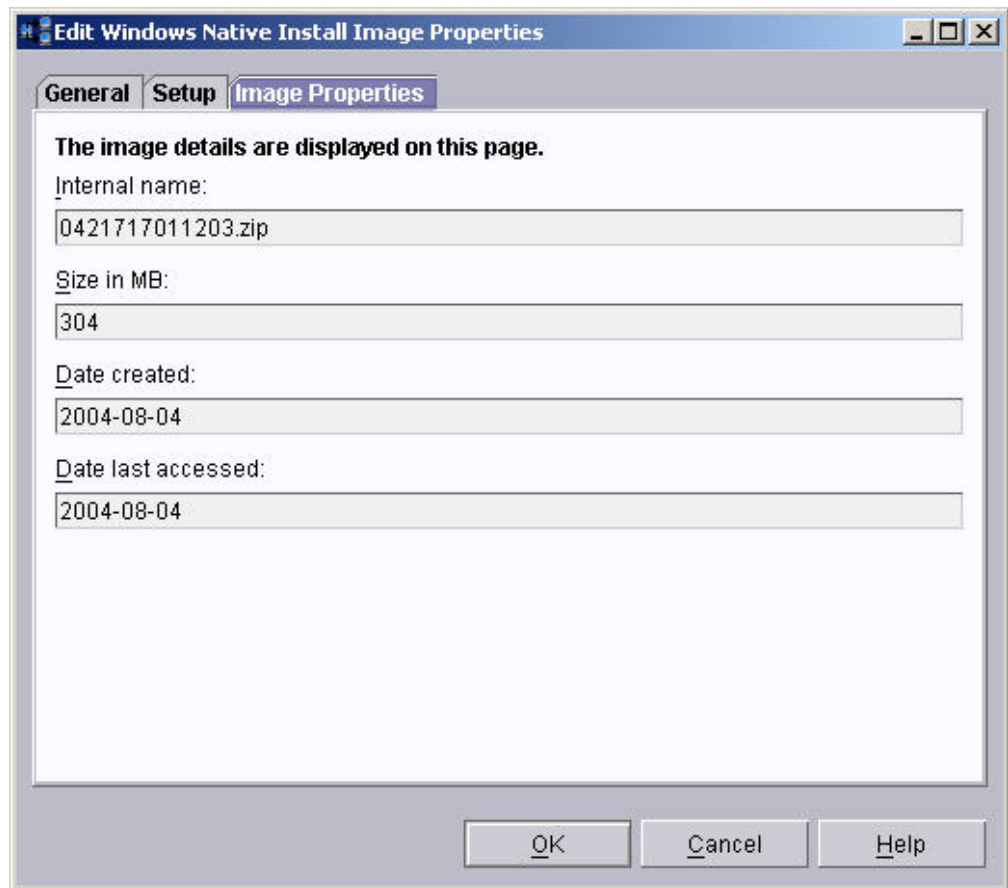


Figure 24. Image Properties page

5. Click **OK**.

Deleting an image

You can use the Image Management option to delete an image, provided that the image file is not associated with any existing tasks or STC data. When an image is deleted, it also is deleted from each distributed repository.

Complete the following steps to delete an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

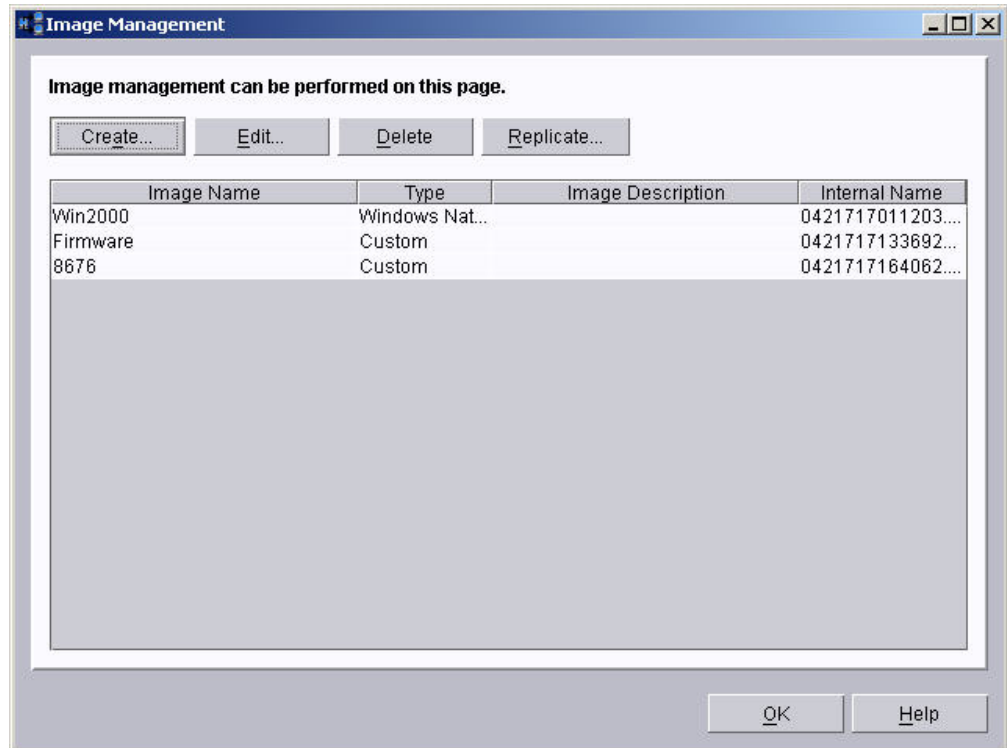


Figure 25. Image Management window

2. From the list of images, select the image that you want to delete.
3. Click **Delete**. The image is deleted.

Replicating an image

You can use the Image Management option to copy images from the master repository to a distributed repository. You can replicate images to multiple remote repositories at the same time.

Complete the following steps to replicate an image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

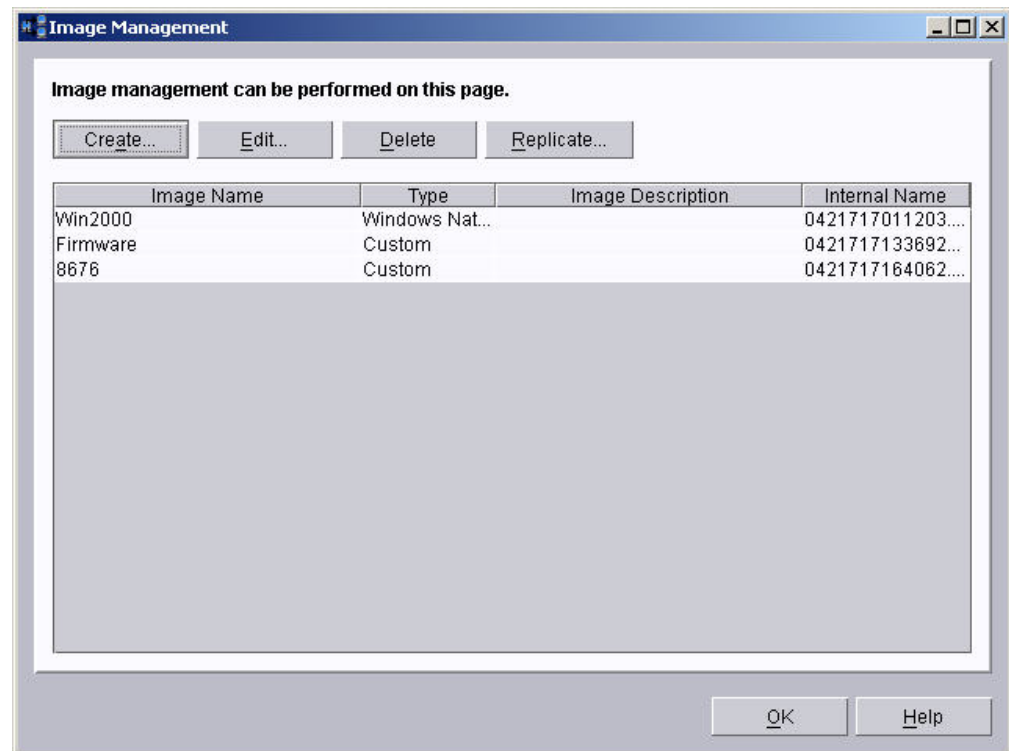


Figure 26. Image Management window

2. Select the image or images that you want to replicate; then, click **Replicate**. The Replicate Images window opens.

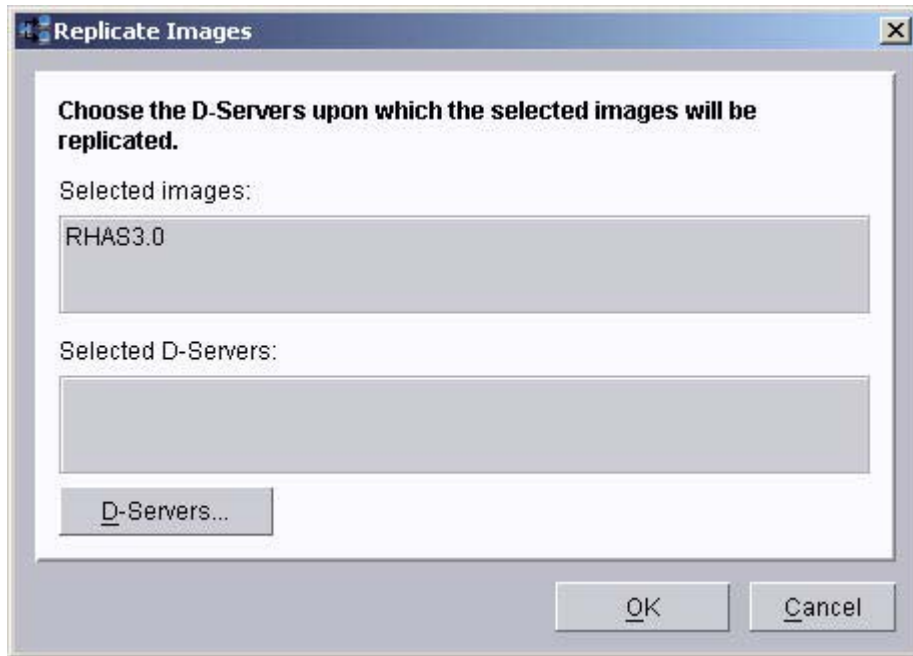


Figure 27. Replicate Images window

3. Select the remote deployment servers:
 - a. Click **D-Server**. The DServers window opens.
 - b. Select the remote deployment server to which you want to replicate the image. To select multiple servers, press Ctrl and select the servers.
 - c. Click **OK**. The remote deployment servers are displayed in the Replicate Images window.
4. Click **OK**. The image is replicated.

Chapter 5. Configuring RDM

This chapter provides information about how to configure RDM Server and RDM Deployment Server.

Configuring RDM Server

RDM Server, the main component of RDM, contains the application logic for RDM. You can configure the following server and system options using IBM Director Console on the management server or on a remote deployment server:

- Set how long RDM displays successful and failed replication transactions in the transactions list
- Set timeout values for system responses
- Set timeout values for server responses
- Set which scan task is used by default
- Enable or disable the default scan task
- Enable or disable forced shutdowns of target systems by using IBM Director Agent

Complete the following steps to configure RDM Server options:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Options** → **Change Server Options**. The RDM Options window opens.

The screenshot shows the 'RDM Options' dialog box with the 'Server' tab selected. The 'Time to Keep Replication Transactions' section has two input fields: 'Time after success (minutes): 10' and 'Time after error (minutes): 10'. The 'Timeouts' section has two input fields: 'Time for Server to wait for a System response (minutes): 120' and 'Time for Scan to wait for a user's response to questions (minutes): 4'. The 'Scan Task' section has two radio buttons: 'Scan Enabled' (selected) and 'Scan Disabled'. Below the radio buttons is a dropdown menu for 'Default Scan Task' with 'Basic Scan' selected. At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

Figure 28. RDM Options window: Server page

On the Server page, set the time intervals for replication transactions and time-outs, and enable or disable the default scan task. On the System page, set the server response time and forced shutdown option.

2. Complete the following steps to configure the options on the Server page:
 - a. In the **Time after success (minutes)** field, type the number of minutes that the transaction remains in the replication list after it is successfully completed. The default setting is 10 minutes.
 - b. In the **Time after error (minutes)** field, type the number of minutes that the transaction remains in the replication list after an error occurs. The default setting is 10 minutes.
 - c. In the **Time for Server to wait for a System response (minutes)** field, type the number of minutes that the server waits for a system response before generating a fail event. The value that you type is used as the default when you run a task. You can override this default value by setting the timeout value in the command list of the task. The default setting is 120 minutes.

Note: Typically, when a timeout error occurs, it is because of some other error that occurred during the task. On rare occasions, however, a task will fail if the time that is required to complete the task exceeds the default timeout value. For future successes, modify the command list of the task to include a longer timeout than the default server value. For information about using the TIMEOUT command in a command list, see Chapter 24, "Command-list commands," on page 275. Also, a system might take longer than the configured timeout value and still successfully complete a task. This indicates that the system took longer than expected to complete the last instruction that was sent from RDM Server. An error is still logged to indicate the timeout failure.

- d. In the **Time for Scan to wait for a user's response to questions (minutes)** field, type the number of minutes that a scan task waits for user interaction. The value that you type is used as the default when you run a Scan task. You can override the default value by setting the timeout value in the command list of the task. The default setting is 4 minutes.
- e. In the Scan Task group box, click **Scan Enabled** to automatically run the specified scan task for new systems, or click **Scan Disabled** to prevent new systems from being scanned.
- f. In the **Default Scan Task** field, select the scan task that is to be used for new systems. The default setting is **Basic Scan**.

3. Complete the following steps to configure the options on the System page:
 - a. Click the **System** tab. The System page is displayed.

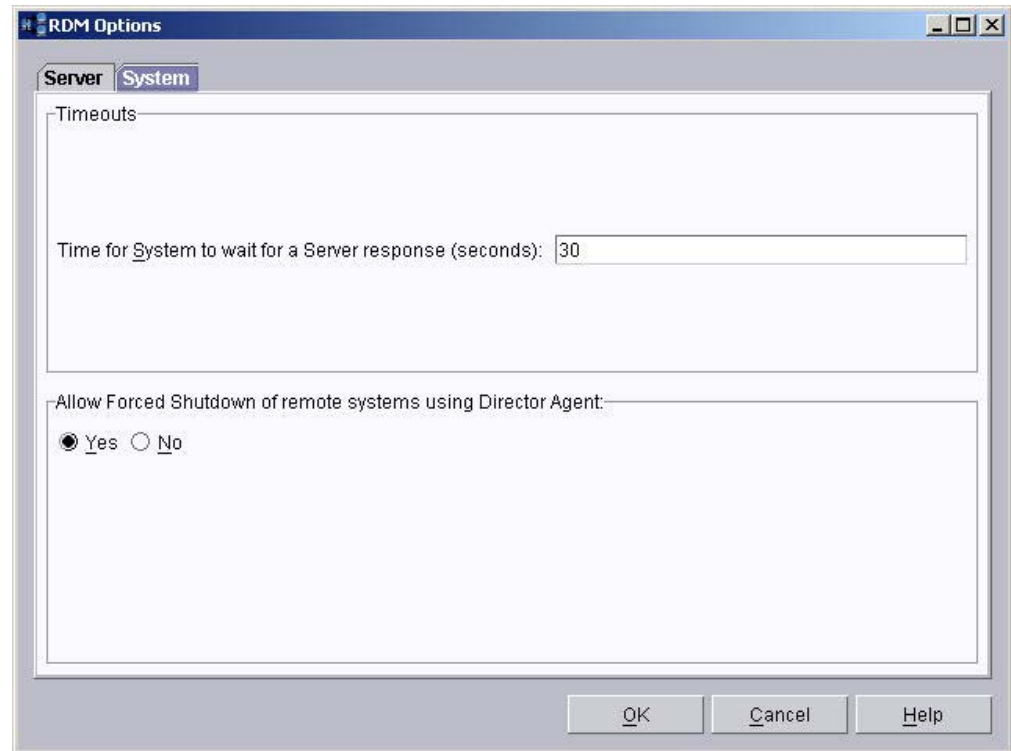


Figure 29. RDM Options window: System page

- b. In the **Time for System to wait for a Server response (seconds)** field, type the number of seconds that a system waits for a response from RDM Server. The default is 30 seconds.
 - c. In the Allow Forced Shutdown of remote systems using Director Agent group box, click **Yes** or **No**.
4. Click **OK**.

Adding a remote deployment server to RDM

RDM Deployment Server acts as a file-server application that delivers programs and data files to target systems. It also handles all communication between the target system and the management server.

From IBM Director Console, you can add a remote deployment server to RDM; however, you must first install RDM Deployment Server on the server that you want to use as a remote deployment server. After you install RDM Deployment Server, you can configure the remote deployment server through IBM Director Console.

Complete the following steps to add a remote deployment server to the RDM database:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Options** → **Change D-Server Options**. The Deployment Server Management Options window opens.

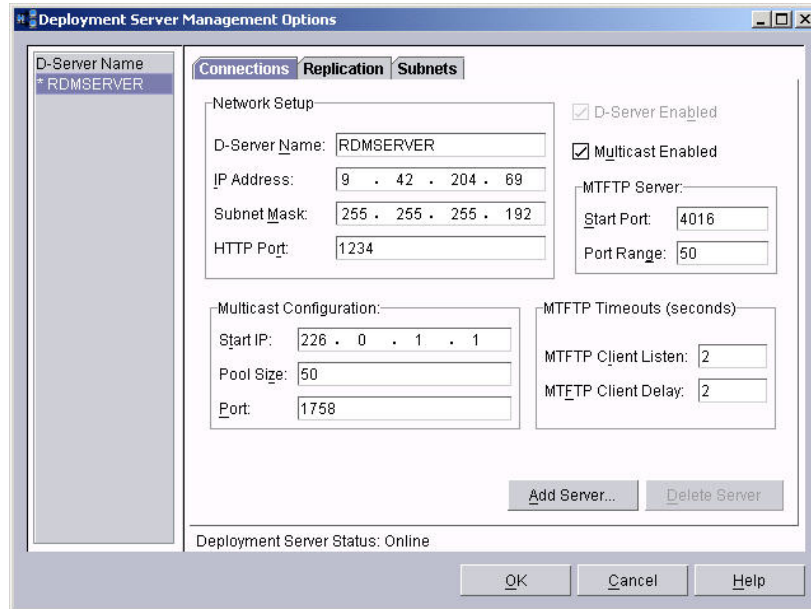


Figure 30. Deployment Server Management Options window

2. Click **Add Server**. The Add D-Server window opens.

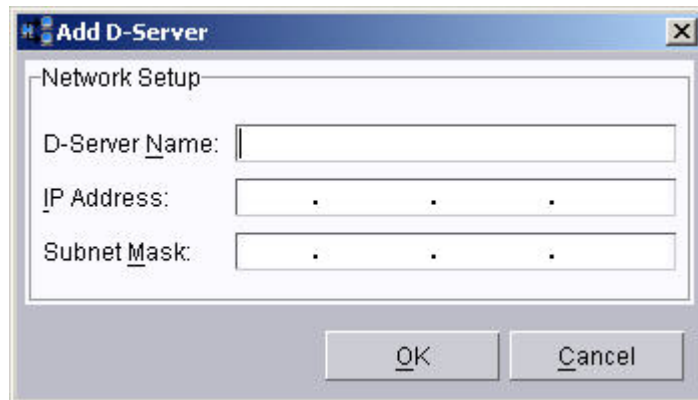


Figure 31. Add D-Server window

3. Provide information about the remote deployment server:
 - a. In the **D-Server Name** field, type a name for the deployment server. The name that you type is used to identify the remote deployment server within IBM Director Console.

Note: The name that you type does not change the network-defined host name of the managed system.

- b. In the **IP Address** field, type the IP address of the deployment server.

Note: After you add a deployment server to RDM, you cannot use IBM Director Console to change its IP address. For information about how to change the IP address of a remote deployment server, see “Changing the IP address of a remote deployment server” on page 55.
 - c. In the **Subnet Mask** field, type the subnet mask for the deployment server.
 - d. Click **OK**. The new deployment server is added to the **D-Server Name** list.
4. You can configure additional deployment server information on the Connections, Replication, and Subnets pages. For information about configuring RDM Deployment Server, see “Configuring RDM Deployment Server (D-Server).” When finished adding information, click **OK**.

Configuring RDM Deployment Server (D-Server)

You can configure the following RDM Deployment Server settings using IBM Director Console:

- IP address that is used by a remote deployment server
- HTTP listening port
- Timeouts for MFTFTP server
- Multicast configuration
- Subnets

You can configure the settings for a remote deployment server by using IBM Director Console, only when that remote deployment server is powered-on and in communication with the management server.

If you are working with a remote deployment server, you also can:

- Enable or disable RDM Deployment Server
- Enable or disable multicast
- Enable or disable replication
- Configure the replication threshold

The settings that are displayed in the Remote Deployment Server Management Options window are a subset of the values that are saved in the initialization file (`dserver.ini`) for the applicable deployment server. When you install RDM Deployment Server, RDM automatically creates the `dserver.ini` file and saves it to one of the following locations:

For Linux	<code>/RDM_installation/local</code>
For Windows	<code>d:\RDM_installation\local</code>

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory in which RDM is installed.

The instance of RDM Deployment Server running on the management server logs errors in the mds.log file. The instance of RDM Deployment Server running on a remote deployment server logs errors in the rds.log file. The log files are saved in one of the following locations:

For Linux */RDM_installation/log*

For Windows *d:\RDM_installation\log*

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory where RDM is installed.

Complete the following steps to use IBM Director Console to configure a deployment server:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Options** → **Change D-Server Options**. The Deployment Server Management Options window opens.

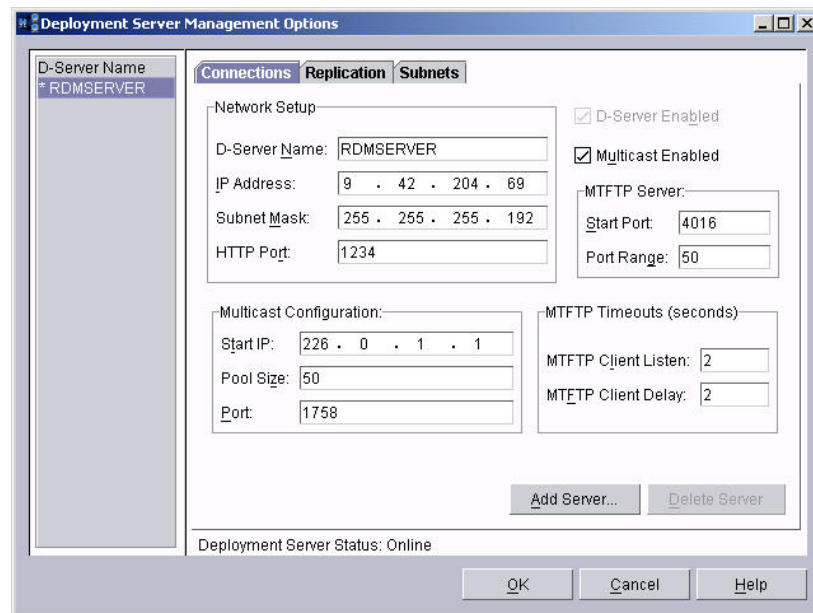


Figure 32. Deployment Server Management Options window

Note: An asterisk (*) next to the name of a deployment server indicates that it is the instance of RDM Deployment Server that is running on the management server.

The settings for the selected deployment server are displayed in the right pane.

2. On the Connections page, configure the network, multicast, and MTFTP server and timeout settings for the deployment server.
3. On the Replication page set the large-files threshold and configure the replication times.

4. On the Subnets page, manage and configure the subnets that are served by each deployment server.

Note: If you make any configuration changes to a remote deployment server that is enabled, the IBM RDM D-Server service on that system is automatically restarted after you apply the changes. If the remote deployment server is not enabled, the IBM RDM D-Server service is not restarted. For a management server, if you modify the Network Setup settings, the IBM RDM D-Server service on the management server and on each remote deployment server is automatically restarted after you apply the changes. If the IBM RDM D-Server service is restarted while it is performing an MTFTP operation, the MTFTP operation will fail with an illegal TFTP operation error.

Enabling a remote deployment server

After you enable a remote deployment server, it can receive and respond to requests from target systems within the network. Typically, remote deployment servers are used in wide area networks.

Note: You cannot use IBM Director Console to enable or disable the instance of RDM Deployment Server that is running on the management server.

Enabling a single remote deployment server

Complete the following steps to enable a remote deployment server:

1. In the **D-Server Name** list, on the Connections page of the Remote Deployment Management Options window, select the deployment server that you want to enable.
2. Select the **D-Server Enabled** check box to enable the selected deployment server, or clear the check box to disable the selected deployment server.

Enabling all remote deployment servers

Complete the following steps to enable all remote deployment servers at once:

1. On the management server, navigate to the *director_installation\classes* directory, where *director_installation* is the directory in which IBM Director is installed.
2. Using an ASCII text editor, open the *rdm.ini* file and add the following line:
`enableAllRds=yes`
3. Save the modified file.
4. Restart the IBM Director Server service.

Enabling multicast

After you enable multicasting for a deployment server, the server can receive and respond to multicast requests from target systems within the network.

Complete the following steps to enable or disable multicasting for a deployment server:

1. In the **D-Server Name** list, on the Connections page of the Remote Deployment Management Options window, select the deployment server that you want to enable.
2. Select the **Multicast Enabled** check box to enable multicasting for the selected deployment server, or clear the check box to disable multicasting for the selected deployment server.

Configuring the network settings

Complete the following steps to configure the network settings for a deployment server:

1. In the **D-Server Name** list, on the Connections page of the Remote Deployment Management Options window, select the deployment server that you want to configure.
2. (Optional) To change the name of the deployment server, in the **D-Server Name** field, type a new name for the selected deployment server. The name that you type is used to identify the selected instance of RDM Deployment Server within IBM Director and RDM only. The name that you type does not change the network-defined host name of the managed system.
3. (Management server only) In the **IP Address** field, type the IP address for the deployment server. The **IP Address** field for remote deployment servers is disabled and cannot be changed in this window. If you modify the IP address of the management server by using RDM, the IBM RDM D-Server service is automatically stopped and restarted on the management server after you complete your changes.

Note: After you add a remote deployment server to RDM, you cannot use IBM Director Console to change its IP address. You must configure the IP address of a remote deployment server locally. For information about how to change the IP address of a remote deployment server, see “Changing the IP address of a remote deployment server” on page 55.

4. In the **Subnet Mask** field, type the subnet mask for the deployment server.
5. In the **HTTP Port** field, type the HTTP port address that the deployment server uses to communicate with the management server. The minimum value that you can enter is 1024 and the maximum value is 65535.

Configuring the multicast settings

In the Multicast Configuration group box, you can configure the multicast settings for a deployment server. Multicast enables the selected deployment server to send information to a single reserved IP address. The information is received and processed by multiple systems that belong to the multicast group. Typically, multicast is used to send deployment images to a large number of target systems simultaneously. The set of systems that listen on a specific IP multicast address is called a *multicast group*. IP addresses for multicast are reserved and assigned from within the Class-D IP address range, from 224.0.0.0 through 239.255.255.255.

Complete the following steps to configure the multicast settings for a deployment server:

1. In the **Start IP** field on the Connections page of the Remote Deployment Management Options window, type the first address (Class-D) that is to be reserved for the deployment server to multicast files. By default, RDM uses 226.0.1.1 for the multicast address. The IP address must be between the range of 226.0.1.1 and 239.255.255.1.

Note: Typically, Class-D addresses in the range 224.0.0.0 through 226.0.0.0 are reserved by other applications for non-RDM purposes.

2. In the **Pool Size** field, type the number of consecutive Class-D addresses (from the starting IP address that is specified in the **Start IP** field) that are to be reserved for multicasting files. The pool size can be a minimum of 10 and a maximum of 255. The default is 50.

3. In the **Port** field, type the User Datagram Protocol (UDP) port number to which the deployment server will send files when it multicasts. The port number is used in conjunction with the IP addresses that are within the range that is specified by the Start IP and Pool Size. The port can be a minimum of 70 and a maximum of 65535. The default is 1758.

Configuring the MFTFTP settings

Complete the following steps to configure the MFTFTP settings for a deployment server:

1. In the **Start Port** field, type the first UDP port number from which the deployment server will send a file that is requested by a target system (using either unicast or multicast mode). This restricts the port range for MFTFTP traffic. Typically, when a firewall or router is used with RDM, the values that you enter for Start Port and Port Range must correspond to the applicable values that are configured for the router or firewall. The start port can be a minimum of 4016 and a maximum of 65535. The default is 4016.
2. In the **Port Range** field, type the number of consecutive port addresses from the Start Port for the deployment server to listen for MFTFTP services. The port range can be a minimum of 10 and a maximum of 65535. The default is 50. Make sure that the range that you specify does not exceed 65535 when it is added to the Start Port value that you entered in step 1.
3. In the **MFTFTP Client Listen** field, type the number of seconds that a target system listens to determine whether a file is being transmitted on the network. When this time interval is exceeded, the target system requests the file from the deployment server. The default setting is 2 seconds.
4. In the **MFTFTP Client Delay** field, type the number of seconds that a client system with an incomplete file transmission waits before requesting the file from the deployment server. The default setting is 2 seconds.

Configuring the replication settings

The Replication page for each deployment server defines rules that indicate how data is replicated from the master repository to the remote repository on the selected deployment server. Each deployment server can use a different set of rules.

Note: Replication is always from the management server to a remote deployment server. As a result, the replication settings are not used by the instance of RDM Deployment Server that is running on the management server. The Replication page can be displayed for the management server; however, the settings cannot be edited.

Complete the following steps to configure the settings on the Replication page:

1. From the “Remote Deployment Management Options” window, click the **Replication** tab. The Replication page is displayed.

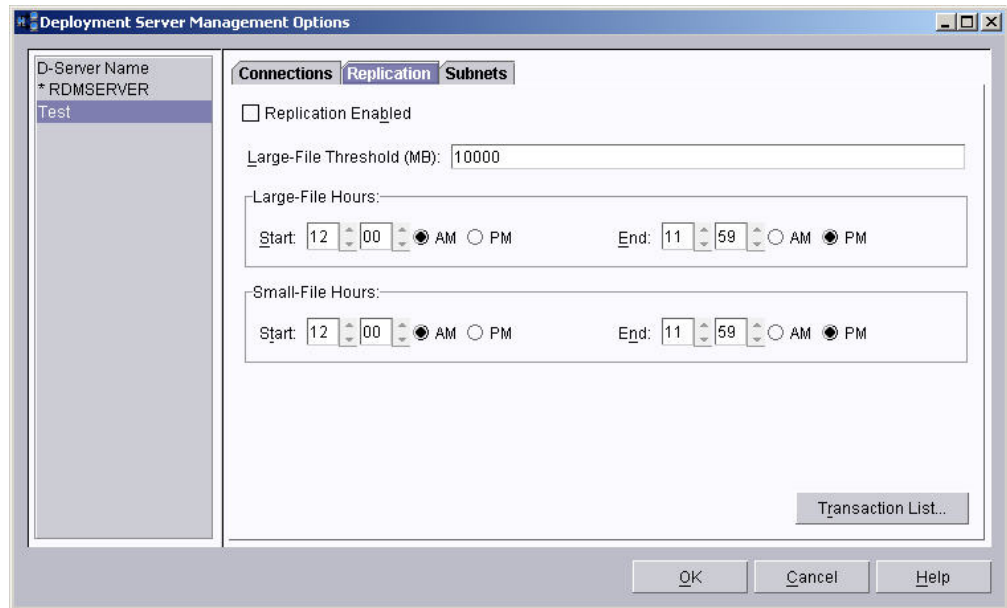


Figure 33. Deployment Server Management Options window: Replication page

2. (Remote deployment server only) Select the **Replication Enabled** check box to enable replication on the selected deployment server, or clear the check box to disable the replication for the selected deployment server.
3. In the **Large-File Threshold (MB)** field, type the minimum file size that the deployment server will use to determine whether a file is “large.” Files that are smaller than the value that you enter are considered “small” files.
4. In the **Large-File Hours** group box, complete the applicable fields to indicate the hours within which a large file can be replicated by the selected deployment server. To avoid excessive network traffic, large files are typically replicated in the evening when there is minimal network demand by users. Small files are a subset of large files, and are replicated during the large-file hours and small-file hours.
5. In the **Small-File Hours** group box, complete the applicable fields to indicate the hours within which a small file can be replicated by the selected deployment server.

Note: The times that you specify for large-file hours can coincide with the times that you specify for small-file hours.

6. To display a list of transactions that have been replicated by the selected deployment server, click **Transaction List**. Transactions that are complete or in error are removed from the list, according to the times that are specified on the Server page in the RDM Options window. For information about how to set how long transactions are displayed, see “Configuring RDM Server” on page 41.

The transaction status is one of the following states:

- **Pending:** The transaction is scheduled to run later.
- **In process:** The transaction is currently running. You cannot delete a transaction in this state.

- **Error:** The transaction had an error.
- **Complete:** The transaction was completed successfully.

The transaction type is one of the following types:

- **User initiated:** The replication was initiated manually through the Image Management option.
- **Automatic update:** The replication was initiated automatically.

To delete a transaction, select the transaction in the list, and then click **Delete**.

To refresh the list, click **Refresh**.

To close the Transaction List window, click **Close**.

7. Click **OK**.

Configuring which subnets are served

From the Subnets page, you can display and edit which subnets are served by a deployment server. You also can display all of the subnets that are being served by deployment servers.

RDM can run a task against a target system only if the subnet of the target system is listed as a subnet for one of the deployment servers. Each deployment server can serve multiple subnets, however, multiple deployment servers cannot serve the same subnet. You must add a subnet to RDM for each subnet that contains target system.

Note: Remote deployment servers cannot be on the same subnet as the management server.

Complete the following steps to configure the settings for a deployment server:

1. From the Remote Deployment Management Options window, click the **Subnets** tab. The Subnets page is displayed.

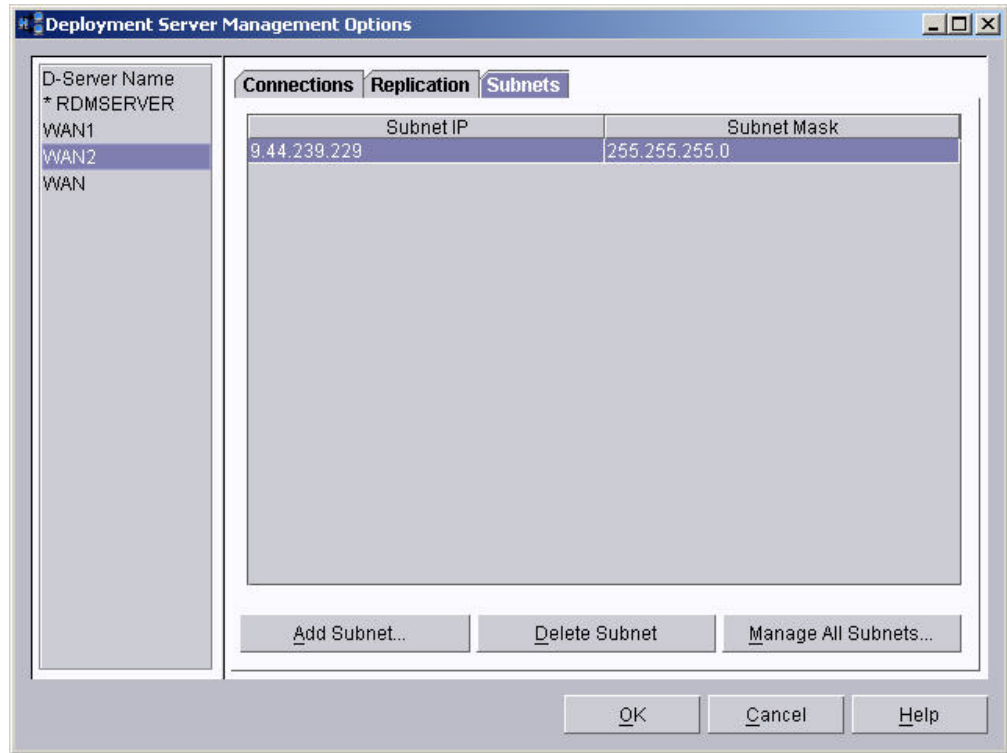


Figure 34. Remote Deployment Management Options window: Subnets page

2. Configure the settings:
 - To add a subnet to the list of subnets that are served by a deployment server, click **Add Subnet**; then add the applicable IP address and subnet mask information and click **OK**.

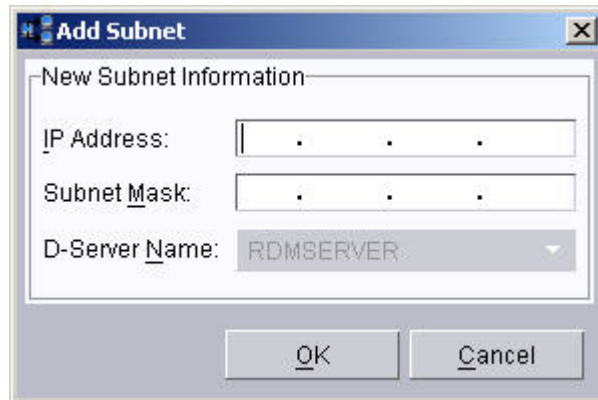


Figure 35. Add Subnet window

- To delete a subnet, in the subnets list, select a subnet; then, click **Delete Subnet**. The subnet is deleted from the list on the Subnets page. You can no longer run tasks against target systems that belong to the deleted subnet.
- To display a list of all of the subnets for all of the deployment servers that are in the RDM database, click **Manage All Subnets**. The Subnet Management window opens.

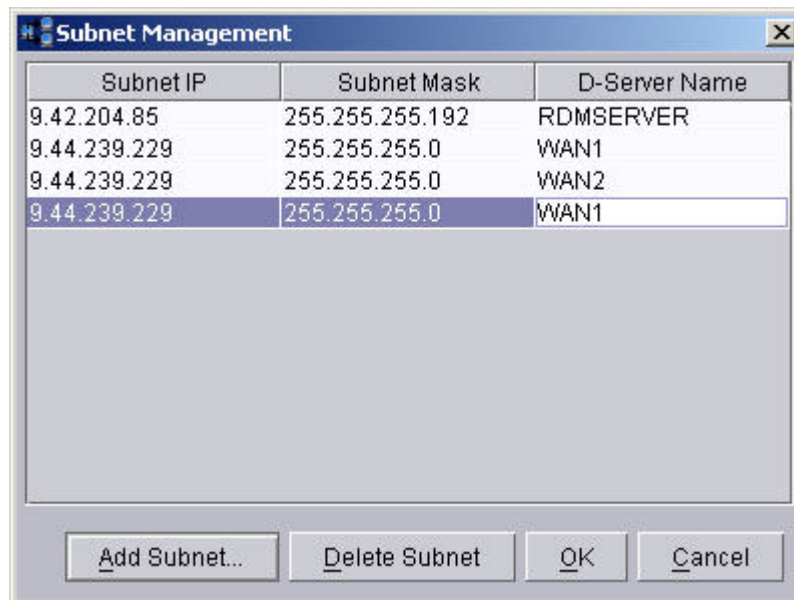


Figure 36. Subnet Management window

Note: You can assign a subnet to a different deployment server by selecting the subnet that you want to assign the deployment server to and then selecting another deployment server from the **D-Server Name** field.

Configure the applicable settings; then, click **OK**.

3. Click **OK** to apply the changes, or click **Cancel** to exit with no changes.

Restarting RDM Deployment Server (D-Server)

You can stop and start the IBM RDM D-Server service from the command prompt of the system on which the service is running. On rare occasions, you might need to stop the IBM RDM D-Server service. For example, you can restart the service to erase the mds.log or rds.log file in preparation for a problem-debugging test.

Windows

Complete the following steps to restart the IBM RDM D-Server service on a deployment server that is running Windows:

1. From a command prompt, type the following command to stop the IBM RDM D-Server service:

```
net stop dserver
```
2. From a command prompt, type the following command to start the IBM RDM D-Server service:

```
net start dserver
```

Linux

Complete the following steps to restart the IBM RDM D-Server service on a deployment server that is running Linux:

1. Type the following command to stop the IBM RDM D-Server service; then, press Enter:

```
/etc/init.d/RDMdserver stop
```
2. Type the following command to start the IBM RDM D-Server service; then, press Enter:

```
/etc/init.d/RDMdserver start
```

Deleting a remote deployment server from RDM

From IBM Director Console, you can delete a deployment server from the RDM database. Deleting a deployment server does not uninstall RDM Deployment Server from the server on which it is installed. When you delete a deployment server, it is removed from the list of deployment servers that are displayed in IBM Director Console and it is no longer used by RDM tasks and commands.

Note: If the deployment server cannot communicate with the management server when you uninstall RDM Deployment Server, the deployment server might remain listed in the Deployment Server Management Options window. To remove it, you must manually delete the deployment server listing after it is uninstalled.

Complete the following steps to delete a deployment server from RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Options** → **Change D-Server Options**. The Deployment Server Management Options window opens.

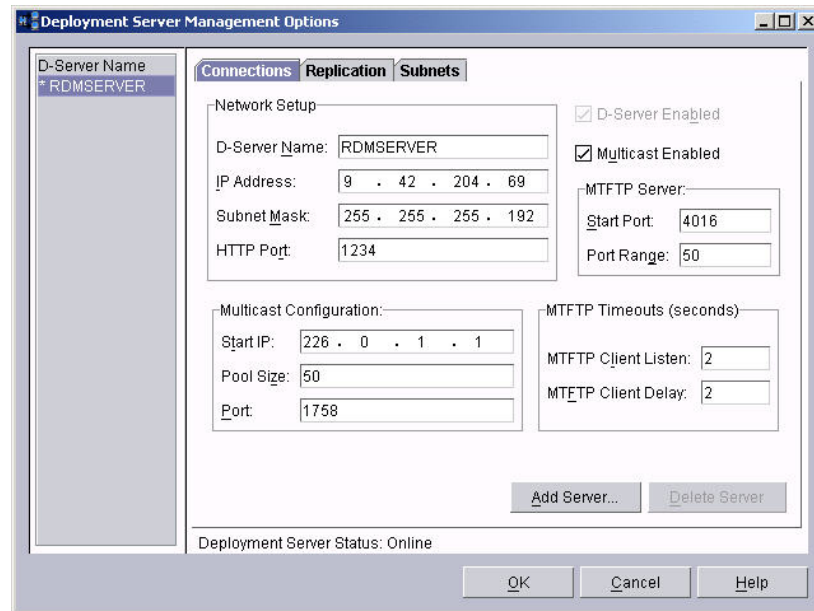


Figure 37. Deployment Server Management Options window

2. In the **D-Server Name** list, select the deployment server that you want to delete.
3. Click **Delete Server**. A confirmation message is displayed.



Figure 38. Delete Confirmation window

4. Click **Yes**.

Changing the IP address of a remote deployment server

If the IP address of a remote deployment server changes, you *must* update the IP address that is specified in RDM. Consider the following information:

- You must change the IP address from the deployment server. You cannot do this remotely.
- You cannot use IBM Director Console to update the IP address of the deployment server. For systems running Linux, you must modify the `dserver.ini` file. For systems running Windows, you must run the `dsconfig` utility.

Changing the IP address of a remote deployment server on Linux

You can modify the values in the `dserver.ini` file to change the IP address that is specified in RDM for a remote deployment server that is running Linux. Before you change the IP address in the `dserver.ini` file, you must change the IP address of the deployment server on the network. For information about changing an IP address of a system, see the documentation provided with your operating system.

Complete the following steps to change the IP address of a remote deployment server that is running Linux:

1. Change to the directory where the `dserver.ini` file is located. Type the following command and press Enter:

```
cd /rdm_installation/local
```

where `rdm_installation` is the directory where RDM Deployment Server is installed.

2. Using an ASCII text editor, open the `dserver.ini` file and change the value of the `IpAddress` parameter to the IP address of the deployment server.
3. Save the modified `dserver.ini` file.
4. Stop the IBM RDM D-Server service. Type the following command and press Enter:

```
/etc/init.d/RDMdserver stop
```

5. Start the IBM RDM D-Server service. Type the following command and press Enter:

```
/etc/init.d/RDMdserver start
```

Changing the IP address of a remote deployment server on Windows

You can use the RDM D-Server Configuration (`dsconfig`) utility to change the IP address of a remote deployment server that is running Windows. Before you use the utility to change the IP address, you must change the IP address of the deployment server on the network. For information about changing an IP address of a system within your network, see the documentation provided with your operating system.

Complete the following steps to change the IP address of a remote deployment server that is running Windows:

1. From the Windows desktop of the remote deployment server, click **Start** → **Programs** → **Remote Deployment Manager** → **D-Server Config**. The RDM D-Server Configuration window opens.

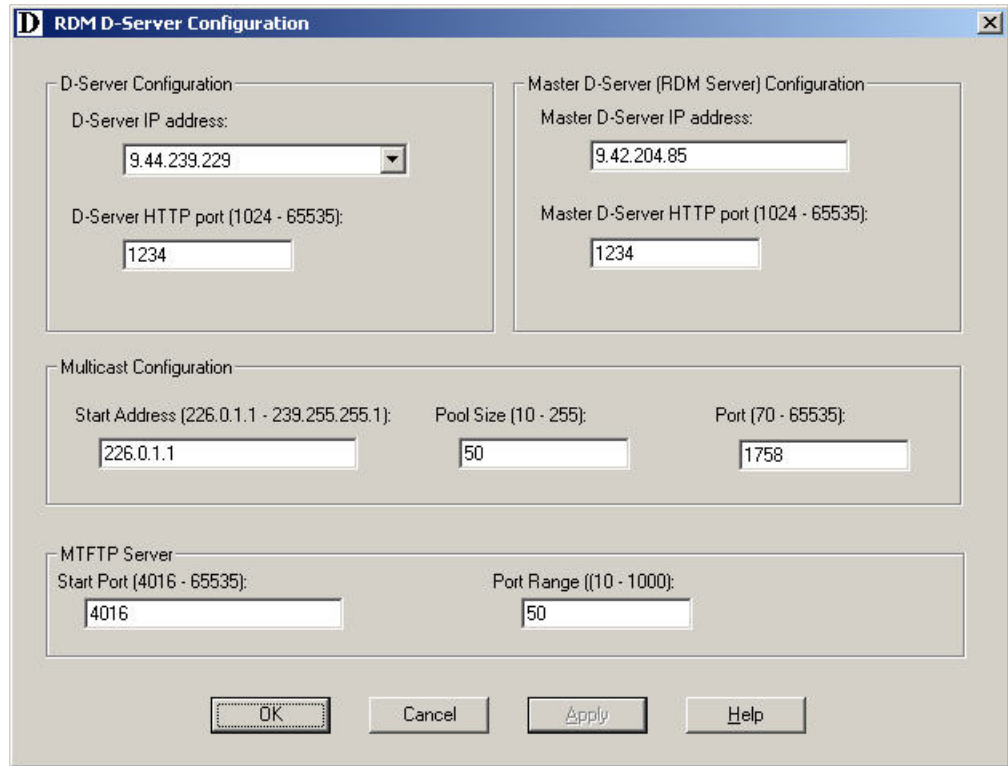


Figure 39. RDM D-Server Configuration window

Note: You also can type the following command from a command prompt, to start the RDM D-Server Configuration utility:

```
run d:\RDM_installation\bin\DsConfig.exe
```

where *d* is the disk drive letter of the hard disk drive where RDM is installed and *RDM_installation* is the directory where RDM Deployment Server is installed.

2. In the **D-Server IP address** field, select the IP address that the deployment server uses to communicate with RDM Server. If the server contains multiple network adapters with multiple IP addresses, the IP addresses will be displayed in the **D-Server IP address** field. Select the one to use for RDM communications. This field is only present if you are configuring a remote deployment server.
3. Configure any additional settings as applicable; then, click **OK**.

Chapter 6. Configuring systems and tasks

This chapter provides information about the System/Task Configuration (STC) window. Each task in RDM provides access to a System/Task Configuration window that is specific to that task. For some tasks, the fields in a System/Task Configuration window display read-only task-related information for the selected system. For a task that requires configuration, you can use the fields in the System/Task Configuration window to display or enter information that is required to run that task. The information that you enter is specific to the target system on which you plan to run the task. For example, the serial number for a VMware installation might be different for each target system to which you deploy VMware. You can use the VMware System/Task Configuration window to enter the serial number for a specific target system.

System/Task Configuration

The System/Task Configuration window associates one or more target systems with a task and defines all the parameters that are needed to run that task on each of the systems. Some RDM tasks must be configured through the System/Task Configuration window before you can run the tasks against target systems.

The following steps outline what RDM does when a System/Task Configuration window is opened:

1. RDM attempts to fill in the values for all of the parameters that are used by the task. The parameter values are retrieved from one of the following sources:
 - A previous STC configuration that is in the database. When a task is initially configured for a specific target system, the STC values are permanently saved to RDM and are used each time that task is run against that system. RDM continues to use the saved STC values until you change them. These values cannot be changed by modifying the default values that are used by the task or the template. To change the values for the target system you must either clear the values by using the Unconfigure System option or edit them through the STC window.
 - A default value from the task. If a target system has not been previously configured for a specific task by using the STC window, the default values that are saved to the task are used by RDM.
2. RDM qualifies the task by verifying that the task can be run against the selected system. If there are any qualification errors, RDM displays an error message. From the error message window, you can select the **Ignore Failure** option to ignore errors for the systems that fail qualification. These systems will continue to be configured in STC. Otherwise the systems are removed from the list of systems to be configured in the STC window.
3. You can optionally enter values in the STC window.
4. RDM validates the task by verifying the parameter values. RDM displays a validation error message for the systems that fail validation. These messages will continue to be displayed until all of the validation errors are resolved.
5. RDM then stores STC data in the RDM database for the target systems that have been configured and have passed validation.

You can use any of the following methods to open a System/Task Configuration window for an RDM task:

- Drag the task onto the object that represents the system or group. A context menu is displayed. Click **Configure systems**.
- Drag the object that represents the target system or group onto the task icon. Click **Configure systems**.
- Right-click a task. A context menu is displayed. Click **Configure systems**.

The STC window opens, with the selected systems shown in the STC grid.

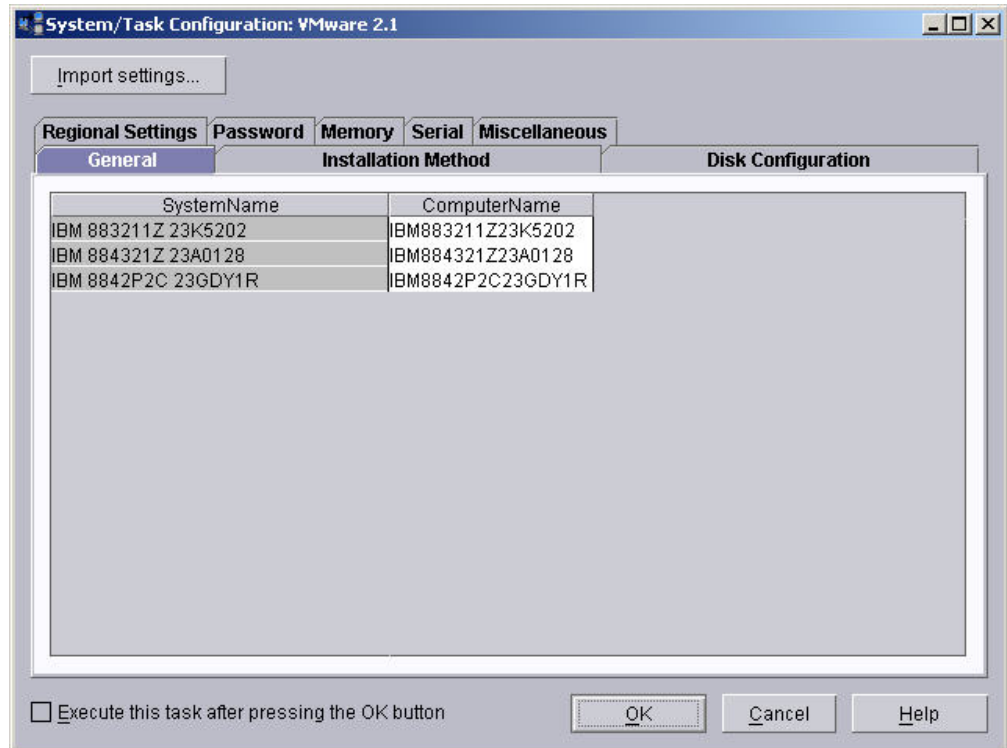


Figure 40. VMware task: System/Task Configuration window

If the task has multiple tabs, click each tab and edit the applicable STC information.

When the STC information is complete, you can select the **Execute this task after pressing the OK button** check box (lower left corner of the STC window). When you click **OK**, a window is displayed that lets you select one of the following options:

- **Schedule**
- **Execute Now**
- **Cancel**

To remove a system from the System/Task Configuration window, right-click a system, and then click **Remove System**. This option removes the configured system from the window, but it does not remove its data from the RDM database.

To delete the configuration information of a system from the RDM database, right-click a system, and then click **Unconfigure System**. The STC data for the selected task is deleted from the RDM database.

Importing STC settings

For tasks that require configuration, you can use the System/Task Configuration window to import the applicable STC data to RDM.

Importing STC data might be useful if you have a large number of systems that you plan to deploy. Typically, the system information for a target system, such as the IP address, subnet masks, domain name system (DNS) server, Windows Internet Naming Service (WINS) server, and computer name, are determined during the planning stage, prior to deployment. If the information is already in an accessible format, such as a spreadsheet, you can export or cut-and-paste the applicable data into a comma-separated value (CSV) file. You can then import the data to RDM to avoid having to retype it.

Creating a CSV file

In RDM, you can import STC data only from a CSV file. You can use an ASCII text editor to create or edit an existing CSV file that contains STC data. You also can use a spreadsheet program to create the data and export it to a CSV file. You can then import the data into RDM.

Use the following guidelines to create the CSV file:

- The header row (the first line of the CSV file) must contain the case-sensitive names (headers) of the corresponding columns that are displayed in the System/Task Configuration window. Headers can be in any order, but they must be separated by commas. System Name is the only required header.
- The remaining lines can contain the STC data for each target system that you want to include. The STC data must correspond to the headers in the first line of the CSV file and must be separated by commas.

Note: Null values must be delimited.

- If a header does not correspond to a column in the System/Task Configuration window, RDM ignores that header and does not import the corresponding data.
- If a system name does not correspond to an STC system name, RDM ignores that line and does not import any of the data for that system.
- You can omit column names and data from the CSV file for STC data that you do not want to import.

Importing STC data from a CSV file

Complete the following steps to import STC data from a CSV file:

1. Drag the target system that you want to configure onto a task. A context menu is displayed.

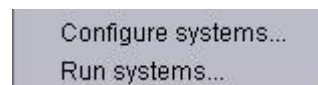


Figure 41. Context menu

2. Click **Configure systems**. The STC window opens, with the selected system shown in the STC grid.

3. Click **Import settings** to import parameter values for the systems displayed in the STC. The “Locate the file to be imported” window opens.

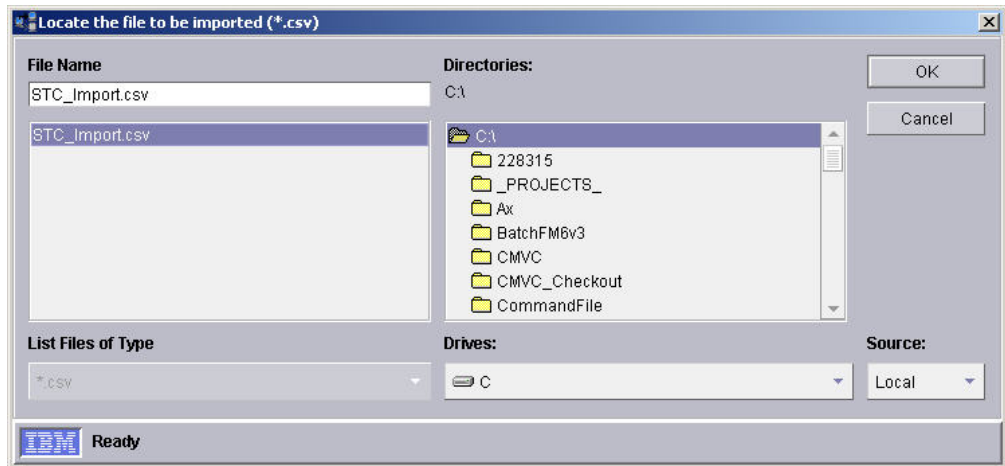


Figure 42. “Locate the file to be imported” window

4. In the **Source** field, select the system where the source files are located. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.

5. In the **Directories** list, navigate to the directory where the CSV file is saved.
6. In the **File Name** list, select the CSV file that you want to import.
7. Click **OK**. The values from the CSV file are imported to the System/Task Configuration window.

Target system qualification

System qualification determines whether a target system meets the hardware requirements that are necessary to run a specific task. By default, when you configure a system that does not meet the requirements for a specific task, a System Qualification Errors window opens.

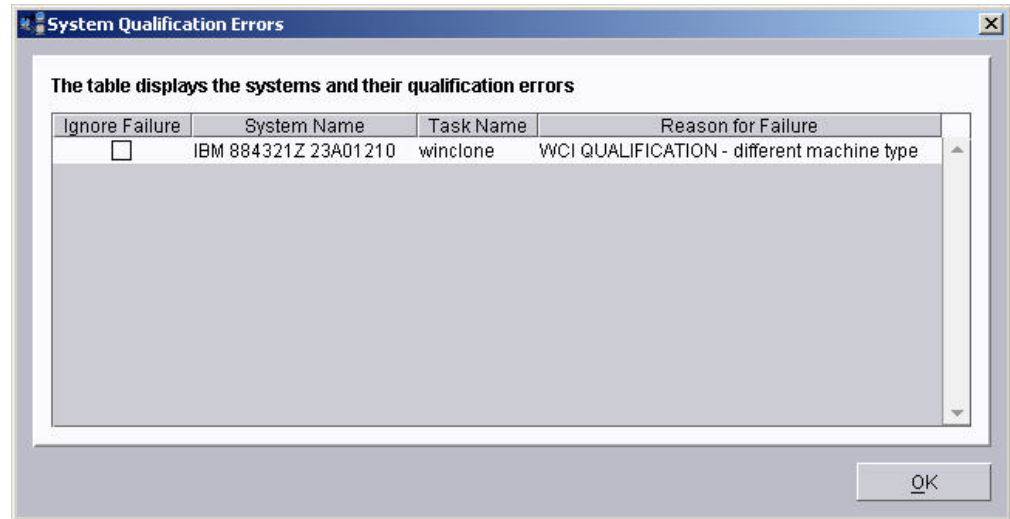


Figure 43. System Qualification Errors window

If the **Ignore Failure** check box is available, you can select it to ignore the system qualification errors and continue with configuring the system.

Note: For some tasks and templates, you can select the **Ignore failure in systems qualification** check box to ignore the system qualification errors on systems that you configure or run the task against.

System qualification errors also might occur due to one of the following conditions:

- The target system inventory data that is stored in the database is out-of-date. To make sure that RDM has the most current inventory data for a target system, run a Scan task against the target system.
- The target system inventory data that is stored in the database is in the process of being updated. This can happen if the target system has just been added to RDM and the data is still being populated. This also can happen if prior to system qualification, you run a task against the target system and as a result, some of the inventory data is still being updated. Make sure that no tasks are running against the target system.

Depending on the task, there are a different set of requirements that are used to determine whether it can be run against the target system:

CMOS Update

One of the CMOS Update images that is used by the task must correspond to the BIOS product code and level that is used on the target system.

Custom

System qualification is always skipped for Custom tasks.

Get Donor

System qualification is always skipped for the Get Donor task.

Linux Native Install

System qualification is always skipped for Linux Native Install tasks.

Power Restore

System qualification is always skipped for Power Restore tasks.

RAID Clone Configuration

System qualification depends on the type of clone file that is specified for the task:

- Configuration backup files require that a ServeRAID™, IDEal RAID, or integrated small computer system interface (SCSI) controller with RAID capabilities be installed.
- Command files require that a ServeRAID, IDEal RAID, or integrated SCSI controller with RAID capabilities be installed. In addition, the target system must have physical drives at the channel/SCSI IDs that are called in the configuration commands, and the physical drives must have adequate size to accommodate the logical drives that are defined. The file type must match the RAID controller type. The RAID level specified in the command file must be supported by the RAID controller. The logical drive letter specified in the command file is checked for validity. The specified clone command file must exist. The syntax of the command file is checked for validity.

RAID Custom Configuration

Target systems must have a ServeRAID, IDEal RAID, or integrated SCSI controller with RAID capabilities installed. Target systems must have enough adequately sized physical drives to support the task configuration. The file type must match the RAID controller type. The RAID level specified in the command file must be supported by the RAID controller. The logical drive letter specified in the command file is checked for validity. The syntax of the command file is checked for validity.

Remote Storage Configuration

The target systems must have the applicable adapter for the task. The target system also must have been scanned in when it was on an active fabric. For information about system qualification for the Remote Storage Configuration built-in tasks, see Chapter 16, “Scan,” on page 191.

Scan

System qualification is always skipped for Scan tasks.

Script

All tasks within a script (except those that are configured to ignore system qualification errors) must pass the qualification that is specified for each task. For example, if a Script task includes a System Firmware Flash task and a Windows Native Install task, both tasks must pass their individual qualifications for the Script task to qualify.

Secure Data Disposal

If a specific drive is selected, it must be present on the target system. If a drive is not specified, at least one drive must be present on the target system.

System Firmware Flash

One of the System Firmware images that is used by the task must correspond to the BIOS product code and level that is used on the target system.

The “Deploy latest system firmware” task requires further qualification: if the **Always Flash** option is selected for the task, target systems are flashed even if the version is the same. If the **Apply only when the latest version is newer than the current system BIOS level** option is selected, target systems that have the same or earlier version are disqualified.

VMware Native Install

System qualification is skipped for VMware Native Install tasks.

Windows Clone Install

Target systems must have the same number of network cards or more as defined by the task. Also, the machine type for target systems must match the machine type that is defined in the donor image for the selected task.

Windows Native Install

Target systems must have the following hardware:

- The applicable number of disk drives that are specified in the task.
- A minimum of 4 Gigabyte (GB) hard disk drive space. Additionally, there must be enough physical disk drive space on the applicable disks for the partitions that are specified in the task.
- The applicable number of network cards as defined in the task.
- The applicable amount of memory that the target system is required to have depends on the version of Windows that is being deployed:
 - Windows 2000 Professional requires 32 MB
 - Windows XP requires 64 MB
 - Windows 2000 Server requires 128 MB
 - Windows 2000 Advanced Server requires 128 MB
 - Windows Server 2003, Standard Edition requires 128 MB
 - Windows Server 2003, Enterprise Edition requires 128 MB
 - Windows Server 2003, Web Edition requires 128 MB

Chapter 7. Importing and exporting

This chapter provides information about how to use the Import/Export option to copy tasks, images, and system data from one RDM Server installation and save them to another.

Note: RDM does not support exporting system-specific configuration information (STC data) for a task. For example, you can export a System Firmware Flash task and the BIOS image that it uses, but you cannot export the STC data for the target systems that have been configured to use the task.

You can export or import RDM data from both Windows and Linux-based RDM installations. The RDM data that you export is not operating-system specific. As a result, RDM data that is exported from RDM running on a Windows system can be imported to RDM that is running on a Linux system, and vice versa.

From the **Tasks** menu in IBM Director Console, you can:

- Import and export RDM system data
- Import and export RDM task
- Import and export RDM images

Importing and exporting RDM system data

In RDM 4.20, each target system is represented by a set of data that is stored in the IBM Director database. You can import this system data from RDM version 3.x or later, or you can export the data from your current version of RDM.

Importing system data is useful when you already have information that describes the systems that you want to import. For example, you might want to add systems to RDM that are already in production, but you do not want to restart the systems (which would initiate the Basic Scan task and populate the database with system data for each supported system). If the system data that you want to import exists in a format that you can access, such as a spreadsheet or another system-management tool, you can use an ASCII text editor to convert the information to the format that is used by RDM. You can then import the information to RDM.

Note: Typically, after you import system data to RDM you must run a Scan task against the new systems that are displayed to make sure that the data in RDM is updated.

Exporting system data is useful when you want to use the information in another system-management tool. It is also useful when you want to manage the systems through another management server. For example, when you upgrade to RDM version 4.20 from 3.x, you must first uninstall RDM 3.x. To avoid losing the system data from the 3.x installation, you can export the system data before you uninstall RDM. The system data that you export is saved as a text file to the directory that you specify. After you install RDM 4.20, you can import the system data from the text file. For information about exporting system data from RDM version 3.x, see your *RDM 3.x Operations Guide*.

Exporting RDM system data

You can use the Export RDM 4.x Systems option to export system data to a comma-separated value (CSV) file. Possible uses for the file are to import the system data into another system-management application or to import the system data into another instance of RDM Server. If you import the system data into another instance of RDM Server, you can use IBM Director Console to access the target systems that are included in the CSV file.

Complete the following steps to export RDM 4.x systems:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Import/Export** → **Export RDM 4.x Systems**. The Export Systems window opens.

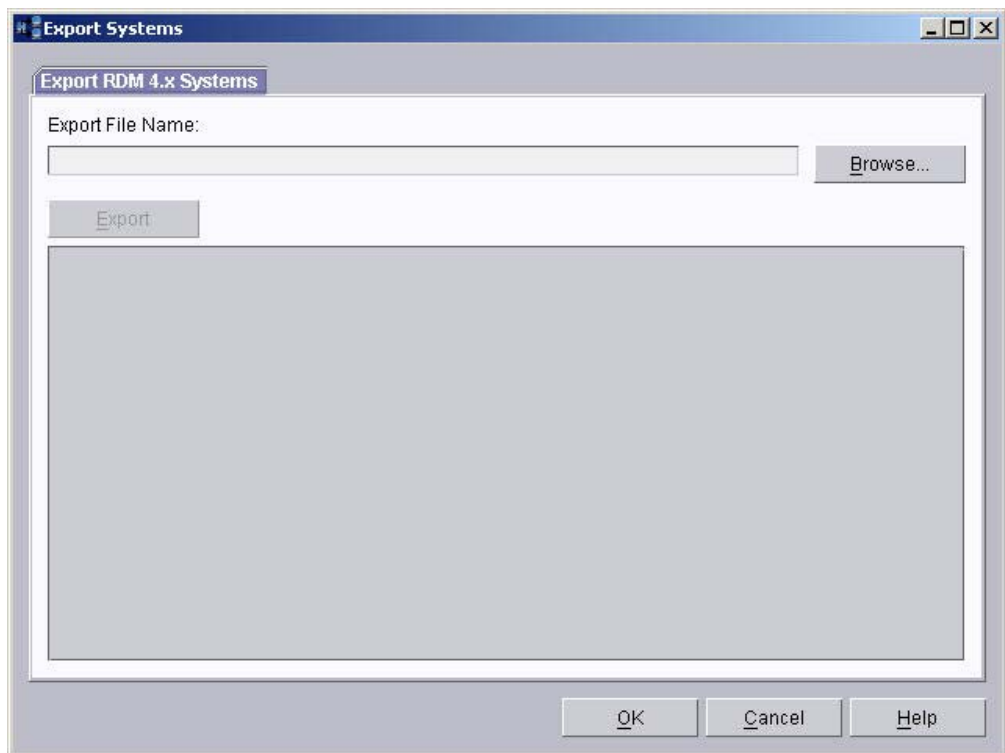


Figure 44. Export Systems window

2. Complete the following step to select the directory to which the file is exported:
 - a. Click **Browse**. The Export File window opens.

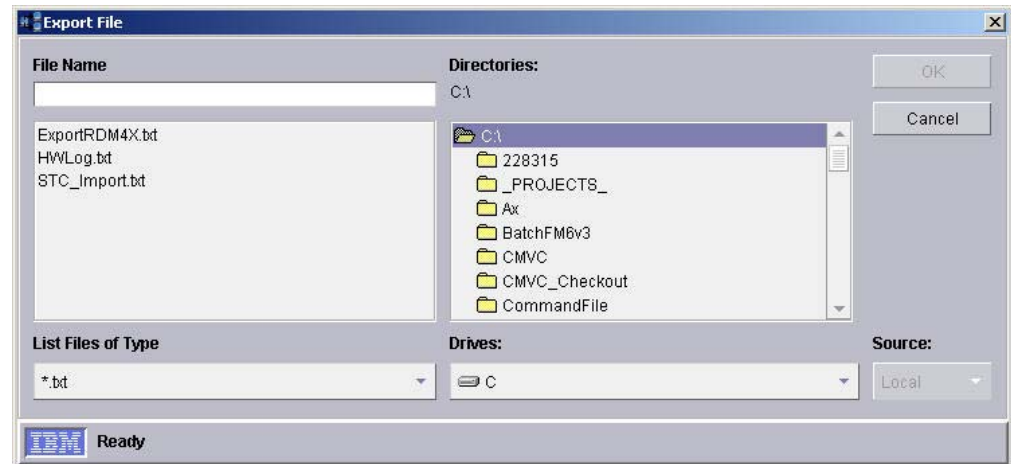


Figure 45. Export File window

- b. In the **Source** field, select the system where the source file is to be exported. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.

- c. Navigate to the directory where you want to save the file.

3. In the **Name** field, type a name for the exported systems file.

Note: If you save the file to a network directory and you plan to import it to another instance of RDM Server, make sure that the directory is accessible from the system on which you plan to import it.

4. Click **OK**. The Export Systems window opens and the file name that you specified is displayed.
5. Click **Export**. The Export Progress indicator is displayed.
6. Click **OK**.

Saving system data to a CSV file

You can use an ASCII text editor to create a CSV file that includes RDM system data. You can then import the data into RDM. After you import the system data, the new systems are displayed in IBM Director Console. You can run RDM tasks against the new systems.

Use the following guidelines to create a CSV file that includes RDM system data:

- Use an ASCII text editor to create or edit the CSV file. Typically, the CSV file is created by using a spreadsheet program; then, it is edited using an ASCII text editor.
- The file must have the .txt file extension.
- The first line of the CSV file must be the following string (including the quotation marks):
"\$IBM RDM"
- The second line of the CSV file must contain the headers of the system data that you want to import. Headers can be in any order, but they must be separated by commas. At a minimum, the following headers must be included in the second line of the CSV file:

Valid The value that you enter for a target system in this field indicates whether the system can be imported to RDM. To import the target system to RDM, you must set the value to 1.

System Name

The value that you enter represents the system name that will be displayed in IBM Director Console.

NIC MAC Address.0

The value that you enter represents the mac address of the first NIC on the target system.

Note: Unrecognized headers are ignored. The corresponding system data for an unrecognized header is also ignored.

- The remaining lines can contain the system data for each target system that you want to include. The system data that you include must correspond to the headers in the second line of the CSV file and must be separated by commas.

After you import the file you must run an RDM scan task against the new systems.

Importing RDM system data

You can use one of the following two options to import applicable RDM system data into RDM 4.20:

- Import RDM 3.x Systems
- Import RDM 4.x Systems

After you import the system data into RDM, the new systems are displayed in IBM Director Console. You can run RDM tasks against the new systems.

Note: After importing system data, make sure that you run an RDM scan against the new systems before you run any other RDM tasks.

Complete the following steps to import system data into RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Import/Export**; then, click the applicable version of RDM system data that you want to import (**Import RDM 3.x Systems** or **Import RDM 4.x Systems**). The Import Systems window opens.
2. Click **Browse**. The Import File window opens.
3. In the **Source** field, select the system where the file that you want to import is located. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.

4. Navigate to the directory from which you want to import the file.
5. In the **File Name** list, select the file you want to import.
6. Click **OK**. The Import Systems window opens and the file name that you specified is displayed.
7. Click **OK**. The systems are imported.

Importing and exporting RDM tasks

You can use RDM to import or export RDM tasks from one instance of RDM Server to another. Importing and exporting an RDM task is useful when you have multiple instances of RDM Server that require the same RDM task. Rather than recreate the task on each management server, you can create the task once, export it, and then import it on the management server on which you want to use it. You also can import or export multiple tasks at once.

Exporting RDM tasks

You can use the Export RDM tasks option to export specific RDM tasks to a directory that you specify.

Some RDM tasks, when they are run, use other RDM resources, such as images, files, parameters, and subtasks. For example, to successfully run an Update CMOS task, you must also have a corresponding firmware flash image for the Update CMOS task to use.

When you export a task, the applicable resources that are associated with the task are also exported.

Note: The System Firmware Flash images that are used by the Deploy latest firmware task are not exported with that task. This is because Deploy latest firmware task is not associated with a specific image until you actually run the task against a target system. When you run this task against a target system, the latest System Firmware Flash image is selected from the repository for that system.

RDM exports the task and the applicable resources to a single directory. To create this directory, you must specify a base directory and an export name. RDM uses the information that you provide to create the following export directory:

base_directory\RDM_Export\export_directory

where:

- *base_directory* is the location that you specify in step 5 on page 73 as the base directory
- *export_directory* is the directory to which RDM saves the data and all the applicable resources when the task is exported. The date of the export (in the form of *yyyymmdd*) and the name that you enter in the **Export Name** field are concatenated to create the *export_directory* name.

Note: If you want to import the task, you must navigate to and select the *export_directory* that RDM created when the task was exported.

Complete the following steps to export an RDM task:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Import/Export** → **Export RDM Tasks**. A warning window opens to indicate that no other RDM actions should be performed during the task export process. Also, make sure that no other RDM tasks are currently running before you continue.

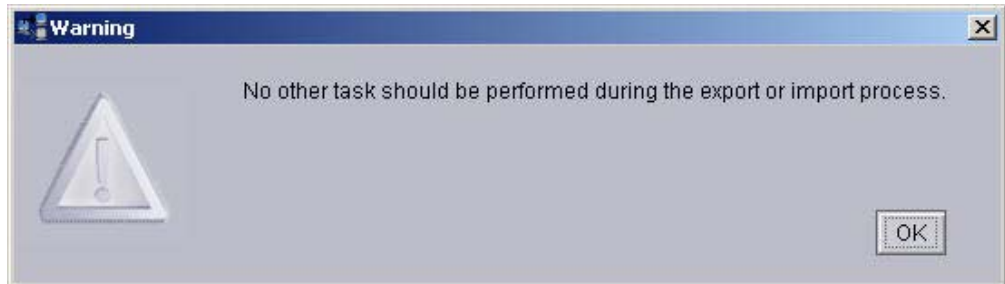


Figure 46. "Export warning" message

2. Click **OK**. The Export Tasks window opens.

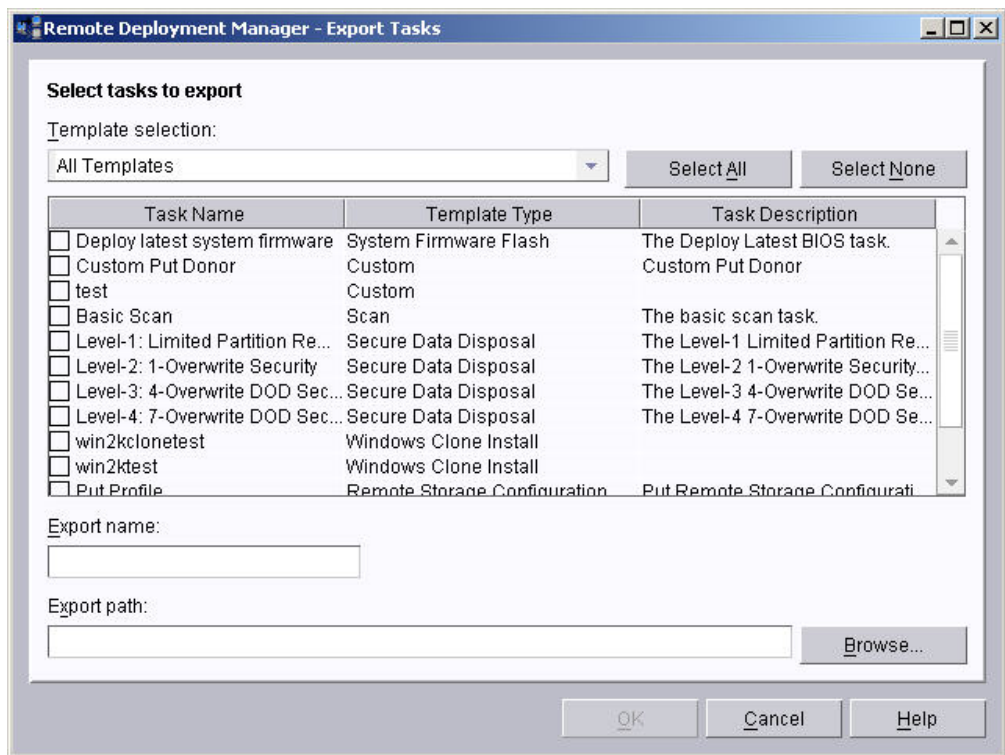


Figure 47. Export Tasks window

3. In the list of tasks, click the check box for each task that you want to export.

Notes:

- a. To display only the tasks that are associated with a specific template, in the **Template selection** list, select a template.
- b. To select all the tasks in the list of tasks, click **Select All**.
- c. To clear all the selected tasks in the list of tasks, click **Select None**.

4. In the **Export Name** field, type a descriptive name for the directory to which the exported files are to be saved. RDM uses the name that you type to create an export directory that contains the exported tasks and related files.
5. Select the base directory to which you want to export the files:
 - a. Click **Browse**. The Select Export Location window opens.

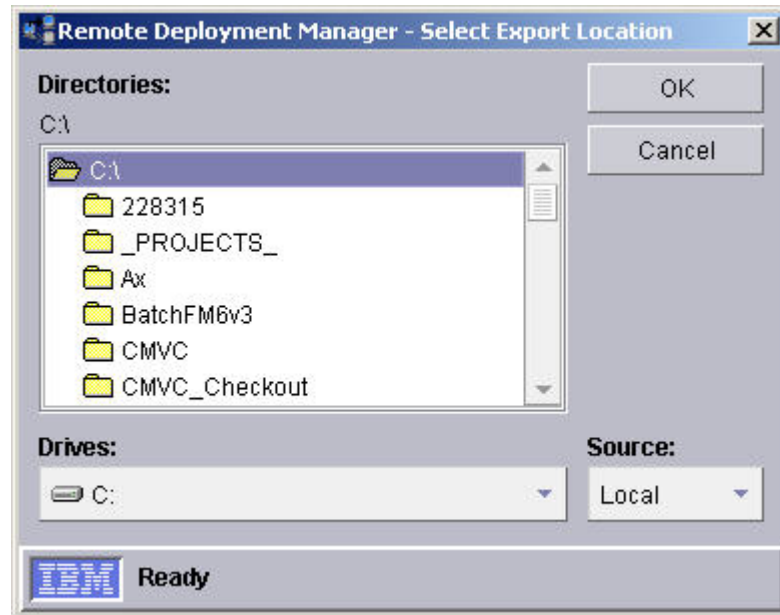


Figure 48. Select Export Location window

- b. In the **Source** field, select the system to which you want to export the files. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.
 - c. Navigate to the base directory where you want to save the export directory; then, click **OK**.

Note: In the base directory that you specify, RDM creates an RDM_Export directory in which it saves the export directory that you created in step 4.
6. Verify the export information; then click **OK**. The Export Task Progress window opens. When the task export process is completed a confirmation window opens.
7. Click **OK**.

Importing RDM tasks

You can use the **Import RDM Data** option to import into RDM an RDM task that has been exported to an export directory. When you import a task, the applicable resources that the task uses, such as parameters, images, and other tasks are also imported. For information about importing a task, see “Importing data” on page 75.

Importing and exporting RDM images

You can use RDM to import or export RDM an image from one instance of RDM Server to another. Importing and exporting an RDM image is useful when you have multiple RDM installations in different networks that require the same deployment image. Rather than recreate the image on each management server, you can create the image once, export it, and then import it to the instance of RDM Server on which you want to use it. You can then deploy the image from that instance of RDM Server to the applicable systems.

Exporting RDM images

You can use the **Export RDM Images** option to export specific RDM images to a directory. To create this directory, you must specify a base directory and an export name. RDM uses the information that you provide to create the following export directory:

base_directory\RDM_Export\export_directory

where:

- *base_directory* is the location that you specify in step 5 on page 73 as the base directory
- *export_directory* is the directory to which RDM saves the data and all the applicable resources when the image is exported. The date of the export (in the form of *yyyymmdd*) and the name that you enter in the **Export Name** field are concatenated to create the *export_directory* name.

Note: If you want to import the image, you must navigate to and select the *export_directory* that RDM created when the image was exported.

Complete the following steps to export an RDM image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Import/Export** → **Export RDM Images**. A warning window opens to indicate that no other RDM task should be run during the image export process.
2. Click **OK**. The Export Images window opens.
3. In the list of images, select the check box for each image that you want to export.

Notes:

- a. To show only the images that are associated with a specific template, in the **Template selection** list, select a template.
 - b. To select all the images in the list of images, click **Select All**.
 - c. To clear all the selected images in the list of images, click **Select None**.
4. In the **Export Name** field, type a descriptive name for the directory to which the exported files are to be saved. RDM uses the name that you type to create an export directory that contains the exported image.
 5. Complete the following steps to select the base directory that you want to export the files to:
 - a. Click **Browse**. The Select Export Location window opens.
 - b. In the **Source** field, select the system to which you want to export the files. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.

- c. Navigate to the base directory where you want to save the export directory; then, click **OK**.

Note: In the base directory that you specify, RDM creates an RDM_Export directory in which it saves the export directory that you created in step 4 on page 74.

6. Verify the export information; then click **OK**. The Export Image Progress window opens. When the image export is completed a confirmation window opens.
7. Click **OK**.

Importing RDM images

You can use the **Import RDM data** option to import into RDM an RDM image that has been exported to an export image file. For information about importing a task, see “Importing data.”

Importing data

You can use the **Import RDM Data** option to import the following two types of RDM data:

- Images
- Tasks

If you have a task or image file that has been exported from RDM, you can import them to an instance of RDM Server and deploy them to supported systems.

If you import a task or image to instance of RDM Server that already has a corresponding task or image with the same name, RDM automatically renames the imported task or image by appending a number to the end of the image or task name. If you import a task that contains a user-defined parameter and the imported parameter has the same name as an existing user-defined parameter, the data types must also be the same. The default value of the user-defined parameter that you import replaces the default value of the existing parameter in the task templates that use that parameter (this does not affect the value of the user-defined parameters with the same name that are used by existing tasks).

If you import a task that contains a user-defined parameter and the imported parameter has the same name as an existing user-defined parameter but the data types are different, the import process fails.

Complete the following steps to import data to RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Import/Export** → **Import RDM Data**.
2. Click **OK**. The Import Data window opens.

3. Complete the following steps to select the data directory that you want to import:
 - a. Click **Browse**. The Select Import Data Directory window opens.
 - b. In the **Source** field, select the system where the data that you want to import is located. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.
 - c. Navigate to the directory where the RDM export directory is saved; then, click **OK**.
4. Click **OK**.

Part 3. Running RDM tasks

Chapter 8. CMOS Update

You can use the CMOS Update template to create a CMOS Update task that remotely configures BIOS settings on one or more target systems. The settings that you can update might include:

- Assignments for devices and input/output (I/O) ports
- Power-on password
- Start options, including startup (boot) sequences
- Interrupt request (IRQ) settings

The BIOS settings of a computer are saved to the Complementary Metal Oxide Semiconductor (CMOS) chip. To create a CMOS Update image, you must first configure a donor system so that it has the applicable BIOS code (system firmware flash) and settings. You can capture the BIOS settings that are saved to the CMOS chip by using a CMOS configuration utility. On IBM systems, this utility is included on the BIOS update diskette that is used to update BIOS code on that system. The BIOS code on the BIOS update diskette must be at the same level as the BIOS code on the donor system. The utility saves the settings to a CMS file (a file with a .cms extension). You can then use RDM and the CMS file to create a CMOS Update image.

Finally, you can create a CMOS Update task that uses the CMOS Update image. The CMOS Update image can be used only with its corresponding System BIOS image, which has a specific BIOS version and level. The BIOS code on the target system must be at that same version and level.

Before you use the CMOS Update template to create a task, make sure that you have a BIOS update diskette, which also contains the CMOS configuration utility (typically, srcmosxx.exe or cmosutil.exe, where xx is a two-letter model-specific designation).

This chapter provides the procedures that you must complete in the following order to create and then run a CMOS Update task:

1. Prepare the donor system:
 - a. Update a donor system with the applicable BIOS code or make sure that the BIOS code for the donor system is at the same level as the code on the BIOS update diskette.
 - b. Configure the CMOS settings on the donor system as applicable.

For information about how to prepare a donor system to copy the CMOS settings, see “Preparing the donor system” on page 80.
2. Save the BIOS settings from the donor system to a CMS file. For information about how to save BIOS settings to a file, see “Saving the BIOS settings to a CMS file” on page 80.
3. Use the RDM Image Management option and the CMS file to create the CMOS Update image and save it to the repository.

Note: If you have not already saved the applicable System BIOS image to the RDM repository, you must use the RDM Image Management option to create a System BIOS image before you save the CMOS Update image to the repository.

For information about how to save CMOS settings to RDM, see “Creating a CMOS Update image” on page 81.

4. Create a CMOS Update task that uses the CMOS Update image. You must make sure that the applicable System BIOS image is already saved to the RDM repository. For information about how to create a CMOS Update task, see “Creating a CMOS Update task” on page 85.
5. Run the CMOS Update task against the applicable target systems. For information about how to run a CMOS Update task, see “Running a CMOS Update task” on page 89.

Preparing the donor system

Before you create a CMOS Update image, update the BIOS code on the donor system with the applicable system firmware or make sure that the BIOS code on the donor system is at the same level as the code on the BIOS update diskette. You also must create the System BIOS image so that it can be used in conjunction with the CMOS Update image that you want to create. For information about how to update the BIOS code on a donor system and how to create a System BIOS image, see “Creating a System Firmware Flash image in RDM” on page 216.

After you update or verify the BIOS code on the donor system, configure the applicable BIOS settings, such as power-on password and boot options.

The target systems to which you deploy a specific CMOS Update image must also have the corresponding BIOS code.

Saving the BIOS settings to a CMS file

After you update the BIOS code on the donor system and configure the BIOS settings as needed, you can use the applicable utility that is packaged with the BIOS update diskette to save the settings as a CMS file. The procedure in this section uses the `cmosutil.exe` utility. Some IBM BIOS update diskettes use a different CMOS utility or a different command-line syntax. Use the flash utility that comes with your BIOS code. For information about the utility, see the applicable readme file on the BIOS update diskette.

You cannot create a CMS file from Windows or Linux. You must capture the settings from DOS.

Complete the following steps to save the BIOS settings to a CMS file:

1. Copy the `cmosutil.exe` file onto a DOS-startable (bootable) diskette.
2. If necessary, power off the donor system.
3. Insert the DOS-startable (bootable) diskette into the diskette drive of the donor system.
4. Start the donor system.
5. At the DOS prompt, type the applicable command to save the CMS file. To which command to use with the utility, see the readme file that comes with the utility that you use. For example, this version of the `cmosutil.exe` utility uses the following command:

```
cmosutil /s filename.cms
```

where *filename* is the name of the CMS file to which you want the settings to be saved.

Creating a CMOS Update image

You can use the CMS file that you created and the Image Management option to create a CMOS Update image. A CMOS Update image is a group of settings that are associated with a specific system machine type and BIOS code level.

Note: Before you can create a CMOS Update image, you must create the corresponding System BIOS image. For information about how to create a System BIOS image, see “Creating a System Firmware Flash image in RDM” on page 216.

Complete the following steps to save a CMS file to the RDM repository as a CMOS Update image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

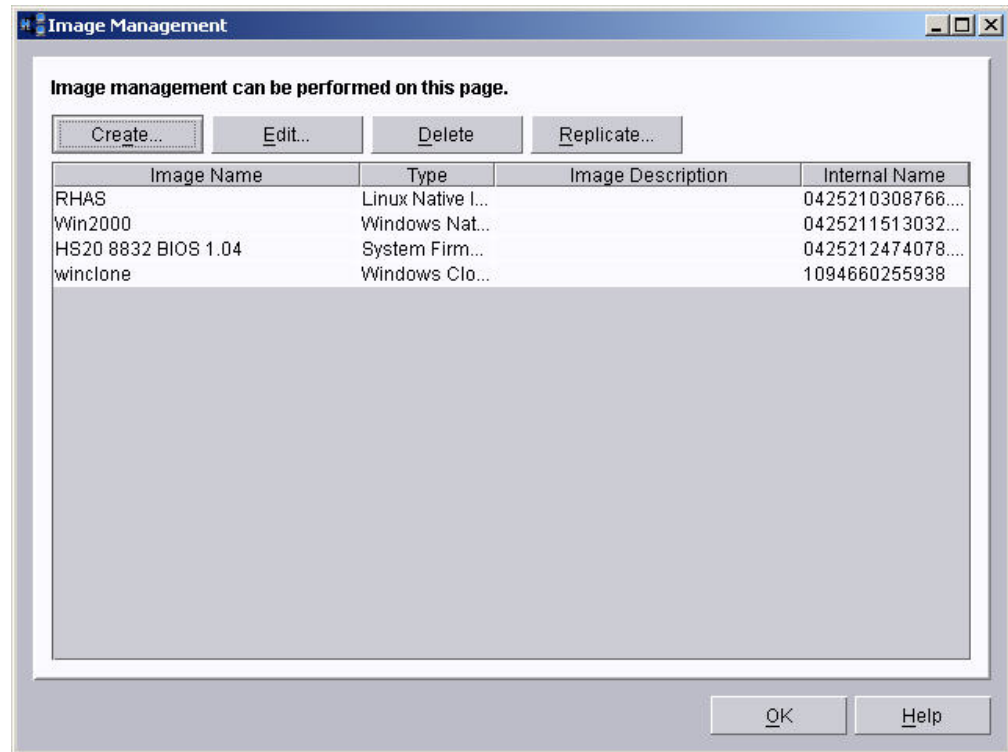


Figure 49. Image Management window

2. Click **Create**. The Create Image window opens.

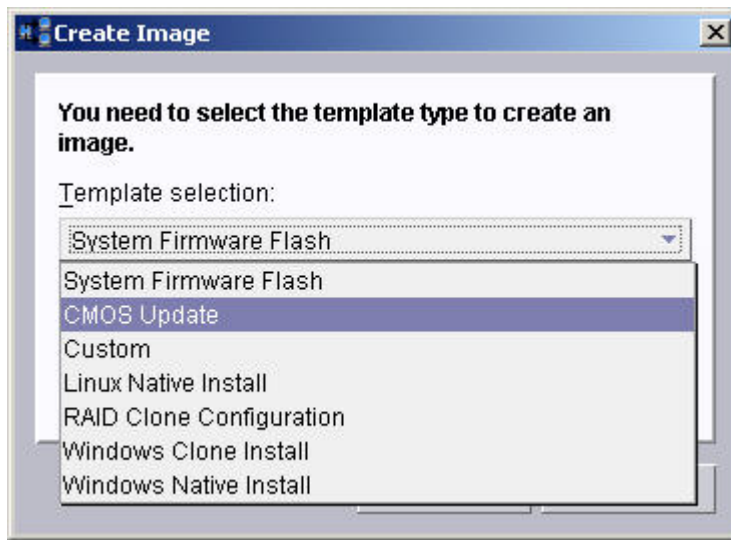


Figure 50. Create Image window

3. In the **Template selection** field, select **CMOS Update**; then, click **OK**. The Create CMOS Update Image window opens and the General page is displayed.

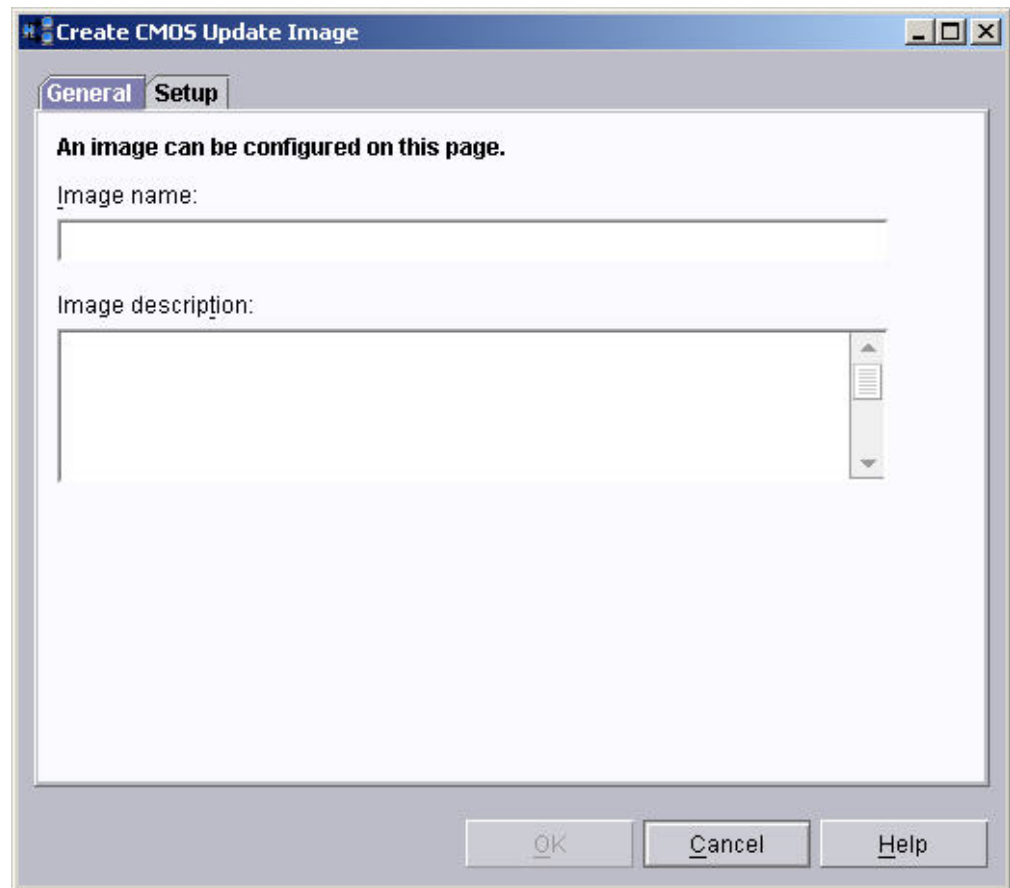


Figure 51. Create CMOS Update Image window: General page

4. In the **Image name** field, type a name for the CMOS Update image. Later, when you create a task, the name that you type in this field will be displayed in the list of images that you can select to add to the task.
5. (Optional) In the **Image description** field, type a brief description for the CMOS Update image.

6. Click **Setup**. The Setup page is displayed.

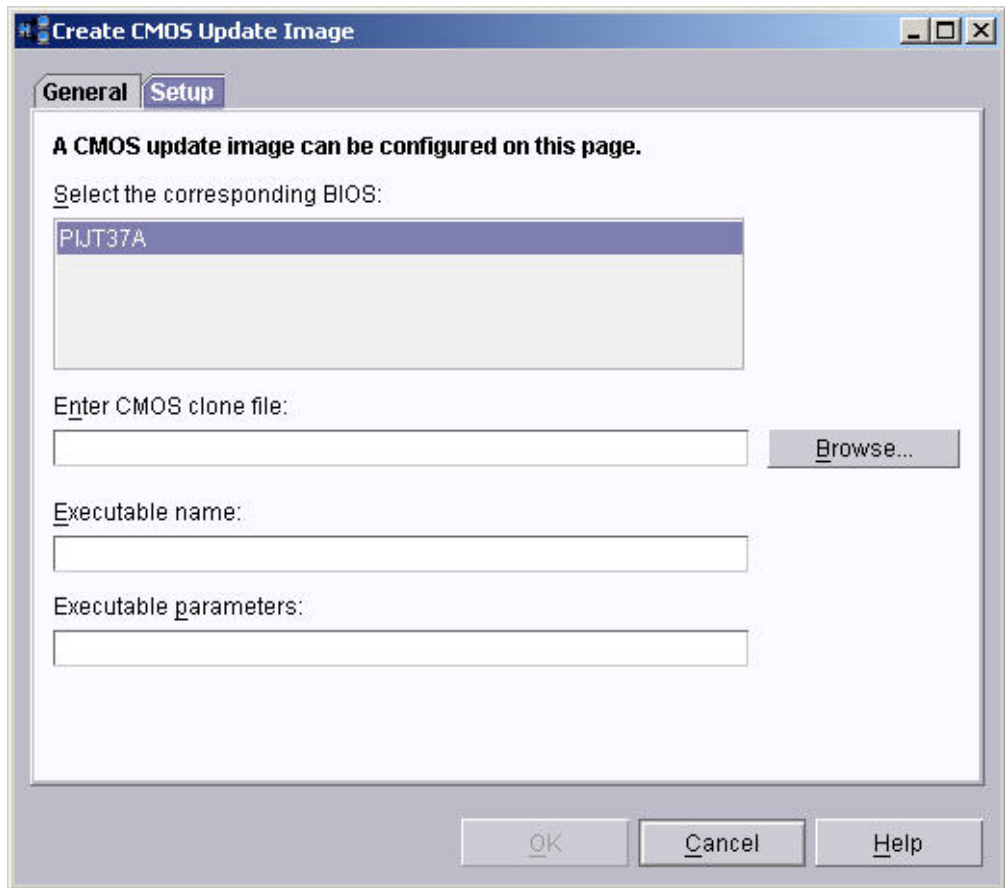


Figure 52. Create CMOS Update Image window: Setup page

7. In the **Select the corresponding BIOS** field, select the applicable System BIOS image that corresponds to this CMOS Update image.

Note: You must select the System BIOS image that corresponds to the BIOS configuration settings that are saved in the CMOS Update image. If you select the wrong System BIOS image, the CMOS Update task that you create might fail when you run it.

8. Complete the following steps to select the file:
 - a. Click **Browse**. The “Locate the CMOS donor file” window opens.

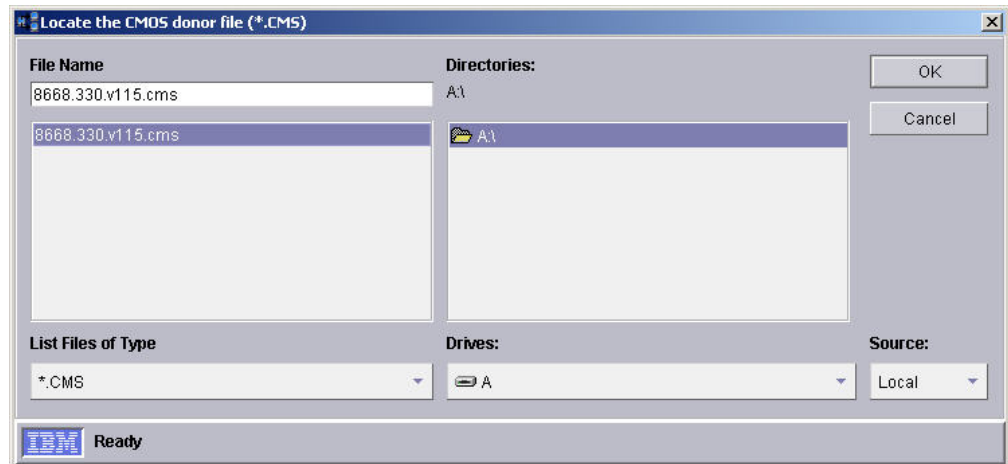


Figure 53. “Locate the CMOS donor file” window

- b. In the **Source** field, select the system where the source file is located. You can choose between the local system or the management server.

Note: If the local system is the management server, **Local** specifies the files that your operating-system account is authorized to access, and **Server** specifies the files that the IBM Director Server service can access.
 - c. If the CMS file is on a diskette, insert it into the diskette drive.
 - d. Navigate to the CMS file, and select it.
 - e. Click **OK**.
 9. Click **OK**. The Task Image Creation Progress window opens. The CMOS Update image is saved to the RDM repository.
 10. Click **OK**.

Creating a CMOS Update task

To apply a CMOS Update image to a target system, you must create a CMOS Update task that contains the CMOS Update image that you want to deploy. When creating the CMOS Update task, you can select an existing CMOS Update image to use, or you can create a new one.

You can associate multiple CMOS Update images with a single task. When you run the task, the applicable CMOS Update image is applied to each system according to the BIOS code level on that system.

Complete the following steps to create a CMOS Update task:

1. Right-click **CMOS Update** and click **Create new task**. The CMOS Update window opens.

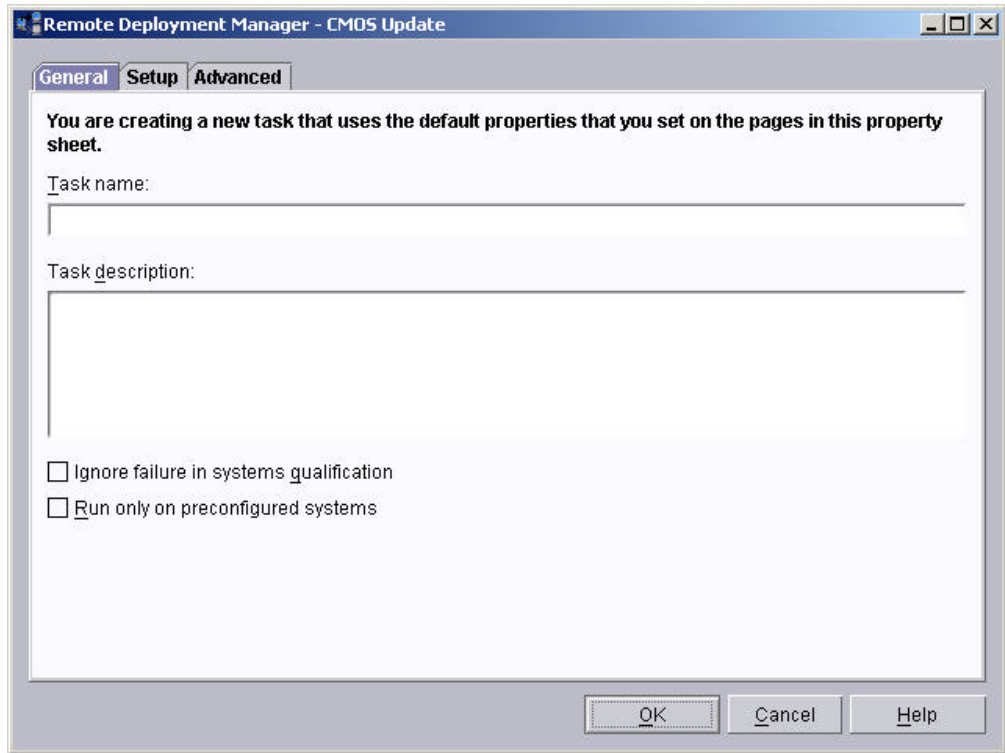


Figure 54. CMOS Update window: General page

2. In the **Task name** field, type a name for the task.
3. (Optional) In the **Task description** field, type a brief description of the task.

4. Click the **Setup** tab. The Setup page is displayed.

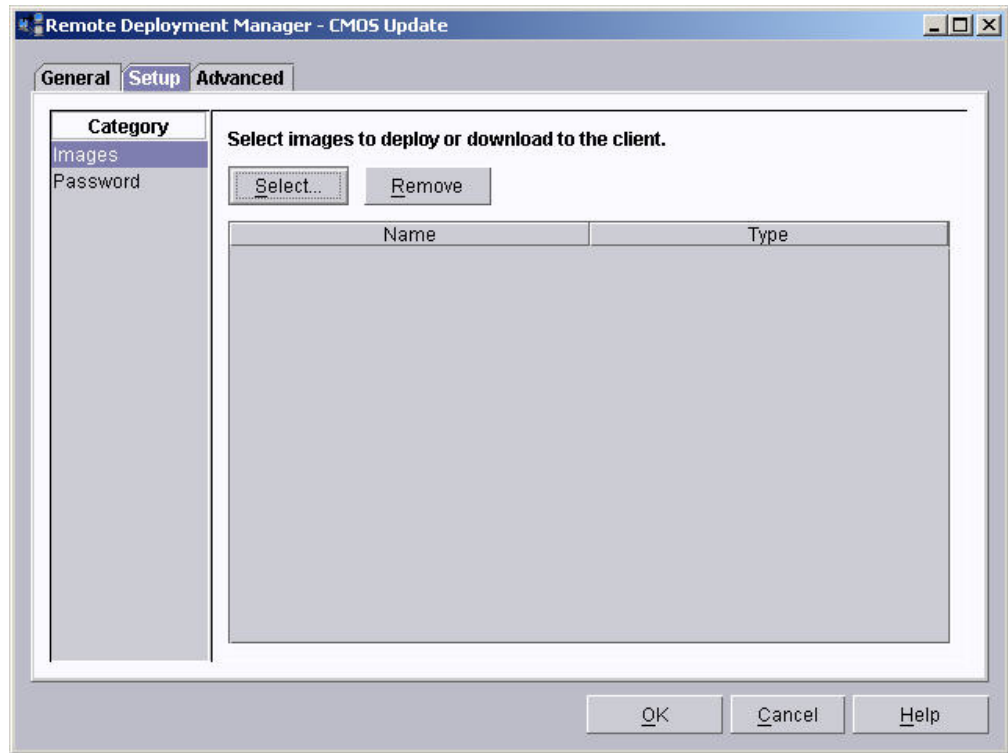


Figure 55. CMOS Update window: Setup page

5. In the Category pane, select **Images**; then, click **Select**. The Image Selection window displays the CMOS Update images that have been imported to the RDM repository.

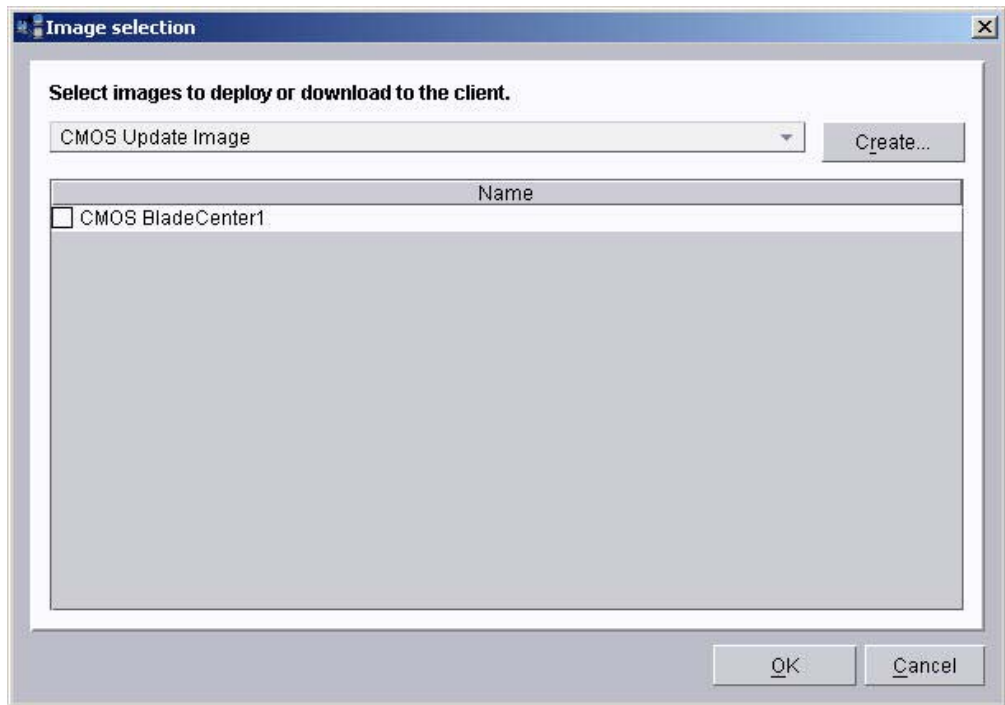


Figure 56. Image Selection window

6. From the **Name** list, select each image that you want to use; then, click **OK**. The Setup page displays the CMOS Update images that you associate with the task.

Note: If you have not already used RDM Image Management to create a CMOS Update image and associate it with a System BIOS image, you can click **Create** to create the image.

7. Complete the following steps if a password is required to access the CMOS settings on the target system:
 - a. In the Category pane, select **Password**. The password options are displayed.

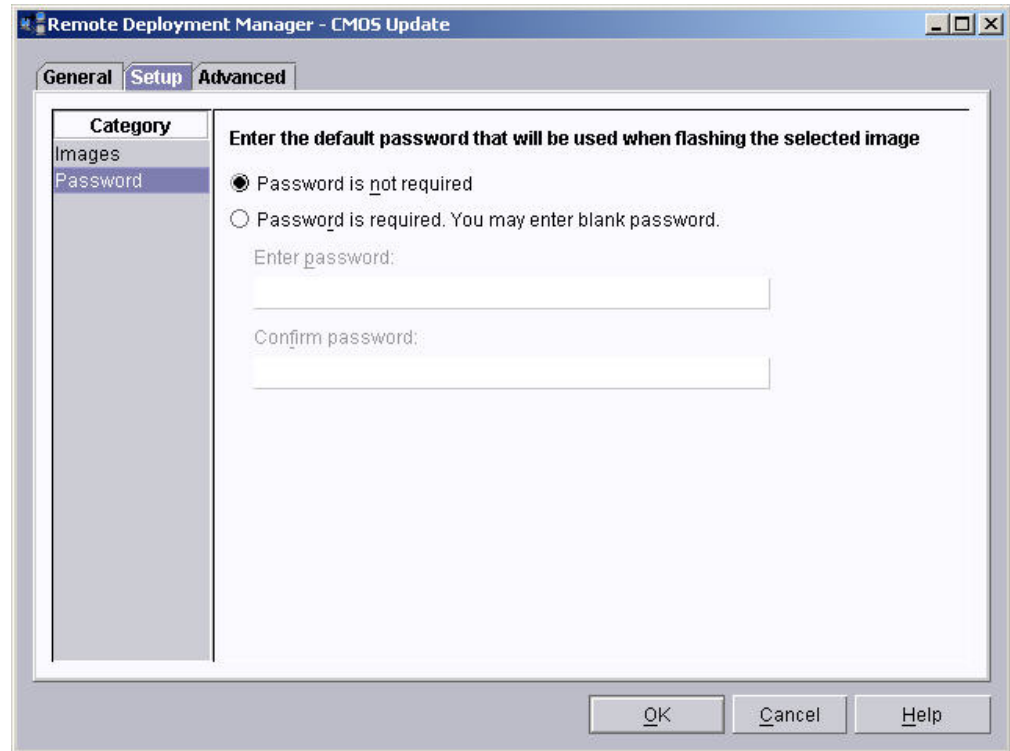


Figure 57. CMOS Update window: Setup page: Password category

- b. Select **Password is required**.
 - c. In the **Enter Password** field, type the password that is required to access the target system CMOS settings.
 - d. In the **Confirm Password** field, retype the required password.
8. Click **OK** to create the task. The task is displayed in the Tasks pane under **CMOS Update**.

Running a CMOS Update task

After you create a CMOS Update task, you can use RDM to run the task on the target systems that you specify.

Complete the following steps to run a CMOS Update task:

1. From IBM Director Console, expand the **Remote Deployment Manager** task tree. The RDM tasks are displayed.
2. Expand the **CMOS Update** task tree.
3. Drag the CMOS Update task that you want to use to the target system or group that you want to update; then, select **Run systems**. The CMOS Update window opens.
4. To run the task immediately, click **Execute Now**.
5. To schedule the task to run in the future, click **Schedule**; then, complete the applicable fields in the Schedule window.

If a CMOS Update task fails, an error code is displayed on the monitor of the target system during the startup process.

Note: You might have to press F8 during the startup process on the target system to step through each command that is being processed and to make note of where the CMOS update fails.

Complete the following steps to display the error codes and their descriptions:

1. Start the system from a DOS diskette that contains the utility program that you used to create the CMS file.
2. At a command prompt, type the applicable command:

```
A:\CMOSUTIL /?
```

or

```
A:\SRCMOSxx /?
```

where *xx* is a two-letter model-specific designation.

The error codes and their descriptions are displayed.

Using the lccmos.bat file

During a remote update of the CMOS settings, RDM runs one of the following programs, `lccmos.bat`, `cmosutil.exe`, or `srcmosxx.exe`, depending on the BIOS image. Here is an example of the command RDM runs:

```
CALL LCCMOS.BAT %CMOSFILE%
CALL CMOSUTIL.EXE %CMOSFILE% /UPDATE /NOREBOOT /QUIET
CALL SRCMOSNV.EXE %CMOSFILE% /UPDATE /NOREBOOT /QUIET
```

If you understand the process of updating BIOS settings, you might create or modify an `lccmos.bat` file to customize this process. See the `readme` file on the BIOS update diskette for more information.

The utility programs for different IBM systems might require different command-line syntax. For example, to perform a CMOS update on an xSeries 330 server, you must create an `lccmos.bat` file. The default RDM file cannot be used because the required syntax is different. For example:

```
REM LCCMOS.BAT file created by the customer for xSeries 330
REM to override the default syntax for CMOSUTIL.EXE.
cmosutil.exe /R %1
```

Any system whose `cmosutil` program uses `-s` and `-r` to save and restore, rather than `/s` and `/r`, requires an `lccmos.bat` file. Make a note of what syntax each system uses when you create the CMS file initially. Use one of the following commands in your batch file:

```
cmosutil.exe -r filename.cms
cmosutil.exe -r %1
```

Chapter 9. Custom

The Custom task template is a general-purpose template that you can use to create additional tasks that are not installed with RDM. You can use the Custom task template to create a task that performs the RDM commands that you define.

Creating a Custom task

Complete the following steps to create a Custom task:

1. Right-click **Custom**. The Custom menu is displayed.
2. Click **Create new task** on the Custom menu. The Custom window opens and the General page is displayed.

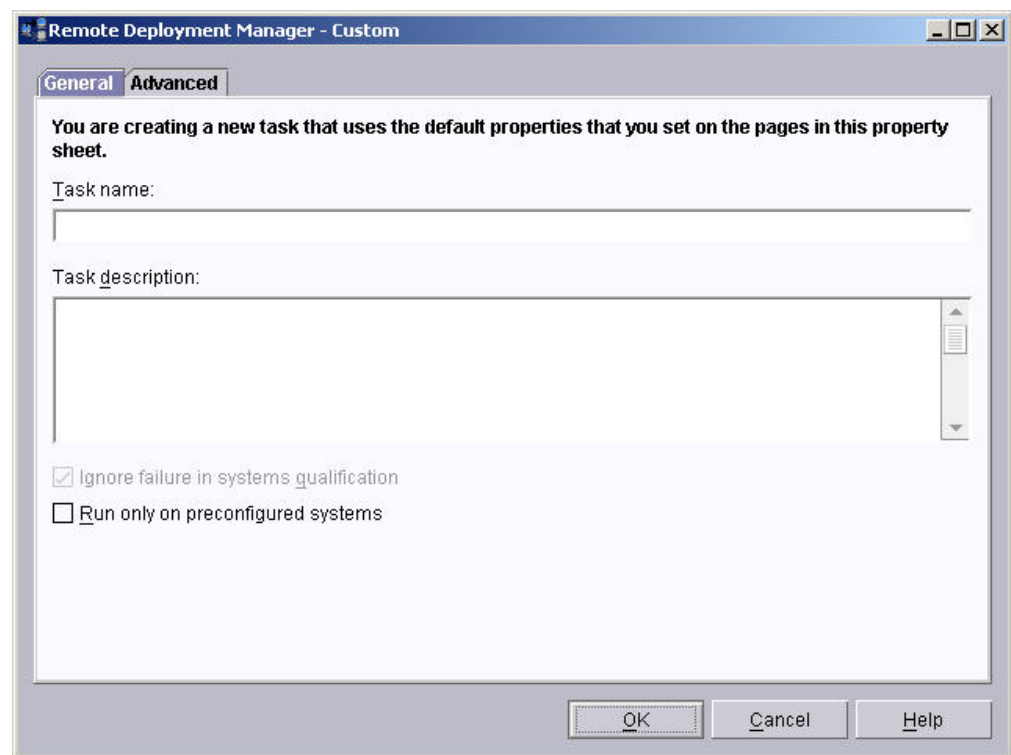


Figure 58. Custom window: General page

3. Complete the following steps to provide the basic information for the task:
 - a. In the **Task** name field, type a descriptive name to identify the task.
 - b. In the **Task description** field, type a brief description of the task.

Note: System qualification is always disabled for Custom tasks.

- c. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that have been pre-configured for use with the task using the System/Task Configuration window. For information, see Chapter 6, "Configuring systems and tasks," on page 59.

4. Click the **Advanced** tab. The available information categories are displayed in the left pane:
 - Command list
 - User parameters
 - Task folder

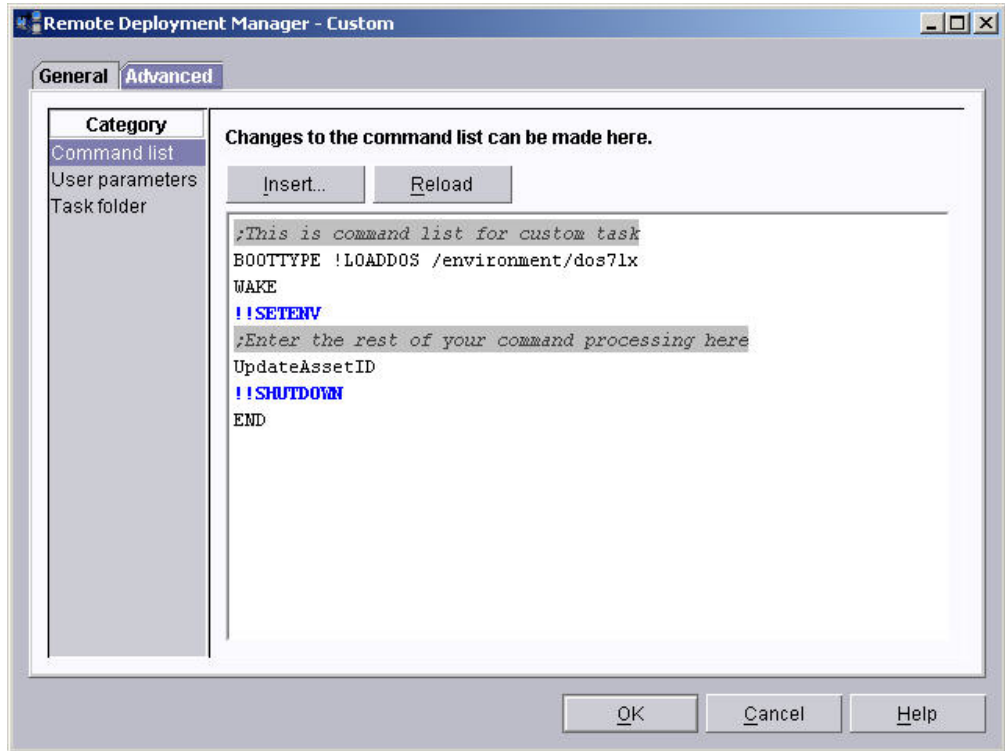


Figure 59. Custom window: Advanced page

5. In the left pane, click **Command list**; then, add any commands needed for the task. The command list is a list of RDM, DOS, and Linux commands that you can add to a task which will invoke them when the task is run.

Notes:

- a. RDM does not check the syntax or verify the commands that you add to the Command list.
- b. To restore the command list to its original state, click **Reload**.

Refer to Chapter 24, “Command-list commands,” on page 275 for information on commands and syntax within a command list.

6. Select and include an image. For information, see “Advanced properties - Command list” on page 19.
7. Add a parameter to the User parameter list. For information, see “Advanced properties - User parameters” on page 22.
8. Click **OK**. The task is displayed in the IBM Director Tasks pane under the Custom task template.

Creating a Custom task to deploy a donor image

Complete the following steps to create a custom task to deploy a donor image to a target system:

1. Capture a donor image from a system using the Donor Image task. For information, see Chapter 10, “Donor Image (Get Donor),” on page 99.
2. Right-click **Custom**. The Custom menu is displayed.
3. Click **Create new task** on the Custom menu. The Custom window opens and the General page is displayed.

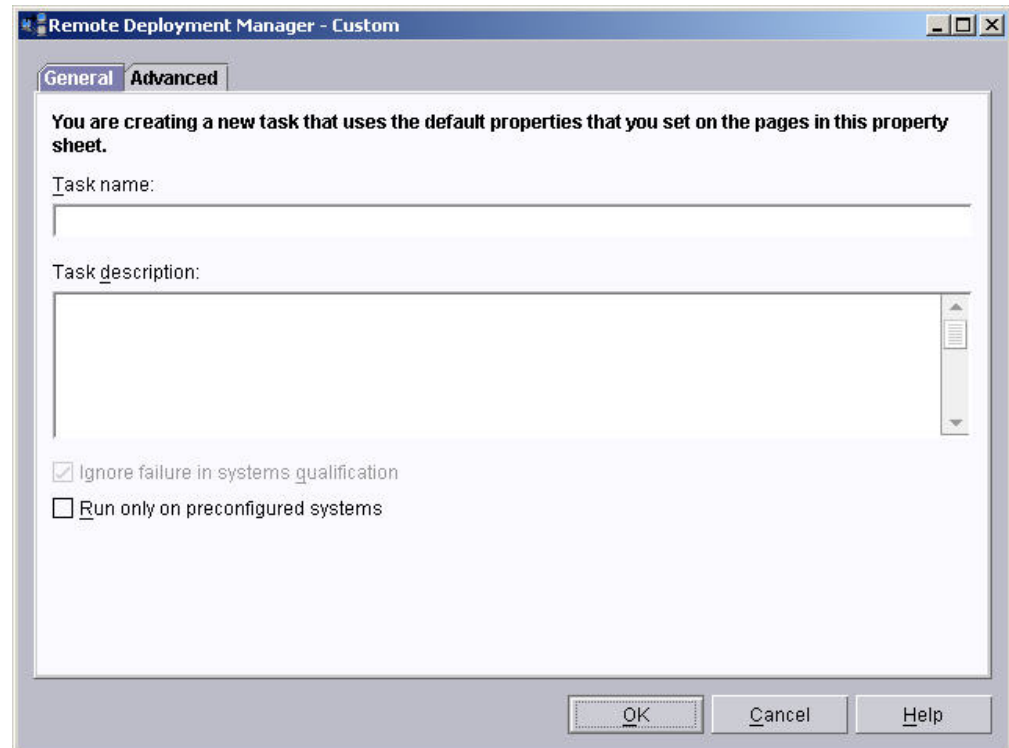


Figure 60. Custom window: General page

4. In the **Task** name field, type “Custom Put Donor” to identify the task.

- Click the **Advanced** tab. The available information categories are displayed in the left pane: Command list, User parameters, and Task folder.

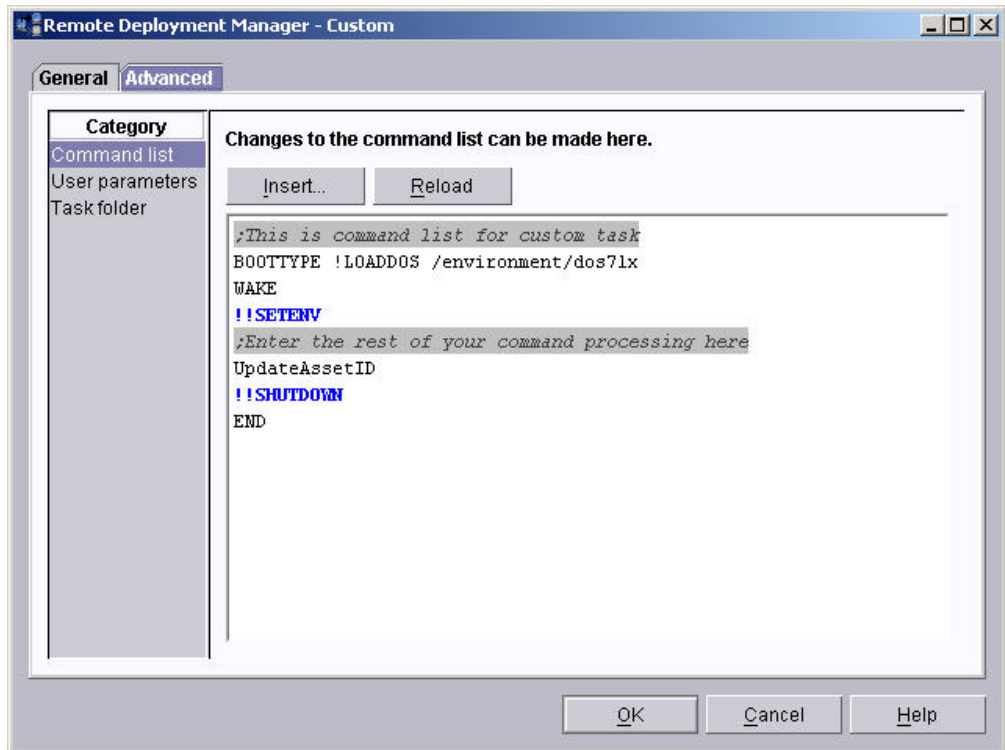


Figure 61. Custom window: Advanced page

- In the left pane, click **Command list**; then, edit the command list so that it displays as follows:

```

;This is the command list for the Custom Put Donor task
BOOTTYPE !LOADDOS /environment/dos71c
WAKE
!!SETENV
;Enter the rest of your command processing here
TIMEOUT 240
!deploy\deploy.bat
UpdateAssetID
!!SHUTDOWN
END

```

Refer to Chapter 24, “Command-list commands,” on page 275 for information on commands and syntax within a command list.

- Add a parameter to the User Parameters list:
 - In the left pane click **User parameters**; then, click **Select**. The User Parameters window opens.
 - Click **Create**. The Create User Parameter window opens.
 - In the **Name** field, type the name “CloneFolder” to identify the parameter.
 - In the **Default Value** field, leave the field blank.
 - Click the **Display in STC** check box.
 - Click **OK**. The User Parameters window displays the new user parameter.
 - Select the check box in the Name column for this parameter.

8. Add a second parameter to the User Parameters list:
 - a. Click **Create**. The Create User Parameter window opens.
 - b. In the **Name** field, type the name "CloneFileName" to identify the parameter.
 - c. From the **Data type** list, select the "String" data type for the parameter.
 - d. In the **Default Value** field, type the default value "clone.pqi" for the parameter.
 - e. Click the **Display in STC** check box.
 - f. Click **OK**. The User Parameters window displays the new user parameter.
 - g. Select the check box in the Name column for this parameter.
 - h. Click **OK**.
9. Click **OK** to create the new task. The task is displayed in the IBM Director Tasks pane under the Custom task template.

The task can be used to deploy any captured image. You must configure the task before use. Complete the following steps to configure the task for use with a target system:

1. Drag the task to the system; and then, select the **Configure systems** command.
2. Click the **User Parameters** tab.
3. In the CloneFolder column, type the internal image name of the clone folder.
4. (Optional) Select the **Execute this task after pressing the OK button** check box.
5. Click **OK**.

Creating a Custom task to capture BIOS settings (CMOS configuration)

You can create a Custom task that saves the BIOS settings from a target system as a CMS file. The file is saved to a directory on the management server. You can then use the CMS file to create a CMOS Update image in RDM.

Before you create this task, consider the following information:

- Make sure that you already created the applicable System BIOS image that will be used with the BIOS settings that you capture. For information about creating a System BIOS image, see Chapter 19, "System Firmware Flash," on page 215
- Make note of the internal image name of the System BIOS image. This image name will be used in this procedure.
- Make note of the CMOS configuration utility that was provided with the BIOS update diskette that you used to create the System BIOS image for your target system. Also make note of the parameters that are used by the utility to capture the BIOS settings. On many IBM systems, the utility is named `cmosutil.exe` and it uses the following syntax to capture the BIOS settings: `cmosutil /s capturefile`

Complete the following steps to create a Custom task to capture the BIOS settings that are saved to a target system:

1. Right-click **Custom**. The Custom menu is displayed.
2. Click **Create new task**. The Custom window opens and the General page is displayed.
3. In the **Task** name field, type
Get CMOS Settings

4. Click the **Advanced** tab. The available information categories are displayed in the left pane: Command list, User parameters, and Task folder.
5. In the left pane, click **Command list**; then, edit the command list so that it displays as follows:

```

;This is command list for custom task
BOOTTYPE !LOADDOS /environment/dos71x
WAKE
!!SETENV
;Enter the rest of your command processing here
!%RAMDSK%
!mtftp get %%SERVER_IP%%
template\%%TASKTEMPLATEID%\%%TASKTOID%\cmoscapt.bat
cmoscapt.bat!cmoscapt.bat
UpdateAssetID
!!SHUTDOWN
END

```

Note: The syntax lines that begin with !mtftp and template\ must be typed as one continuous line, with no line breaks.

For information on commands and syntax that can be used within a command list, see Chapter 24, “Command-list commands,” on page 275.

6. Create the BiosImage parameter:
 - a. In the left pane click **User parameters**; then, click **Select**. The User Parameters window opens.
 - b. Click **Create**. The Create User Parameter window opens.
 - c. In the **Name** field, type
BiosImage
 - d. In the **Data type** field, select **String**.
 - e. Leave the **Default Value** field blank.
 - f. Select the **Display in STC** check box.
 - g. Click **OK**. The User Parameters window displays the new BiosImage user parameter.
 - h. Select the **BiosImage** check box in the Name column.
7. Create the CMOSImageFile parameter:
 - a. Click **Create**. The Create User Parameter window opens.
 - b. In the **Name** field, type
CMOSImageFile
 - c. In the **Data type** field, select **String**.
 - d. Leave the **Default Value** field blank.
 - e. Click the **Display in STC** check box.
 - f. Click **OK**. The User Parameters window displays the new CMOSImageFile user parameter.
 - g. Select the **CMOSImageFile** check box in the Name column.
8. Click **OK**. The User parameters list displays the two new parameters.
9. Click **OK** to save the task.

10. Make a note of the task folder name and location for the new task:
 - a. After creating the new Get CMOS Settings task, right-click on the task, and select **Edit Task**.
 - b. Click the **Advanced** tab.
 - c. In the left-pane, click **Task folder**.
 - d. In the right pane, make a note of the location of the task folder.
 - e. Click **Cancel** to close the task.
11. Create the supporting DOS batch file.

Note: The Get CMOS Settings task has been created; however you must provide a supporting DOS batch file to enable the task to work.

- a. Open an ASCII text editor.
- b. Type the following text, making sure to modify the CMOSUTIL line as applicable to reflect the CMOS capture utility that you are using:

```
@ECHO OFF
ECHO *****
ECHO * Remote Deployment Manager
ECHO * (C) Copyright IBM Corp. 2003 All rights reserved.
ECHO *****
ECHO * Batch file for CMOS Capture task.
ECHO *****
SET RDRASLEVEL=0
SET RDSTATUS=RDCMOS000I
REM Change directory to RAMDISK
%RAMDISK%
RDAGENT /L "Getting BIOS Image %BiosImage%"
MTFTP get %SERVER_IP% image\%BiosImage% bios.zip
if errorlevel 1 goto MTFTPERR
unzip -C bios.zip
del bios.zip
RDAGENT /L "Capturing %CMOSImageFile%"
REM Modify the line below for the appropriate capture utility
CMOSUTIL /s %CMOSImageFile%
IF errorlevel 0 goto CAPTURED
SET RDSTATUS=RDCMOS001E
RDAGENT /L "Capture failed"
GOTO END
:CAPTURED
RDAGENT /L "%CMOSImageFile% Captured"
Echo "Attempting File Transfer"
MTFTP put %SERVER_IP% %CMOSImageFile% %CMOSImageFile%
IF errorlevel 1 goto MTFTPERR
RDAGENT /L "%CMOSImageFile% Transferred to DServer"
GOTO CMOSDONE
:MTFTPERR
call mftfprc.bat
echo "MTFTP Error"
a:
goto END
:CMOSDONE
a:
echo "CMOS Capture complete."
SET RDSTATUS=RDCMOS000I
:END
```

- c. Save the file as cmoscapt.bat in the CMOS capture task folder.

12. This task can be used to capture the BIOS settings from multiple target systems. Before you run the task on a target system, you must configure the task for that system. Complete the following steps to configure a target system to use the Get CMOS Settings task:
 - a. Drag the **Get CMOS Settings** task to the target system; and then, select the **Configure systems**.
 - b. Click the **User Parameters** tab.
 - c. In the **BiosImage** field, type the internal image name from RDM of the System BIOS image for that target system.
 - d. In the **CMOSImageFile** field, type the name to be used for the CMS file. This file will be created under DOS. The name that you type must use the DOS 8.3 file naming conventions.
 - e. (Optional) Select the **Execute this task after pressing the OK button** check box.
 - f. Click **OK**.

When you run the task, the CMS files are saved in the *rdm_installation/temp* directory where *rdm_installation* is the directory in which RDM has been installed.

You can use the CMS files to create CMOS Update images.

Chapter 10. Donor Image (Get Donor)

The Donor Image template provides access to the Get Donor task. The Donor Image template and the Get Donor task cannot be modified.

You can use the Get Donor task to create an exact copy of the first active partition on the first disk drive of a managed system running Windows. The system that you copy the image from is called the *donor system*, and the content of the partition that you copy is called the *donor image*. Typically, before you run the Get Donor task, you use the Microsoft System Preparation utility (Sysprep) to prepare the donor system. After the target system has been prepared, you can run the Get Donor task. The Get Donor task uses a Symantec utility to create the donor image and save it to the RDM repository as a PQI file. You can apply the donor image to one or more target systems that use the same Hardware Abstraction Layer (HAL). The best results are achieved when the hardware configuration of the donor system matches that of the target system. If you have systems that differ greatly in configuration, manufacturer, or model, create a separate image for each system type.

The Symantec utility that is provided with RDM is a simplified version of Symantec ImageCenter that you can use to copy only the first active partition from a managed system. To create an image that includes multiple disk partitions, you must install the retail version of Symantec ImageCenter and configure the applicable settings in RDM. For information about creating donor images that include multiple partitions, see “Upgrading to DeployCenter version 5.5” on page 107.

If you already have a PQI file that you want to use as a donor image, you can use the Image Management option and that file to create the donor image. If your version of RDM uses the simplified version of Symantec ImageCenter, the PQI file that you use must be saved by using low compression and include only a single partition. If your version of RDM uses the retail version of Symantec ImageCenter, the PQI file can include multiple partitions. For information about creating a donor image by using the Image Management option and a PQI file, see “Using the Image Management option and a PQI file” on page 105.

This chapter provides the procedures that you typically complete in the following order to create a donor image:

1. Prepare the donor system.
2. Create a donor image.

After you save a donor image to the RDM repository, you can use the Windows Clone Install task to deploy the donor image to target systems. For information about the Windows Clone Install task, see Chapter 21, “Windows Clone Install,” on page 233.

Note: This section provides the minimal steps that are required to create a donor image. For information about cloning procedures, see Appendix A, “Additional cloning procedures using Sysprep,” on page 337.

Preparing the donor system

Complete the following steps to prepare the donor system:

1. Install the Windows operating system.
2. Install and configure the applications.
3. Run the Sysprep utility on the donor system to prepare the hard disk drive to be copied.

These steps are used to prepare the Windows operating system to be cloned. Typically, Windows cloning is used to clone applications that require no configuration or for applications that can be configured using RDM. Some applications, however, cannot be effectively cloned using RDM because they require complex configurations or because after they are configured, their configurations cannot be changed.

For information about additional donor preparations that might be required for your system, see the Appendix A, “Additional cloning procedures using Sysprep,” on page 337.

Installing and configuring applications

The Get Donor task creates an image that includes the entire contents of the first active partition of the disk drive of the donor system. To avoid having to install common applications on each deployment system later, install the most common applications and configure them.

Complete the following steps to install and configure the applications on a donor system:

1. Log on to the donor system by using the administrator account.
2. Install and configure the applications as necessary.

Note: If you want the target systems to use a Power Restore partition, set up the donor system with a Power Restore partition to ensure that the boot partition will not be too large when it is deployed.

Running Sysprep

Before performing any of the steps in this documentation, read the *Microsoft Windows Corporate Deployment Tools User's Guide*. The Sysprep utility configures the registry of the target system to run the Windows Mini-Setup wizard the first time that the system is started.

RDM currently supports Sysprep versions 1 and 2. Both versions of Sysprep provide the following features:

- Makes sure that unique SIDs are generated when the donor image is distributed to a target system.
- Makes sure that the Windows Mini-Setup wizard runs the first time that the target system is started. The Mini-Setup wizard is a subset of the Windows Setup process; it provides prompts for user-specific information, configures operating-system settings, and detects new hardware. You can automate the Mini-Setup wizard by including an answer file (sysprep.inf) in the directory where the Sysprep utilities are located.

If you use Sysprep version 2 or later, you also can use the following new features:

Mass storage support

To add support for multiple mass storage devices, Sysprep must pre-process the sysprep.inf file, and the file must contain a [SysprepMassStorage] section. The -bmsd parameter populates the [SysprepMassStorage] section in the sysprep.inf file so that it can be pre-processed the next time Sysprep is run. You also can add the BuildMassStorageSection = Yes string to the [Sysprep] section of the sysprep.inf file to automatically build the mass storage section when you run Sysprep. The sysprep.inf file must be in same directory as the sysprep.exe program when it is run.

Note: The version of Sysprep that comes with Windows® XP does not support the -bmsd parameter. You can, however, run the version of Sysprep that comes with Windows Server 2003 on a Windows XP installation and use the -bmsd parameter.

Factory mode

The -factory parameter prepares a donor system that will start in a network-enabled state *before* the Windows Mini-Setup wizard runs. This enables you to update device drivers, run Plug and Play enumeration, install applications, or make configuration changes before the target system is delivered to the user. The winbom.ini file is the answer file for the Factory mode.

Reseal support

The -reseal parameter clears the Event Viewer logs and prepares the target system for delivery to the user. You must use the -reseal parameter after you perform tasks in Factory mode.

Clean The -clean parameter removes unused mass storage device drivers and phantom Plug and Play device drivers from the Windows registry and device manager.

Sysprep Version 2.0 is supported on Windows XP and Windows Server 2003 only. If the donor system is running Windows 2000, you must use Sysprep Version 1. Sysprep Version 1 does not support Factory mode or mass storage. Sysprep Version 1.1 supports mass storage, but it does not support the -bmsd parameter or the [BuildMassStorageSection] section in the sysprep.inf file.

Complete the following steps to run the Sysprep utility on the donor system:

1. Make sure you have the following two utilities: sysprep.exe and setupcl.exe utilities. They are available on the Windows 2000, Windows 2003, and Windows XP operating system CDs (in the support\deployment\deploy.cab directory), or you can download updated versions from <http://www.microsoft.com>.
2. Make sure that the donor system is part of a workgroup. If the donor system is joined to a domain, Sysprep removes it from the domain.
3. Make sure that the password that is set up for the default administrator is blank.
4. Create a directory for the Microsoft utilities; for example, type
`d:\winnt\support\deployment`
where *d* is the drive letter of the disk drive.

Note: If you want to use Factory mode, you must copy the factory.exe program to this directory. Also, if you want to support multiple mass

storage devices, the sysprep.inf file in this directory must contain a [SysprepMassStorage] section that is populated with the applicable information.

5. Copy the sysprep.exe and setupcl.exe utilities to the new directory on the donor system.
6. Close all windows on the donor system.
7. Click **Start** → **Run**; then, in the **Open** field, type cmd to open a Command Prompt window.

8. Run sysprep. For example, type

```
d:\winnt\support\deployment\sysprep
```

where *d* is the drive letter of the disk drive.

The Sysprep utility prepares the donor system for imaging and removes system settings to prevent conflicts when you deploy the image. A message window opens.

9. Click **OK** to continue.

Note: Depending on the version of Sysprep that you use, the GUI that is displayed might be different. Make sure that the **MiniSetup** check box is selected. Also, if applicable, select whether to run in Factory or Reseal mode.

10. For Microsoft Windows XP Professional, a new window opens. Select **MiniSetup** and make sure that **Shutdown** is selected; click **OK** for Sysprep to be completed. After Sysprep is completed, the donor system is shut down.

After Sysprep is run on most mobile computers, the computer does not shut down automatically. You can manually shut down the computer without any errors when the blue screen with the mouse pointer appears after a few minutes.

The Mini-Setup option that is used with Sysprep for Windows XP Professional has limitations on its definition of new users. A clone installation of Windows XP Professional which uses the new login screen will not display the RDM-assigned user. Press Ctrl+Alt+Del twice in rapid succession to display the classic login screen.

After you prepare the donor system, you can use the Get Donor task to create a Windows Clone Install image (PQI file) of that system and save it to the RDM repository.

Creating a donor image

You can create a donor image by using the Get Donor task or you can use the Image Management option and a PQI file.

Using the Get Donor task

After you prepare the donor system, you can use RDM to configure the Get Donor task to capture the image from that system. Then, you can use RDM to create donor image and save it to the repository. The Get Donor task uses a Symantec utility (PQIDplyZ.exe) to create the donor image and save it to the RDM repository as a PQI file. The resulting image can be several gigabytes in size.

The Symantec utility can obtain an image only from an Ethernet-connected donor system. Systems in a Token Ring network cannot be used to obtain a donor image.

Complete the following steps to create a donor image:

1. In the Tasks pane, expand **Remote Deployment Manager**; then, expand **Donor Image**. The Get Donor task is displayed.
2. Drag Get Donor onto the donor system in the Group Contents pane. A menu is displayed.

Note: Because of system-resource limitations, do not run more than a few Get Donor tasks concurrently.

3. Click **Configure systems** to configure the Get Donor task for the specific system. The System/Task Configuration: Get Donor window opens.

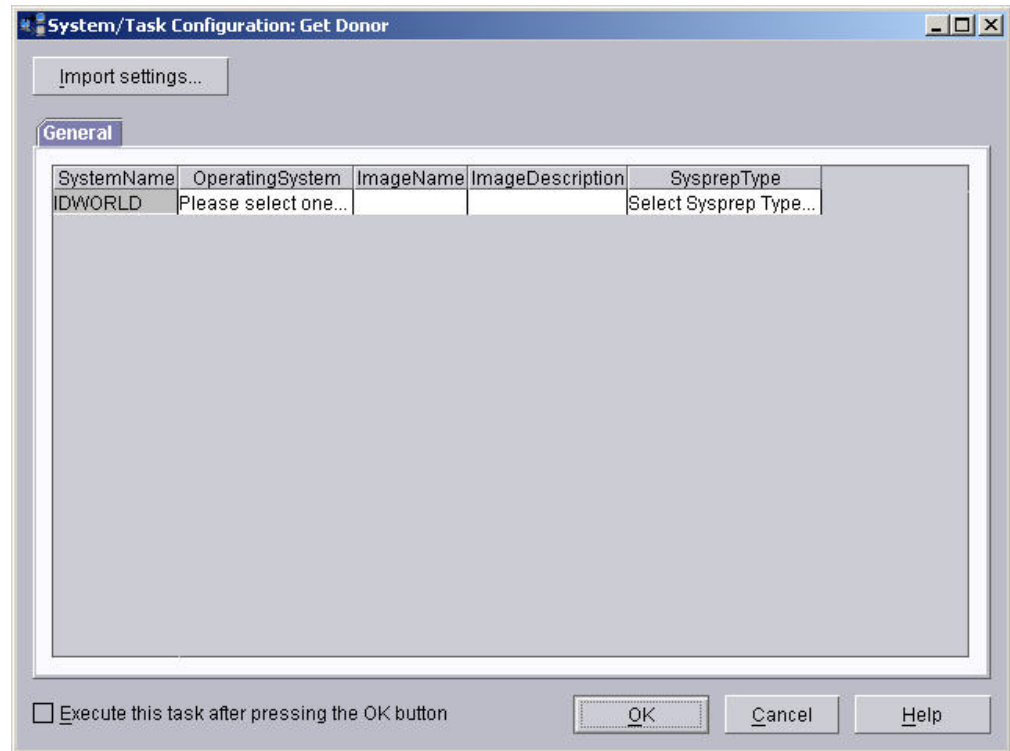


Figure 62. System/Task Configuration: Get Donor window

4. In the **OperatingSystem** field, select the operating system that is installed on the donor system.
5. In the **ImageName** field, type a descriptive name for the donor image.
6. (Optional) In the **ImageDescription** field, type a description for the image.
7. In the **SysprepType** field, select the applicable sysprep type. If you prepared the donor system in factory mode, select **FACTORY**. If you prepared the system in reseal mode, select **RESEAL**.

Note: If you create several large donor image files, the management server might run out of disk space. RDM does not monitor the hard disk space on the server for the Get Donor task; you must make sure that there is enough disk space to perform the task. The size of the donor image file is dependent on the data that you are saving. Typically, the file is compressed to half the size of the used data on the applicable partition or disk; however, there is no way to predict how large a donor image will be.

- To run the task immediately, select the **Execute this task after pressing the OK button** check box; then, click **OK**. To run the task from the Tasks pane, drag the Get Donor task to the configured system; then, click **Run systems**. An RDM message window opens.

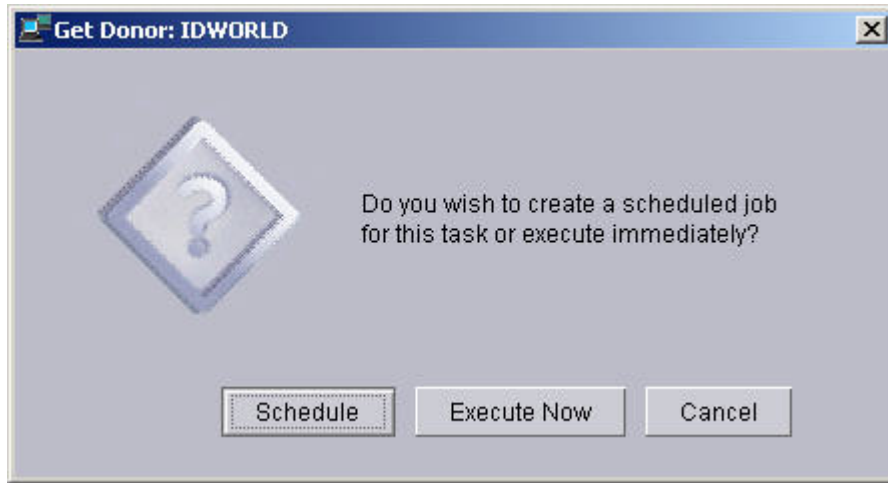


Figure 63. Get Donor (Built-in) window

- Click **Execute Now**. RDM sends a wake-up event to the donor system. The progress of the event is displayed on the monitor of the target system. The resulting image can be several gigabytes in size.

Note: When you run the Get Donor task against a target system that is served by a remote deployment server, the target system will be suspended after `capture.bat` is completed. During this time, the remote deployment server is copying the donor image to the management server. If you cancel the Get Donor task while the task is running, you might not be able to run the task again until the canceled task finishes copying the donor file to the management server. When replication is complete, the target system shuts down and the task is complete.

After you successfully create a donor image, you can use the Windows Clone Install task to deploy the image. For information about Windows Clone Install, see Chapter 21, “Windows Clone Install,” on page 233.

Using the Image Management option and a PQI file

Complete the following steps to create a donor image by using the Image Management option and a PQI file:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

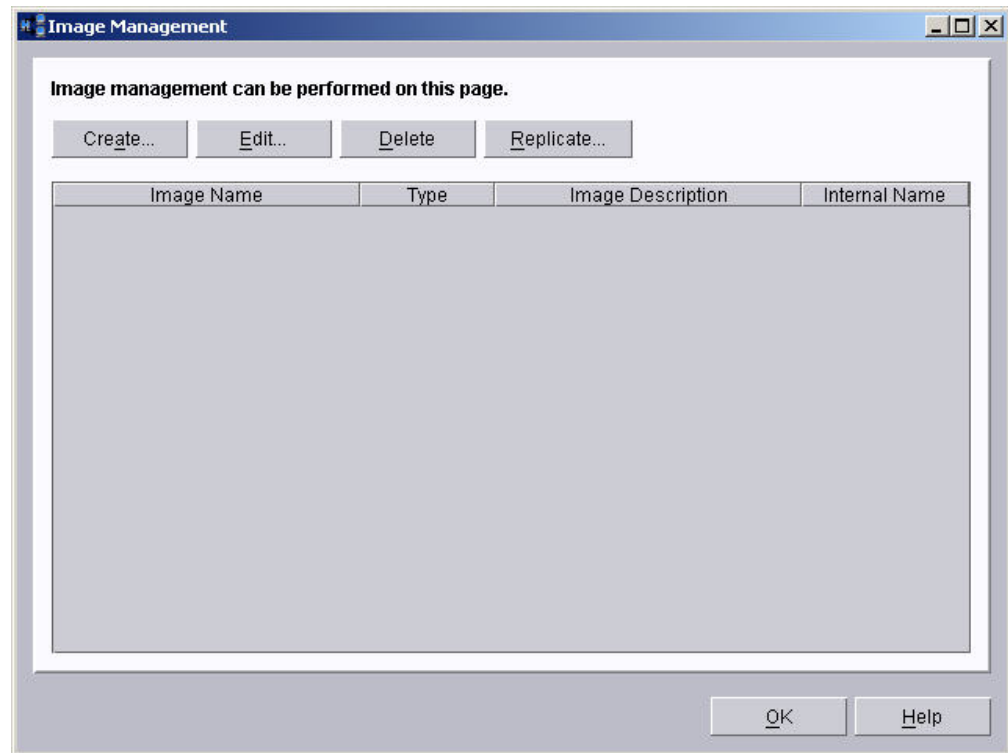


Figure 64. Image Management window

2. Click **Create**. The Create Image window opens.

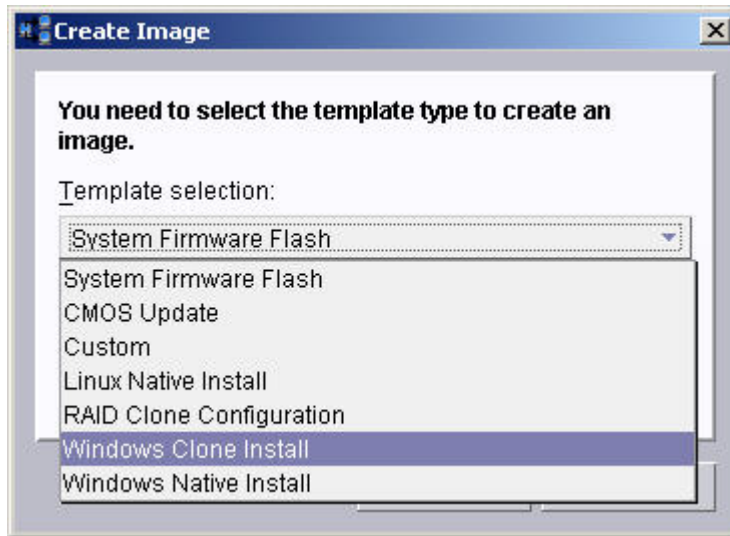


Figure 65. Create Image window

3. In the **Template selection** field, select **Windows Clone Install**; then, click **OK**. The Create Windows Clone Install Image window opens.

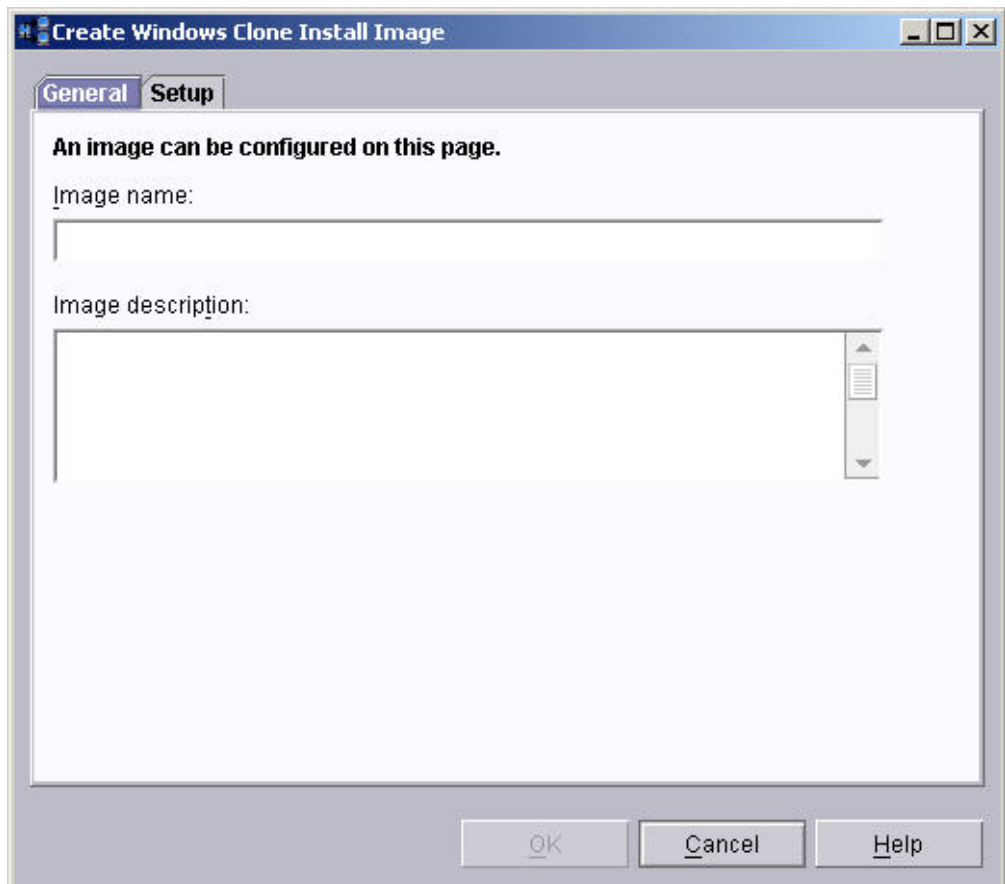


Figure 66. Create Windows Clone Install Image window

4. Set the properties for the image:
 - a. In the **Image name** field, type a name for the image.

- b. (Optional) In the **Image description** field, type a brief description of the image.
5. Click **Setup**. The Setup page is displayed.

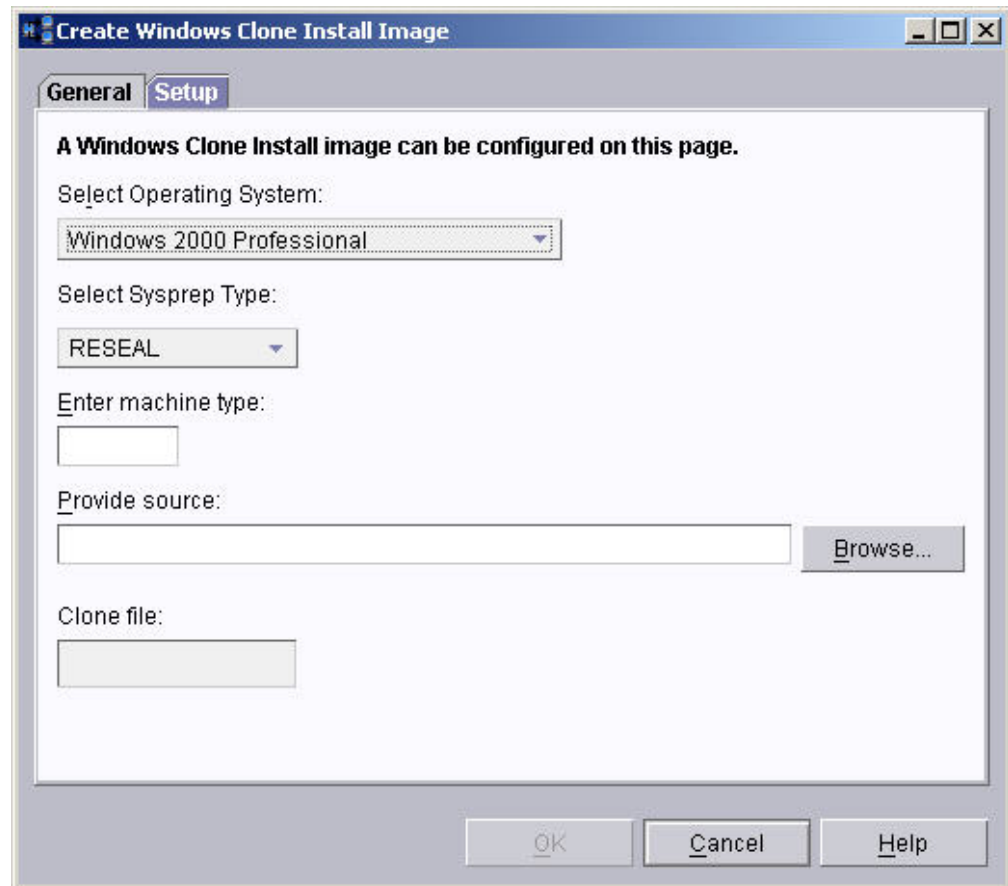


Figure 67. Create Windows Clone Install Image window: Setup page

6. In the **Select Operating System** field, click to select the operating system of the PQI file.
7. In the **Select Sysprep Type** field, click to select the sysprep type.

Note: For information on the Reseal and Factory sysprep options, see “RDM-supported options in Sysprep version 2.0” on page 337.
8. In the **Enter machine type** field, type the four-digit machine type number of the target system.
9. Click **Browse** to locate and select the PQI source file.
10. Click **OK**. The Windows Clone Install Image window closes.

Upgrading to DeployCenter version 5.5

RDM uses a simplified version of the Symantec ImageCenter utility, which you can use to create and restore donor images only from the first partition on a managed system. To create an image that includes all of the disk partitions on the first disk drive of the target system, you must upgrade to Symantec DeployCenter, which includes the full version of Symantec ImageCenter. This section provides information about how to install and configure Symantec DeployCenter 5.5.

Complete the following steps to upgrade to DeployCenter 5.5:

1. Install DeployCenter 5.5 on the management server. When prompted, make sure that you install Boot Disk Builder.
2. Complete the following steps to create the unicast files that are required for the upgrade:
 - a. Run the DeployCenter **Boot Disk Builder** utility.
 - b. Create a Standalone boot disk.
 - c. When prompted to save the boot disk contents, select **Copy boot disk contents to a folder**; then, save the contents to a directory on the server.

Note: When you create a unicast boot image, the following two files are created:

- pqimgctr.exe
- pqdplctr.rtc

These files are copied to RDM Server in a later step.

3. Copy the two unicast files (pqimgctr.exe and pqdplctr.rtc) that you created in step 2 to the following directory:

```
d:\RDM_installation\local\env\71c
```

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory in which RDM is installed.

4. (Optional) You can edit the script files that are used by RDM and DeployCenter. The DeployCenter installation script file (wcifull.txt) is located in the 71c\deploy directory. The Get Donor DeployCenter script file (store.txt) is located in the 71c\capture directory. For information about editing these files, see the documentation that comes with DeployCenter.
5. Navigate to the *RDM_installation\local\env* directory on the management server, where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory in which RDM is installed.
6. Run the mkimages.bat utility.
7. (Optional) Complete the following steps to upgrade the unicast Image Server.

Note: You might have to restart the management server for the service to complete these steps.

- a. Compare the version of the ucservice.exe file that comes with RDM to the version that comes the DeployCenter installation. If the RDM version is an earlier version, go to step 7b. Otherwise, go to step 8 on page 109.

- b. On the management server, and on each deployment server, open a command prompt and type the following commands:

```
CD "d:\RDM_installation\bin"
```

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory in which RDM is installed.

```
UCSERVICE /unregserver  
RENAME ucservice.exe ucservice.old
```

- c. On the management server, copy the ucservice.exe file that was installed with DeployCenter (by default, ucservice.exe is installed at the root of the hard disk drive) to the following directory:

```
d:\RDM_installation\bin
```

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory in which RDM is installed.

- d. Run the following command (all on one line):

```
ucservice.exe /service /startup auto /imagedir  
"d:\RDM_installation\repository\image" /logfile"  
d:\RDM_installation\log\pqlog.txt"
```

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory in which RDM is installed.

For example, if you installed RDM in the default location, type the following command (all on one line):

```
ucservice.exe /service /startup auto /imagedir  
"c:\Program Files\IBM\RDM\repository\image" /logfile  
"c:\Program Files\IBM\RDM\log\pqlog.txt"
```

- e. If necessary, restart the management server to start the ucservice service.
8. Complete the following steps to test the DeployCenter 5.5 upgrade:
- From IBM Director Console, run the **GetDonor** task against a target system that contains multiple partitions.
 - Immediately after the Starting PC DOS message is displayed on the monitor of the target system press the F8 key. This enables you to step through each statement of the batch files.

Note: Make sure that you use F8 to step through the tasks. Although, capture.bat contains error-handling logic, it might not detect the kinds of errors that you might make in the above procedure.

- c. Press the y key to execute each statement in-turn. Make sure that no errors occur.

Note: If an error occurs, debug it, and fix it as applicable. Typically most errors occur due to typographical errors in the files that you created. To rerun the test, you must:

- Turn off the target system with the power switch.
- From IBM Director Console, right-click on the target system in the middle pane; then click **Remote Deployment Manager** → **Cancel Tasks**.

- After the GetDonor task is completed, create a donor system that contains the Windows operating system and applications that you want. Make sure that it contains two or more partitions, and that each partition contains some files.
- Run the Microsoft SysPrep utility on the donor system.
- Run an RDM Get Donor task on the donor system.
- Create an RDM Windows Clone Install task that uses the image that you created.

Chapter 11. Linux Native Install

You can use the Linux Native Install template in RDM to create a task that remotely installs the Linux operating system onto target systems.

The Linux Native Install template uses a wizard to gather the configuration information and create tasks.

Before you create the task, you can use the Image Management option in RDM to save the applicable Linux installation files to the master repository as a Linux installation image. The Linux Native Install task that you create uses the Linux installation image to deploy the Linux operating system to the target systems that you run the task against.

This chapter provides the procedures that you must complete in the following order to create a Linux Native Install task and deploy Linux to a target system:

1. Create a custom Linux installation image.
2. Create a Linux Native Install task.
3. (Optional) Configure the systems.
4. Run the Linux Native Install task.

Right-click **Linux Native Install** in the Tasks pane to display two options:

- *Create New Task* - starts the Linux Native Install wizard. You are guided through a series of windows in a predefined order. The data you enter is validated for each window when you click **Next**. Most of the wizard pages are very similar to the tabs in the property sheet for this task. All the crucial information on each page can be changed by clicking **Back**.

Click **Finish** on the last page of the wizard to complete the task. A Linux install task folder is created in the master repository. The name of the folder is the task number.

- *Edit Template* - accesses the template notebook containing all of the properties for the template. The values set in the template notebook are the defaults used when you create a new Linux Native Install task.

When you create a task, it is added to the Tasks pane under **Linux Native Install**. Right-click the new task to edit, delete, or copy the task.

When RDM scans a system, it assigns a default name to the system, in the form *MachinetypeMachinemodel-Serialnumber*. This *system name* is displayed in IBM Director Console. When a Linux Native Install task is run on a system without an operating system, RDM uses this system name for the TCP/IP host name. If a Linux Native Install task is run on a system on which Linux is already installed, RDM recognizes and uses the TCP/IP host name.

If the assigned computer name is not valid, RDM changes the computer name using the following rules:

- Remove spaces and characters that are not valid from the computer name. The following characters are not valid: `~!@#%&*()=+[]{}|;:”’,<>/?.
For example, *pear rfrsh* would be changed to *pearrfrsh*.
- Truncate from the end to make the computer name no longer than 63 characters.
- Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
- Add *_1*, *_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.

Creating an operating-system image

Before you can use RDM to deploy a Linux installation, you must create an operating-system image.

Complete the following steps to create a Linux native installation image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

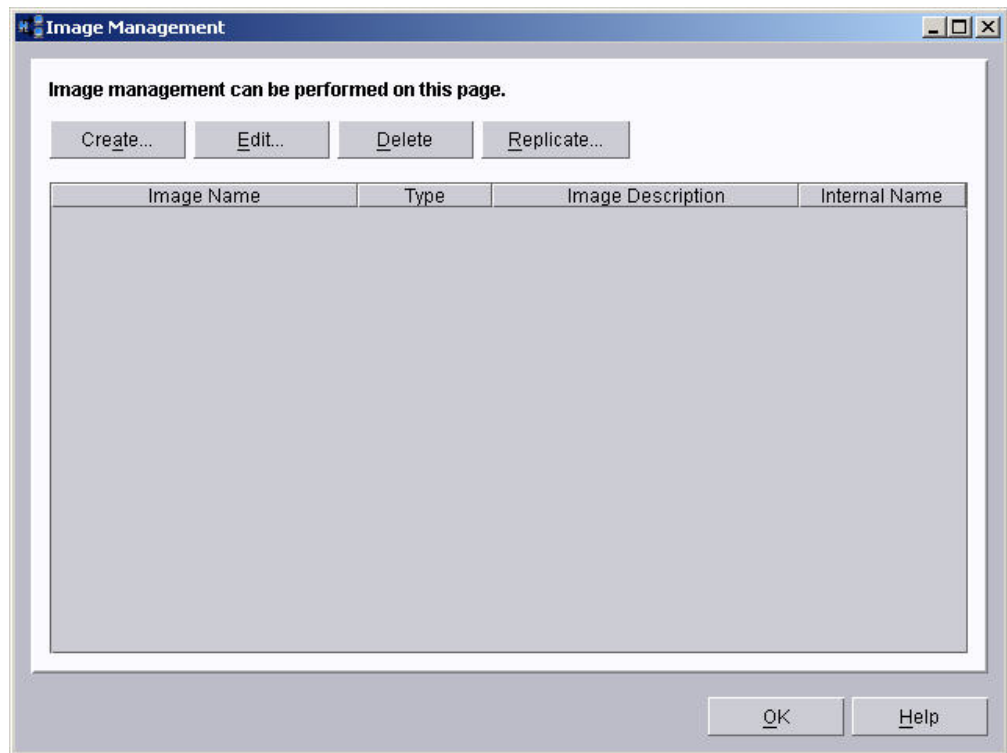


Figure 68. Image Management window

2. Click **Create**. The Create Image window opens.

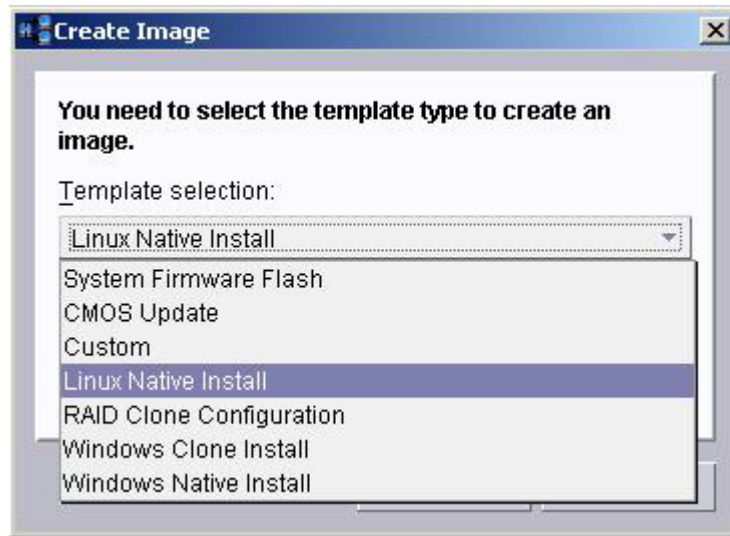


Figure 69. Create Image window

3. In the **Template selection** field, select **Linux Native Install**; then, click **OK**. The Create Linux Native Install Image window opens and the General page is displayed.

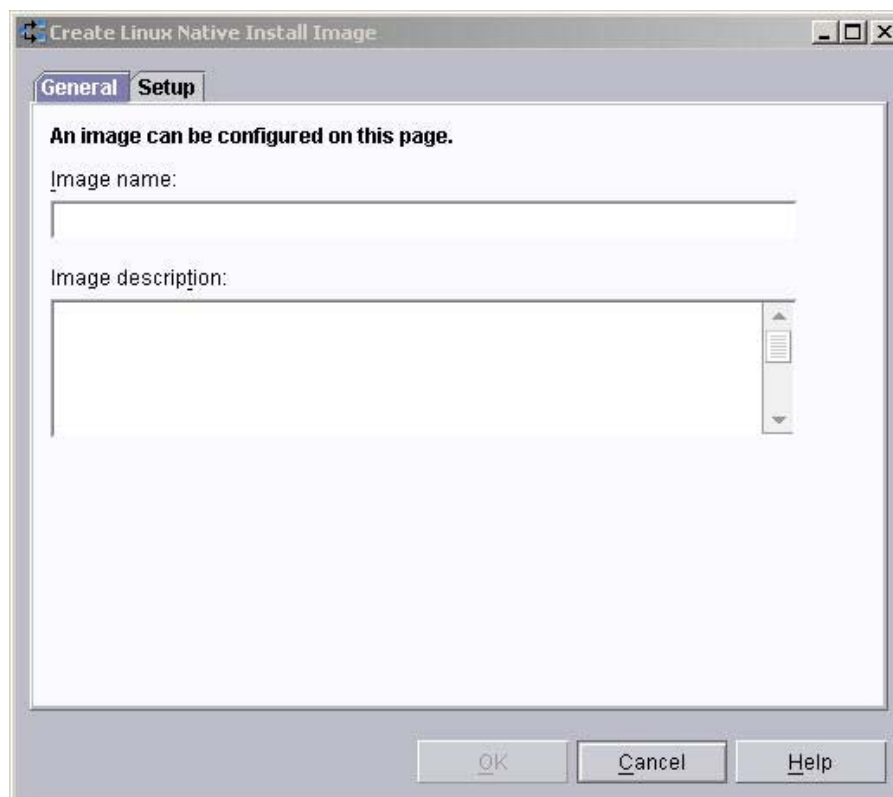


Figure 70. Create Linux Native Install Image window: General page

4. In the **Image name** field, type a name for the Linux image.
5. (Optional) In the **Image description** field, type a brief description for the Linux installation image.

6. Click **Setup**. The Setup page is displayed.

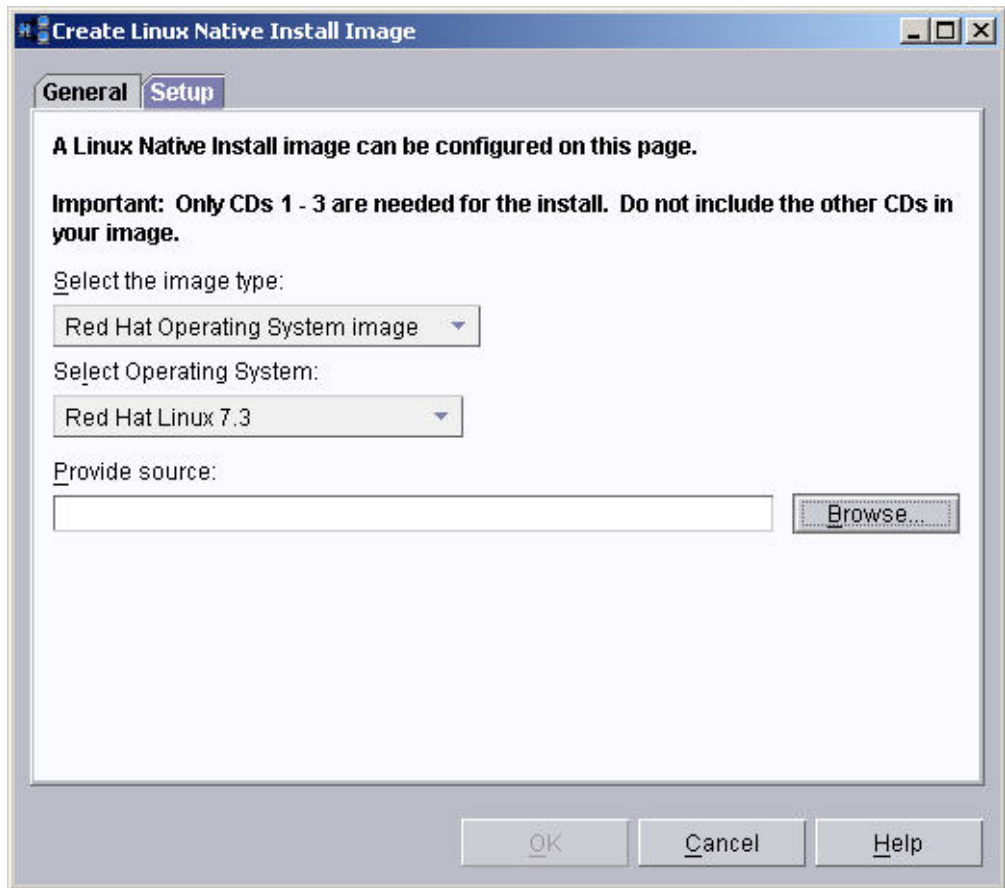


Figure 71. Create Linux Native Install Image window: Setup page

7. In the **Select the image type** field, select **Red Hat Operating System image**.
8. In the **Select Operating System** field, select the applicable Red Hat® Linux operating system.
9. Insert the Linux Installation CD into the CD-ROM drive.

Notes:

- a. If the Linux installation files are saved to a shared network drive, you do not have to insert the installation CD into the CD-ROM drive. The installation files, however, must be accessible from the management console that you use to create the Linux Native Install task.
 - b. Only CDs 1-3 are required to save the installation files to RDM.
10. Click **Browse** and navigate to the Linux RPM-GPG-KEY file.
 11. Click **OK**. The Task Image Creation Progress window opens and the progress of the image being saved to the master repository is displayed.
 12. When prompted, remove the first CD from the CD-ROM drive and insert the next CD into the CD-ROM drive.

13. When prompted, remove the second CD from the CD-ROM drive and insert the third CD into the CD-ROM drive.
14. When finished, click **Done**; then, click **OK**.

After you have created the Linux native installation image and it is saved into the master repository, you can create a Linux Native Install task.

Creating an IBM Director Agent image

Before you can use RDM to deploy IBM Director Agent for Linux with a Linux operating-system installation image, you must create an IBM Director Agent installation image.

Complete the following steps to create a IBM Director Agent installation image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

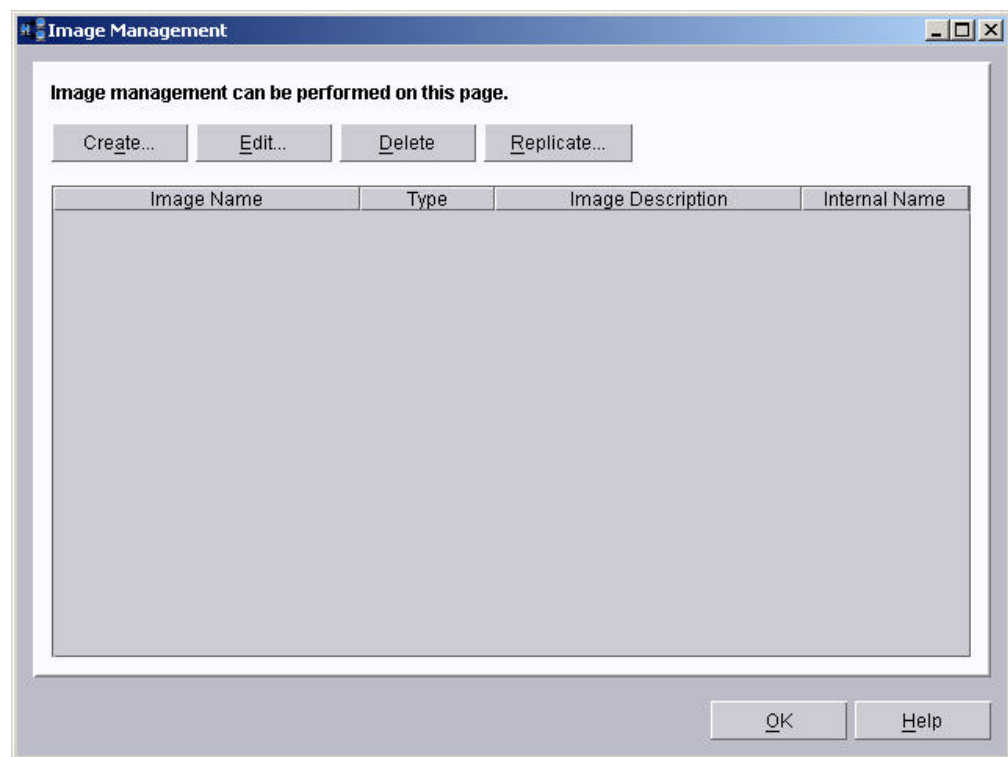


Figure 72. Image Management window

2. Click **Create**. The Create Image window opens.

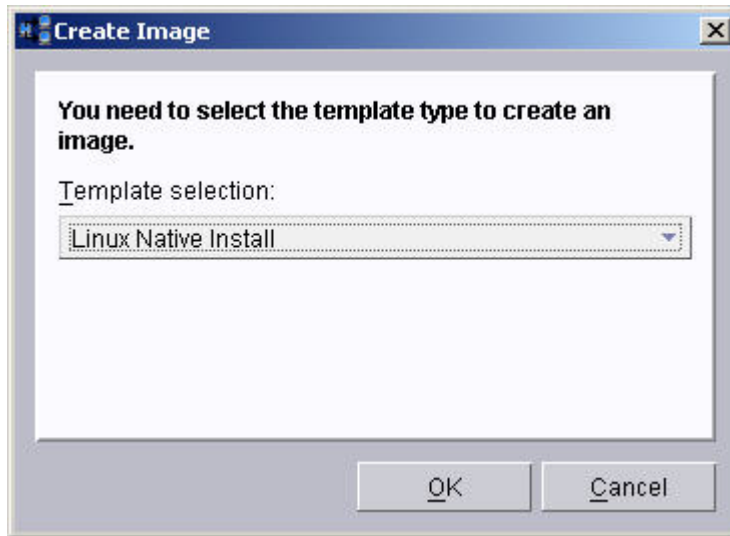


Figure 73. Create Image window

3. In the **Template selection** field, select **Linux Native Install**; then, click **OK**. The Create Linux Native Install Image window opens and the General page is displayed.

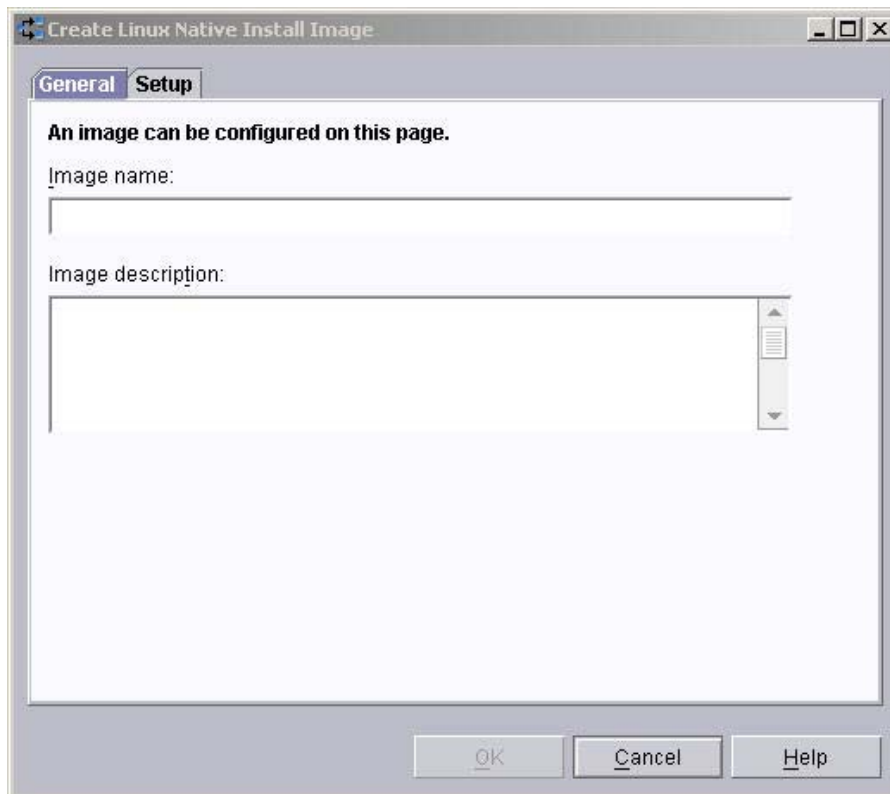


Figure 74. Create Linux Native Install Image window: General page

4. In the **Image name** field, type a name for the IBM Director Agent installation image.
5. (Optional) In the **Image description** field, type a brief description for the IBM Director Agent installation image.

6. Click **Setup**. The Setup page is displayed.

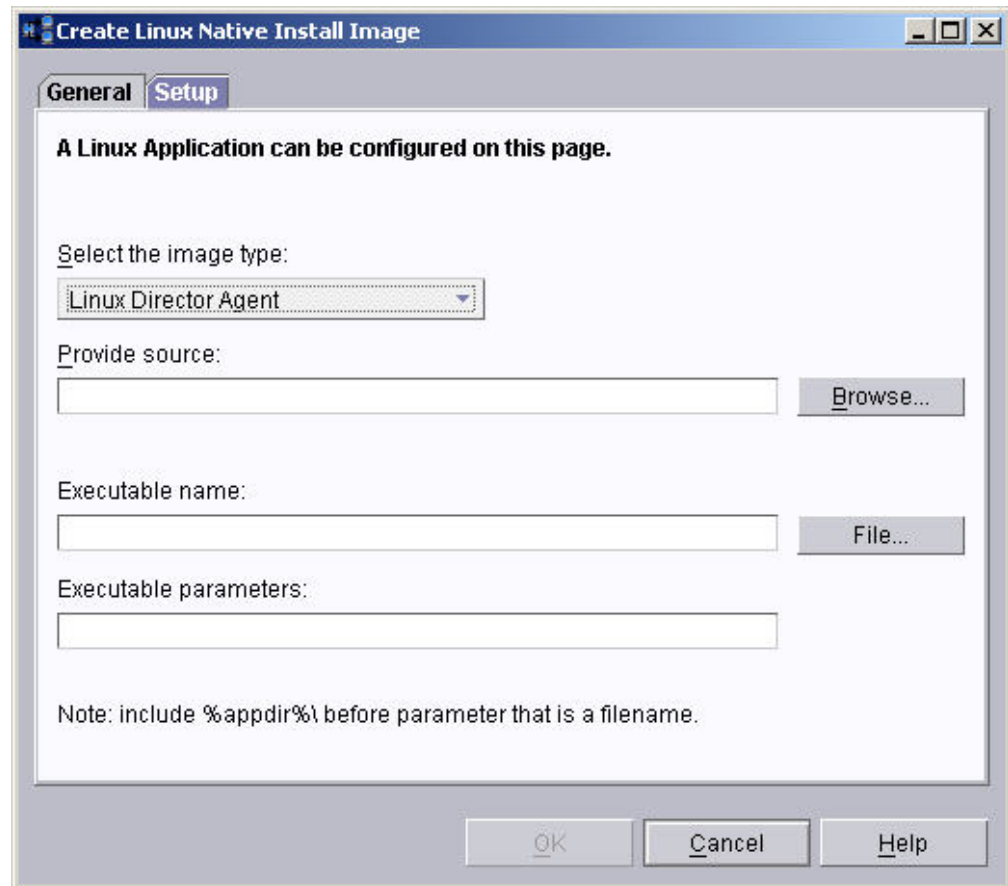


Figure 75. Create Linux Native Install Image window: Setup page

7. In the **Select the image type** field, select **Linux Director Agent**.
8. Insert the IBM Director 4.20, or later, CD into the CD-ROM drive.
9. Click **Browse**; then, select the dirinstall file in the director/agent/linux/i386 directory.
10. (Optional) Type any executable parameters you want to pass to the installer.
11. Click **OK**. The Task Image Creation Progress window opens and the progress of the image being saved to the master repository is displayed.
12. Click **OK**.

Creating a Linux application installation image

Before you can use RDM to deploy an application installation image with a Linux operating-system installation image, you must create an application installation image.

Complete the following steps to create an application installation image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

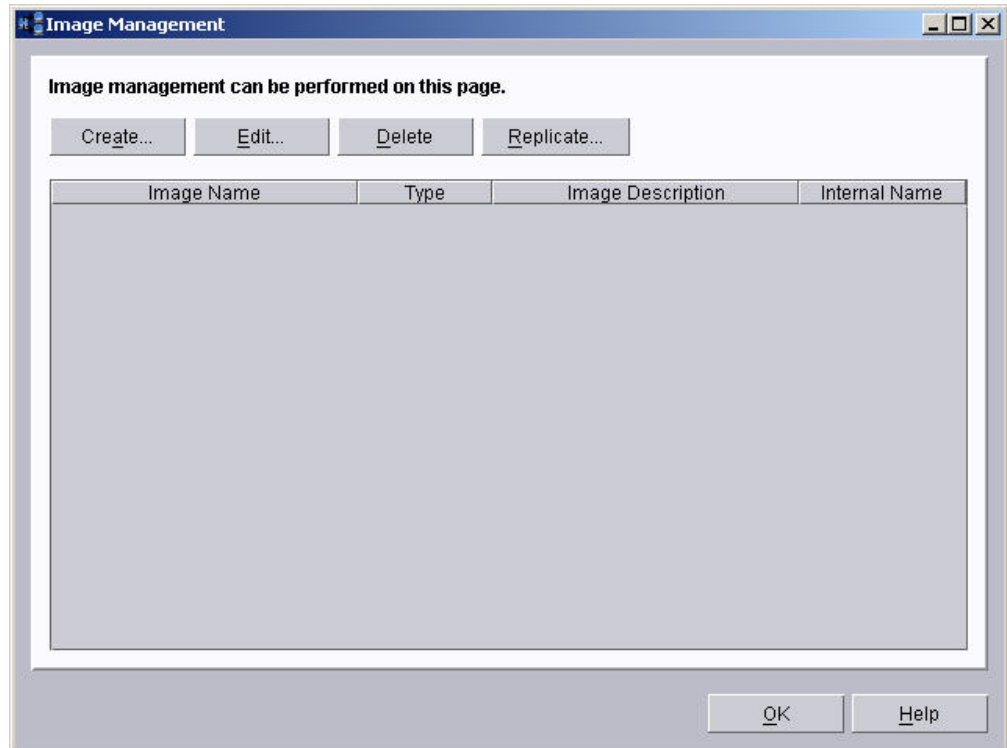


Figure 76. Image Management window

2. Click **Create**. The Create Image window opens.

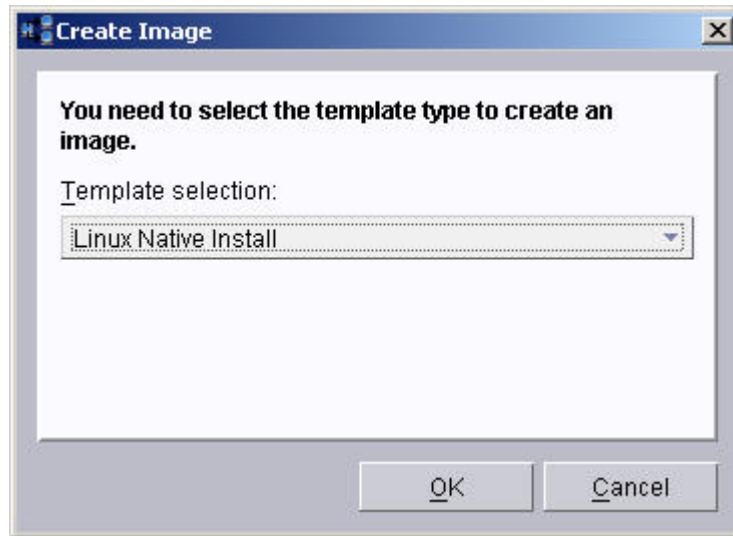


Figure 77. Create Image window

3. In the **Template selection** field, select **Linux Native Install**; then, click **OK**. The Create Linux Native Install Image window opens and the General page is displayed.

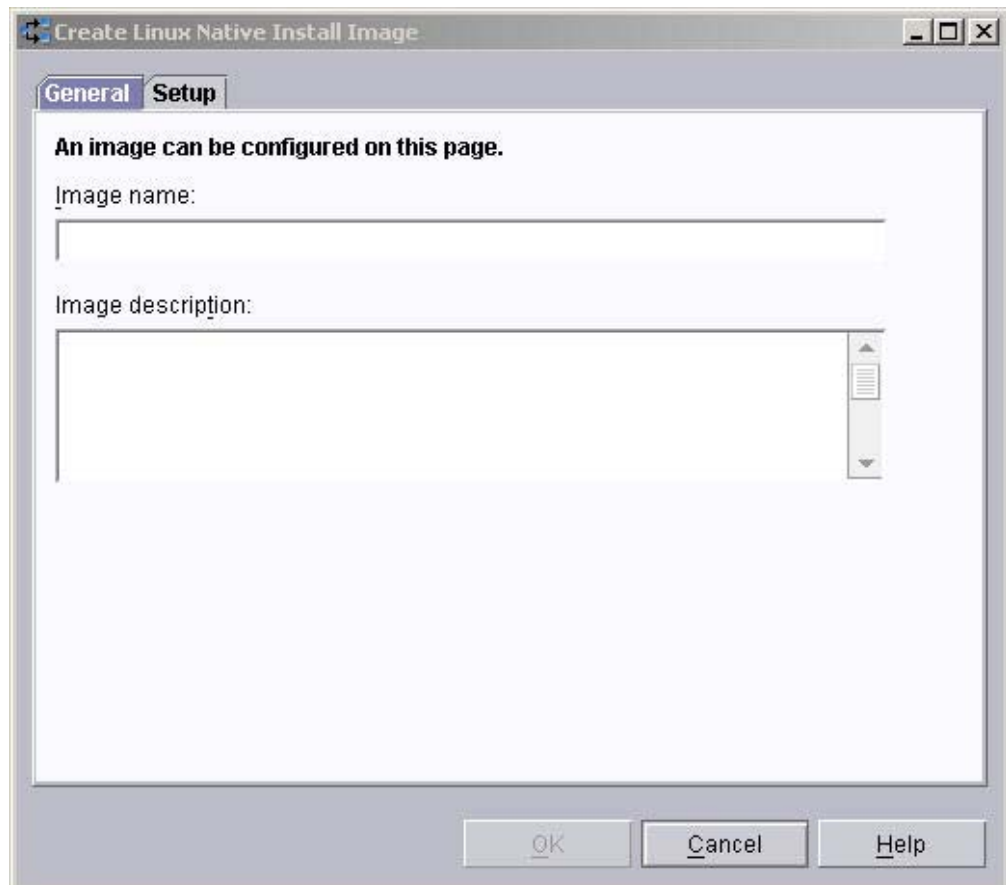


Figure 78. Create Linux Native Install Image window: General page

4. In the **Image name** field, type a name for the application installation image.

5. (Optional) In the **Image description** field, type a brief description for the application installation image.
6. Click **Setup**. The Setup page is displayed.
7. In the **Select the image type** field, select **Linux Application**.

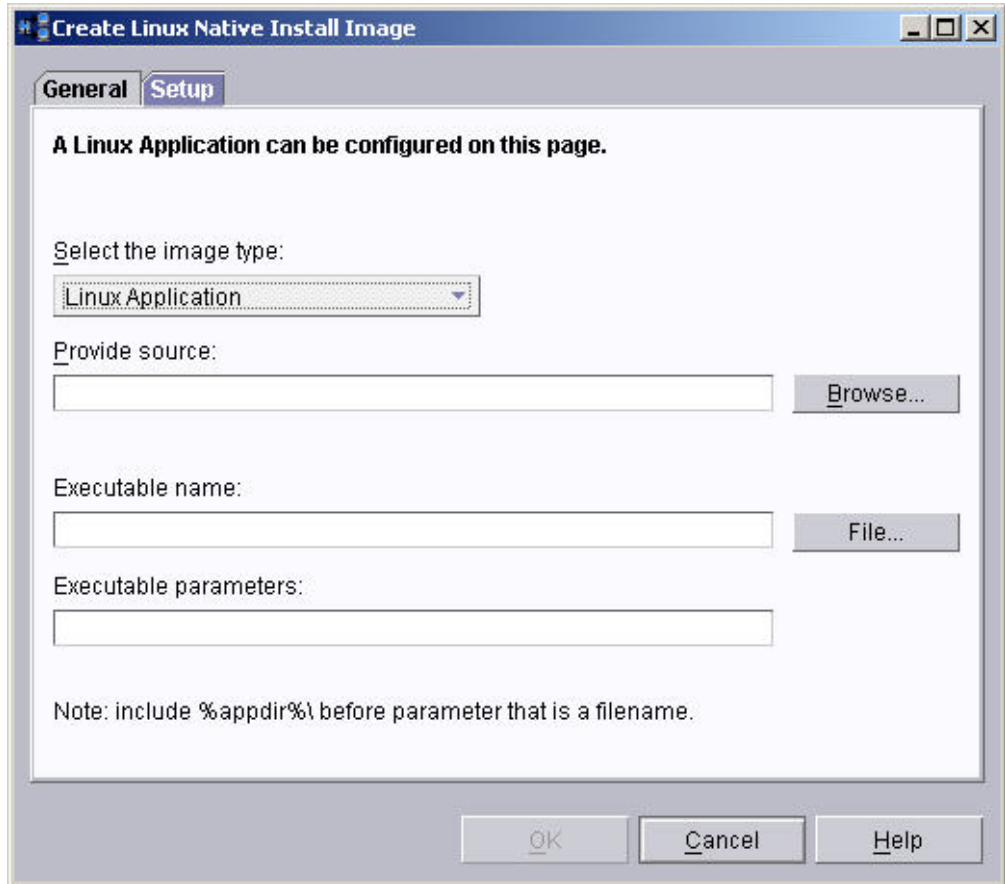


Figure 79. Create Linux Native Install Image window: Setup page

8. Click **Browse**; and then select the directory that contains the installation files.
9. Click **OK**.
10. Click **File**. Select the application install file in the directory you selected in step 8.
11. (Optional) Type any executable parameters you want to pass to the installer.
12. Click **OK**. The Task Image Creation Progress window opens and the progress of the image being saved to the master repository is displayed.
13. Click **OK**.

Creating a Linux Native Install task

Complete the following steps to create a Linux Native Install task:

1. Right-click **Linux Native Install**. The Linux Native Install task menu is displayed.
2. Click **Create new task**. The Linux Native Install window opens.

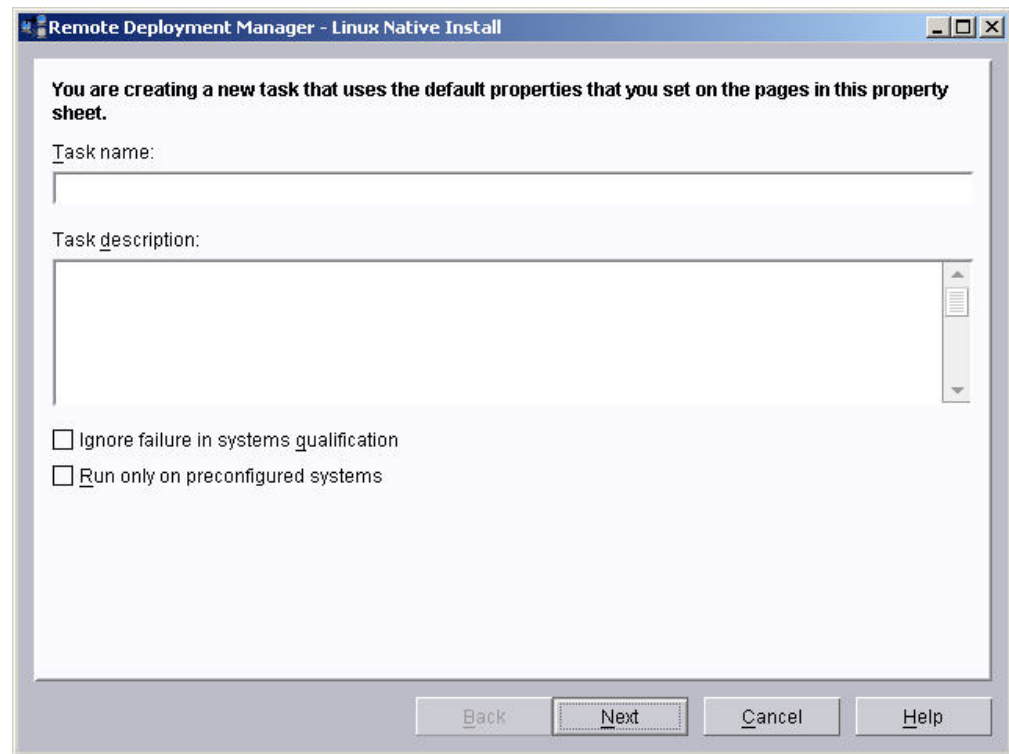


Figure 80. Linux Native Install task: “You are creating a new task” window

3. Provide the basic information for the task:
 - a. In the **Task name** field, type a descriptive name to identify the task.
 - b. (Optional) In the **Task description** field, type a brief description of the task.
 - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
 - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
 - e. Click **Next**. The list of associated images is displayed.
4. Select the Linux native installation image to be used on target systems:
 - a. Click **Select**. The “Image selection” window opens.

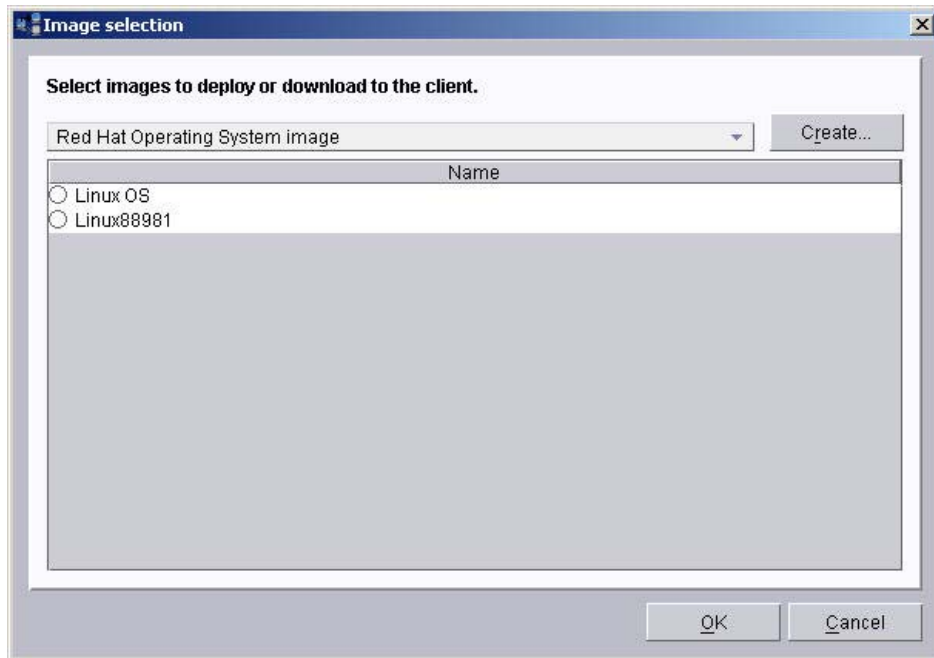


Figure 81. "Image selection" window

- b. Select the Linux native installation image that you want to use; then, click **Next**.

Note: If you have not already created the Linux native installation image, you can click **Create** to create the image. For information, see "Creating an operating-system image" on page 112.

- c. Click **OK**. The list of associated images displays the selected Linux native installation image.

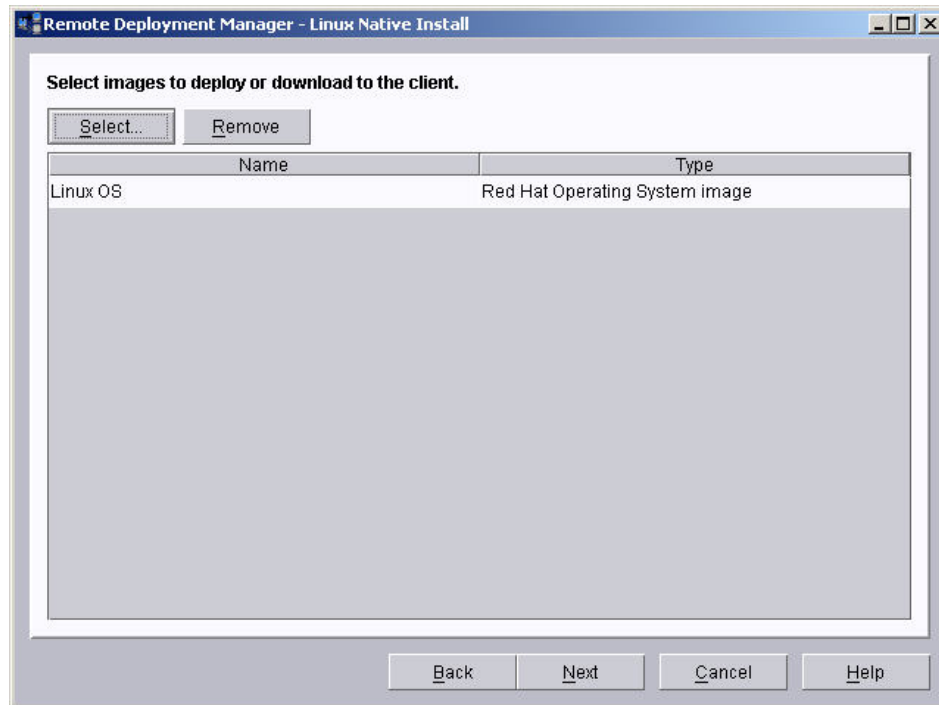


Figure 82. Linux Native Install task: "Select images" window

- d. (Optional) Select an IBM Director 4.20 for Linux installation image to include with the operating-system installation image. For information on creating an IBM Director 4.20 for Linux installation image, see "Creating an IBM Director Agent image" on page 115.
 - e. (Optional) Select one or more application installation images to include with the operating-system installation image. For information on creating an IBM Director 4.20 for Linux installation image, see "Creating a Linux application installation image" on page 118.
5. Click **Next**. The Partition Configuration window is displayed.

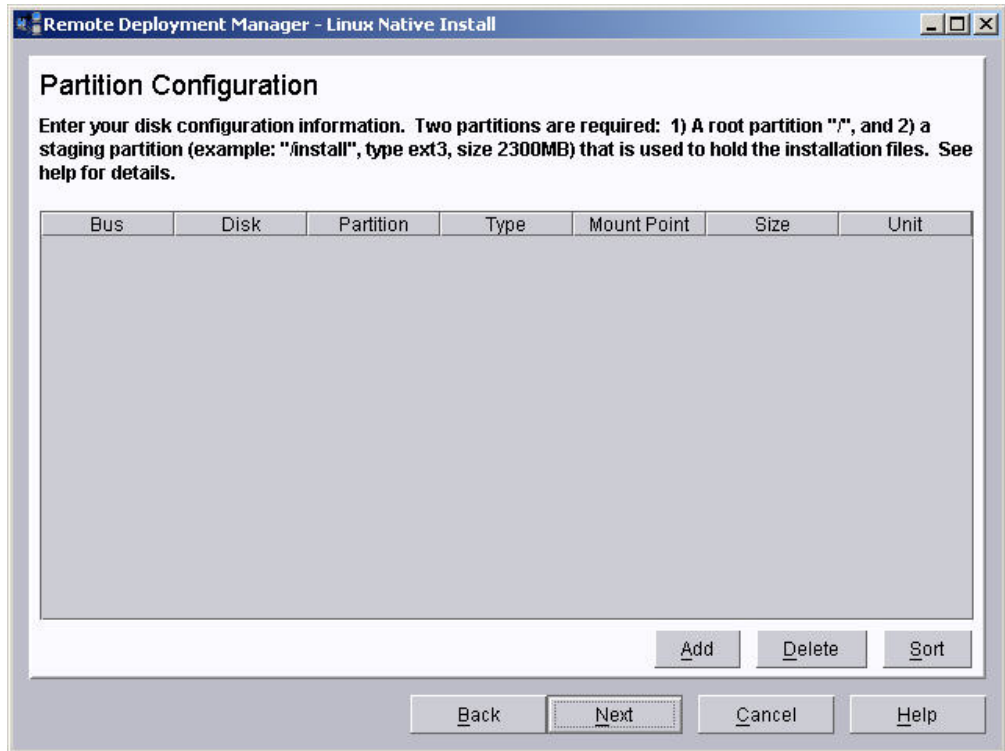


Figure 83. Linux Native Install task: Partition Configuration window

6. Configure the partitions:

Note: To successfully deploy a Linux native installation, only a root partition (/) and a staging partition (for an example, /install) are required.

- a. Click **Add** to add a partition. The “Enter the data for the new partition” window opens.

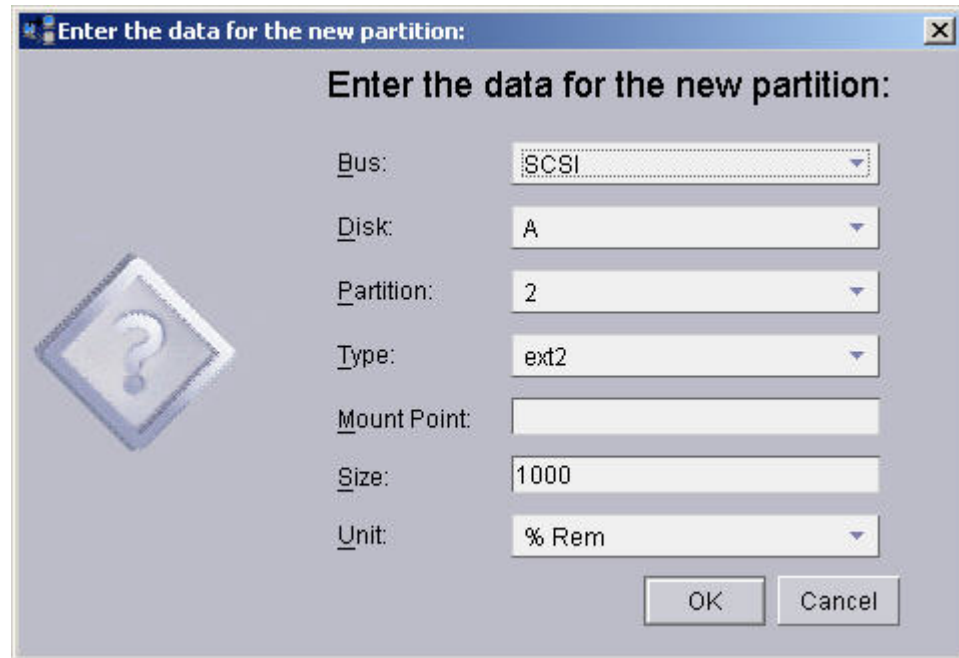


Figure 84. “Enter the data for the new partition” window

- b. In the **Bus** field, select whether the hard drive is connected to a **SCSI** or **IDE** bus.
Note: When you create a Linux Native Install task for a blade server with IDE RAID configured, you must select SCSI as the drive type instead of IDE.
- c. In the **Disk** field, select drive letter of the hard disk drive to which you want to add the partition.
- d. In the **Partition** field, select the partition number for the partition.
Note: Partitions 1 through 4 are primary partitions. Partitions 5 and up are extended partitions.
- e. In the **Type** field, select the type of file system for the partition.
- f. In the **Mount Point** field, type the mount point for the selected partition.
- g. In the **Size** field, type the size in megabytes (MB) or as a percentage of the total size remaining, depending on the specified Unit.
- h. In the **Unit** field, select the unit of measure for the size of the partition. Select **MB** for Megabyte, or **% Rem** for percentage remaining. % rem allocations cannot exceed 100% for the primary partitions (1 through 4). % rem allocations for partitions 5 through 16 must not exceed 100%.
- i. Click **Next**. The Boot Loader Configuration window is displayed.

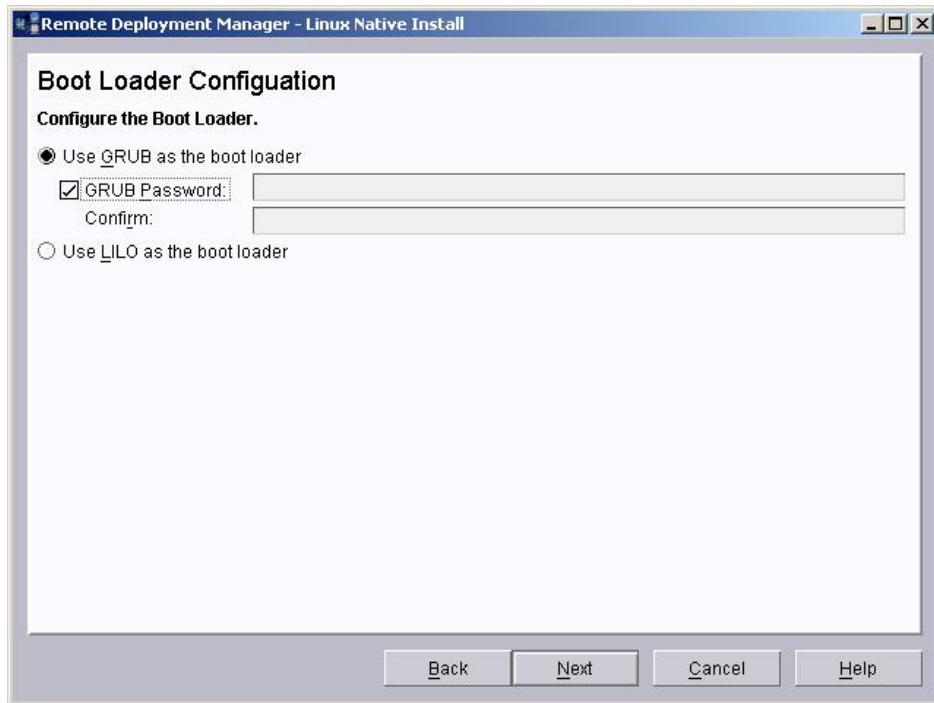


Figure 85. Linux Native Install task: Boot Loader Configuration window

7. Select one of the following boot loader options to be used on target systems:

Use GRUB as the boot loader

This option uses the *Grand Unified Boot loader (GRUB)*, a multi-platform boot loader. If a password is required to access the boot loader, select **GRUB Password**; then, type the password in the **GRUB Password** and **Confirm** fields.

Use LILO as the boot loader

This option uses the *Linux Loader (LILO)*.

8. Click **Next**. The Regional Parameter Setup window is displayed.

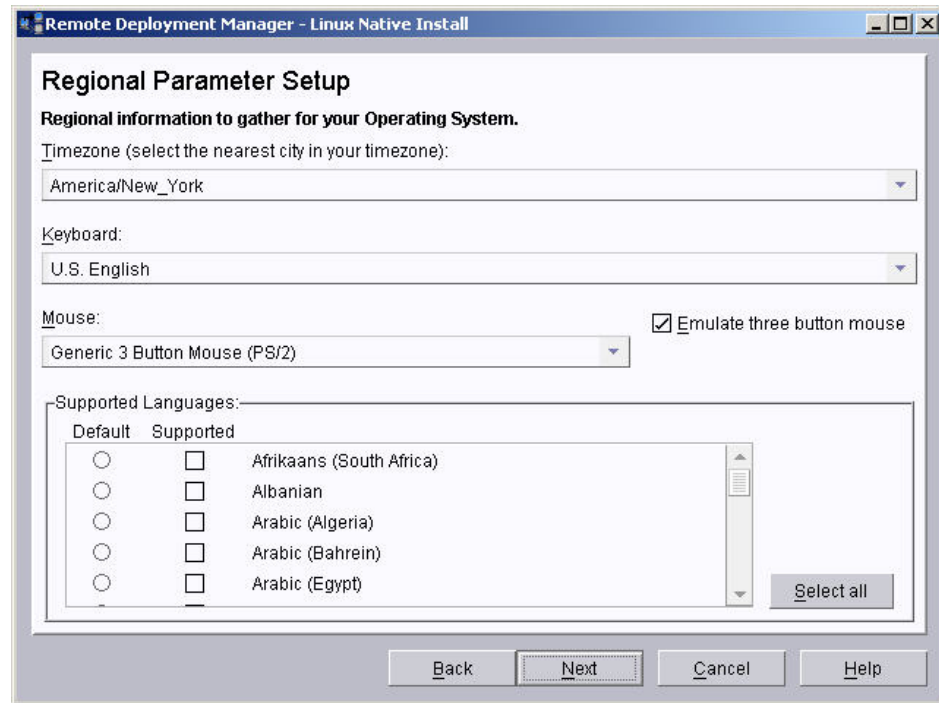


Figure 86. Linux Native Install task: Regional Parameter Setup window

9. Configure the regional information:
 - a. In the **Timezone** field, select the time zone.
 - b. In the **Keyboard** field, select the keyboard layout.
 - c. In the **Mouse** field, select the type of mouse.
 - d. To emulate a three button mouse, select **Emulate three button mouse**.
 - e. In the **Supported Languages** list, select the languages that you want the deployment to support.
10. Click **Next**. The TCP/IP Setup Information window is displayed.

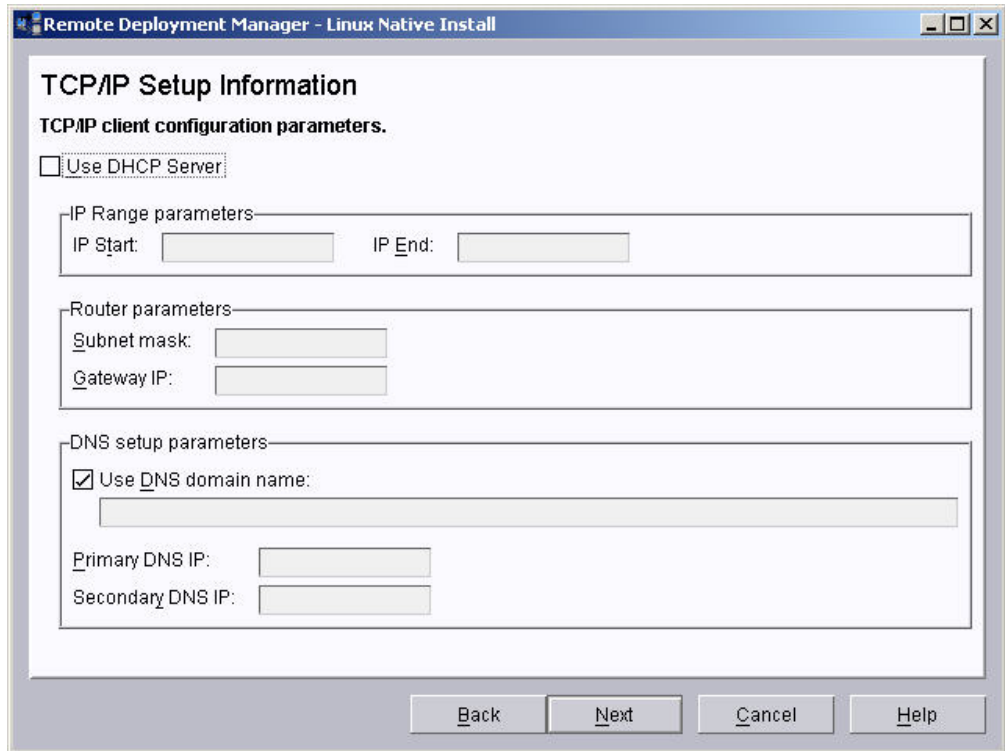


Figure 87. Linux Native Install task: TCP/IP Setup Information window, with Use DHCP Server check box cleared

11. Configure the TCP/IP settings:
 - a. By default, the **Use DHCP Server** check box is selected, which configures the target system to automatically be configured using a DHCP server. Clear the **Use DHCP Server** check box to configure the TCP/IP settings.
 - b. In the **IP Range parameters** fields, type the starting and ending IP addresses to indicate the range of IP addresses that can be used for the target system.
 - c. In the **Subnet mask** field, type the subnet mask to be used by the target system.
 - d. In the **Gateway IP** field, type the IP address for the gateway to be used by the target system.
 - e. To configure the target system to use a DNS domain name, select the **Use DNS domain name** check box; then, type the domain name in the field.
 - f. To provide the IP address for the primary DNS, in the **Primary DNS IP** field, type the IP address.
 - g. To provide the IP address for the secondary DNS, in the **Secondary DNS IP** field, type the IP address.
12. Click **Next**. The Password Authentication window opens.

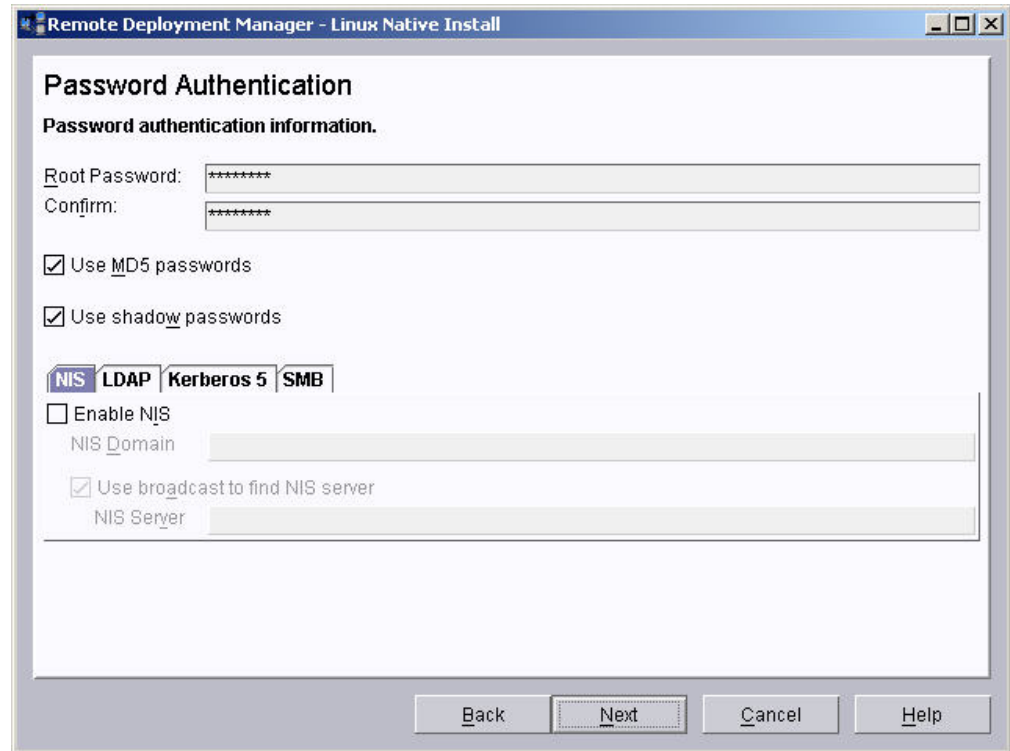


Figure 88. Linux Native Install task: Password Authentication window

13. Configure password authentication:
 - a. In the **Root Password** field, type the password for the root account to be used on target systems.
 - b. In the **Confirm** field, retype the password.
 - c. To enable message digest 5 (MD5) passwords, which supports passwords up to 256 characters, select the **Use MD5 passwords** check box. The default is eight characters or less.
 - d. To enable shadow passwords, select the **Use shadow passwords** check box. Shadow passwords is a Red Hat Linux feature that encrypts the passwords and saves them in a secured file. To access the file, a user must have a higher level of permission.
 - e. Click the **NIS** tab to configure Network Information Service (NIS); then, complete the applicable fields on the NIS page.
 - f. Click the **LDAP** tab to configure Lightweight Directory Access Protocol (LDAP); then, complete the applicable fields on the LDAP page.
 - g. Click the **Kerberos 5** tab to configure network authentication to use the Kerberos 5 protocol; then, complete the applicable fields on the Kerberos 5 page.
 - h. Click the **SMB** tab to configure Server Message Block (SMB) protocol for file sharing; then, complete the applicable fields on the SMB page.
14. Click **Next**. The Group Packages Selection window is displayed.

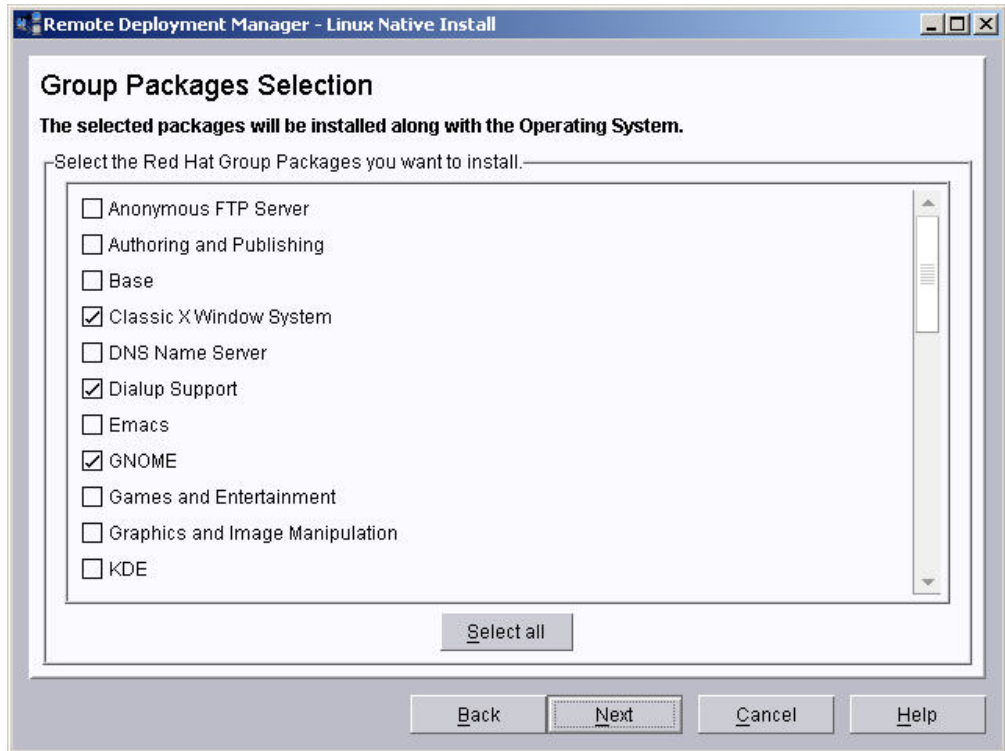


Figure 89. Linux Native Install task: Group Packages Selection window

15. Select the packages to be installed:
 - a. Available optional packages are listed. Select each group of packages to be installed. Selected groups are indicated with a check mark. To select all groups, click **Select all**.
Required packages are installed automatically as part of the installation options.

Note: If **X Windows** is selected, the Classic X Window System (Red Hat 7.3) and the X Window System (Red Hat 7.3 and 8.0) packages are installed even if they are not selected.
16. Click **Next**. The Firewall Configuration window is displayed.

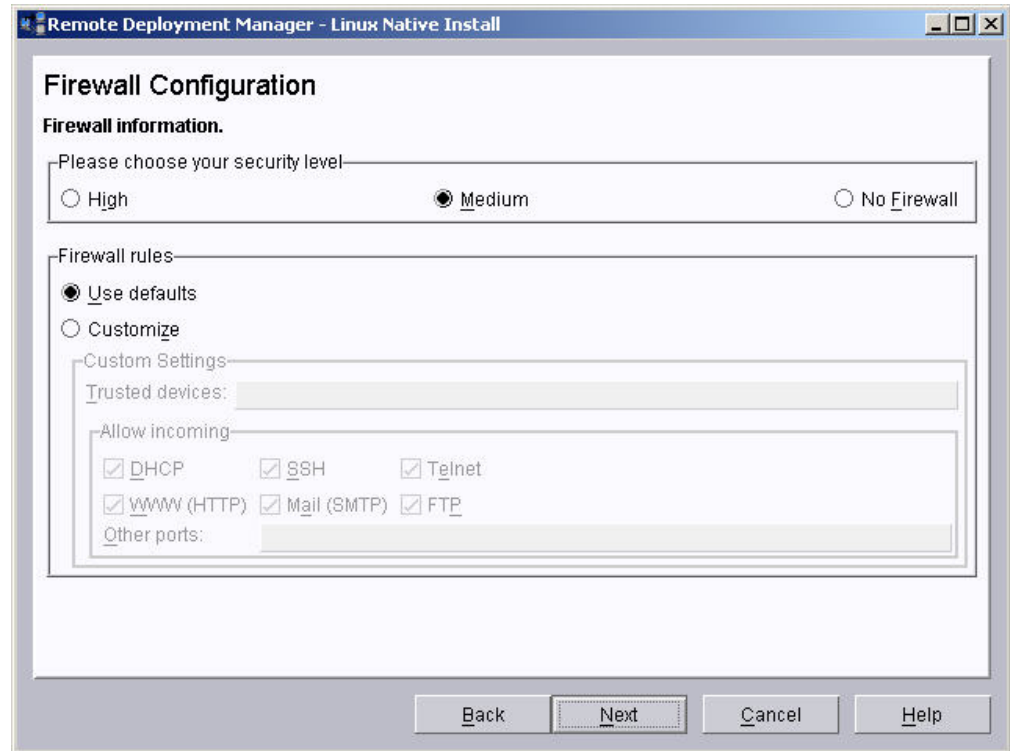


Figure 90. Linux Native Install task: Firewall Configuration window

17. Select **High**, **Medium** or **No Firewall** to set the security level.

Notes:

a. **High**

If you choose **High**, the system will not accept connections that are not explicitly defined. By default, the **High** setting enables only the following connections:

- DNS replies
- DHCP - so any network interfaces that use DHCP can be properly configured

If you choose **High**, your firewall will not allow the following:

- Active mode FTP (passive mode FTP, used by default in most clients, should still work)
- Internet Relay Chat (IRC) Direct Client Connection (DCC) file transfers
- RealAudio
- Remote X Window system clients

If you are connecting your system to the Internet, but do not plan to run a server, this is the safest choice. If additional services are needed, you can choose **Customize** to use specific services through the firewall.

b. **Medium**

If you choose **Medium**, your firewall will not allow remote systems to have access to certain resources on your system. By default, access to the following resources is not allowed:

- Ports lower than 1023 - the standard reserved ports, used by most system services, such as FTP, Secure Shell (SSH), telnet, and HTTP
- The Network File System (NFS) server port (2049)
- The local X Window System display for remote X clients
- The X Font server port (by default, xfs does not listen on the network, it is disabled in the font server)
- If you want to use resources such as RealAudio, while still blocking access to normal system services, choose **Medium**. Select **Customize** to allow specific services through the firewall.

c. **No Firewall**

Selecting **No Firewall** provides complete access to your system and does not perform security checking. Security checking is the disabling of access to certain services. This should only be selected if you are running on a trusted network (not the Internet) or plan to do more firewall configuration later.

18. For each of the three security levels, by default **Use defaults** is selected. Choose **Customize** to add trusted devices or to use additional incoming services:

- **Trusted Devices**

Selecting any of the Trusted Devices allows access to your system for all traffic from that device; it is excluded from the firewall rules. For example, if you are running a local network, but are connected to the Internet through a PPP dialup, you can check eth0 and any traffic coming from your local network will be allowed. Selecting eth0 as trusted means all traffic over Ethernet is allowed, but the ppp0 interface is still blocked by a firewall. If you want to restrict traffic on an interface, leave it cleared.

It is not recommended that you make any device that is connected to public networks, such as the Internet, a trusted device.

- **Allow Incoming**

Enable these options to use specified services to pass through the firewall.

- **DHCP**

If you allow incoming DHCP queries and replies, you allow any network interface that uses DHCP to determine its IP address. DHCP is normally enabled. If DHCP is not enabled, your system can no longer get an IP address from a DHCP server.

- **SSH**

SSH is a suite of tools for logging into and executing commands on a remote system. Use this option if you plan to use SSH tools to access your system through a firewall. Install the openssh-server package to access your system remotely, using SSH tools.

- **Telnet**

Telnet is a protocol for logging into remote systems. Telnet communications are unencrypted, and provide no security from network snooping. Allowing incoming Telnet access is not recommended. If you do want to allow inbound Telnet access, you will need to install the telnet-server package.

- **WWW (HTTP)**
The HTTP protocol is used by Apache (and by other Web servers) to serve Web pages. Use this option if you plan on making your Web server publicly available. This option is not required for viewing pages locally or for developing Web pages. Install the Apache package if you want to serve Web pages.
- **Mail (SMTP)**
Use this option for incoming mail delivery through your firewall so that remote hosts can connect directly to your system to deliver mail. You do not need to use this if you collect your mail from your Internet service provider (ISP) server using Post Office Protocol, version 3 (POP3) or Internet Message Access Protocol (IMAP), or if you use a tool such as fetchmail. An improperly configured symmetric multiprocessing (SMTP) server can allow remote systems to use your server to send spam.
- **FTP**
The FTP protocol is used to transfer files between systems on a network. Use this option if you plan on making your FTP server publicly available. Install the wu-ftpd (and possibly the anonftp) package for this option.
- **Other ports**
You can access ports that are not listed here by listing them in the Other ports field. Use the following format: port:protocol. For example, if you want to allow IMAP access through your firewall, you can specify imap:tcp. You can also explicitly specify numeric ports; to allow UDP packets on port 1234 through the firewall, type 1234:udp. To specify multiple ports, separate them with commas. For example:
2112:tcp,2393:udp.

Note: Type the protocol name in lower-case.

19. Click **Next**. The X Windows Setup window is displayed.

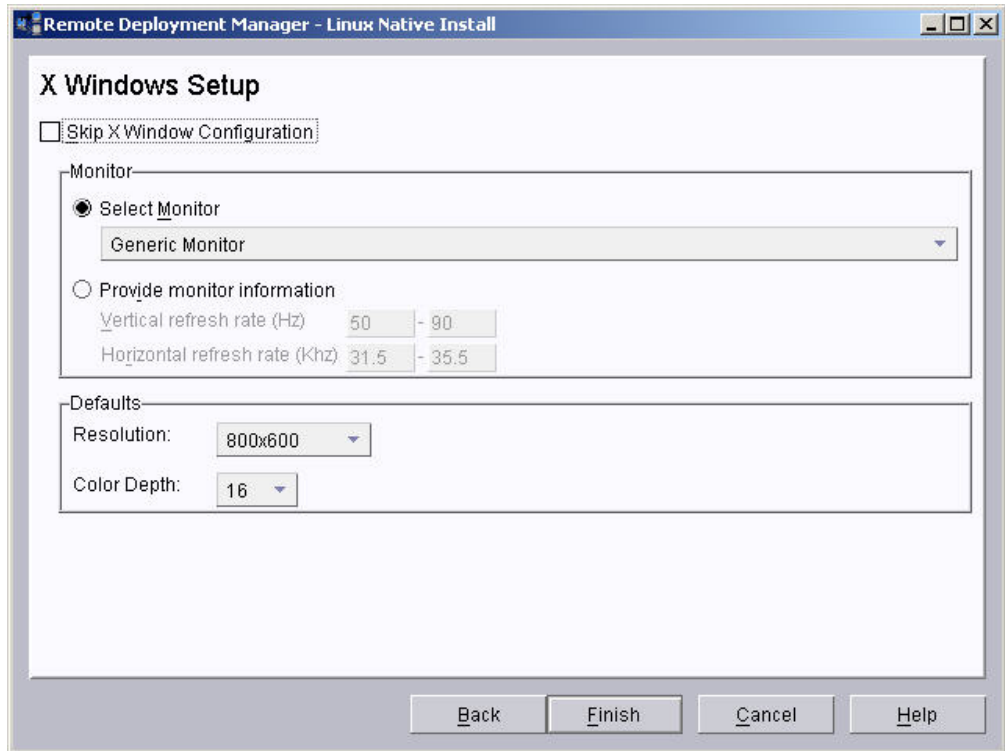


Figure 91. Linux Native Install task: X Windows Setup window, with Skip X Windows Configuration check box cleared

20. Configure the X Windows settings:

- a. By default, the **Skip X Window Configuration** check box is selected. Clear the **Skip X Window Configuration** check box to configure X Windows.

Notes:

- 1) If the **Skip X Window Configuration** check box is selected, the Linux Native Install task will not configure the X Window System. You must configure the X Window System after the installation is complete.
 - 2) RDM cannot configure X Window System support for systems with a Remote Supervisor Adapter II. For X Windows support, you must configure the X Window System after the installation is complete. For information, see “Configuring X Windows for systems with a Remote Supervisor Adapter II” on page 137.
- b. In the Monitor group box, select one of the following options:
 - **Select Monitor**
 - **Provide monitor information**
 - c. If you select **Select Monitor**, you must also select the monitor type to be used on the target system.
 - d. Click **Provide monitor information** to set the monitor parameters.
 - 1) Type the minimum and maximum vertical refresh rates in the **Vertical refresh rate** fields.
 - 2) Type the minimum and maximum horizontal refresh rates in the **Horizontal refresh rate** fields.
 - e. Select the **Resolution** and **Color Depth** settings the Linux Native Install task will use as its default monitor settings.

Note: If you allow the default monitor (Generic Monitor) to remain, and do not select the actual monitor that you will be using, Linux will ignore any resolutions higher than 800x600. If you select your actual monitor (and it allows higher resolutions), the resolution you specify is used.

21. Click **Finish**. The Linux Native Install task is displayed in the IBM Director Console Tasks pane.

Creating a customized Linux Native Install operating-system image

You can use the Image Management option to create custom Linux installation images to RDM Deployment Server. You can then use RDM to deploy those images to target systems within your network.

Complete the following steps to create a custom Linux installation image.

1. Obtain the installation source files for the Red Hat distribution.
2. Copy the Red Hat installation CDs to a directory on the management server (the server where RDM Server is installed). Maintain the directory structure.
3. Determine which package files are required for the installation.
 - a. Navigate to the `comps` file. (The `comps` file is the file in which package groups are defined.) This file is typically located in the installation source tree directory: `/RedHat/base`.

Note: The `comps` file is named “comps” in Red Hat Linux 7.3 and Red Hat Enterprise Linux Advanced Server 2.1. It is named `comps.xml` in Red Hat Linux 8.0 and Red Hat Enterprise Linux Advanced Server 2.1 Quarterly Update 2 or later.

- b. Make a backup copy of the `comps` file.
 - c. Open the `comps` file in an ASCII text editor and determine the packages or package groups that you want to remove. (Red Hat Package Manager (RPM) packages typically have interdependencies. If you remove a file that is required for the installation, the installation will fail.) If you remove a package or package group from the `comps` file, you also must remove all references to that package or package group from the `comps` file, otherwise the installation will fail.
 - d. Remove the corresponding sections in the `comps` file for each package or package group that you want to remove.
 - e. Save and close the `comps` file.
4. From the installation source files that you copied to your Linux system, remove the unnecessary package files (those files that you removed mention of from the `comps` file). Typically, these files are located in the installation source tree directory `/RedHat/RPMS` and have a `.rpm` file extension.
 5. To regenerate the `hdlist` file, issue the following command from a command prompt on a Linux system:

```
genhdlist --withnumbers installation_source_tree
```

where *installation_source_tree* is the path to the installation source tree you modified in step 4.

6. Create an operating-system installation image using the contents of *installation_source_tree* on the management server. For information, see “Creating an operating-system image” on page 112.

Important: When you create the task that will use the customized installation image, select only the packages and package groups present in the modified comps file, otherwise the installation will fail.

Running a Linux Native Install task

After you create a Linux Native Install task, you can run the task against one or more target systems.

Complete the following steps to use a Linux Native Install task to install Linux on a target system:

1. Expand **Linux Native Install**. The Linux Native Install tasks are displayed.
2. Drag the Linux Native Install task that you want to run onto the target system that you want to install Linux. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 6, "Configuring systems and tasks," on page 59.
5. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then click **OK**. Otherwise, go to step 6.
6. Click **OK**.

Configuring X Windows for systems with a Remote Supervisor Adapter II

RDM cannot configure X Windows support for systems with a Remote Supervisor Adapter II. You must configure X Windows on these target systems after the installation task is completed. Be sure to select the “X Window System” and “Classic X Window System” packages for Red Hat 7.3 and the “X Window System” package for Red Hat 8.0. Once the Linux Native Install task is completed, you can configure X Windows on the target system.

(Red Hat Linux 7.3 only) Complete the following steps to configure X Windows:

1. From a shell prompt, run the following command:
`Xconfigurator --expert`
2. When the screen that allows you to select your video adapter driver is displayed, select the following driver:
`VESA driver (generic)`
3. For the resolution use:
`1024x768`
4. For color depth use:
`16`
5. When you get to the “Starting X” window where it asks “XConfigurator will now start X to test your configuration”, select **OK**. For the GUI prompt asking if you want to have X Windows start on reboots, select **Yes**.
6. Click **OK** on the informational message pop-up that follows.
7. You should now be back at a shell prompt. To go to X Windows, type the following command:
`init 5`
You should now have a graphical login screen.

(Red Hat Linux 8.0 only) Complete the following steps to configure X Windows:

1. From a shell prompt, run the following command:
`redhat-config-xfree86 --set-driver='vesa' --forceui`
The Resolution and Color Depth settings are displayed. Pick **1024x768** for Resolution, and **Thousands of colors (16 bit)** for Color Depth. On the **Setup** tab, you can select your Monitor Type and Video Card. The Video Card value is already set to what is needed so do not change it, but you should select your Monitor Type. Click **OK** when finished.
2. Back at a shell prompt, type the following command:
`Xtest`
At the *Can you see this message?* prompt, click **Yes**. At the *Would you like to have your computer start up in graphical mode when your system starts up?* prompt, click **Yes**.
3. You should now be back at a shell prompt. To go to X Windows, type the following command:
`init 5`
You should now have a graphical login screen.

Chapter 12. Power Restore

Power Restore performs two related operations, backups and restores of the boot partition and the Master Boot Record. The Power Restore task uses the Power Restore program and a light version of the ImageCenter technology from Symantec.

This chapter explains how Power Restore performs the following work:

- The save-to-backup operation, which creates a backup image of the boot partition (usually the C: drive) of the target system and also can create a backup copy of the Master Boot Record
- The restore operation, which restores the boot partition from the selected image and also can restore the Master Boot Record from its backup copy

Power Restore works with images and partitions. An image is one or more related files and it is a copy of all the used sectors on the boot partition of the target system. A partition is a division of a disk that Power Restore uses to store up to two images in the Power Restore partition.

Information about the image files (whether they exist or not, their creation date and optional comments) are stored in the Power Restore Information Sector on the hard disk drive. The backup copy of the Master Boot Record is stored in another sector on the hard disk drive. Neither of these sectors are used by Windows or DOS.

The Power Restore partition is the same size as the active (boot) partition on the target system and is on the same drive as the boot partition. The Power Restore partition is a hidden partition, which reduces the risk of users accidentally deleting the image files.

Power Restore can be run in the following ways:

- As an RDM task
- Locally on a target system using one of the following methods:
 - A startable (bootable) diskette or CD
 - IBM Boot Manager

Review the operational guidelines before you run the Power Restore task.

Operational guidelines

See the compatibility guide for the list of release-related items for the Power Restore task.

- Power Restore is backwards compatible with Power Restore backups created with RDM 3.1 and later. It is incompatible with backups created with LCCM 3.0 and earlier.
- If you attempt to perform a Save operation on a system with an LANClient Control Manager (LCCM) 3.0-style Rapid Restore partition, the partition is replaced with an RDM 4.2-style Power Restore partition and a new Power Restore-style backup image is created.
- If you attempt to perform a Restore operation on a system with an LCCM 3.0-style Rapid Restore partition, RDM indicates a restore failure.

The Power Restore task has the following restrictions:

- The Power Restore backup partition must be the same size as the boot partition
- The Power Restore backup partition must exist on the same drive as the boot partition
- The Power Restore backup partition must be the fourth partition-table entry in the Master Boot Record
- Power Restore backups can only be made of the boot partition and the Master Boot Record; no other partitions can be backed up with Power Restore
- No more than two backup “image file” collections can exist in the Power Restore backup partition
- Restoring the Master Boot Record from a backup copy can repair a corrupted Master Boot Record, but it does not restore changes made to Windows itself (for example Windows registry information) when you use Windows tools to delete or change partitions

Running Power Restore as an RDM task

You can run Power Restore as an RDM task to save and restore backups of the boot partition and the Master Boot Record. Backups of the boot partition are saved in image files. If you select Boot Partition the image file options become available. There can be up to two image files: the **A image file** and the **B image file**. You can select either of the images, or you can choose to save to or restore from the **Older of A or B image files** or the **Newer of A or B image files**, if both image files exist on the system.

In the IBM Director Tasks pane, expand the **Remote Deployment Manager** group. Right-click **Power Restore** in the Tasks pane to display two options:

- *Create New Task* - accesses the task notebook. All of the property sheets are available for editing.
- *Edit Template* - accesses the template notebook containing all of the properties for the template. The values set in the template notebook are the defaults used when you create a new Power Restore task.

Creating a Power Restore task using RDM

When you create a task, it is added to the Tasks pane under **Power Restore**. Right-click the new task to edit, delete, or copy the task.

Complete the following steps to specify what operations and images you want created in the new Power Restore task:

1. From IBM Director Console, expand the **Remote Deployment Manager** task in the Tasks pane.
2. Right-click **Power Restore**. The Power Restore menu is displayed.
3. Click **Create new task**. The Power Restore window opens.

4. Click the **Setup** tab. The Setup page is displayed.

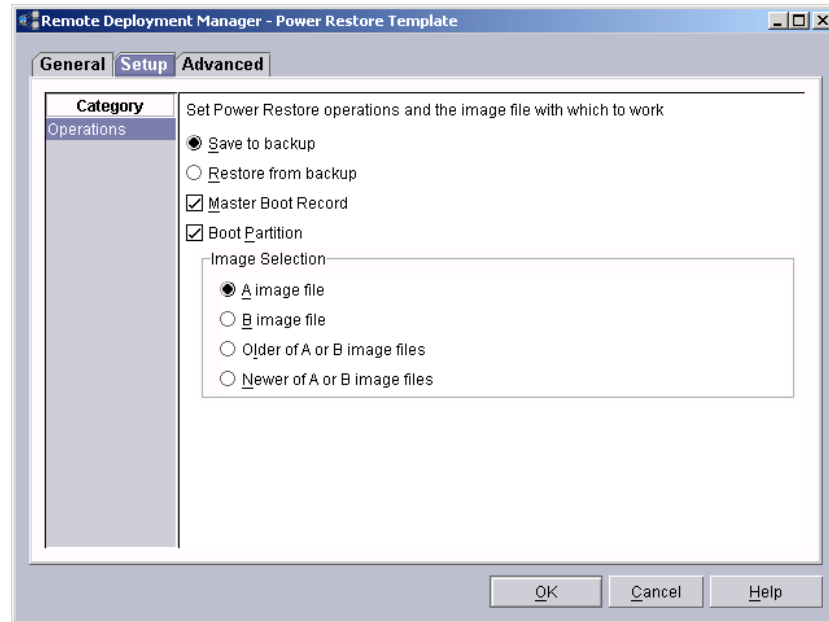


Figure 92. Power Restore Operations category

5. Select which operation you want to perform:
 - Save to backup
 - Restore from backup
6. Select what you want to backup (select either or both):
 - Master Boot Record
 - Boot Partition

Note: If you choose the Boot Partition option and the selected image file does not exist, the restore task fails.

7. Select which type image you want to use:
 - A image file
 - B image file
 - Older of A or B image files
 - Newer of A or B image files
8. Click **OK**.

The new task appears in the IBM Director Tasks pane under Power Restore.

Running Power Restore locally on the target system

Power Restore tasks are normally run as an RDM task. You can run Power Restore locally on a target system, without using IBM Director Console, by using one of the following local media:

- A startable (bootable) Power Restore diskette
- A startable (bootable) Power Restore CD-ROM
- The Power Restore partition on the target system

Note: To use the Power Restore partition, IBM Boot Manager for Power Restore must be installed on the target system.

You can use the aforementioned local media to perform the following tasks:

- Start the Power Restore backup and restore operations from a startable (bootable) diskette or CD-ROM.
- Start the Power Restore backup and restore operations by pressing the F11 function key, during the boot process of a PC, on which you have installed IBM Boot Manager.
- Create the Power Restore partition from a startable (bootable) diskette or CD-ROM.
- Install IBM Boot Manager from a startable (bootable) diskette or CD-ROM.

Using a startable disk to run Power Restore

You can install or start Power Restore from a startable disk (either a diskette or a CD-ROM). Both the install process and start process use the same disk. You must first prepare the diskette, and then create the startable CD-ROM from the diskette image to create a startable CD-ROM. Creating the diskette involves formatting it as a boot diskette and then copying specific files onto it.

Creating a Power Restore start diskette and CD-ROM

Complete the following steps to create a startable Power Restore Installation/Start diskette:

1. Insert a blank diskette into drive A on the Windows RDM Server or the first diskette drive on the Linux RDM Server
2. If running RDM on Linux, make sure the diskette is unmounted.
3. For Windows navigate to the following directory:
rdm\repository\environment\dos\restore
4. Run file build_pr.bat
5. For Linux navigate to the following directory:
/opt/IBM/RDM/repository/environment/dos/restore
6. Type the following command:
./build_pr.sh

You need to use the Power Restore Installation/Start diskette as the boot image when creating a startable Power Restore Installation/Start CD-ROM. The CD-ROM can be made using any of several popular CD-authoring software packages, a CD-ROM recorder, and a CD-R or CD-R/W disc.

Running Power Restore from startable disk

There are several states a system can be in when it is booted from the Power Restore diskette or CD-ROM. These states and their resulting actions include:

State	Action
RDM 4.2-style Power Restore partition is on system	Power Restore interface is displayed
RDM 3.1-style Power Restore partition is on system	Power Restore partition and files are updated to RDM 4.2-style and Power Restore interface is displayed
LCCM 3.0-style "Rapid Restore" or "Rave" partition is on system	Rapid Restore/Rave partition is removed and replaced with an RDM 4.2-style Power Restore partition and Power Restore interface is displayed
No Rapid Restore/Rave or Power Restore partition is on system, but adequate* free space exists on system	Power Restore partition is created and Power Restore interface is displayed
No Rapid Restore/Rave or Power Restore partition is on system and no adequate* free space exists on system	Error message is displayed

* The Power Restore partition uses the same space that is used by the boot partition. Additional partitions (such as extended partitions with logical drives defined on them) might exist on the system prior to adding a Power Restore partition. No more than four partitions, including the Power Restore partition, can exist on a system.

Complete the following steps to run Power Restore from a startable disk:

1. Change the BIOS settings on the system to boot from the diskette or CD-ROM, depending on which type of disk you want to use.
2. Insert the applicable disk into the appropriate drive.
3. Reboot or power-on the system. The Power Restore interface is displayed.
4. When the Power Restore interface is displayed, select which actions you want to perform.

Using IBM Boot Manager to run Power Restore

You can use IBM Boot Manager to run Power Restore on a system. Instead of booting from a startable diskette or CD-ROM, the system is booted from the Power Restore partition on the hard disk drive.

Note: All partitions on the system, including the Power Restore partition, must be created and formatted prior to installing IBM Boot Manager. If an unformatted partition is present, the installation will not complete.

You need to perform the following tasks before using IBM Boot Manager:

1. Have Power Restore already installed on the system
2. Create a startable IBM Boot Manager for Power Restore disk
3. Install IBM Boot Manager for Power Restore
4. Reboot the system

Creating a startable IBM Boot Manager for Power Restore installation diskette

To work with IBM Boot Manager, the Power Restore partition must be formatted as a startable FAT32 drive. IBM PC DOS 7.1, while it does understand the FAT32 file system, cannot be used if the physical start of the partition is more than four gigabytes from the physical start of the drive. This four-gigabyte starting limitation is restrictive for current computers that have hard disk drives that are much larger than eight gigabytes. To circumvent this limitation you must use versions of Microsoft DOS that work with FAT32, such as the DOS that comes with Windows 98 and Windows 98 Second Edition. You will have to obtain the Microsoft Windows 98 or Windows 98 Second Edition.

To create a startable IBM Boot Manager for Power Restore Installation diskette, perform the following steps:

1. From Microsoft Windows 98 or Windows 98 SE, format a diskette with system files by either using the format `a: /s` command from a Command Prompt window or right-click the diskette icon in My Computer or Windows Explorer, choosing the Format option, and then select **Copy system files** in the Format window.
2. Copy the `sys.com`, `himem.sys`, and `ramdrive.sys` files from the Windows 98 or Windows 98 SE system to the diskette (in default installations, the files `himem.sys` and `sys.com` can be found in the `\windows` folder and the file `ramdrive.sys` can be found in the `\windows\command` folder).
3. Insert the diskette into drive A on the Windows RDM Server or the first diskette drive on the Linux RDM Server.
4. If running RDM on Linux, make sure the diskette is unmounted.
5. For Windows navigate to the following directory:
`rdm\repository\environment\dos\restore`
6. Run file `build_bm.bat`
7. For Linux navigate to the following directory:
`/opt/IBM/RDM/repository/environment/dos/restore`
8. Type the following command:
`./build_bm.sh`

You need to use the IBM Boot Manager for Power Restore Installation diskette as the boot image when creating a startable IBM Boot Manager for Power Restore Installation CD-ROM. The CD-ROM can be made using any of several popular CD-authoring software packages, a CD-ROM recorder, a CD-R or CD-R/W disc.

Installing IBM Boot Manager for Power Restore

IBM Boot Manager for Power Restore cannot be installed as an RDM task. Installing IBM Boot Manager for Power Restore requires Power Restore to be present on the system. To install IBM Boot Manager for Power Restore on a system, set the system to boot from the diskette drive or CD-ROM, insert the IBM Boot Manager Installation diskette or CD-ROM in the appropriate drive, and power up the system. The installation is automatic and requires one reboot. When it is finished, it will prompt you to remove the diskette or CD-ROM and to power the system off.

Notes:

1. All partitions on the system must be formatted prior to installing IBM Boot Manager. If an unformatted partition is present, the installation will not complete.
2. IBM Boot Manager requires you to define the Power Restore partition in a particular entry in the Master Boot Record. If you create an additional partition on the hard disk drive after you installed IBM Boot Manager, IBM Boot Manager will not function correctly. You will need to uninstall then re-install both the Power Restore partition and IBM Boot Manager in order for Boot Manager to work.

Installing IBM Boot Manager for Power Restore requires Power Restore to be present on the system.

Creating a Power Restore task locally on the target system

You can run Power Restore locally on a system by using either a startable disk or IBM Boot Manager. When you run Power Restore locally on the target system, the system accesses one of two types of interfaces:

- GUI-based interface - Use this interface if the system has a video card capable of a 640 x 480 resolution, 256-color graphics mode. The interface looks like Figure 93:

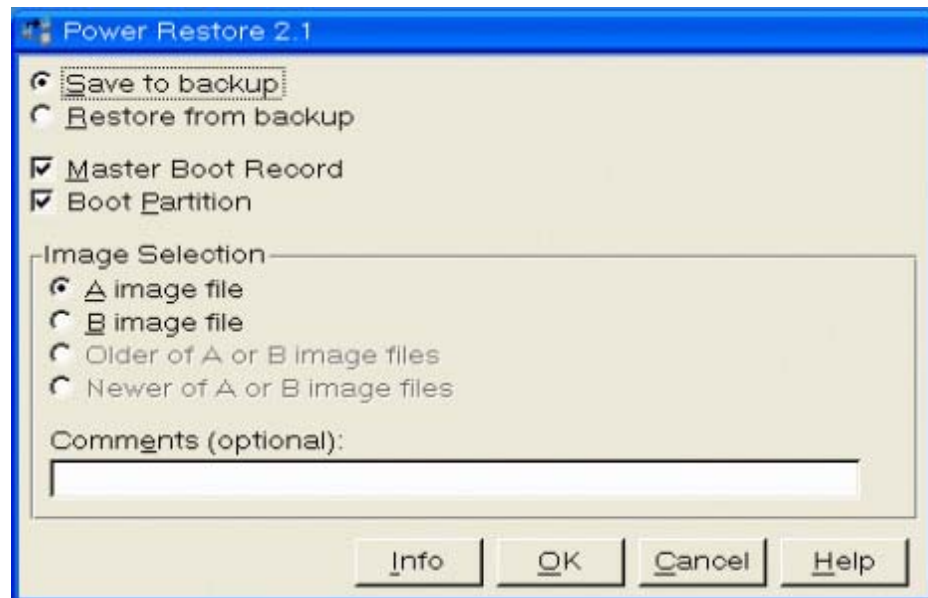


Figure 93. Power Restore GUI-based user interface

- Text-mode variation of the GUI interface - Use this interface if the system does not meet the previous GUI based requirements. The interface looks like Figure 94:

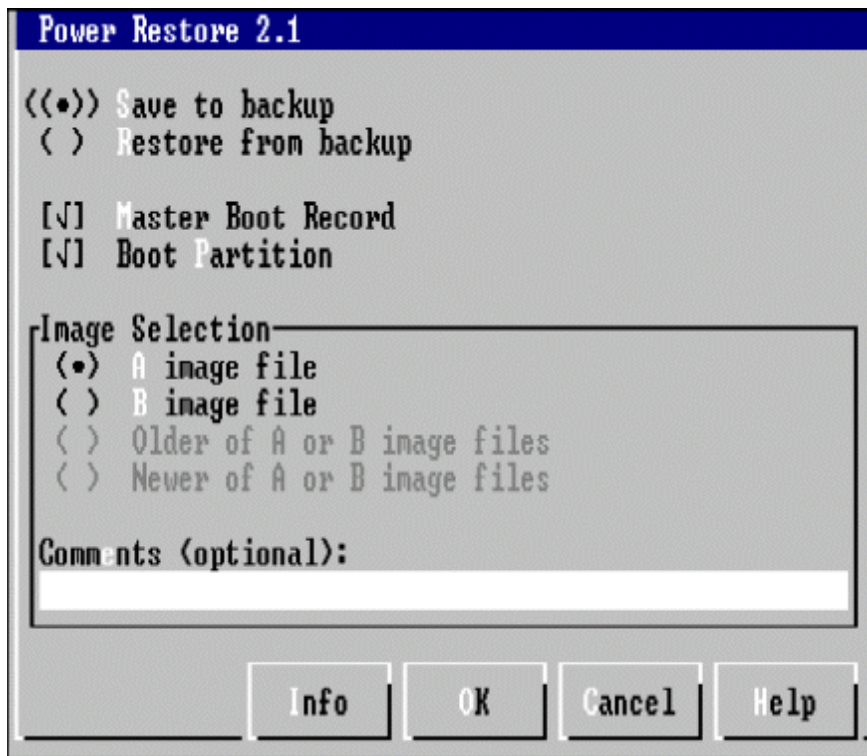


Figure 94. Power Restore text-based user interface

You can use the Power Restore interface to perform the following tasks:

- Select whether to perform a Save operation or a Restore operation
- Select whether to perform the operation on the Master Boot Record, the boot partition or both
- Select which image file to save the boot partition to or restore it from
- Define optional comments related to the selected image file on Save operations
- View optional comments related to the selected image file on Restore operations
- View the dates of the image files
- View a help window on the use of the user interface
- View information about the partition table on the boot drive

Click **OK** to perform the specified operation in the new task or **Cancel** to exit without performing any Save or Restore actions. When the selected action has finished, the system will power-off.

Note: Some systems cannot be powered off by software and must be powered off manually.

The user interface is designed to prevent you from making wrong choices, such as attempting to restore the boot partition from a non-existent image file.

Removing the Power Restore partition and IBM Boot Manager

This section describes the procedures used to remove the Power Restore Partition and IBM Boot Manager. If you are removing the Power Restore partition you must also remove the IBM Boot Manager for Power Restore application.

Removing the Power Restore partition

Removing the Power Restore partition requires the removal of both the hidden partition and the Power Restore Information Sector. Failure to do so can allow a Power Restore task to run on the target system but to fail in its operation.

Complete the following steps to remove the Power Restore partition:

1. Create a startable DOS diskette (Power Restore Uninstall Diskette).
2. Copy PARTTOOL.COM from RDM\repository\environment\dos\restore\bootmanager to the new Power Restore Uninstall Diskette.
3. Boot the system using the IBM Boot Manager for Power Restore Uninstall Diskette.
4. Run the PARTTOOL /O /P /X command, either directly or from a batch file, to remove the Power Restore partition.
5. Run the PARTTOOL /O /P /F command, either directly or from a batch file, to flush the Power Restore information sector.
6. If IBM Boot Manager for Power Restore is installed on the target system, go to "Removing IBM Boot Manager for Power Restore."
7. Remove the Power Restore Uninstall Diskette and power-off the system.

Notes:

- a. Removing the Power Restore partition frees up the space it used but does not add that space to any of the remaining partitions.
- b. If you do not perform step 5 in this process (flush the Power Restore information sector), subsequent attempts to install Power Restore on the system will fail since the Power Restore installation process will incorrectly determine that the Power Restore partition still exists on the system.

Removing IBM Boot Manager for Power Restore

Complete the following steps to remove IBM Boot Manager for Power Restore:

1. Create a startable DOS diskette (Power Restore Uninstall Diskette).
2. Copy the following files from the IBM Boot Manager for Power Restore Installation Diskette or CD to the new IBM Boot Manager for Power Restore Uninstall Diskette:
 - BMGR.EXE
 - BMGR.SCR
 - BOOT.BIN
3. Copy PARTTOOL.COM from RDM\repository\environment\dos\restore\bootmanager to the new Power Restore Uninstall Diskette.

4. Boot the system using the IBM Boot Manager for Power Restore Uninstall Diskette.
5. Run the following commands, either directly or from a batch file:
 - `BMGR /R`
 - `PARTTOOL /O /P /N`
6. Remove the IBM Boot Manager for Power Restore Uninstall Diskette and power off the system.

Chapter 13. RAID Clone Configuration

You can use the RAID Clone Configuration template to create tasks that configure the following RAID controllers:

- IBM ServeRAID controllers
- Integrated SCSI controllers with RAID capabilities (LSI 1020 or LSI 1030)
- IDEal RAID controllers
- ServeRAID-7t serial advanced technology attachment (SATA) controller
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers

The RAID Clone Configuration template uses a file to specify the RAID configuration information.

For information about RAID and RAID configurations, see the documentation that came with your RAID controller.

Note: For you to use the RAID Clone Configuration template, the IBM Director ServeRAID Manager feature must be installed on the management server.

Creating a RAID configuration file

To use the RAID Clone Configuration template, you must create a file that contains the RAID configuration information. There are two types of configuration files:

Configuration backup file

This text file contains the output that is generated when the applicable backup command is run against a RAID controller that has the configuration that you want to clone. You can manually modify the backup files for the following models:

- IDEal RAID controllers
- ServeRAID-7t SATA controller
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers

You cannot manually modify the backup files for integrated SCSI controllers with RAID capabilities (LSI 1020 or LSI 1030) and earlier ServeRAID controller models.

Configuration command file

This is a DOS batch file that contains the applicable commands that are needed to configure a RAID controller.

The following table contains information about the command-line utilities that you can use to create a configuration file.

Table 3. Command-line utilities used to configure RAID controllers

Type of RAID controller	Utility	For information, see
Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)	cfg1030	"cfg1030.exe" on page 300
IDEal RAID controller	hypercfg	"hypercfg.exe" on page 302
ServeRAID-7e (Adaptec HostRAID) for SCSI controller	raidsetl.exe	"raidsetl.exe" on page 306
ServeRAID-7t SATA controller	acu.exe	"acu.exe" on page 308
ServeRAID-7e (Adaptec HostRAID) for SATA controller	acuichsv.exe	"acuichsv.exe" on page 309
Remaining ServeRAID controller models	ipssendl	"ipssendl.exe" on page 303

To use the RAID configuration utilities, you must create a DOS-startable diskette with the applicable utility on the diskette.

Creating a DOS-startable diskette

For the following RAID controllers, you must copy the applicable utility onto a DOS-startable diskette.

- Integrated SCSI controllers with RAID capabilities (LSI 1020 or LSI 1030)
- IDEal RAID controllers
- ServeRAID-7t SATA controller
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers

If you installed RDM in the default location, the RAID configuration command-line utilities are in the following ZIP files. You can copy the applicable utility onto a DOS-startable diskette from these ZIP files:

For Linux	<code>d:\Program Files\IBM\rdm\repository\environment\dos\DOSUTILS.ZIP</code>
For Windows	<code>d:/opt/IBM/RDM/repository/environment/dos/DOSUTILS.ZIP</code>

where *d* is the drive letter of the hard disk drive.

To create a DOS-startable diskette for the remaining ServeRAID controller models, complete the following steps:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. Insert a blank diskette into the diskette drive.

- At the DOS or command prompt, type the following command and press Enter:
`e:\diskette\tools\dsk4w32 e:\diskette\dos.img a:`

where

- `e` is the drive letter of the CD-ROM drive.
 - `a` is the drive letter of the diskette drive.
- Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
 - Remove the diskette from the diskette drive and label the diskette *IBM ServeRAID Support for DOS*.

The *IBM ServeRAID Support for DOS* diskette provides the `ipssend` utility, the ServeRAID device driver for DOS (`ipsraspi.sys`), and a sample `config.sys` file. Make sure that the following line is included in the `config.sys`:

```
device=ipsraspi.sys
```

Creating a configuration backup file

You can create a configuration backup file by using the applicable command-line utility to save information about a RAID controller configuration to a diskette or physical drive.

The following characteristics of the donor and target systems must be identical:

- Type of RAID controller
- Number and size of physical drives
- Channels to which the physical drives are attached

The RAID controller in the donor system must be correctly configured before you create the backup file.

Complete the following steps to create a configuration backup file.

- Start (boot) the applicable diskette on the donor system:

RAID controller	Diskette
Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)	A DOS-startable diskette that contains the <code>cfg1030</code> utility
IDEal RAID controller	A DOS-startable diskette that contains the <code>hypercfg</code> utility
ServeRAID-7e (Adaptec HostRAID) for SCSI controller	A DOS-startable diskette that contains the <code>raidsel</code> utility
ServeRAID-7t SATA controller	A DOS-startable diskette that contains the <code>acu</code> utility
ServeRAID-7e (Adaptec HostRAID) for SATA controller	A DOS-startable diskette that contains the <code>acuichsv</code> utility
Remaining ServeRAID controller models	The <i>IBM ServeRAID Support for DOS</i> diskette

2. From the command prompt, type the applicable command:

RAID controller	Command
Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)	<code>cfg1030 backup <i>controller filename</i></code>
IDEal RAID controller	<code>hypercfg /1 /<i>filename</i></code> Note: If you do not provide a file name, hypercfg.dat is used.
ServeRAID-7e (Adaptec HostRAID) for SCSI controller	<code>raidse1 save <i>filename</i></code> Note: You must provide a file name with the extension .xml.
ServeRAID-7t SATA controller	<code>acu /r <i>filename</i></code> Note: You must provide a file name. If you do not provide the file extension, .mlc is used.
ServeRAID-7e (Adaptec HostRAID) for SATA controller	<code>acuichsv /r <i>filename</i></code> Note: You must provide a file name. If you do not provide the file extension, .mlc is used.
Remaining ServeRAID controller models	<code>ipssend backup <i>controller filename</i></code> Note: You must provide a file name.

where *controller* is the controller number and *filename* is the fully qualified name of the configuration backup file.

The backup file is created on the diskette.

Note: (ServeRAID-7t SATA controllers only) You can modify the configuration backup file for this controller model.

Creating a configuration command file

You can create a DOS batch file that contains the applicable commands for configuring a RAID controller.

Note: ServeRAID-7e (Adaptec HostRAID) for SATA and ServeRAID-7t SATA controllers do not support command files.

Example of a configuration command file for a ServeRAID controller

The following batch file might be used to configure a ServeRAID controller.

```
REM ServeRAID Command File for RDM
IPSSENDL SETCONFIG 1 DEFAULT NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSSENDL STRIPESIZE 1 32
if ERRORLEVEL 1 goto RDS_ERROR
IPSSENDL CREATE 1 LOGICALDRIVE NEWARRAY 500 1 1 0 3 0 NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSSENDL CREATE 1 LOGICALDRIVE A MAX 1 1 0 3 0 NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSSENDL CREATE 1 LOGICALDRIVE NEWARRAY MAX 5E 1 3 3 4 1 7 3 6 NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
IPSSENDL SETSTATE 1 4 0 HSP
if ERRORLEVEL 1 goto RDS_ERROR
:RDS_ERROR
```

This batch file contains commands that perform the following actions on controller 1:

1. Restores the controller to the factory-default settings.
2. Sets the controller stripe size to 32 KB.
3. Creates a logical drive on a new array; the size of the logical drive is 500 MB, the RAID level is 1, and it is made up of physical drives at channel 1, SCSI ID 0 and channel 3, SCSI ID 0.
4. Creates a logical drive on array A; the logical drive uses all available space in the array, the RAID level is 1, and it is made up of physical drives at channel 1, SCSI ID 0 and channel 3, SCSI ID 0.
5. Creates a logical drive on a new array; the logical drive uses all available space in the array, the RAID level is 5E, and it is made up of physical drives at the following locations:
 - Channel 1, SCSI ID 3
 - Channel 3, SCSI ID 4
 - Channel 1, SCSI ID 7
 - Channel 3, SCSI ID 6
6. Creates a hot spare drive from the physical drive at channel 4, SCSI ID 0.

Example of a configuration command file for an integrated SCSI controller with RAID capabilities

The following batch file might be used to configure an integrated SCSI controller with RAID capabilities.

```
REM LSI53C1020/1030 Command File for RDM
CFG1030 SETCONFIG 1 DEFAULT NOPROMPT
if ERRORLEVEL 1 goto RDS_ERROR
CFG1030 CREATE 1 LOGICALDRIVE NEWARRAY 500 1 1 0 1 1
if ERRORLEVEL 1 goto RDS_ERROR
CFG1030 SETSTATE 1 1 2 HSP
if ERRORLEVEL 1 goto RDS_ERROR
:RDS_ERROR
```

This batch file contains commands which perform the following actions on controller 1:

1. Restores the controller to the factory-default settings.
2. Creates a logical drive on a new array; the size of the logical drive is 500 MB, the RAID level is 1, and it is made up of physical drives at channel 1, SCSI ID 0 and channel 1, SCSI ID 1.
3. Creates a hot spare drive from the physical drive at channel 1, SCSI ID 2.

Example of a configuration command file for an IDEal RAID controller

The following batch file might be used to configure an IDEal RAID controller.

```
REM IDEal RAID Command File for RDM
hypercfg /am /s
```

This batch file contains a command that creates a RAID level-1 configuration.

Example of a configuration command file for a ServeRAID-7e (Adaptec HostRAID) for SCSI controller

The following batch file might be used to configure an ServeRAID-7e (Adaptec HostRAID) for SCSI controller.

```
REM ServeRAID-7e (Adaptec HostRAID) for SCSI controller Command File for RDM
raidse1 -D all
raidse1 -Z all
raidse1 -l 1 -g d0b0t410 d0b0t510
raidse1 -a build d0b0t410 -p high
```

This batch file contains commands that perform the following actions:

1. Delete all arrays in an existing configuration.
2. Clears all the physical drives on the HostRAID channel.
3. Creates a logical drive on a new array; the logical drive uses all available space in the array, the RAID level is 1, and it is made up of physical drives at the following locations:
 - Controller 0 (d0), Channel 0 (b0), SCSI ID 4 (t4)
 - Controller 0 (d0), Channel 0 (b0), SCSI ID 5 (t5)
4. Builds the RAID array. The -p high parameter forces the initialization of the array.

Creating a RAID Clone Configuration image

You can use RDM Image Management to import a RAID Clone Configuration file to the RDM repository. You can then create RAID Clone Configuration tasks to configure RAID controllers on target systems by using the file that you imported.

Complete the following steps to save a file to the RDM repository as a RAID Clone Configuration image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

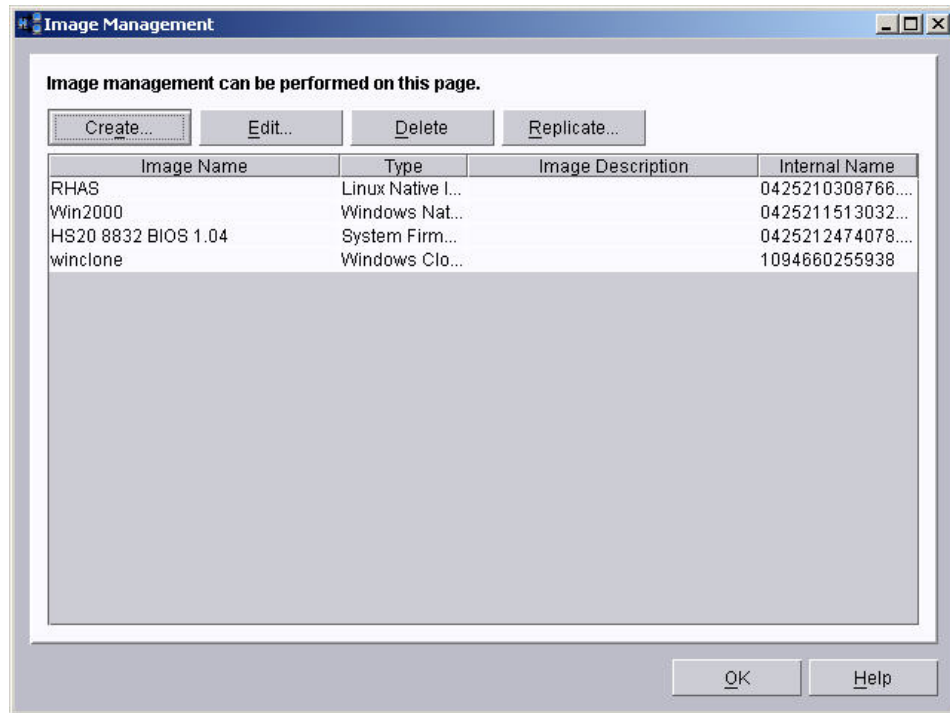


Figure 95. Image Management window

2. Click **Create**. The Create Image window opens.

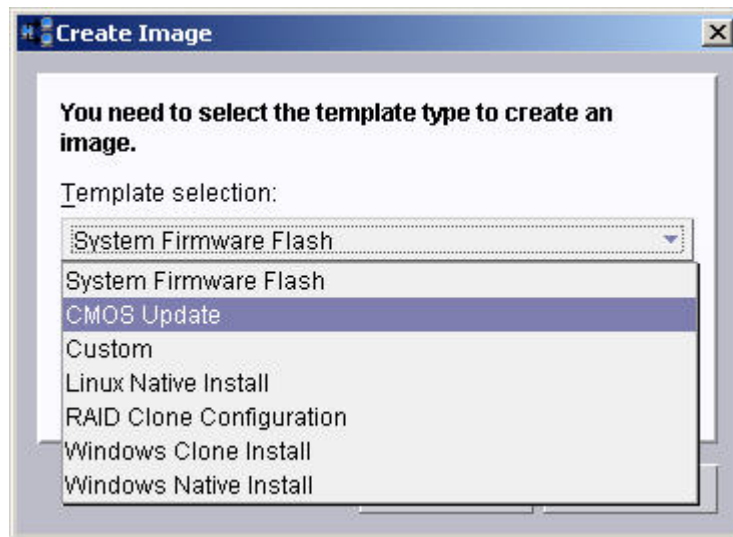


Figure 96. Create Image window

3. In the **Template selection** field, select **RAID Clone Configuration**; then, click **OK**. The Create RAID Clone Configuration Image window opens, and the General page is displayed.

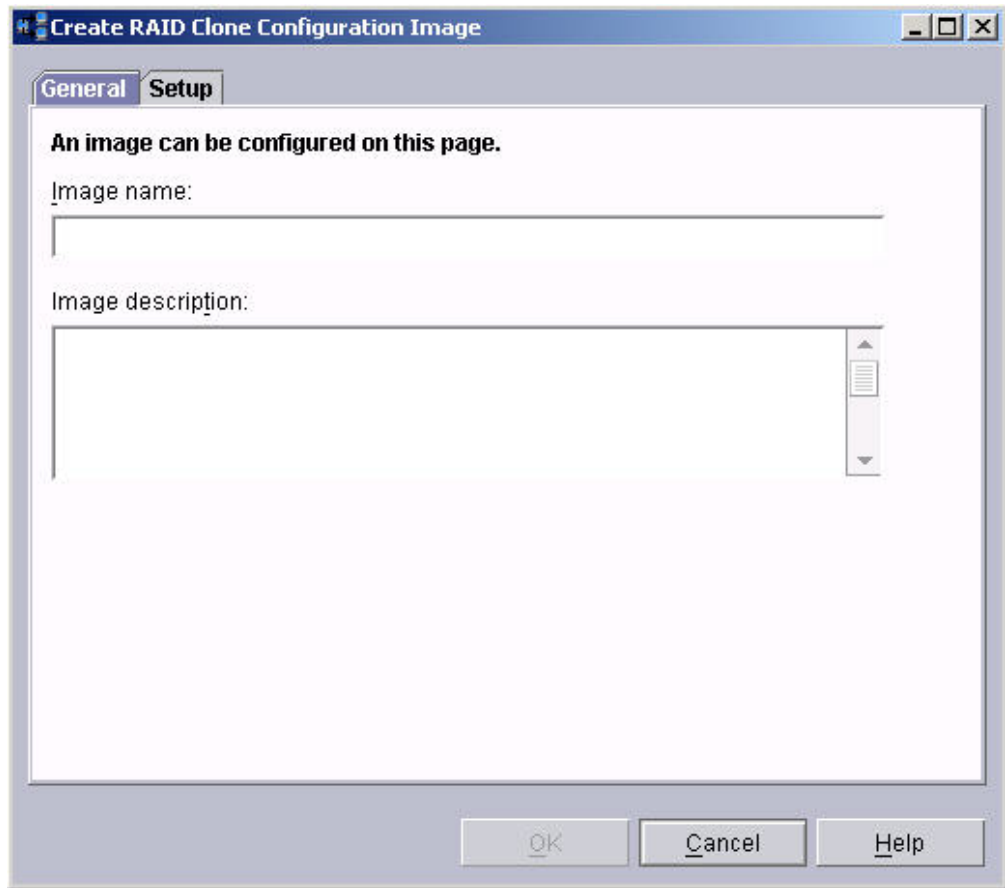


Figure 97. Create RAID Clone Configuration Image window: General page

4. In the **Image name** field, type a name for the RAID Clone Configuration image. Later, when you create a task, the name that you type in this field will be displayed in the list of images that you can select to add to the task.
5. (Optional) In the **Image description** field, type a brief description for the RAID Clone Configuration image.
6. Click **Setup**. The Setup page is displayed.

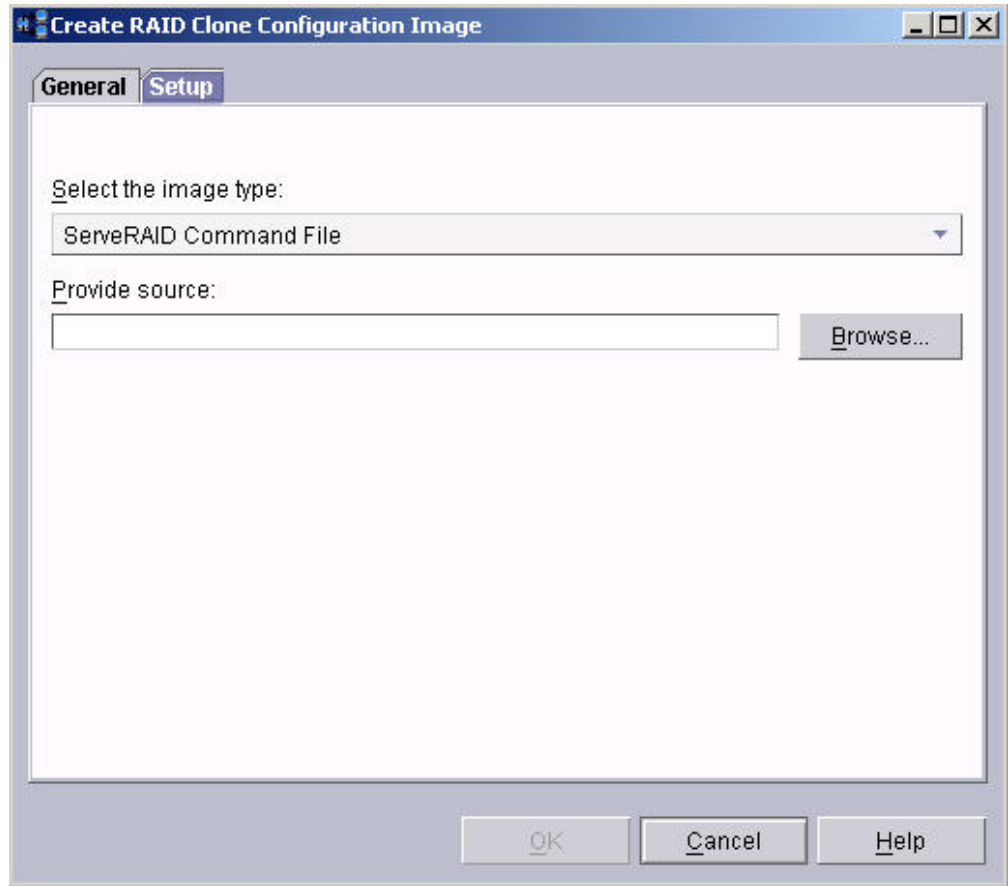


Figure 98. Create RAID Clone Configuration Image window: Setup page

7. In the **Select the image type** field, select the RAID file type that you want to use to deploy the RAID Clone Configuration image.
8. In the **Provide source** field, type the fully qualified file name of the RAID configuration file.

Otherwise, to navigate to the RAID Clone Configuration file, click **Browse**. The “Locate the RAID clone file” window opens.

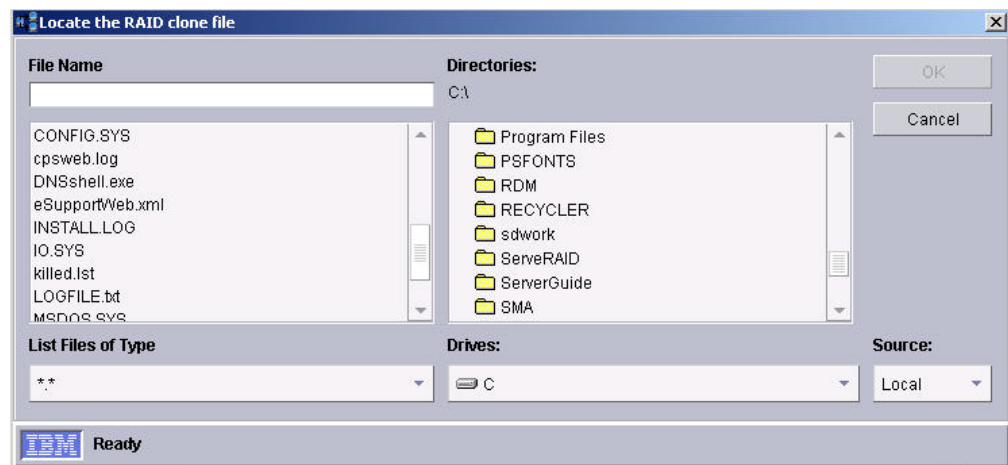


Figure 99. “Locate the RAID clone file” window

Complete the following steps to select the file:

- a. In the **Source** field, use one of the following procedures:
 - Select **Local** to browse the directories on the management console that you are using.
 - Select **Server** to browse the directories on the management server.
 - b. If you saved the image file to a diskette, insert the diskette, navigate to the file and select it. Otherwise, navigate to the directory to which you saved the file.
 - c. Click **OK**.
9. Click **OK**. The Task Image Creation Progress window opens. The RAID Clone Configuration image is saved to the RDM master repository.
 10. Click **OK**.

Creating a RAID Clone Configuration task

Complete the following steps to create a RAID Clone Configuration task:

1. In the Tasks pane, click **RAID Clone Configuration → Create new task**. The RAID Clone Configuration window opens, and the General page is displayed.

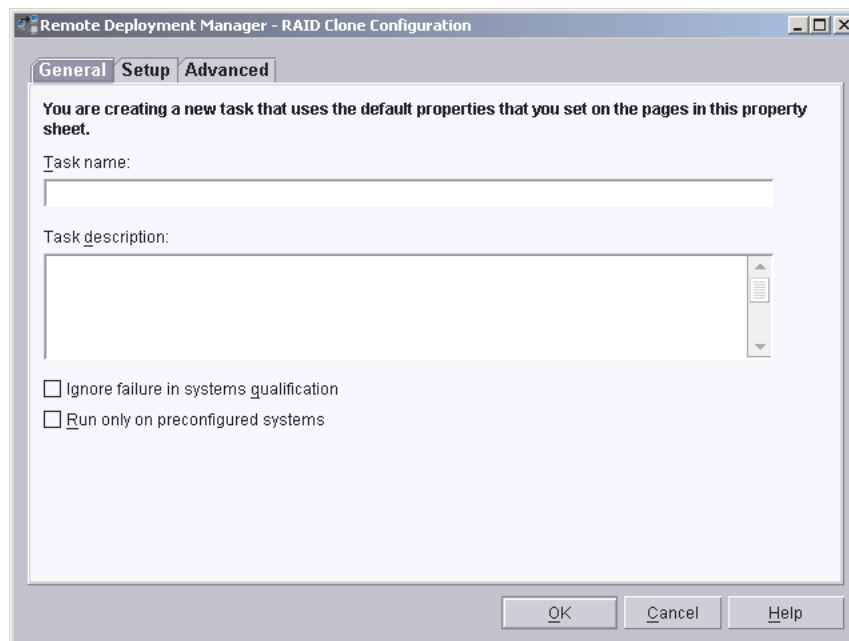


Figure 100. RAID Clone Configuration window

2. Set the basic properties for the task:
 - a. In the **Task name** field, type a unique name for the task.
 - b. (Optional) In the **Task description** field, type a description of the task.
 - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
 - d. Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values stored in the RDM database.

3. Click the **Setup** tab. The Setup page is displayed.

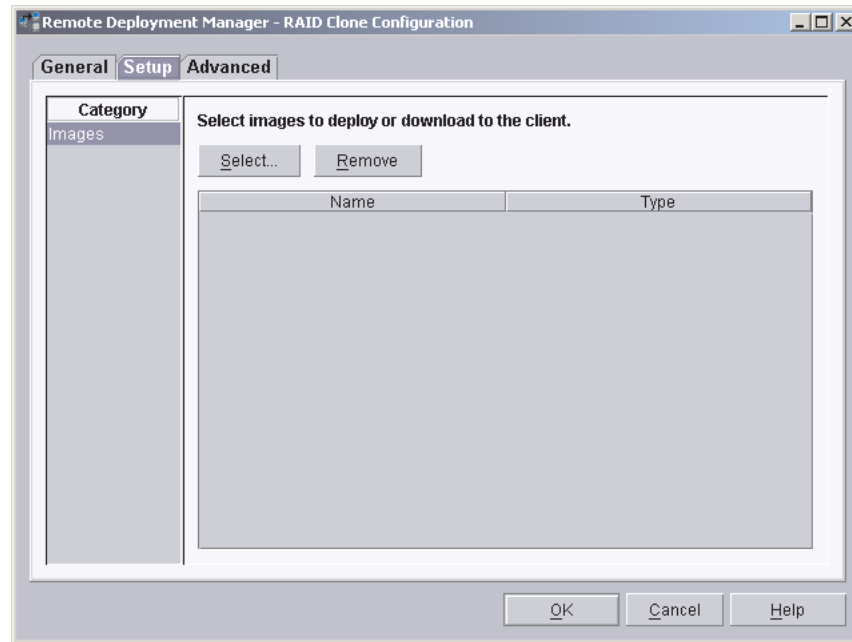


Figure 101. RAID Clone Configuration window: Setup page

4. In the right pane, click **Select**. The Image Selection window opens.

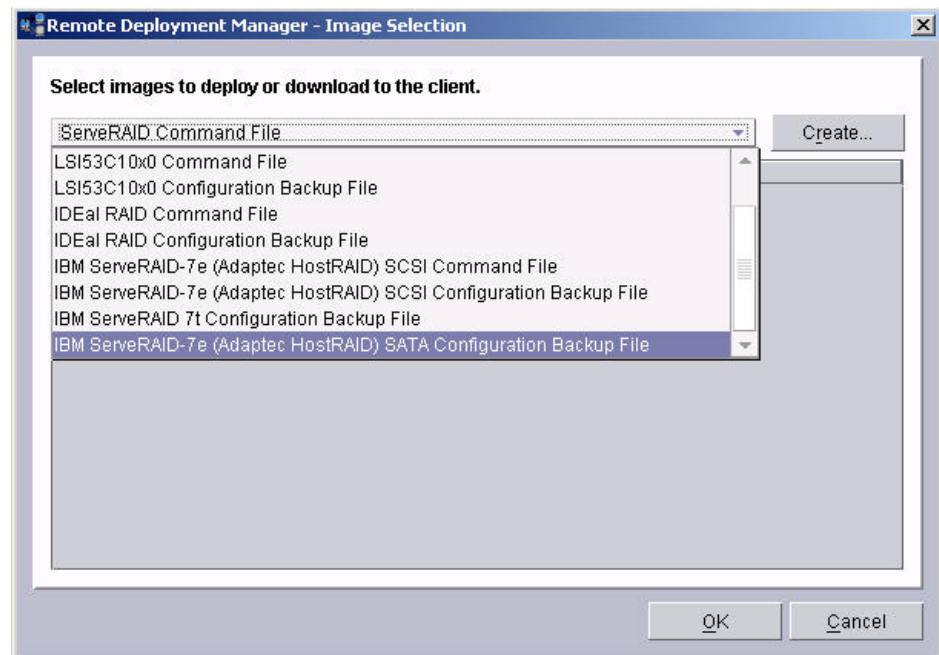


Figure 102. Image Selection window

5. If an image file for the task already exists, go to step 6 on page 160. Otherwise, create a RAID Clone Configuration image. See "Creating a RAID Clone Configuration image" on page 154.

6. Select the RAID Clone Configuration file and then click **OK**. The Setup page is displayed again, and the RAID Clone Configuration file is displayed in the right pane.
7. Click **OK**. The new task is displayed under RAID Clone Configuration in the Tasks pane of IBM Director Console.

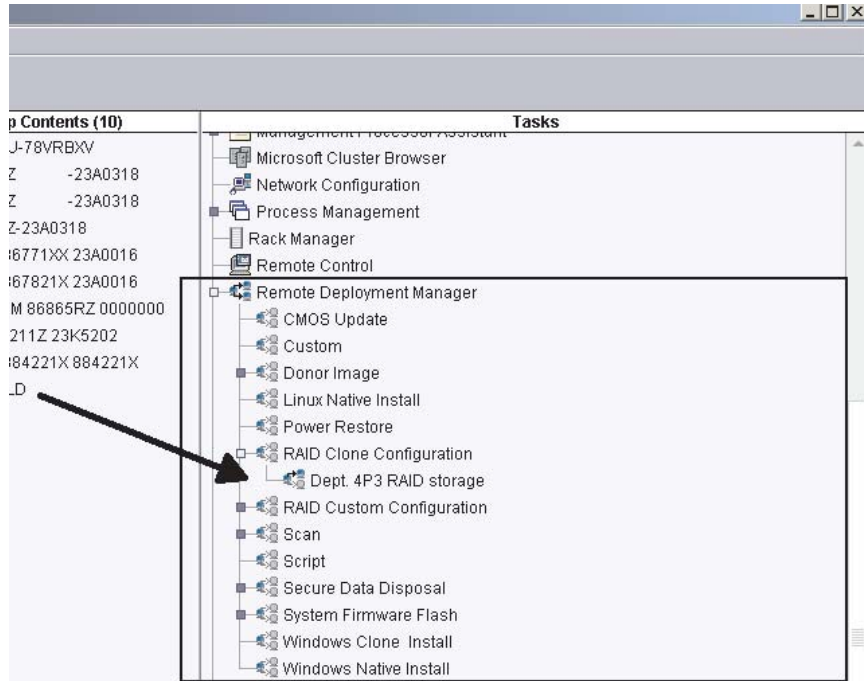


Figure 103. IBM Director Console Tasks pane: RAID Clone Configuration task

Chapter 14. RAID Custom Configuration

You can use the RAID Custom Configuration template to create tasks that configure the following RAID controllers:

- IBM ServeRAID controllers
- Integrated SCSI controllers with RAID capabilities (LSI 1020 and LSI 1030)
- IDEal RAID controllers
- ServeRAID-7t SATA controllers
- ServeRAID-7e (Adaptec HostRAID) for SCSI controllers
- ServeRAID-7e (Adaptec HostRAID) for SATA controllers

Note: For you to use the RAID Custom Configuration template, the IBM Director ServeRAID Manager feature must be installed on the management server.

For information about RAID and RAID configurations, see the documentation that came with your RAID controller.

The Express RAID Configuration task is created already. The RAID Custom Configuration template uses a wizard to gather the RAID configuration information and create other tasks.

Note: (ServeRAID-7t SATA controllers only) If you are creating a configuration backup file for the ServeRAID-7t SATA controller, the following properties are used:

- Read cache is always enabled.
- Write cache is always disabled.
- Arrays are created using the maximum size. If you enter a different size, the maximum size is used.
- Depending on the configuration method for the RAID level, a wait option determines if the method completes in the foreground or background.

RAID level	Configuration method	Wait option setting
1	Quick Init	Wait=Yes
5	Clear	Wait=Yes
10	Build/Verify	Wait=No

If you require different settings, you must create a custom configuration file using the RAID Clone Configuration task.

Express RAID Configuration task

The Express RAID Configuration task is a built-in task. It configures a RAID controller by performing the following actions:

- Creates arrays by grouping together same-sized physical drives.
- Creates one logical drive per array.

- Assigns a RAID level according to the number of physical drives in array:
 - An array with a single physical drive is assigned RAID level-0.
 - An array with two physical drives is assigned RAID level-1.
 - An array with three physical drives is assigned RAID level-5, if that RAID level is supported by the controller.
 - An array with four physical drives is assigned RAID level-10, if that RAID level is supported by the controller.
- If the assigned RAID level is not RAID level-0, RAID level-5E, or RAID level-5EE, designates a hot-spare drive for the controller. If one or more arrays have four or more physical drives, the largest-sized drive is removed from those arrays and is designated the hot-spare drive, except when RAID level-10 is used.

Creating a RAID Custom Configuration task

For ServeRAID-6 controllers and earlier models, you must create a new RAID Custom Configuration task if you want to:

- Use RAID level-1E, RAID level-5E, or RAID level-5EE
- Restrict the maximum size of a logical drive

Complete the following steps to create a RAID Custom Configuration task:

1. In the Tasks pane, click **RAID Custom Configuration** → **Create new task**. The RAID Custom Configuration window opens.

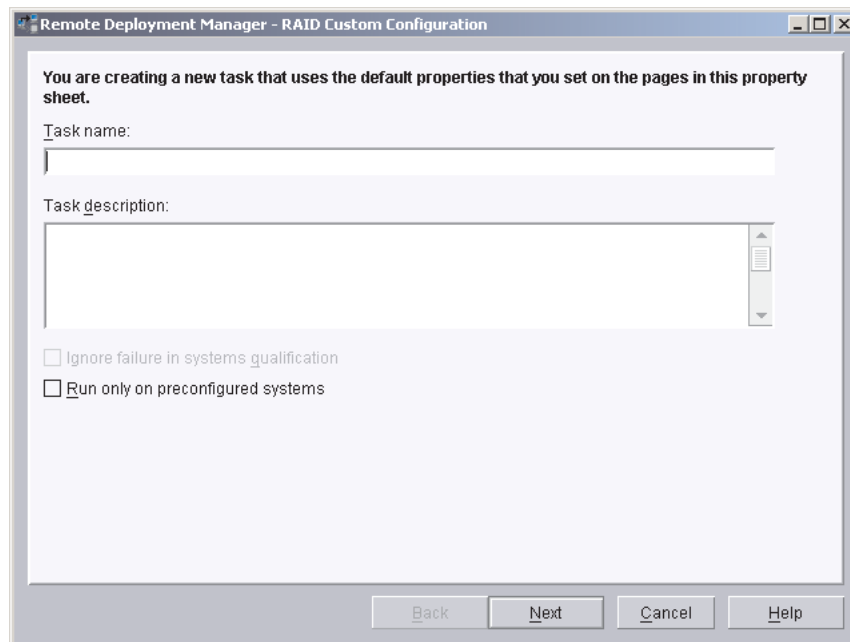


Figure 104. RAID Custom Configuration window

2. Set the basic properties for the task:
 - a. In the **Task name** field, type a unique name for the task.
 - b. In the **Task description** field, type a description of the task.
 - c. Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values that are stored already in the RDM database.

3. Click **Next**. The General Controller Information window opens.

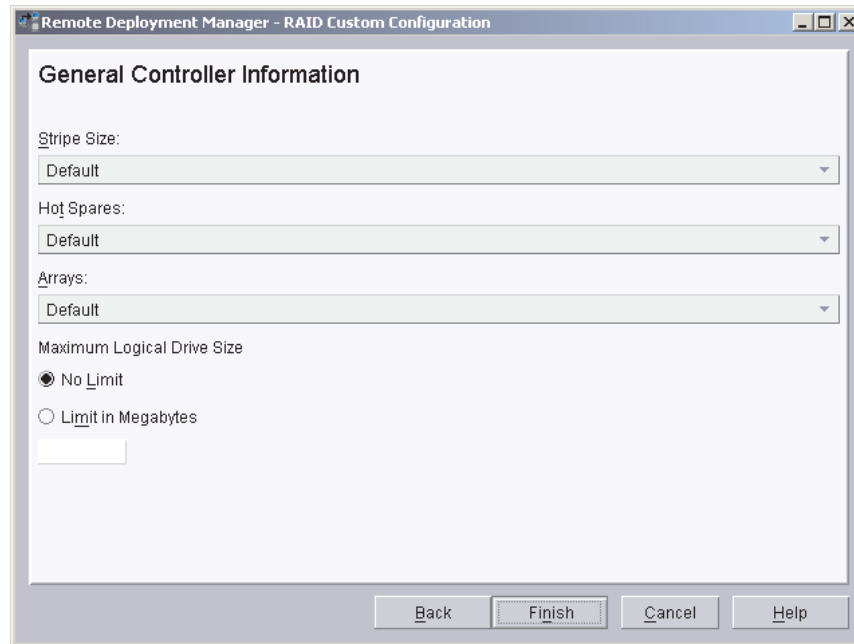


Figure 105. General Controller Information window

4. Configure the RAID controller:
 - a. In the **Stripe Size** field, select the stripe size, in bytes.

Table 4. Valid stripe sizes for RAID controllers

RAID controller	Valid stripe sizes	Default stripe size
ServeRAID controller	8 KB, 16 KB, 32 KB, and 64 KB	8 KB
Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)	1 MB Note: If you select a stripe size other than Default or 1M, when the task is run, a system qualification error is generated indicating an invalid stripe size.	1 MB
IDEal RAID controller	64 KB, 128 KB, 256 KB, 512 KB, 1 MB, 2 MB, and 4 MB	64 KB
ServeRAID-7e (Adaptec HostRAID) for SCSI controller	16 KB, 32 KB, and 64 KB	64 KB
ServeRAID-7t SATA controller	16 KB, 32 KB, and 64 KB	64 KB
ServeRAID-7e (Adaptec HostRAID) for SATA controller	16 KB, 32 KB, and 64 KB	32 KB

- b. In the **Hot Spares** field, select the number of hot-spare drives. You can select any number in the range 0 through 8. If the RAID level is 1, 1E, or 5, the default value is 1; otherwise, the default value is 0. Whether you can specify a hot-spare drive depends on the RAID level of the logical drive and the number of physical drives in the array.

Note: You cannot assign a hot-spare drive for a RAID level-0 logical drive. Nor can you assign a hot-spare drive for RAID level-5E and RAID level-5EE logical drives as they have built-in spare drives.

- c. In the **Arrays** field, select the number of arrays. You can select any number in the range 0 through 8. If you select the default value, the arrays are configured according to the algorithm that is used for the Express Configuration task.
- d. Set the maximum size of the logical drive. By default, **No Limit** is selected. If you select **Limit in Megabytes**, type the maximum size (in MB) of the logical drive.

Notes:

- 1) (IDEal RAID, ServeRAID-7e (Adaptec HostRAID) for SCSI, ServeRAID-7t SATA, and ServeRAID-7e (Adaptec HostRAID) for SATA controllers) You cannot limit the maximum size of the logical drive. These controllers use the maximum size even if you select **Limit in Megabytes**.
 - 2) (ServeRAID controllers and integrated SCSI controllers with RAID capabilities (LSI 1020 and LSI 1030)) Consider setting a maximum logical drive size if the operating system that you plan to install has restrictions concerning the size of logical drives.
5. If you selected **Default** in the **Arrays** field, go to step 11 on page 167. Otherwise, click **Next**. The Array Information window opens.

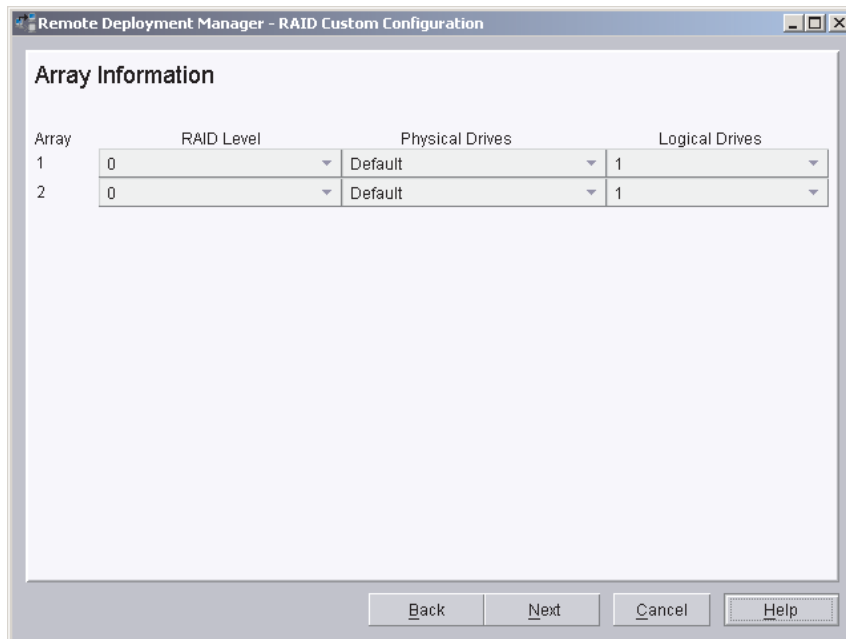


Figure 106. Array Information window

6. Configure the array:

- a. In the **RAID Level** field, select a RAID level. This RAID level is used for all logical drives in the array.

Table 5. Valid RAID levels for RAID controllers

RAID controller	Valid RAID levels
ServeRAID-5i controller and earlier models	0, 1, 1E, 5, 5E, or 10 Note: If you select RAID level-5EE for one of these models, the RAID level is changed automatically to RAID level-5E.
ServeRAID-6i controller and later models	0, 1, 1E, 5, 5EE, or 10 Note: If you select RAID level-5E for one of these models, the RAID level is changed automatically to RAID level-5EE.
Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)	1
IDEal RAID controller	0 and 1
ServeRAID-7e (Adaptec HostRAID) for SCSI controller	0, 1, and 10
ServeRAID-7t SATA controller	0, 1, and 10
ServeRAID-7e (Adaptec HostRAID) for SATA controller	0, 1, and 10

- b. In the **Physical Drives** field, select the number of physical drives that make up the array. You can select any applicable number in the range 1 through 16, as long as the number of physical drives is available and allowable for the selected RAID level. If you select the default value, the minimum number of physical drives that are required for the specified RAID level is allocated. If you select the default value for the last array, the maximum number of available physical drives is allocated
- c. In the **Logical Drives** field, select the number of logical drives in the array. See the following table for the maximum number of logical drives that you can configure on each RAID controller.

Table 6. Maximum number of logical drives that you can configure for each RAID controller

RAID controller	Maximum number of logical drives
ServeRAID controller	8
Integrated SCSI controller with RAID capabilities (LSI 1020 and LSI 1030)	1
IDEal RAID controller	8
ServeRAID-7e (Adaptec HostRAID) for SCSI controller	4
ServeRAID-7t SATA controller	4
ServeRAID-7e (Adaptec HostRAID) for SATA controller	4

7. Repeat steps 6a to 6c for each array.

8. Click **Next**. The Logical Drive Information window opens.

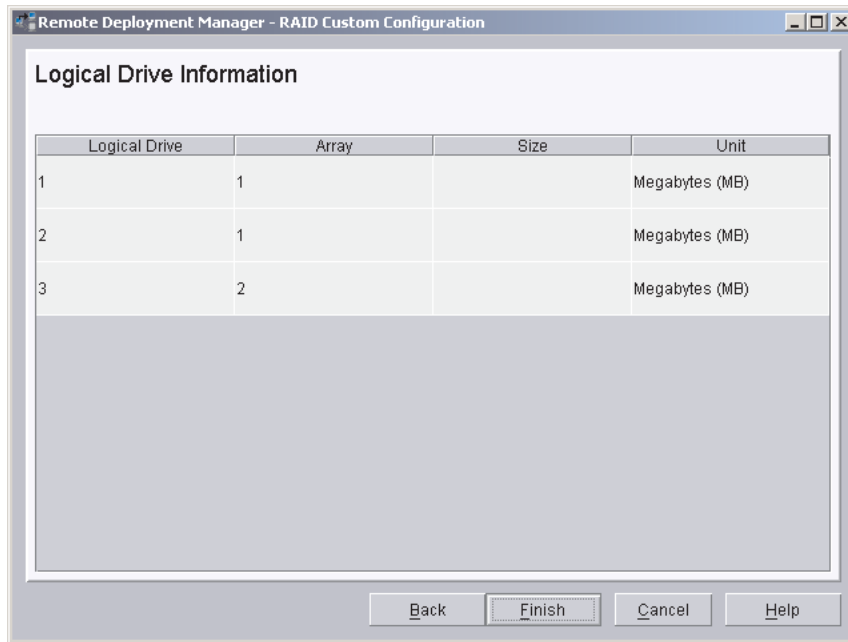


Figure 107. Logical Drive Information window

9. Configure the logical drive:
 - a. In the **Size** field, type the size of the logical drive (in MB or as a percentage of the available space).
 - b. In the **Unit** field, select the unit of measurement.

Notes:

- a. (IDEal RAID, ServeRAID-7e (Adaptec HostRAID) for SCSI, ServeRAID-7t SATA, and ServeRAID-7e (Adaptec HostRAID) for SATA controllers) Regardless of the size that you select, the logical drive is configured to use the maximum available physical drive space.
 - b. Logical drives that are assigned a size in MB are configured before logical drives that are assigned a size as a percentage of the available space. For example, if you specify that an array contains three logical drives of sizes 2000 MB, 50%, and 4000 MB, and if the total available size for the array is 16 GB, the size of logical drive 2 is 5 GB ($.50 * (16 \text{ GB} - 6 \text{ GB})$).
10. Repeat steps 9a to 9b for each logical drive.

11. Click **Finish**. The new task is displayed in the Tasks pane under the RAID Custom Configuration task.

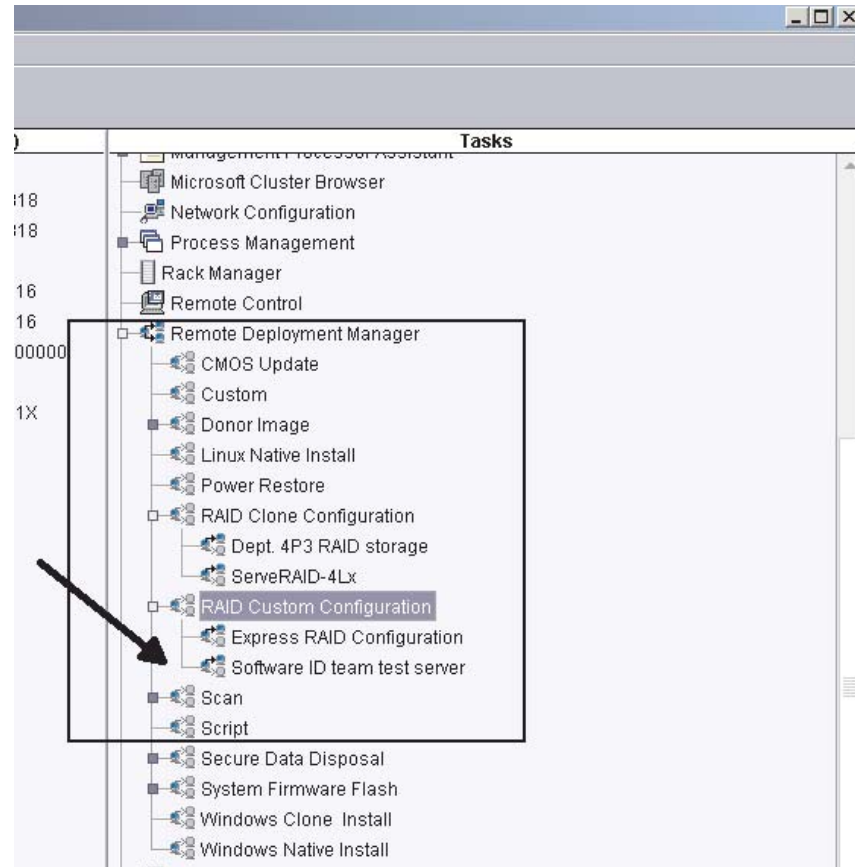


Figure 108. IBM Director Console Tasks pane: RAID Custom Configuration task

Chapter 15. Remote Storage Configuration

You can use the Remote Storage Configuration template to create tasks that allocate and deallocate a logical unit number (LUN) on a remote storage network. This chapter provides information about how to use the predefined Remote Storage Configuration tasks that are installed with RDM, and it also provides the steps that are required to create remote storage configuration tasks.

Working with network storage devices requires the following tasks:

- Add the network storage devices. Use the Network Storage tool to add information about your network storage devices. See “Network storage devices and switches” on page 172 for more information.
- Configure the remote storage. Use the Remote Storage Configuration task to configure your network storage devices. See “Configuring remote storage” on page 176 for more information.

FASTT Storage Manager 8.42 or later must be installed on the management server. The path environment variable must include the directory that contains SMcli.exe. The Storage Partitioning Premium Feature key must also be installed on the FASTT storage server. The Qlogic adapters in the fabric must have version 1.35 or later BIOS code.

Supported devices

See the compatibility guide for the list of supported Fibre Channel storage servers and switches. Nonsupported switches can be a functional part of the fabric if one of the supported BladeCenter Fibre Channel switches is present in the network.

Shared LUNs are not supported by remote storage in RDM 4.20. This has the following effects:

- You cannot create a shared LUN by using an Allocate LUN task.
- The Get profile task will not save information about shared LUNs, and put profile will not restore any shared LUN information.
- The Delete Mapping and LUNs task will not delete any shared LUN or its mapping.
- The Configure Fibre host bus adapter (HBA) task will not configure boot to a shared LUN.

Network storage configuration examples

Network storage devices can have different configurations. Each of the three network configurations that are shown use a BladeCenter chassis with a Fibre Channel switch. In each configuration, RDM Server must have IP connectivity to both the network storage devices and the BladeCenter unit.

Figure 109 is a basic network storage configuration.

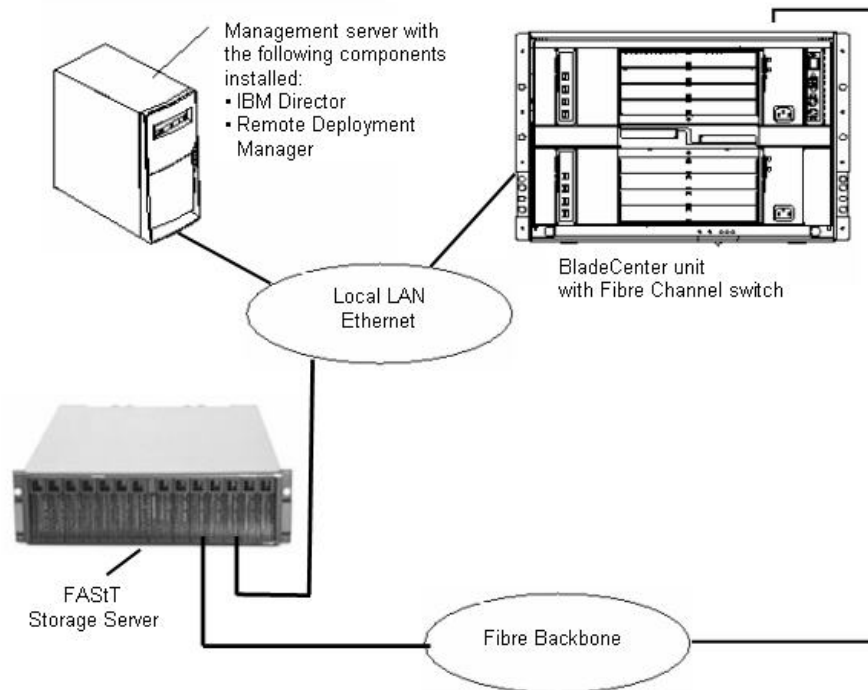


Figure 109. Basic network storage configuration

Figure 110 shows a configuration that incorporates an external Fibre Channel switch or stand-alone server into the fabric. The stand-alone server must have a Qlogic Fibre Channel adapter installed.

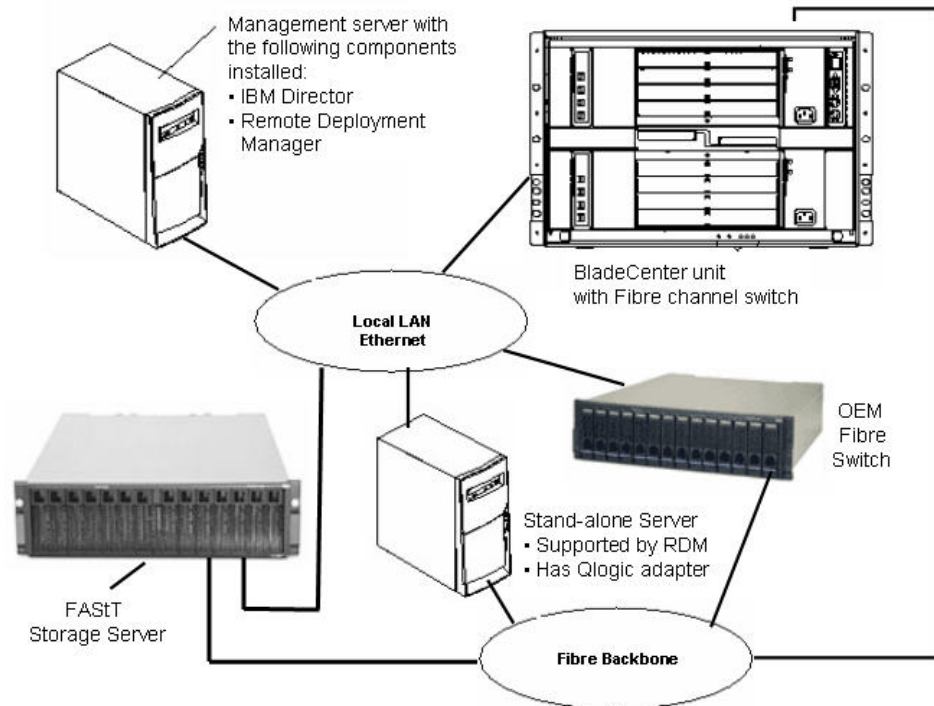


Figure 110. Network storage configuration with external Fibre Channel switch and stand-alone server

Figure 111 shows a configuration of storage devices in a remote network. The remote storage devices must be able to communicate over Ethernet with RDM Server.

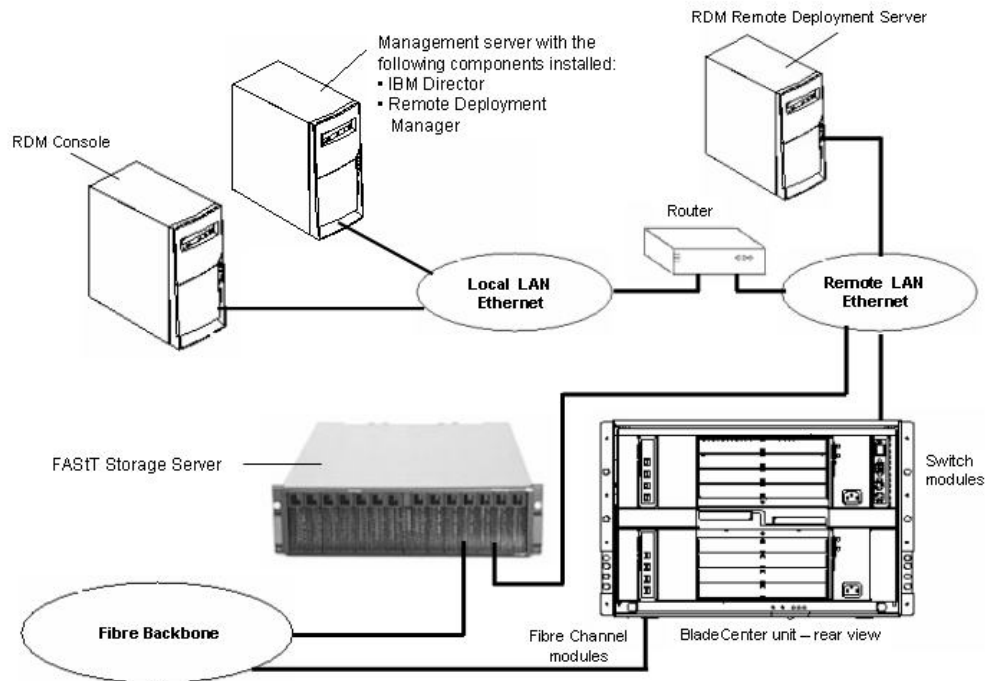


Figure 111. Network storage configuration with Remote Deployment Server

Network storage devices and switches

RDM provides a Network Storage notebook in which you can enter information about the Fibre Channel storage servers and switches in the storage area network (SAN). You can use Remote Storage Configuration to add network storage devices and switches to the SAN.

Adding a network storage device

Complete the following steps to add information about a network storage device:

1. In IBM Director Console click **Tasks** → **Remote Deployment Manager** → **Network Storage**. The Network Storage Configuration window opens. Previously added storage devices and their associated information are displayed.

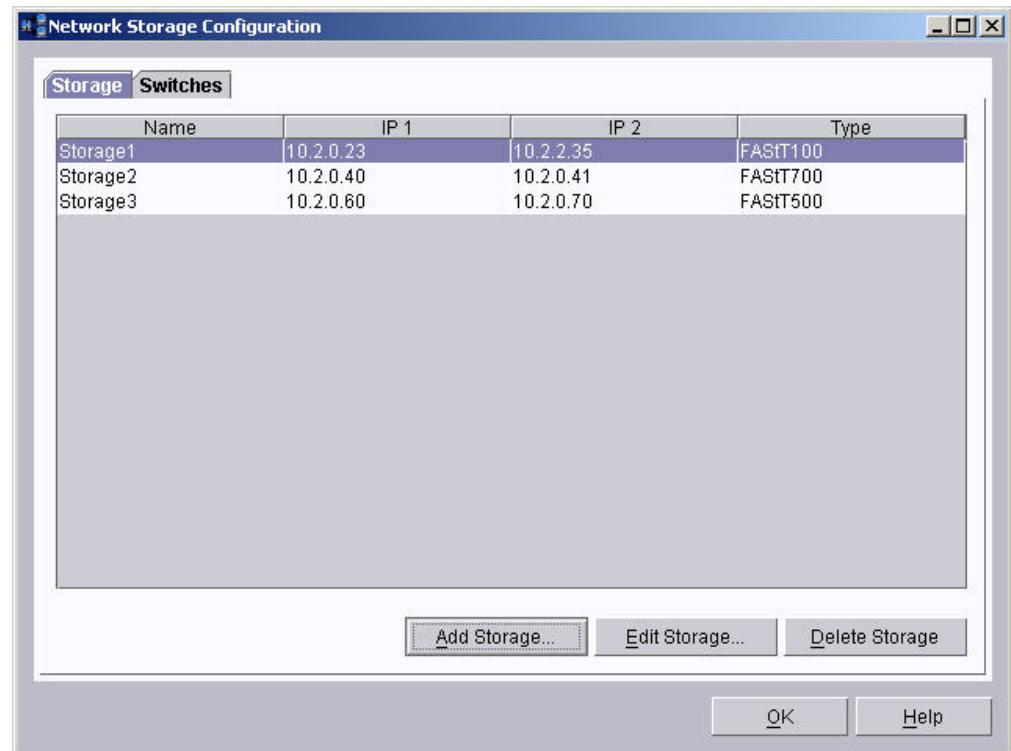


Figure 112. Network Storage Configuration window: Storage page

2. Click **Add Storage** to add a network storage device. The Add Storage window opens.

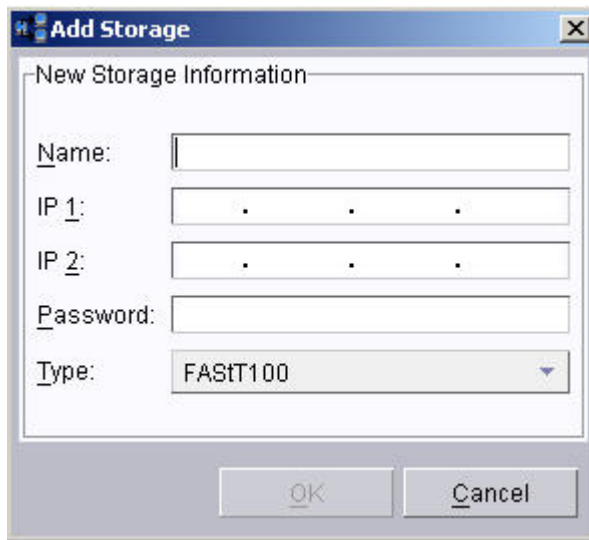


Figure 113. Add Storage window

3. In the **Name** field, type a name (maximum of 255 characters) to identify the network storage device in the RDM storage device list. There are no character restrictions for this field.
4. In the **IP 1** field, type the first IP address of the selected network storage device that you want to add.
5. If both controllers on the FAST storage server are enabled, in the **IP 2** field, type an IP address.
6. If a password has been enabled on the FAST storage server, in the **Password** field, type the password.
7. In the **Type** field, select the storage device type for the network storage device. The following choices are available:
 - FAST100
 - FAST200
 - FAST500
 - FAST600
 - FAST700
 - FAST900
8. Click **OK** to add the selected data for the new storage device. The Network Storage Configuration window opens.

Adding a switch

Complete the following steps to add information about a switch:

1. In IBM Director Console click **Tasks** → **Remote Deployment Manager** → **Network Storage**. The Network Storage Configuration window opens.
2. Click the **Switches** tab. The Switches page is displayed. Previously added switches and their associated information are displayed.

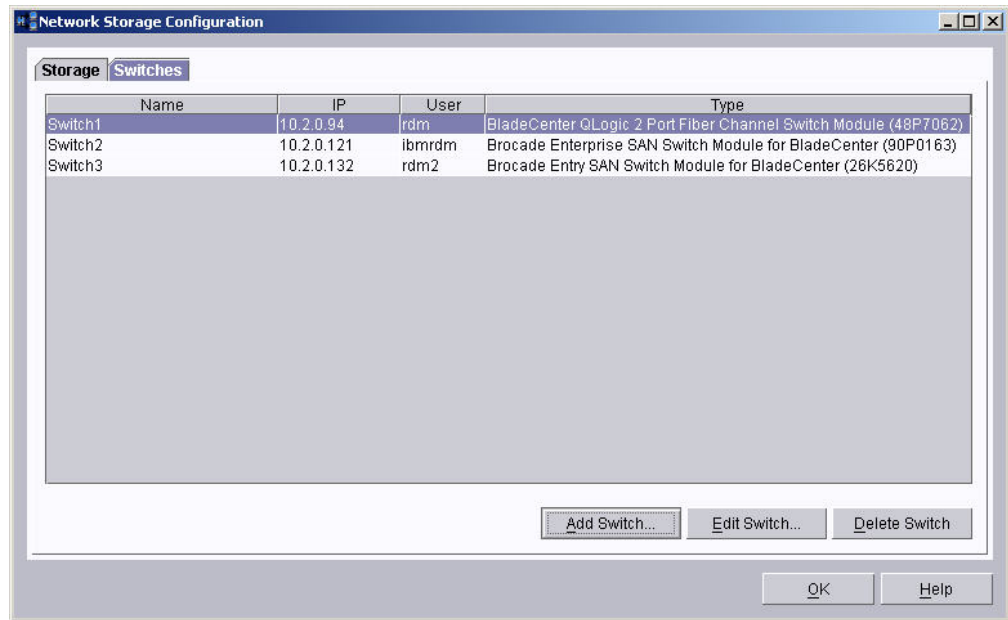


Figure 114. Network Storage Configuration window: Switches page

3. Click **Add Switch**. The Add Switch window opens.

Note: When adding a switch, add only two per fabric, one as the primary and the second as a backup-failover switch.

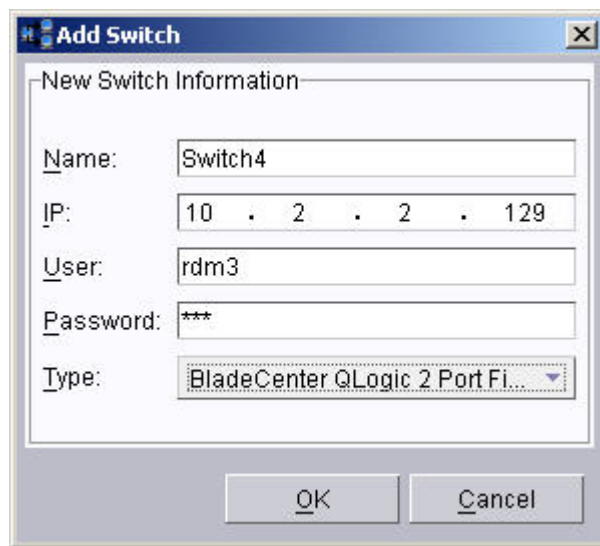


Figure 115. Add Switch window

4. In the **Name** field, type a descriptive name for the switch.
5. In the **IP** field, type the IP address of the switch.
6. If security has been enabled for the switch, in the **User** field, type the user ID that is used to access the switch.
7. In the **Password** field, type a password.
8. In the **Type** field, select the switch type from the following choices:
 - BladeCenter Qlogic 2 Port Fibre Channel Switch Module

- BladeCenter Qlogic 6 Port Fibre Channel Switch Module
 - Brocade Enterprise SAN Switch Module for BladeCenter
 - Brocade Entry SAN Switch Module for BladeCenter
9. Click **OK**. The Network Storage Configuration window opens.

Configuring remote storage

After you add the required information about your network storage devices and switches, you must configure them by using the Remote Storage Configuration task. You can modify and configure remote storage in the following ways:

- Modify the defaults and policy settings in the Storage Server Provisioning Tool (SSPT) file SSPTSetting.xml
- Create a new Allocate LUN task
- Configure a system by using one of the following options:
 - User-created Allocate LUN task
 - One of the five predefined Remote Storage Configuration tasks

Modifying the SSPTSetting.xml file

SSPT performs the background remote storage configuration function for RDM. The Remote Storage Configuration task options are controlled by the SSPTSetting.xml file, which is in the RDM\local directory. The settings in the SSPTSetting.xml file affect all the remote storage tasks except the Configure HBA and Get Host Profile tasks. This file controls the following items:

- Zoning policy
- Storage allocation policy
- Default zone, host groups, and device names (for example, LUN prefix)

You can change the configuration by modifying the values in the SSPTSetting.xml. The modified values do not take effect until you restart IBM Director. The following table contains information about the commonly used fields in the SSPTSetting.xml file and what those modifiable fields represent.

Table 7. SSPTSetting.xml file field definitions

Element	Content
HostGroupName	Use this field to specify the default host group name RDM_Group.
DeviceNamePrefix	Use this field to specify the default LUN name prefix DEV_.
PoolAllocationPolicy	Use the default MINIMAL to select the smallest drive that will satisfy the requested LUN size. If you select the MAXIMAL option the configuration takes the largest number of same size drives that will satisfy the requested LUN size.
UseOfDifferentSizedDevicesEnabled	Use this field to specify the use of different size devices to satisfy the storage request. If you get a failure message that states Not enough space and the FAST Storage Manager shows that you have enough storage space for the request, change this setting to true. Enabling the use of different sized storage devices is one solution that might fix the problem and let you complete the storage request. The default is false.
FabricZoningEnabled	Use this to set up zones for future connections. Note: If zoning was previously disabled, any connections that were made through the switch will be lost and need to be manually added to the zone, after enabling this option. The default is true.

Table 7. SSPTSetting.xml file field definitions (continued)

Element	Content
FabricNumberOfZones	Use this field to specify the maximum number of Fibre Channel zones you want created by SSPT. The default value is 16.
FabricZoneName	Use this field to specify the zone name prefix that SSPT will use. The default name is RDMZone.
FabricInstallZoneName	Use this field to specify the zone name prefix that RDM/SSPT will use when installing operating systems. SSPT will create a special install zone to eliminate multiple paths during installations. The default name is RDMInstallZone.
FabricZoneSetName	Use this field to specify the zone set name that SSPT will use if no active zone set has been found in the fabric. The default name is RDMZoneSet.

Creating an Allocate LUN task

To configure storage devices that are on a remote SAN, RDM uses the values you set in the template to allocate and deallocate LUNs when you deploy a server. To access the template expand the Remote Deployment Manager group. Right-click the **Remote Storage Configuration** task. Two options are available:

- Create New Allocate LUN Task
- Edit template

Select **Create New Allocate LUN Task** to define the characteristics of a storage server and assign a name to that LUN. This task allocates a LUN on a remote storage server and configures the client HBA to detect any boot LUN (LUN 0) that is allocated. The Create New Allocate LUN task uses the standard RDM notebook that consists of these tabs: **General**, **Setup**, and **Advanced**. Use the Setup page to create, configure and delete LUNs.

To create a new Allocate LUN task, complete the following steps:

1. From the IBM Director Console Tasks pane, right-click **Remote Storage Configuration**.
2. Click **Create New Allocate LUN Task**. The Remote Storage Configuration window opens.

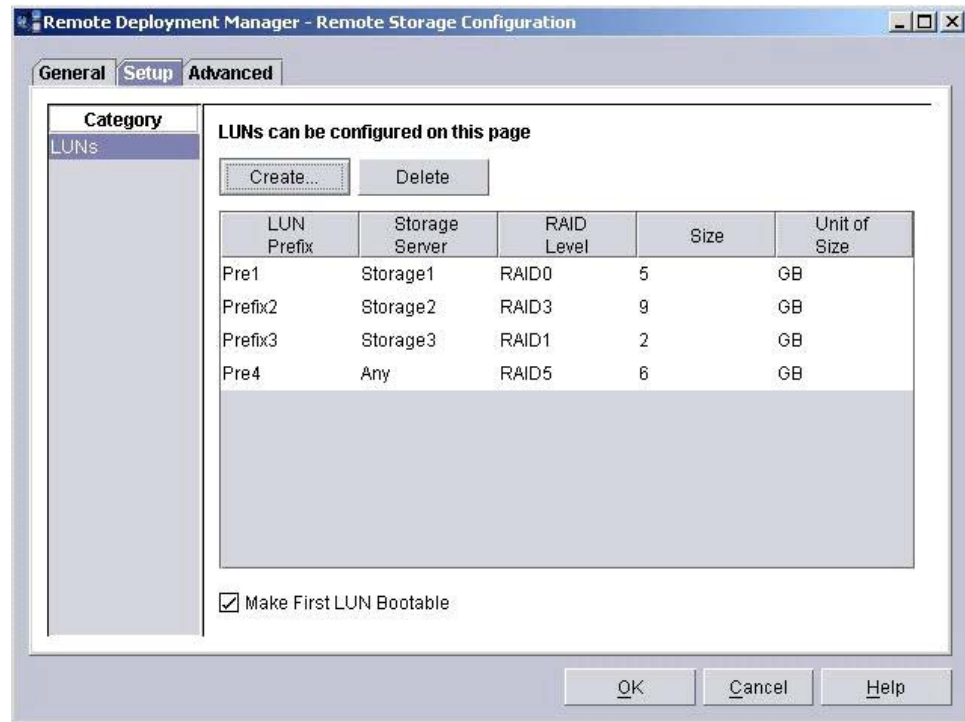


Figure 116. Remote Storage Configuration: Configuring LUNs

3. Enter the General and Advanced tab information. The **General** and **Advanced** properties are explained in Chapter 3, “Working with RDM templates,” on page 15. The remainder of this procedure provides information about the Setup properties for Remote Storage Configuration.
4. Click the **Setup** tab.
5. Click the **Make First LUN Bootable** check box to make the first LUN in the list LUN 0. This check box is selected by default. If you do not select this check box the first LUN receives the first available LUN number (for example LUN 1).
6. Click **Create**. The Create LUN window opens.

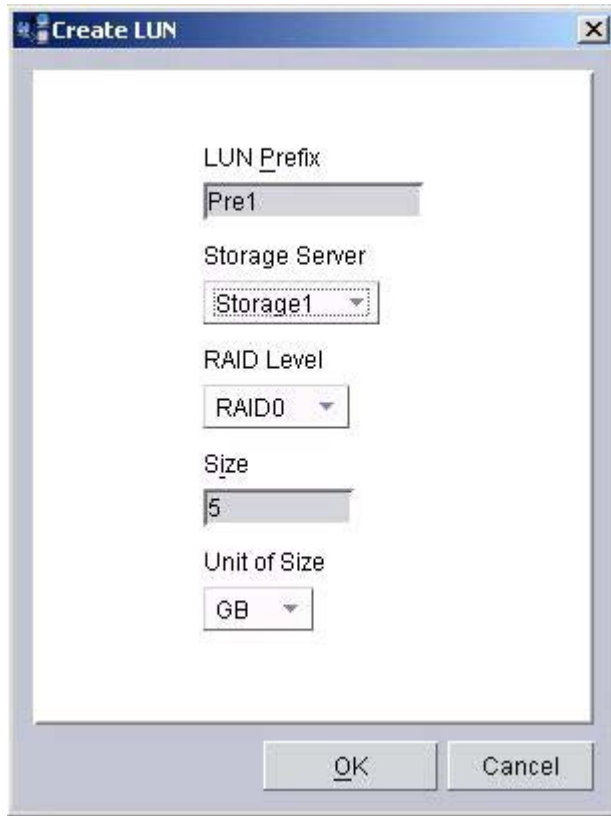


Figure 117. Create LUN window

7. In the **LUN Prefix** field, type a LUN prefix (maximum of 10 characters and double quotes can not be used in the name). This prefix is combined with a unique ID to create a LUN name. If you leave this field blank, the default prefix **DEV_** is used. You can modify the default prefix in the SSPTSetting.xml file. See “Modifying the SSPTSetting.xml file” on page 177.
8. In the **Storage Server** field, select a storage server to allocate space from, or select **Any** to allocate space from any available storage server. This field lists all the supported storage servers.
9. In the **RAID Level** field, select the applicable storage server. This field lists all the supported RAID levels for the currently selected storage server. If the selected storage server is **Any**, the list includes all RAID levels that are supported by any supported storage server.
10. In the **Size** field, type a number (maximum of 6 digits) to specify the amount of space to allocate on the storage server. The number that you type represents Megabyte (MB), Gigabyte (GB), or Terabyte (TB), depending on which unit of size that you selected in the **Unit of Size** field.
11. In the **Unit of Size** field, select a unit of size, which is used with the number that you typed in the **Size** field.
12. Click **OK**. The Remote Storage Configuration window opens.

Configuring a system on a user-created Allocate LUN task

You can configure a system on a Remote Storage task that you created by using Create New Allocate LUN task or one of the five predefined tasks. You can configure a system by using one of the following methods:

- Dragging a target system (allocated LUN) onto the applicable Remote Storage task
- Dragging the task onto the target system
- Right-clicking the **Remote Storage Configuration** task and selecting **Configure systems**

Complete the following steps to configure a system by using a user-created allocate LUN task:

1. Expand the **Remote Storage Configuration** group icon.
2. Drag a target system onto a user-created Allocate LUN task.
3. Click **Configure systems**.

If qualification succeeds, the STC page displays the selected LUN that you dropped onto the task, the SystemName is the name of the target system. You can configure the target system by modifying the fields on the STC page. (In the following illustration, the user-created Allocate LUN task is named “allocate 10GB boot lun”).

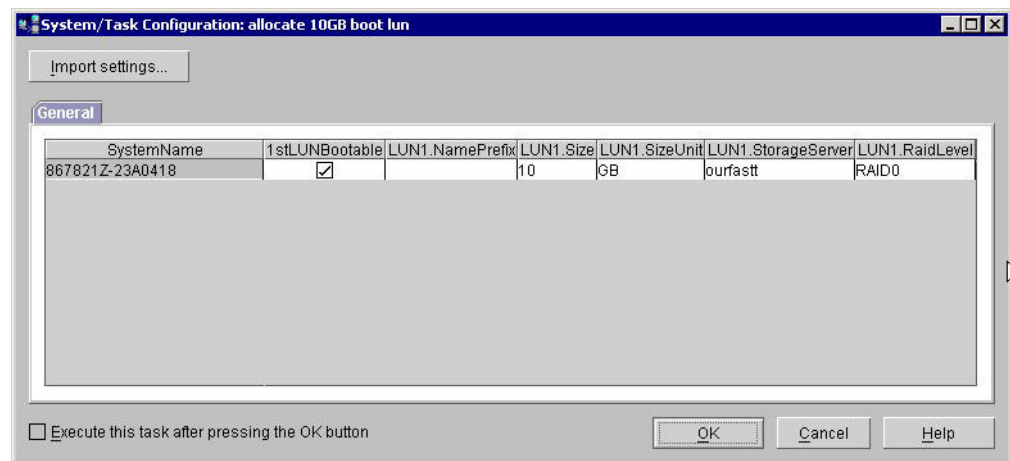


Figure 118. “System/Task Configuration: allocate 10GB boot lun” window

4. In the **1stLUNBootable** field, select the check box to make the first LUN in the list LUN 0. This check box is selected by default.
5. In the **LUN1.NamePrefix** field, type a LUN prefix (maximum of 10 characters). This prefix is combined with a unique ID to create a LUN name. If you leave this field blank, a default prefix is used.
6. In the **LUN1.Size** field, type a number (maximum of 6 digits) to specify the amount of space to allocate on the storage server. The number that you type represents MB, GB, or TB, depending on which unit of size that you selected in the **LUN1.SizeUnit** field.
7. In the **LUN1.SizeUnit** field, select a unit of size, which is used with the number that you typed in the **LUN1.Size** field.
8. In the **LUN1.StorageServer** field, select a storage server to allocate space from, or select **Any** to allocate space from any available storage server. This field lists all the supported storage servers.

9. In the **LUN1.RAIDLevel** field, select the applicable storage server. This field lists all the supported RAID levels for the currently selected storage server. If the selected storage server is **Any**, the list includes all RAID levels that are supported by any supported storage server.
10. Click **OK**.

Configuring a system on a predefined task

You can configure remote storage by editing one of the five predefined task templates of Remote Storage Configuration. To edit these tasks, expand the Remote Storage Configuration group icon. The five predefined tasks are displayed.



Figure 119. Remote Storage Configuration: Five predefined tasks

In the Create New Allocate LUN task and all five predefined tasks, RDM performs system qualification when you click **Configure systems**. The following error messages can occur during the system qualification process:

- If the target system does not contain a supported Fibre Channel controller you will get an error message stating No fibre HBA detected.
- If no fabric name is shown in the Fibre Channel adapter table, when viewing the IBM Director inventory on the target system, you will get an error message stating No fabric name detected. Please ensure that the system is connected to an active fabric and rescan it.

The following sections explain how to edit the five predefined task templates.

Configure Fibre HBA Boot Settings

This task configures the host bus adapter to detect any boot LUN (LUN 0) that is currently allocated and mapped to the system on a remote storage server.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Configure Fibre HBA Boot Settings**. Click **Configure systems**.

Note: A qualification error message states This system does not have any LUNs mapped. This error occurs when no LUNs are defined for the target system on any storage server.

3. If qualification succeeds, the System/Task Configuration (STC) page is displayed, and it lists all the LUNs that are currently mapped to the system.

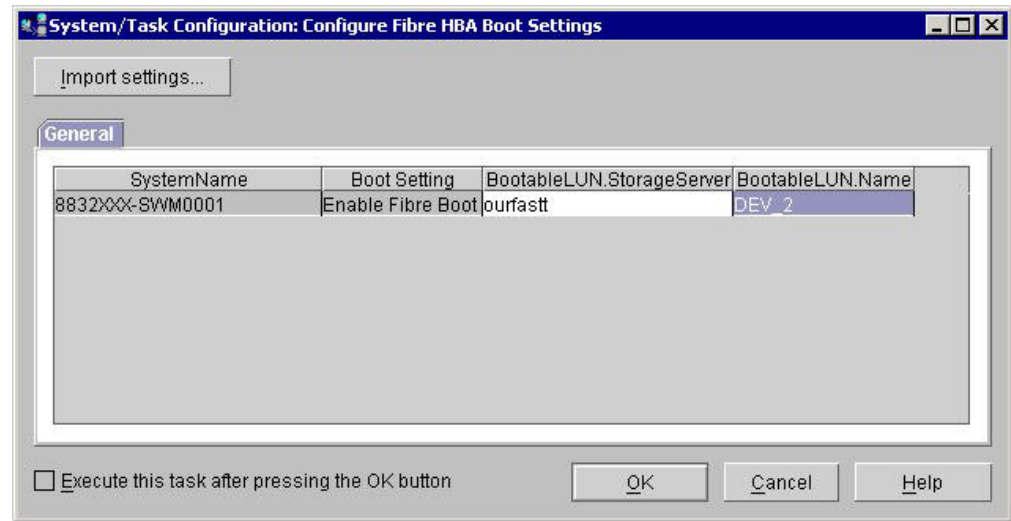


Figure 120. System/Task Configuration: Configure HBA Boot Settings

4. In the **BootableLUN.StorageServer** field, select the storage server to which you want the target system to boot. This field lists all the supported storage servers that are configured and have bootable LUNs (LUN 0).
5. Click **OK**.

Delete Mapping

This task deletes the LUN mappings for the target system. The actual LUNs are not deleted.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Delete Mapping**. Click **Configure systems**.

Note: A qualification error message states This system does not have any LUNs mapped. This error occurs when no LUNs are defined for the target system on any storage server.

3. If qualification succeeds, the STC page is displayed, and it lists all the LUNs that are currently mapped to the system.

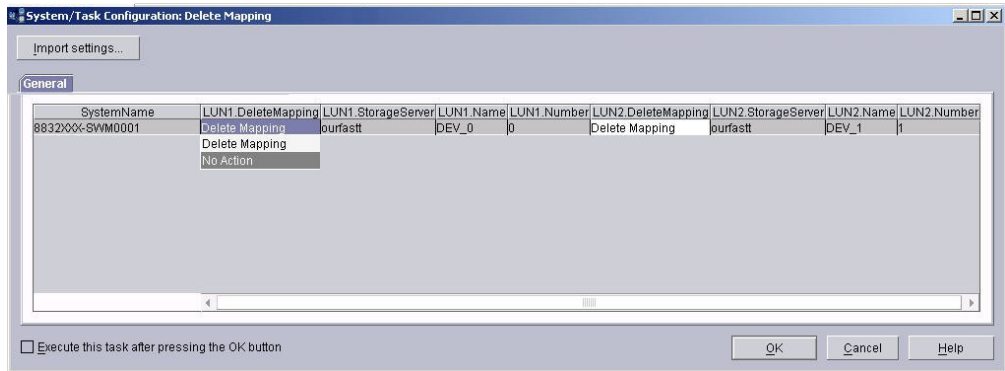


Figure 121. System/Task Configuration: Delete Mapping

4. In the **DeleteMapping** field, click one of the following options:
 - Select **Delete Mapping** to delete the mapping for the selected LUN (LUN1 or LUN2) on the selected system.
 - Select **No Action** to keep the current mapping.

Note: The default for this task is **Delete Mapping**. When you drag a system onto the Delete Mapping task and it runs without displaying the STC page, this task deletes all the mappings.

5. Click **OK**.

Delete Mapping and LUNs

This task deletes the LUN mappings for the target system and deletes the LUNs.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Delete Mapping and LUNs**. Click **Configure systems**.

Note: A qualification error message states This system does not have any LUNs mapped. This error occurs when no LUNs are defined for the target system on any storage server.

3. If qualification succeeds, the STC page is displayed, and it lists all the LUNs that are currently mapped to the system.

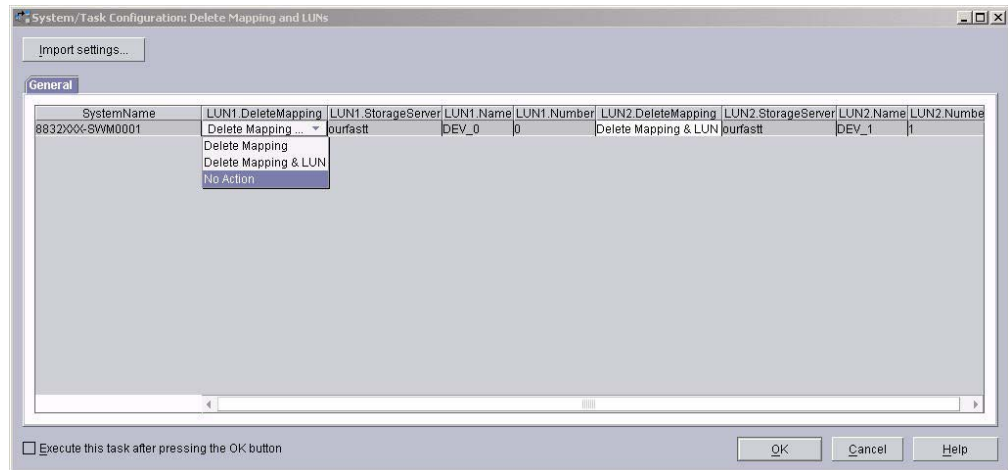


Figure 122. System/Task Configuration: Delete Mapping and LUNs

4. In the **DeleteMapping** field, select one of the following options:
 - Select **Delete Mapping** to delete the mapping for the selected LUN (LUN1 or LUN2) on the selected system.
 - Select **Delete Mapping & LUN** to delete the mapping for the LUN on the selected system and delete the LUN configuration.

Note: The default for this task is **Delete Mapping & LUN**. When you drag a target system onto the Delete Mapping and LUN task and it runs, without displaying the STC page, this task deletes all the mappings and associated LUNs.

- Select **No Action** to keep the current mapping.
5. Click **OK**.

Get Profile

This task captures the current mapping of remote storage LUNs to a target system and the corresponding fabric settings. Get Profile stores this information in a remote storage image.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Get Profile**. Click **Configure systems**.
3. If qualification succeeds, the STC page is displayed, and it lists all the LUNs that are currently mapped to the system.

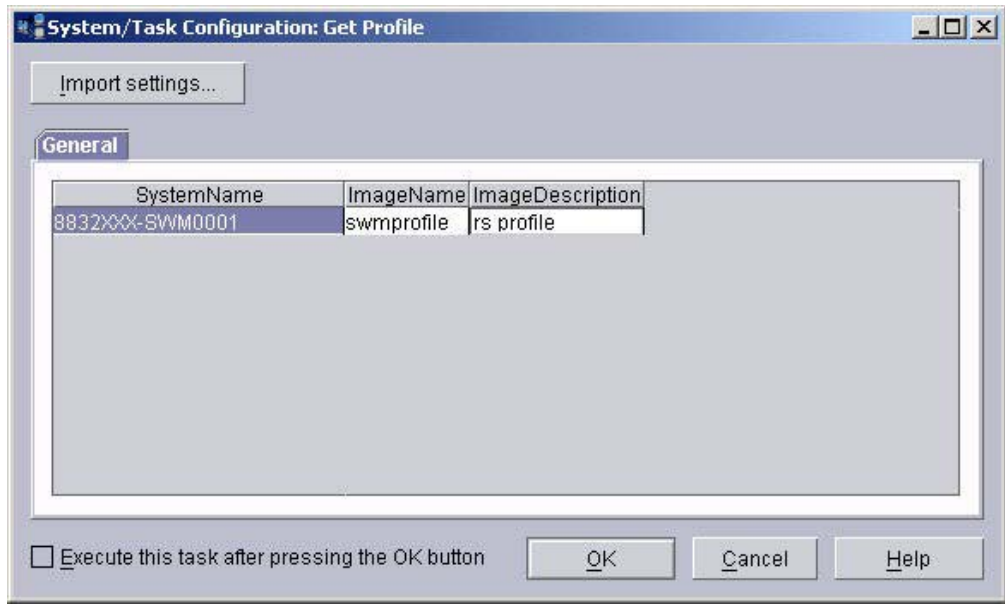


Figure 123. System/Task Configuration: Get Profile

4. In the **ImageName** field, type the name of profile image to which you want to save the LUN configuration. The name must be unique.
5. In the **ImageDescription** field (optional), type a brief description of the profile image that you are creating.
6. Click **OK**.

Put Profile

This task restores or distributes the mappings that were previously saved through the Get Profile task. It also reconfigures the target system to detect the new mappings.

Complete the following steps to use this task:

1. In the IBM Director Console Tasks pane, expand the **Remote Deployment Manager** icon.
2. Expand the **Remote Storage Configuration** group icon and right-click **Put Profile**. Click **Configure systems**.
3. If qualification succeeds, the STC page is displayed.

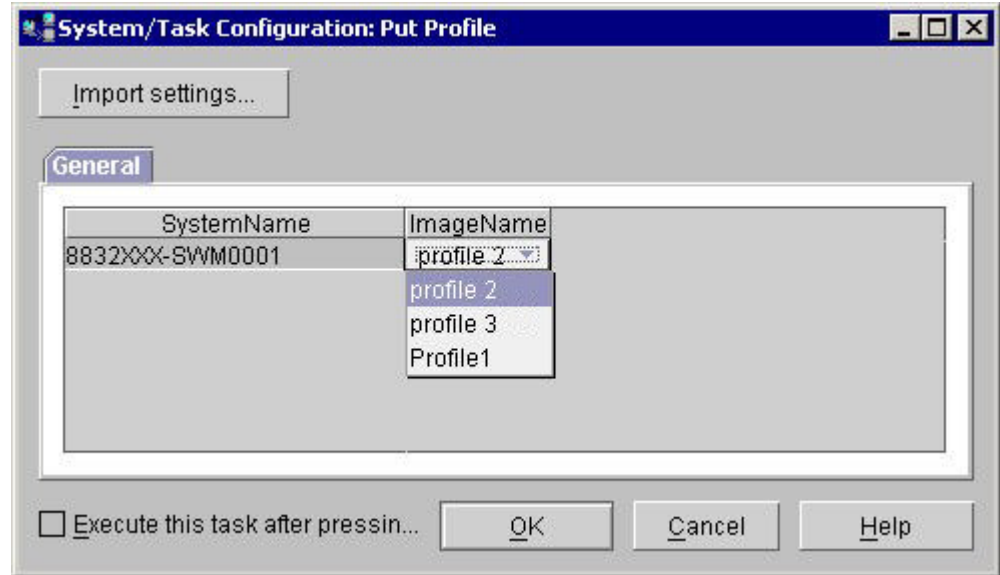


Figure 124. System/Task Configuration: Put Profile

4. In the **ImageName** field, select the profile image that contains the LUN configuration that you want to deploy.
5. Click **OK**.

Configuring remote storage tasks for dual boot

You can configure remote storage tasks for dual boot. After deploying operating system environments to the LUNs you configured and obtained their host profiles, you can schedule tasks to map the host to a different LUN (operating system) at specific times. The following illustration shows a host (Server Z) with two LUNs, one with a Windows image and the other with a Linux image. The task maps each LUN to the host at the previously scheduled time.

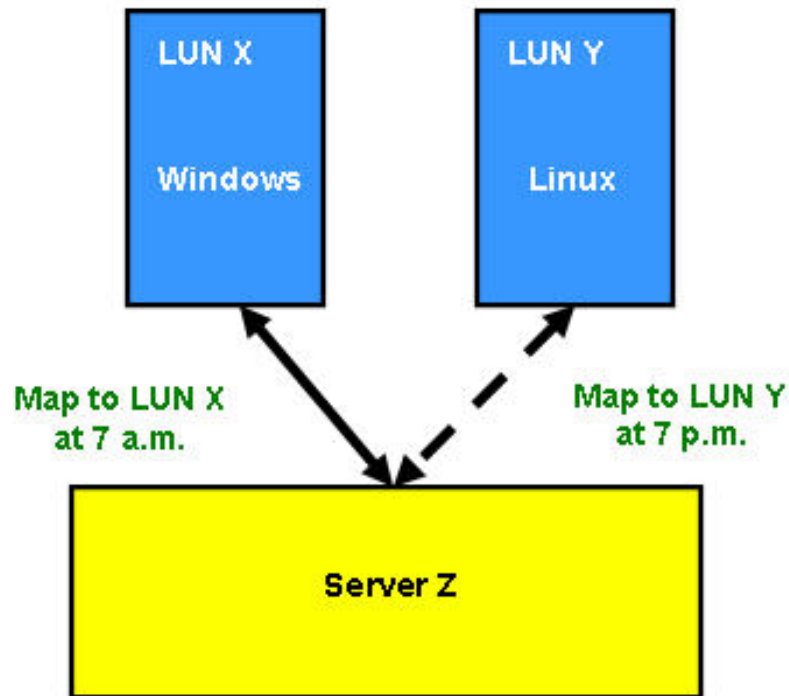


Figure 125. Configuring remote storage for dual-boot operating systems

The following procedure is an example of how to create and schedule a dual-boot environment on remote storage:

1. Select **Create New Allocate LUN Task** to allocate boot LUN X to Server Z.
2. Deploy the Windows operating system and applications to LUN X.
3. Select **Get Profile** on LUN X to obtain a Windows profile image for Server Z (the image name is windows_serverz).
4. Select **Delete Mapping** to delete the Server Z mapping to LUN X.
5. Select **Create New Allocate LUN Task** to allocate boot LUN Y to Server Z.
6. Deploy the Linux operating system and applications to LUN Y.
7. Select **Get Profile** on LUN Y to obtain a Linux profile image for Server Z (image name linux_serverz).
8. Select **Delete Mapping** to delete the Server Z mapping to LUN Y.
9. Copy the Put Profile task to create a new Put Profile task for the Windows environment (windows_put).
10. Drag Server Z onto the Windows Put Profile task (windows_put) and configure it, specifying the Windows image name windows_serverz.
11. Copy the Put Profile task to create a new Put Profile task for the Linux environment (linux_put).
12. Drag Server Z onto the Linux Put Profile task (linux_put) and configure it, specifying the Linux image name linux_serverz.
13. Use the IBM Director Scheduler to schedule the windows_put task to map the Windows profile on Server Z at 7 a.m.
14. Use the Director Scheduler to schedule the linux_put task to map the Linux profile on Server Z at 7 p.m.

You can expand this same procedure to boot a number of different images from a single server. You also can use this procedure to dynamically move images between different servers.

Chapter 16. Scan

You can use the Scan template to create tasks that query the hardware of target systems and add that inventory information to the IBM Director database. Since RDM tasks cannot run until a system has been scanned, the Scan task is the first RDM task that you run against each target system. The Scan task accomplishes the following:

- Adds the target system to IBM Director Console, if the system was not already displayed
- Obtains hardware information about the system.
- Optionally, obtains user-defined information that you enter at the target system.

Note: In IBM Director Console, the Group Contents pane lists all of the systems that are detected by IBM Director. Some of these systems could have been discovered by using the RDM Scan task and some could have been discovered by using one of the IBM Director discovery tools. If one of these systems has not been scanned by using the RDM Scan task, some of the other RDM tasks cannot run successfully against that system. Make sure that an RDM Scan task has been run against each system that is displayed in the Group Contents pane before you try to run another RDM task against it.

Basic Scan task

The Basic Scan task is a built-in task. It is the default Scan task that is used by RDM when a system that is unknown to RDM boots to the network. Typically, the only modification that you will make to the Basic Scan task is to enable BladeCenter naming. You can create a new Scan task if you require additional customization.

Creating a Scan task

You can use the Scan template to create new Scan tasks. The values set in the template are the defaults that are used when you create a new Scan task.

Complete the following steps to create a new Scan task:

1. In the Tasks pane, right-click **Scan** then click **Create New Task**. The Scan window opens and the General page is displayed.

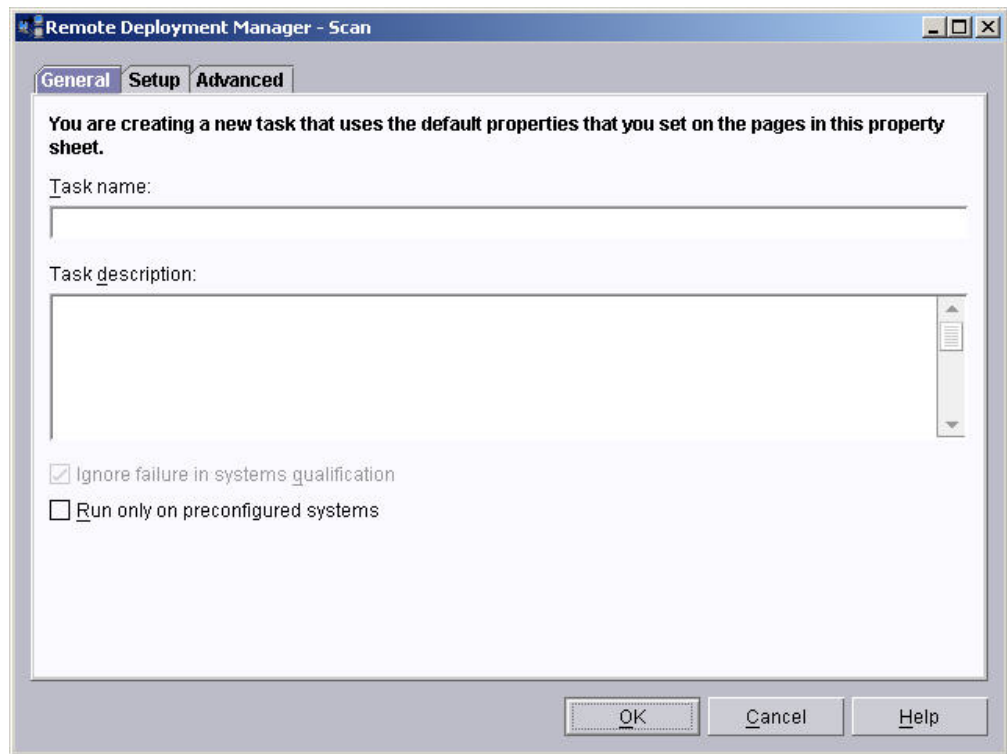


Figure 126. Scan task: General page

2. In the **Task name** field, type a unique name for the task.
3. (Optional) In the **Task description** field, type a description of the task.

4. Click the **Setup** tab. The Setup page is displayed.
The Setup page contains properties that let you customize the settings of the user prompts. You can create user prompts, assign a language to display the prompts, and set a timeout requirement for user responses. For more information about user prompts, see “Working with user prompts” on page 198. The Setup page also lets you enable automatic naming of blade servers.

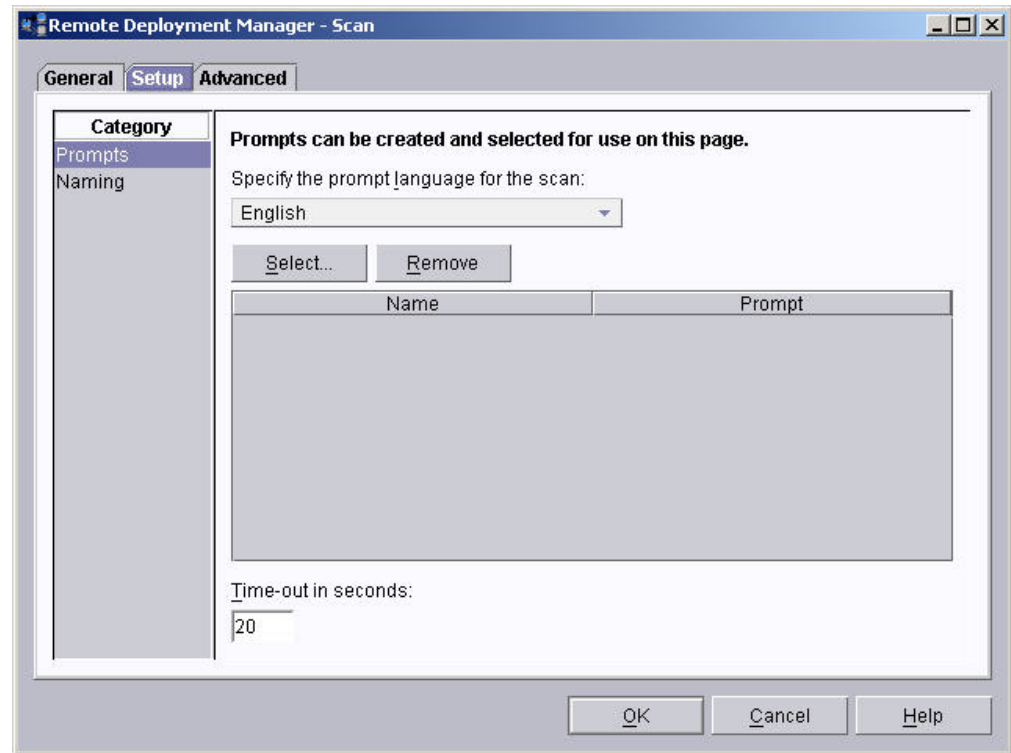


Figure 127. Setup page

5. (Optional) Configure the prompts:
 - a. Click on the **Time-out in seconds** field to enter the number of seconds to wait for the user response after the first prompt is displayed. If the prompt is not answered within the specified time, RDM does not collect that information and the Scan task is terminated.

- b. Click **Select** in the right pane to add prompts to the template. The User Prompts window is displayed.

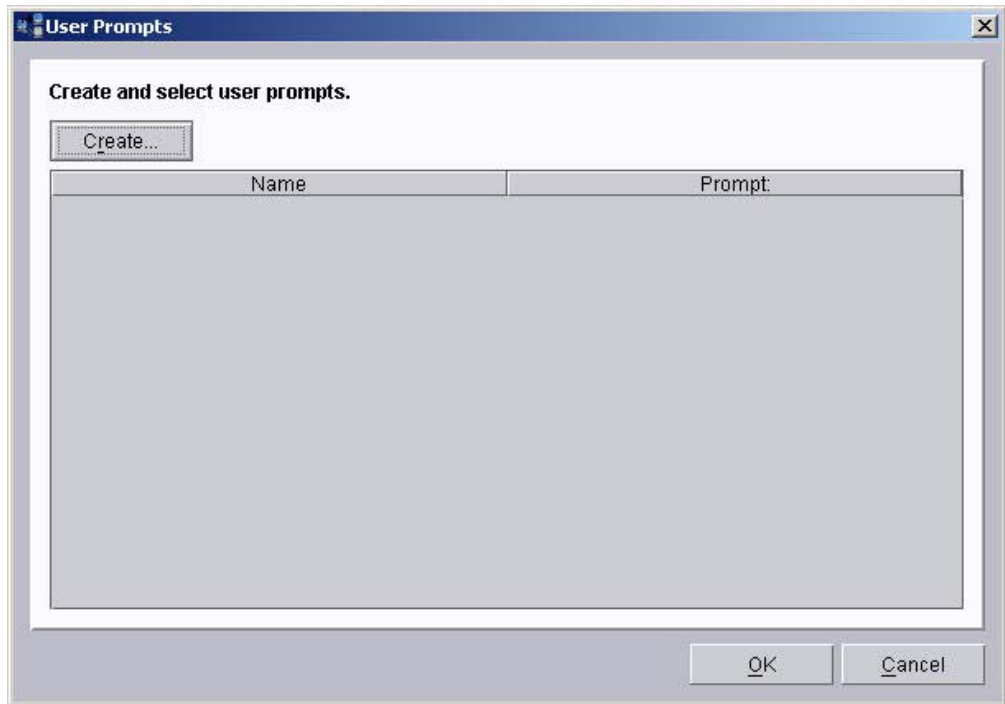


Figure 128. User Prompts window

- c. Click **Create**. The Create User Prompt window is displayed.

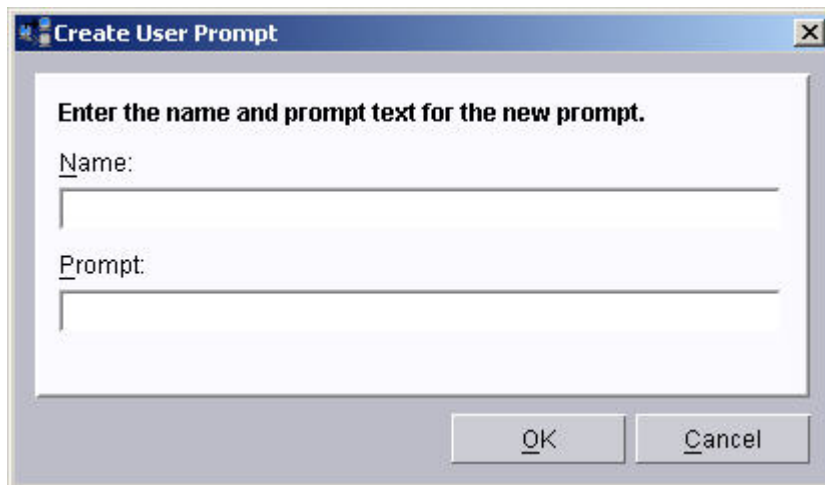


Figure 129. Create User Prompt window

- d. In the **Name** field type a unique name for the prompt. You must use only valid alphanumeric characters.
- e. In the **Prompt** field, type the user prompt. This is the text that will be displayed on the target system.

- f. Click **OK**. The User Prompts window reopens and the selected user prompts are displayed.

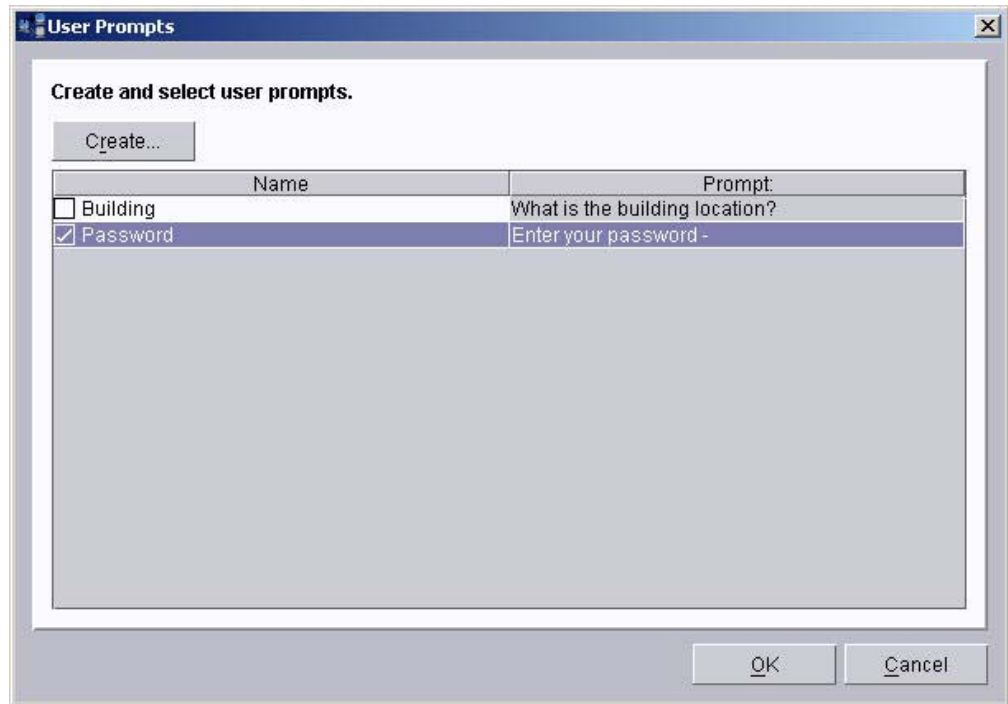


Figure 130. User Prompts window

- g. Select the check box for each prompt that you want to use in this Scan task.

- h. Click **OK**. The Scan window opens and the selected user prompts are displayed.

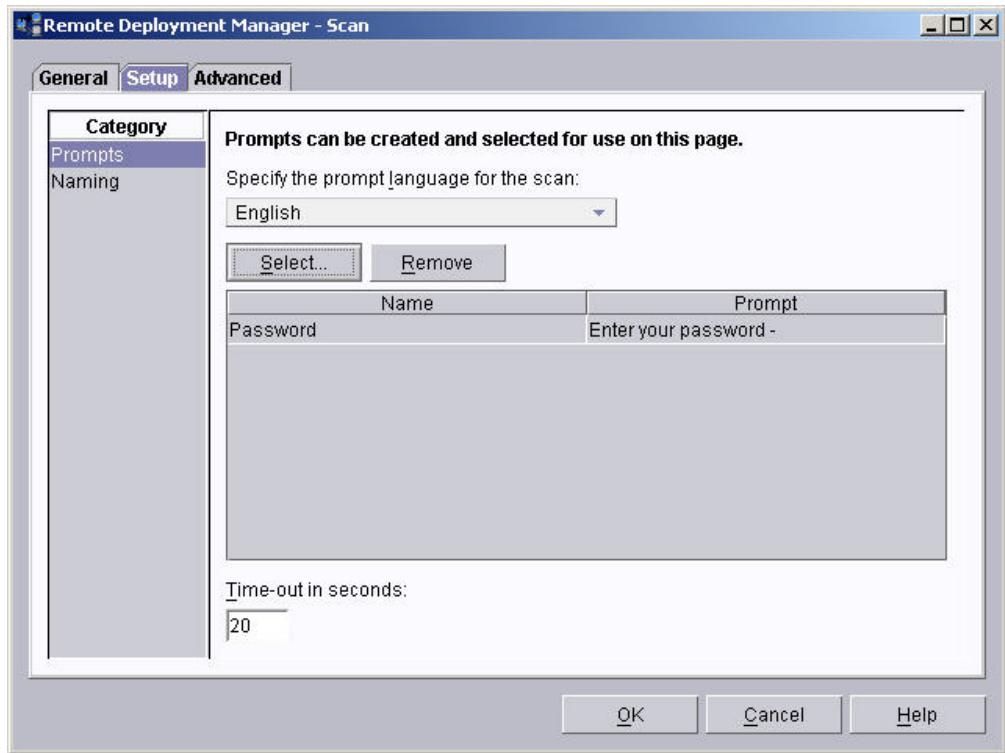


Figure 131. Setup page with selected prompts

6. (Optional) Complete the following steps to rename blade servers automatically when they are scanned:
 - a. In the Category pane click **Naming**. The Naming page is displayed.

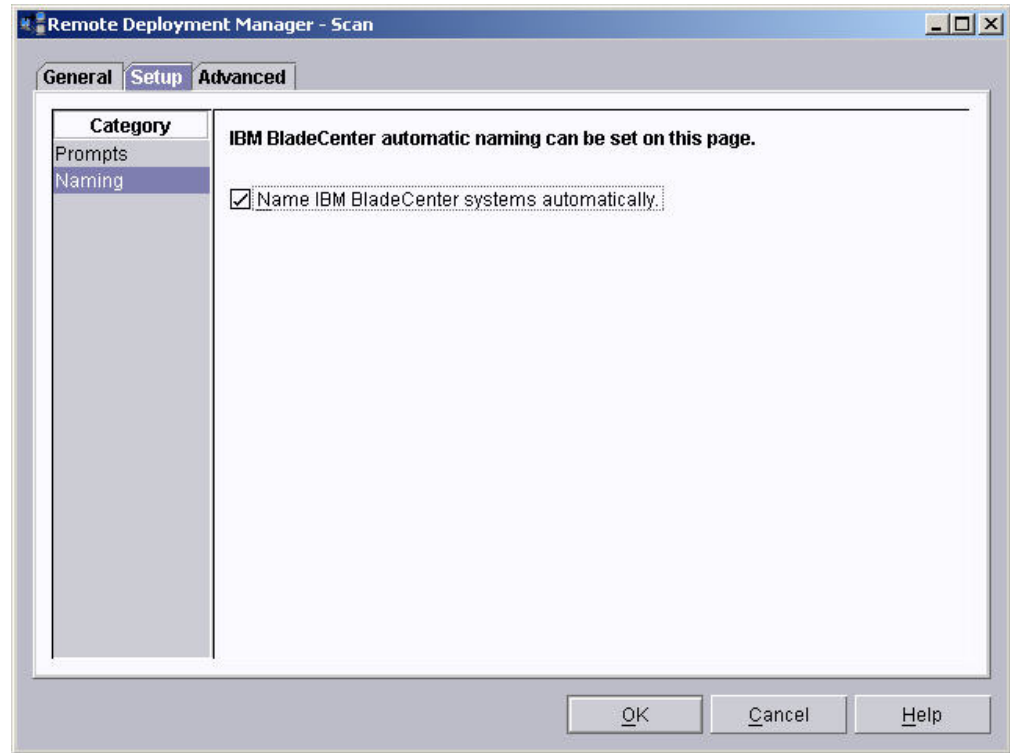


Figure 132. Naming page

- b. Select the **Name IBM BladeCenter systems automatically** check box to ensure that blade servers are automatically named.

Note: If you clear the **Name IBM BladeCenter systems automatically** check box, the blade server is automatically given then the name of the system as detected by the IBM Director Discovery task.

When this Scan task is run against a blade server, the blade server is automatically given the following name: *BladeCenterChassis-BBayNumber* where *BladeCenterChassis* is the name of the BladeCenter chassis, and *BayNumber* is the number of the bay. If the BladeCenter chassis for the blade server has not been detected by IBM Director, *BladeCenterChassis* is the Universal Unique Identifier (UUID) of the blade server.

Note: If you select the blade renaming option, the task will always rename blade servers. Make sure not to run such a Scan task against a blade server that you do not want to rename.

You can modify the renaming algorithm by altering the values in the `SystemNaming.properties` file. For information about modifying the `SystemNaming.properties` file see, “Configuring the renaming algorithm” on page 198.

7. Click **OK**. The new task is displayed in the RDM Scan tree.

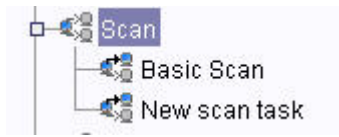


Figure 133. Created Scan task in Scan tree

Configuring the renaming algorithm

Scan tasks that you configure to automatically rename BladeCenter systems use the RDM default renaming algorithm. The renaming algorithm is defined in the SystemNaming.properties text file, which is located in the applicable directory on the management server:

For Linux	<code>/RDM_installation/local</code>
For Windows	<code>d:\RDM_installation\local</code>

where *d* is drive letter of the hard disk drive and *RDM_installation* is the directory where RDM is installed.

To change the default renaming algorithm, you must modify the system SystemNaming.properties file.

Note: Changes that you make to the renaming algorithm in the SystemNaming.properties file will be used by any Scan task in which the **Name IBM BladeCenter systems automatically** check box is selected.

Complete the following steps to modify the renaming algorithm that is used with the Scan task:

1. Navigate to the SystemNaming.properties file and use an ASCII text editor to open it.

Note: The file is fully commented and contains information about how to change the renaming algorithm.

2. Modify the naming conventions as applicable.
3. Save and close the file.

Working with user prompts

You can use user prompts when you need information from the person who is operating the target system. The prompt that you create is displayed on the monitor of the target system when the Scan task is run against that system. For example, you might configure the default Scan task to prompt a user to answer the following two questions:

- What is your department number?
- What is your city?

If a new system is set up on your network and is configured to boot to the network, the two prompts that you created are displayed when the system is turned on. The answers by the person who is operating the target system are saved to the IBM Director database. Using these two user prompt values, you also could customize the Scan task to modify the name of the target system in IBM Director.

When you are working with a Scan task or template, the user prompts that you create can be used only with other Scan tasks. The responses to these user prompts can be used with any other RDM task or template.

Removing a user prompt from a Scan task or template

You can remove a user prompt from a Scan task or template. If you are working with the Scan template, a user prompt that you remove is no longer available in the default list of user prompts for new Scan tasks that you create by using the template. Existing tasks, however, that already use that user prompt are not affected and will continue to use it. If you are working with a specific Scan task, a user prompt that you remove is no longer used when that task is run against a target system. The user prompt also is removed from the default list of user prompts on the Setup page for that Scan task. Removing a user prompt does not delete it from RDM. For information about deleting a user prompt, see “Editing or deleting a user prompt” on page 200.

Complete the following steps to remove a user prompt from a Scan task or template:

1. In the Tasks pane, right-click on the Scan template or the Scan task that you want to modify; then, click **Edit task** or **Edit template** as applicable. The Scan window opens and the General page is displayed.

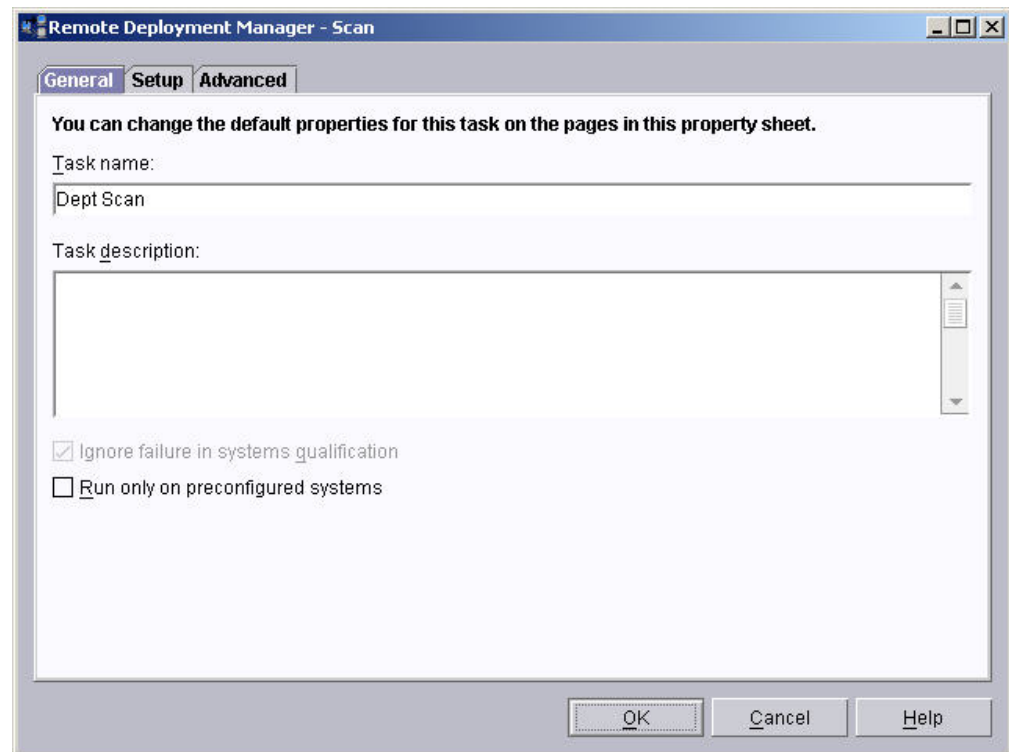


Figure 134. Scan template: General page

2. Click the **Setup** tab. The Setup page is displayed.

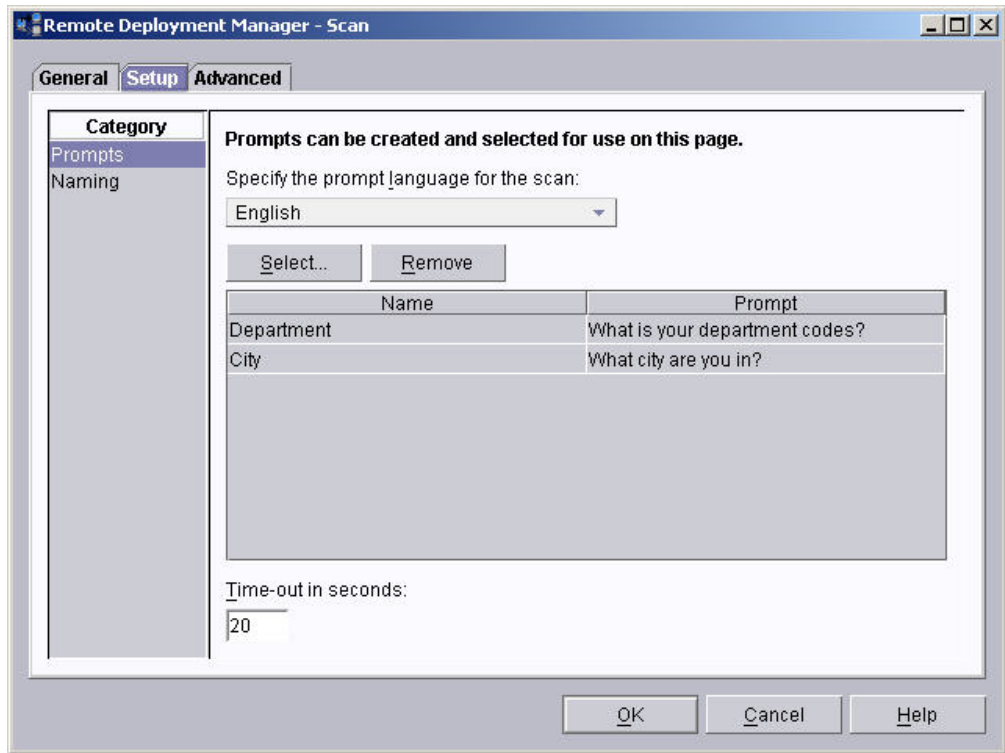


Figure 135. Scan template: Setup page

3. In the left pane, click **Prompts** to view the Prompts pane. In the Prompts pane, you can select and remove user prompts that the template or task uses. The user prompts that are displayed in the Prompts pane will be used by the Scan task or template.
4. Select the user prompt that you want to remove; then, click **Remove**.

Editing or deleting a user prompt

You can edit or delete a user prompt only when you are working with the Scan template property sheet. You cannot edit or delete a user prompt when you are working with a task. You can delete a user prompt only if it is not being used by any existing tasks.

Complete the following steps to edit or delete a user prompt:

1. In the Tasks pane, right-click on the Scan template; then, click **Edit template**. The Scan window opens and the General page is displayed.

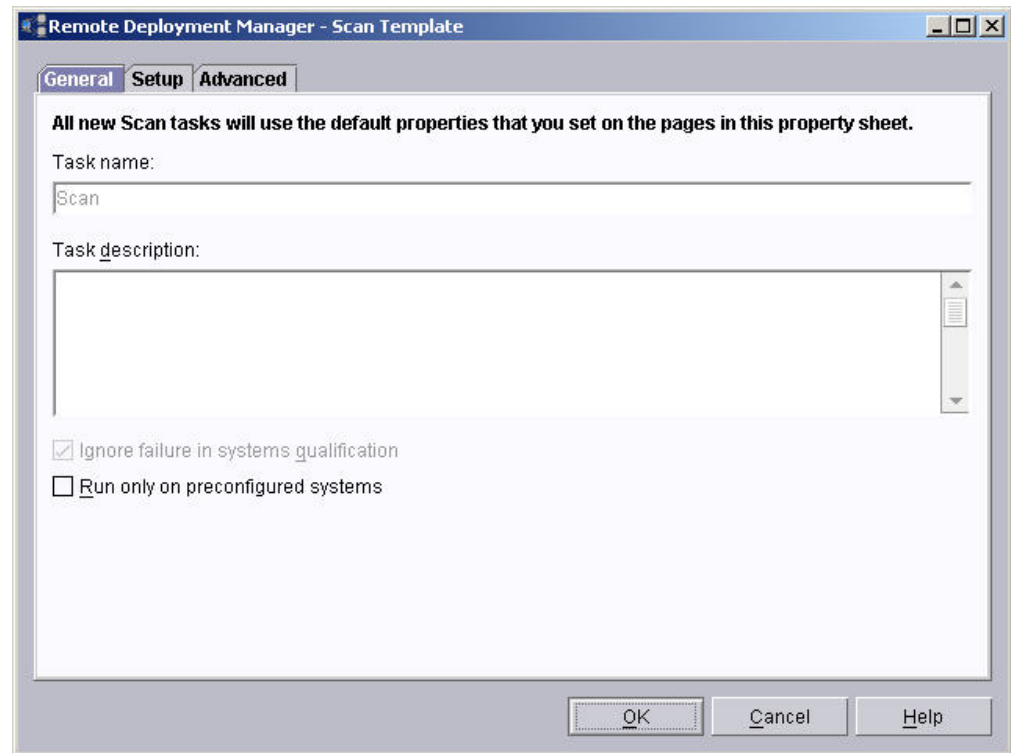


Figure 136. Scan template: General page

2. Click the **Setup** tab. The Setup page is displayed.

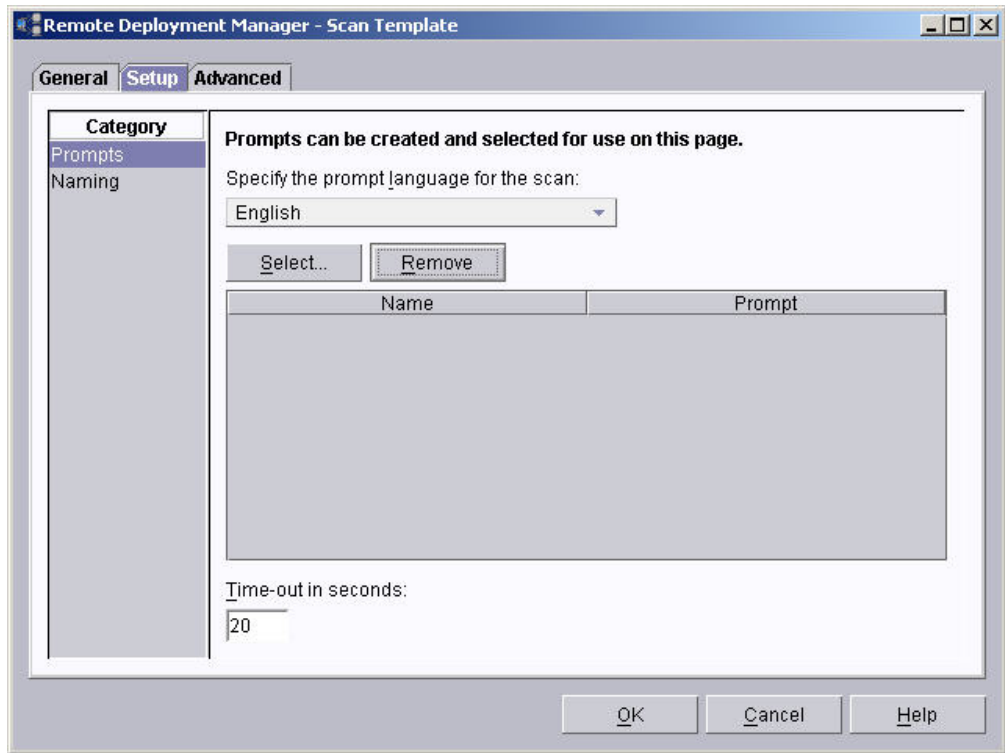


Figure 137. Scan template: Setup page

3. In the left pane, click **Prompts** to view the Prompts pane.
The user prompts that are displayed in the Prompts pane will be used by tasks that are created by using the Scan template.

4. Click **Select**. The User Prompts window opens.

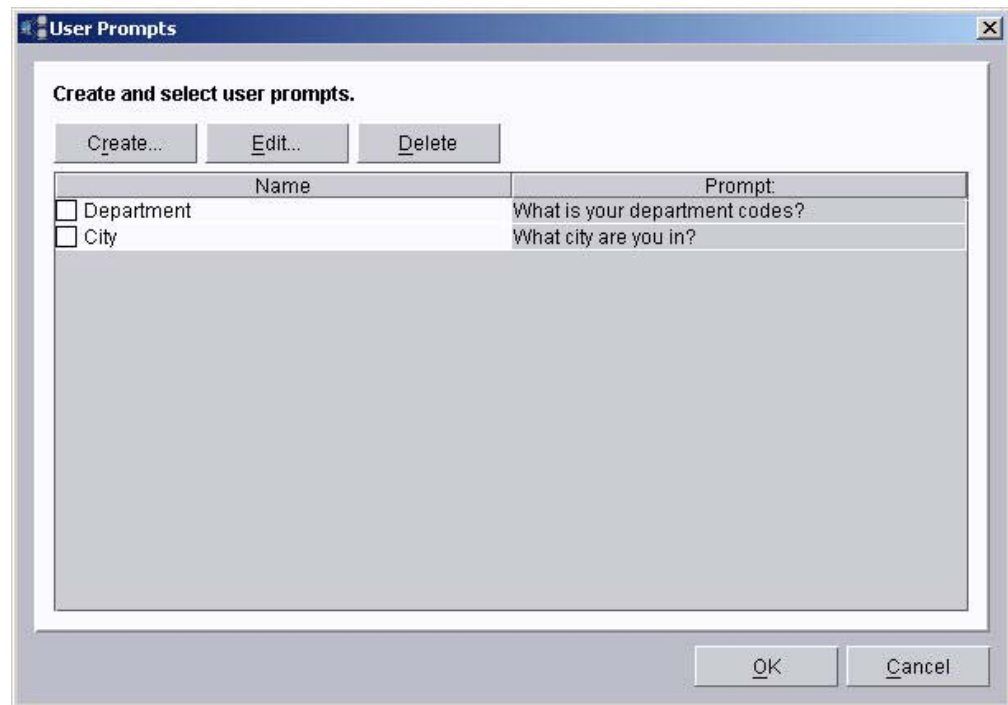


Figure 138. Scan template: User Prompts window

5. (Optional) Complete the following steps to edit a user prompt:
 - a. Select the user prompt that you want to edit; then, click **Edit**. The Edit User Prompt window opens. You cannot change the name of a user prompt. You can change only the user prompt that is displayed on the target system.
 - b. In the **Prompt** field, edit the user prompt text as applicable.
 - c. Click **OK**.
6. (Optional) To delete a user prompt, select the user prompt that you want to delete; then, click **Delete**.

Working with user prompt responses

You can use the response from a user prompt to rename the target systems that you run the Scan task against. The renaming algorithm is defined in the SystemNaming.properties text file. You can use the following variable name to access the response from a user prompt:

`RDM.user_prompt_name`

where `user_prompt_name` is the name that you assigned the user prompt that created. For example, you can create a user prompt that asks, "What department are you in?" You name the prompt DEPT. To access the response to the user prompt in the SystemNaming.properties text file, you use the RDM.DEPT variable. For information about configuring the renaming algorithm, see "Configuring the renaming algorithm" on page 198.

Chapter 17. Script

You can use the Script template to create a task that runs a sequence of other RDM tasks against a target system. You can choose existing tasks as subtasks of a Script task. The subtasks are run against the target system in the order you specify. Typically, a Script task consists of all the steps required to roll out a system, for example:

1. Flashing the system firmware
2. Updating CMOS
3. Installing an operating system and applications

The Script task is one of the most common tasks that is run in RDM.

Right-click **Script** in the Tasks pane to display two options:

- *Create New Task* - accesses the task notebook.
- *Edit Template* - accesses the template notebook containing all of the properties for the template. The values set in the template notebook are the defaults used when you create a new Script task.

When you create a task, it is added to the Tasks pane under **Script**.

Qualification considerations

When you select **Ignore failure in systems qualification** for a Script task, the selection applies to that Script task and all of its subtasks. The purpose for ignoring qualification errors on a Script task is to handle those situations in which one subtask depends upon the work of another subtask to be completed before its own qualification can pass. For example, a system with an unconfigured RAID array will generate errors when qualification for a Windows Native Install task is run against that system. However, with a Script task, you can put a RAID Custom Configuration task before a Windows Native Install task to enable the RAID to be configured before the Windows Native Install task is run. By selecting **Ignore failure in systems qualification** in the Script task, the Script task does not run the individual subtask qualifications as part of its own qualification and does not report errors.

The previous situation could also be handled by selecting **Ignore failure in systems qualification** on the Windows Native Install task. That solution might not be desired, especially if that task is also used on other systems outside of the Script task. Some errors that could be caught by qualification would not be realized until running the task against a system.

Note: Select the **Ignore failure in systems qualification** check box if you include two tasks in a Script task, and one task depends on the other to configure hardware.

Task selection

Complete the following steps to create a Script task:

1. Right-click **Script** in the Tasks pane, then click **Create New Task**. The Script window is displayed.

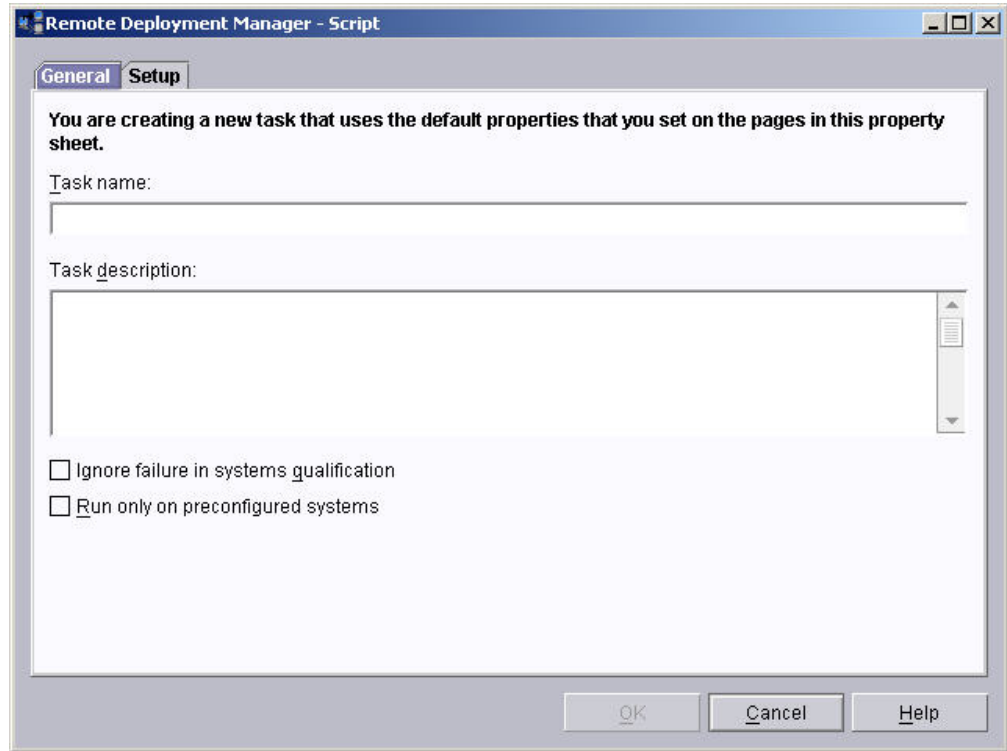


Figure 139. Script window: General tab

2. Provide the basic information for the task:
 - a. In the **Task name** field, type a descriptive name to identify the task.
 - b. In the **Task description** field, type a brief description of the task.
 - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.

Note: When you select **Ignore failure in systems qualification for a Script task**, the selection applies to that Script task and all of its subtasks. For information about Script task qualification, see "Qualification considerations" on page 205.

- d. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
3. Click the **Setup** tab.

4. Select **Task Selection** in the **Category** field.

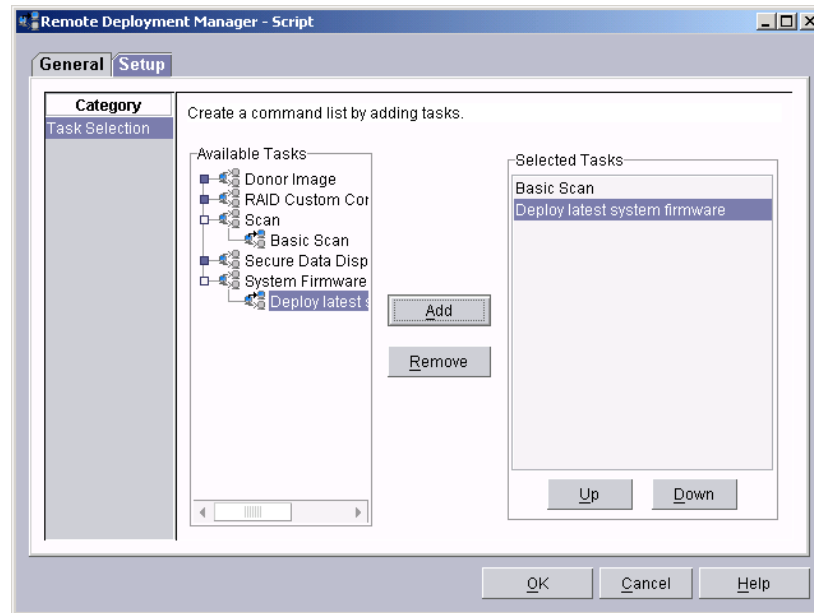


Figure 140. Task Selection category for Script

The **Available Tasks** group box contains a tree view of all RDM tasks. The **Selected Tasks** group box contains an ordered list of the tasks that are contained in this Script task. The tasks are run in the order in which they occur in this list (top task first).

5. In turn, select each task that you want to include in the script, and then click **Add**. When you click **Add**, the highlighted tasks are copied from the **Available Tasks** group box to the **Selected Tasks** group box.

Note: You also can drag each task to the **Selected Tasks** group box.

6. Order the tasks in the **Selected Tasks** group box as applicable. Highlight one item or multiple consecutive items, and then click **Up** or **Down** to change their order sequence.

Note: You can click **Remove** to delete the highlighted task from the **Selected Tasks** group box.

7. Click **OK** to create the task. The new task is displayed under Script in the Tasks pane of IBM Director Console.

Chapter 18. Secure Data Disposal

You can use the Secure Data Disposal template to create tasks designed to remove (scrub) data from the drives on target systems. All drives and partitions that are accessible by the BIOS on the target system can be scrubbed.

Before you run a Secure Data Disposal task, consider the following items:

- The first fibre drive on a system is accessible by the BIOS. You can use a Secure Data Disposal task to scrub that drive. Other fibre drives are not accessible by the BIOS, and cannot be scrubbed using a Secure Data Disposal task.
- There might be sectors of a drive that are not accessible by the BIOS on a target system. This might occur if there are damaged sectors on a drive that have been remapped by the drive controller. This task does not erase these sectors.
- It is a best practice to configure all drives on a target system to non-RAID before you run a Secure Data Disposal task.
- The command list for a Secure Data Disposal task contains commented-out commands and instructions. For target systems that contain ServeRAID controllers, you can specify that each logical drive is configured as RAID 0 by uncommenting the applicable statements. To change the RAID configuration for other kinds of RAID drives, you must edit the command list as applicable.

The Secure Data Disposal template uses a notebook window to gather the scrub information and create a task. The following built-in tasks are installed with RDM:

- Level-1 Limited Partition Removal
- Level-2 1-Overwrite Security
- Level-3 4-Overwrite DOD Security
- Level-4 7-Overwrite DOD Security

Level-1 Limited Partition Removal task

The Level-1 Limited Partition Removal task is a built-in task that overwrites the master boot record, the first 100 sectors of each partition, and the last two sectors of all of the drives and partitions that are accessible to the system BIOS. The pattern used for the overwrite operation is 0x0000.

This disposal method is intended to make files inaccessible to normal file-system-based tools. The disposal algorithm for this task corresponds to the /L=1 parameter for SCRUB3.EXE.

Level-2 1-Overwrite Security

The Level-2 1-Overwrite Security task is a built-in task that overwrites every sector on the on all of the drives and partitions that are accessible to the system BIOS. The pattern used for the overwrite operation is 0x0000. This disposal method is intended to make data inaccessible by any software technique. The disposal algorithm for this task corresponds to the /L=2 parameter for SCRUB3.EXE.

Level-3 4-Overwrite DOD Security

The Level-3 4-Overwrite DOD Security task is a built-in task that overwrites every sector on all of the drives and partitions that are accessible to the system BIOS on the target system. A Secure disposal overwrites every sector on the applicable drives that are installed on the system four times with the following two-byte patterns (in this order):

1. A random pattern
2. The bit-wise complement of the first random pattern
3. A different random pattern
4. A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. The disposal algorithm for this task corresponds to the /L=3 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

Level-4 7-Overwrite DOD Security

The Level-4 7-Overwrite DOD Security task is a built-in task that overwrites every sector on all of the drives and partitions that are accessible to the system BIOS on the target system. A secure disposal overwrites every sector on the applicable drives that are installed on the system seven times with the following two-byte patterns (in this order):

1. A random pattern
2. The bit-wise complement of the first random pattern
3. A different random pattern
4. The bit-wise complement of the second random pattern
5. A third random pattern
6. The bit-wise complement of the third random pattern
7. A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. The disposal algorithm for this task corresponds to the /L=4 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

Creating a Secure Data Disposal task

Complete the following steps to create a Secure Data Disposal task:

1. In the Tasks pane, expand the **Remote Deployment Manager** task.
2. Right-click **Secure Data Disposal** → **Create new task**. The Secure Data Disposal window opens.

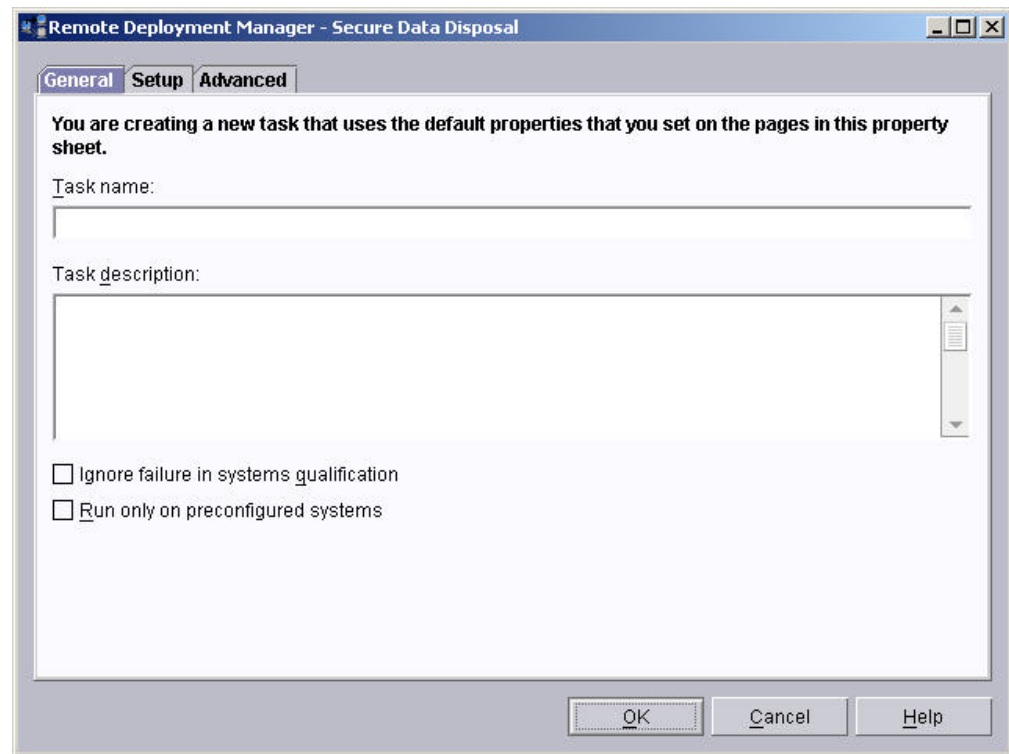


Figure 141. Secure Data Disposal window

3. On the General page, set the basic properties for the task:
 - a. In the **Task name** field, type a unique name for the task.
 - b. (Optional) In the **Task description** field, type a description of the task.
 - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.

Note: The STC settings for Secure Data Disposal tasks are read-only. As a result, the status of the **Run only on preconfigured systems** check box does not affect the result of the task.

4. Configure the disposal settings:
 - a. Click the **Setup** tab. The Setup page is displayed.

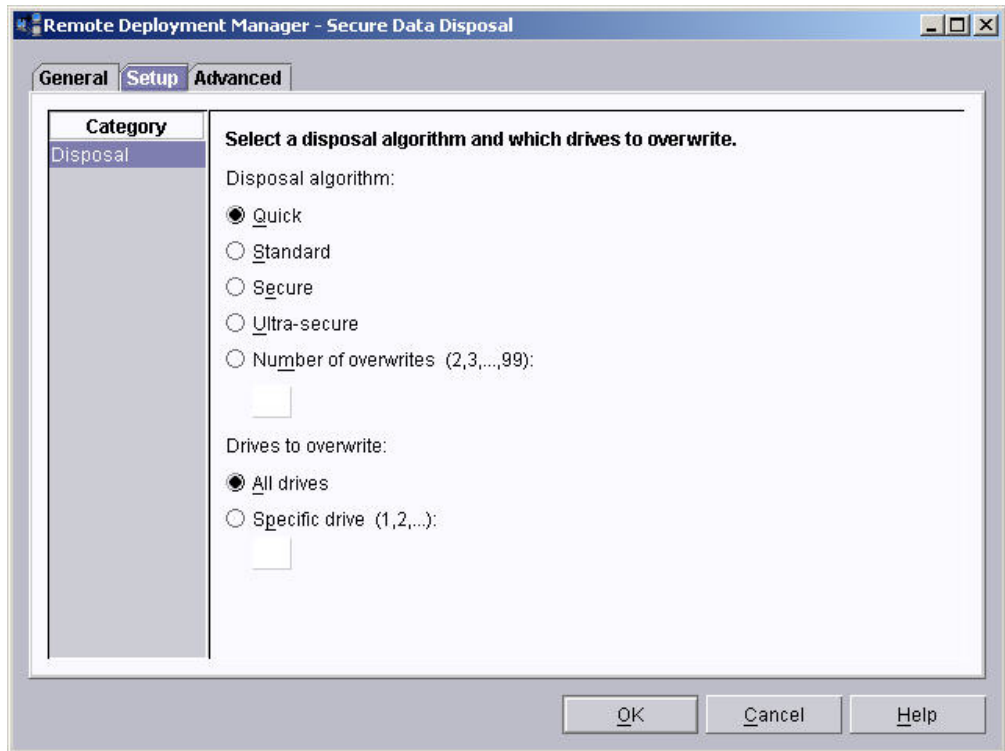


Figure 142. Secure Data Disposal window: Setup page

- b. Select one of the following options to indicate the disposal algorithm to be used:

Quick Overwrites the master boot record, the first 100 sectors of each partition, and the last two sectors on the applicable drives that are installed on the target system. The pattern used for the overwrite operation is 0x0000.

This disposal method is intended to make files inaccessible to normal file-system-based tools. This disposal algorithm corresponds to the /L=1 parameter for SCRUB3.EXE.

Standard

Overwrites every sector on the applicable drives that are installed on the target system. The pattern used for the overwrite operation is 0x0000.

This disposal method is intended to make data inaccessible by any software technique. This disposal algorithm corresponds to the /L=2 parameter for SCRUB3.EXE.

Secure

Overwrites every sector on the applicable drives that are installed on the system four times with the following patterns (in this order):

- 1) A random pattern
- 2) The bit-wise complement of the first random pattern
- 3) A different random pattern
- 4) A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. This disposal algorithm corresponds to the /L=3 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

Ultra-secure

Overwrites every sector on the applicable drives that are installed on the system seven times with the following patterns (in this order):

- 1) A random pattern
- 2) The bit-wise complement of the first random pattern
- 3) A different random pattern
- 4) The bit-wise complement of the second random pattern
- 5) A third random pattern
- 6) The bit-wise complement of the third random pattern
- 7) A 0x0000 pattern

This disposal method is intended to make the data inaccessible by any technique. This disposal algorithm corresponds to the /L=4 parameter for SCRUB3.EXE. It meets the United States Department of Defense standards.

Number of overwrites

Overwrites every sector on the applicable drives that are installed on the target system N times, where N is a number that you specify. RDM uses a different random pattern for each overwrite until it reaches the last (N th) overwrite. The last overwrite uses a 0x0000 pattern. For example, if you type 4 in the number field, RDM overwrites the applicable drives four times in the following patterns (in this order):

- 1) A random pattern
- 2) A second random pattern
- 3) A third random pattern
- 4) A 0x0000 pattern

In the number field, type a number (2-99) to specify the number of times that you want to overwrite the drives.

- c. Select one of the following options to indicate which drives to are to be overwritten:

All drives

Overwrites all of the drives and partitions that are accessible to the system BIOS. This option corresponds to the /D=ALL parameter for SCRUB3.EXE.

Specific drive

Overwrites the drive that you specify in the entry field. Drive numbering starts at 1, not 0. This option corresponds to the /D=<n> parameter for SCRUB3.EXE.

5. Click **OK** to create the task. The new task appears in the Tasks pane under Secure Data Disposal. Right-click on the task to edit, copy, or delete it.

Chapter 19. System Firmware Flash

You can use the System Firmware Flash template to create a System Firmware Flash task to update the firmware on target systems that support RDM.

Note: This task can be used to deploy firmware only to IBM systems. To deploy firmware to non-IBM systems, you must create a Custom task. For information about how to create a Custom task, see “Creating a Custom task” on page 91.

You can use the System Firmware Flash template to create and name a System Firmware Flash task. You then configure the task by associating one or more firmware images with it. After the task is created, you can run it by dragging it to the target systems that are displayed in IBM Director Console, or you can use IBM Director Scheduler to run the task at a later time. When you run the task, RDM validates the selected firmware images with the selected target systems and updates each system by using the applicable firmware. When a task contains multiple firmware images that have the same product code, RDM uses the firmware image that has the latest BIOS level. RDM does not update systems for which it does not have firmware.

This chapter provides the procedures that you must complete in the following order to create and then run a System Firmware Flash task:

1. Create a firmware update diskette.
2. Create a System Firmware Flash image in RDM.
3. Create a System Firmware Flash task.
4. Run the System Firmware Flash task.

Deploy latest system firmware task

The Deploy latest system firmware task is a built-in task. If there is any firmware in the repository that is applicable to the target system, this task updates the target system with the latest version that is in the repository. If there is no firmware in the repository that is applicable to the target system, this task fails with a qualification error.

Creating a firmware update diskette

When you create a System Firmware Flash task, you also must create a firmware image for the task to use.

Firmware updates from IBM are available from IBM support Web sites or on disks that come with IBM products. BIOS and firmware updates are distributed as self-extracting executable (.exe) files that are used to create update (flash) diskettes. If you already have a firmware diskette or source file that you want to use to create a System Firmware Flash task, you can use the diskette or source file with Image Management option to create a firmware image. For information about creating a firmware image by using the Image Management option, see “Creating a System Firmware Flash image in RDM” on page 216.

Complete the following steps to create a firmware update diskette:

1. Navigate to the Web site that provides the firmware download for which you want to create a firmware update diskette.

2. Download the self-extracting file to a directory.
3. To create a bootable update diskette from the self-extracting file, insert a blank diskette into the diskette drive. For information about creating the firmware image, see the documentation that comes with the firmware image that you download.
4. At the command prompt of the directory where the executable file is located, type the name of the self-extracting file and press Enter. The firmware image is saved to the diskette. Some firmware images might require multiple diskettes. When prompted, insert the additional diskette to complete the firmware image.

After you have created a firmware image and saved it to one or more diskettes, use RDM Image Management to import the firmware image to the RDM repository.

Creating a System Firmware Flash image in RDM

You can use the Image Management option to create a System Firmware Flash image in RDM. You can then create a System Firmware Flash task that uses the image that you create.

Complete the following steps to use the Image Management option to create firmware image in RDM:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

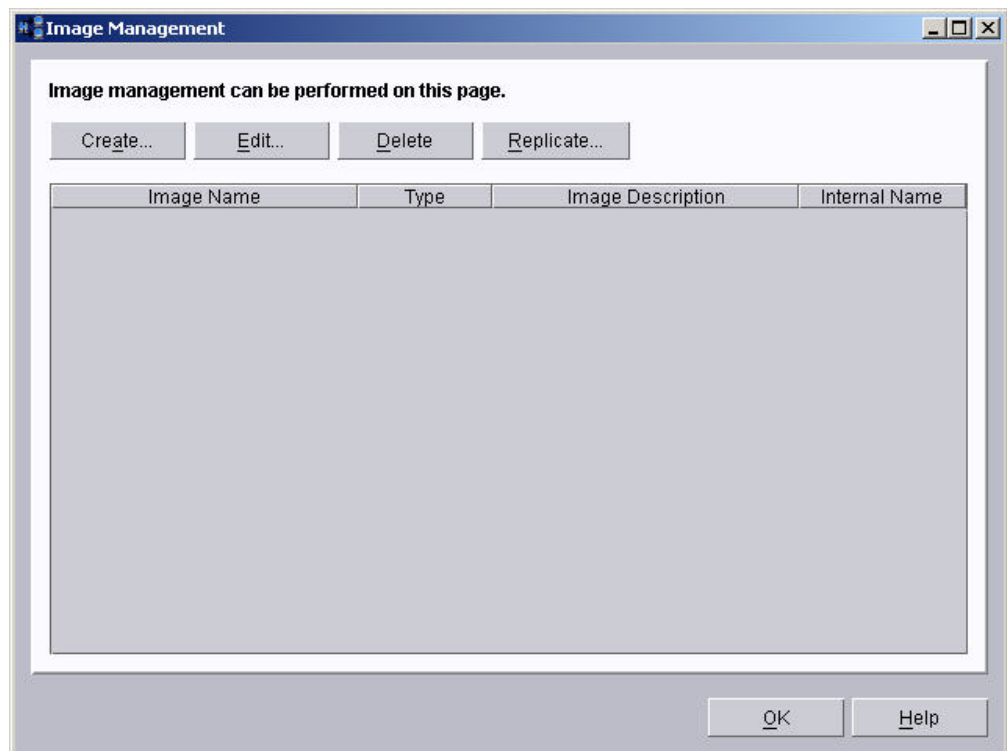


Figure 143. Image Management window

2. Click **Create**. The Create Image window opens.

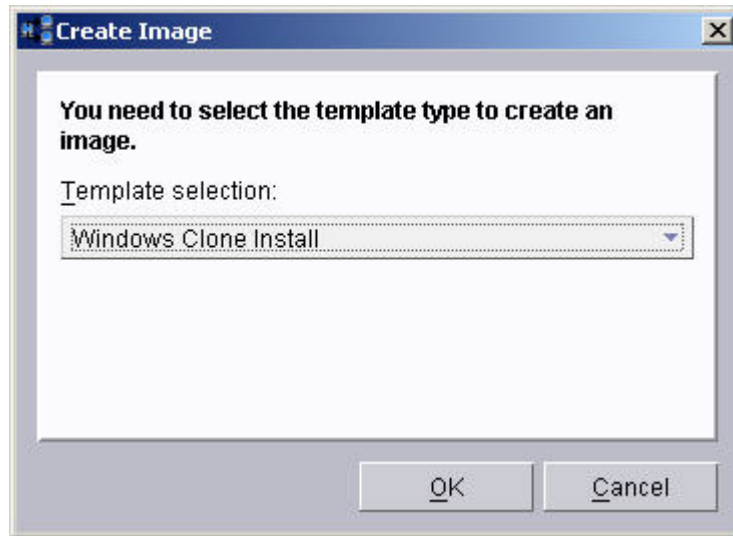


Figure 144. Create Image window

3. In the **Template selection** field, select **System Firmware Flash**; then, click **OK**. The Create System Firmware Flash Image window opens, and the General page is displayed.

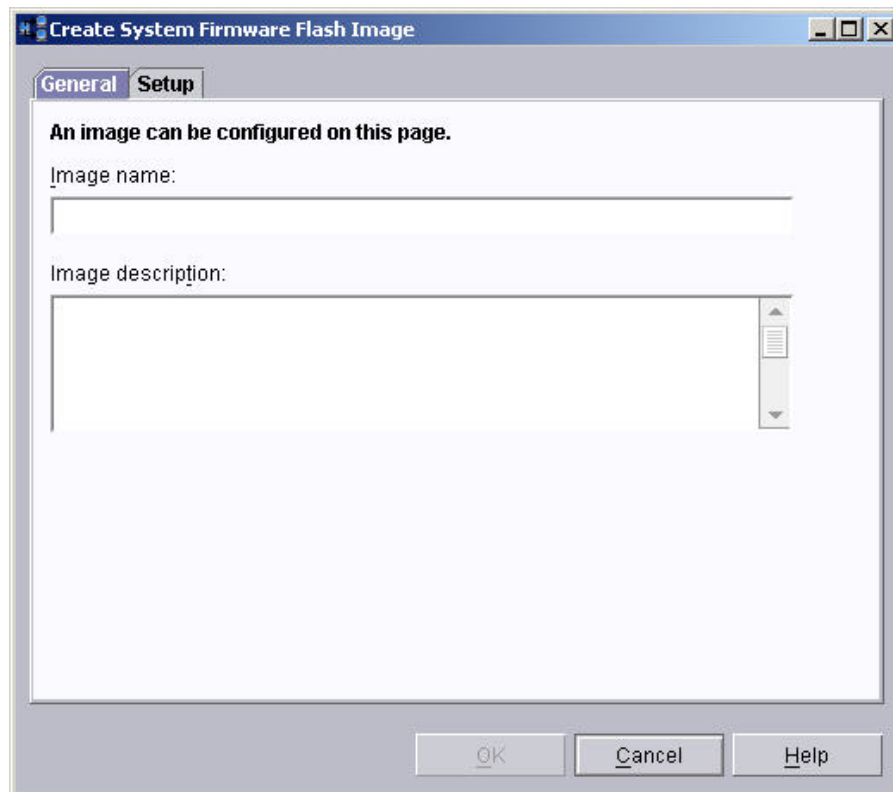


Figure 145. Create System Firmware Flash Image window: General page

4. In the **Image name** field, type a name for the firmware image. Later, when you create a task, you can associate the firmware image with the task by using the image name.

5. (Optional) In the **Image description** field, type a brief description of the firmware image.
6. Click **Setup**. The "Setup" page is displayed.

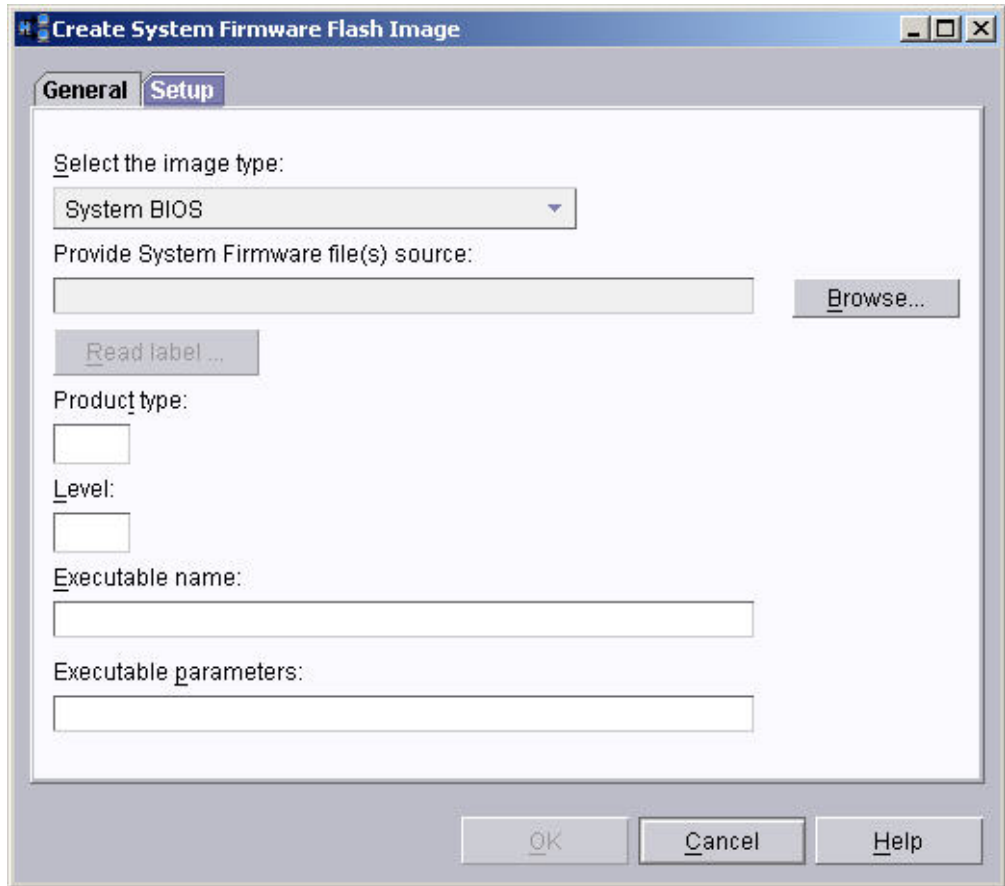


Figure 146. Create System Firmware Flash Image window: Setup page

7. In the **Select the image type** field, select one of the following types of firmware images:

System BIOS

You can create a System BIOS image to update the BIOS code for an IBM system.

Embedded Controller

You can create an Embedded Controller image to update the embedded controller program only for an IBM ThinkPad® mobile computer.

Integrated Systems Management Processor

You can create an Integrated Systems Management Processor image to update the code only for a service processor that ships on an IBM server system. You cannot use this option to update the code for adapters that you add to a system.

8. To read the image from a diskette, insert the diskette that contains the firmware image into the diskette drive.
9. Select the source for the System Firmware Flash image:

- a. Click **Browse**. The “Select directory” window opens.

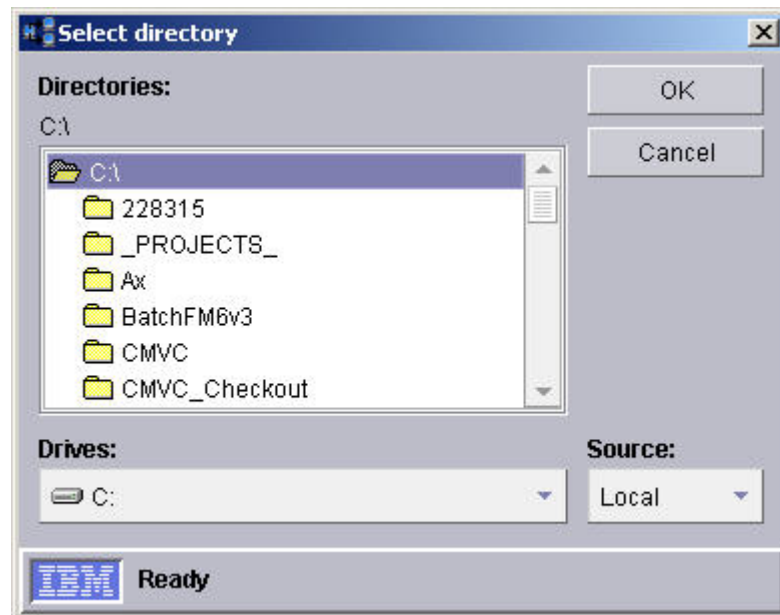


Figure 147. “Select directory” window

- b. In the **Source** field, select the system where the image is located. You can choose between the local system or the management server.
Note: If the local system is the management server, **Local** specifies the directories that your operating-system account is authorized to access, and **Server** specifies the directories that the IBM Director Server service can access.
 - c. In the **Drive** field, select the drive letter where the file is saved.
 - d. Click **OK**.
10. Click **Read label**. If the source is a firmware diskette, RDM reads the diskette label and populates the remaining fields. If RDM cannot identify the firmware information, you are prompted to enter the required information.
Note: When the firmware is later deployed to a target system, the default commands for the firmware are run. You can override these commands by using the **Executable name** and **Executable parameters** fields.
 11. Click **OK**. The Task Image Creation Progress window opens. The firmware image is saved to the master repository. If the firmware is contained on multiple diskettes, RDM automatically prompts you for additional disks as applicable.

After you create a firmware image in RDM, you can associate the firmware image with one or more System Firmware Flash tasks. You also can create a CMOS Update task that uses the image. For information about how to create a CMOS Update task, see “Creating a CMOS Update task” on page 85.

Creating a System Firmware Flash task

After you create a firmware image in RDM, you can create a System Firmware Flash task that uses the image. You can select specific System Firmware Flash images that are to be used in the task.

Complete the following steps to create a System Firmware Flash task:

1. In the Tasks pane, expand the **Remote Deployment Manager** task tree. The RDM tasks are displayed.
2. Right-click **System Firmware Flash** in the task pane and click **Create new task**. The System Firmware Flash window opens.

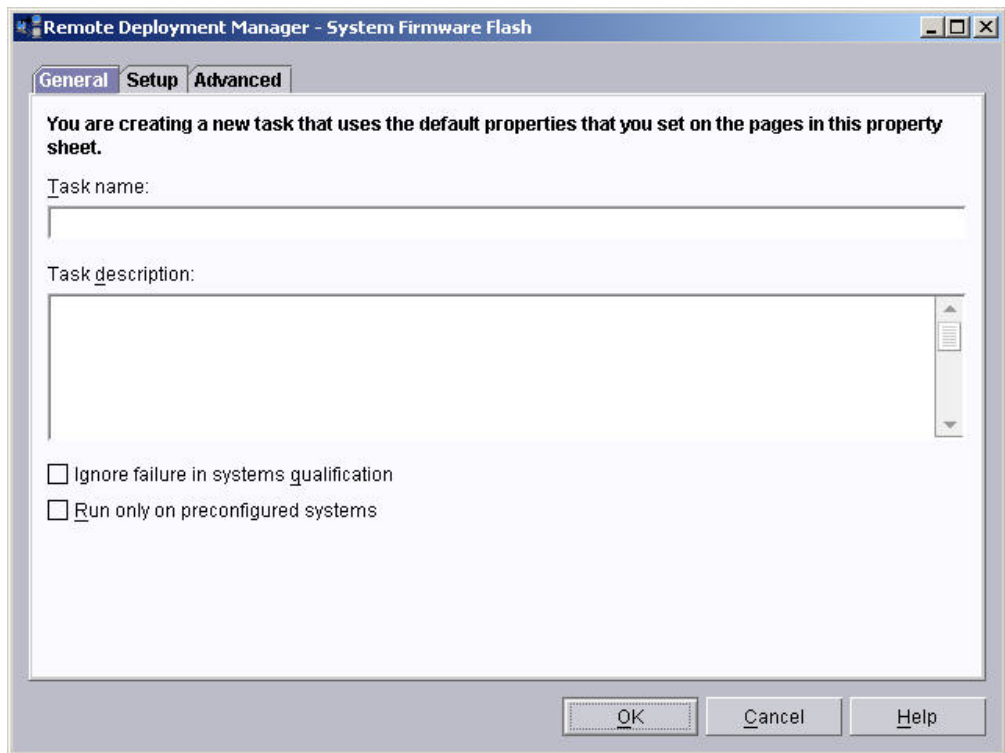


Figure 148. Remote Deployment Manager - System Firmware Flash window: General page

3. Complete the fields on the General page:
 - a. In the **Task name** field, type a name for the task.
 - b. In the **Task description** field, type a brief description for the task.
 - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
 - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values that are stored in the RDM database.

4. Complete the fields on the Setup page:

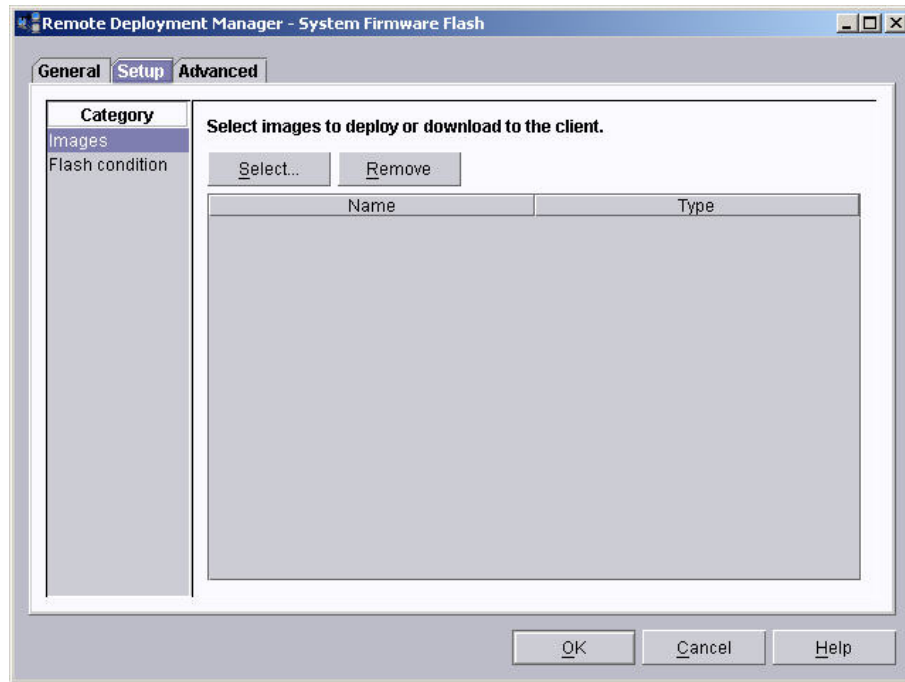


Figure 149. Remote Deployment Manager - System Firmware Flash window: Setup page

- a. Click the **Setup** tab. The Setup page is displayed.
- b. From the **Category** list, select **Images**; then, click **Select**. The Image Selection window opens.

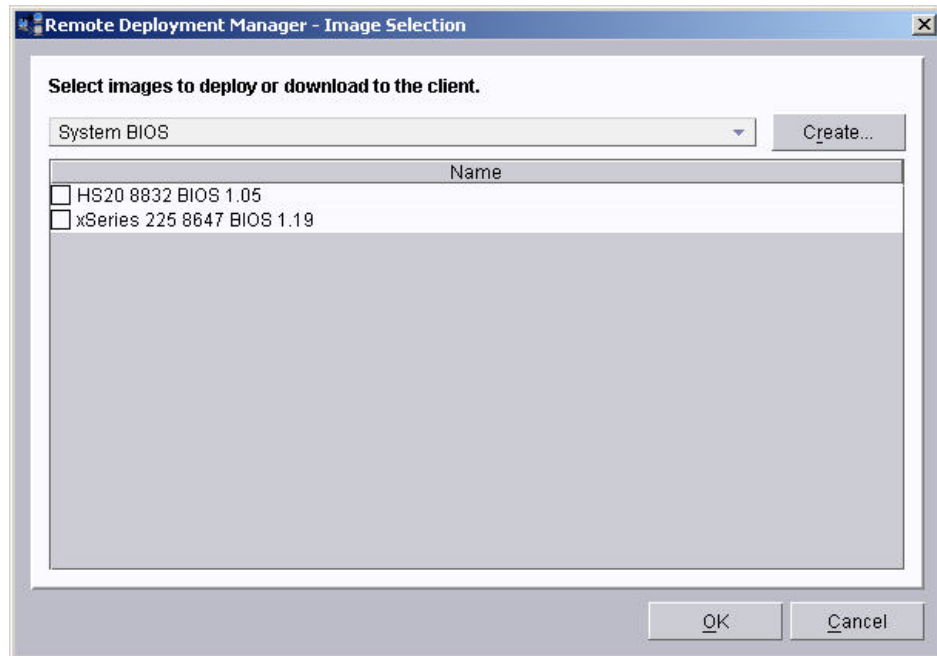


Figure 150. Image Selection window

- c. From the drop-down list, select the type of firmware that you want to use with the task. The Image Selection window displays the applicable firmware images that are in the RDM repository.
- d. From the **Name** list, select the check box for each firmware image that you want to use; then, click **OK**. The Setup page displays the selected firmware images.

Notes:

- 1) If the firmware image that you want to use is not already in the repository, you can click **Create** to add it.
 - 2) To remove an image from the list, select the image (within the list) that you want to remove; then, click **Remove**. The image is removed from the task; however, it is still available in the RDM repository. If you want to delete the image from the repository, you can use the Image Management option. For information about deleting an image from RDM, see “Deleting an image” on page 38.
- e. From the **Category** list, select **Flash condition**; then, use one of the following procedures:
 - Select **Always flash** to always flash the target system that uses the task, regardless of what firmware version is on the target system.
 - Select **Flash only if different from current version** to flash the target system only if the firmware image that is used by the task is a different version from the firmware version on the target system.
5. Click **OK** to create the task. The task is displayed in the Tasks pane under the **System Firmware Flash** task.

Running a System Firmware Flash task

Complete the following steps to run a System Firmware Flash task:

1. From IBM Director Console, expand the **Remote Deployment Manager** task tree. The RDM tasks are displayed.
2. Expand the **System Firmware Flash** task tree. The System Firmware Flash tasks are displayed.
3. Drag the applicable System Firmware Flash task to the target system or group that you want to update. The BIOS code level of the target system is part of the information that is collected during the scan process.

Note: System Firmware Flash tasks do not contain any values that require configuration; however, you can select **Configure systems** to display the firmware information for the selected target systems.

When you deploy firmware to a target system, one of the images that is used by the System Firmware Flash task must correspond to the BIOS code level of the target system.

Chapter 20. VMware Native Install

You can use the VMware Native Install template in RDM to create a task that remotely installs VMware ESX Server 2.1 (or later) on a target system.

The VMware Native Install template uses a wizard to gather the installation information and create a task.

Typically, RDM tasks that are used to deploy an operating system use an operating system image from the RDM repository. A VMware Native Install task, however, does not use an image from the RDM repository. Before you create a VMware Native Install task, you must save the VMware installation files to a supported file server (HTTP, FTP, or NFS) in your network. The VMware Native Install task that you create uses the VMware installation files to deploy VMware Server. When you run a VMware Native Install task, the target system connects to the file server to install VMware Server. Make sure that the target system to which you plan to deploy VMware Server meets the system requirements for the VMware software. For information about VMware system requirements and installation, see the documentation that comes with your VMware software.

This chapter provides the procedures that you must complete in the following order to create a VMware Native Install task and deploy VMware ESX Server to a target system:

1. Copy the VMware installation image to an accessible network directory.
2. Create a VMware Native Install task.
3. (Optional) Configure the systems.
4. Run the VMware Native Install task.

Copying a VMware installation image to a network

Before you can use RDM to deploy VMware ESX Server 2.1, you must copy the VMware installation files to a file server that can be accessed by the target system.

If applicable, make sure that you make note of the user name and password that are required to connect to the file server. If they are required, you must provide them when you create the VMware Native Install task.

Creating a VMware Native Install task

After you copy the VMware installation files to a file server, you can create a VMware Native Install task to deploy the image.

Complete the following steps to create an VMware Native Install task:

1. In the Tasks pane, expand the **Remote Deployment Manager** task.
2. Right-click **VMware Native Install**. The VMware Native Install task menu is displayed.

3. Click **Create new task**. The VMware Native Install window opens.

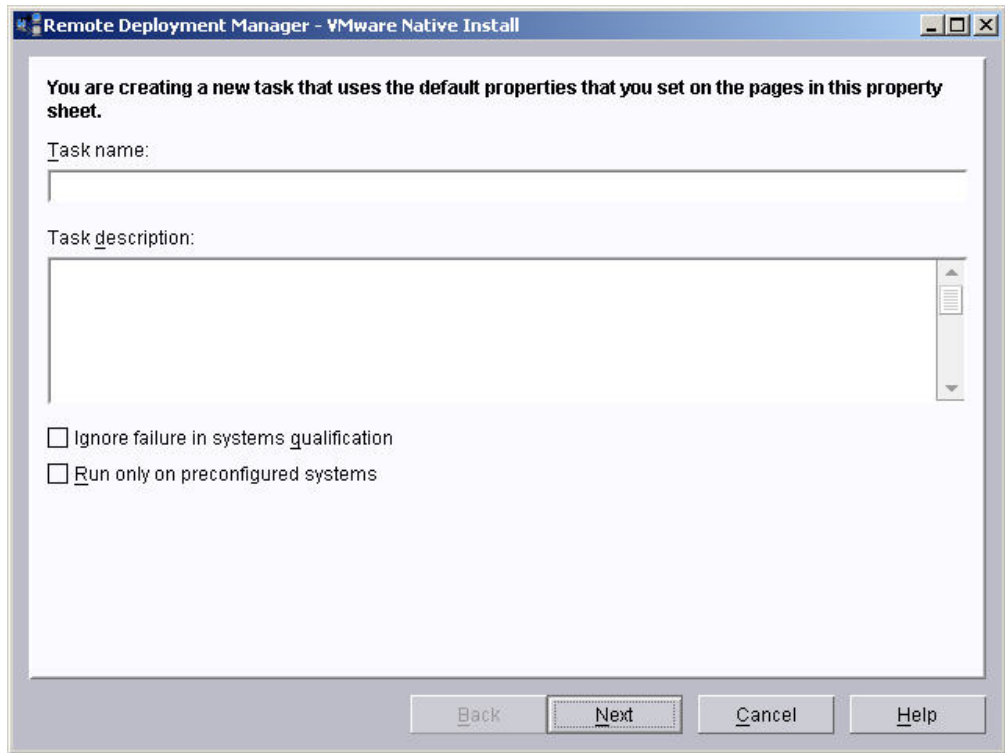


Figure 151. VMware Native Install task: "You are creating a new task" window

4. Provide the basic information for the task:
 - a. In the **Task name** field, type a descriptive name to identify the task.
 - b. (Optional) In the **Task description** field, type a brief description of the task.
 - c. (Optional) Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
 - d. (Optional) Select the **Run only on preconfigured systems** check box to ensure that the task runs only on a target system that has system values that are stored in the RDM database.

e. Click **Next**. The VMware License Agreement is displayed.

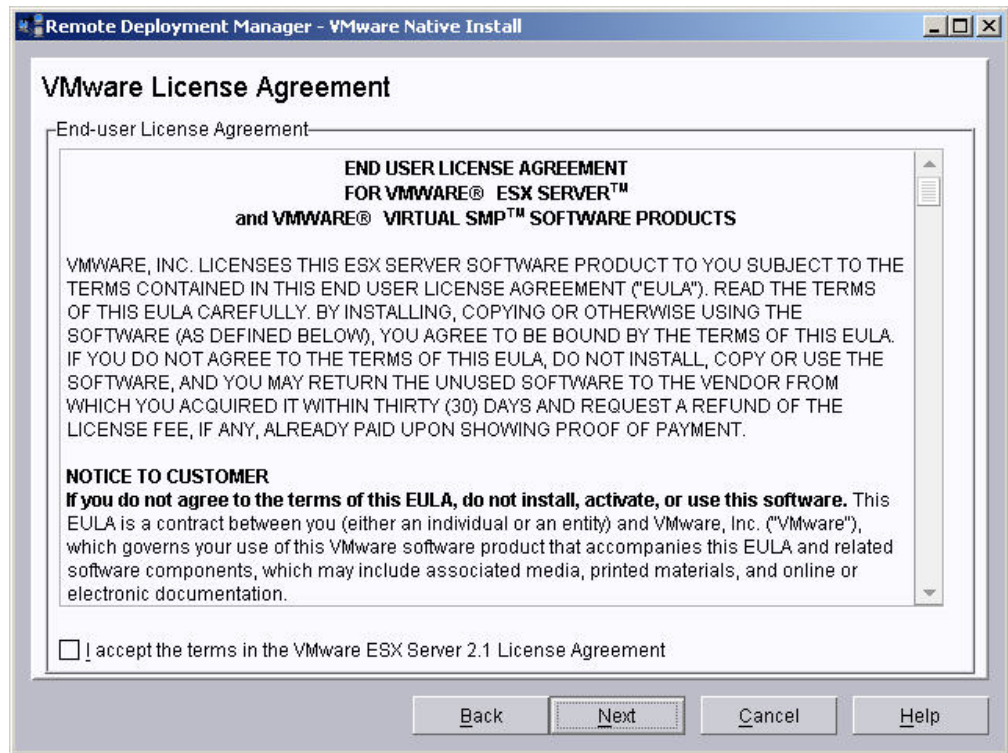


Figure 152. VMware Native Install task: VMware License Agreement window

5. Read the license agreement and click **I accept the terms in the VMware ESX Server 2.1 License Agreement**; then, click **Next**. The Installation Configuration window is displayed.

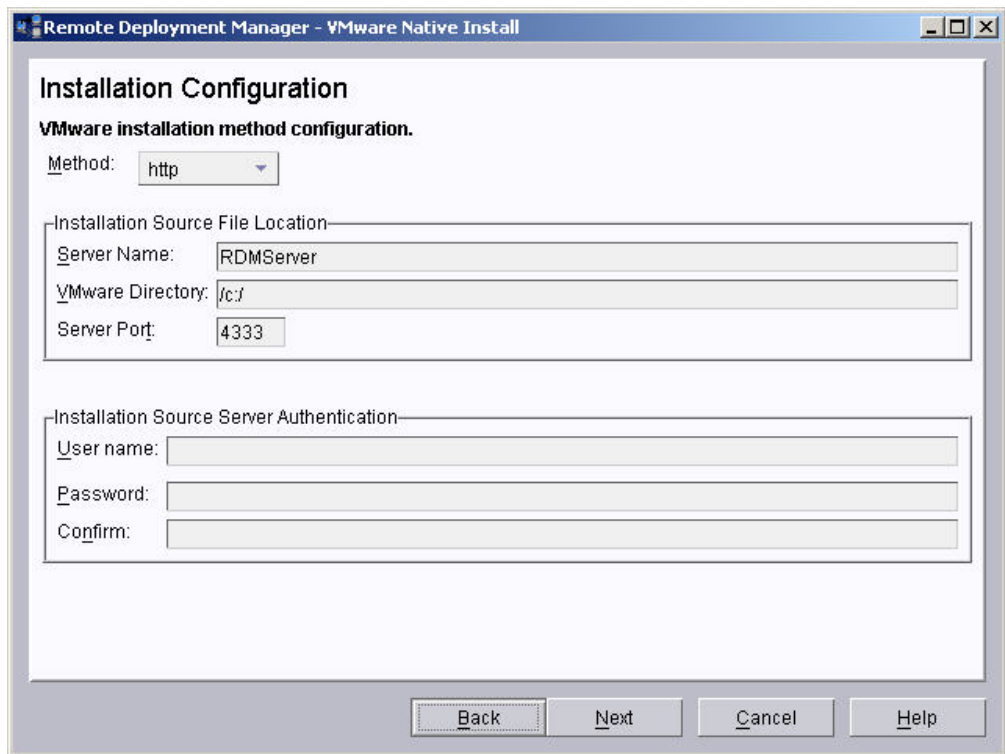


Figure 153. VMware Native Install task: Installation Configuration window

6. Select the installation image:
 - a. In the **Method** field, select the VMware installation method.
 - HTTP** Select Hypertext Transfer Protocol (HTTP) if the VMware installation files have been saved to the directory on a Web server.
 - FTP** Select File Transfer Protocol (FTP) if the VMware installation files have been saved to the directory on a FTP server.
 - NFS** Select Network File System (NFS) if the VMware installation files have been saved to the directory on a network file system.
 - b. In the **Server Name** field, type the name or the IP address of the server where the VMware installation files are saved. The server name can be a maximum of 255 characters long.
 - c. In the **VMware Directory** field, type the directory path to the VMware installation files on the file server. The VMware directory path can be a maximum of 255 characters long.
 - d. In the **Server Port** field, type the server port number for the file server. The server port number must be between 1 and 65535.
 - e. In the **User name** field, type the user name that is required to access the server on which the VMware installation files are saved. The user name can be a maximum of 255 characters long.
 - f. In the **Password** field, type the password that is required to access the server on which the VMware installation files are saved.

g. Click **Next**. The Partition Configuration window is displayed.

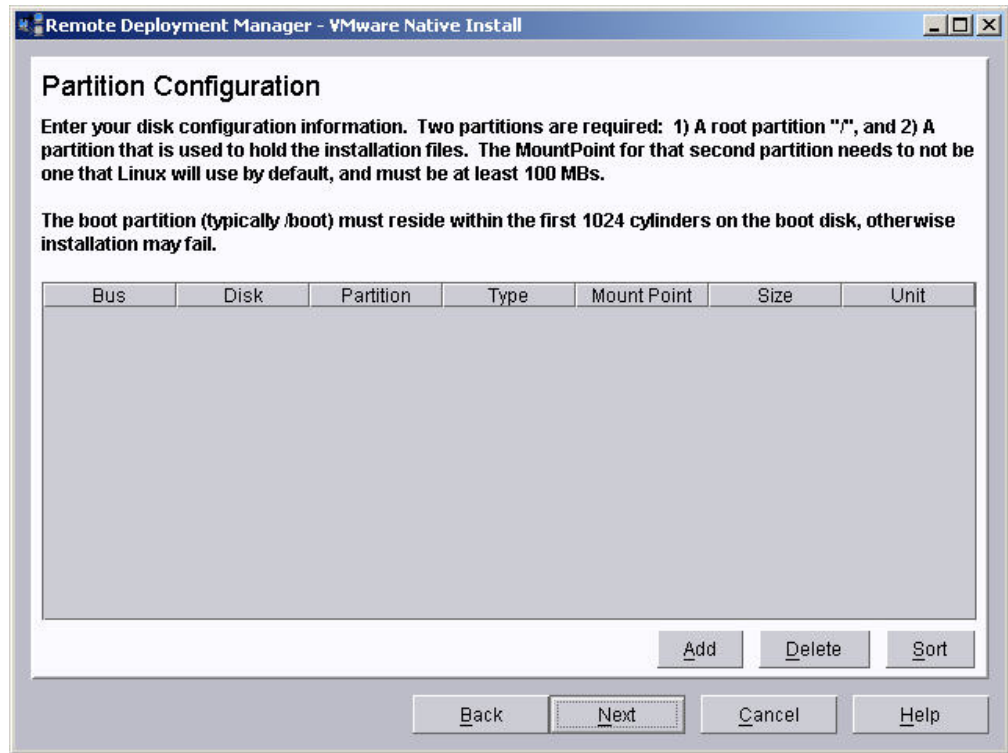


Figure 154. VMware Native Install task: Partition Configuration window

7. Configure the partitions.

Note: VMware requires a boot partition (mounted at /boot) with a minimum size of 25 MB as the first partition on the hard disk drive. For information about the partition requirements for installing VMware ESX Server, see the documentation that comes with VMware ESX Server.

- a. Click **Add** to add a partition. The “Enter the data for the new partition” window opens.

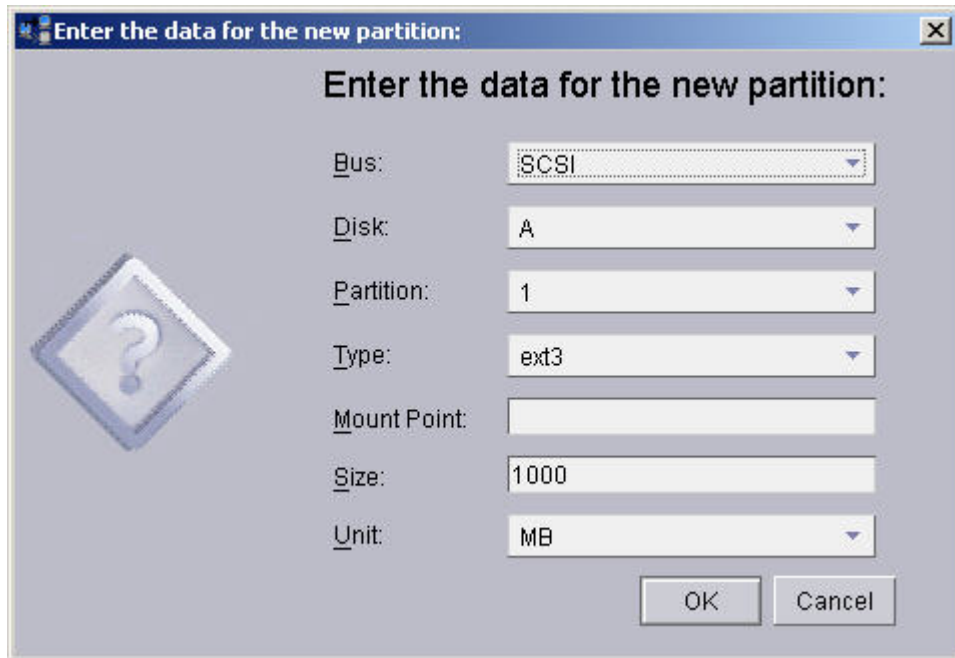


Figure 155. “Enter the data for the new partition” window

- b. In the **Bus** field, select whether the hard disk drive is connected to a SCSI or IDE bus.
- c. In the **Disk** field, select the drive letter of the hard disk drive to which you want to add the partition.
- d. In the **Partition** field, select the partition number for the partition. Partitions 1 through 4 are primary partitions. Partitions 5 and up are extended partitions.
- e. In the **Type** field, select the type of file system for the partition.
- f. In the **Mount Point** field, type the mount point for the selected partition.
- g. In the **Size** field, type the size, in megabytes (MB) or as a percentage of the total size remaining, depending on the specified unit.
- h. In the **Unit** field, select the unit of measure for the size of the partition. Select **MB** to allocate a size in megabytes, or **% Rem** to allocate a size as a percentage of the unallocated disk space. % rem allocations cannot exceed 100% for the primary partitions (1 through 4). % rem allocations for the extended partitions (5 through 16) must not exceed 100%.
- i. Click **OK**.

Note: To sort the partitions in ascending order according to the disk letter and partition number, click **Sort**.

- j. Repeat steps 7a-7i for each partition that you want to create.

- k. Click **Next**. The TCP/IP Setup Information window opens.

Remote Deployment Manager - VMware Native Install

TCP/IP Setup Information

TCP/IP client configuration parameters.

Use DHCP Server

IP Range parameters

IP Start: IP End:

Router parameters

Subnet mask: Gateway IP:

DNS setup parameters

Use DNS domain name:

Primary DNS IP: Secondary DNS IP:

Back Next Cancel Help

Figure 156. VMware Native Install task: TCP/IP Setup Information window, with Use DHCP Server check box cleared

8. Set up the TCP/IP information.
- Clear the **Use DHCP Server** check box to configure the TCP/IP settings.
 - In the **IP Range parameters** fields, type the starting and ending IP addresses to indicate the range of IP addresses that can be used for the target system.
 - In the **Subnet Mask** field, type the subnet mask that is to be used by the target system.
 - In the **Gateway IP** field, type the IP address for the gateway that is to be used by the target system.
 - To configure the target system to use a DNS domain name, select the **Use DNS domain name** check box; then, type the domain name in the field.
 - To provide the IP address for the primary DNS, in the **Primary DNS IP** field, type the IP address.
 - To provide the IP address for the secondary DNS, in the **Secondary DNS IP** field, type the IP address.

- h. Click **Next**. The Miscellaneous window opens.

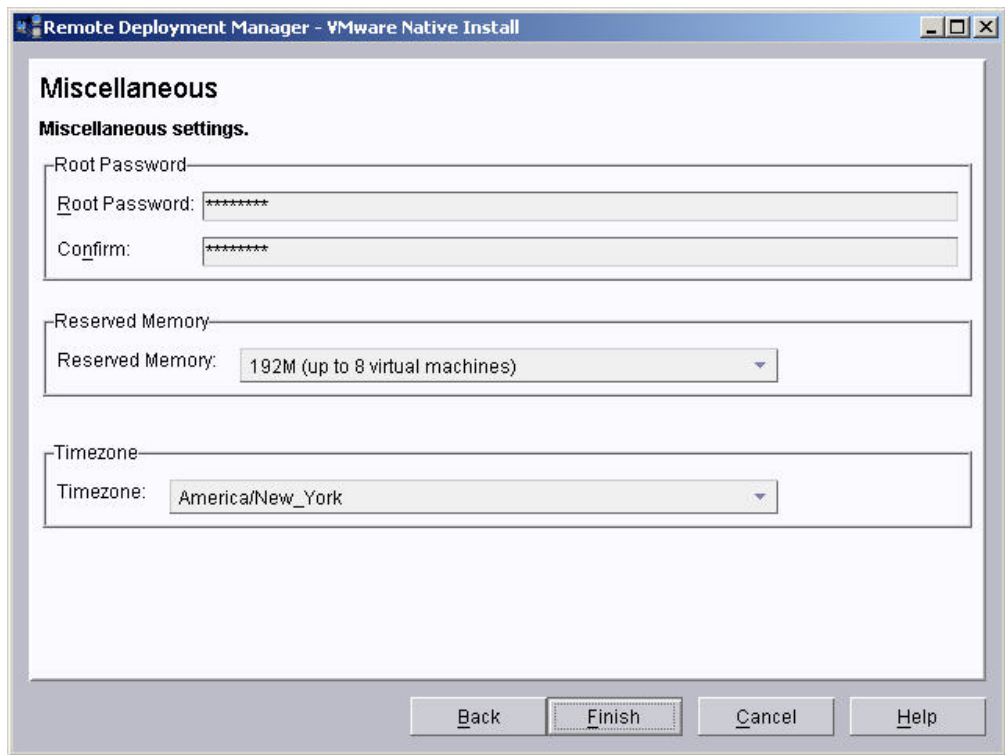


Figure 157. VMware Native Install task: Miscellaneous window

9. Configure the miscellaneous settings:
- In the **Root Password** field, type the password for the root account that is to be used on the target system. The root password can be a maximum of 64 characters long.
 - In the **Reserved Memory** field, select the one of the following memory options that is to be used on the target system:
 - 192M (up to 8 virtual machines)
 - 272M (up to 16 virtual machines)
 - 384M (up to 32 virtual machines)
 - 512M (up to 64 virtual machines)
 - 800M (max reserved memory)
 - In the **Timezone** field, select the time zone.
 - Click **Finish**. The VMware task is displayed in the IBM Director Console Tasks pane.

Configuring a target system

Before you run a VMware Native Install task against a group of target systems, you can configure the systems. Typically, you use the **Configure systems** option from the IBM Director Console menu to add system-specific information to the applicable systems, such as a serial number or a password. When you create a VMware task, the serial information, which is unique for each system, is not requested by RDM. However, you can enter system-specific information remotely by using the **Configure systems** option before you run the task. You also can modify other system-specific information such as root password and regional settings.

Complete the following steps to configure the VMware task for a specific system:

1. From IBM Director Console, expand **Remote Deployment Manager** in the Tasks pane.
2. Expand **VMware Native Install**.
3. Drag the VMware Native Install task onto the target system or systems. The **Task** menu is displayed.
4. Click **Configure systems**. The System/Task Configuration window opens.

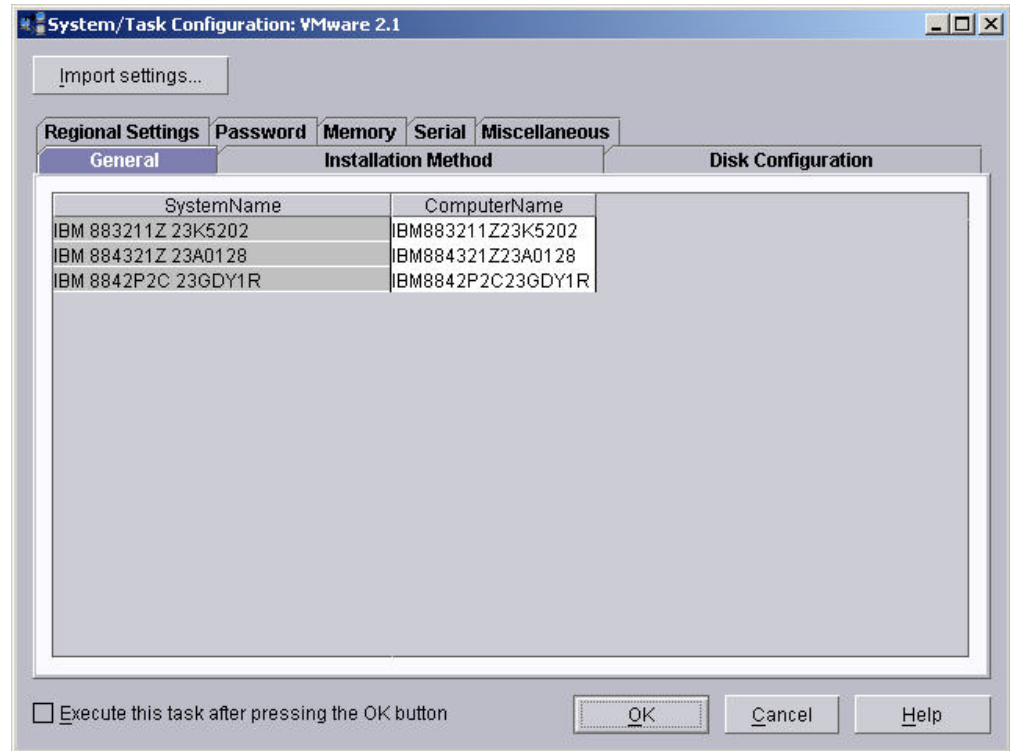


Figure 158. System/Task Configuration window

5. Configure the serial numbers for a target system:
 - a. Click the **Serial** tab. The Serial page is displayed.

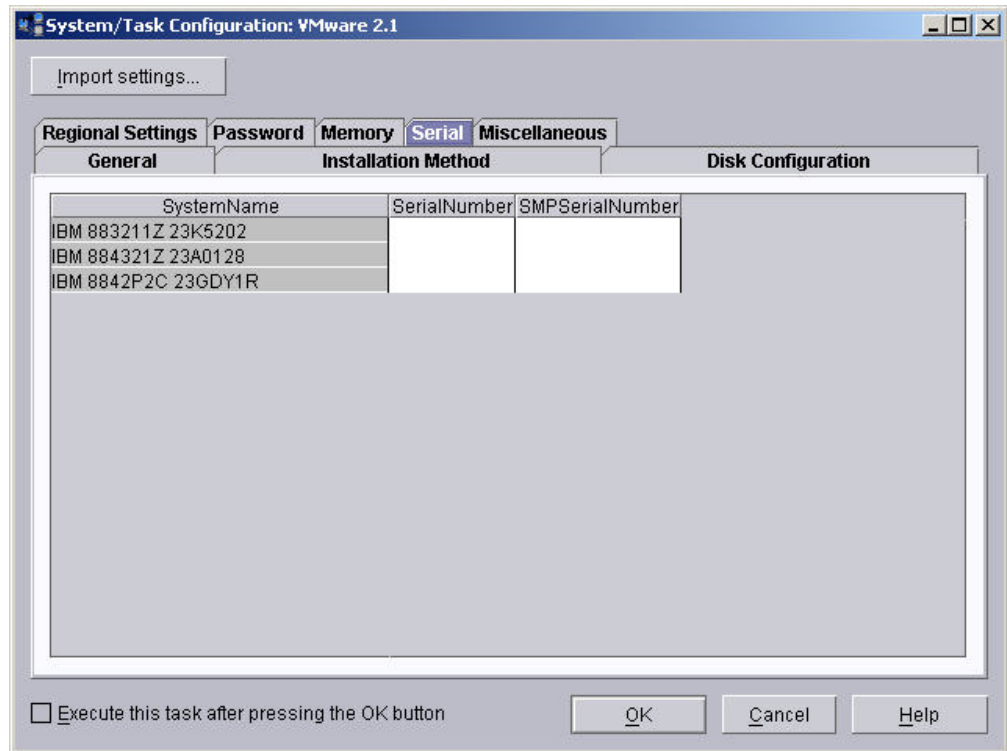


Figure 159. System/Task Configuration window: Serial page

- Note:** If you configure more than one system at a time, make sure the row for the system that you want to configure is selected.
- b. In the **Serial Number** field, type the serial number that was provided with your VMware software.
 - c. In the **SMP Serial Number** field, type the symmetric multiprocessing (SMP) serial number for the target system. This serial number is required if you want to install VMware Virtual SMP for ESX Server on the target system.
6. Update the other configuration information as applicable.
 7. Click **OK**.

Running a VMware task

Complete the following steps to use a VMware Native Install task to install VMware on a target system:

1. From IBM Director Console, expand **Remote Deployment Manager** in the Tasks pane.
2. Expand **VMware Native Install**. The VMware Native Install tasks are displayed.
3. Drag the VMware Native Install task that you want to run onto the target system. The **Task** menu is displayed.
4. Click **Run systems**. A confirmation window opens.
5. Click **Execute Now**.

Chapter 21. Windows Clone Install

You can use the Windows Clone Install template to create tasks that use a clone image to install Windows on target systems. You select the image from a list of Windows clone images that have already been saved in the master repository. The same image can be downloaded to multiple systems.

The clone installation image contains the operating system and applications designed to meet the requirements of a specific end user, department, or group of end users that perform similar tasks. The image consists of an exact bit-by-bit copy of a donor system. See “Creating a donor image” on page 102 for more information.

The Symantec utility that is provided with RDM is a simplified version of Symantec ImageCenter that you can use to copy only the first active partition from a managed system. To create an image that includes multiple disk partitions, you must install the retail version of Symantec ImageCenter and configure the applicable settings in RDM. For information about creating donor images that include multiple partitions, see “Upgrading to DeployCenter version 5.5” on page 107.

Note: The Symantec software used to obtain the clone image does not support Token Ring.

The Windows Clone Install template uses a wizard to gather the configuration information and create tasks.

This chapter provides the procedures that you must complete in the following order to create a Windows Clone Install task and run it on a target system:

1. Create a Windows Clone Install image and save to the master repository.
2. Create a Windows Clone Install task.
3. (Optional) Configure the target systems.
4. Run the Windows Clone Install task.

When RDM scans a system, it assigns a default name to the system, in the form *MachinetypeMachinemodel-Serialnumber*. This *system name* is displayed in IBM Director Console. When a Windows Clone Install task is run on a system without an operating system, RDM uses this system name for the Windows computer name. If a Windows Clone Install task is run on a system on which Windows is already installed, RDM recognizes and uses the computer name.

If the assigned computer name is not valid, RDM changes the computer name using the following rules:

- Remove spaces and characters that are not valid from the computer name. The following characters are not valid: `~!@#%&*()=+[]\|;:”,<>/?.
For example, *pear rfrsh* would be changed to *pearrfrsh*.
- Truncate from the end to make the computer name no longer than 63 characters.
- Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
- Add *_1*, *_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.

Creating a Windows Clone Install image

Before you can run a Windows Clone Install task, you must create an installation image and save the applicable installation files to the master repository.

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

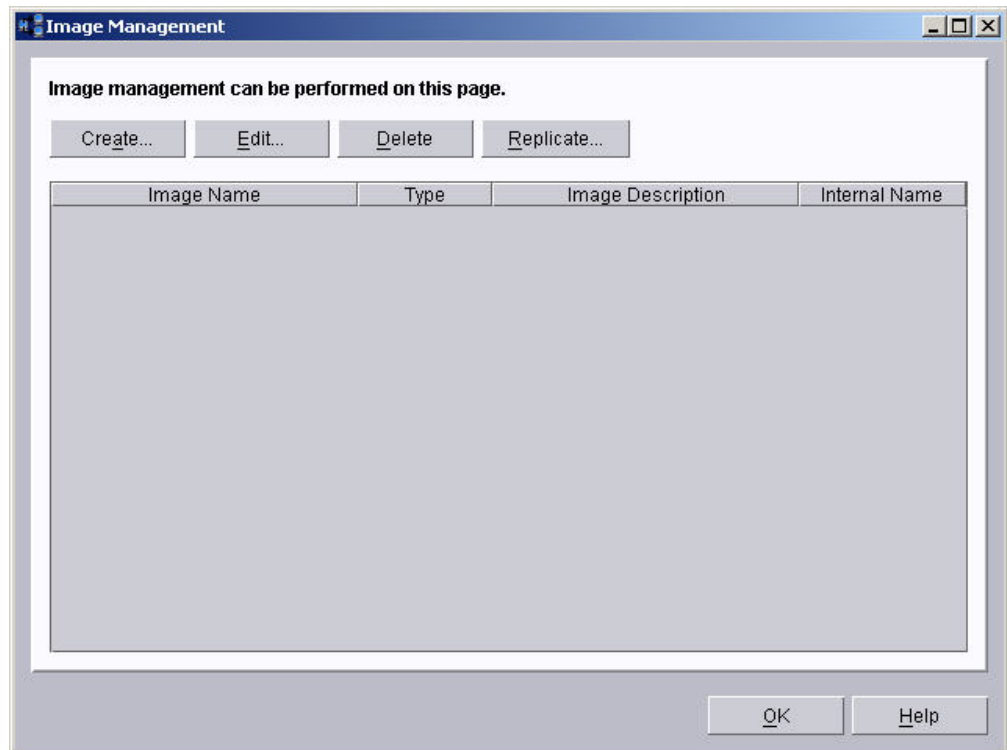


Figure 160. Image Management window

2. Click **Create**. The Create Image window opens.

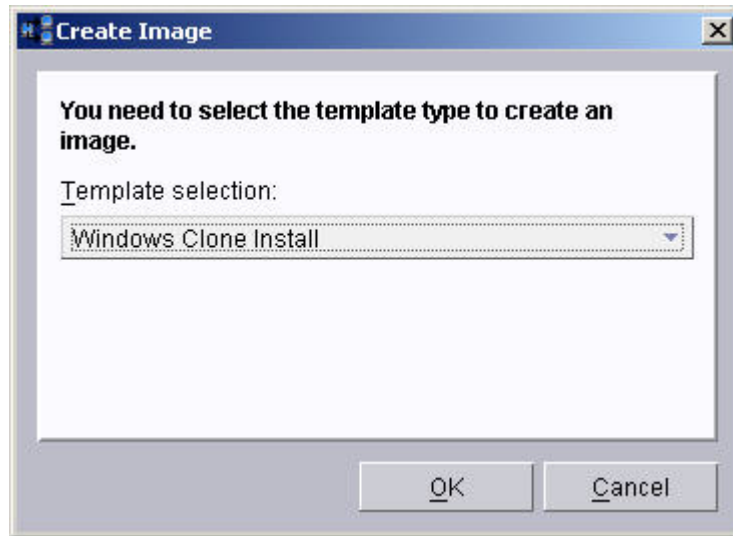


Figure 161. Create Image window

3. In the **Template Selection** field, select **Windows Clone Install**.
4. Click **OK**. The Create Windows Clone Install Image window opens.

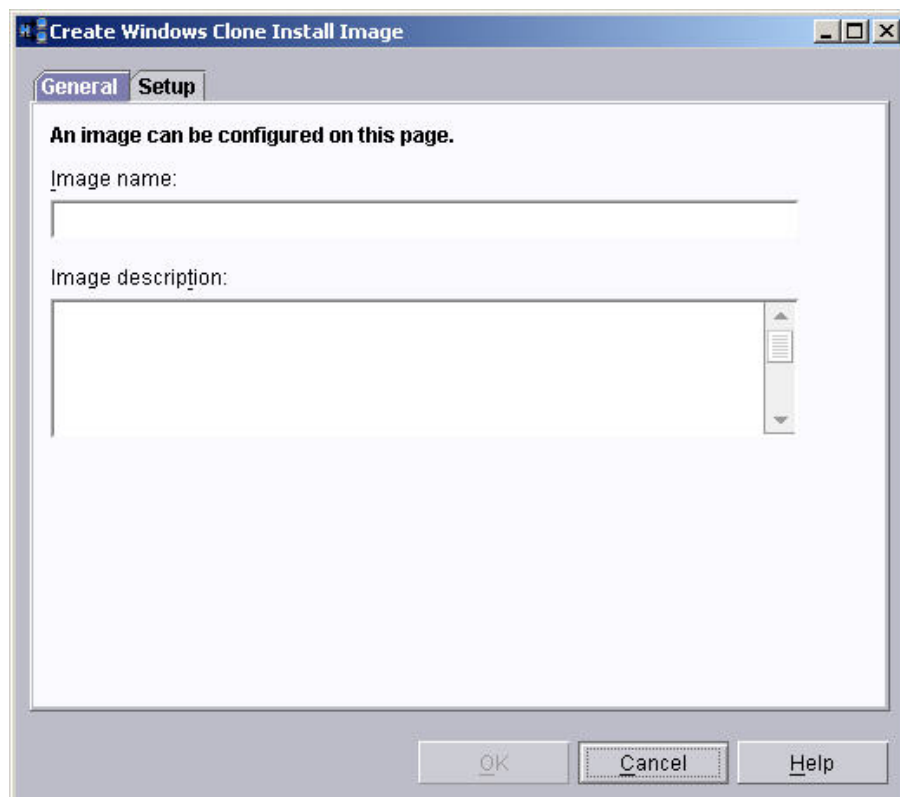


Figure 162. Create Windows Clone Install Image window: General page

5. On the General page, complete the following steps to provide the basic information for the task:
 - a. In the **Image name** field, type a descriptive name to identify the image.

- b. (Optional) In the **Image description** field, type a brief description of the image.
6. Click the **Setup** tab. The Setup page of the Create Windows Clone Install Image window is displayed.

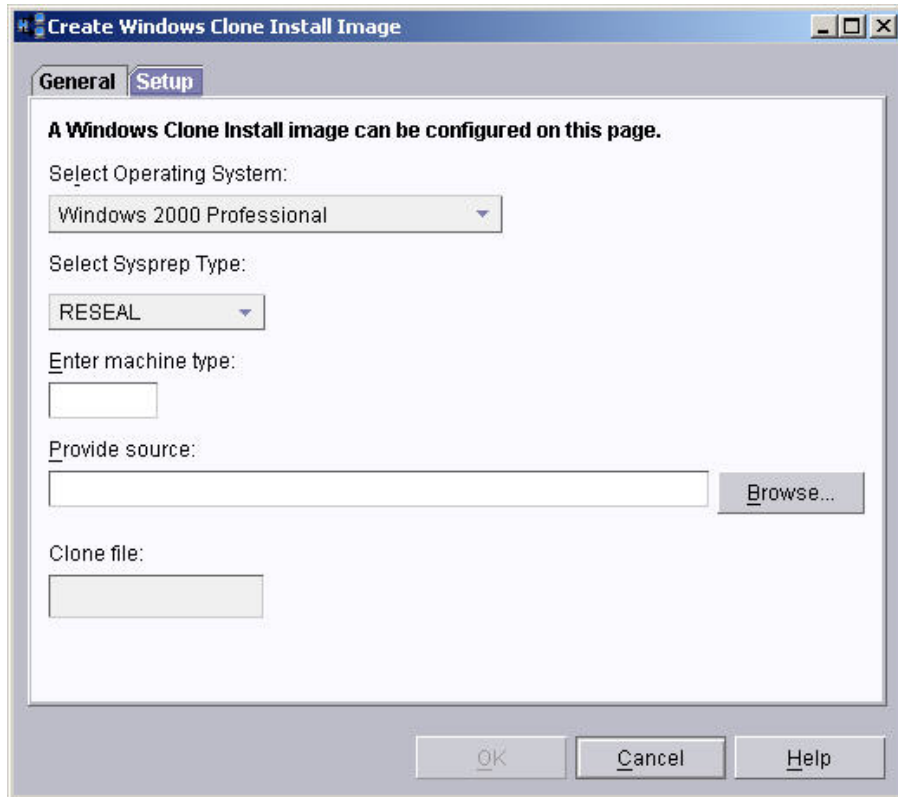


Figure 163. Create Windows Clone Install Image window: Setup page

7. In the **Select Operating System** field, click to select the operating system of the image.
8. In the **Select Sysprep Type** field, click to select the sysprep type.

Note: For information on the Reseal and Factory sysprep options, see “RDM-supported options in Sysprep version 2.0” on page 337.
9. In the **Enter machine type** field, type the four-digit machine type number of the target system.
10. Click **Browse** to locate and select the Windows Clone Install source file.
11. Click **OK**.

Creating a Windows Clone Install task

Complete the following steps to create a Windows Clone Install task:

1. Right-click **Windows Clone Install**. The Windows Clone Install task menu is displayed.
2. Click **Create new task**. The Windows Clone Install window opens.

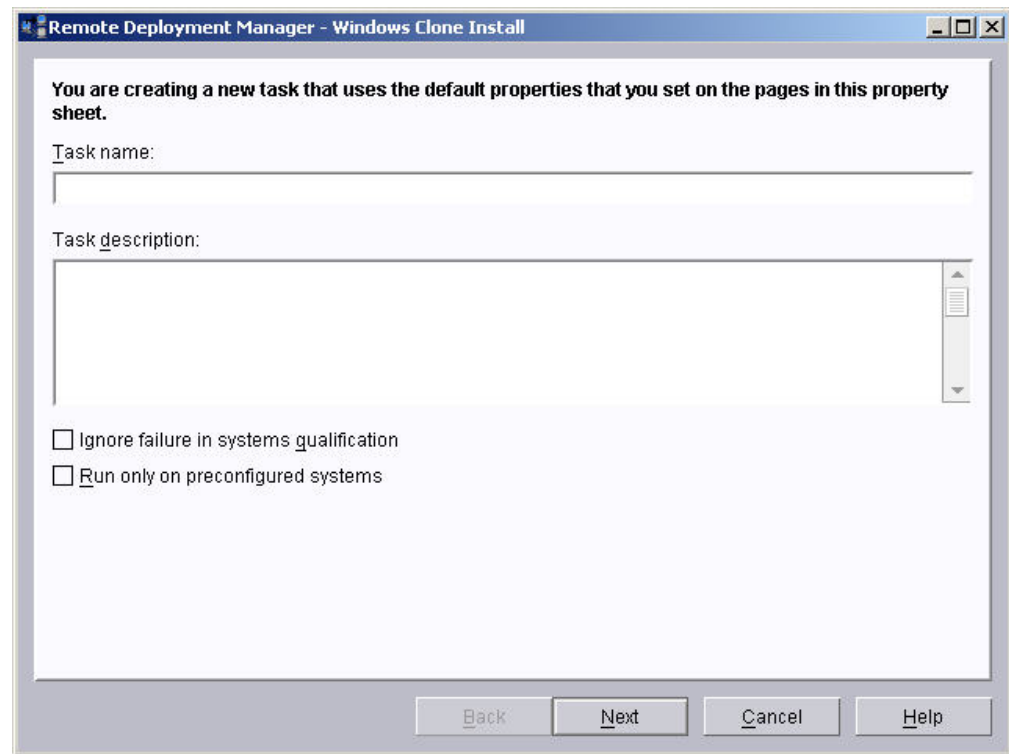


Figure 164. Windows Clone Install task: “You are creating a new task” window

3. Provide the basic information for the task:
 - a. In the **Task name** field, type a descriptive name to identify the task.
 - b. (Optional) In the **Task description** field, type a brief description of the task.
 - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
 - d. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
4. Click **Next**. The “Select images” window is displayed.

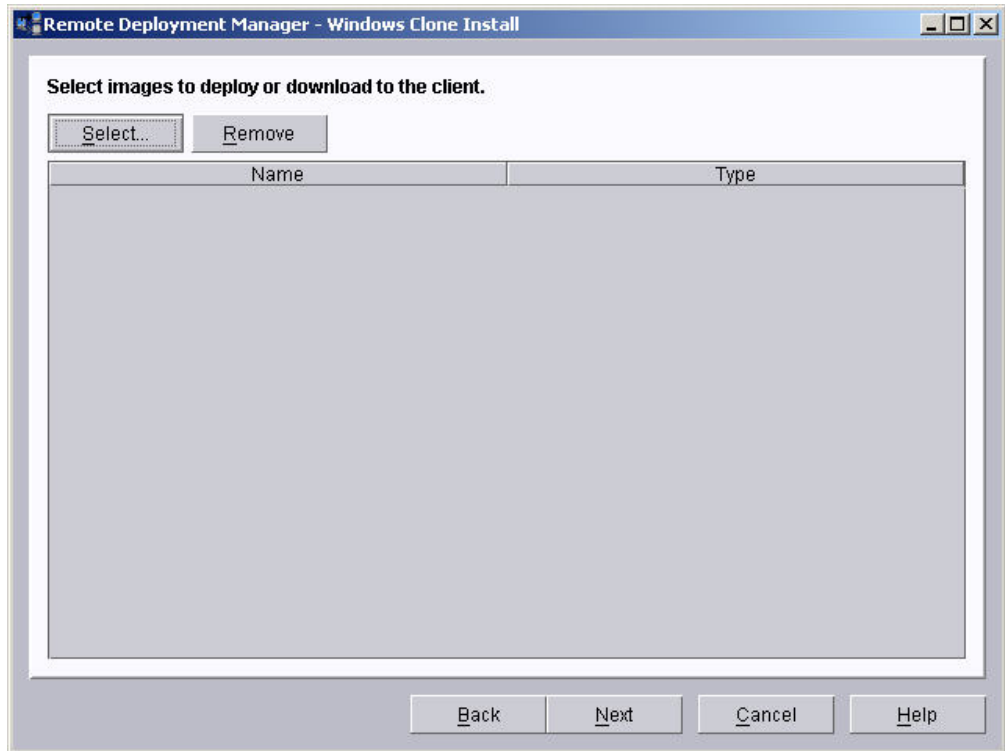


Figure 165. Windows Clone Install task: “Select images” window

5. Select the image:
 - a. Click **Select**. The “Image selection” window is displayed.

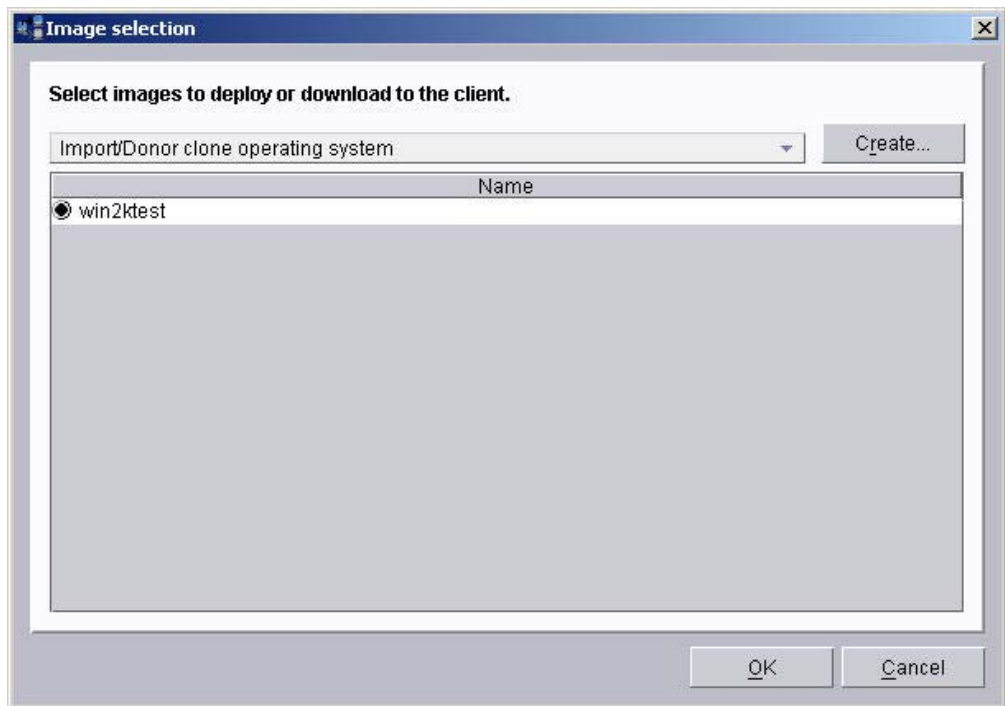


Figure 166. “Image selection” window

- b. From the list of images, click the image to be used.

- c. Click **OK**. The “Image selection” window closes.
6. In the “Select images” window, click **Next**. The “Personal information” window is displayed.

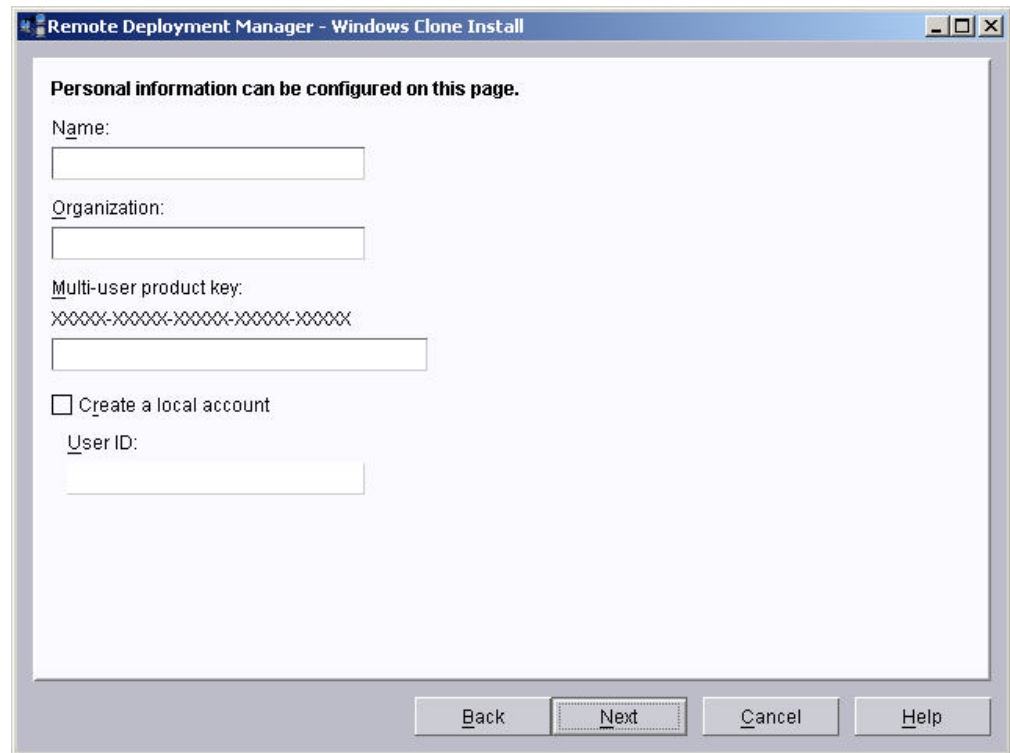


Figure 167. Windows Clone Install task: “Personal information” window

7. Specify the personal information:
 - a. In the **Name** field, type the name of the registered user of the system, for example, John Doe.
 - b. In the **Organization** field, type the company name for the system being deployed, for example, IBM Corporation.
 - c. In the **Multi-user product key** field, type the Certificate of Authorization for the Windows operating system being deployed. The CD key format has a length of 29 characters, formatted in five 5-character alphanumeric tokens separated by hyphens.
 - d. (Optional) Select the **Create a local account** check box if you want to create a local user on the system being deployed. Then, in the **User ID** field, type the name of the user account.
8. Click **Next**. The “Regional information” window is displayed.

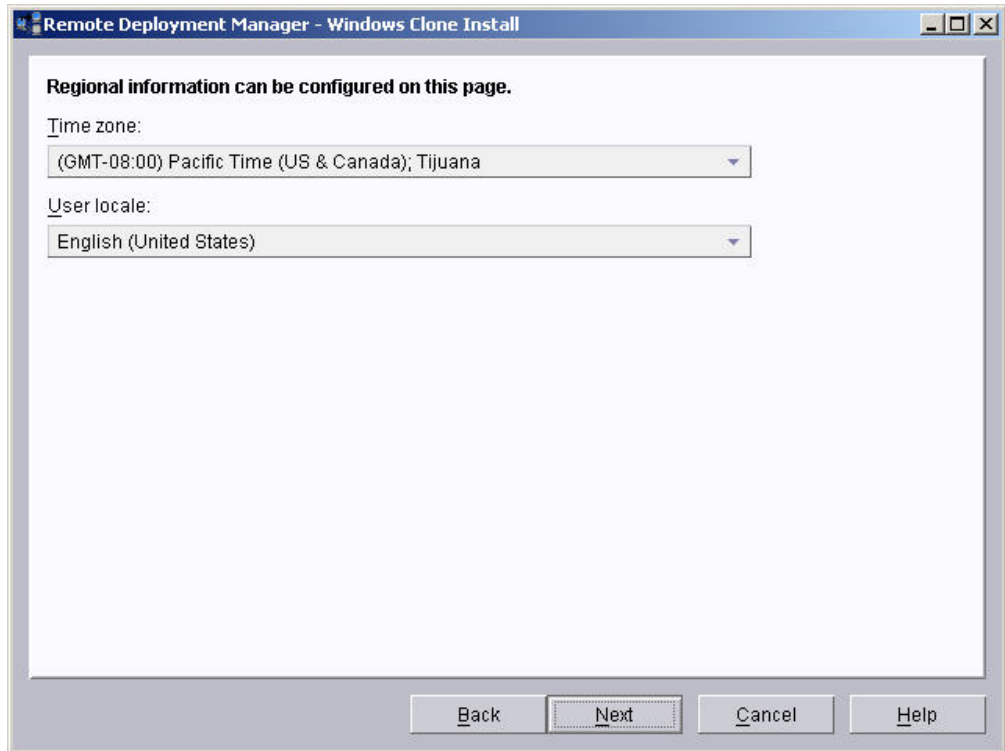


Figure 168. Windows Clone Install task: “Regional information” window

9. Configure the regional settings:
 - a. In the **Time zone** field, select the time zone.
 - b. In the **User locale** field, select the language to display.
10. Click **Next**. The “Network environment” window is displayed.

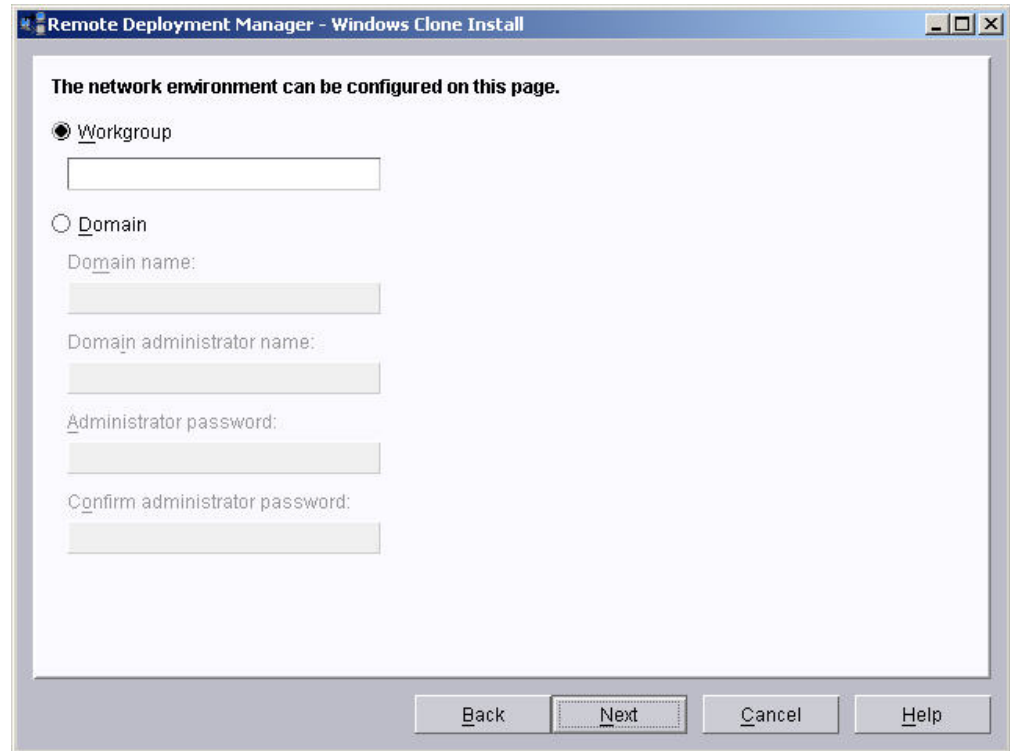


Figure 169. Windows Clone Install task: “Network environment” window

11. Configure the network environment:
 - a. By default, the **Workgroup** check box is selected, which configures the target system to automatically be configured using a workgroup. Type the workgroup name in the **Workgroup** field.
 - b. (Optional) Select the **Domain** check box to configure the domain for the target system. Type the domain name, the domain administrator name, and the domain administrator password in the applicable fields.
12. Click **Next**. The “Network protocols” window is displayed.

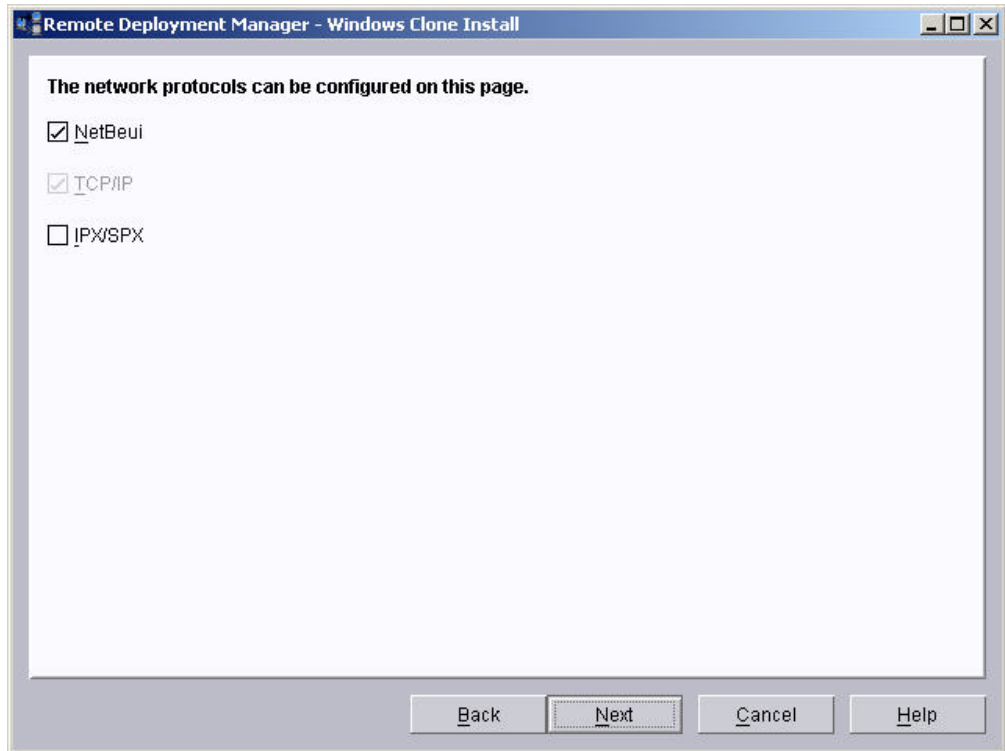


Figure 170. Windows Clone Install task: "Network protocols" window

13. Select the check box for the protocols to be configured on the target system.
14. Click **Next**. The TCP/IP window is displayed.

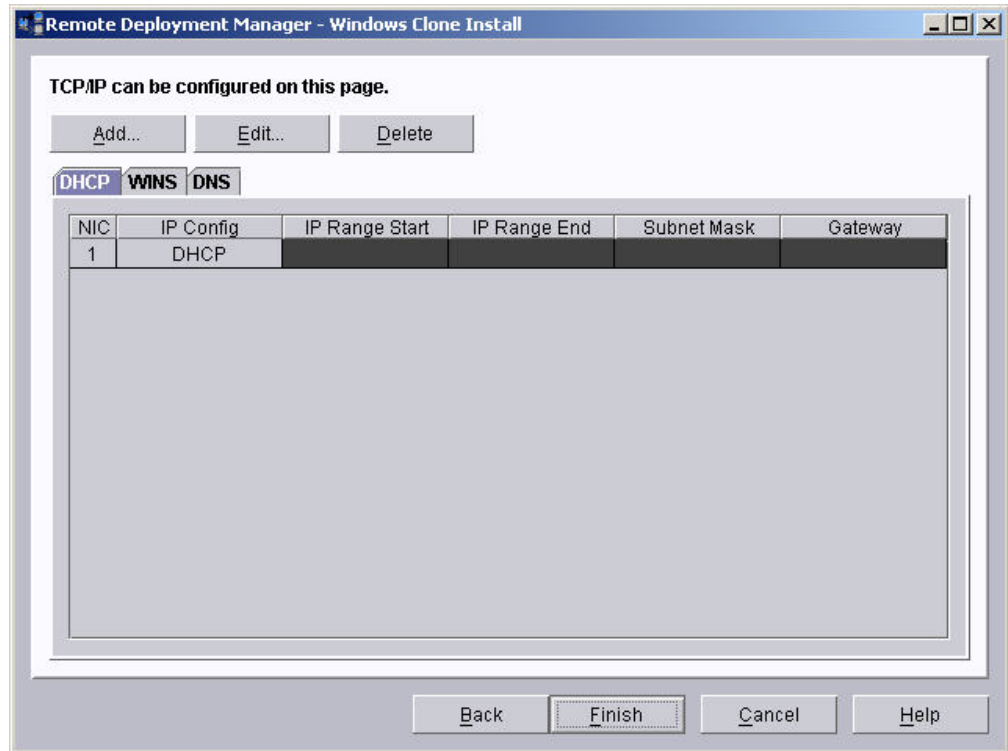


Figure 171. Windows Clone Install task: TCP/IP window

15. On the DHCP page, select the first network adapter, then click **Edit**. The Edit Adapter window is displayed.

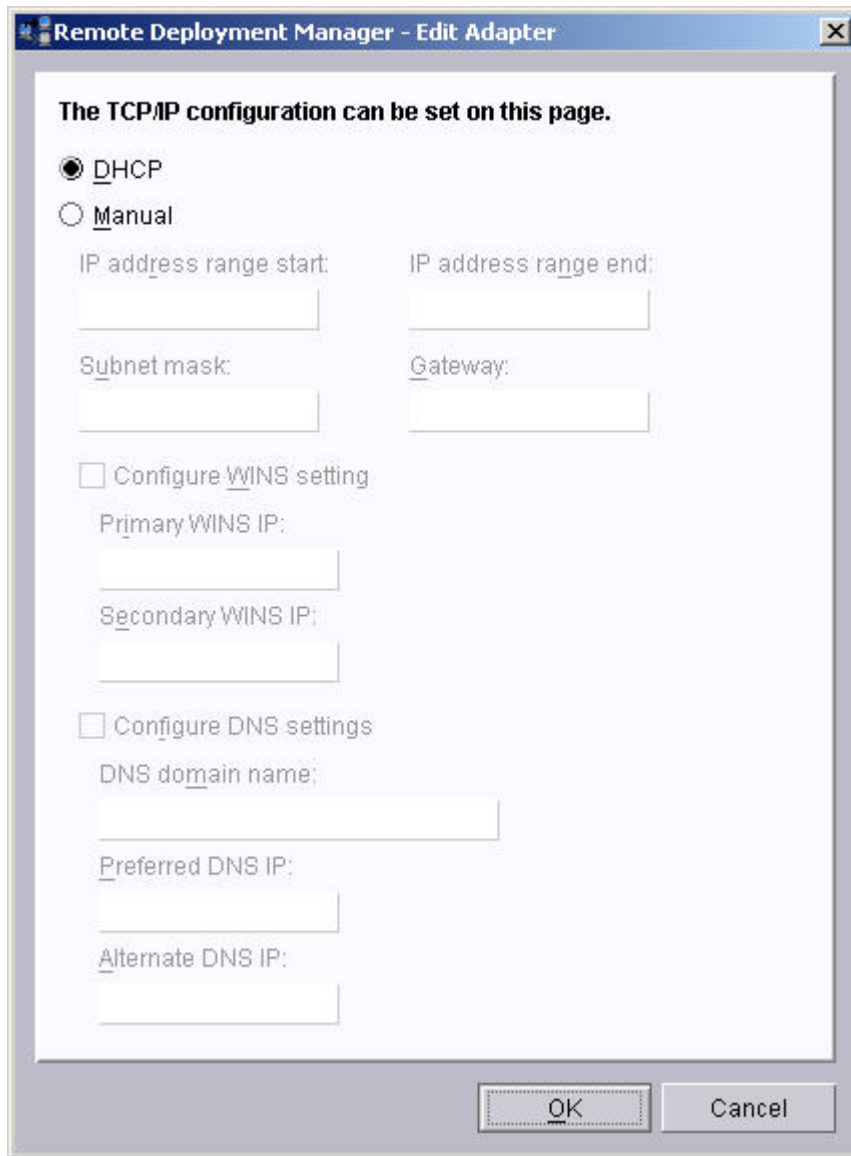


Figure 172. Edit Adapter window

16. By default, **DHCP** is selected, which configures the target system to automatically be configured using a DHCP server. To manually configure DHCP, click **Manual** and go to step 17. Otherwise, go to step 20 on page 245.
17. Configure the DHCP settings:
 - a. In the **IP address range start** field, type the IP address of the start of the IP address range.
 - b. In the **IP address range end** field, type the IP address of the end of the IP address range.
 - c. In the **Subnet mask** field, type the subnet mask.
 - d. In the **Gateway** field, type the IP address of the gateway server.
18. (Optional) Configure the WINS settings:
 - a. Select the **Configure WINS setting** check box.
 - b. In the **Primary WINS IP** field, type the primary WINS server IP address.

- c. In the **Secondary WINS IP** field, type the secondary WINS server IP address.
19. (Optional) Configure the DNS settings:
 - a. Select the **Configure DNS setting** check box.
 - b. In the **DNS domain name** field, type the domain name.
 - c. In the **Preferred DNS IP** field, type the primary DNS server IP address.
 - d. (Optional) In the **Alternate DNS IP** field, type the alternate DNS server IP address.
20. Click **OK**. The Edit Adapter window closes.
21. Click **Finish**.

When you create a task, it is added to the Tasks pane under **Windows Clone Install**. Right-click on the task to edit, copy or delete it.

Running the Windows Clone Install task

Complete the following steps to use a Windows Clone Install task to install Windows on a target system:

1. Expand **Windows Clone Install**. The Windows Clone Install tasks are displayed.
2. Drag the Windows Clone Install task onto the target system. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 6, “Configuring systems and tasks,” on page 59.
5. To run the task immediately, select the **Execute this task after pressing the OK button** check box; then click **OK**. Otherwise, go to step 6.
6. Click **OK**.
7. After the task is completed, log on to the target system using a user account with administrator privileges so that the Windows Clone Install task cleanup script can run.

Notes:

1. (Images using Windows XP only) To complete a Windows Clone Install task using an image that contains a Windows XP operating system, you must first run sysprep and make sure to select the “run mini-setup” check box.
2. If the video settings of the installation image are not valid for the graphics device of the target system, Windows Setup changes the video settings to the closest match for the graphics device of the target system.

Modifying the Windows Clone Install answer file

When you clone a system, the administrative password that is used on the system is not cloned. If you want a Windows Clone Install task to set the administrative password, you must modify the answer file (answer2.txt) that is associated with the Windows Clone Install image that the task uses.

Complete the following steps to modify the answer file used with a Windows Clone Install task:

1. Copy the Windows Clone Install task:
 - a. Right-click the task; then, click **Copy task**. The Windows Clone Install window opens.
 - b. In the **Task** name field, type a descriptive name to identify the task.
 - c. Click **OK**.
2. Determine the location of the answer file associated with the copy of the Windows Clone Install task. (To determine the location of the task folder, open the task notebook and view the task folder information on the Advanced page.)
3. Open the answer2.txt file in an ASCII text editor and locate the [GUIUnattended] section.
4. Set the AdminPassword=* key to equal your password, for example:

```
AdminPassword="myPassword"
```
5. Save the modified answer file.

Chapter 22. Windows Native Install

You can use the Windows Native Install template to create tasks that install Windows and applications on target systems. The Windows Native Install template uses a wizard to gather the configuration information and create tasks.

This chapter provides information about the following operations:

- Creating a Windows Native Install image
- Creating a Windows Native Install task
- Running a Windows Native Install task

When RDM scans a system, it assigns a default name to the system, in the form *MachinetypeMachinemodel-Serialnumber*. This *system name* is displayed in IBM Director Console. When a Windows Native Install task is run on a system without an operating system, RDM uses this system name for the Windows computer name. If a Windows Native Install task is run on a system on which Windows is already installed, RDM recognizes and uses the computer name.

If the assigned computer name is not valid, RDM changes the computer name using the following rules:

- Remove spaces and characters that are not valid from the computer name. The following characters are not valid: `~!@#%&*()=+[]{}|;:","<>/?.
For example, *pear rfrsh* would be changed to *pearrfrsh*.
- Truncate from the end to make the computer name no longer than 63 characters.
- Append the letter a in front, if the computer name contains all digits, for example, *12345* is changed to *a12345*.
- Add *_1*, *_2*, and so on, to the end of the duplicate computer name, if the computer name is duplicated.

Creating a Windows Native Install image

You can use the Image Management option to create a Windows Native Install image. A Windows Native Install image can be one of the following items:

- Windows operating system
- Service pack
- Desktop wallpaper
- Software Delivery Assistant file
- System Migration Assistant file
- Application

A Windows Native Install image has a maximum size of 2 GB.

Complete the following steps to create a Windows Native Install image:

1. From IBM Director Console, click **Tasks** → **Remote Deployment Manager** → **Image Management** → **Create and Modify Images**. The Image Management window opens.

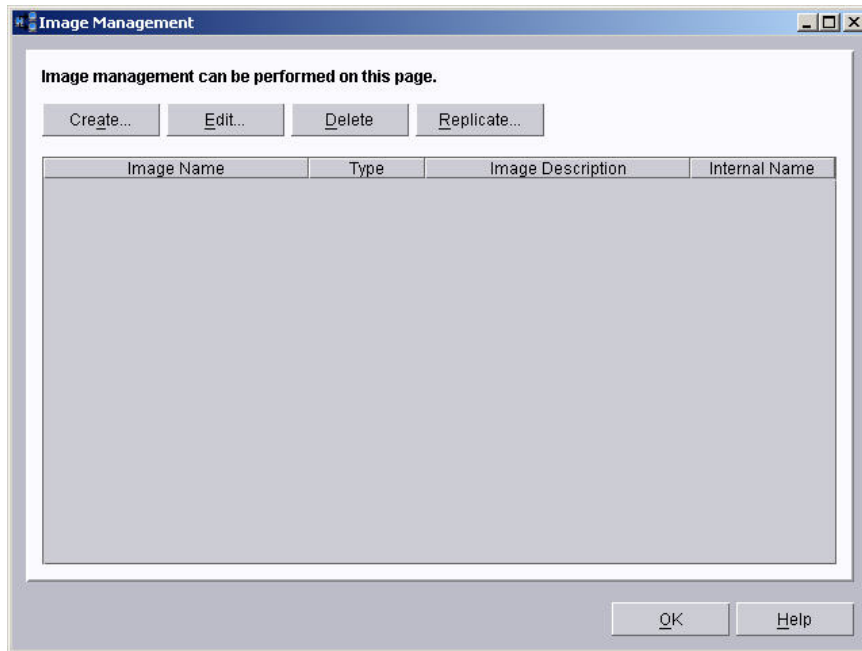


Figure 173. Image Management window

2. Click **Create**. The Create Image window opens.

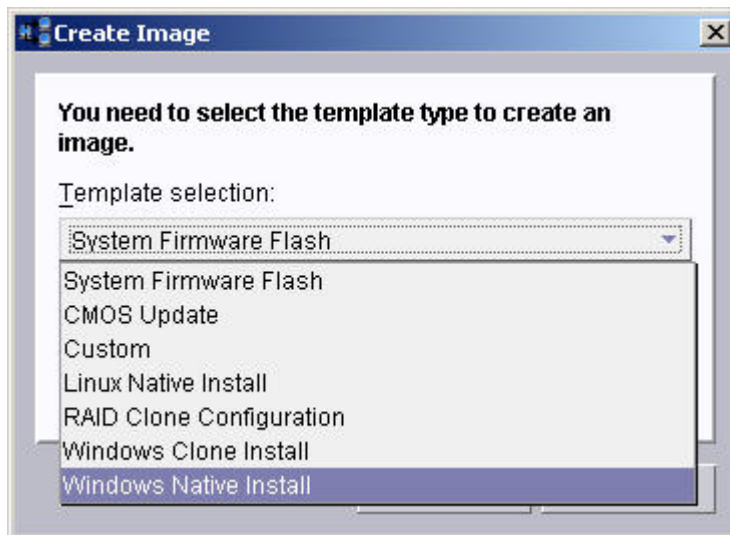


Figure 174. Create Image window

3. In the **Template selection** field, select **Windows Native Install**; then, click **OK**. The Create Windows Native Install Image window opens and the General page is displayed.

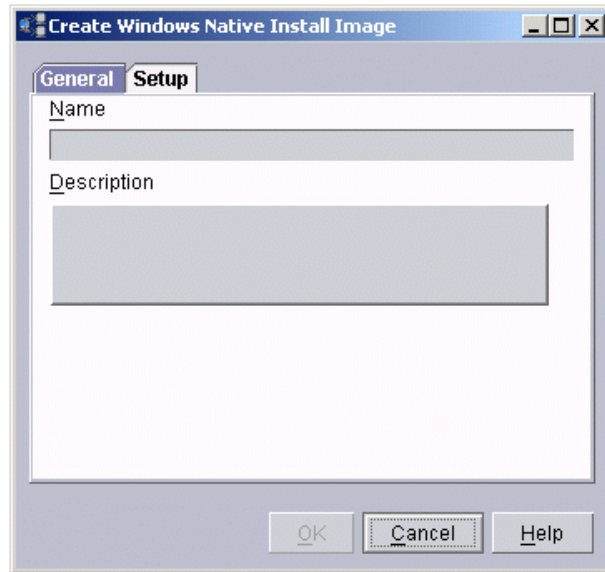


Figure 175. Create Windows Native Install Image window: General page

4. Specify information about the image:
 - a. In the **Name** field, type a name for the image
 - b. (Optional) In the **Description** field, type a brief description of the image.
5. Click **Setup**. The Setup page is displayed.

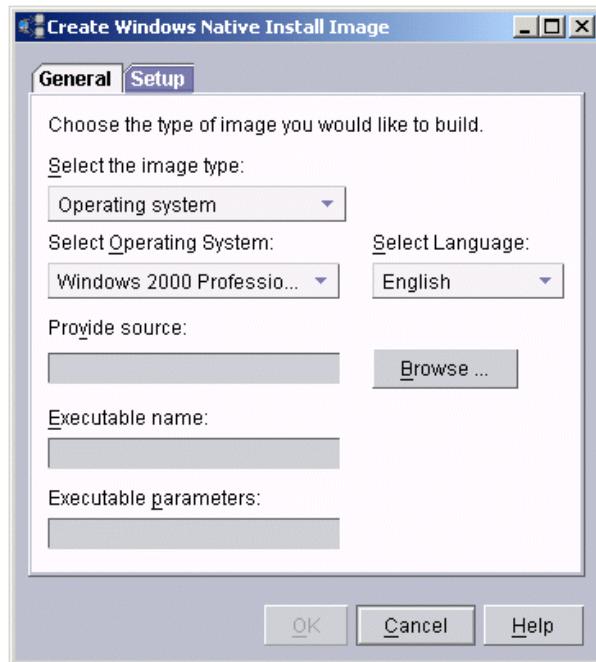


Figure 176. Create Windows Native Install window: Setup page

6. In the **Select the image type** field, select the type of image that you want to create.

Note: Wallpaper can be deployed to the local administrator of the target system only.

If you selected	Go to
Operating system	Step 7
Service pack	Step 8
Desktop wallpaper file	Step 9
Software Delivery Assistant	Step 9
System Migration Assistant	Step 9
Application	Step 9

7. Create an operating-system image:
 - a. In the **Select Operating System** field, select the applicable Windows operating system.
 - b. (Optional) In the **Select Language** field, select the applicable language.
 - c. Insert the Windows Installation CD into the CD drive.

Note: If the Windows installation files are saved to a drive that is accessible from the management console that you use to create the image, you do not have to insert the installation CD into the CD drive.

- d. Click **Browse** and navigate to the Windows WINNT.EXE file. By default, the WINNT.EXE file is located in the \I386 directory.
 - e. Click **OK**. Go to step 10 on page 251.
8. Create a service pack image:
 - a. In the **Enter Service Pack** field, type the service pack.
 - b. Click **Browse** and navigate to the Windows UPDATE.EXE file.
 - c. Click **OK**. Go to step 10 on page 251.
9. Create a desktop wallpaper image, a Software Delivery Assistant image, a System Migration Assistant image, or an application image:
 - a. In the **Provide source** field, type the fully qualified name of the source. Alternately, click **Browse** and navigate to the applicable file.

Notes:

- 1) For a desktop wallpaper image, the source file must be a BMP file. For a Software Delivery Assistant image, the source file must be an EXE file. For a System Migration Assistant file, the source file must be an IBM System Migration Assistant (SMA) file. For an application image, the source file must be the applicable installation file.
 - 2) If you create an application image that is based on a batch file, the last command in the batch file must be an exit command; otherwise, the Windows Native Install task will never be completed.
- b. Click **OK**. Go to step 10 on page 251.

10. Click **OK**. The Task Image Creation Progress window opens and the progress of the operation is displayed.
11. When prompted, insert the applicable volume into the CD drive; then, click **OK**.
12. When finished, click **OK**.

Creating a Windows Native Install task

Complete the following steps to create a Windows Native Install task:

1. Right-click **Windows Native Install**; then, click **Create new task**. The Windows Native Install window opens.
2. Provide the basic information for the task:
 - a. In the **Task** name field, type a descriptive name to identify the task.
 - b. In the **Task description** field, type a brief description of the task.
 - c. Select the **Ignore failure in systems qualification** check box to enable the task to run on a target system that fails system qualification.
 - d. Select the **Run only on preconfigured systems** check box to ensure that the task only runs on a target system that has system values stored in the RDM database.
 - e. Click **Next**. The “Select an operating system image” window opens.

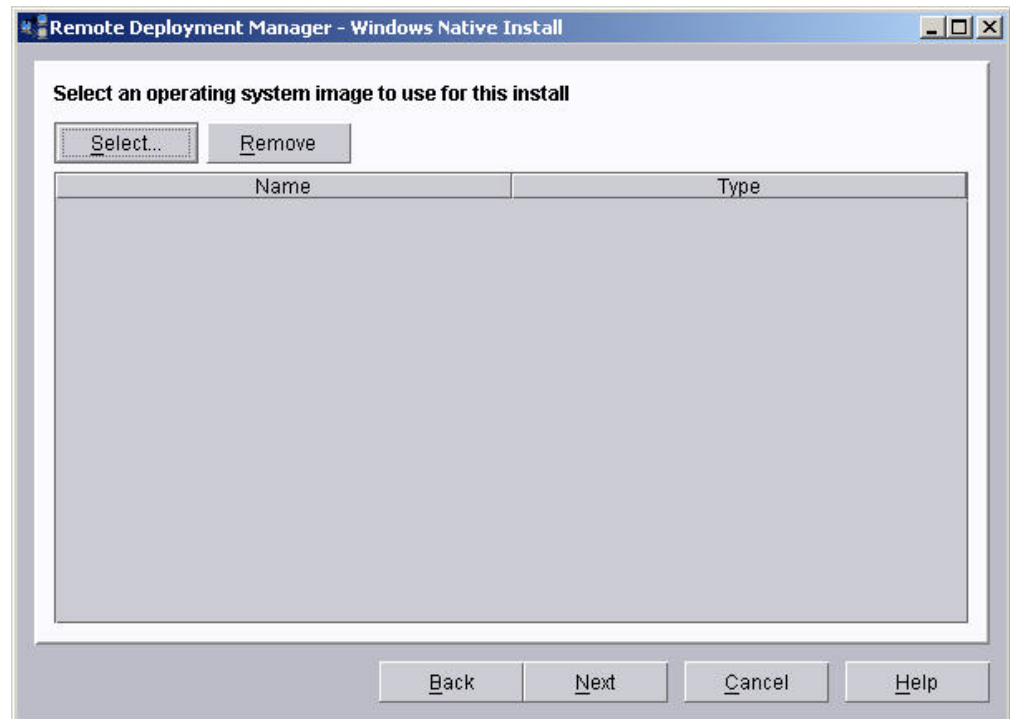


Figure 177. Windows Native Install task: “Select an operating system image” window

3. Select the Windows Native Install image:
 - a. Click **Select**. The “Image selection” window opens.

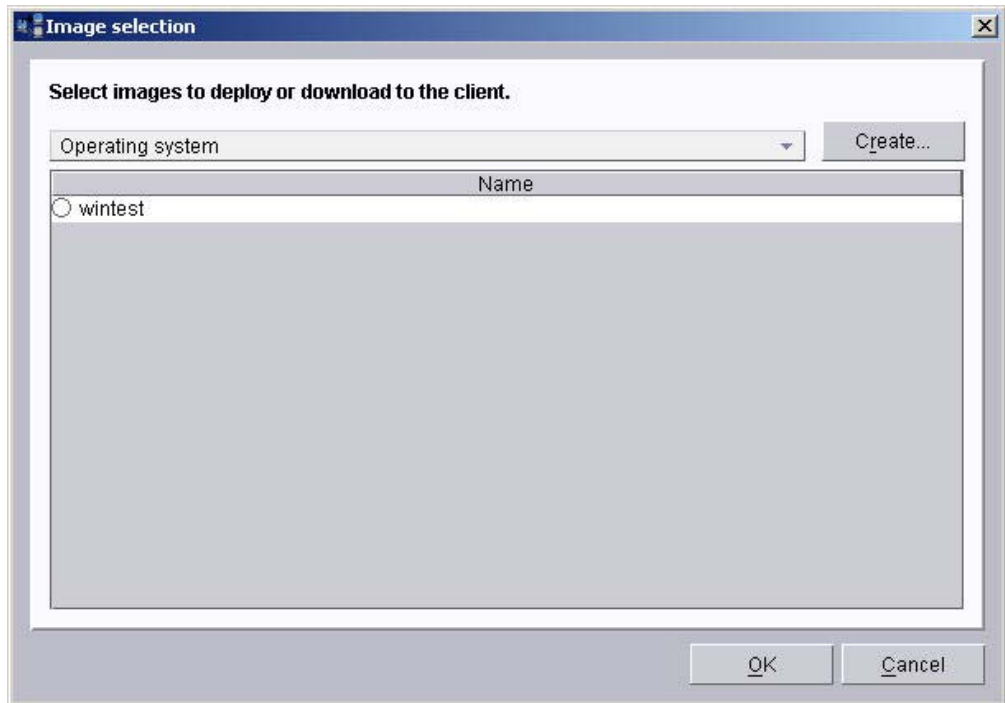


Figure 178. "Image selection" window

- b. Select the Windows Native Install image that you want to use.

Note: If you have not already created the Windows Native Install image, click **Create** to create the image. See "Creating a Windows Native Install image" on page 247 for more information.

- c. Click **OK**. The "Select an operating system image" window reopens, and the selected image is displayed.

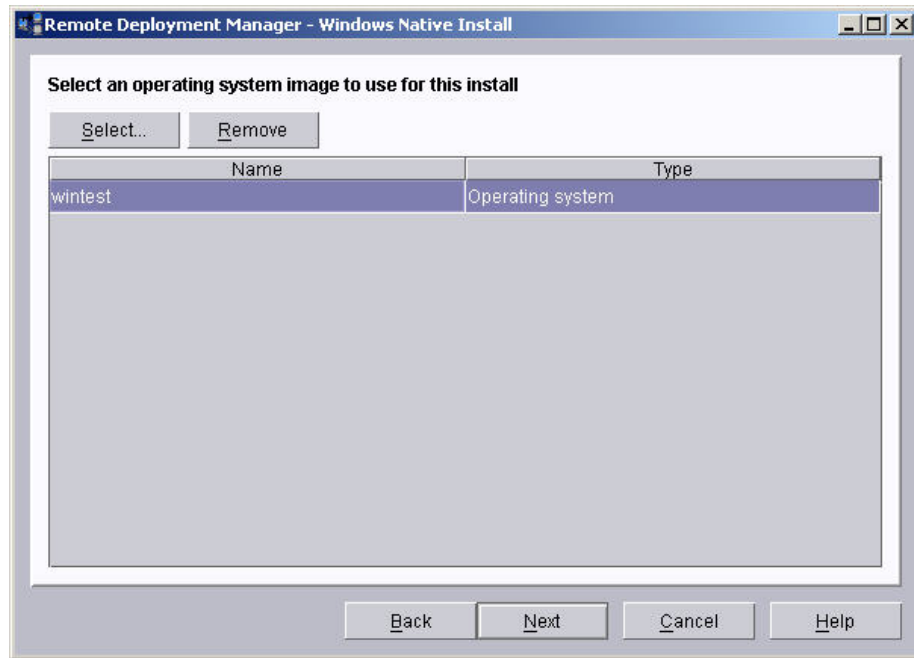


Figure 179. Windows Native Install task: “Select an operating system image” window

4. Click **Next**. The “Select images of other types” window opens.
5. (Optional) Add additional images, such as service packs or desktop wallpaper, to the task:
 - a. Click **Select**. The “Image selection” window opens.

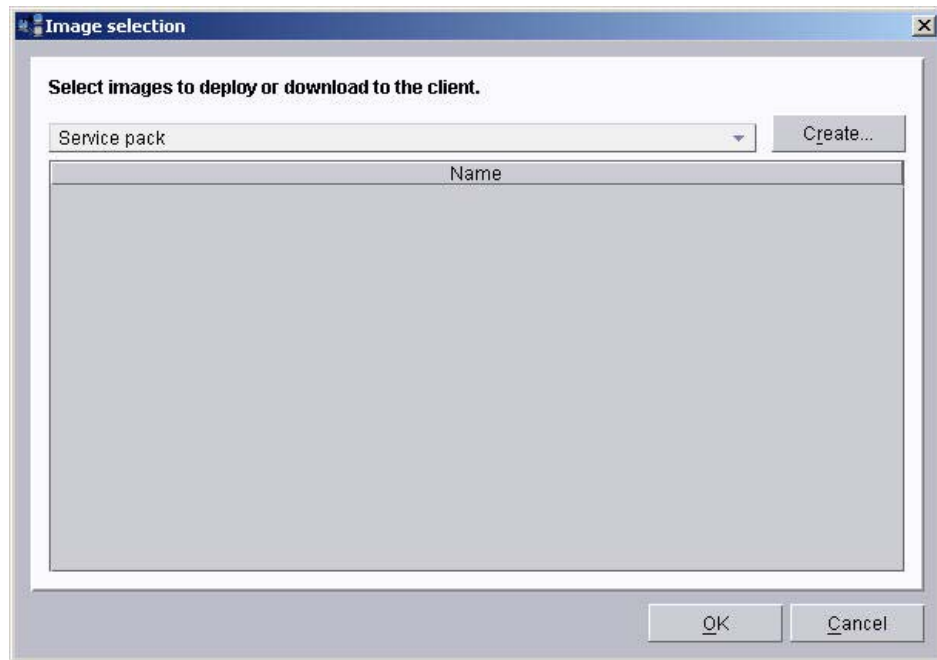


Figure 180. “Image selection” window

- b. In the field above the **Name** field, select the image type.
- c. Click the image file that you want to use; then; click **OK**.

- d. Repeat steps 5a through 5c on page 253 until you have selected all the images for the task.
6. Click **Next**. The Partitions window opens.

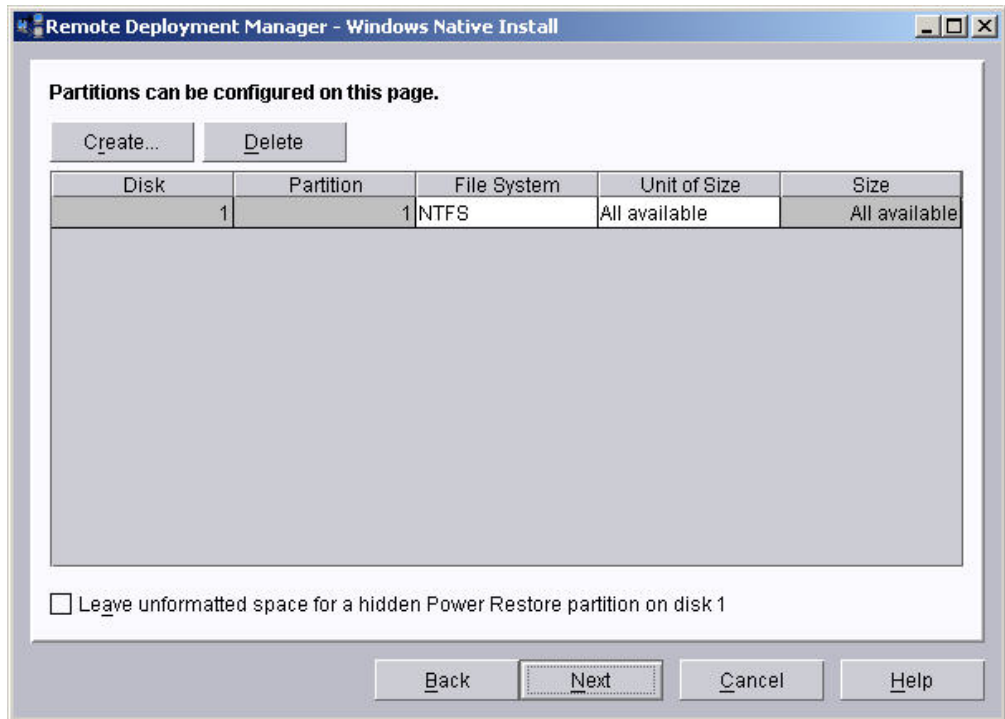


Figure 181. Windows Native Install task: Partitions window

7. The default settings for the partition are displayed. If you want to accept the default settings, go to step 9 on page 255. Otherwise, continue to step 8.
8. Configure the partitions:
 - a. Click **Add**. The Create Partition window opens.

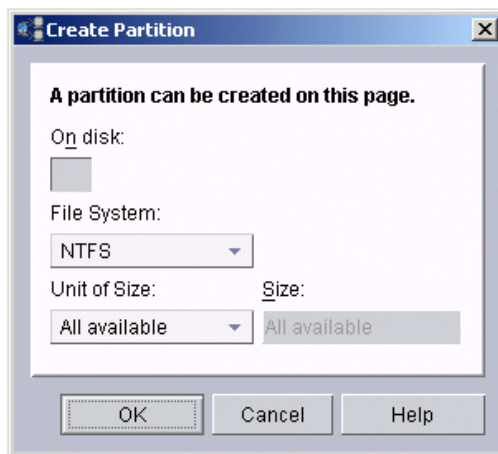


Figure 182. Create Partition window

- b. In the **On disk** field, type the disk number on which you want the partition to be created.

Note: The first disk is number 1. Letters are not valid.

- c. In the **File System** field, select the file system type.
- d. In the **Unit of Size** field, select the unit of measure for the size of the partition. Select **MB** for Megabyte, or **All available** for percentage remaining.

Note: Only one partition can be defined as All available on a disk.

- e. (Optional) In the **Size** field, type the size in megabytes (MB) or as a percentage of the total size remaining, depending on the specified unit.
- f. Click **OK**. The new partition is displayed in the Partition Configuration window.
- g. Repeat step 8 on page 254 until you have configured all partitions.
9. (Optional) Select **Leave unformatted space for a hidden Power Restore partition on disk 1** to reserve unformatted space for a power restore partition on the primary (boot) partition. The unformatted partition created by selecting this check box is equal to the size of partition 1 of this disk (disk 1).

Note: Use the Power Restore task to create the actual Power Restore backup.

10. Click **Next**. The “Personal information” window opens.

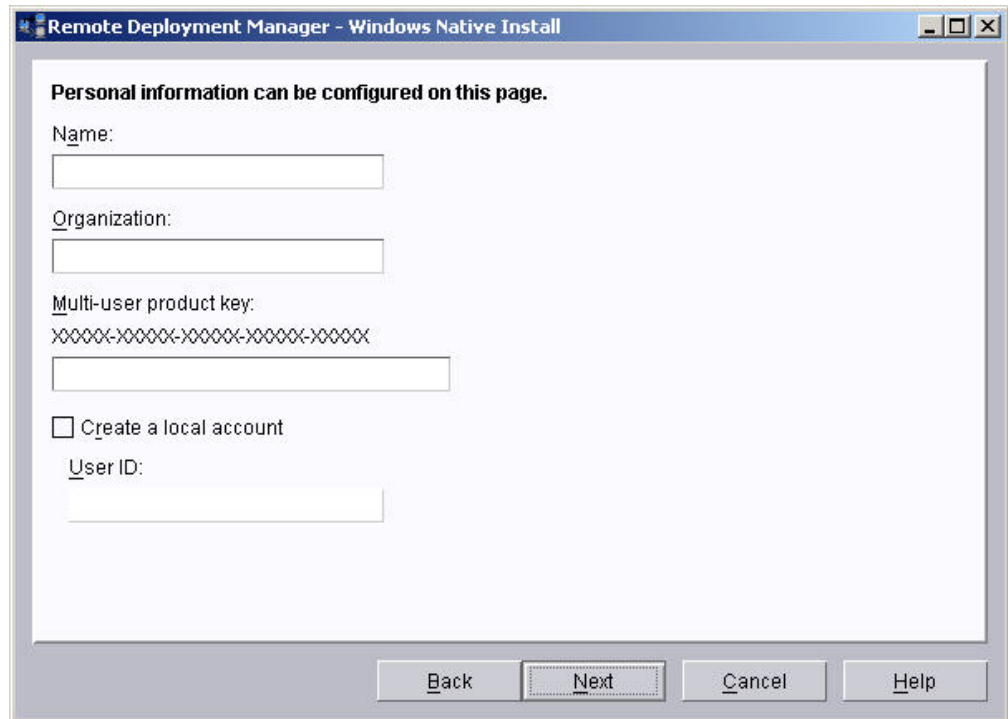


Figure 183. Windows Native Install task: “Personal information” window

11. Specify the personal information:
 - a. In the **Name** field, type the name of the registered user of the system, for example, John Doe.
 - b. In the **Organization** field, type the company name, for example, IBM Corporation.

- c. In the **Multi-user product key** field, type the certificate of authorization for the Windows operating system. The CD key is 29 characters in length, formatted in five 5-character alphanumeric tokens separated by hyphens.
 - d. (Optional) Select **Create a local account** if you want to create a local user on the target system. Then, in the User ID field, type the name of the user account.
12. Click **Next**. The Licensing window opens.

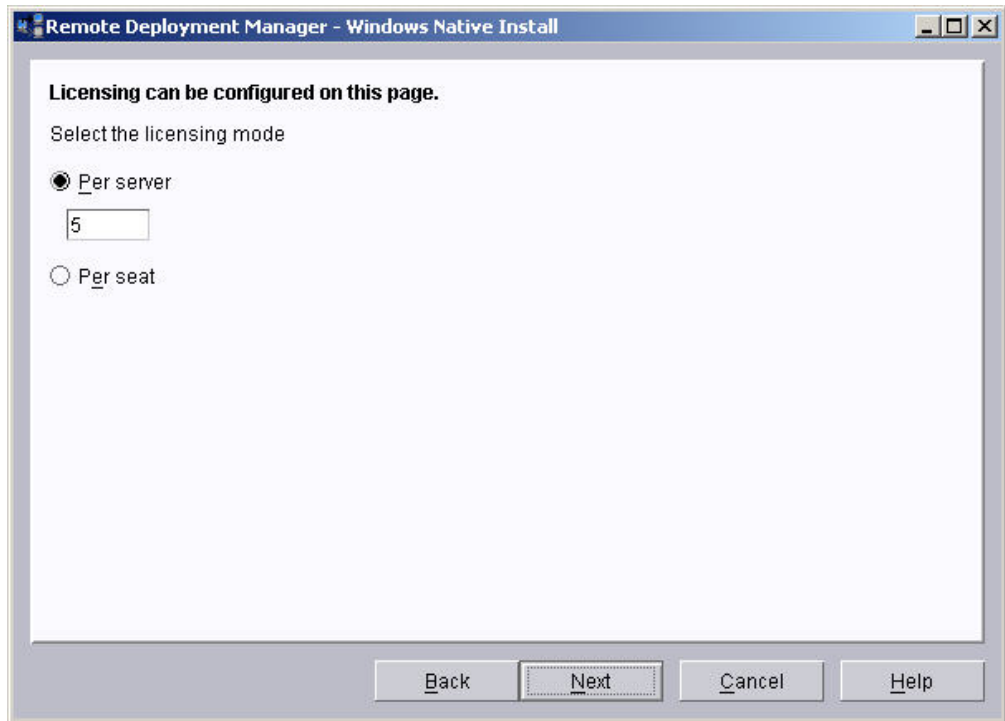


Figure 184. Windows Native Install task: Licensing window

13. Select the licensing mode. If you select **Per Server**, specify the number of licenses.
14. Click **Next**. The “Regional information” window opens.

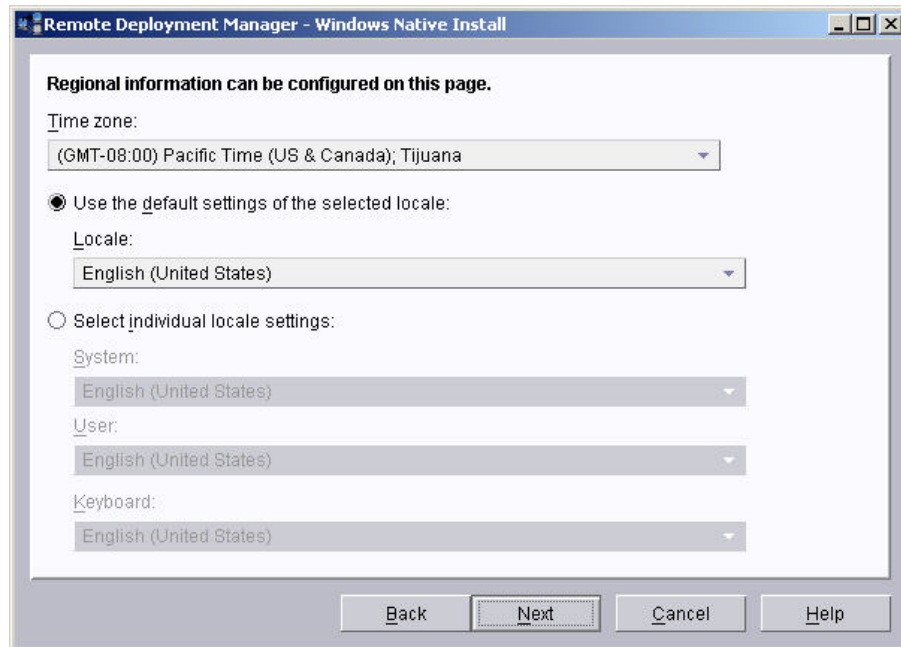


Figure 185. Windows Native Install task: “Regional information” window

15. Configure the regional information:
 - a. In the **Time Zone** field, select the time zone.
 - b. In the **User locale** field, select the language to display.

16. Click **Next**. The “Network environment” window opens.

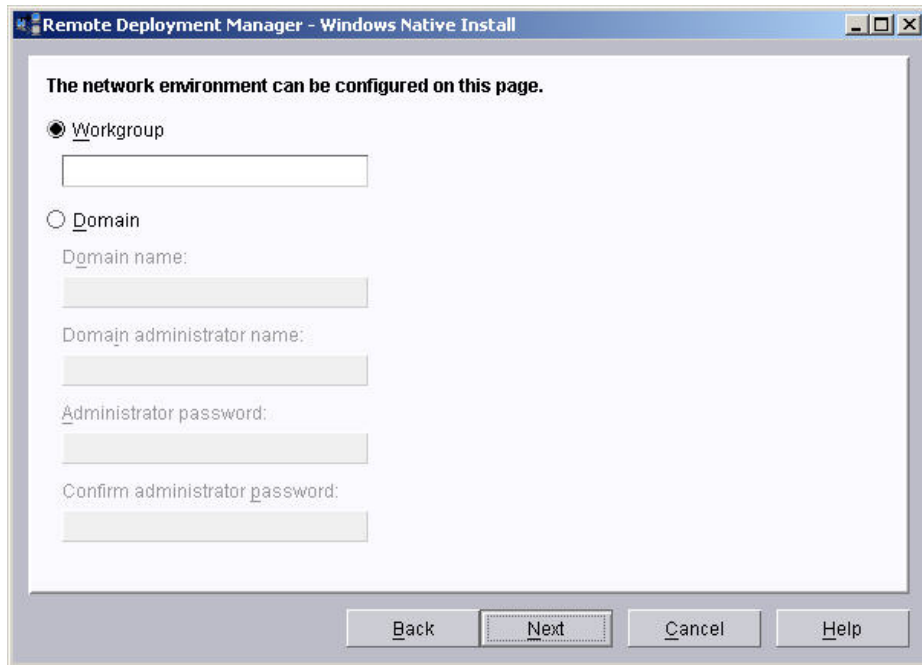


Figure 186. Windows Native Install task: “Network environment” window

17. By default, the **Workgroup** check box is selected. Click **Domain** to configure the domain for the target system.
If you choose to configure a domain, type the domain name, the domain administrator name, and the domain administrator password in the applicable fields.
18. Click **Next**. The “Network protocols” window opens.

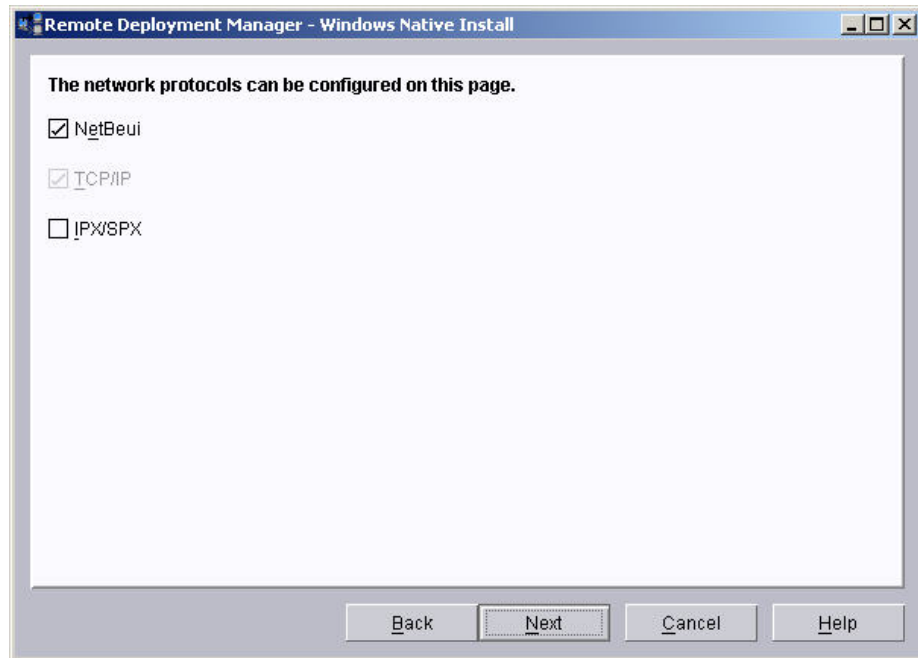


Figure 187. Windows Native Install task: "Network protocols" window

19. Select the network protocols.

20. Click **Next**. The TCP/IP window opens and the DHCP page is displayed.

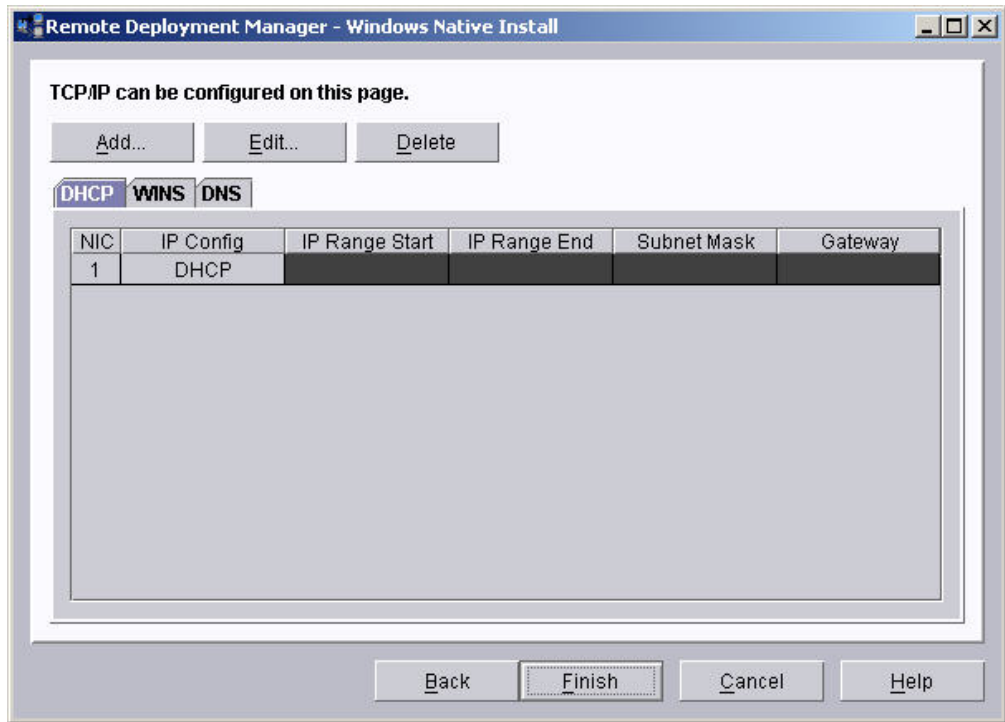


Figure 188. Windows Native Install task: TCP/IP window

21. Select a NIC entry; then, click **Edit**. The Edit Adapter window opens.

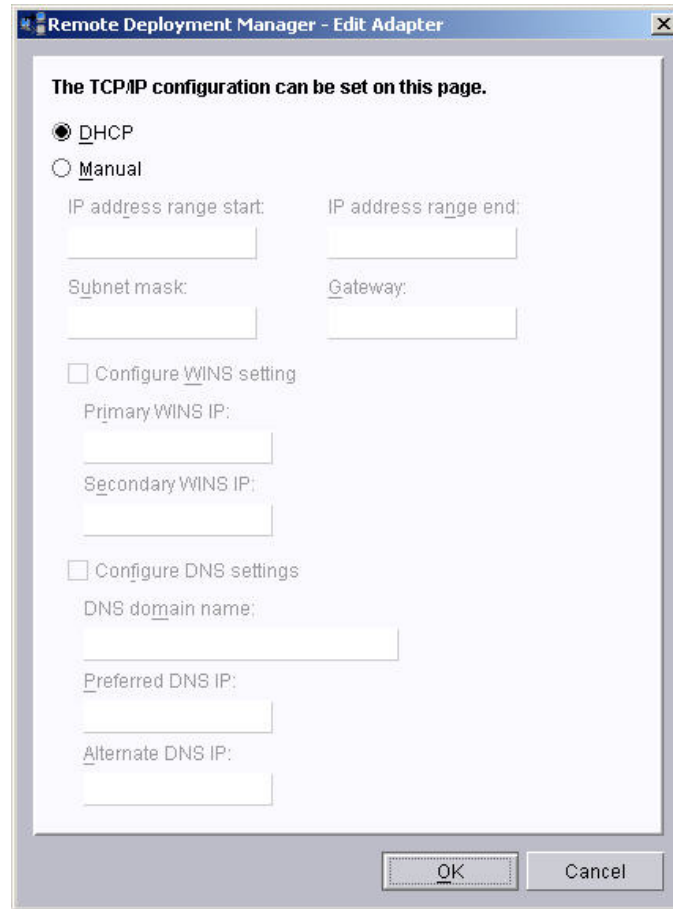


Figure 189. Edit Adapter window

22. By default, **DHCP** is selected. This specifies that the target system is automatically configured using a DHCP server. To accept the default setting, go to step 26 on page 262. Otherwise, continue to step 23.
23. Manually configure the TCP/IP settings:
 - a. In the **IP address range start** field, type the IP address of the start of the IP address range.
 - b. In the **IP address range end** field, type the IP address of the end of the IP address range.
 - c. In the **Subnet mask** field, type the subnet mask.
 - d. In the **Gateway** field, type the IP address of the gateway server.
24. (Optional) Manually configure the WINS settings:
 - a. Select the **Configure WINS setting** check box.
 - b. In the **Primary WINS IP** field, type the IP address of the primary WINS server.
 - c. In the **Secondary WINS IP** field, type the IP address of the secondary WINS server.

25. (Optional) Manually configure the DNS settings:
 - a. Select the **Configure DNS setting** check box.
 - b. In the **DNS domain name** field, type the domain name.
 - c. In the **Preferred DNS IP** field, type the primary IP address of the DNS server.
 - d. (Optional) In the **Alternate DNS IP** field, type the IP address of the alternate DNS server.
26. Click **OK**.
27. Click **Finish**. The new task is displayed in the Tasks pane under the Windows Native Install task.

Creating a Windows Native Install task that installs IBM Director Agent

Complete the following steps to create a Windows Native Install task that installs IBM Director Agent:

1. Copy the IBM Director Agent installation files from the IBM Director CD to an accessible drive.
2. Open the diragent.rsp file in an ASCII text editor. This file is in the director\agent\windows\i386 directory.
3. Modify and save the diragent.rsp file. The file follows the Windows INI file format and is fully commented.

Note: The diragent.rsp file must contain the following line:

```
RebootIfRequired = N
```

If the RebootIfRequired flag is set to Y, the Windows Native Install task will fail.

4. Create a Windows Native Install image that uses the IBM Director Agent installation files as the source. In the **Executable parameters** field, type the following command:

```
-a silent RSP="%appdir%\diragent.rsp" waitforme
```

Note: For IBM Director version 4.11 and earlier, enter `silent waitforme` as the executable parameter.

5. Create a Windows Native Install task that uses the newly-created image.

Note: (Windows XP with Service Pack 2 target systems only) By default, the Windows XP Service Pack 2 firewall blocks Internet Control Message Protocol (ICMP), which IBM Director Server uses to communicate with IBM Director Agent. The Windows XP Service Pack 2 firewall must be configured to permit ICMP traffic, or IBM Director Agent cannot communicate with IBM Director Server.

Running a Windows Native Install task

Note: (Target systems that start from a fibre drive) Before you run a Windows Native Install task, you must first configure the switches and storage servers using the Remote Storage Configuration task.

Complete the following steps to run a Windows Native Install task:

1. Expand the **Windows Native Install** task. The Windows Native Install tasks are displayed.
2. Drag the Windows Native Install task onto the target system. The Task menu is displayed.
3. Click **Configure systems**. The System/Task Configuration window opens.
4. Configure the target system for use with the task. For information, see Chapter 6, “Configuring systems and tasks,” on page 59.

To run the task immediately, select the **Execute this task after pressing the OK button** check box.

5. Click **OK**.
6. After the task is completed, log on to the target system using a user account with administrator privileges. This enables the Windows Native Install task cleanup script to run.

Editing the Windows Native Install template

This section contains information about the following topics:

- Working with device drivers
- Specifying whether the installation directory is deleted from the target system

Working with device drivers

RDM stores device drivers in the RDM repository. By editing the Windows Native Install task template, you can perform the following operations:

- View information about a device driver
- Add a device driver to the master repository
- Remove a device driver from the master repository

Viewing device driver information

Complete the following steps to view information about a device driver:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install Template window opens and the General page is displayed.

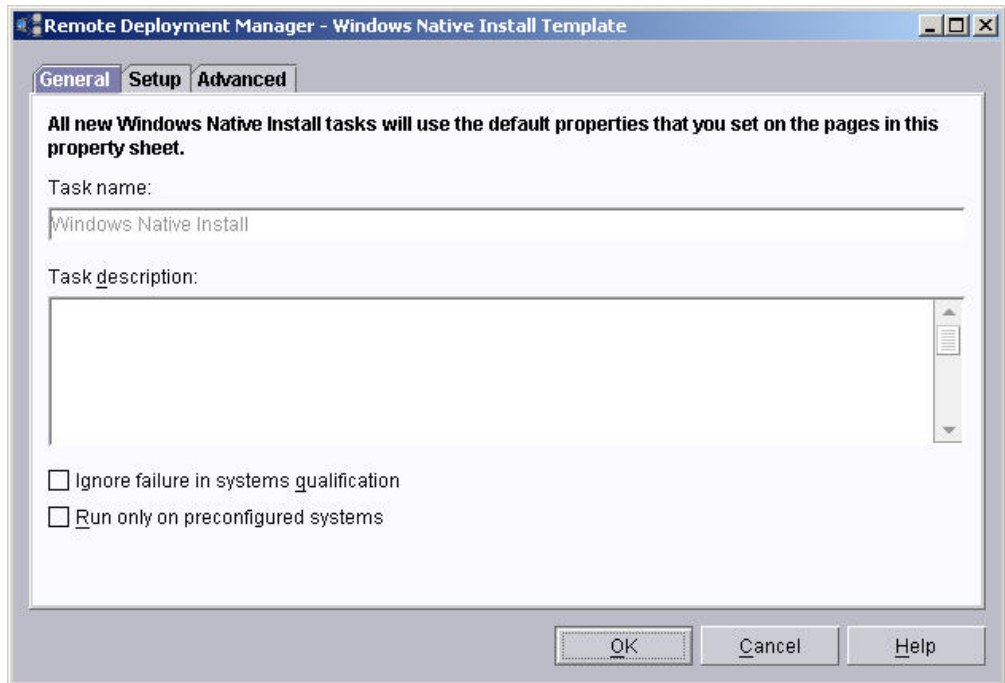


Figure 190. Windows Native Install Template window: General page

3. Click **Setup**. The Setup page is displayed.
4. In the Category pane, click **Drivers**. The Drivers pane is displayed.

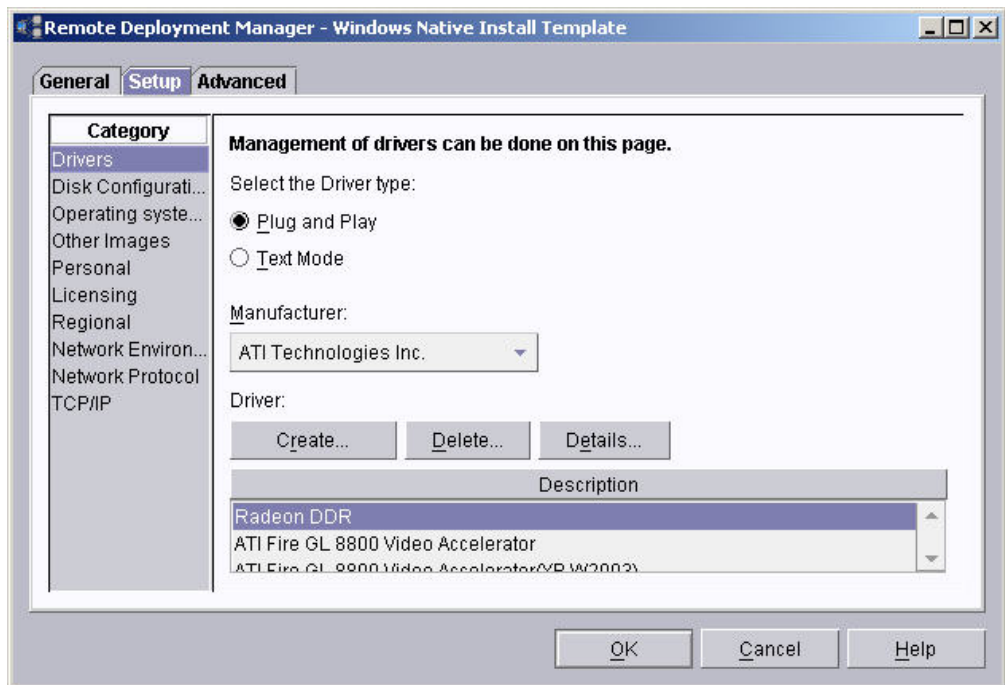


Figure 191. Windows Native Install Template window: Setup page with driver information displayed

5. Specify information about the device driver:
 - Click either **Plug and Play** or **Text Mode** to specify the device driver type.
 - In the **Manufacturer** field, select the company that manufactures the device driver.

The device drivers that match the criteria that you specified are listed in the group box.

6. Select the device driver and click **Details**. The Driver Details window opens.

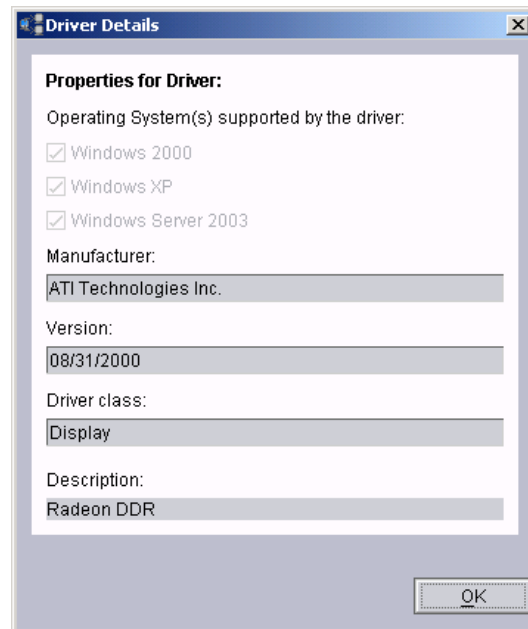


Figure 192. Driver Details window

Adding a driver to the master repository

Note: If you add a device driver, make sure that you replicate the file to any remote deployment server before you deploy an image that uses the device driver.

Complete the following steps to add a device driver to the master repository:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install Template window opens and the General page is displayed.
3. Click **Setup**. The Setup is displayed.
4. In the Category pane, click **Drivers**. The Drivers pane is displayed.
5. In the **Manufacturer** field, select the select the company that manufactures the device driver.

To add a Plug and Play device driver	Go to step 6 on page 266
To add a text mode device driver	Go to step 8 on page 266

6. Click **Plug and Play**; then, click **Create**. The Create Driver window opens.

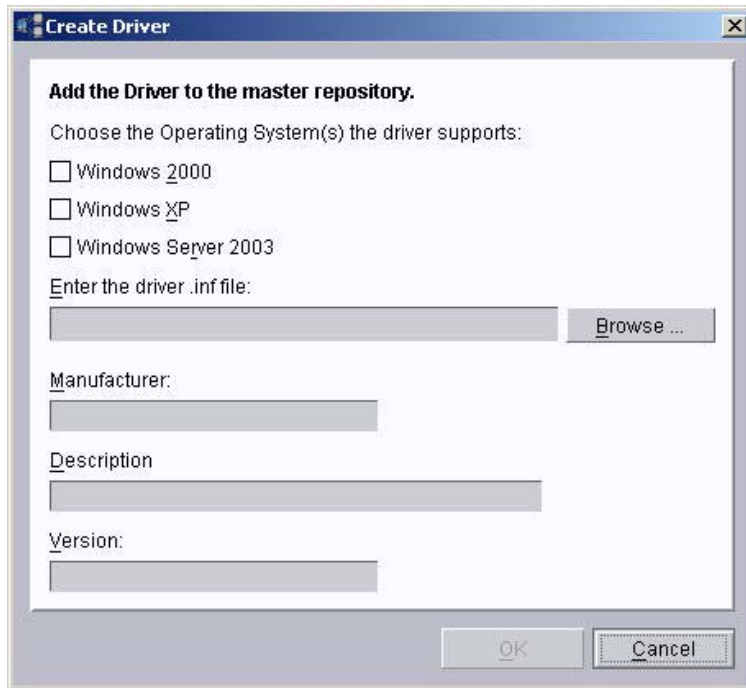


Figure 193. Create Driver window, Plug and Play device drivers

7. Specify information about the Plug and Play device driver:
 - a. Select the applicable check boxes to specify the operating systems that the device driver supports.
 - b. In the **Enter the driver.inf file** field, type the fully qualified name of the INF file. You also can click **Browse** and navigate to the INF file.
 - c. Verify the version number of the driver.

Note: RDM does not check whether a device driver is compatible with target-system hardware or other software.
 - d. Click **OK**.
8. Click **Text Mode**; then, click **Create**. The Create Driver window opens.

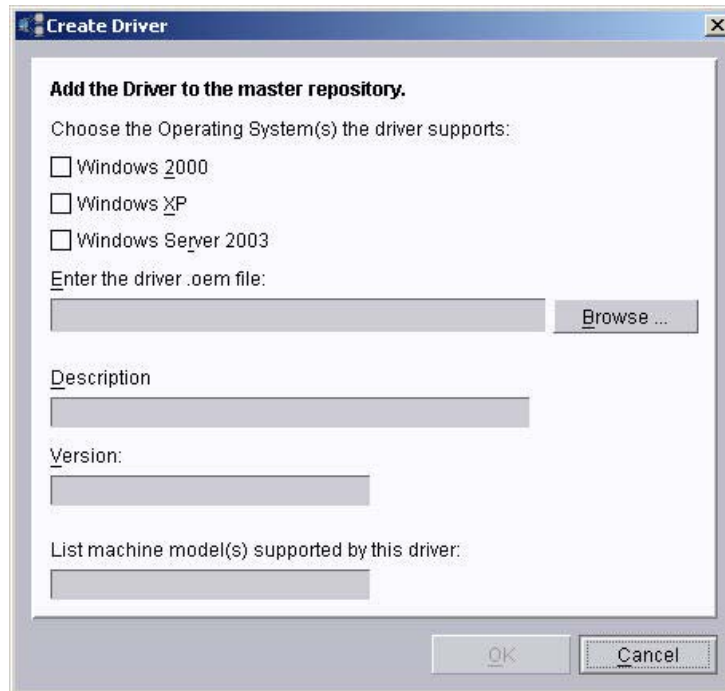


Figure 194. Create Driver window, Text-mode device drivers

9. Specify information about the text-mode device driver:
 - a. Select the applicable check boxes to specify the operating systems that the device driver supports.
 - b. In the **Enter the driver.oem file** field, type the fully qualified name of the OEM file. You also can click **Browse** and navigate to the OEM file.
 - c. Verify the version number of the driver.

Note: RDM does not check whether a device driver is compatible with target-system hardware or other software.

- d. In the **List machine model(s) supported by this driver** field, type the machine models that the device driver supports.
- e. Click **OK**.

Deleting a device driver

Complete the following steps to delete a device driver from the master repository:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install Template window opens and the General page is displayed.
3. Click **Setup**. The Setup page is displayed.
4. In the Category pane, select **Drivers**. The Drivers pane is displayed.
5. Select the device driver:
 - a. Click either **Plug and Play** or **Text Mode** to specify the device driver type
 - b. In the **Manufacturer** field, select the company that manufactures the device driver.
 - c. In the **Description** field, select the device driver.
6. Click **Delete**. The Delete Driver window opens.

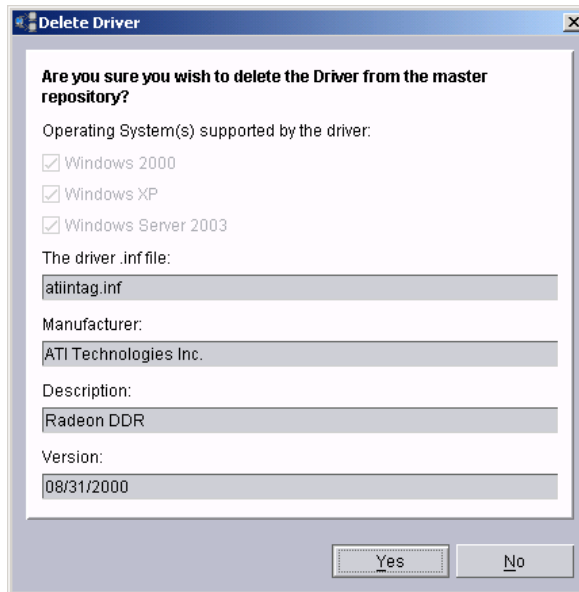


Figure 195. Delete Driver window

7. Click **Yes**. The device driver is deleted from the master repository.

Deleting the operating-system installation directory from a target system

When a Windows Native Install task is run on a target system, RDM copies the i386 directory from the repository to the target system. RDM then uses that i386 directory to install Windows on the target system. You can choose whether to have the i386 directory deleted during the post-installation cleanup process.

Complete the following steps to specify whether or not the operating-system installation directory is deleted from the target system:

1. Right-click **Windows Native Install**. The Windows Native Install task menu is displayed.
2. Click **Edit template**. The Windows Native Install window opens.
3. Click **Advanced**. The Advanced page is displayed.

4. In the Category pane, click **Miscellaneous**. The Miscellaneous page is displayed.

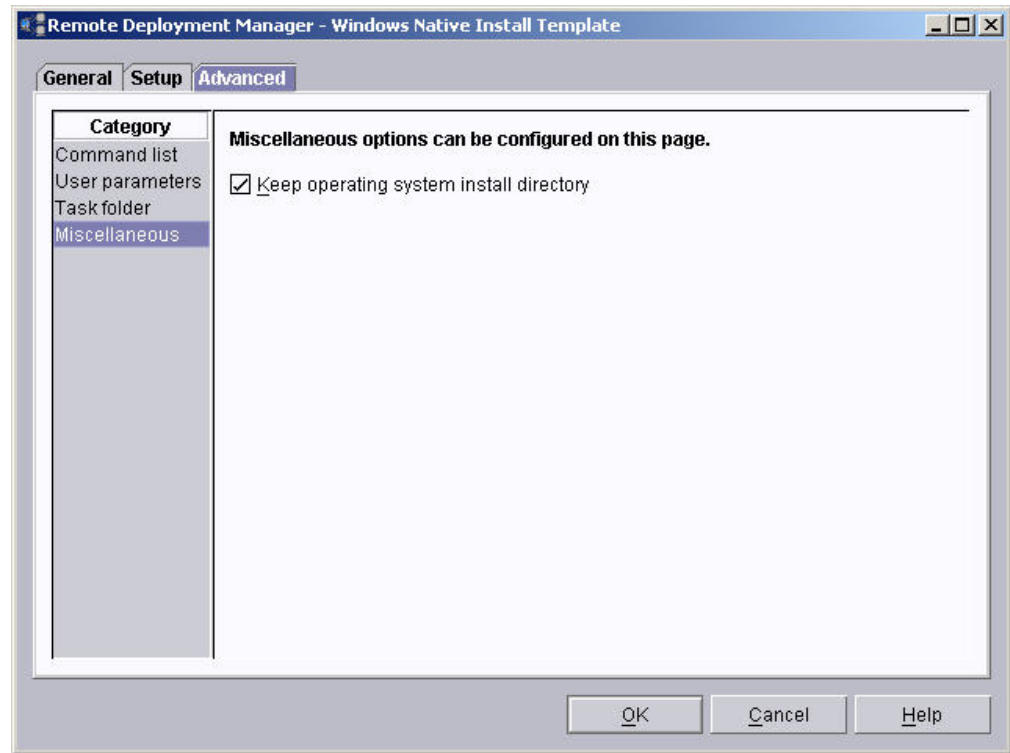


Figure 196. Windows Native Install Template window: Advanced page

5. Select or clear the **Keep operating system install directory** check box.
6. Click **OK**.

Part 4. Additional RDM information

Chapter 23. Advanced mkimages.bat usage

You can build custom DOS system environments by copying and editing the `mkimages.bat` file. You can also create a startable (bootable) DOS 7.1 diskette and run an RDM utility from the diskette.

Building custom DOS system environments using `mkimages.bat`

RDM provides DOS 7.1 for its DOS system environments. DOS 7.1 is a modified version of IBM DOS 7.0 (also known as IBM DOS 2000) that is compatible with the FAT32 file system.

RDM provides the following DOS system environments:

- `dos71s`
- `dos71x`
- `dos71p`
- `dos71f`

Different kinds of RDM tasks require different DOS configurations. If you have an RDM task that requires a different DOS configuration, you can create your own DOS system environments, or modify the DOS system environments that are included with RDM. RDM uses `rdm\local\env\mkimages.bat` to build its DOS system environments. The `mkimages.bat` file uses the `bpdisk.exe` program to build a DOS system environments. For information, see “`bpdisk.exe`” on page 291.

If you want to use the RDM DOS RDAGENT in your Command List or `Autoexec.bat` file, complete the following steps:

1. Find the `mkimages.bat` file in the `RDM_installation\local\env\` directory, where `RDM_installation` is the directory where RDM is installed.
2. Copy the `mkimages.bat` file as `mymkimages.bat`.
3. Add the following code to your section of the `mkimages.bat` file.

```
Copy baseimg myDos
bpdisk -d myDos -i b
bpdisk -d myDos -i mypgms
Move myDos ..\...\repository\environment\myDos
```

Note: The line

```
Move myDos ..\...\repository\environment\myDos
```

should be the last line of your section.

4. (Optional) To use the DOS Extended Memory Manager in your DOS system environment, add the following code to your `mymkimages.bat` file:

```
bpdisk -d myDos -i o\e\dos
```
5. (Optional) To use the RDM random access memory (RAM) Drive in your DOS system environment, add the following code to your `mymkimages.bat` file:

```
bpdisk -d myDos -i o\r\dos
```
6. (Optional) To use the RDM High Memory support in your DOS system environment, add the following code to your `mymkimages.bat` file:

```
bpdisk -d myDos -i o\h\dos
```

7. (Optional) To use the DOS 7.1 formatting utilities in your DOS system environment, add the following code to your mymkimages.bat file:

```
bpdisk -d myDos -i o\i\dos
```
8. (Optional) To use the RDM Windows Install Utilities in your DOS system environment, add the following code to your mymkimages.bat file:

```
bpdisk -d myDos -i o\i\dos
```
9. Save mymkimages.bat.

Note: Make sure that you re-run the mymkimages.bat file after every change you make.

Building DOS diskettes for use with RDM

You can create a startable (bootable) DOS 7.1 diskette with RDM utilities and run an RDM utility from the diskette. Complete the following steps to create a startable (bootable) DOS 7.1 diskette:

1. Complete the following steps to format a 1.44-MB diskette with a blank label using the RDM DOS 7.1 format.com utility:
 - a. On an RDM Remote D-Server installed on Windows, open a command prompt window.
 - b. Type the following command:

```
cd "c:\Program Files\IBM\RDM\local\env\o\i\dos\"
```
 - c. Type the following command:

```
format a: /U /
```
2. Complete the following steps to extract the core files from the BASEIMG file onto the diskette:
 - a. Type the following command:

```
cd "c:\Program Files\IBM\RDM\local\env"
```
 - b. Type the following command:

```
bpdisk -d baseimg -O IBMBIO.COM,A:\IBMBIO.COM
```
 - c. Type the following command:

```
bpdisk -d baseimg -O IBMDOS.COM,A:\IBMDOS.COM
```
 - d. Type the following command:

```
bpdisk -d baseimg -O COMMAND.COM,A:\COMMAND.COM
```
3. Copy any files or RDM utilities that you need onto the diskette.

Chapter 24. Command-list commands

This chapter provides information about the commands that are used in command lists.

Note: You can use a semicolon (;) at the beginning of a line to make that line a comment. Comments are not displayed or processed.

Server commands

A server command runs on the management server. A server command does not begin with an exclamation point. Server commands include the ones that are listed in Table 8 and can also be commands that are specific to the task driver that was implemented when the task driver was created.

Server command syntax

To pass a parameter to the RDM Server, enclose the parameter in percentage signs for example %var1%:

Table 8. Server commands

Command	Syntax and explanation
BOOTTYPE	<p>Syntax: BOOTTYPE [!LOADDOS !LOADBOOTSTRAP !BOOTLOCAL] <i>bootimagefile</i></p> <p>where <i>bootimagefile</i> is the name of the boot image file.</p> <p>What it does: Specifies the type of DOS or Linux boot image file that is to be loaded into the RAM on a target system. This command precedes a WAKE or SHUTDOWN_AND_WAKE command.</p>
END	<p>Syntax: END</p> <p>The END command has no parameters.</p> <p>What it does: Ends the command list, usually the last command in a task. This command can be use for all tasks. RDM will not process any commands after the END command. If the END command is omitted from a task list, RDM stops interpreting commands after it processes the last command in the task list.</p> <p>This should be the last command in all command lists. Some tasks, such as Windows Native Install, will never complete a command list if END is not specified.</p>

Table 8. Server commands (continued)

Command	Syntax and explanation
SETLUNHOSTTYPEIFFIBRE	<p>Syntax: SETLUNHOSTTYPEIFFIBRE <i>ADTstatus</i> "<i>HostPortTypeString</i>"</p> <p>where:</p> <ul style="list-style-type: none"> • <i>ADTstatus</i> is one of the following strings: <ul style="list-style-type: none"> – ADT_ENABLED – ADT_DISABLED <p>If you issue the ADT_ENABLED parameter and the firmware does not support ADT, for the <i>HostPortTypeString</i> specified, the parameter is changed to ADT_DISABLED. The converse is also true, if you issue the ADT_DISABLED parameter and the firmware does support ADT, for the <i>HostPortTypeString</i> specified, the parameter is changed to ADT_ENABLED.</p> <ul style="list-style-type: none"> • <i>HostPortTypeString</i> specifies an operating system for the port. This parameter can be repeated and can contain different attributes of a specific operating system. To determine the possible values you can use for the <i>HostPortTypeString</i>, from a DOS or Linux command prompt type: SMcli x.x.x.x -c "show storagesubsystem profile;" <p>where <i>x.x.x.x</i> is the IP address of the FAS<i>T</i> storage server</p> <p>What it does: This command combines the parameters (<i>ADTstatus</i> and <i>HostPortTypeString</i>) into a search parameter. The command queries the list of supported host-type ports for a match with the search parameter, and then sets the host-port type on the FAS<i>T</i> storage server. The host-port types vary by firmware level.</p>
SUBTASK	<p>Syntax: BOOTTYPE [!LOADDOS !LOADBOOTSTRAP !BOOTLOCAL] <i>bootimagefile</i></p> <p>where <i>bootimagefile</i> is the name of the boot image file.</p> <p>What it does: Appends and runs the specified task. This command can be used with all tasks.</p> <p>Note: You cannot use subtask to run the task that the subtask is in.</p>
SHUTDOWN_AND_WAKE	<p>Syntax: SHUTDOWN_AND_WAKE</p> <p>The SHUTDOWN_AND_WAKE command has no parameters.</p> <p>What it does: Shuts down a system and then wakes it up again. This command is used with the CMOS and BIOS tasks on systems that must be turned off after a flash update and before a Scan task is run.</p>
TIMEOUT	<p>Syntax: TIMEOUT <i>time</i></p> <p>where <i>time</i> is the number of minutes.</p> <p>What it does: Changes the time that the server will wait for the target system to send its next request for work.</p>

Table 8. Server commands (continued)

Command	Syntax and explanation
WAKE	<p>Syntax:</p> <p>WAKE</p> <p>The WAKE command has no parameters.</p> <p>What it does: Wakes a target system. A BOOTTYPE command should precede a WAKE command, but you can include one or more commands after the BOOTTYPE command and before the WAKE command. If WAKE is the first command, a BOOTTYPE command must immediately follow it.</p>

Server command examples

In the following example, the server command BOOTTYPE sets DOS71C as the running environment after the next restart of the server.

```
BOOTTYPE !LOADDOS /environment/dos71c
```

In the following example, the server command BOOTTYPE sets bstrap.0 as the bootstrap environment after the next restart of the server.

```
BOOTTYPE !LOADBOOTSTRAP bstrap.0
```

In the following example, the server command BOOTTYPE sets the server to restart from the local hard disk after the next restart of the server.

```
BOOTTYPE !BOOTLOCAL
```

In the following example, the server command SUBTASK calls a separate task named Intellistation MPro Bios.

```
SUBTASK Intellistation MPro Bios
```

In the following example, the server command TIMEOUT causes the server to wait for 8 minutes for the target system to send its next request for work before marking the task as failed.

```
TIMEOUT 8
```

In the following example, the server command TIMEOUT causes the server to wait for %var1% minutes for the target system to send its next request for work before marking the task as failed.

```
TIMEOUT %var1%
```

In the following example, there is a 6.10.06.00 firmware table with a list of all the host-port types that are supported. The table is followed by several SETLUNHOSTTYPEIFFIBRE command examples.

Table 9. List of host-port types for the 6.10.06.00 firmware table

INDEX	ADT STATUS	HOST-PORT OS
0	Disabled	Windows NT® Non-Clustered (SP5 or higher)
1	Disabled	Windows NT Clustered (SP5 or higher)
2	Disabled	Windows 2000/Server 2003 Non-Clustered
3	Disabled	Windows 2000/Server 2003 Clustered
4	Enabled	NetWare-IBMSAN
5	Enabled	Linux
6	Disabled	AIX
7	Enabled	HP-UX
8	Disabled	Solaris
9	Enabled	Windows 2000/Server 2003 Non-Clustered (supports DMP)
10	Disabled	Irix
11	Enabled	NetWare Failover
12	Enabled	IBM TS SAN VCE
13	Disabled	LNXCCL
14	Enabled	Solaris (with Veritas DMP)
15	Enabled	Windows 2000/Server 2003 Clustered (supports DMP)

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and selects index 12 from the table and sets the host-port type to IBM TS SAN VCE with ADT Enabled.

```
SETLUNHOSTTYPEIFFIBRE ADT_ENABLED "IBM TS SAN VCE"
```

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and selects index 14 from the table and sets the host-port type to Solaris (with Veritas DMP) with ADT Enabled.

```
SETLUNHOSTTYPEIFFIBRE ADT_ENABLED "Solaris" "DMP"
```

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and has two selections that match, index 9 and index 15. Both indexes have ADT Enabled, Windows and 2003 parameters. In this situation the command will select the first index it receives a match on, which is index 9. The command sets the host-port type to Windows 2000/Server 2003 Non-Clustered (supports DMP) with ADT Enabled.

```
SETLUNHOSTTYPEIFFIBRE ADT_ENABLED "Windows" "2003"
```

In the following example, the server command SETLUNHOSTTYPEIFFIBRE creates a search parameter and selects index 5 from the table and sets the host-port type to Linux with ADT Enabled.

Note: Since the firmware supports ADT for Linux this command changed the ADT setting from ADT_DISABLED to ADT_ENABLED.

```
SETLUNHOSTTYPEIFFIBRE ADT_DISABLED "Linux"
```

Target-system commands

A target-system command begins with a single exclamation point and runs in the system environment. You can use any DOS or Linux command as a target-system command.

Target-system syntax

To pass a parameter to the target system, enclose the parameter in double percent signs, for example %%var1%%.

Table 10. Target-system commands

Command	What it does	Syntax
!MTFTP	Performs MTFTP commands.	MTFTP [get put] %%server_ip%% source_path destination_path where: <ul style="list-style-type: none"> • <i>server_ip</i> is the IP address of the MTFTP server. • <i>source_path</i> is the path of the source file. • <i>destination_path</i> is the path of the destination file. (VMware and Linux systems only) When you edit the command list for a VMware Native Install or a Linux Native Install task, a fully qualified directory path in an mtftp command is relative to the mtftp directory. To access the root level of the target system, make sure that you specify the path by using /rootfs at the beginning of the fully qualified directory path.
!SLEEP	Causes the system to sleep for the specified time, with the time in seconds.	!SLEEP time_in_seconds where <i>time_in_seconds</i> is the number of seconds you want the system to sleep.
!UNZIP	Unzips files to current directory. For information about the unzip utility, see “unzip.exe” on page 329.	!UNZIP zipfile_name where <i>zipfile_name</i> is the name of the zipped file.
!*.*	Indicates an IBM PC-DOS command on a target system can be used with the .!. as a target-system command will be stripped of .!. and run as a normal command. You can use any command that is valid in the target system environment.	!command where <i>command</i> is the DOS command that is to be passed to the target system.

Target-system command examples

In the following example, the target-system command SLEEP causes the target system to pause for 10 seconds.

```
!sleep 10
```

In the following example, the target-system command UNZIP uncompresses the file filename.

```
!unzip filename.zip
```

In the following example of the !*. * command, the target system passes the myBatchFile.bat command to run the named batch file:

```
!myBatchFile.bat
```

In the following example, the !myBatchFile.bat command is passed by the RDMAgent to the command interpreter as myBatchFile.bat %var1%, where %var1% is replaced by the environment setting.

```
!myBatchFile.bat %%var1%%
```

RdAgent commands

An RdAgent command begins with two exclamation points and runs in the system environment. An RdAgent command is understood by the RDM Agent executable.

RdAgent syntax

Table 11. RdAgent commands

Command	What it does	Syntax
!!REBOOT	<p>Restarts a system. When the system restarts, it loads the environment that was specified in the last BOOTTYPE command. After the environment is loaded, RDM processes any commands that follow the !!REBOOT command in the task list.</p> <p>By default, RDM runs the !!SHUTDOWN command after processing all the commands in a task list. To change the default behavior and restart the system after a task is completed, use one of the following procedures:</p> <ul style="list-style-type: none"> • Replace the !!SHUTDOWN command with !!REBOOT. • Place the !!REBOOT command in front of the END command. • Substitute the !!REBOOT command for the END command. <p>If you create a Script task that calls other tasks, add only the !!REBOOT command to the Script task that you are editing. Do not modify the subordinate tasks.</p> <p>RDM will not process a !!REBOOT command that follows a !!SHUTDOWN command.</p> <p>When booting the target system multiple times in the same command list, you must set the BOOTTYPE before you call the !!REBOOT command. If you do not, the target system will load the previous BOOTTYPE command.</p>	<p>!!REBOOT</p> <p>The REBOOT command takes no parameters.</p>
!!SETENV	<p>Sets all environment variables for RdAgent session. This command is used with operating-system installations to pass task parameters to the RDAGENT command that is called directly from the server task list.</p>	<p>!!SETENV</p> <p>The SETENV command takes no parameters.</p>

Table 11. RdAgent commands (continued)

Command	What it does	Syntax
!!SHUTDOWN	<p>Turns off a system after a task is completed. RDM does not process any commands that follow the !!SHUTDOWN command in a task list. If the !!SHUTDOWN command is not specified, RDM runs the !!SHUTDOWN command after processing all the commands in a task list.</p> <p>To change the default behavior and restart the system after a task is completed, use the !!REBOOT command. If you create a Script task that calls other tasks, change the !!REBOOT or !!SHUTDOWN command only for the Script task that you are editing. Do not modify the subordinate tasks.</p>	<p>!!SHUTDOWN</p> <p>The SHUTDOWN command takes no parameters.</p>

RdAgent command examples

In the following example, the RdAgent command reboot causes the target system to reboot.

```
!!REBOOT
```

In the following example, the RdAgent command shutdown causes the target system to shut down.

```
!!SHUTDOWN
```

In the following example, the RdAgent command SETENV sets the environment variables for the target-system DOS session by using the parameters included in the task.

```
!!SETENV
```

Chapter 25. Utilities

The command-line syntax in this document uses the following conventions:

- Commands are shown in lowercase letters.
`dsconfig`
- Optional commands or variables are enclosed in brackets.
`dsconfig [/q]`
- Variables are shown in italics and explained immediately afterward.
`!ccustom File1`

where *File1* is the fully qualified name of the text file that you want to modify.

- When you must type one of two or more alternative parameters, the parameters are separated by vertical bars.
`rdagent /r [/d] | /g=File | /l Message | /e | /fs`

DOS utilities

This section describes IBM DOS 7.0 and 7.1 utilities. Some of the DOS 7.0 utilities described were changed for DOS 7.1.

RDM uses the following DOS utilities:

- `bmgr.exe`
- `command.com`
- `dynaload.com`
- `emm386.exe`
- `fdisk.com`
- `fdisk32.exe`
- `format.com`
- `format32.com`
- `fsid.com`
- `ibmbio.com`
- `ibmdos.com`
- `mem.exe`
- `ndis.dos`
- `netbind.com`
- `protman.exe`
- `smartdrv.exe`

bmgr.exe

You can use this utility to modify the boot code on a hard disk drive so that before the operating system starts, you are prompted to press a key (usually F11) to force the system to boot from the `ibm_service` partition.

The `bmgr` utility uses the following syntax:

```
bmgr [/r]
```

where `/r` is an optional parameter that specifies that the boot manager code is to be uninstalled from the target hard drive.

dynaload.com

You can use the `dynaload` utility in a batch file to load a device driver dynamically after the system starts. RDM automatically uses the `dynaload` utility to load ServeRAID device drivers (when needed) to download the RAID configuration to the ServeRAID adapter. The `dynaload` utility is part of DOS. For information about using the `dynaload` utility to load other device drivers, see your DOS documentation.

fdisk.com

You can use the `fdisk` command to perform the following tasks:

- Partition a hard disk with FAT16 partitions
- Prepare a hard disk for formatting

Notes:

1. Before partitioning a hard disk, you can use the `scrub3.exe` utility to delete the master boot record and reset the hard disk to a known state.
2. If you use RDM to create FAT16 partitions for use under DOS (in a Custom task, for example), your system can have only 1 or 2 DOS drives. You can create more partitions, but no more than two can be primary or logical DOS drives.
3. The version of the `fdisk` utility that is provided with RDM can be used with command-line arguments or a response file. Using command-line arguments provides more flexibility and can provide standardized partition sizes regardless of the hard disk capacity.

Syntax

The `fdisk` command uses the following syntax:

```
fdisk drive [/status | /pri:size | /ext:size | /log:size | /mbr]
```

where *drive* identifies the hard disk drive and *size* is the size of the partition or logical drive, in MB. The `fdisk` command numbers the first physical hard disk drive as 1 and the second physical drive as 2.

The following table contains information about the fdisk optional parameters.

Table 12. fdisk optional parameters

Command	What it does	Syntax
/pri:size	Creates a primary DOS partition. Limit 1 per physical hard drive. The maximum size using FAT16 is 2 GB, and using FAT32 is 2000 GB.	fdisk <i>drive</i> /pri:size
/ext:size	Creates an extended DOS partition. Limit 1 per physical hard drive.	fdisk <i>drive</i> /ext:size
/log:size	Creates a logical drive on the extended DOS partition. Limit 23 per extended partition.	fdisk <i>drive</i> /log:size
/mbr	Writes a new master boot record of the primary drive.	fdisk <i>drive</i> /mbr
/status	Displays an overview of the hard disk drive partition information.	fdisk [<i>drive</i>] /status where [<i>drive</i>] is an optional parameter that specifies the hard disk drive. If [<i>drive</i>] is not specified, an overview of the hard disk drive partition information for all hard disk drives on the server is displayed.

Examples of using the fdisk command

The following table contains examples of using the fdisk command.

Table 13. Examples of using the fdisk command

Command	What it does
fdisk 1 /delete:all	Deletes all partitions on drive 1
fdisk 1 /pri:3500	Creates a 3500 MB primary partition on drive 1
fdisk 1 /ext:4000	Creates a 4000 MB extended partition on drive 1
fdisk 1 /log:2000	Creates a 2000 MB logical drive in the extended partition on drive 1

Using fdisk command-line arguments

You can use fdisk command-line arguments in RDM batch files as an alternative to creating binary response files.

DOS can work with a maximum of two partitions: one primary and one extended. The maximum primary partition size that is recognized by DOS is 2048 MB. The maximum extended partition size is 8064 MB. The largest logical drive that can be contained within the extended partition is 2048 MB, but you can have multiple logical drives. When you use the fdisk command, if you specify a partition size that is larger than the amount of available disk space, a partition that uses whatever amount of disk space is available will be created. Therefore, a system environment that includes the /ext:8064 parameter can be used on any system, regardless of the hard disk capacity.

Examples of using fdisk command-line arguments

The following table contains examples of using fdisk command-line arguments in system environments, which should be typed on one line (ignoring line breaks due to the table's column width.)

Table 14. Examples of using fdisk command-line arguments

Batch file	What it does
<code>fdisk 1 /pri:2048 /ext:2048 /log:2048</code>	Creates the following partitions on a 5 GB hard disk: <ul style="list-style-type: none">• 2 GB primary partition• 2 GB extended partition that contains a 2 GB logical partition.• 1 GB unused
<code>fdisk 1 /pri:2048 /ext:3076 /log:2048 fdisk 1 /log:1024</code>	Creates the following partitions on a 5 GB hard disk: <ul style="list-style-type: none">• 2 GB primary partition• 3 GB extended partition that contains two logical drives: a 2 GB drive and a 1 GB drive

Using fdisk response files

To create a response file, perform the fdisk procedure and record every keystroke that you make. Then, use an ASCII text editor to create a binary file that contains the ASCII codes for the keystrokes. (Enter is decimal 13, hex 0D; Esc is decimal 27, hex 1B.) Be sure to include the final keystroke (Enter) to restart the system.

You can create a response file by modifying one of the existing response files. For example, complete the following steps to modify lc5050fd.dat to create a response file that creates one or more partitions of a fixed size:

1. Create a copy of lc5050fd.dat with a new name. Be sure to keep the .dat extension.
2. Open the file in an ASCII text editor. Not all the characters are readable.
3. In the fourth response, change 50 to any number from 1 through 100 to specify the percentage of the hard disk space that is to be used for the primary partition. Do not change any other characters.
4. Save the file.

fdisk32.exe

You can use the fdisk32 utility to create hard disk drive partitions larger than 2048 MB.

After the partition table is changed, you must restart the system for the change to take effect. You can then use the following command to prepare the partition for use:

```
FORMAT32 C:
```

Typically, you can provide the required keyboard input to the fdisk32.exe command in the redirected file:

```
%LCCMPATH%\FDISK32 < LCFDISK.DAT
```

Syntax

The fdisk32 utility uses the following syntax:

```
fdisk32 [/status | /pri:size | / ext:size | /log:size \ /mbr]
```

where *drive* identifies the hard disk drive and *size* is the size of the partition or logical drive, in MB.

The following table contains information about the fdisk32 optional parameters.

Table 15. fdisk32 optional parameters

Function	What it does	Syntax
/pri:size	Creates a primary DOS partition. Limit 1 per physical hard drive. The maximum size using FAT16 is 2 GB, and using FAT32 is 2000 GB.	fdisk32 <i>drive</i> /pri: <i>size</i>
/ext:size	Creates an extended DOS partition. Limit 1 per physical hard drive.	fdisk32 <i>drive</i> /ext: <i>size</i>
/log:size	Creates a logical drive on the extended DOS partition. Limit 23 per extended partition.	fdisk32 <i>drive</i> /log: <i>size</i>
/mbr	Writes a new master boot record of the primary drive.	fdisk32 <i>drive</i> /mbr
/status	Displays an overview of the hard disk drive partition information.	fdisk32 [<i>drive</i>] /status where [<i>drive</i>] is an optional parameter that specifies the hard disk drive. If [<i>drive</i>] is not specified, an overview of the hard disk drive partition information for all hard disk drives on the server is displayed.

Example of using the fdisk32 utility

The following table contains an example of using the fdisk32 utility.

Table 16. Example of using the fdisk32 utility

Command	What it does
fdisk32 1 /pri:4096	Creates a 4096 MB primary partition on drive 1

format.com

You can use the format command to prepare a disk partition for use with DOS.

Important: The format command prompts you to define a volume label; however, RDM will not create a startable partition if a volume label is defined.

Typically, you can provide the required keyboard input to the format.com command in the redirected file:

```
%LCCMPATH%\FORMAT %TARGET% < FORMAT.DAT
```

Syntax

The format command uses the following syntax:

```
format drive: [/V[:label]] [/Q] [/U] [/F:size] [/B | /S] [/C]
```

where *drive* is the drive letter of the hard disk drive.

For information about the syntax that is used for format, see your DOS documentation.

The following table contains information about the functions of the format command.

Table 17. format optional parameters

Function	What it does	Syntax
Volume	Assigns a volume label to the DOS drive	format drive: /v:label
Quick format	Deletes the FAT and the root directory of a previously formatted hard disk but does not scan the hard disk for bad areas	format drive: /q]
Unconditional format	Performs an unconditional format	format drive: /u]
Diskette size	Specifies the size of the diskette that is being formatted	format drive: /f:size]
Space for system files	Allocates space on the formatted disk for system files	format drive: /b]
Copy system files	Copies system files to the formatted disk	format drive: /s]
Tracks per side	Specifies the number of tracks per disk side	format drive: /t:tracks]
Sectors per track	Specifies the number of sectors per track	format drive: /n:sectors]
Format eight sectors per track	Formats eight sectors per track	format drive: /8]
Revert to less conservative handling of bad blocks	Reverts to less conservative handling of bad blocks	format drive: /c]

Example of using the format command

Issuing the following command line prepares the primary partition on a drive:

```
format c:
```

This is the standard DOS format command.

Using the format.dat response file

RDM provides a response file, format.dat, that you can use to run the format command unattended to create DOS FAT16 tracks and sectors in a specified partition.

The format.dat file produces the following responses.

```
y ENTER          Format an existing partition
ENTER           No volume label is assigned
```

Do not create variations of this response file.

format32.com

You can use the format32 command to prepare a FAT32 disk partition for use with DOS. Use the format32 command to format FAT32 partitions only, that is, partitions that were created through the fdisk32.exe utility.

Important: The FORMAT command prompts the user to define a volume label as a part of its process. RDM will not create a startable partition if a volume label is named.

You can use the format command to define areas of the hard disk that can receive and store data.

Typically, you can provide the required keyboard input to the format32.com command in the redirected file:

```
%LCCMPATH%\FORMAT32 %TARGET% < %LCCMPATH%\FORMAT.DAT
```

Syntax

The format32 command uses the following syntax:

```
format32 drive: [/v:label] [/q] [/autotest]
```

where *drive* is the drive letter of the hard disk drive.

The following table contains information about the functions of the format32 command.

Table 18. format32 optional parameters

Function	What it does	Syntax
Volume	Assigns a volume label to the DOS drive	format32 <i>drive</i> : /v: <i>label</i>
Quick format	Deletes the file allocation table (FAT) and the root directory of a previously formatted hard disk but does not scan the hard disk for bad areas	format32 <i>drive</i> : [/q]
No prompt	Formats the partitions without prompting for input	format32 <i>drive</i> : [/autotest]

Example of using the format32 command

Issuing the following command does a quick format of drive C and sets the volume label of the partition to win2000 without being prompted to do so:

```
format32 /v:win2000 c: /q /autotest
```

fsid.com

You can use the fsid command to return an error code that identifies the file system or partition type of the specified drive or partition.

The fsid command uses the following syntax:

```
fsid /d=x /p=y
```

where *x* is the drive number (from 0 through the number of drives in the system) and *y* is the partition number (from 0 through 3).

The following return values are possible:

0	Unidentified partition type
1	FAT12
4	FAT16
5	Extended partition
6	BIGDOS FAT16
7	NTFS
11	FAT32
12	FAT32 (Int 13 Ext)
14	BIGDOS FAT16 (Int 13 Ext)
15	Extended Partition (Int 13 Ext)
17	Hidden FAT12
18	EISA partition
20	Hidden FAT16
21	Hidden extended partition
22	Hidden BIGDOS FAT16
23	Hidden NTFS
27	Hidden FAT32
28	Hidden FAT32 (Int 13 Ext)
30	Hidden BIGDOS FAT16 (Int 13 Ext)
31	Hidden Extended Partition (Int 13 Ext)
66	Dynamic disk volume
130	Linux swap file
131	Linux Ext 2
134	Legacy FT FAT16
135	Legacy FT NTFS

- 139 Legacy FT FAT32
- 140 Legacy FT FAT32 (Int 13 Ext)
- 999 Unrecognized partition type

mem.exe

You can use the mem utility to list the amount of used and free memory in the system. It is provided in the DOS system environment for use as a debugging tool. For information about mem.exe, see the DOS documentation.

Miscellaneous utilities

RDM uses the following miscellaneous utilities:

- bpdisk.exe
- idewc.exe

bpdisk.exe

You can use the bpdisk utility to create or modify a boot image without using a diskette. In Windows, it is in the \local\env directory.

You can use the bpdisk utility to perform the following tasks:

- Insert or extract single files or complete subdirectories from a boot image
- Create optimized boot images that allocate only the actual storage space that is occupied by the included files
- Create boot images in all common DOS diskette formats, including 1.2 MB, 1.44 MB, and 2.88 MB formats
- Write DOS batch files that create or update multiple boot images

The bpdisk command uses the following syntax:

```
bpdisk -d file [-v] [-D | -t file | -f dsize,bsec | -e | -I dst[,src] | -i  
dir | -O src[,dst] | -o dir | -m dir | -p dsize]
```

where -d *file* is the file name of the boot image (an existing image or an image that should be created).

The following table contains information about the bpdisk optional parameters.

Table 19. bpdisk optional parameters

Command	What it does	Syntax
-v	Gives more technical information about bpdisk operations. It can be used together with other options or alone.	bpdisk -d <i>file</i> -v
-D	Shows a recursive directory listing of all files in the boot image identified by the -d option.	bpdisk -d <i>file</i> -D
-t <i>file</i>	Displays the contents of a file in the boot image defined by the -d option.	bpdisk -d <i>file</i> -t <i>file</i>
-f <i>dsize,bsec</i>	Formats a new boot image. The name of the boot image is defined with the -d option or by the environment variable bpdisk. If the boot image already exists, it will not be overwritten.	bpdisk -d <i>file</i> -f <i>dsize,bsec</i> where: <ul style="list-style-type: none"> • <i>dsize</i> is the format of the boot image (320, 360, 640, 720, 1200, 1440, or 2880). Initially, BPDISK will not allocate the space needed for the complete boot image; it will do this later, when files are copied into the boot image. • <i>bsec</i> points to a file or drive which holds the boot sector and the system files for the boot image. • The 2 arguments must be separated by a comma.
-e	Delete a file from the boot image.	bpdisk -d <i>file</i> -e <i>file</i>
-l <i>dst[,src]</i>	Copies a file into an existing boot image.	bpdisk -d <i>file</i> -l <i>dst[,src]</i> where: <ul style="list-style-type: none"> • <i>dst</i> is the name of the file in the boot image. • <i>src</i> is the name of the file that is the name of the file to be copied. • If <i>src</i> is omitted, then the name of the <i>dst</i> file, with the directory path removed, is used; in this case, the source file must be in the current directory.
-i <i>dir</i>	Copies all files (recursively) from directory <i>dir</i> into the boot image.	bpdisk -d <i>file</i> -i <i>dir</i> where <i>dir</i> is the name of the directory. To specify the current directory, use a period (.).

Table 19. bpdisk optional parameters (continued)

Command	What it does	Syntax
-O src[,dst]	Copies a file out of the boot image. It copies file <i>src</i> from the boot image to file <i>dst</i> .	<code>bpdisk -d file -O src[,dst]</code> where file <i>src</i> is copied from the boot image to file <i>dst</i> .
-o dir	Copies all files (recursively) from the boot image to the specified directory.	<code>bpdisk -d file -o dir</code> where <i>dir</i> is the name of the directory. To specify the current directory, use a period (.).
-m dir	Creates a new subdirectory in the boot image.	<code>bpdisk -d file -m dir</code> where <i>dir</i> is the name of the new subdirectory.
-p dsize	Enlarges an existing boot image by a specified number of kilobytes. Additional space might be required in a boot image if a program writes files into the image.	<code>bpdisk -d file -p dsize</code> where the image is enlarged by <i>dsize</i> kilobytes.

idewc.exe

You can use this utility to enable write-caching on IDE drives on BladeCenter blade servers.

The idewc utility uses the following syntax:

```
idewc
```

Power restore utilities

This section contains information about the following utilities:

- createpr.com
- getramd.exe
- macsubst.exe
- parttool.exe
- pr.exe
- prerr.exe
- prsource.exe
- reboot.com
- seterror.com

createpr.com

You can use the createpr command during the installation of a Power Restore partition to create a batch file, fdisk.bat, that contains the configuration values for the primary partition. Depending on the task, either fdisk32.com or pqimgctr.exe uses the batch file to create a primary partition. The createpr command always returns 0.

The createpr command uses the following syntax:

```
createpr [/a | /b | /c | /size]
```

where:

- /a specifies that all unpartitioned hard disk space is to be used.
- /b specifies that only hard disk space equal to the size of the boot partition is to be used.
- /c specifies that hard disk space equal to the combined total that is used by the other partitions on the boot drive is to be used .
- /size is the amount of hard disk space, in MB, that is to be used.

getramd.exe

You can use the getramd utility to search the available disk drives and determine which drive is the RAM drive. The numeric value that is returned (1 through 24) corresponds to the drive letters (c through z), where c is drive 1 and z is drive 24. A returned value of 0 (zero) indicates that no RAM drive was identified.

The getramd utility uses the following syntax:

```
getramd
```

macsubst.exe

You can use the macsubst utility to replace all the instances of %MAC_ADDRESS_n% in a text file with the actual MAC address of the *n*th NIC in a target system. This utility returns 0 if it is completed successfully or 1 if it generates an error.

The macsubst utility uses the following syntax:

```
macsubst filename
```

where *filename* is the fully qualified name of the text file, for example, c:\temp\answer.txt. You must use 8.3 notation for the name of the text file.

parttool.com

You can use the parttool utility to configure and retrieve the partition information from the partition table in the master boot record on a system. You also can use the parttool command to work with the power restore information sector. The parttool utility returns 0 if the operation is completed successfully or 999 if the operation is not completed successfully.

The following table contains information about parttool commands and their syntax.

Table 20. parttool commands and syntax

Command	What it does	Syntax
/?	Lists the syntax for the utility. In addition, the codes that are associated with the partition types are displayed.	parttool /?
/d	Lists the partition information for the master boot record, such as type and size.	parttool /Drive /d [/v] where: <ul style="list-style-type: none">• <i>Drive</i> is the drive number.• <i>/v</i> enables verbose logging.
/h	Hides the specified partition when the hard disk drive information is displayed in DOS.	parttool /Drive /h <i>Partition</i> [/v] where: <ul style="list-style-type: none">• <i>Drive</i> is the drive number.• <i>Partition</i> specifies the partition that is hidden:<ul style="list-style-type: none">– <i>ff</i> specifies the first partition.– <i>ll</i> specifies the last partition.– <i>la</i> specifies all partitions.– <i>lNumber</i> is the partition number (0-3).• <i>/v</i> enables verbose logging.
/u	Unhides the specified partition when the hard disk drive information is displayed in DOS.	parttool /Drive /u <i>Partition</i> [/v] where: <ul style="list-style-type: none">• <i>Drive</i> is the drive number.• <i>Partition</i> specifies the partition that is unhidden:<ul style="list-style-type: none">– <i>ff</i> specifies the first partition.– <i>ll</i> specifies the last partition.– <i>la</i> specifies all partitions.– <i>lNumber</i> is the partition number (0-3).• <i>/v</i> enables verbose logging.
/w	Swaps the partition numbers of the two partitions.	parttool /Drive /w <i>Partition1 Partition2</i> [/v] where: <ul style="list-style-type: none">• <i>Drive</i> is the drive number.• <i>Partition1</i> and <i>Partition2</i> are partition numbers (0-3).• <i>/v</i> enables verbose logging.

Table 20. *parttool* commands and syntax (continued)

Command	What it does	Syntax
/a	Sets the bootable partition on a hard disk drive.	<p><code>parttool /Drive /a Partition [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Partition</i> is the number (0-3) of the partition that you want to configure as the active (bootable) partition. • <i>/v</i> enables verbose logging.
/g	Retrieves the type of the specified partition. By default, the type is returned as the error code.	<p><code>parttool /Drive /g Partition [/f] [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Partition</i> is the number (0-3) of the partition of which you want to retrieve the type. • <i>/f</i> creates a <code>part_env.bat</code> file and saves the type of the specified partition to the <code>partition_Partition</code> variable. • <i>/v</i> enables verbose logging.
/s	Sets the partition type for a specified partition. Attention: This command might cause the operating system to identify the partition as usable but damaged.	<p><code>parttool /Drive /s Partition# PartitionType [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Partition#</i> is the partition number (0-3). • <i>PartitionType</i> is an integer that specifies the partition type. • <i>/v</i> enables verbose logging.
/m	Performs a power restore operation on the master boot record. You either can copy or replace the master boot record.	<p><code>parttool /Drive /m Operation [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Operation</i> indicates the type of operation to be performed on the master boot record: <ul style="list-style-type: none"> – /b specifies copy – /r specifies replace • <i>/v</i> enables verbose logging.
/p	Updates the power restore information sector.	<p><code>parttool /Drive /p Flag [Comments] [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Flag</i> indicates the type of flag that is saved to the power restore information sector: <ul style="list-style-type: none"> – /a specifies that image A exists – /b specifies that image B exists • <i>Comments</i> is a string. If the string includes spaces, you must surround it with quotation marks ("). • <i>/v</i> enables verbose logging.

Table 20. *parttool* commands and syntax (continued)

Command	What it does	Syntax
/p	Updates the power restore information sector.	<p><code>parttool /Drive /p Operation [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Operation</i> indicates the type of operation that is performed on the power restore information sector: <ul style="list-style-type: none"> – /d specifies that the contents of the power restore information sector are displayed – /f specifies that the power restore information sector is flushed. – /m specifies that a flag is saved to the power restore information sector, indicating that IBM Boot Manager is installed – /n specifies that a flag is saved to the power restore information sector, indicating that IBM Boot Manager is not installed • /v enables verbose logging.
/c	<p>Retrieves information about the power restore sector.</p> <p>If not otherwise noted, the command returns 1 if the specified condition is true, and it returns 0 (zero) if the specified condition is false.</p>	<p><code>parttool /Drive /c Condition [/v]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>Drive</i> is the drive number. • <i>Condition</i> is one of the following: <ul style="list-style-type: none"> – /3 specifies that the third entry in the master boot record is defined. – /f specifies that the third entry in the master boot record is a FAT32 partition. – /h specifies that the third entry in the master boot record is a hidden FAT32 partition. – /i specifies that the drive letter for the power restore partition is returned. The numeric value that is returned (1 through 24) corresponds to the drive letter (c through z, where c is drive 1 and z is drive 24). A returned value of 999 indicates that the drive letter could not be retrieved. – /p m n s s specifies the version level of IBM Boot Manager for Power Restore that is installed, where <i>m</i> is the major version number, <i>n</i> is the minor version number, and <i>ss</i> is the sub-minor version number. – /r specifies whether Rapid Restore partitions are defined. • /v enables verbose logging.

pr.exe

The power restore utility (pr) is used to perform the following operations:

- Back up or restore the master boot record
- Generate the commands that run the Symantec ImageCenter engine and back up or restore the boot partition

Depending on whether it is run as part of an RDM task or from the command line, pr operates differently.

RDM task

It runs silently. Information specified through the RDM task is translated into the batch file and the ImageCenter script file

Command line

It runs with a GUI. User-specified information is used to create the batch file and the ImageCenter script file.

When run from the command line, pr also can be used to generate detailed information about the partition table.

Syntax

The pr utility uses one of the following syntax statements:

1. pr /i | /p | /v

where:

- /i specifies that pr is run in interactive mode.
- /p specifies that pr is run in interactive mode, but the user cannot save to the A image file.
- /v specifies that detailed partition table information is displayed.

2. pr *MasterBootRecord* *BootPartition* *Image*

where:

- *Mode* is one of the following strings:
 - /s specifies that a save operation is performed. The pr program runs in silent mode.
 - /r specifies that a restore operation is performed. The pr program runs in silent mode.
- *MasterBootRecord* indicates whether the operation is performed on the master boot record. It is one of the following strings:
 - /y specifies yes.
 - /n specifies no.
- *BootPartition* indicates whether the operation is performed on the boot partition: /
 - y specifies yes.
 - /n specifies no. If the *Image* parameter is issued, it is ignored.
- *Image* indicates which of the two images is used:
 - /a specifies the A image file.
 - /b specifies the B image file.
 - /o specifies the older image file.
 - /n specifies the newer image file.

prerr.com

The prerr utility is used by the Get Donor, Power Restore, and Windows Clone Install tasks. It retrieves the Symantec ImageCenter error codes and convert them to RDM error codes. The corresponding messages are then displayed in IBM Director Console. The prerr command returns 0 if it is completed successfully. It returns 1 if it is not completed successfully.

The prerr command uses the following syntax:

```
prerr Mode Image [Comments]
```

where:

- *Mode* is one of the following strings:
 - **s** specifies that the utility runs in scripted mode.
 - **i** specifies that the utility runs in interactive mode. If an occur occurs, a PAUSE statement is appended to the pr_err.bat file.
- *Image* is one of the following strings:
 - **a** specifies image A
 - **b** specifies image B
- *Comments* is a string.

prsource.exe

The prsource.exe file is a self-extracting zipped file that contains several utility programs. While a Power Restore partition is being installed or a Power Restore operation is running, MTFTP can copy the prsource.exe file instead of copying the individual files, resulting in faster performance.

reboot.com

You can use this command to restart a system that is running DOS.

The reboot command uses the following syntax:

```
reboot
```

There are no command line parameters.

seterror.com

You can use this command to set the error level.

The seterror command uses the following syntax:

```
seterror /n
```

where *n* is 0 or a positive integer from 1 through 32767.

RAID configuration utilities

This section describes the RAID configuration utilities provided by RDM.

cfg1030.exe

You can use the cfg1030 utility to configure an integrated SCSI controller with RAID capabilities (an LSI1030 or LSI1020 controller). You can perform the following tasks:

- Create a logical drive and assign it RAID level-1
- Back up the configuration settings to a file
- Generate information about the controller and its RAID configuration
- Create a hot-spare drive
- Restore a controller to the factory-default settings

Syntax

The cfg1030 utility uses the following syntax:

`cfg1030 command parameters`

Table 21 contains information about the cfg1030 commands and parameters.

Table 21. *cfg1030 commands and parameters*

Command	What it does	Syntax
backup	Saves the configuration settings for the controller to a file.	<code>cfg1030 backup <i>controller filename</i> [qsync]</code> where <ul style="list-style-type: none">• <i>controller</i> is the number of the SCSI controller.• <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory.• [qsync] is an optional parameter that specifies that the logical drive is quick synchronized. The first 32 KB of the physical drives in the logical drive are cleared to 0. Important: When you use the backup command in a file that is used by the RAID Clone Configuration task, use the qsync parameter to prevent a full synchronization. A full synchronization can be significantly longer than a quick synchronization.
create	Creates a logical drive.	<code>cfg1030 create <i>controller logicaldrive newarray size</i> 1 {1 <i>drive</i>} [qsync]</code> where <ul style="list-style-type: none">• <i>controller</i> is the number of the SCSI controller. An LSI1030 controller will have two controller numbers (1 and 2) associated with it.• <i>size</i> is one of the following values:<ul style="list-style-type: none">– The size of the logical drive in MB– MAX specifies that you want to use all available space in the array• {1 <i>drive</i>} is a repeatable parameter that specifies the hard disk drives included in the logical drive. The channel number is always 1, and <i>drive</i> is the SCSI ID of the hard disk drive.• [qsync] is an optional parameter that specifies that the logical drive is quick synchronized. The first 32 KB of the physical drives in the logical drive are cleared to 0. Important: When you use the create command in a file that is used by the RAID Clone Configuration task, use the qsync parameter to prevent a full synchronization. A full synchronization can be significantly longer than a quick synchronization.

Table 21. *cfg1030* commands and parameters (continued)

Command	What it does	Syntax
getconfig	Lists information about the controller. This information includes controller type, firmware version, BIOS version, logical drive information, and physical drive information.	<p><code>cfg1030 getconfig <i>controller</i> [<i>option</i>]</code></p> <p>where</p> <ul style="list-style-type: none"> • <i>controller</i> is the number of the SCSI controller. • [<i>option</i>] is an optional parameter that specifies the information that is returned, and <i>option</i> is one of the following values: <ul style="list-style-type: none"> – AD specifies the controller information – LD specifies the logical drive information – PD specifies the physical drive information – ALL specifies all information <p>If <i>option</i> is not specified, by default the <code>getconfig</code> command returns all information.</p>
restore	Configures a controller using information and settings stored in a file.	<p><code>cfg1030 restore <i>controller filename</i></code></p> <p>where</p> <ul style="list-style-type: none"> • <i>controller</i> is the number of the SCSI controller. • <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <code>cfg1030</code> command searches for the file in the local directory.
setconfig	Deletes logical drives and restores a controller to the factory-default settings.	<p><code>cfg1030 setconfig <i>controller</i> default</code></p> <p>where <i>controller</i> is the number of the SCSI controller.</p>
setstate	Creates a hot-spare drive.	<p><code>cfg1030 setstate <i>controller drive</i> hsp</code></p> <p>where</p> <ul style="list-style-type: none"> • <i>controller</i> is the number of the SCSI controller. • <i>drive</i> is the SCSI ID of the hard disk drive.

Examples of using the cfg1030 utility

Table 22 contains examples of using the cfg1030 utility.

Table 22. Examples of using the cfg1030 utility

Command	What it does
<pre>cfg1030 create 1 logicaldrive newarray max 1 1 0 1 1 qsync</pre> <p>(The command must be typed all on one line.)</p>	<p>Performs the following actions:</p> <ul style="list-style-type: none"> • Creates a new array and logical drive using controller 1 • Uses all the available space in the array for the logical drive • Assigns the logical drive RAID level-1 • Uses the physical drives at channel 1, SCSI ID 0 and SCSI ID 1 • Specifies that a quick synchronization is performed, preventing a time-intensive full synchronization of the physical drives.
<pre>cfg1030 setstate 1 0 1 HSP</pre>	<p>Designates the physical drive at channel 0, SCSI ID 1 as a hot spare drive for controller 1.</p>

hypercfg.exe

You can use the hypercfg utility to configure an IDEal RAID controller. You can perform the following tasks:

- Create a logical drive and assign it RAID level-1 or RAID level-0
- List the configuration of hard disk drives attached to an IDEal RAID controller and write the information to a file
- List BIOS information for the IDEal RAID controller
- Create a logical drive using configuration information that is stored in a file

Syntax

The hypercfg utility uses the following syntax:

`hypercfg command parameter`

Table 23 contains information about the hypercfg commands and parameters.

Table 23. hypercfg commands and parameters

Command	What it does	Syntax
configuration	Creates a logical drive and assigns it a RAID level.	<p><code>hypercfg <i>configuration</i></code></p> <p>where <i>configuration</i> is one of the following commands:</p> <ul style="list-style-type: none"> • /AM assigns the logical drive RAID level-1. • /ASStripeSize assigns the logical drive RAID level-0 and stripes data across the logical drive in blocks of <i>StripeSize</i>. <i>StripeSize</i> is one of the following values, in KB: 32, 64, 128, 256, 512, 1024, 2048, 4096.
@filename	Creates a logical drive using configuration information stored in a file.	<p><code>hypercfg @<i>FileName</i></code></p> <p>where <i>FileName</i> is a fully qualified file name.</p>

Table 23. hypercfg commands and parameters (continued)

Command	What it does	Syntax
/l	Shows the configuration for the hard disk drives attached to the IDEal RAID controller. It also can write the information to a file.	hypercfg /l [/filename] where [/filename] is an optional parameter that specifies that the information be written to a file, and filename is a fully qualified file name.
/s	Performs operations without waiting for input.	hypercfg /s
/v	Shows the BIOS information for the IDEal RAID controller.	hypercfg /v

Examples of using the hypercfg utility

Table 24 includes examples of using the hypercfg utility.

Table 24. Examples of using the hypercfg utility

Command	What it does
hypercfg /AM	Creates a logical drive and assigns it RAID level-1.
hypercfg /AS64	Creates a logical drive and assigns it RAID level-0. Stripes data across the drives in 64 KB blocks.
hypercfg /l	Lists information for the two physical drives attached to the IDEal RAID controller.
hypercfg /l /fhypercfg.cfg /s	Lists the information for the two physical drives attached to the IDEal RAID controller; then, without waiting for input, writes the data to the hypercfg.cfg file.
hypercfg /@hypercfg.cfg	Configures a logical drive using the information stored in the hypercfg.cfg file.

For more information, see the *IBM BladeCenter HS20 - LSI IDEal RAID User's Guide*. It can be downloaded from <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-52750>.

ipssendl.exe

You can use the ipssendl utility to configure an IBM ServeRAID controller. You can perform the following tasks:

- Back up controller information
- Create logical drives and assign RAID levels
- List information about a controller, logical drive, or physical drive
- Restore a controller configuration from a file or diskette
- Reset a controller to the factory-default settings

Notes:

1. RDM 4.20 includes ipssendl, version 7.10.17. It is a best practice to upgrade ServeRAID BIOS code and firmware to version 7.10.17 before using the ipssendl command. However, the ipssendl command will work with ServeRAID BIOS code and firmware later than version 4.84.
2. The ipssendl command supports IBM ServeRAID controllers, version 4 and later.
3. You must load the ServeRAID device driver for DOS (ipsraspi.sys) on the target system before using ipssendl. This device driver is on the *IBM ServeRAID drivers for DOS* diskette. The diskette also includes a sample config.sys that shows how to install the device driver. See "Creating a DOS-startable diskette" on page 150 for more information.

Syntax

The ipssendl utility uses the following syntax:

`ipssendl command parameters`

Table 25 contains information about ipssendl commands and parameters.

Table 25. *ipssendl commands and parameters*

Command	What it does	Syntax
backup	Saves information concerning a controller configuration to a diskette or physical drive. This information includes BIOS settings, array and logical drive definitions, and cluster parameters.	<code>ipssendl backup <i>controller filename</i> [noprompt]</code> where: <ul style="list-style-type: none"> <i>controller</i> is the ServeRAID controller number (1-12). <i>filename</i> is a fully qualified file name. <code>noprompt</code> is an optional parameter that overrides the user prompt.
create	Creates logical drives on either an existing or a new array. To define a new array, type the channel and SCSI ID of the physical drives. Note: You cannot create RAID level-00, level-10, level-1E0, and level-50 logical drives with this function. After the logical drive is created, a quick initialization is done. The quick initialization process initializes the first 1024 sectors of the logical drive. If you assign the logical drive RAID level-5 RAID level-5E and the ServeRAID controller supports auto-synchronization, the logical drive is automatically synchronized in the background. If the controller does not support the auto-synchronization feature, you can use the IPSSENDL <code>synch</code> function to synchronize the RAID level-5, RAID level-5E, or RAID level-5EE logical drives. After synchronization, the logical drives are available for storing data.	<code>ipssendl create <i>controller logicaldrive options size raidlevel</i> [<i>channel sid</i>] [noprompt]</code> where: <ul style="list-style-type: none"> <i>controller</i> is the ServeRAID controller number (1-12). <i>options</i> is one of the following values: <ul style="list-style-type: none"> NEWARRAY specifies that you are creating a new array and logical drive ARRAYID is the array ID (A-H) of an existing array <i>size</i> is one of the following values: <ul style="list-style-type: none"> The size, in MB, of the logical drive MAX indicates that you want to use all available space in the array <i>raidlevel</i> is the RAID level for the logical drive (0, 1, 1E, 5, or 5E). If you specify NEWARRAY, <i>channel sid</i> is the channel number for the device (1-4), and <i>sid</i> is the SCSI ID for the device (0-15). You can specify as many as 16 physical drives. <code>noprompt</code> is an optional parameter that overrides the user prompt.
getconfig	Lists information about a controller, logical drive, or physical drive. This information potentially includes (but is not limited to) the following items: <ul style="list-style-type: none"> Controller type BIOS code, boot block, device driver, and firmware versions Logical drive status, RAID level, and size Physical drive type, SCSI ID, presence of Predictive Failure Analysis® (PFA) Physical drive state 	<code>ipssendl getconfig <i>controller options</i></code> where: <ul style="list-style-type: none"> <i>controller</i> is the ServeRAID controller number (1-12). <i>options</i> is one of the following values: <ul style="list-style-type: none"> AD specifies the controller information. LD specifies the logical drive information. PD specifies the physical device information. AL specifies all information. This is the default option.

Table 25. *ipssendl* commands and parameters (continued)

Command	What it does	Syntax
restore	Loads a configuration file from a file stored on a diskette or hard disk drive. This information overwrites the existing configuration information and BIOS settings stored on a ServeRAID controller.	<p><code>ipssendl restore <i>controller filename</i> [noprompt]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>controller</i> is the ServeRAID controller number (1-12). • <i>filename</i> is a fully qualified file name. • <code>noprompt</code> is an optional parameter that overrides the user prompt.
setconfig	Modifies the controller configuration. You can restore the configuration to the factory-default settings, or you can copy the configuration from the attached physical drives.	<p><code>ipssendl setconfig controller <i>option</i> [noprompt]</code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>controller</i> is the ServeRAID controller number (1-12). • <i>option</i> is one of the following values: <ul style="list-style-type: none"> – DEFAULT restores the controller to the factory-default settings. All logical drives are deleted. – IMPORTDRIVE imports the configuration from the attached physical drives. • <code>noprompt</code> is an optional parameter that overrides the user prompt.
setstate	Changes the state of a physical drive.	<p><code>ipssendl setstate controller channel <i>scsi_id new_state</i></code></p> <p>where:</p> <ul style="list-style-type: none"> • <i>controller</i> is the ServeRAID controller number (1-12). • <i>channel</i> is the channel number of the physical drive (1-4). • <i>scsi_id</i> is the SCSI ID number of the physical drive (0-15). • <i>new_state</i> is one of the following values: <ul style="list-style-type: none"> – EMP (empty) – RDY (ready) – HSP (hot spare) – SHS (standby hot spare) – DDD (defunct disk drive) – DHS (defunct hot spare) – RBL (rebuild) – SBY (standby) – ONL (online)

Examples of using the ipssendl utility

Table 26 contains examples of using the ipssendl utility.

Table 26. Examples of using the ipssendl utility

Command	What it does
ipssendl create 1 logicaldrive newarray max 5 1 0 1 1 1 2 1 3 1 4 noprompt (The command must be typed all on one line.)	Uses controller 1 to create a new array with a RAID level-5 logical drive. The array uses the drives on channel 1 at SCSI ID 0, 1, 2, 3, and 4. The logical drive uses all the available space in the array.
ipssendl backup 1 c:\myraid.cfg	Saves the configuration information for controller 1 to the myraid.cfg file, located in the root directory of drive C.
ipssendl restore 1 c:\myraid.cfg	Restores the configuration information from the myraid.cfg file to controller 1.
ipssendl setconfig 1 default	Restores controller 1 to the factory-default settings.

raidse.exe

You can use the raidse utility to configure a ServeRAID-7e (Adaptec HostRAID) for SCSI controller. You can perform the following tasks:

- Create a logical drive and assign it either RAID level-0 or RAID level-1
- Back up the configuration settings to a file
- Generate information about the controller and its RAID configuration
- Create a hot-spare drive
- Restore a controller to the factory-default settings

Syntax

The raidse utility uses the following syntax:

`raidse command parameters`

Table 27 contains information about the raidse commands and parameters.

Table 27. raidse commands and parameters

Command	What it does	Syntax
-a	Specifies the type of build action to perform on the array.	raidse -a <i>action</i> [autofix] where <ul style="list-style-type: none"> • <i>action</i> is one of the following build actions: <ul style="list-style-type: none"> – build specifies the build operation – rebuild specifies the rebuild operation – verify specifies the verify operation • Note: The verify parameter is applicable for the optimal state only. • autofix turns on the autofix function during a verify operation
-B	Marks or unmarks a startable (bootable) drive.	raidse -B + <i>drive</i> - <i>drive</i> where <i>drive</i> is the drive ID.
-b	Specifies a bus or channel on which to operate.	raidse -b <i>ID</i> where <i>ID</i> is the bus or channel ID. Note: If you do not specify a value for <i>ID</i> , the default is 0.
-D	Deletes an array or logical drive, or all arrays.	raidse -D <i>ID</i> all where <i>ID</i> is the array or logical drive ID.

Table 27. *raidset commands and parameters (continued)*

Command	What it does	Syntax
-d	Specifies a controller on which to operate.	raidset -d <i>ID</i> where <i>ID</i> is the controller ID. Note: If you do not specify a value for <i>ID</i> , the default is 0.
-delinfo	Specifies the delete information option when deleting RAID-level 1 logical drives.	raidset -delinfo <i>drive</i> where <i>drive</i> is one of the following options: <ul style="list-style-type: none"> • pri, which specifies the primary drive • sec, which specifies the secondary drive • all, which specifies both primary and secondary drives • none, which specifies no drives Note: If you do not specify a value for <i>drive</i> , the default is none.
-F	Forces the creation of an array. Typically this is used when a partition table is detected.	raidset -F
-g	Specifies device IDs. Note: Use this command in conjunction with the -l command.	raidset -g { <i>ID</i> } where <i>ID</i> is the device ID.
-L	Lists information for the specified type.	raidset -L <i>type</i> where <i>type</i> is one of the following types: <ul style="list-style-type: none"> • controller, which specifies the controller information • physical, which specifies the physical drive information • logical, which specifies the logical drive information • raid, which specifies the raid level information • all, which specifies all information
-l	Specifies the RAID level to create in the configuration.	raidset -l <i>level name</i> where <ul style="list-style-type: none"> • <i>level</i> is one of the following RAID levels: <ul style="list-style-type: none"> – 0 – 1 – 10 • <i>name</i> is an optional name
load	Configures a controller using information and settings stored in a file.	raidset load <i>filename</i> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the raidset command searches for the file in the local directory.
loadB	Configures an array using information and settings stored in a file.	raidset loadB <i>filename</i> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the raidset command searches for the file in the local directory.
-p	Specifies a driver background task priority.	raidset -p <i>priority</i> where <i>priority</i> is one of the following priorities: <ul style="list-style-type: none"> • high • medium • low Note: If you do not specify a value for <i>priority</i> , the default is medium.

Table 27. *raidset* commands and parameters (continued)

Command	What it does	Syntax
-q	Specifies quiet mode.	<code>raidset -q</code>
-S	Adds or deletes a spare drive to an array.	<code>raidset -S +ID -ID</code> where <i>ID</i> is the spare drive ID.
save	Saves the configuration settings for the controller to a file.	<code>raidset save filename</code> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.xml</code> .
-Z	Wipes out the meta data and partition table on one or all physical drives on the current channel.	<code>raidset -Z ID all</code> where <i>ID</i> is the physical drive ID.
-z	Specifies the required stripe-unit size when creating a RAID-level 0 or RAID-level 10 logical drive.	<code>raidset -z size</code> where <i>size</i> is one of the following stripe-unit sizes: <ul style="list-style-type: none"> • 16KB • 32KB • 64KB Note: If you do not specify a value for <i>size</i> , the default is 64KB.

For more information, see the documentation that comes with the server or RAID controller.

acu.exe

You can use the `acu` utility to configure a ServeRAID-7t controller. You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

Syntax

The `acu` utility uses the following syntax:

`acu command parameters`

Table 28 contains information about the `acu` commands and parameters.

Table 28. *acu* commands and parameters

Command	What it does	Syntax
/P	Creates containers and configures channel settings using information stored in a file.	<code>acu /P filename</code> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <code>acu</code> command searches for the file in the local directory. You can optionally provide the file extension <code>.ccu</code> .
/R	Saves the container and channel configuration settings for the controller to a file.	<code>acu /R filename</code> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.mlc</code> .

Table 28. *acu* commands and parameters (continued)

Command	What it does	Syntax
/C	Specifies an optional controller ID for systems that have more than one controller ID.	<code>acu /C ID</code> where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.

For more information, see the documentation that comes with the server or RAID controller.

acuichsv.exe

You can use the `acuichsv` utility to configure a ServeRAID-7e (Adaptec HostRAID) for SATA controller. You can perform the following tasks:

- Back up the configuration settings to a file
- Configure a controller using configuration settings backed up to a file.
- Specify additional controller IDs

Syntax

The `acuichsv` utility uses the following syntax:

`acuichsv command parameters`

Table 29 contains information about the `acuichsv` commands and parameters.

Table 29. *acuichsv* commands and parameters

Command	What it does	Syntax
/P	Creates containers and configures channel settings using information stored in a file.	<code>acuichsv /P filename</code> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the <code>acu</code> command searches for the file in the local directory. You can optionally provide the file extension <code>.ccu</code> .
/R	Saves the container and channel configuration settings for the controller to a file.	<code>acuichsv /R filename</code> where <i>filename</i> is the filename. The filename can be fully qualified. If you provide only a filename, the file is saved to the local directory. You must provide a file with the extension <code>.mlc</code> .
/C	Specifies an optional controller ID for systems that have more than one controller ID.	<code>acuichsv /C ID</code> where <i>ID</i> is the controller ID. A default of 0 indicates the first controller in the systems.

For more information, see the documentation that comes with the server or RAID controller.

RDM utilities

RDM uses the following RDM utilities:

- aiaread.exe
- aiawrite.exe
- appsinst.exe
- bootini.com
- bstrap.0 and lccm.1
- cleanup.exe
- deditd.exe
- getvol.exe
- lccustom.exe
- lccm.1 and bstrap.0
- lcips.dos
- lcreboot.exe
- makepqs.com
- mergeini.exe
- mftfp.exe
- poweroff.com
- prepdsks.exe
- raidcfg.exe
- ramdisk2.exe
- rave.exe
- redirect.exe
- rdagent.exe
- scan.exe
- scrub3.exe
- sleep.exe
- treboot.exe
- tshudwn.exe
- unzip.exe

aiaread.exe

You can use the aiaread utility to read the contents of the Asset Information Area (AIA) of the Radio Frequency Identification (RFID) chip. The chip is battery-maintained and contains system-specific asset information. The aiaread utility runs in DOS only.

Syntax

The aiaread utility uses the following syntax:

```
aiaread group [field] [/f=file] [/a] [/s] [/x] [/p=prefix]
```

where:

- *group* is one of the following strings:
 - leasedata
 - networkconnection
 - ownerdata
 - preloadprofile
 - userassetdata
 - USERDEVICE
- *field* is the group-specific field. See Table 30 for more information. By default, all fields are read.
- /f=*file* specifies the file where the output information is written (the output file), and *file* is the fully qualified name of the output file. By default, the output information is written to stdout.
- /a specifies that the output information is appended to the output file. By default, the output file is overwritten.
- /s specifies that the output information is formatted as SET statements, for example, SET *field* = *value*. By default, the output information has a *field* = *value* format.
- /x specifies that the following fields are excluded:
 - Fields that have zero values
 - Fields that do not have values, for example, fields that contain null strings.
- /p specifies that the word **prefix** is prepended to the name of each field

The following table lists the fields for the AIA utilities, aiaread.exe and aiawrite.exe.

Table 30. Fields for the AIA utilities

Group	Fields
leasedata	<ul style="list-style-type: none">• lease_amount• lease_end_date• lease_start_date• lease_term• lessor

Table 30. Fields for the AIA utilities (continued)

Group	Fields
networkconnection	<ul style="list-style-type: none"> • gateway • ipaddressN • loginname • numics • systemname • subnetmaskN <p>where N is an integer greater or equal to one, and N is less than or equal to the value of the numics field. By default, it is set to one.</p>
ownerdata	<ul style="list-style-type: none"> • department • location • phone_number • ownername • ownerposition
preloadprofile	<ul style="list-style-type: none"> • image • imagedate
userassetdata	<ul style="list-style-type: none"> • asset_number • last_inventoried • purchase_date • warranty_duration • warranty_end
USERDEVICE	<p>These fields (maximum of five) are user-defined.</p> <p>Note: These fields are case-sensitive.</p>

Examples of using the aiaread utility

The following table contains examples of using the aiaread utility.

Table 31. Example of using the aiaread utility

Command	What it does
aiaread ownerdata	<p>Displays the values of all the ownerdata fields. For example, the following information might be displayed:</p> <pre>OWNERNAME=jim smith DEPARTMENT=219 LOCATION=Room 315 PHONE_NUMBER=3765 OWNERPOSITION=Manager</pre> <p>The information is written to the default output file, stdout.</p>

Table 31. Example of using the aiaread utility (continued)

Command	What it does
aiaread ownerdata /f c:\owner.bat	Creates a batch file, owner.bat, that contains the following information: SET OWNERNAME=jim smith SET DEPARTMENT=219 SET LOCATION=Room 315 SET PHONE_NUMBER=3765 SET OWNERPOSITION=Manager

aiawrite.exe

You can use the aiawrite utility to write data to the AIA of the Radio Frequency Identification (RFID) chip. The chip is battery-maintained and contains system-specific asset information. This program runs in DOS only.

Syntax

The aiawrite utility uses the following syntax:

```
aiawrite group {field=value} | /f=file
```

where:

- *group* is one of the following strings:
 - leasedata
 - networkconnection
 - ownerdata
 - preloadprofile
 - userassetdata
 - USERDEVICE
- *field=value* is a repeatable statement. Separate *field=value* pairs with a comma (,). Consider the following information:
 - *field* is the group-specific field. See Table 30 on page 311 for more information.
 - *value* is string or numeric value assigned to the field. If *value* is a string that contains a space, you must surround the string with quotation marks ("").
- */f=file* is an optional parameter that specifies that the information is input from a file (an input file), and *file* is the fully qualified name of the input file. The input file contains *field=value* pairs, and each pair must be listed on a separate line.

Note: If the AIA is uninitialized (the factory-default state), you can initialize it by issuing the following command:

```
aiawrite group
```

This accomplishes the following operations:

- Sets all fields that take strings to null values
- Set all fields that take dates or numbers to 00000000 (eight zeros).

Example of using the aiawrite utility

Issuing the following command writes South to the area field of the userdevice group:

```
aiawrite userdevice area=South
```

appsinst.exe

You can use the appsinst utility to install applications.

The appsinst command uses the following syntax:

```
appsinst Application
```

where *Application* is the fully-qualified name of the application you want to install.

bootini.com

You can use the bootini command to modify the boot.ini file to ensure that it is pointing to the first partition on the drive.

On a donor system, the boot partition might possibly be other than the first partition on the drive, and the boot.ini file points to that partition. If an image is captured from the donor system and deployed to a target system, the image is placed on the first partition. This might cause the target system to fail to boot, because the boot.ini file is pointing to the wrong partition.

The bootini command uses the following syntax:

```
bootini
```

cleanup.exe

You can use the cleanup utility to remove installation files.

The cleanup utility uses the following syntax:

```
cleanup
```

deditd.exe

You can use the deditd utility to replace, insert, or append strings within text files.

Syntax

The deditd utility uses the following syntax:

```
deditd Option [Frequency] TargetFile [String1] String2
```

where:

- *Option* is one of the following strings:
 - **/ia** specifies that *String2* is inserted after *String1*.
 - **/ib** specifies that *String2* is inserted before *String1*.
 - **/ila** specifies that *String2* is inserted on the line after *String1*.
 - **/ilb** specifies that *String2* is inserted on the line before *String1*.
 - **/r** specifies that *String1* is replaced with *String2*.
 - **/iae** specifies that *String2* is appended to a line at the end of the text file.
 - **/ias** specifies that *String2* is appended to a line at the start of the text file.
- *Frequency* is an optional parameter that specifies the number of time the deditd operation is performed. It is one of the following strings:
 - **/n=number**, where *number* is an integer
 - **/n0** specifies that the deditd operation should be repeated as many times as there are occurrences of *String1*.

If *Frequency* is not specified, by default, the *deditd* operation is performed once.

- *TargetFile* is the fully qualified name of the text file.
- *String1* is an optional parameter that specifies a string in the text file.
- *String2* specifies the string that is added to the text file.

Example of using the *deditd* utility

Issuing the following command replaces the first five occurrences of **loadhigh** with **load** in the file `c:\autoexec.bat`:

```
deditd /r /n5 c:\autoexec.bat loadhigh load
```

dsconfig.exe

You can use the *dsconfig* utility to configure RDM Deployment Server (D-Server) options on either the management server or remote deployment servers. This utility runs on Windows only. It automatically runs as part of the RDM Server or RDM Deployment Server (D-Server) installation process.

The *dsconfig* utility uses the following syntax:

```
dsconfig [/q]
```

where */q* causes the utility to run silently.

See “Configuring RDM Deployment Server (D-Server)” on page 45 for more information.

getvol.exe

You can use the *getvol* utility to create a file, `deleteme.txt`, in the temp directory. The `deleteme.txt` file contains a single record that is the volume label of the diskette that is in diskette drive A. If there is no diskette in the drive, the `deleteme.txt` file is not created. If the `deleteme.txt` file already exists, it is overwritten.

The *getvol* utility uses the following syntax:

```
getvol
```

lccustom.exe

You can use the *lccustom* utility to replace the DOS environment variables in a text file with specific values. This utility substitutes the values that are supplied by the RDM system and profile parameter pages; it also can substitute the values used in SET statements in a specified text file.

Syntax

The *lccustom* utility uses the following syntax:

```
lccustom File1 [File2] [VariableFile] [/v]
```

where:

- *File1* is the fully qualified name of the text file that you want to modify.
- *File2* is the fully qualified name of the modified text file. If this parameter is not issued, *File1* is overwritten.
- *VariableFile* is the fully qualified name of a file that sets the values for the DOS environment variables.
- */v* specifies that verbose logging is enabled.

Consider the following information:

- The DOS environment variables must be enclosed in percentage signs (%).
- A value that is set in *VariableFile* takes precedence over a value for the same variable that is set in the DOS command-line environment.
- Environment variables specified in *VariableFile* can have a null value. For example, if *VariableFile* contains the following statement, all instances of %UserName% would be removed entirely from the text file against which you ran the lccustom utility:
SET UserName =
- The lccustom utility does not use the current directory for work files, so it can be run from a read-only directory.
- The lccustom utility modifies one line at a time. The maximum line length is 8 KB. Lines that are longer than 8 KB might not be fully converted.

Example of using lccustom.exe

For example, consider files that contain the following statements:

unattend.txt

```
OrgName = "%COMPANY%"  
Computername = "%CNAME%"  
ProductID = %PRODUCTID%"  
JoinDomain = %DOMAIN%"  
NetworkAddress = %CADDRESS%"
```

rdm_xp.bat

```
SET COMPANY=IBM  
SET PRODUCTID=AG94949-87243  
SET DOMAIN=AMD0012
```

When you run the following command, the DOS environment variables in the unattend.txt file are replaced by the values specified in the rdm_xp.bat file:

```
lccustom c:\unattend.txt c:\answer2.txt c:\temp\rdm_xp.bat
```

The modified answer file is written to c:\answer2.txt, which contains the following text:

```
OrgName = IBM  
Computername = SYS10  
ProductID = AG94949-87243  
JoinDomain = AMD0012  
NetworkAddress = 006094A5BBBB
```

The values of environment variables CNAME and CADDRESS were present in the DOS command-line environment.

lccm.1 and bstrap.0

The lccm.1 and bstrap.0 utilities are bootstrap programs that are loaded and run on the target system. They communicate with RDM Deployment Server to download and run the system environment.

The following informational messages might be displayed on the target system monitor:

```
IBM Bootstrap Loader 2.1 (RDM v4.20)
(C) Copyright IBM Corp. 1999,2004 All Rights Reserved.
Copyright (C) 1997,1999 Intel Corporation.
Contacting RDM D-Server
Booting RDM System Environment "environment/dos71x" from RAM disk ...
Performing local boot ...
Loading second bootstrap
Receive Reboot command ...
Receive Shutdown command ...
Reboot in 3 seconds ...
```

The following error or warning messages might be displayed on the target system monitor.

```
RDB00T000I Bootstrap starts up successfully
RDB00T001W No D server IP found. Default to DHCP server.
RDB00T002W No udp ports defined. Default to
RDB00T003E !PXE structure is invalid
RDB00T004E PXENV+ structure is invalid
RDB00T005E Get cached packet failed
RDB00T006E Could not get pointer to original packet storage
RDB00T007E No response from server.
RDB00T008E Received invalid message type (Sig/Dtype/Opcode)
RDB00T009E Message XID not match
RDB00T010E Unknown work type received
RDB00T011E Unknown work option received
RDB00T012E Not support floppy image larger than 2880KB
RDB00T013E Not enough extended memory
RDB00T014E Could not download boot image
RDB00T015E ENV RAMdisk image corrupted
RDB00T016E Cannot update 40:13
RDB00T017E Cannot remove undi code
RDB00T018E Could not open UDP connection
RDB00T019E UDP write failed.
RDB00T020E PXE-E79: NBP is too big to fit in free base memory.
RDB00T021E Failed to send DHCP Release
RDB00T022E PXE-E81: Invalid DHCP option format.
RDB00T023E Transferring control to RAMdisk image failed.
RDB00T024E Restart to new bootstrap failed.
RDB00T025E Failed to read hard disk boot sector
```

The following messages are displayed by bstrap.0 only.

```
Invalid DHCP option format
Bad or missing discovery server list. #1
Bad or missing multicast discover address #1
Bad or missing discovery server list #2
Bad or missing multicast discover address #2
Bad or missing PXE menu and/or prompt information. #1
Bad or missing PXE menu and/or prompt information. #2
No MAN_INFO or OS_INFO options found
Press <Space> for Configuration Services or <Esc> or <Ctrl-C> to cancel
Press <Esc> to cancel network boot
No services selected
Network boot canceled by keystroke
Network Boot Menu
Key Description
Esc    Cancel network boot
Press key to select desired network boot (1", 2", Space", ESC)
Network boot canceled by keystroke
```

Icips.dos

The Icips file is the DOS IP stack that is used on target systems to which images are deployed. The following informational text might be displayed on the target system:

```
IBM DOS Multicast UDP/IP Stack v1.0 (RDM v4.12)
Copyright IBM Corp. 2003 All Rights Reserved.
```

The Icips file contains the following messages:

```
RDIPST001E The protocol manager could not be opened."
RDIPST002E The protocol manager would not accept a request."
RDIPST003E The protocol manager would not supply a configuration image."
RDIPST004E The protocol manager would not accept module registration."
RDIPST005E No MAC driver bindings were specified in PROTOCOL.INI"
RDIPST006E System Resources are not available to hold the current parameter
configuration in PROTOCOL.INI.
RDIPST007I Driver will not fit in UMB, loading low."
RDIPST008I Chaining multiple LAN drivers."
RDIPST010E Too many MAC driver binds specified in PROTOCOL.INI"
RDIPST011E An unrecognized keyword was found in PROTOCOL.INI:"
RDIPST012E A value is required for keyword in PROTOCOL.INI."
RDIPST013E The value specified for a keyword is not valid."
RDIPST014E The value specified for a keyword is not within the allowed range."
RDIPST015E A duplicate keyword was found in PROTOCOL.INI."
RDIPST016E Section for this Driver missing in PROTOCOL.INI."
RDIPST017E Error loading - Press F1 to continue."
```

Icreboot.exe

You can use the Icreboot utility to restart a system from within Windows.

The Icreboot utility uses the following syntax:

```
Icreboot
```

makepqs.com

The makepqs utility is used by the Get Donor task. This utility creates a Symantec ImageCenter script, **pqstore.com**, that is used to capture the boot partition on a target system.

The makepqs utility uses the following syntax:

```
makepqs
```

mergeini.exe

You can use the mergeini utility to merge two INI or INF files together.

The mergeini utility uses the following syntax:

```
mergeini file1 file2
```

where the contents of *file1* are merged with the contents of *file2* and the results are written to *file2*.

mtftp.exe

You can use the mtftp utility to transfer files between a target system and RDM Deployment Server (D-Server). On the target system, the files must be in the RDM/temp directory or a subdirectory of RDM/temp. On the management server or a remote deployment server, the files must be in the repository. If the path of the file is not specified, RDM uses the following default location:

On the target system	RDM/temp
On the management server or remote deployment server	Root of the repository

When an mtftp command is run, a mtftprc.bat is created. If the mtftp command runs successfully, the file is empty. If the mtftp command does not run successfully, the mtftprc file contains statements to set the rdstatus and rdraslevel environment variables to the applicable failure codes. Running the mtftprc.bat file transfers the mtftp error log to the RDM/temp directory on the management server.

The mtftp utility uses the following syntax:

```
mtftp Action DServerIP [Port] Source Destination [Options] -iTargetIP
```

where:

- *Action* is one of the following commands:
 - **get** specifies that the file is transferred from the management server to the target system.
 - **put** specifies that the file is transferred from the target system to the management server. This parameter is supported only for unicast transmissions.
- *DServerIP* is the IP address of the MTFTP service.
- *Port* is the port number on which the MTFTP service listens. By default, the port number is assumed to be either 1759 (multicast) or 69 (unicast).
- *Source* is the name of the file to be transferred. If you do not specify the file path, RDM searches for the file in the default location.

- *Destination* is the name of the file to which the contents of *SourceFile* are written. If you do not specify the file path, RDM searches for the file in the default location.
- *Options* is one or more of the following parameters:
 - **-aN** specifies that every *N*th packet is acknowledged, and *N* is a multiple of 2. If this parameter is not issued, by default every packet is acknowledged.
 - **-bBlockSize** specifies the size of the data packet used in get operations, and *BlockSize* is a multiple of 512. The maximum size is 8192. If this parameter is not specified, the default packet size of 2560 is used.
 - **-m** specifies that MTFTP is used.
 - **-lListen** specifies the client listen value, and *Listen* is the number of seconds. By default, the current client listen value is used.
 - **-tDelay** specifies client delay value, and *Delay* is the number of seconds. By default, the current client delay value is used.
 - **-v** specifies that the progress of the transfer operation is displayed in detail.
 - **-d** specifies that detailed information useful for program debugging is displayed.
 - **-r** specifies that the file is replicated from the master repository to the remote repository without transmission to the target system.
- **-iTargetIP** specifies NIC on the target system, and *TargetIP* is the IP address of the target system.

Note: The **-iTargetIP** parameter is not supported for the DOS version of mtftp.

poweroff.com

You can use this command to turn off the system.

The poweroff command uses the following syntax:

```
poweroff
```

prepdsk.exe

You can use this utility to generate batch files that partition and format the hard disks.

raidcfg.exe

The raidcfg utility is used by the Scan task. It scans a target system and determines whether an RDM-supported RAID controller is installed. If such a controller is present, raidcfg.exe calls the applicable utility to retrieve the configuration information for the RAID controller. It then logs the output to the raid.cfg file.

ramdisk2.exe

You can use this utility to determine the drive letter of the RAM drive. It sets an environment variable, RAMDSK, to the RAM drive letter followed by a colon, then outputs the value of RAMDSK to the screen.

Syntax

The ramdisk2 utility uses the following syntax:

```
ramdisk2
```

Example of using the ramdisk2 utility

Assume that the system on which the ramdisk2 command is run has two partitions on its hard drive, which are the C: and D: drives. When the ramdisk2 command is issued on that system, the drive letter returned to the screen will be E, indicating that E: is the RAM drive.

rave.exe

The rave utility is used only as part of Power Restore, when it converts the hidden partition from the old format to the new format. This program, the older Rapid Restore program from LCCM 3.0 and earlier versions, comes with RDM (unchanged from LCCM 3.0).

rdagent.exe

The rdagent utility is used on target systems to which images are deployed. It is used for communication with RDM Deployment Server. It typically is run by RDM files, such as autoexec.bat, to loop through and run the task commands. It also is used by batch files or command-list files to display messages in the task execution history.

Syntax

The rdagent utility uses the following syntax:

```
rdagent /r [/d] | /g=File | /l Message | /e | /fs
```

where

- /r specifies that rdagent requests work from RDM Server.
- /d is an optional parameter that specifies that detailed information that might be helpful for program debugging is displayed.
- /g=File specifies that rdagent requests work from RDM Server. The work is saved to the specified file.
- File is the fully qualified name of the file.
- /l Message specifies that rdagent sends the specified message to RDM Server; it then is written to the IBM Director task log. (To view the message, set the detail level to high.)
- Message is a string. If the string includes spaces, enclose the string in quotation marks ("").
- /e sets the local default environment variables.
- /fs forces the target system to shut down.

Messages

The following informational messages might be displayed on the system monitor.

```
RDAGENT Contacting server ... (N)
RDAGENT Notifying server ... (N)
RDAGENT Received shutdown command.
RDAGENT Received reboot command.
RDAGENT Received command file.
RDAGENT Received set env command.
RDAGENT Received ack
RDAGENT Received nack
```

where *N* is an integer that specifies the number of times rdagent has attempted to contact or notify RDM Server.

The following error or warning messages might be displayed on the system monitor.

```
RDAGEN001E Error parsing arguments
RDAGEN002E File not found: %s
RDAGEN003E Sending invalid opcode (%04xh)
RDAGEN004E Failed to open file to write: %s
RDAGEN005E PXE interrupt 1A failed or bad PXE struct
RDAGEN006E Failed to get communication info
RDAGEN007E Failed to get DHCP packet\n
RDAGEN008E Failed to bind with IP stack, RC=%04xh
RDAGEN009E Error setting filter, RC: %04xh
RDAGEN010E Transmit Error, RC=%04xh
RDAGEN011E No buffers available
RDAGEN012E Failed to unbind from IP stack, RC=%04xh
RDAGEN013E Receive invalid message type
RDAGEN014E Receive invalid work type
RDAGEN015W Receive invalid work option
RDAGEN016E No response from server.
RDAGEN017E SETENV data has wrong format
RDAGEN020E Socket open error
RDAGEN021E Socket bind error
RDAGEN022E Socket connect error
RDAGEN023E Socket select error
RDAGEN024E Socket send error
RDAGEN025E Socket recv error
RDAGEN026E Socket setsockopt error
```

redirect.exe

The redirect utility redirects stderr output to the same destination as the stdout output. As stdout output is directed to a specified file, the redirect utility also sends the stderr output to that file.

Syntax

The redirect utility uses the following syntax:

```
redirect executable >destfile
```

where *executable* is a DOS command or executable file name (whose stderr output is being redirected), and *destfile* is the specified destination file for both the stderr and stdout output.

Example of using the redirect utility

Issuing the following command redirects all stderr and stdout output to the file raidcstm.log.

```
redirect raidcustom.bat >raidcstm.log
```

scan.exe

The scan utility collects hardware information about the system to which images are being deployed. It runs in DOS.

The scan utility generates the following text output:

```
System Scan v1.0 (RDM v4.20)
```

The scan utility generates the following messages.

```
RDSCAN000I Scan succeeded.
RDSCAN001E Failed to set locale.
RDSCAN002E Memory allocation failed
RDSCAN003E Failed to open file for output
RDSCAN004E Non-IBM system detected
RDSCAN005I Default scan running
RDSCAN006E Invalid input data file format
RDSCAN007E Failed to retrieve system info
RDSCAN008E Failed to retrieve Bios info
RDSCAN009E Failed to retrieve ECU info
RDSCAN010E Failed to retrieve processor info
RDSCAN011E Failed to retrieve memory info
RDSCAN012E Failed to retrieve hard disk info
RDSCAN013E Failed to retrieve PCI info
RDSCAN014E Failed to retrieve nic info
RDSCAN015E Failed to retrieve Raid info
RDSCAN020E Failed to update AID (input might be too large).
RDSCAN021E General scan error
RDSCAN022I Detected same BIOS version
RDSCAN023I Detected different BIOS version
```

scrub3.exe

The scrub3 utility is used by the Secure Data Disposal task. It runs in DOS and permanently erases all of the data on one or more drives.

Attention: Because this utility erases data from disks, use caution when running scrub3.exe, whether from a bootable diskette or from an RDM task. You cannot recover data if you make a mistake.

You can use the scrub3.exe utility to erase data from the following types of drives:

- A Fibre Channel drive that is the boot drive
- Physical drives that are not connected to a RAID controller
- RAID logical drives

Attention: The scrub3 utility is only going to erase data from the portion of the RAID drives that is part of the logical drive.

You cannot use the scrub3 utility to erase data from the following drives:

- Physical drives attached to a RAID controller that are not configured as logical drives
- A Fibre Channel drive that is not the boot drive

Syntax

The scrub3 utility uses the following syntax:

```
scrub3 [/?] | [[/q=no] [/s=no] {/d=drive|/d=all} {/L=level|/w=writes} [b/no]]
```

The following table contains information about scrub3 parameters.

Table 32. scrub3 parameters

Parameter	What it does
/q=no	Displays the maximum number of messages. It is intended for "in the field" debugging only. Do not use this parameter unless it is necessary. If you use this parameter, use it in the leftmost position in the command.
/s=no	Specifies that the scrub signature is not to be written to the disks that are being erased.
/b=no	Causes the program not to check whether its boot drive is C: or higher. It overrides the default, which is not to allow scrub3.exe to run when the boot drive is any drive other than A: or B:. It is useful when you want to run from a bootable CD or a bootable service partition.
/d= <i>drive</i> where <i>drive</i> is the drive number of the drive that is to be erased. /d=all	Erases only the installed drive (<i>drive</i>) on the system or erases all drives. The /d parameter is required and has no default value.

Table 32. scrub3 parameters (continued)

Parameter	What it does
<p><code>/L=level</code></p> <p>where <i>level</i> is a number (1, 2, 3, or 4) that specifies the security level of the disposal operation.</p>	<p>/L=1 Limited security. The first 63 sectors on the drive (including the master boot record), the last two sectors on the drive, and the first 100 sectors on each partition are overwritten with a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with this pattern). This operation is very fast. The drive will not be usable through standard I/O methods. However, this operation is not secure: it leaves most of the partitions on the drive unchanged.</p> <p>/L=2 Medium security. All sectors on the drive are overwritten one time with a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with this pattern). This operation is relatively slow and involves many write operations. Actual speed depends on the size and speed of the target drives.</p> <p>/L=3 DOD-compliant security. All sectors on the drive are overwritten four times with the following patterns (in this order): a random pattern, the bit-wise complement of that random pattern, a different random pattern, and a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with these patterns). This operation is quite slow, and it takes four times as long as an /l=2 operation.</p> <p>/L=4 DOD-compliant security. All sectors on the drive are overwritten seven times with the following patterns (in this order): a random pattern, the bit-wise complement of that random pattern (three times, each with a different random pattern), and a 0x0000 pattern (that is, each pair of bytes on the sector is overwritten with these patterns). This operation is quite slow, and it takes seven times as long as an /l=2 operation.</p> <p>You are required to provide a value for either the /l parameter or the /w parameter. The /l parameter has no default value.</p>
<p><code>/w=writes</code></p> <p>where <i>writes</i> is an integer greater than 1 and less than 100. You also can use /w=done to write once with a random pattern, before a final write with a 0x0000 pattern. /w=done</p>	<p>Specifies the number of times (<i>writes</i>) that each sector is overwritten or writes once (done) with a random pattern before a final write with a 0x0000 pattern. Either the /w parameter or the /l parameter is required. The /w parameter has no default value.</p>
<p><code>/?</code></p>	<p>Displays a description of the syntax that is used for the scrub3 utility. If you run scrub3.exe with no parameters, the same output is displayed. The /? parameter causes all other parameters to be ignored.</p>

Examples of using the scrub3 utility

The following table contains examples of using the scrub3 utility.

Table 33. Examples of using the scrub3 utility

Example	What it does
scrub3 /L=1 /D=ALL	Overwrites the master boot record, the first 100 sectors of each partition, and the last two sectors on each drive in the system. The pattern used for the write operation is 0x0000. None of the data on any of the drives can be accessed with standard methods. However, most of the data on these drives can be read successfully by a program that uses low-level BIOS read functions.
scrub3 /q=no /d=2 /L=2	Overwrites each sector on drive 2 with a pattern of 0x0000. None of the other drives in the system is changed. Debugging messages are displayed in the command window (that is, on stdout), along with all the standard messages that this program produces.
scrub3 /d=all /L=3	Overwrites each byte on each sector of each drive in the system four times. None of the data on any of the drives is recoverable. This is not the normal way to run scrub3.exe. It takes an extremely long time to run. However, overwriting four times provides good protection from attempts to recover data with specialized sensitive electronic equipment.
scrub3 /d=all /L=2	<p>Uses an 0x00 pattern to overwrite each byte on each sector of each drive in the system. None of the data on any of the drives is recoverable. This example is the typical way to run scrub3.exe.</p> <p>The drives are modified according to the parameters that the user specified on the command line. By default (you can override with the /s=no command-line parameter), a small partition is created on each scrubbed disk. It contains a brief summary of the scrub3.exe processing that was done. If you boot the system to this partition, the summary is displayed on the system's monitor. The signature can include:</p> <ul style="list-style-type: none"> • The utility and version used • Command executed • Date and time of execution • Return code(s)

The following figures show an example of scrub3 output and a scrub3 signature.

```

IBM Secure Data Disposal Utility v2.0 <RDM v4.20>
Licensed Materials - Property of IBM
<C> Copyright IBM Corp. 1999, 2004 All Rights Reserved.

RDMCM003I Execution started at: Friday, July 02, 2004 14:56:35

Number of <physical or RAID logical> drives found: 2

Processing drive 1
Overwriting each sector with repeating hexadecimal pattern: 0000
0%                               50%                               100%
Friday, July 02, 2004 15:10:01 Elapsed time <minutes>: 13.4

Processing drive 2
Overwriting each sector with repeating hexadecimal pattern: 0000
0%                               50%                               100%
Friday, July 02, 2004 15:23:55 Elapsed time <minutes>: 27.3

Writing signature on scrubbed drives.

Processing drive 1
Processing drive 2

IBM Secure Data Disposal Utility
Return code ..... 0
Execution Complete.

```

Figure 197. Example of scrub3.exe output

```

IBM Secure Data Disposal Utility 2.0
IBM Remote Deployment Manager 4.20
Date and time of execution ... 9/20/2004 00:24:45
Command executed ..... A:\SCRUB3.EXE /l=1 /d=all
Return code ..... 0

```

Figure 198. scrub3 signature

scrub3 messages

The following table lists messages for the scrub3 utility.

Table 34.

Code	Message
RDMDD001E	Buffer allocation of size " << iSize << " failed.
RDMDD002E	Failure overwriting partition.
RDMDD004E	Null pointer passed to internal function.
RDMDD005E	Failure in Interrupt 13 function call.
RDMDD006E	Failure reading sector " << ulSec. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMDD007E	Start sector plus number of sectors is too large.
RDMDD008W	Failure initializing progress indicator.
RDMDD009E	Unable to allocate buffer for disk write.
RDMDD010E	Cannot write sector at LBA " << szSec << "; error code is " (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMDD011W	Failure displaying progress indicator.
RDMDD012E	This program must be run after booting from an A: or B: drive.
RDMDD013I	Boot drive number (1=a:, 2=b:, ...):

Table 34. (continued)

Code	Message
RDMDD014E	Error from BIOS call.
RDMDD017I	Command-line parameter.
RDMDD018E	Invalid command-line parameter. (Correct the error and run the program again.)
RDMDD019I	Hard drive to be erased.
RDMDD020I	Total sectors on hard drive:
RDMDD021E	Required parameter missing: (Correct the error and run the program again.)
RDMDD039E	Failure creating MBR object.
RDMDD040E	Failure creating SCRUBB_DISK object.
RDMDD041E	Bad return code from pCurrentDisk->IsValid
RDMDD042E	Failure creating array of SCRUBB_DISK objects.
RDMDD043E	Error in level-1 disk writing. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMDD044E	Failure reading hard drive; terminating erase operation. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMDD045E	Target drive is not a local, physical drive.
RDMCM901E	Unable to write to disk drive. (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMCM902E	The BIOS call to get physical drive parameters was not successful.
RDMCM903E	DOS error number: (Look up the DOS error in the DOS documentation and debug the problem.)
RDMCM904E	Number of read errors: (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMCM905E	Number of write errors: (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMCM906E	Unable to write to disk drive. Error code: (This might indicate a bad drive. If it does not respond to standard drive-failure recovery techniques, destroy the drive.)
RDMCM999E	Internal error in function " << szFunc << "; file name is " << szFile << "; line number is " << szLine << ".
RDMCM001I	Null return code from setlocale function call.
RDMCM002I	Locale used by this program:
RDMCM003I	Execution started at:
RDMCM004I	Execution completed at:
RDMCM005W	Time functions not working on this system.
RDMCM017I	Command-line parameter:
RDMCM023E	Error in command-line parameter: (Correct the error and run the program again.)
RDMCM011E	Return code from int86x function:

sleep.exe

You can use the sleep utility to halt processing for a specified number of seconds.

The sleep utility uses the following syntax:

```
sleep seconds
```

where *seconds* is the number of seconds that processing is to be halted.

treboot.exe

You can use this utility to restart the system.

The treboot utility uses the following syntax:

```
treboot
```

tshudwn.exe

You can use the tshudwn utility to shut down the system.

The tshudwn utility uses the following syntax:

```
tshudwn
```

unzip.exe

You can use this utility to unzip a ZIP file.

The unzip utility uses the following syntax:

```
unzip file
```

where *file* is the name of the file that you want to unzip. To see a full list of all unzip parameters, type the following command from a command prompt: `unzip -?`

Symantec utilities

RDM uses the following Symantec utilities:

- pqaccd.exe
- pqidplyz.exe

For information about the Symantec utilities, go to <http://www.symantec.com>.

pqaccd.exe

You can use the pqaccd utility to perform basic file operations (such as dir and copy) on drives and partitions that are not normally visible to DOS. RDM uses this utility to copy a modified setup.inf file to a folder on a system that has received a cloned Windows image. That file directs the mini-installation process that customizes the Windows installation for a user.

pqidplyz.exe

You can use the pqidplyz utility to create image files or to back up an entire partition. This utility is used by the Windows Clone Install task and the Power Restore task.

Chapter 26. Solving RDM problems

This table lists some of the RDM problem symptoms and suggested actions. Additional solutions to RDM problems are documented in the RDM White Papers on the IBM Web site. For information about how to access RDM resources on the IBM Web site, see “Getting help and information from the World Wide Web” on page 368.

Table 35. Solving RDM problems

Symptom	Suggested Action
Qualification error stating the data is not available	<p>If an error in qualification reports that data is not available in a Native Managed Object (NMO), the database might not be populated. This can occur in the following situations:</p> <ol style="list-style-type: none"> 1. Perform an IBM Director Discovery which will create new NMOs. 2. Drag one of the NMOs to an RDM task and click Run systems. <p>Because the IBM Director database update is still in progress (in the background), the error occurs. Typically, wait a short time (30 to 60 seconds) before using a new NMO for an RDM task.</p>
Disk reading or writing errors	<p>Sometimes hard-disk or RAID-adapter manufacturers provide firmware updates to correct reported problems. You should check the Web sites of your system, RAID adapter, and disk manufacturers to see if an update is available.</p> <p>In some cases, you can create an RDM Custom task to deploy the firmware update, depending on the particular update program capabilities and memory-usage constraints.</p>
You do not know what level of RDM that you are running	<p>In IBM Director Console, click Help → Product Information. The IBM Director Product Information window opens. Scroll down to IBM Remote Deployment Manager. The product version is listed in the Version column.</p>
Target systems do not wake up	<p>RDM powers on a target system using one of the following methods:</p> <ul style="list-style-type: none"> • Sending a packet to the MAC address of the target system, using a subnet-directed broadcast. • Using the IBM Director Management Processor Assistant task to communicate with a service processor or the BladeCenter Assistant task to communicate with a management module. The target system hardware must support this functionality. <p>If this problem occurs on all target systems, configure the network to forward subnet-directed broadcast packets on all routers between the RDM D-Server to the target system.</p> <p>If this problem occurs on one target system only, the system might have been improperly shutdown. Disconnect the power cables from the system and reconnect them.</p>
<p>If a target system is connected to a port that has the filtering and drop all options turned on, the following errors might occur:</p> <p>RDBOOT019E UDP write Failed RDBOOT007E No Response from server</p>	<p>The filtering and drop all options introduce delays into the Address Resolution Protocol (ARP) process on a switch.</p> <p>If these errors occur, do not use any options that introduce delays into the ARP process.</p>

Table 35. Solving RDM problems (continued)

Symptom	Suggested Action
Cannot change RAID configuration.	<p>If you try to change your RAID configuration with any RAID Clone or RAID Custom task and receive the message, "You cannot change the configuration. A rebuild, logical drive migration, RAID compression/decompression or RAID-5EE compaction/expansion is in progress.", the following workarounds are available:</p> <ol style="list-style-type: none"> 1. If you have physical access to the system, type Ctrl+I to restore the factory-default settings. 2. If you have physical access to the system, pull another one of the drives in the array being compressed, rebuilt, or migrated. 3. Use ipssendl to set one of the drives in the array as dead, either by running ipssendl at the system or creating an RDM custom task and running it remotely. 4. Wait until the compression, migration, or rebuild has completed, and then rerun the Express task.
(Linux only) When creating a system firmware image, the USB floppy drive is not mounted.	<p>Make sure the mtools package is installed on the system that you are using. Also, make sure that the mdir command can list the contents of the drive. For information on installing and configuring mtools, see the documentation that came with your Linux distribution.</p>
Installation of IBM Boot Manager was interrupted, and the system cannot restart.	<p>If the installation of IBM Boot Manager on a local system is interrupted, it might leave the computer in a non-startable state. Complete the following steps to repair the computer:</p> <ol style="list-style-type: none"> 1. Start the PC with a DOS boot diskette. 2. Replace the DOS boot diskette with the IBM Boot Manager Installation diskette. 3. From the DOS prompt, run the following commands: HIDEPART A U HIDEPART L H 4. Remove the IBM Boot Manager Installation diskette and restart the PC.
Installation of Power Restore was interrupted, and the system cannot restart.	<p>If the installation of Power Restore on a local system is interrupted, it might leave the computer in a non-startable state. Follow these steps to repair the computer:</p> <ol style="list-style-type: none"> 1. Start the PC with a DOS boot diskette. 2. Replace the DOS boot diskette with the Power Restore Installation diskette. 3. From the DOS prompt, run the following commands: HIDEPART A U HIDEPART L H 4. Remove the Power Restore Installation diskette and restart the PC.
Error exporting systems or profiles.	<p>If you export a systems or profiles database, and use spaces in the file name or path name, you will get an error message. RDM does not allow the use of spaces. Try again without spaces.</p>
<p>If you edit the following files in a Linux text editor, the new line characters are not present.</p> <p>Note: If you open a file in Notepad on the Windows operating system, all of the text in a file is displayed on one line.</p> <ul style="list-style-type: none"> • Files that are zipped into a DOS image using mkimages.bat • Files that are transferred to the target system using mftfp in DOS mode 	<p>After editing a file using a Linux text editor, use the unix2dos program to add the new line characters to the file.</p>

Table 35. Solving RDM problems (continued)

Symptom	Suggested Action
<p>Invalid product ID error is displayed on the target system when you run a Windows Native Install task against it.</p>	<p>This error might occur when you have changed the product key that is saved to the Windows Native Install task but have not cleared the STC information for the target system, which contains an value for the product key that is not valid.</p> <p>When a task is initially configured for a specific target system, the STC values are permanently saved to RDM and are used each time that task is run against that system. RDM continues to use the saved STC values until you change them. You cannot change these by modifying the default values that are used by the task or the template. To change the values for the target system you must either clear the values by using the Unconfigure System option or edit them in the STC window.</p> <p>Complete the following steps to unconfigure the target system for the task and run the task:</p> <ol style="list-style-type: none"> 1. Drag the Windows Native Install task onto the target system, and then click Configure systems. 2. In the STC window, right-click on the target system, and then click Unconfigure System. The STC data for the selected task is deleted from the RDM database. 3. Close the STC window. 4. Drag the Windows Native Install task onto the target system, and then click Run.
<p>The RDM task is no longer displayed in the IBM Director Console Tasks pane.</p>	<p>IBM Director Server was reset without reinstalling RDM. See “Resetting IBM Director Server” on page 334 for more information.</p>

Resetting IBM Director Server

Attention: The following procedure removes all IBM Director and RDM data. The procedure cannot be undone.

The `twgreset` command resets the following features of IBM Director Server:

- Persistent storage
- The database tables

Use this command only if the persistent data or the database tables have been corrupted. Complete the following steps to reset IBM Director Server:

1. On the management server, type the following commands:

```
net stop twgipc
twgreset
```

2. Uninstall RDM 4.20.

3. Install RDM 4.20.

4. Start IBM Director Server.

5. On each remote deployment server, type the following commands:

```
net stop dserver
net start dserver
```

6. On each remote deployment server, enable RDM Deployment Server with the user interface.

Part 5. Appendixes

Appendix A. Additional cloning procedures using Sysprep

This appendix provides information for using the Sysprep utilities to prepare a donor system before you run the Get Donor task. Before performing any of the steps in this chapter, make sure you also read the *Microsoft® Windows Corporate Deployment Tools User's Guide* (Deploy.chm).

Running Sysprep on a donor system accomplishes the following tasks:

- Generates unique security identifiers (SIDs) when the donor image is distributed to a target system.
- Runs the Windows Mini-Setup wizard the first time that the target system is started. The Mini-Setup wizard is a subset of the Windows Setup process; it provides prompts for user-specific information, configures operating-system settings, and detects new hardware. You can automate the Mini-Setup wizard by including an answer file (sysprep.inf) in the directory where the Sysprep utilities are located. By default, the directory is *d*:\sysprep, where *d* is the drive letter of the hard disk drive.

RDM-supported options in Sysprep version 2.0

RDM supports the following features in Sysprep version 2.0 or later:

Mass storage support

The `-bmsd` parameter and [BuildMassStorageSection] section in the `sysprep.inf` file instructs Sysprep to build a list of device drivers for mass storage controllers. This eliminates the need to manually edit the `sysprep.inf` file as outlined in the Sysprep version 1.1 documentation.

Note: The version of Sysprep that comes with Windows XP does not support the `-bmsd` parameter. You can, however, run the version of Sysprep that comes with Windows Server 2003 on a Windows XP installation, and use this new parameter.

Factory mode

The `-factory` parameter prepares a donor system that will start in a network-enabled state *before* the Windows Mini-Setup wizard runs. This enables you to update device drivers, run Plug and Play enumeration, install applications, or make configuration changes before the target system is delivered to the end user. The `winbom.ini` file is the answer file for the factory-mode process.

Reseal support

The `-reseal` parameter clears the event viewer logs and prepares the target system for delivery to the end user. You must use the `-reseal` parameter after you perform tasks in factory mode.

Clean The `-clean` parameter removes unused mass storage device drivers and phantom Plug and Play device drivers from the Windows registry and device manager. This parameter is usually called from the `cmdlines.txt` (`pqcmdln.txt` in RDM) file.

Sysprep version 2.0 is supported on Windows XP and Windows Server 2003 only. If the donor system is running Windows 2000, you must use Sysprep version 1.x.

Notes:

1. Sysprep version 1.x does not support Factory mode.

2. Sysprep version 1.x does support Mass storage support, but does not support the `-bmsd` parameter or the `[BuildMassStorageSection]` section in the `sysprep.inf` file.

Using Sysprep version 2.0 in factory mode

This section describes how to use factory mode in Sysprep version 2.0 with RDM version 4.11 Update 3 or later. You can use Sysprep in factory mode to add device drivers or applications, run custom commands, and customize INI files for an image before running the Sysprep Mini-Setup wizard.

Complete the following steps to create a Windows Clone Install task that uses a donor image created using Sysprep factory mode.

1. Create a donor system:
 - a. Install the operating system and applications on the donor system.
 - b. Create a directory on the donor system to contain the Sysprep files from the `deploy.cab` file on the Microsoft Windows CD.
 - c. (Optional) Copy Plug and Play driver files to the donor system. See “Adding Plug and Play drivers to a Windows Clone Install task” on page 339 for more information.
 - d. (Optional) Copy application files to the donor system. See “Adding applications to a Windows Clone Install task” on page 341 for more information.
 - e. (Optional) Configure and copy base configuration files to the donor system:
 - 1) Copy `oobeinfo.ini` to the `%windir%\system32\oobe` directory.
 - 2) Copy `oeminfo.ini` to the `%windir%\system32` directory.
 - 3) Copy `ocm.txt` to the location where the `sysprep.inf [GuiRunOnce]` command will call `sysocmgr` (typically `c:\ocm.txt`).
 - f. Run Sysprep in Factory mode on the donor system to prepare the system to start (boot) in a factory session. During a factory session, you can add device drivers and applications before using the Mini-Setup wizard. When the operation is completed, Sysprep shuts down the donor system.
2. Run a Get Donor task on the donor system to create an image of the system boot partition. Make sure to select Sysprep type **Factory** in the Get Donor System Task Configuration window.
3. Create a Windows Clone Install task that uses the new image you just created; then, complete the following optional steps as required:
 - a. (Optional) Create custom task parameters to use with the `winbom.ini` file:
 - 1) Right-click the new Windows Clone Install task and click **Edit task**. The task notebook opens.
 - 2) Click the **Advanced** tab. The Advanced page is displayed.
 - 3) Select the **User Parameter** option in the Category pane.
 - 4) Click **Select** in the right pane. You can use an existing parameter or create a new task parameter.
 - 5) Select the **Show in STC** check box; then, click **OK** to add the task parameter to the task.

- b. (Optional) Go to the task folder of the new Windows Clone Install task that you created and edit the winbom.ini file to add device driver and application deployment information:
 - Map Plug and Play driver paths to the winbom.ini answer file
 - Map application configuration paths and commands to winbom.ini
 - Configure other configuration files, as required, using winbom.ini and the Sysprep 2.0 documentation
 - Add RDM parameters to the winbom.ini file, as applicable. For example, for the Autologon task parameter you might add the following value:
 AutoLogon=%AutoLogon%
4. Configure a set of systems for the new Windows Clone Install task. Provide applicable values in the System Task Configuration window for system-unique parameters:
 - a. Drag the systems to the task; then, select the task.
 - b. Make sure that all user parameters are properly configured.
5. Run the Windows Clone Install task on the set of systems.

After the Windows Clone Install task deploys the PQI image to the target system, the system starts in factory mode and performs the installation and configuration tasks that are specified in the winbom.ini file.

Attention: You can interfere with the expected operation of an unattended Windows Clone Install task in factory mode if the winbom.ini file is not configured correctly. Verify the following settings:

- Autologon must be correct
- ResealMode must be correct (for example, ResealMode=Mini)
- Reseal option must be correct (for example, Reseal=Reboot)

For information about configuring the winbom.ini file, see the *Microsoft Windows Corporate Deployment Tools User's Guide (Deploy.chm)*.

Adding Plug and Play drivers to a Windows Clone Install task

Complete the following steps to add Plug and Play drivers to a Windows Clone Install task.

1. Create a directory for each Plug and Play driver on the donor system.

Note: By default, the root directory for driver directories is *d:\drv*, where *d* is the drive letter of the hard disk drive. Each driver is put in its own directory derived from that root.

2. Copy all required files (for example, DLL, CAT, INF, SYS, and INI files) for each Plug and Play driver to the applicable directory.

Note: If the device driver installation uses EXE files, you must add the applicable information to the [GuiRunOnce] section of the sysprep.inf file and the [OEMRunOnce] section of the winbom.ini file.

3. Run Sysprep in either reseal or factory mode.

Notes:

- a. For reseal mode, use the -pnp option on the command line. If you are running Sysprep version 2.0, you can select the -pnp option from the Sysprep graphical user interface.
- b. For factory mode, select **Factory Mode** and the **PnP** check box.

4. Run the built-in Get Donor task provided by RDM to capture the donor image. If you ran Sysprep in reseal mode, go to step 5. If you ran Sysprep in factory mode, go to step 6.
5. Configure the answer file for reseal mode and deploy the image:
 - a. Create a Windows Clone Install task, using the image created in step 4.
 - b. Right-click the new Windows Clone Install task; then, click **Edit Task**. The task notebook opens.
 - c. Click the **Advanced** tab. The Advanced page is displayed.
 - d. Select **Task Folder** to view the location of the task folder in the main pane.
 - e. Click **OK**.
 - f. Navigate to the task folder for the new task, and open the answer2.txt file in an ASCII text editor.
 - g. Uncomment or add the following line in the Unattended section of the answer2.txt file:


```
OemPnPDriversPath
```

Then, add the path to each Plug and Play driver on the donor system to this line. For example:

```
OemPnPDriversPath=drv\net;drv\video
```

Note: Windows automatically adds %Systemroot% to each path.
 - h. Save and close the answer2.txt file.
 - i. Run the Windows Clone Install task on the client systems. The Plug and Play drivers are installed by the Windows Mini-Setup wizard.
6. Configure the answer file for factory mode and deploy the image:
 - a. Create a Windows Clone Install task using the image created in step 4.
 - b. Right-click the new Windows Clone Install task; then, click **Edit Task**. The task notebook opens.
 - c. Select the **Advanced** tab. The Advanced page is displayed.
 - d. Select **Task Folder** to view the location of the task folder in the main pane.
 - e. Click **OK**.
 - f. Navigate to the task folder for the new task and open the winbom.ini file in an ASCII text editor.
 - g. Uncomment or add the following line in the PnPDriverUpdate section of the winbom.ini file:


```
DevicePath
```

Then, add the path to each Plug and Play driver on the donor system to this line. For example:

```
DevicePath=net; video
```

Note: The path indicated by the TargetRoot parameter is added automatically to each path. Make sure that the combination of TargetRoot and DevicePath settings map to the correct directory on the donor image (for example, TargetRoot=c:\drv).
 - h. Save and close the winbom.ini file.
 - i. Run the Windows Clone Install task on the client systems. The Plug and Play drivers are installed during the Windows factory session.

Adding applications to a Windows Clone Install task

This section describes how to perform unattended installations of applications during a Windows Clone Install task. You can add applications to a Windows Clone Install task by copying the applicable installation files to a donor system before it is cloned; then, you can reference files and installation scripts from the command prompt during the post-deployment phase of the Windows Clone Install task.

Notes:

1. If you use the [GuiRunOnce] section of sysprep.inf (answer2.txt in RDM), the application installation might not complete because RdAgent might restart (reboot) the system before the application installation completes. Using Sysprep in factory mode and adding information to the [OEMRunOnce] section of winbom.ini prevents this from happening.

For Windows 2000 operating systems, or when using Sysprep in reseal mode, you must add commands to the beginning of the PQAgent.bat file that is called by the Windows Startup process before RdAgent runs in order to install applications.

You can also add post-install commands to the WCI task command list. In the Command list page of the Advanced tab, add post-install commands after `BOOTTYPE !LOADDOS /environment/dos71c` and before `!!REBOOT`.

2. This section uses IBM Director Agent as a specific example of an application added to a Windows Clone Install task.

Complete the following steps to add an application to a Windows Clone Install task.

1. Copy all application files to the donor system.

For IBM® Director Agent, create the following directory on the donor system:

```
c:\dirAgent\windows
```

Then, copy the following files from the *IBM Director CD* to the new directory:

```
director\agent\windows\i386\*.*
```

2. Remove any known registry entries for the application on the donor system.

Note: If you previously uninstalled IBM Director Agent from the donor system, that system contains a registry key that you must remove.

For IBM Director Agent, you must delete the TWGMachineID key from the following section in the Windows registry:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\ComputerName\ComputerName]
```

3. Prepare the donor system using Sysprep in factory mode; then, shut down the donor system.
4. Run the Get Donor task on the donor system. Make sure that you select factory mode as the Sysprep type.
5. Create a Windows Clone Install task that uses the image that you created in step 4.
6. Create any required batch or support files necessary for the application installation; then, add the following information to the Windows Clone Installation task folder:
 - a. Right-click the Windows Clone Install task that you created in step 5; then, click **Edit Task**. The task notebook opens.
 - b. Click the **Advanced** tab. The Advanced page is displayed.
 - c. Select **Task Folder** to view the location of the task folder in the main pane.
 - d. Click **OK**.

- e. Navigate to the task folder; then, open the winbom.ini file in an ASCII text editor.
- f. Add the applicable information to the winbom.ini file for the application that you are adding to the Windows Clone Install task.

For IBM Director Agent, the following information must be added to the winbom.ini file:

```
[OEMRunOnce]
"Installing Director Agent","DirectorAgent.CmdLine",APP
```

```
[DirectorAgent.CmdLine]
CmdLine="UNATTENDED rsp="c:\dirAgent\windows\diragent.rsp" waitforme"
SetupFile="ibmsetup.exe"
SourcePath="c:\dirAgent\windows"
```

- g. Save and close the winbom.ini file.
7. Run the Windows Clone Install task on the target systems.

Supporting multiple mass storage devices

This section describes how to configure sysprep.inf to include support for more than one mass storage device. This procedure enables RDM to deploy a common image to client systems that have different types of mass storage devices.

The procedures in this section are written as if all mass storage devices used in the deployment process have been connected to the donor system at some time, or Microsoft CAB files containing the device drivers are available. If a mass storage controller uses a different device driver than what is provided by Windows, you must follow the Sysprep documentation in order to include support for the controller.

Preparing the donor system

Install the device driver for each mass storage device you must support on the donor system. This might require that you temporarily connect the mass storage device to the donor system. If more than one mass storage device uses the same device driver, you only have to connect one device to the donor system.

For information about configuring a sysprep.inf file, see the *Microsoft Windows Corporate Deployment Tools User's Guide* (Deploy.chm).

After preparing the donor system, go to the following applicable sections:

- Adding SysPrepMassStorage for Windows 2000 on page 342
- Adding SysPrepMassStorage for Windows XP and Windows Server 2003 on page 343
- Adding SysPrepMassStorage with the -bmsd parameter on page 344

Adding SysPrepMassStorage for Windows 2000

Complete the following steps to add multiple mass storage device support for Windows 2000.

Note: This procedure requires Sysprep version 1.1, which you can obtain from the Microsoft Web site.

1. Extract the Sysprep files to any directory on the donor system (for example, c:\sysprep_update).

2. Change to the tools directory and run the pnpids.exe program on the folder that contains the INF files for your mass storage devices. For example:

```
pnpids.exe c:\winnt\inf\scsi.inf >scsi.txt
```

Note: If you do not specify an INF file, all INF files in the directory are processed. For example:

```
pnpids.exe c:\myInfs\ >myInfs.txt
```

Use the output file to merge with the sysprep.inf file later in this procedure. Some common INF files that are used to create hardware IDs are: Machine.inf, Scsi.inf, Pnp SCSI.inf, and Mshdc.inf.

3. Create a new text file named sysprep.inf.
4. Open this new sysprep.inf file and create a [SysPrepMassStorage] section.
5. Copy the output from the pnpids.exe program output file to the sysprep.inf file under the [SysPrepMassStorage] section. For example:

```
;Install IBM ServeRAID  
AdapterPCI\VEN_1014&DEV_002E="%systemroot%\inf\scsi.inf"
```

6. (Optional) Find the INF file in the %windir%\inf directory that corresponds to each mass storage device; then, reference the PCI\Vendor ID to the INF file in sysprep.inf.

For example, to install an IBM ServeRAID -5i controller on a system that was deployed with a donor image containing support for an IBM ServeRAID™-4Mx controller, you must add the following text to the [SysPrepMassStorage] section of the sysprep.inf file:

```
;ServeRAID 5i controller  
PCI\VEN_1014&DEV_01BD&SUBSYS_02591014="C:\winnt\inf\oemscs01.inf"
```

Note: The INF file might have a different name, depending on the operating system and hardware configuration.

7. Save and close this new sysprep.inf file; then, copy the file to the same directory as the Sysprep program on the donor system.
8. Run Sysprep with the new sysprep.inf file on the donor system. Make sure that the system shuts down after Sysprep completes.
9. On the management server, uncomment the sysprep -clean command in the pqcmdln.txt file (located in the rdmpath\local\env\71c\custimg\ directory). Make sure that the path to the Sysprep program matches the path on the donor system.

Note: Installing an upgrade to RDM may overwrite customizations you have made to RDM batch or command files.

10. Run mkimages.bat from the RDMinstalldirRDMinstalldir\local\env directory.
11. Configure and run the Get Donor task on the donor system.

Adding SysPrepMassStorage for Windows XP and Windows Server 2003

Complete the following steps to add multiple mass storage device support for Windows XP and Windows Server 2003.

Note: This procedure requires sysprep.exe and accompanying files from the support\deployment\deploy.cab directory on the Windows operating-system CD.

1. Extract files to any directory on the donor system (for example, c:\sysprep).

2. Create a new text file named sysprep.inf.
3. In the sysprep.inf file, create a [SysPrepMassStorage] section.
4. Create a [SysPrep] section and add the following line to this section:
`BuildMassStorageSection=Yes`
 When you run Sysprep, Plug and Play information that is found in the following INF files is used to create hardware IDs: Machine.inf, Scsi.inf, Pnp SCSI.inf, and Mshdc.inf.
5. Save and close the sysprep.inf file; then, copy the file to the same directory as the Sysprep program on the donor system.
6. Run Sysprep in reseat mode with the new sysprep.inf file on the donor system. The [SysPrepMassStorage] section of the sysprep.inf file is updated automatically. Make sure that the system shuts down after Sysprep completes.
7. On the management server, uncomment the sysprep -clean command in the pqcmdln.txt file (located in the rdmPath\local\env\71c\custimg\ directory). Make sure that the path to the Sysprep program matches the path on the donor system.
8. Run mkimages.bat from the RDMinstalldir\local\env directory.
9. Configure and run the Get Donor task on the donor system.

Adding SysPrepMassStorage with the -bmsd parameter

Note: This procedure requires sysprep.exe and accompanying files from the support\deployment\deploy.cab directory on the Windows operating-system CD.

For Windows XP, you must download the latest release of Sysprep version 2.0 from the Microsoft Web site.

Complete the following steps to add multiple mass storage device support with the -bmsd parameter:

1. Extract files to any directory on the donor system (for example, c:\sysprep).
2. Create a new text file named sysprep.inf that contains an empty [SysPrepMassStorage] section.
3. Save and close the sysprep.inf file; then, copy the file to the same directory as the Sysprep program on the donor system.
4. From a command prompt on the donor system, type the following command and press Enter:
`sysprep.exe -bmsd`

The [SysPrepMassStorage] section of the sysprep.inf file is updated automatically. You can delete any entries that are not required for your configuration.

5. Run Sysprep in reseat mode with the new sysprep.inf file on the donor system. The [SysPrepMassStorage] section of the sysprep.inf file is updated automatically. Make sure that the system shuts down after Sysprep completes.
6. On the management server, uncomment the sysprep -clean command in the pqcmdln.txt file (located in the rdmPath\local\env\71c\custimg\ directory). Make sure that the path to the Sysprep program matches the path on the donor system.
7. Run mkimages.bat from the RDMinstalldir\local\env directory.
8. Configure and run the Get Donor task on the donor system.

Cloning systems that have IBM Director Agent installed

You can create a Windows Clone Install task that is based on a donor image created from a donor system on which IBM Director Agent is installed. However, to make sure that the IBM Director Agent files and registry entries are unique for each target system, you must create or modify specific files and save them to the Windows Clone Install task folder before running the task. Table 36 lists the files and what they do.

Table 36. Files that are used by a Windows Clone Install task that deploys IBM Director Agent

File	What it does
da-fix.bat	This batch file is run on the target system after Windows and IBM Director Agent is installed. It adjusts the Windows registry settings, configures the network driver for IBM Director Agent, and (if Web-based Access is installed) names the Web server daemon. Finally, it deletes the files that it has called.
diragt.bat	This batch file is called by the command list for the Windows Clone Install task; it copies the files from the RDM task folder to the target system.
dirrest.reg	This file is called by da-fix.bat; it modifies the Windows registry settings.
diragent.rsp	This file is called by da-fix.bat; it configures the network driver for IBM Director Agent.
httpd.conf	(If Web-based Access is installed only) This file is called by da-fix.bat; it is renamed httpd.conf and saved to the managed system.
pqcmdl.txt	This file calls the da-fix.bat file

Complete the following steps to create a Windows Clone Install task that deploys IBM Director Agent:

1. Select a donor system.

Notes:

- a. The donor system must be part of a workgroup; it cannot be part of a domain, a cluster services server, or a certificate services server.
 - b. Either the built-in administrator password must be blank or you must add the password to the answer2.txt file in the task folder for the Windows Clone Install task that you create in step 6 on page 346.
2. If necessary, install and configure applications on the donor system:
 - a. Log on to the donor system using an operating system account that has administrator privileges.
 - b. Install and configure any applications that you want the donor image to contain.
 3. If the donor system has Web-based Access installed, prepare Web-based Access for cloning:
 - a. Make sure that Web-based Access is initialized and running properly. For more information, see the IBM Director documentation.
 - b. Copy the httpd.conf file to a temporary location on the management server. If you installed IBM Director Agent in the default location, this file is located in the following directory:

`d:\Program Files\IBM\Director\websrv\conf`

where *d* is the drive letter of the hard disk drive.

4. Run the Sysprep utility on the donor system:
 - a. Copy the sysprep.exe and setupcl.exe utilities to the donor system. These utilities are located in the support\deployment\deploy.cab directory on the Microsoft Windows CD. You can also download the CD from the Microsoft Web site at <http://www.microsoft.com>.
 - b. To run Sysprep, from a command prompt, type the following command and press Enter:

```
d:\Path\sysprep
```

where *d*: is the drive letter of the hard disk drive and *Path* is the path of the directory where you copied the sysprep.exe and setupcl.exe utilities.

- c. When prompted, click **OK**.

If the donor system is running Windows 2000, Sysprep completes and the donor system shuts down.

If the donor system is running Windows XP or Windows Server 2003, the System Preparation Tool window opens. In the **Flags** group box, select the **MiniSetup** check box; in the **Shutdown** field, select **Shutdown**. Click **Reseal**. Sysprep completes and the donor system shuts down.

If the donor system is a mobile computer (laptop) and fails to shut down automatically, manually power off the system when a blue screen and cursor is displayed.

5. Run the Get Donor task against the donor system. A donor image is created.
6. Create a Windows Clone Install task:
 - a. Use the donor image that you created in step 5 to create a Windows Clone Install task. Note the location of the task folder.
 - b. Modify the command list so that it includes the following text:

```
;This is command list for clone Full deployment task
BOOTTYPE !LOADDOS /environment/dos71c
WAKE
TIMEOUT 240
!custing\setUser.bat
!!SETENV
!deploy\deploy.bat
!custing\custing.bat
!mtftp get %SERVER_IP%
template\%TASKTEMPLATEID%\%TASKTOID%\diragt.bat diragt.bat
!diragt.bat
BOOTTYPE !BOOTLOCAL
!!REBOOT
BOOTTYPE !LOADDOS /environment/dos71c
!!REBOOT
UpdateAssetID
!!SHUTDOWN
END
```

Note: The commands that you must add are highlighted in boldface.

7. Create the following files and save them to the task folder for the Windows Clone Install task that you created in step 6:
 - da-fix.bat
 - diragent.rsp
 - diragt.bat
 - dirrest.reg
 - predirag.reg

Table 37 lists information about these files and their content.

Table 37. Files and their content

File name	File content
da-fix.bat	<pre>TITLE DA-FIX.BAT RDM processing... regedit /s c:\predirag.reg del "c:\program files\ibm\director\data\twgmach.id" /F del "c:\program files\ibm\director\data\netdrvr.ini" /F cd \ cd "program files\ibm\director\bin\" twgipccf.exe /r:c:\diragent.rsp REM This line is only needed if Web-based Access is installed move /Y "c:\httpd.conf" "c:\program files\ibm\director\websrv\conf\httpd.conf" REM Post-installation registry edit regedit /s c:\DirRest.reg REM Cleanup del c:\diragent.rsp del c:\httpd.conf del c:\predirag.reg del c:\dirrest.reg del c:\da-fix.bat</pre> <p>Note: The lines highlighted in boldface are required only if the donor image contains Web-based Access.</p>
diragent.rsp	<pre>[Agent]=Y Driver.TCPIP=1 WakeOnLan=1 ;AddKnownServerAddress=TCPIP::XXXX.XXXX.XXXX.XXXX</pre> <p>Notes:</p> <ol style="list-style-type: none"> 1. This enables all TCPIP drivers and the Wake on LAN feature. You also can configure other options; for more information, see the diragent.rsp file located on the <i>IBM Director CD</i>. This file is fully-commented and located in the director\agent\windows\i386 directory. 2. To ensure that the system will be automatically discovered by IBM Director Server, uncomment the AddKnownServerAddress statement and substitute the IP address of the management server for XXXX.XXXX.XXXX.XXXX. (IBM Director Server must be configured to automatically add new systems that contact it.)

Table 37. Files and their content (continued)

File name	File content
diragt.bat	<pre> mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\da-fix.bat a:\da-fix.bat if errorlevel 1 goto MTFTPERR SET STATUS="Copying da-fix.bat" PQAccD /copy a:\da-fix.bat 1:\da-fix.bat if errorlevel 1 goto FAIL2 mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\diragent.rsp a:\diragent.rsp if errorlevel 1 goto MTFTPERR SET STATUS="Copying diragent.rsp" PQAccD /copy a:\diragent.rsp 1:\diragent.rsp if errorlevel 1 goto FAIL2 mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\dirrest.reg a:\dirrest.reg if errorlevel 1 goto MTFTPERR SET STATUS="Copying dirrest.reg" PQAccD /copy a:\dirrest.reg 1:\dirrest.reg if errorlevel 1 goto FAIL2 mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\predirag.reg a:\predirag.reg if errorlevel 1 goto MTFTPERR SET STATUS="Copying predirag.reg" PQAccD /copy a:\predirag.reg 1:\predirag.reg if errorlevel 1 goto FAIL2 mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\pqcmdln.txt a:\pqcmdln.txt if errorlevel 1 goto MTFTPERR SET STATUS="Copying pqcmdln.txt to cmdlines.txt" PQAccD /copy a:\pqcmdln.txt 1:\sysprep\i386\%OEM%\cmdlines.txt if errorlevel 1 goto FAIL2 REM These next 5 lines are only needed if Web-based Access is installed REM mtftp get %SERVER_IP% TEMPLATE\%TASKTEMPLATEID%\%TASKTOID%\httpd.con a:\httpd.con REM if errorlevel 1 goto MTFTPERR REM lccustom a:\httpd.con REM PQAccD /copy a:\httpd.con 1:\httpd.con REM if errorlevel 1 goto FAIL2 REM httpd.con will later be renamed to httpd.conf goto END :MTFTPERR CALL MTFTPERR.BAT @ECHO Failure %STATUS% GOTO END :FAIL2 SET RDRASLEVEL=1 SET RDSTATUS="RDMSWM234E Failure %STATUS%" @ECHO Failure %STATUS% :END </pre> <p>Note: If you want to use Web-based access with RDM, make sure that you uncomment the mtftp, lccustom, and PDAccD command lines in the Web-based access section.</p>
dirrest.reg	<pre> Windows Registry Editor Version 5.00 [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\TWGIPC] "Start"=dword:00000002 [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\DirWbs] "Start"=dword:00000002 </pre> <p>Note: The lines highlighted in boldface are required only if the donor image contains Web-based Access.</p>

Table 37. Files and their content (continued)

File name	File content
predirag.reg	Windows Registry Editor Version 5.00 [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\TWGIPC] "Start"=dword:00000003 [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\DirWbs] "Start"=dword:00000003 [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\ComputerName\ComputerName] "TWGMachineID"=hex:

8. Modify the following files and save them to the task folder for the task that you created in step 6:

- (If the donor image contains Web-based Access only.) httpd.conf
- pqcmdln.txt

Table 38 lists information about the files, their locations, and the content that you must change.

Note: Be sure to rename httpd.conf to httpd.con.

Table 38. Files, their location, and the content that must be changed

File name	File location	File content
httpd.conf	This file is located in the temporary directory to which you saved the file in step 3b on page 345. Note: On the management server, this file is named httpd.con. On the target system this file is named httpd.conf.	define DirectorAgentServerName %COMPUTERNAME% Note: The change you must make is highlighted in boldface. The line is located in the "Configuration Parameters" section at the beginning of the file.
pqcmdln.txt	If you installed RDM Server in the default location, the file is located in the following directory: <i>d</i> : \Program Files\IBM\RDM\local\env\71c\custimg where <i>d</i> : is the drive letter of the hard disk drive. Note: The pqcmdln.txt file is later renamed to cmdlines.txt.	[Commands] "c:\sysprep\getdir.exe" "c:\autoBoot.bat" "c:\da-fix.bat" ;"c:\sysprep\sysprep.exe -clean" Note: The line you must add is highlighted in boldface.
predirag.reg	This file is located in the temporary directory to which you saved the file in step 3b on page 345.	define DirectorAgentServerName %COMPUTERNAME% Note: The change you must make is highlighted in boldface. The line is located in the "Configuration Parameters" section at the beginning of the file.

When you run the Windows Clone Install task against a target system, the IBM Director Agent files and registry entries are unique.

Using IBM Director to remotely run Sysprep on a managed system

Complete the following steps to remotely run Sysprep on a managed system:

1. Install IBM Director Agent on the managed system. You can use a Windows Native Install task to install an operating system and IBM Director Agent to do this.

Make sure to restart the system after IBM Director Agent is installed.

2. If you have not scanned the managed system with RDM already, run a Scan task on the system or complete the following steps to use IBM Director to discover it.

From IBM Director Console, click **Tasks** → **Discover Systems** → **IBM Director Systems**. After a few seconds, all systems with IBM Director Agent installed are displayed in the Group Contents pane. The system might be shown more than once if RDM has scanned the system previously.

You can differentiate RDM-scanned systems from IBM Director-discovered systems by the appearance of the icons. See the IBM Director documentation for more information.

3. Copy the Sysprep utilities to a directory on either the management server or a management console. These utilities are located in the support\deployment\deploy.cab directory on the Microsoft Windows CD. You can also download them from the Microsoft Web site at <http://www.microsoft.com>.
4. Transfer the utilities to the managed system:
 - a. From the Tasks pane, drag the **File Transfer** task onto the managed system. The File Transfer window opens.
 - b. From the Source File System pane, drag the directory that contains the utilities onto the c:\ drive in the Target File System pane. The progress of the File Transfer task is displayed.
5. Create a process task that will run Sysprep:
 - a. In the Tasks pane, expand the **Process Management** task.
 - b. Double-click the Process Tasks subtask. The Process Task window opens.
 - c. In the **Command** field, type the applicable Sysprep command.
 - d. Click **File** → **Save As**. The Save As window opens.
 - e. Type a name and click **OK**. The new process task is displayed under **Process Tasks** in IBM Director Console.
6. Run the process task:
 - a. Drag the process task that you created in step 5 onto the managed system in the Group Contents pane. The Process Task window opens.
 - b. Click **Execute Now**. The Execution History window opens and the progress of the task is displayed. The managed system shuts down automatically.

Appendix B. Creating custom system environments

RDM tasks involve running a DOS system environment on the target system. When RDM is installed, several system environments are built.

You can create custom system environments to meet the needs of a particular environment. For example, you might want to run a task against a target system that contains a NIC that requires a special memory allocation during startup.

To change a default system environment, you first create a custom system environment. Then, you modify the system environment substitution file (bootEnvir.sub). The next time you run a task, the alternate system environments that are specified in the system environment substitution file are used.

Creating a custom system environment

If you need a system environment that does not come with RDM, you must create a custom system environment. You can do so by copying and renaming, then modifying, an existing system environment.

Complete the following steps to create a custom system environment:

1. Create a new directory in one of the following locations on the management server:

Linux	RDM/local/env
Windows	RDM\local\env

2. Copy all supporting files (including the autoexec.bat and config.sys files) and DOS device drivers to the directory that you created in step 1.
3. Copy the mkimages.bat file that is in the ..\RDM\local\env directory and rename it.
4. Using an ASCII text editor, open the new batch file that you created in step 3 and add the following lines of code:

```
cp baseimg CustomSysEnviron
bpdisk -d CustomSysEnviron -i NewDirectory
Move CustomSysEnviron ..\..\repository\environment\CustomSysEnviron
```

where *CustomSysEnviron* is the name of the custom system environment, and *NewDirectory* is the directory that you created in step 1.

5. Run the modified batch file. A new system environment is created in the RDM\repository\local\env directory.

To modify the command list for the RDM task, replace the BOOTTYPE command with the following text:

```
BOOTTYPE !LOADDOS /environment/CustomSysEnviron
```

where *CustomSysEnviron* is the name of the custom environment. This instructs RDM to load the custom system environment to the target system when the task is next run.

Modifying the system environment substitution file

To change the default system environment for a particular target system, modify the system environment substitution (bootEnvir.sub) file in the ..\RDM\local\env directory. The next time you run a task, the data from the modified bootEnvir.sub file is used.

Note: Be careful when you modify the bootEnvir.sub file. Since this file is referenced whenever a task is run, be sure to rigorously specify criteria in order to precisely target specific systems. For example, if the only criteria that you specify is a machine type, the alternate system environment will be used for *every* system with that machine type and the specified default system environment.

Syntax

Each line in the bootEnvir.sub file defines one or more rules for substituting an alternate system environment for a default system environment. It uses the following syntax:

```
ModelID::PCIid=DefaultSysEnviron::SubstituteSysEnviron
```

where:

- *ModelID* is either
 - the four-digit machine type number
 - the machine type and model combination
 - the POS string of POS target systems
 - 0 selects all systems
- *PCIid* is either the manufacturer ID for the PCI adapter or 0 (all PCI adapters).
- *DefaultSysEnviron* is the default system environment.
- *SubstituteSysEnviron* is the alternate system environment.

Blank lines in this file are ignored. Use a hash (#) to comment out a line.

Note: Each instance of *ModelID::PCIid* must be unique. To specify more than one system environment substitution for an instance of *ModelID::PCIid*, separate the instances of *DefaultSysEnviron::SubstituteSysEnviron* with a semicolon (;).

Sample bootEnvir.sub file

The following figure contains the contents of the bootEnvir.sub file that comes with RDM 4.20.

```
# *****
# * Remote Deployment Manager
# * (C) Copyright IBM Corp. 2003, 2004 All rights reserved.
# *****
#
# Please see Appendix B of the Operations Guide for
# instructions on how to use this file.
#####
##
##          The data lines begin here
#####
#POS Systems
SurePOS 300::0=dos71f::dos71p
IBM SureOne::0=dos71f::dos71p
4694::0=dos71f::dos71p
4800::0=dos71f::dos71p
8835::0=dos71f::dos71p
4810::0=dos71f::dos71p
```

Figure 199. System environment substitution file (bootEnvir.sub file)

Examples of modifying the bootEnvir.sub file

The following table contains examples of substituting an alternate system environment for the default system environment.

Table 39. Examples of modifying the system environment substitution file (bootEnvir.sub)

Line	What it does
0::80861229=dos70::dos71j	Specifies that when the following set of criteria is true, the system environment dos71j is substituted for the default system environment: <ul style="list-style-type: none"> • PCI adapter ID = 80861229 • Default system environment = dos70
4696::0=dos71s::dos71j	Specifies that when the following set of criteria is true, the system environment dos71j is substituted for the default system environment: <ul style="list-style-type: none"> • Machine type = 4696 • Default system environment = dos71s
4696::80861129=dos71s::dos71j	Specifies that when the following set of criteria is true, the system environment dos71j is substituted for the default system environment: <ul style="list-style-type: none"> • Machine type = 4696 • PCI adapter ID = 80861129 • Default system environment = dos71s

Table 39. Examples of modifying the system environment substitution file
(bootEnvir.sub) (continued)

Line	What it does
8550::0=dos7s::dos71s;dos7s1test::dos7s2test	<p>Specifies the following system environment substitutions for systems with machine type 8550:</p> <ul style="list-style-type: none"> • When the default system environment is dos7s, the system environment dos71s is substituted. • When the default system environment is dos7s1test, the system environment dos7s2test is substituted.

Appendix C. RDM data and files

This appendix contains information about RDM data and the RDM directory structure.

Types of data

There are two primary types of RDM data:

- Data that fits a row/column model. Such data is stored in the RDM database. Entries in the database are used for searching and filtering operations; they can reference the images and files that are stored in the repository.
- Images and files, which are stored in the repository.

RDM directory structure

If you install RDM Server in the default location, the following root directory is created:

For Linux	/opt/IBM/RDM
For Windows	d:\Program Files\IBM\Director\RDM

where *d* is the drive letter of the hard disk.

The root directory contains several subdirectories. The following table contains information about these subdirectories and what they contain.

Table 40. RDM subdirectories and their contents

Subdirectory	What it contains
bin	<ul style="list-style-type: none">• “Server-side” executable files that are not stored in the following directories:<ul style="list-style-type: none">– (Windows) Program Files\IBM\Director– (Linux) /opt/IBM/director• Java™ Runtime Environment (JRE) that is used for remote installations of RDM Deployment Server (D-Server)
docs	RDM documentation
license	License agreements for RDM
local	RDM database on Windows installations and RDM user-configurable properties files
local\drvimport	Driver files imported by the user
local\env	Files and applications that are used to build DOS system environments
local\http	HTTP communication between the management server and remote deployment servers
local\w32drivers	Windows device drivers that are copied to the target system when a Windows Native Install task is run
local\wnihives	Files that are used to modify the Microsoft hivesft files in the Windows Registry
log	RDM log files

Table 40. RDM subdirectories and their contents (continued)

Subdirectory	What it contains
repository	Repository. The repository is the base directory on the local system that an mftfp command from a remote system is permitted to "get" files from.
repository\environment	System environments
repository\image	Images
repository\template	RDM task template folders
repository\template\n1	Specific RDM task template folders, where <i>n1</i> is one of the following numerals: <ul style="list-style-type: none"> • 1 = System Firmware Flash • 2 = CMOS Update • 3 = Custom • 4 = Donor Image • 5 = Linux Native Install • 7 = Power Restore • 8 = RAID Custom Configuration • 9 = Scan • 10 = Script • 11 = Secure Data Disposal • 13 = Windows Clone Install • 14 = Windows Native Install • 16 = RAID Clone Configuration • 17 = Remote Storage Configuration • 18 = VMware Native Install
repository\template\n1\n2	Files that are used by a specific RDM task, where <i>n2</i> is a numeral
temp	Files that are used by the Scan task, including the scan.out file, which RDM Server uses to create or update the IBM Director physical platform managed object (PPMO) that represents the target system. The temp directory is also the location that mftfp from another system copies files onto the local system with a "put" command.

Appendix D. Linux directories

The following table contains the Linux directories that you should not use as mount points:

Table 41. Linux directories

/	/bin	/boot
/boot/grub	/boot/lost+found	/dev
/dev/ataraid	/dev/cciss	/dev/compaq
/dev/cpu	/dev/cpu/0	/dev/cpu/1
/dev/cpu/10	/dev/cpu/11	/dev/cpu/12
/dev/cpu/13	/dev/cpu/14	/dev/cpu/15
/dev/cpu/2	/dev/cpu/3	/dev/cpu/4
/dev/cpu/5	/dev/cpu/6	/dev/cpu/7
/dev/cpu/8	/dev/cpu/9	/dev/dri
/dev/i2o	/dev/ida	/dev/inet
/dev/input	/dev/logicalco	/dev/logicalco/bci
/dev/logicalco/dci1300	/dev/pts	/dev/raw
/dev/rd	/dev/shm	/dev/usb
/dev/video	/etc	/etc/CORBA
/etc/CORBA/servers	/etc/X11	/etc/X11/applnk
/etc/X11/fs	/etc/X11/fvwm2	/etc/X11/lbproxy
/etc/X11/proxymngr	/etc/X11/rstart	/etc/X11/serverconfig
/etc/X11/starthere	/etc/X11/sysconfig	/etc/X11/twm
/etc/X11/xdm	/etc/X11/xinit	/etc/X11/xserver
/etc/X11/xsm	/etc/aep	/etc/alchemist
/etc/alchemist/namespace	/etc/alchemist/switchboard	/etc/alternatives
/etc/atalk	/etc/atalk/nls	/etc/cipe
/etc/cipe/pk	/etc/cron.d	/etc/cron.daily
/etc/cron.hourly	/etc/cron.monthly	/etc/cron.weekly
/etc/cups	/etc/default	/etc/dhccpc
/etc/gconf	/etc/gconf/1	/etc/gconf/gconf.xml.defaults
/etc/gconf/gconf.xml.mandatory	/etc/gconf/schemas	/etc/gnome
/etc/gnome/fonts	/etc/gnome/panel-config	/etc/gtk
/etc/gtk-2.0	/etc/hotplug	/etc/hotplug/pci
/etc/hotplug/usb	/etc/httpd	/etc/httpd/conf
/etc/iproute2	/etc/isdn	/etc/joe
/etc/locale	/etc/locale/cs	/etc/locale/da
/etc/locale/de	/etc/locale/es	/etc/locale/eu_ES
/etc/locale/fi	/etc/locale/fr	/etc/locale/gl
/etc/locale/hu	/etc/locale/id	/etc/locale/is
/etc/locale/it	/etc/locale/ja	/etc/locale/ko

Table 41. Linux directories (continued)

/etc/locale/nn	/etc/locale/no	/etc/locale/pl
/etc/locale/pt	/etc/locale/pt_BR	/etc/locale/ro
/etc/locale/ru	/etc/locale/sk	/etc/locale/sl
/etc/locale/sr	/etc/locale/sv	/etc/locale/tr
/etc/locale/uk	/etc/locale/wa	/etc/locale/zh
/etc/locale/zh_CN.GB2312	/etc/locale/zh_TW	/etc/locale/zh_TW.Big5
/etc/log.d	/etc/log.d/conf	/etc/log.d/scripts
/etc/logrotate.d	/etc/mail	/etc/mail/spamassassin
/etc/makedev.d	/etc/mgetty+sendfax	/etc/midi
/etc/network	/etc/nmh	/etc/ntp
/etc/oaf	/etc/openldap	/etc/opt
/etc/pam.d	/etc/pango	/etc/ppp
/etc/ppp/peers	/etc/profile.d	/etc/rc.d
/etc/rc.d/init.d	/etc/rc.d/rc0.d	/etc/rc.d/rc1.d
/etc/rc.d/rc2.d	/etc/rc.d/rc3.d	/etc/rc.d/rc4.d
/etc/rc.d/rc5.d	/etc/rc.d/rc6.d	/etc/redhat-lsb
/etc/rpm	/etc/samba	/etc/security
/etc/security/console.apps	/etc/sgml	/etc/skel
/etc/smrsh	/etc/sound	/etc/sound/events
/etc/ssh	/etc/sysconfig	/etc/sysconfig/apm-scripts
/etc/sysconfig/console	/etc/sysconfig/network-scripts	/etc/sysconfig/networking
/etc/sysconfig/rhn	/etc/tripwire	/etc/ups
/etc/vfs	/etc/vfs/modules	/etc/w3m
/etc/xinetd.d	/etc/xml	/home
/initrd	/lib	/lib/i686
/lib/iptables	/lib/kbd	/lib/kbd/consolefonts
/lib/kbd/consoletrans	/lib/kbd/keymaps	/lib/kbd/unidata
/lib/kbd/videomodes	/lib/lsh	/lib/modules
/lib/modules/2.4.18-10	/lib/modules/2.4.18-3	/lib/modules/2.4.18-4
/lib/modules/2.4.18-5	/lib/security	/lib/security/pam_filter
/lost+found	/misc	/mnt
/mnt/floppy	/opt	/proc
/root	/root/dhccpc	/root/dhccpcd.rpmsave
/sbin	/tmp	/usr
/usr/X11R6	/usr/X11R6/bin	/usr/X11R6/include
/usr/X11R6/lib	/usr/X11R6/man	/usr/X11R6/share
/usr/bin	/usr/bin/X11	/usr/dict
/usr/doc	/usr/doc/enlightenment-0.16.5	/usr/doc/fnlib-0.5
/usr/etc	/usr/games	/usr/i386-glibc21-linux
/usr/i386-glibc21-linux/bin	/usr/i386-glibc21-linux/include	/usr/i386-glibc21-linux/lib
/usr/include	/usr/include/GL	/usr/include/arpa

Table 41. Linux directories (continued)

/usr/include/asm	/usr/include/atk-1.0	/usr/include/bits
/usr/include/freetype1	/usr/include/freetype2	/usr/include/g++-2
/usr/include/g++-3	/usr/include/gimp-print	/usr/include/glib-1.2
/usr/include/glib-2.0	/usr/include/gnu	/usr/include/gtk-1.2
/usr/include/gtk-2.0	/usr/include/gtkgl	/usr/include/linux
/usr/include/mysql	/usr/include/net	/usr/include/netash
/usr/include/netatalk	/usr/include/netax25	/usr/include/neteconet
/usr/include/netinet	/usr/include/netipx	/usr/include/netpacket
/usr/include/netrom	/usr/include/netrose	/usr/include/nfs
/usr/include/openssl	/usr/include/pango-1.0	/usr/include/pcap
/usr/include/protocols	/usr/include/pwdb	/usr/include/rpc
/usr/include/rpcsvc	/usr/include/scsi	/usr/include/sigc++
/usr/include/sp	/usr/include/sys	/usr/kerberos
/usr/kerberos/lib	/usr/kerberos/share	/usr/lib
/usr/lib/GConf	/usr/lib/Omni	/usr/lib/X11
/usr/lib/alchemy	/usr/lib/ao	/usr/lib/apache
/usr/lib/aspell	/usr/lib/autofs	/usr/lib/bash
/usr/lib/bcc	/usr/lib/bonobo	/usr/lib/cups
/usr/lib/dateconfig	/usr/lib/desktop-links	/usr/lib/exmh-2.4
/usr/lib/games	/usr/lib/gcc-lib	/usr/lib/gconv
/usr/lib/gdk-pixbuf	/usr/lib/gedit	/usr/lib/glib
/usr/lib/glib-2.0	/usr/lib/gnome-pilot	/usr/lib/gnupg
/usr/lib/gtk-2.0	/usr/lib/guppi	/usr/lib/ical
/usr/lib/isdn	/usr/lib/kde2-compat	/usr/lib/kde3
/usr/lib/libuser	/usr/lib/licq	/usr/lib/locale
/usr/lib/lvsb	/usr/lib/mc	/usr/lib/mcop
/usr/lib/metamail	/usr/lib/mgetty+sendfax	/usr/lib/mozilla
/usr/lib/mysql	/usr/lib/netscape	/usr/lib/nmh
/usr/lib/pango	/usr/lib/perl5	/usr/lib/pgsql
/usr/lib/pilot-link	/usr/lib/pkgconfig	/usr/lib/pppd
/usr/lib/python1.5	/usr/lib/python2.2	/usr/lib/qt-2.3.1
/usr/lib/qt-3.0.3	/usr/lib/rar	/usr/lib/rpm
/usr/lib/rpmdb	/usr/lib/sasl	/usr/lib/sigc++
/usr/lib/tcl8.3	/usr/lib/tix8.2	/usr/lib/tk8.3
/usr/lib/vfs	/usr/lib/w3m	/usr/lib/x3270
/usr/lib/xawtv	/usr/lib/xemacs	/usr/lib/xemacs-21.4.6
/usr/lib/xmms	/usr/lib/yp	/usr/lib/zsh
/usr/libexec	/usr/libexec/awk	/usr/libexec/emacs
/usr/libexec/filters	/usr/libexec/openssh	/usr/libexec/rep
/usr/libexec/sawfish	/usr/libexec/xtraceroute	/usr/local
/usr/local/bin	/usr/local/doc	/usr/local/etc

Table 41. Linux directories (continued)

/usr/local/games	/usr/local/include	/usr/local/lib
/usr/local/libexec	/usr/local/sbin	/usr/local/share
/usr/local/src	/usr/man	/usr/man/man1
/usr/sbin	/usr/share	/usr/share/VFlib
/usr/share/aclocal	/usr/share/aclocal-1.4	/usr/share/applets
/usr/share/application-registry	/usr/share/apps	/usr/share/aspell
/usr/share/aumix	/usr/share/authconfig	/usr/share/autoconf
/usr/share/automake	/usr/share/autostart	/usr/share/awk
/usr/share/bonobo	/usr/share/cdrdao	/usr/share/config
/usr/share/control-center	/usr/hare/cups	/usr/share/cvs
/usr/share/dateconfig	/usr/share/dict	/usr/share/doc
/usr/share/emacs	/usr/share/empty	/usr/share/enlightenment
/usr/share/epic	/usr/share/etable	/usr/share/fnlib_fonts
/usr/share/fonts	/usr/share/foomatic	/usr/share/gal
/usr/share/games	/usr/share/gedit	/usr/share/ghostscript
/usr/share/gimp-print	/usr/share/glib-2.0	/usr/share/gnome
/usr/share/gnome-about	/usr/share/gnome-pilot	/usr/share/gnome-print
/usr/share/gnome-terminal	/usr/share/gnome-upgrade	/usr/share/gnupg
/usr/share/groff	/usr/share/grub	/usr/share/gtk-2.0
/usr/share/gtk-doc	/usr/share/gtkhtml	/usr/share/guile
/usr/share/guppi	/usr/share/hwbrowser	/usr/share/hwdata
/usr/share/i18n	/usr/share/icons	/usr/share/idl
/usr/share/info	/usr/share/intltool	/usr/share/jed
/usr/share/kontrol-panel	/usr/share/ksconfig	/usr/share/libtool
/usr/share/licq	/usr/share/locale	/usr/share/magicdev
/usr/share/man	/usr/share/mime-info	/usr/share/mimeInk
/usr/share/misc	/usr/share/mpage	/usr/share/mysql
/usr/share/nmap	/usr/share/oaf	/usr/share/omf
/usr/share/openldap	/usr/share/pgsql	/usr/share/pixmaps
/usr/share/printconf	/usr/share/pspell	/usr/share/redhat-config-network
/usr/share/redhat-config-users	/usr/share/rep	/usr/share/rhn
/usr/share/samba	/usr/share/sawfish	/usr/share/screen
/usr/share/scrollkeeper	/usr/share/sendmail-cf	/usr/share/serviceconf
/usr/share/services	/usr/share/servicetypes	/usr/share/sgml
/usr/share/sndconfig	/usr/share/snmp	/usr/share/sounds
/usr/share/spamassassin	/usr/share/ssl	/usr/share/tabset
/usr/share/terminfo	/usr/share/themes	/usr/share/type-convert
/usr/share/umb-scheme	/usr/share/usermode	/usr/share/vim
/usr/share/vnc	/usr/share/w3m	/usr/share/xemacs-21.4.6
/usr/share/xmms	/usr/share/xtraceroute	/usr/share/zoneinfo
/usr/share/zsh	/usr/src	/usr/src/redhat

Table 41. Linux directories (continued)

/usr/tmp	/var	/var/cache
/var/cache/alchemy	/var/cache/foomatic	/var/cache/httpd
/var/cache/man	/var/db	/var/ftp
/var/ftp/bin	/var/ftp/etc	/var/ftp/lib
/var/ftp/pub	/var/jabberd	/var/jabberd/dialback
/var/jabberd/dnsrv	/var/jabberd/jabberd	/var/jabberd/jsm
/var/jabberd/pthsock	/var/jabberd/spool	/var/jabberd/xdm_file
/var/lib	/var/lib/alternatives	/var/lib/games
/var/lib/misc	/var/lib/mysql	/var/lib/nfs
/var/lib/pgsql	/var/lib/rpm	/var/lib/scrollkeeper
/var/lib/slocate	/var/lib/tripwire	/var/lib/ups
/var/lib/xdm	/var/lib/xkb	/var/local
/var/lock	/var/lock/subsys	/var/lock/xemacs
/var/log	/var/log/httpd	/var/log/vbox
/var/mail	/var/named	/var/nis
/var/opt	/var/preserve	/var/run
/var/run/console	/var/run/mysqld	/var/run/named
/var/run/netreport	/var/run/radvd	/var/spool
/var/spool/anacron	/var/spool/at	/var/spool/cron
/var/spool/fax	/var/spool/lpd	/var/spool/mail
/var/spool/mqueue	/var/spool/rwho	/var/spool/up2date
/var/spool/vbox	/var/spool/voice	/var/tmp
/var/www	/var/www/cgi-bin	/var/www/html
/var/www/icons	/var/www/nut-cgi-bin	/var/yp
/var/yp/binding	/var/yp/masters	/var/yp/yp

Appendix E. Terminology summary and abbreviation list

This appendix provides a summary of Remote Deployment Manager (RDM) terminology and a list of abbreviations that are used in the following RDM documents:

- *Remote Deployment Manager 4.20 Installation and Configuration Guide*
- *Remote Deployment Manager 4.20 User's Reference*

RDM terminology summary

The following terminology is used in the RDM documents.

A *system* is a server, workstation, desktop computer, mobile computer (laptop), or point-of-sale system.

The *RDM software* has three components:

- RDM Server
- RDM Console
- RDM Deployment Server (D-Server)

The hardware in an RDM environment is referred to in the following ways:

- A *management server* is a server on which both IBM Director and RDM Server is installed.
- A *management console* is a system on which both IBM Director Console and RDM Console are installed.
- A *remote deployment server* is a system on which RDM Deployment Server is installed. This system must be in a different subnet than the management server. RDM Console can be installed on this system also.
- A *target system* is a system on which an RDM task is run.

Abbreviations

The following table lists abbreviations that are used in the RDM documents.

Table 42. Abbreviations used in RDM

Abbreviation	Definition
A	
AIA	asset information area
ARP	Address Resolution Protocol
ASCII	American Standard Code for Information Interchange
B	
BIOS	basic input/output system
BOOTP	Bootstrap Protocol
C	
CD	compact disc
CD-R	compact disc–recordable
CD-R/W	compact disc–read write
CD-ROM	compact disc–read-only memory

Table 42. Abbreviations used in RDM (continued)

Abbreviation	Definition
CMOS	complementary metal oxide semiconductor
CSV	comma-separated value
D	
DCC	Direct Client Connection
DHCP	Dynamic Host Configuration Protocol
DOS	disk operating system
DNS	domain name system
DVD	digital video disc
F	
FAStT	Fibre Array Storage Technology
FAT	file allocation table
FTP	File Transfer Protocol
G	
GB	gigabyte
GRUB	Grand Unified Boot Loader
GUI	graphical user interface
H	
HAL	hardware abstraction layer
HBA	host bus adapter
HTTP	Hypertext Transfer Protocol
I	
IBM	International Business Machines Corporation
ICMP	Internet Control Message Protocol
ID	identifier
IDE	integrated drive electronics
IGMP	Internet Group Message Protocol
IMAP	Internet Message Access Protocol
IP	Internet Protocol
IRC	Internet Relay Chat
IRC DCC	Internet Relay Chat Direct Client Connection
IRQ	interrupt request
ISP	Internet service provider
J	
JRE	Java™ Runtime Environment
K	
KB	kilobyte
L	
LAN	local area network
LCCM	LANClient Control Manager
LDAP	Lightweight Directory Access Protocol

Table 42. Abbreviations used in RDM (continued)

Abbreviation	Definition
LILO	Linux Loader
LUN	logical unit number
M	
MAC	media access control
MB	megabyte
MBps	megabytes per second
Mb	megabit
Mbps	megabits per second
MD5	message digest 5
MTFTP	Multicast Trivial File Transfer Protocol
N	
NFS	network file system
NIS	network information service
NIC	network interface card
NMO	native managed object
NTFS	Windows NT 4.0 file system
P	
PC	personal computer
PDF	Portable Document Format
PFA	Predictive Failure Analysis
PPMO	physical platform managed object
POP3	Post Office Protocol, version 3
PXE	Preboot Execution Environment
R	
RAID	redundant array of independent disks
RAM	random access memory
RDM	IBM Remote Deployment Manager
RFID	radio frequency identification
RPM	Red Hat Package Manager
S	
SAN	storage area network
SATA	serial advanced technology attachment
SCSI	small computer system interface
SID	security identifier
SMA	IBM System Migration Assistant
SMB	server message block
SMP	symmetric multiprocessing
SMTP	Simple Mail Transfer Protocol
SSH	Secure Shell
SSPT	Storage Server Provisioning Tool

Table 42. Abbreviations used in RDM (continued)

Abbreviation	Definition
STC	System/Task Configuration
STP	Spanning Tree Protocol
T	
TCP/IP	Transmission Control Protocol/Internet Protocol
TFTP	Trivial File Transfer Protocol
U	
UDP	User Datagram Protocol
UUID	universal unique identifier
W	
WAN	wide area network
WfM	Wired for Management
WINS	Windows Internet Naming Service

Appendix F. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation® system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD or in the *IntelliStation Hardware Maintenance Manual* at the IBM Support Web site.
- Go to the IBM Support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/us/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, go to <http://www.ibm.com/services/>, or go to <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Appendix G. Notices

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

IBM may 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 may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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

Edition notice

© 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.

Trademarks

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

BladeCenter	ServeRAID
e-business logo	ServerGuide
@server	ServerProven
IBM	ThinkPad
IntelliStation	Wake on LAN
Predictive Failure Analysis	xSeries
Redbooks	

Intel and Pentium are trademarks of Intel Corporation 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.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

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

Index

A

acu.exe 150, 308
acuichsv.exe 150, 309
aiaread.exe 311
aiawrite.exe 313
allocate LUNs 169
appsinst.exe 314, 329
Asset ID utilities
 aiaread.exe 311
 aiawrite.exe 313

B

Basic Scan 191
BIOS settings 79
blade servers 197, 198
bmgr.exe 284
books xvi, xvii
boot LUN (LUN 0) 178
bootini.com 314
bootstrap loader program 5
bpdisk.exe 291
bstrap.0 317

C

cfg1030 150
cfg1030.exe 300
cleanup.exe 314
client commands
 examples 280
 overview 279
 syntax 279
clone files 233
CMOS settings
 preparing a donor system 80
 saving to a file 80
CMOS Update
 image
 cmosutil.exe 80
 creating in RDM 81
 task
 creating 85
 LCCMOS.BAT 90
 overview 79
 qualification 63
 running 89
CMOS utility 80
cmosutil.exe 80
command files
 RAID Clone Configuration
 creating 149
 system qualification 64
command list
 client commands
 examples 280
 overview 279

command list (*continued*)
 overview 19
 RdAgent commands
 examples 281
 overview 280
 RDM DOS RDAGENT 273
 server commands
 examples 277
 overview 275
Command List Editor wizard
 overview 19
 using 20
components
 overview 3
 RDM Console 4
 RDM Deployment Server 4
 RDM Server 3
computer names
 Window Native Install 247
 Windows Clone Install
 changing 233
 default 233
configuration
 MTFTP settings 49
 multicast settings 48
 network settings 48
 RDM Deployment Server 45
 RDM Server 41
configuration files
 RAID
 backup file 149, 151
 command file 149, 152
 Sysprep 338
Create New Allocate LUN Task 178
createpr.com 294
CSV
 STC settings 61
 system data 69
Custom task
 creating 91
 deploy donor image 93, 95
 overview 91
 qualification 63
customer support xvii

D

D-Server
 See RDM Deployment Server
D-Server configuration utility 315
data
 exporting 68
 importing 75
deallocate LUNs 169
deditd.exe 314
Deploy latest system firmware task 215
DeployCenter
 testing 109

- DeployCenter *(continued)*
 - upgrading 107
- deployment servers
 - adding to RDM 43
 - configuring
 - MTFTP settings 49
 - multicast settings 48
 - network settings 48
 - replication settings 49
 - subnet settings 51
 - deleting from RDM 54
 - enabling 47
 - IP address 45
 - restarting 54
- device drivers
 - adding 265
 - deleting 267
 - IBM ServeRAID, creating 150
 - TCPIP 347
 - updating with Sysprep 101
 - viewing 263
 - Windows 355
 - Windows Native Install task 263
- DHCPDISCOVER message 5
- discovery
 - diragent.rsp 347
 - Scan task 191
- diskette drive A, virtual 5
- documentation xvi, xvii
- Donor Image
 - See Get Donor task
- donor images
 - creating 102
 - deploying
 - Custom task 93, 95
 - Windows Clone Install task 233, 245
 - overview 99
- donor system
 - installing applications 100
 - overview 100
 - preparing 80
 - running Sysprep 100
- DOS
 - saving BIOS settings 80
 - startable diskette with RAID utilities 150
 - utilities
 - dynaload.com 284
 - fdisk.com 284
 - fdisk32.exe 286
 - format.com 287
 - format32.com 289
 - list of 283
 - mem.exe 291
- dsconfig.exe 315
- dserver service
 - overview 4
 - restarting 54
 - restarting on Linux 54
 - restarting on Windows 54
- dserver.ini 45

E

- eFixes xvii
- examples
 - command list 280
- export
 - images 74
 - overview 67
 - system data 67, 68
 - tasks 71
- Express RAID Configuration 161

F

- fdisk.com 284
- fdisk32.exe 286
- firmware
 - deploying 215
 - update diskette, creating 215
- format.com 287
- format32.com 289
- fsid.com 290

G

- general utilities
 - appsinst.exe 314, 329
 - bootini.com 314
 - bstrap.0 317
 - cleanup.exe 314
 - deditd.exe 314
 - getvol.exe 315
 - lccm.1 317
 - lccustom.exe 315
 - lcips.dos 318
 - lcreboot.exe 318
 - makepqs.com 319
 - mergeini.exe 319
 - mtftp.exe 319
 - poweroff.com 320
 - prepdsk.exe 320
 - raidcfg.exe 320
 - ramdisk2 320
 - rave.exe 321
 - rdagent.exe 321
 - redirect.exe 322
 - scan.exe 323
 - scrub3.exe 323
 - treboot.exe 329
 - tshudwn.exe 329
 - unzip.exe 329
- Get Donor
 - task
 - overview 99
 - qualification 63
 - upgrading to full DeployCenter 107
- Get Donor task
 - creating a donor image 102
 - preparing donor system
 - installing applications 100
 - overview 100

Get Donor task (*continued*)
 preparing donor system (*continued*)
 running Sysprep applications 100
getramd.exe 294
getvol.exe 315

H

help xvii
hypercfg 150
hypercfg.exe 302

I

IBM Boot Manager
 installation of 332
 removing, from Power Restore 147
 utility 284
IBM Director Console 7
IBM Director ServeRAID Manager 149
IBM RDM Deployment Server service 4
IBM Web site
 IBM Director 4.20 xvii
 RDM resources xvii
 Redbooks xvii
 Remote Deployment Manager xvii
 Remote Deployment Manager 4.20 xvi
 ServerGuide xvii
 ServerGuide Scripting Toolkit xvii
 ServerProven xvii
 Support xviii
 Systems Management Software xviii
 UpdateXpress xvii
 xSeries Systems Management xviii
icon status 11
idewc.exe 293
Image Management
 images
 creating 30
 deleting 38
 editing 35
 replicating 39
 overview 29
 starting 29
images
 CMOS Update, creating 81
 creating 30
 deleting 38
 DOS
 RDM Disk Formatting 274
 RDM Extended Memory Manager 273
 RDM High Memory 273
 RDM RAM Drive 273
 RDM Windows Install Utilities 274
 exporting 74
 importing 75
 Linux Native Install
 creating 112
 creating a custom image 135
 overview 10
 properties 35

images (*continued*)
 RAID Clone Configuration, creating 154
 replicating 39
 System Firmware Flash, creating 216
 VMware Native Install 223
import
 images 75
 overview 67
 STC settings 61
 system data 67, 70
 tasks 73, 75
IP address
 configuring
 remote deployment servers 55
 VMware Installation Image 226
ipssendl 150
ipssendl.exe 303

L

lccm.1 317
LCCMOS.BAT 90
lccustom.exe 315
lcips.dos 318
lcreboot.exe 318
Level-1 Limited Partition Removal 209
Level-2 1-Overwrite Security 209
Level-3 4-Overwrite DOD Security 210
Level-4 7-Overwrite DOD Security 210
Linux Native Install
 image
 creating 112
 creating a custom image 135
 task
 configuring X Window System 130
 creating an image 112
 overview 111
 qualification 64
 running 136
Logical Unit Numbers (LUNs) 169
LUNs
 allocate 169
 Create New Allocate LUN Task 178
 deallocate 169
 LUN 0 (boot LUN) 178
 LUN Prefix 180, 181
 Make First LUN Bootable option 179

M

macsubst.exe 294
Make First LUN Bootable option 179
makepqs.com 319
management console 3
management server
 command list
 server commands 275
 description 3
 mds.log 46
master repository 4
mds.log 46

mem.exe 291
menu bar 8
mergeini.exe 319
miscellaneous utilities
 bmgr.exe 284
 bpdisk.exe 291
 fsid.com 290
 idewc.exe 293
 list of 291
MTFTP settings 49
mftftp.exe 319
multicast settings 48

N

naming
 Scan 197, 198
 Scan task 197, 198
network interface card (NIC) 5
network settings 48
NIC (network interface card) 5
non-supported switches, RSC 169

P

parameters
 configuring 59
 importing with RDM data 75
 templates 17
 user parameters 22
parttool.com 295
Power Restore
 IBM Boot Manager, removing 147
 task
 qualification 64
Power Restore utilities
 createpr.com 294
 getramd.exe 294
 macsubst.exe 294
 parttool.com 295
 pr.exe 298
 prerr.com 299
 prsource.exe 299
 reboot.com 299
 seterror.com 299
poweroff.com 320
pqaccd.exe 330
pqidplyz.exe 330
pr.exe 298
Preboot Execution Environment (PXE) 4
prepdsks.exe 320
prerr.com 299
properties
 advanced
 command list 19
 task folder 27
 user parameters 22
 tasks 18
 user parameters 26
property sheets 17
prsource.exe 299

publications xvi, xvii
PXE 4

Q

qualification of target systems 181, 183, 184, 185, 186
qualifications
 overview 63
 tasks 63

R

RAID Clone Configuration
 acu.exe 150
 acuichsv.exe 150
 cfg1030 150
 command file
 creating 149
 system qualification 64
 hypercfg 150
 IBM Director ServeRAID Manager 149
 image
 creating 154
 ipssendl 150
 raidselect.exe 150
 task
 creating 158
 overview 149
 template 149
RAID Clone task
 qualification 64
RAID configuration utilities
 acu.exe 308
 acuichsv.exe 309
 cfg1030.exe 300
 hypercfg.exe 302
 ipssendl.exe 303
 list of 300
 raidselect.exe 306
RAID Custom Configuration
 Express RAID Configuration 161
 task
 creating 162
 overview 161
 qualification 64
raidcfg.exe 320
raidselect.exe 150, 306
ramdisk2 320
rave.exe 321
RdAgent commands
 command list
 examples 281
 overview 280
rdagent program 5
rdagent.exe 321
RDM
 bootstrap loader program 5
 components 3
 RDM Deployment Server 43, 45
 RDM Server 41
 documentation xvi

- RDM (*continued*)
 - Image Management 29
 - master repository 4
 - menu bar 8
 - overview 3
 - remote repository 4
 - tasks
 - creating 16
 - properties 18, 19, 22, 27
 - System Firmware Flash 215
 - templates
 - notebooks 17
 - overview 15
 - parameter values 17
 - property sheets 17
 - terminology 3
 - utilities
 - D-Server configuration 315
 - DOS 283
 - miscellaneous 291
 - overview 283
 - RAID configuration 300
 - Symantec 330
 - Web site xvii
- RDM Console
 - overview 4
- RDM Deployment Server
 - configuring 45
 - initialization
 - dserver.ini 45
 - overview 4
 - Unicast Image Server 4
- RDM DOS RDAGENT 273
- RDM Server
 - configuring 41
 - overview 3
- RDM task templates
 - overview 9
- rdm.ini 47
- rds.log 46
- reboot.com 299
- Redbooks xvii
- redirect.exe 322
- Remote Deployment Manager (RDM)
 - See* RDM
- remote deployment servers
 - See also* deployment servers
 - configuring
 - IP address 55
 - replication settings 49
 - description 3
 - enabling 47
 - master repository 4
 - rdm.ini 47
 - rds.log 46
 - remote repository 4
 - remote repository 4
- Remote Storage Configuration
 - adding storage 172
 - adding switches 174

- Remote Storage Configuration (*continued*)
 - built-in tasks
 - delete mapping 183
 - delete mapping and LUNs 184
 - get profile 185
 - put profile 186
 - configuring remote storage
 - built-in tasks 182
 - Create New Allocate LUN task 178
 - dual boot 187
 - Make First LUN Bootable option 179
 - external fibre switch 171
 - network storage configurations
 - external fibre switch, standalone server 171
 - Remote D-Server 172
 - remote storage devices 172
 - RSC qualification error messages 182
 - standalone server 171
- Remote Storage Configuration (RSC)
 - network storage configurations
 - basic 170
- Remote Storage Configuration task
 - qualification 64
- replication 39
 - configuring 49
 - time intervals 41
- repository
 - master repository 4
 - remote repository 4
- RSC
 - See* Remote Storage Configuration

S

- Scan
 - task
 - automatic naming 197, 198
 - Basic Scan 191
 - creating 192
 - default 41
 - overview 191
 - qualification 64
 - user prompts 193
- scan.exe 323
- Script
 - task
 - creating 206
 - overview 205
 - qualification 64, 205
- scrub
 - overview 209, 215
- scrub3.exe 323
- SCRUB3.EXE
 - parameters
 - level 1 209
 - level 2 209
 - level 3 210
 - level 4 210
- Secure Data Disposal
 - task
 - creating 211

- Secure Data Disposal *(continued)*
 - task *(continued)*
 - Level-1 Limited Partition Removal 209
 - Level-2 1-Overwrite Security 209
 - Level-3 4-Overwrite DOD Security 210
 - Level-4 7-Overwrite DOD Security 210
 - overview 209
 - predefined 209
 - qualification 64
- server commands 275
 - command list
 - examples 277
- service packs xvii
- services
 - dserver
 - restarting 54
 - IBM RDM Deployment Server (dserver service) 4
- seterror.com 299
- status 11
- STC
 - importing
 - CSV file 61
 - settings 61
 - overview 59
- subnet configuration 51
- Symantec utilities
 - list of 330
 - pqaccd.exe 330
 - pqidplyz.exe 330
- Sysprep
 - parameters
 - bmsd 101
 - clean 101
 - factory 101
 - reseal 101
 - running 100
- system data
 - exporting 67
 - importing 67
 - saving to a CSV file 69
 - systems data
 - exporting 68
 - importing 70
- System Firmware Flash
 - image
 - creating in RDM 216
 - types 218
 - task
 - creating 220
 - overview 215
 - running 222
- System/Task Configuration (STC)
 - overview 59
 - RSC qualification error messages 182
- SystemNaming.properties file 198
- systems
 - description 3
 - management console 3
 - management server 3
 - qualification 63
 - remote deployment servers 3

- systems *(continued)*
 - target system 3

T

- target systems
 - description 3
 - qualification 63
- task folder
 - overview 27
- tasks
 - CMOS Update
 - creating 85
 - overview 79
 - creating 16
 - Custom
 - creating 91
 - overview 91
 - exporting 71
 - Get Donor
 - overview 99
 - importing 73, 75
 - Linux Native Install
 - overview 111
 - running 136
 - predefined
 - list of 16
 - properties
 - command list 19
 - general 18
 - task folder 27
 - user parameters 22
 - RAID Clone Configuration
 - creating 158
 - overview 149
 - RAID configuration file 149
 - RAID Custom Configuration
 - creating 162
 - Express RAID Configuration 161
 - overview 161
 - running 11
- Scan
 - automatic naming 197, 198
 - Basic Scan 191
 - creating 192
 - default 41
 - overview 191
 - user prompts 193
- Script
 - creating 206
 - overview 205
 - qualification 205
- Secure Data Disposal
 - creating 211
 - Level-1 Limited Partition Removal 209
 - Level-2 1-Overwrite Security 209
 - Level-3 4-Overwrite DOD Security 210
 - Level-4 7-Overwrite DOD Security 210
 - overview 209
- status icons 11
- status icons, clearing 11

- tasks *(continued)*
 - System Firmware Flash
 - creating 220
 - overview 215
 - running 222
 - VMware Native Install
 - configuring 230
 - creating 223
 - overview 223
 - running 232
 - Windows Clone Install 233
- templates
 - notebooks 17
 - overview 9, 15
 - parameter values 17
 - property sheets 17
- treboot.exe 329
- tshudwn.exe 329

U

- unzip.exe 329
- user parameters
 - deleting 26
 - editing 26
 - overview 22
 - removing 23
- utilities
 - Asset ID
 - aiaread.exe 311
 - aiawrite.exe 313
 - command-line syntax 283
 - D-Server configuration 315
 - DOS
 - dynaload 284
 - fdisk.com 284
 - fdisk32.exe 286
 - format.com 287
 - format32.com 289
 - list of 283
 - mem.exe 291
 - general
 - appsinst.exe 314, 329
 - bootini.com 314
 - bstrap.0 317
 - cleanup.exe 314
 - deditd.exe 314
 - getvol.exe 315
 - lccm.1 317
 - lccustom.exe 315
 - lcips.dos 318
 - lcreboot.exe 318
 - makepqs.com 319
 - mergeini.exe 319
 - mftfp.exe 319
 - poweroff.com 320
 - prepdsks.exe 320
 - raidcfg.exe 320
 - ramdisk2 320
 - rave.exe 321
 - rdagent.exe 321

- utilities *(continued)*
 - general *(continued)*
 - redirect.exe 322
 - scan.exe 323
 - scrub3.exe 323
 - treboot.exe 329
 - tshudwn.exe 329
 - unzip.exe 329
 - miscellaneous
 - bmgr.exe 284
 - bpdisk.exe 291
 - fsid.com 290
 - idewc.exe 293
 - list of 291
 - Power Restore
 - createpr.com 294
 - getramd.exe 294
 - macsubst.exe 294
 - parttool.com 295
 - pr.exe 298
 - prerr.com 299
 - prsource.exe 299
 - reboot.com 299
 - seterror.com 299
 - RAID configuration
 - acu.exe 308
 - acuichsv.exe 309
 - cfg1030.exe 300
 - hypercfg.exe 302
 - ipssendl.exe 303
 - list of 300
 - raidset.exe 306
 - Symantec
 - list of 330
 - pqaccd.exe 330
 - pqidplyz.exe 330

V

- virtual diskette drive A 5
- VMware Native Install
 - image 223
 - task
 - qualification 65
 - tasks
 - configuring 230
 - creating 223
 - overview 223
 - running 232

W

- Wake on LAN 5
- Web site
 - IBM Director 4.20 xvii
 - IBM RDM resources xvii
 - IBM Redbooks xvii
 - IBM Remote Deployment Manager xvii
 - IBM Remote Deployment Manager 4.20
 - publications xvi
 - IBM ServerGuide xvii

Web site *(continued)*

IBM ServerGuide Scripting Toolkit xvii

IBM ServerProven xvii

IBM Support xviii

IBM Systems Management Software xviii

IBM UpdateXpress xvii

IBM xSeries Systems Management xviii

WfM (Wired for Management) 4

Windows

device drivers 355

Windows Clone Install

answer file 246

definition 233

donor image 233

qualification 65

Windows Native Install task

device drivers 263

qualification 65

Wired for Management (WfM) 4

X

X Window System, configuring 130, 137



Part Number: 90P2894

Printed in USA

(1P) P/N: 90P2894

