HP OpenView OS Manager Using Radia

for the Windows operating system

Software Version: 2.0

User's Guide

Manufacturing Part Number: T3424-90107

August 2005

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Revisions

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The following indicates changes for version 2.0 made to this document since the last released edition.

New and Changed Features

General

Updated requirements such as version numbers.

Corrections and minor edits

Chapter 1:
Introduction

Updated Required Infrastructure information.

Chapter 2:
Installing and Configuring the Server Architecture

- Updated information on Multicast. The Radia OS Manager 2.0 supports guaranteed delivery multicast so that you can rollout large numbers of OS images concurrently with greatly improved performance over previous releases.
- Added note Spanned images are not supported with Multicast.
- Modified Updating the Configuration Server and Database on page 44.

Chapter 3:
Installing and Configuring the Image Preparation Architecture

- Removed Creating Linux OS Images
- Added note about Fedora Core screen that appears.

Chapter 4:
Publishing to the Radia Database

- Expanded note that discusses how each Sysprep can be connected to only one OS service.

Chapter 7:
About OS Manager Support for HP Blades

- Added new chapter.

Chapter 8:
Advanced Features

- Added information about Client Operations Profiles
- Replaced Miramar with OV Settings Migration Manager's

Appendix C:
Using Dynamic Maintenance

- Note: Removed Appendix C that was in previous documents
- Added appendix about dynamic maintenance.

Appendix D:
Storing Multiple Logs

- New appendix about how to store multiple logs for a machine.

Contents

1 Introduction

The Radia OS Manager provides the ability to use Radia policy-driven, real-time, state-based management to deploy and configure operating systems (OSs). Use the Radia OS Manager to build machines from a bare-metal state or to replace existing OSs, while applying service packs, patches, hot fixes, applications, and other Radia-managed content, and maintain the devices in-state according to policy. Radia OS Manager ensures the installation of the appropriate operating system based upon the targeted device's capabilities. For example, an image built for a computer with an ACPI BIOS will not be delivered to a computer that lacks an ACPI BIOS.

What the Radia OS Manager does

Radia OS Manager creates cloned files of operating systems that you have built on a reference machine or uses the native install media of the operating system. The appropriate operating system for a particular target device is determined by policy. Radia OS Manager provides multi-criteria policy resolution - the capability of determining the desired state of a managed device - based upon more than one characteristic of that device. Multi-criteria policy resolution allows setting policy to mandate a device's operating system, application portfolio and other managed content based upon:

- An asset tag or other unique identifier imbedded in the device's BIOS
- The network segment the device is connected to
- The manufacture of the device
- The model of the device
- The role of the device plays in your IT infrastructure

Criteria are extensible – you can add to this list.

Benefits of the Radia OS Manager:

- Fully integrated component of the Radia Management Suite, which reduces the learning curve for your administrators.

- Improved speed and reliability of OS deployment with automated policy-based management.
- Increased service levels by maintaining OSs in the right configuration through desired-state automation.
- Reduced IT costs by simplifying and streamlining the OS management process across multiple platforms.

Technology and Components

Radia OS Manager relies upon the industry-standard PXE specification to implement OS management from the pre-execution boot environment. Devices managed by Radia OS Manager must have a network interface card and BIOS that are PXE-compliant. The managed device must be able to boot from a PXE server.

Radia OS Manager consists of the following components:

- **Radia Boot Server** is a Windows-based PXE server and TFTP server.
- **Radia OS Manager Boot Loader (ROMBL)** receives control when the Radia-managed device boots from the network via PXE. It then determines how to continue the boot process. It can either continue to boot to a currently in-state operating system located on the managed device's system drive or it can continue the boot procedure by loading the Radia OS Manager Agent (ROMA) from the Radia Boot Server's TFTP server.
- **Radia OS Manager Agent (ROMA)** is a memory-resident service that ROMBL obtains from the Radia Boot Server TFTP server. It initiates a policy resolution on the Configuration Server through the Radia OS Manager Server, and determines which operating system(s) qualify for installation on the Radia-managed device.
- **Radia OS Manager Server (ROMS)** is a NVDKIT-based web server that communicates with the Configuration Server through TCP/IP. It mediates between the Radia OS Manager and the Configuration Server to resolve policy for the correct operating system(s) for the managed device.
- **Configuration Server** provides policy resolution services to determine the desired state of managed devices. Policy definition can be stored in the Radia Configuration Serve database or in an external policy store. The Configuration Server Database also contains Radia-managed OS packages for operating system images, supporting master boot record

files and partition table files, which have been prepared and published with the Radia OS Manager Image Preparation.

- **Application Manager Client** is the Radia Client that manages service packs, patches, hot fixes, applications and other content. It runs under the operating system booted from the system drive on the Radia-managed device. It works with both Radia OS Manager Boot Loader (ROMBL) and Radia OS Manager Agent (ROMA) to enable management of the operating system by the Radia administrator, according to policy.
- **Proxy Server** is a NVDKIT-based web server that serves the data associated with the Radia OS service to the Radia OS Manager Agent, to install an operating system on a managed device. Proxy Servers can be strategically located within your network infrastructure to optimize Radia's bandwidth utilization.
- **Management Portal** provides the administrative user interface in a web browser for Radia OS Manager. It also stores the status of the operating system for the devices in your environment.
- **Image Preparation Wizard** prepares a reference image for cloning. It inventories the hardware and BIOS and runs Microsoft Sysprep on the reference device. Microsoft Sysprep utility is required to prepare the gold image for cloning.
- **Radia Native Install** prepares an operating system using the standard vendor-provided method.

Supported Operating Systems

The Radia OS Manager components are supported on the following Windows operating systems:

- Windows 2000 Professional, Windows 2000 Server, and Windows 2000 Advanced Server.
- Windows XP Professional.
- Windows Server 2003 Standard Edition and Windows Server 2003 Enterprise Edition.

Required Infrastructure

- Configuration Server 4.5.4 SP 5.
- Radia Client 4.0.1.

- Management Portal 2. 1.
- Administrator Workstation.
- Proxy Server.

Terminology

You should be familiar with the following terms that pertain to OS management.

bare metal machine

A machine that does not have a local OS installed.

device object

An object stored in the Radia Management Portal Zone that contains information about a target machine.

discovery

The process that occurs when a target machine boots and communicates with the Radia Infrastructure. This process determines whether a DEVICE object exists.

gold image

A snapshot of an installed operating system, created with the Radia Image Preparation Wizard. You will use the Radia OS Manager to deploy a clone of a gold image to qualifying target machines.

Local Service Boot (LSB) service

A typical Radia service (LSB) is stored in the PRIMARY.OS.ZSERVICE that is deployed to a Radia Client. This service *must* be deployed to target machines that will use Local Service Boot for OS management.

native install

An installation in which an OS is set up using the standard vendor-provided method. For example, for Windows, this means that the setup program from the Windows distribution media is used to perform the installation. This type of installation can be completely unattended, using `unattend.txt` to respond to the setup program.

OS state

The actual state of the OS, such as invalid, installed, or desired.

Radia OS Connect

A ROM Client Connect that is performed for the Radia OS Manager. The Dname parameter in the Run Once command must be set to OS to specify that this connection is being performed for the Radia OS Manager.

Radia OS Management Agent (ROMA)

A memory-resident Linux-based service, installed on the client from the boot Server that initiates policy resolution.

Radia OS Manager Boot Loader (ROMBL)

Is stored on the target machine and determines whether to boot to an in-state OS located on the system drive, or to load the Radia OS Management Agent onto the target machine.

Radia-managed machine

A machine recognized and managed by the Radia OS Manager. This machine is considered ROM-aware.

reference machine

A workstation or server used to build the OS image to be cloned.

Rombl.cfg

A file installed on the target machine that indicates that the device is under OS management.

ROM-aware Client

The Radia OS Client that has been updated so that your target machines work properly with the Radia OS Manager.

target machine

A workstation or server on which you want to install, replace, or update an OS.

unmanaged OS

A target machine that has been discovered by the Radia OS Manager, but policy has not assigned an OS for the target machine, or policy *is* assigned, however you are not ready to overwrite the existing OS. The current OS for the machine is considered unmanaged.

_UNMANAGED_OS_ is also the name of the service in OS.ZSERVICE that is installed by the RAM Client on the target machine.

About the Product Architecture

Radia OS Manager uses several tools to prepare operating system images and then a group of Radia servers to deploy these images to target machines. Its architecture can be divided into two areas – image preparation and image deployment.

Image Preparation Architecture

Before preparing an image, you must determine how you want to create the image of your OS. HP provides two tools from which to choose.

Image Preparation Wizard
Use the Image Preparation Wizard to prepare a gold image on the reference machine. When you run the wizard, it creates an image that is sent to the Radia OS Manager \upload directory. Then, you can use the Publisher on your administrator machine to promote the image to the Radia Database.

OR

Radia Native Install Packager
Use the Radia Native Install Packager to create an image of a Windows OS on a drive on the reference machine. The resulting image has completed the file copy phase of a Windows installation and contains the Application Manager client. The image is sent to the Radia OS Manager \upload directory and you can use the Publisher to promote the image to the Radia Database.

See Installing and Configuring the Image Preparation Architecture on page **63**

Then, you can use the Publisher to store the image in the Radia Database.

Publisher
Use the Publisher to store the gold image and its associated files in the Radia Database. You can also use the Publisher to publish other files, such as override Sysprep.inf files or unattend.txt files, to the SYSPREP class in the Radia Database. See Publishing to the Radia Database starting on page 99 for details.

After publishing the image, you can prepare to deploy the image to your target machines.

Image Deployment Server Architecture

The Radia OS Manager deployment architecture involves a set of servers designed to manage and deploy OSs to a set of target machines based on a set of criteria. Typically, you will need three server machines. During deployment, the following server components are used:

Machine 1

- DHCP Server
  The target machine uses a DHCP server to obtain an IP address. You can easily implement Radia OS Manager in an existing DHCP-enabled network. There is no need to install additional DHCP servers.

Machine 2 Static IP address

- Radia OS Manager Server
  The Radia OS Manager Server sends requests for images from the target machine to the Configuration Server.
- Configuration Server
  The Configuration Server manages the policy information and images for Radia OS Manager. See the *Configuration Server Guide* on the HP OpenView support web site. The Radia Database must be updated, as described in this document, to accommodate Radia OS Manager.
- Proxy Server
  The Proxy Server is a web server used as a local repository for the gold image. The Proxy Server handles the heavy lifting for transferring gold images to targeted machines. Proxy Servers should be placed and sized to accommodate high volume data transfer. This is consistent with standard Proxy Server recommendations. Where appropriate, separate Proxy Servers may be used for applications and OS file serving. See the *Proxy Server Guide* on the HP OpenView support web site.
- Management Portal.
  This provides a graphical user interface for performing OS management tasks. For general information on how to use Management Portal refer to the *HP-OpenView Management Portal Using Radia, Version 2.1 for Windows*.

You can also install the Publisher on this machine.

Machine 3

- Boot Server (PXE/TFTP servers)
  The Boot Server is a Windows-based PXE (Pre-execution environment) server and TFTP (Trivial File Transfer Protocol) server. Do not install the Boot Server on the same machine as your DHCP server. See *About the Boot Server* on page 39.

  For information about PXE industry standards, see

  http://pxes.sourceforge.net/pxe.html

The following diagram illustrates the deployment architecture.

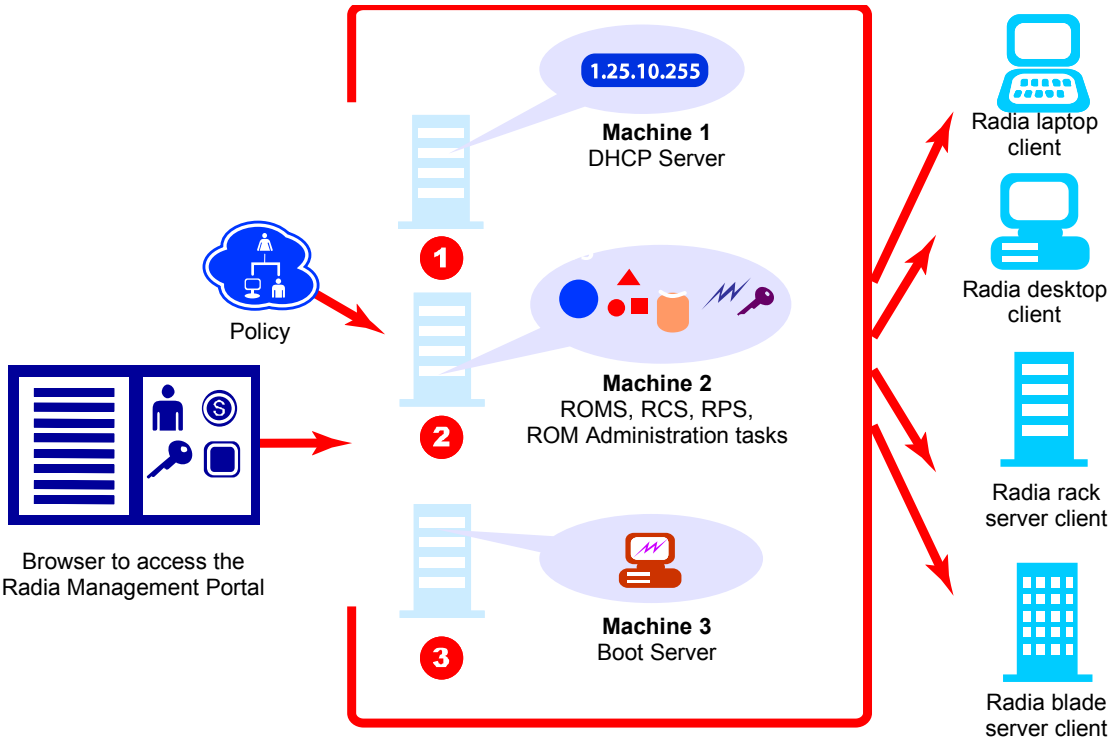


Figure 1: Deployment architecture

Using the Radia OS Manager

Below is a simple, high-level description of how you will use the Radia OS Manager to deploy OSs.

- Decide whether you will use the Radia Image Preparation Wizard to create a gold image or the Radia Native Install Packager to prepare the image.
- If you are going to use the Radia Image Preparation Wizard to create a gold image, install an OS and Radia Client on the reference machine and perform any necessary customizations.
- Once you have an image, it is stored on your Radia OS Manager Server.
- Use the Publisher to publish the image files from the Radia OS Manager Server to the Radia Database.
- Use the Radia OS Manager Server with the Management Portal to perform administrative tasks and define policy in preparation for deploying gold images to your target machines.
- After deploying images to the target machines, use the Radia OS Manager Server with the Management Portal to review the state of your OS deployment.

2 Installing and Configuring the Server Architecture

This chapter describes how to install and configure the various components for operating system (OS) management.

It is helpful to have your license strings accessible.

We suggest that you do the installation in the following order:

1. Install the Radia OS Manager Server.
2. Install the Radia Boot Server.
3. Update the Configuration Server and Database.
   - Version 4.5.4 SP 5 or higher of the Configuration Server.
   - Version 4.1 or higher of the Radia Database.
4. Configure the Management Portal version 2.1.
5. Configure the Proxy Server.
6. Configure the Radia OS Manager Administration to interface with the Management Portal.

Check the HP OpenView support web site for product updates and release notes.

About the Radia OS Manager Server (ROMS)

The machine that hosts the Radia OS Manager Server must have connectivity to the Configuration Server. The Radia OS Manager Server handles requests for OS images obtained from the Configuration Server.

Radia OS Manager Server performs low volume exchange with the Radia OS Management Agent (ROMA) and the Radia OS Manager Boot Loader (ROMBL).

Radia OS Management Agent (ROMA)
The Radia OS Management Agent (ROMA) is a memory-resident Linux-based service, installed on the Boot Server that initiates policy resolution.

Radia OS Manager Boot Loader (ROMBL)
The Radia OS Manager Boot Loader (ROMBL determines whether to boot to an in-state OS located on the system drive, or to load the Radia OS Management Agent onto the target machine.

Every time a target machine boots, the Radia OS Manager Boot Loader (ROMBL) connects with the Radia OS Manager Server, which then accesses the Radia Management Portal Zone to verify that the DEVICE exists. In cases of policy changes or OS reinstall, ROMBL will load ROMA, which will perform resolution and manage the operating system.

The Radia OS Manager Server is capable of handling large numbers of client devices with modest requirements for disk space and memory. It is well suited to be co-resident with the Proxy Server. Radia OS Manager Server is also the initial repository for client logs reflecting boot time

We recommend that you install the Radia OS Manager Server on a separate machine from where your Management Portal resides.

System Requirements

- Static IP address.

Installing the Radia OS Manager Server

This section provides instructions for installing the Radia OS Manager Server. Later, you must configure the Radia OS Manager Administration to interface with the Management Portal so that you can complete ROM

administrative tasks. See Configuring the Management Portal for ROMS on page 49.

To install the Radia OS Manager Server

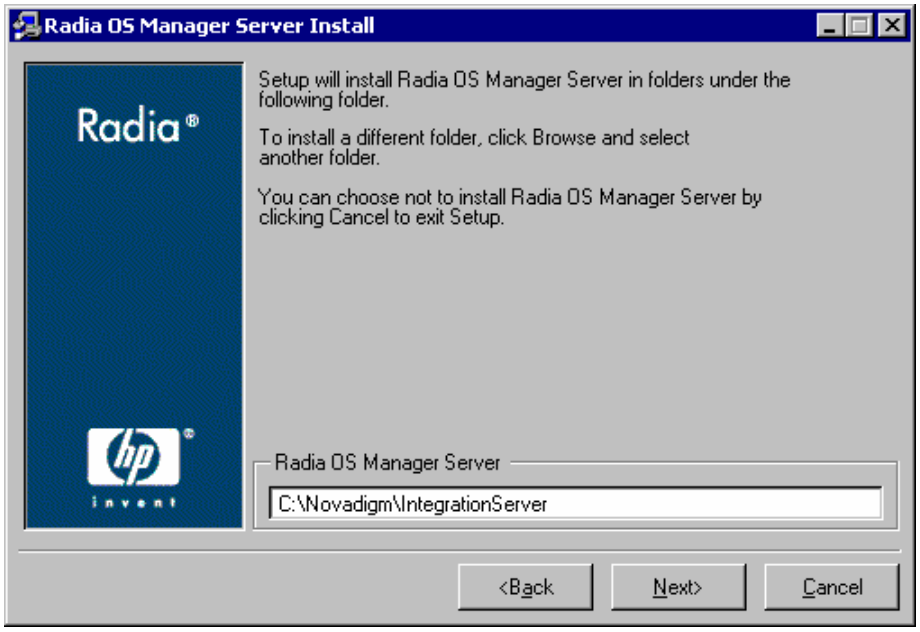
1 From the Radia OS Manager CD-ROM, go to `\os_manager_server\win32`.

2 Double-click **setup.exe**.

The Welcome to Radia OS Manager Server Setup window opens.

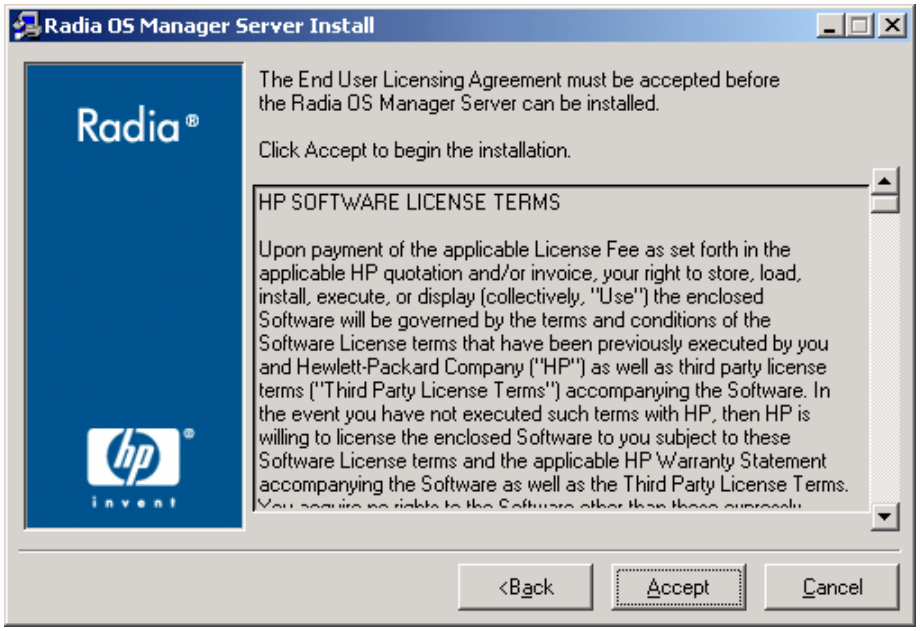
3 Click **Next**.

The Installation Directory window opens.



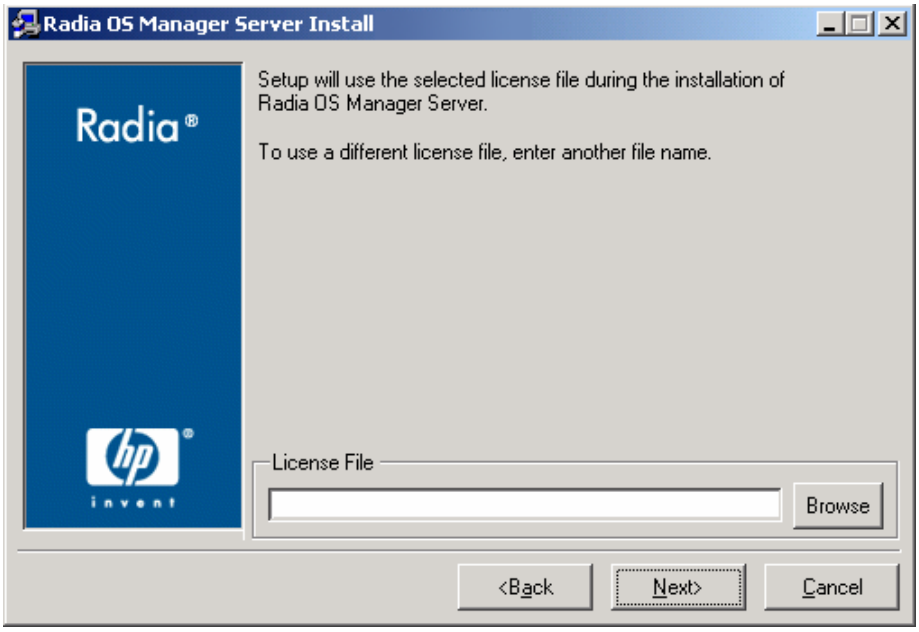
4 Click **Next**.

The End User Licensing Agreement window opens.



5 Click **Accept**.

The License File window opens.



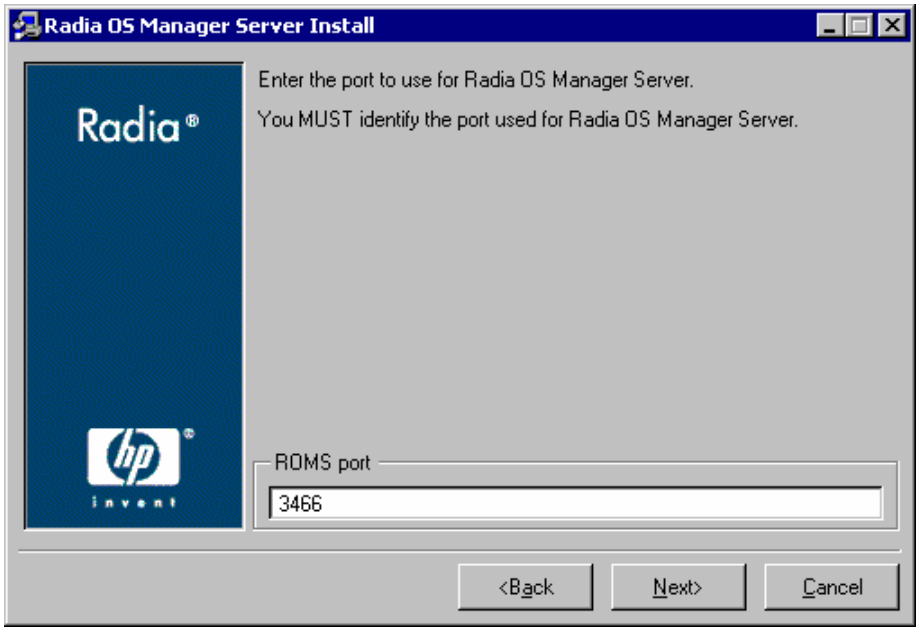
6 Click **Browse** to navigate to your license file.

The license file is installed in `\Novadigm\IntegrationServer\modules`.

To check that your license string is valid, open the Radia Integration Server `httpd-port.log` and search for "License is expired". If you find this string, you must update your license file. See Radia OS Manager Server Logs on page 193 for information about this log.

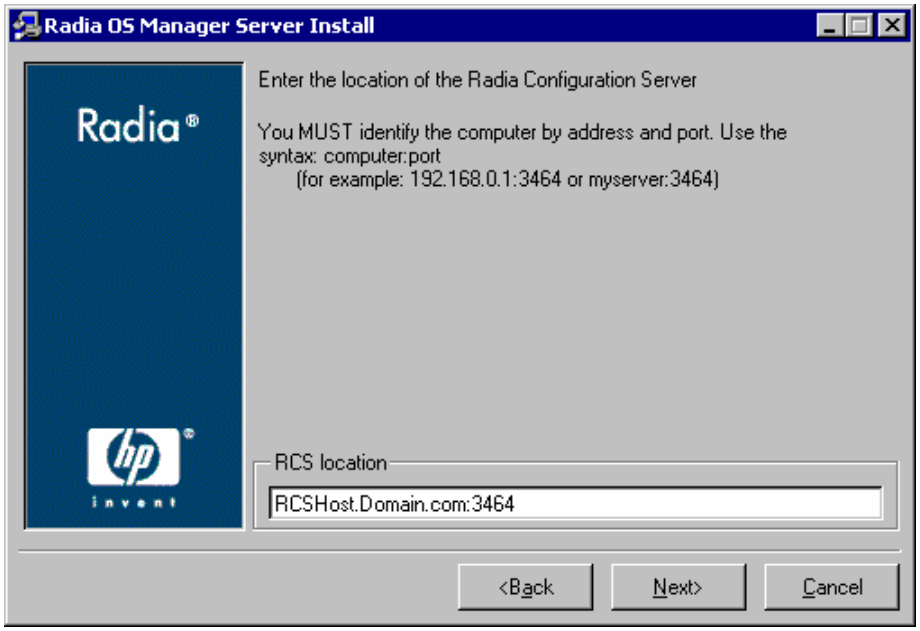
7 Click **Next**.

The Radia OS Manager Server Port window opens.



8 Click **Next**.

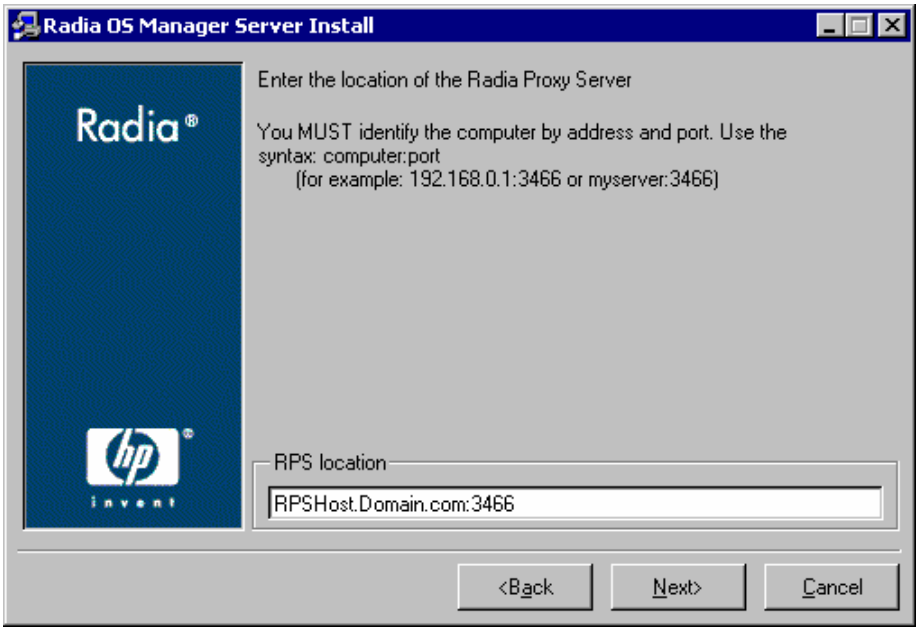
The Configuration Server Location window opens.



9 Specify the address and port for the Configuration Server. You may include the company name and domain, but it is not required.

10 Click **Next**.

The Proxy Server Location window opens.



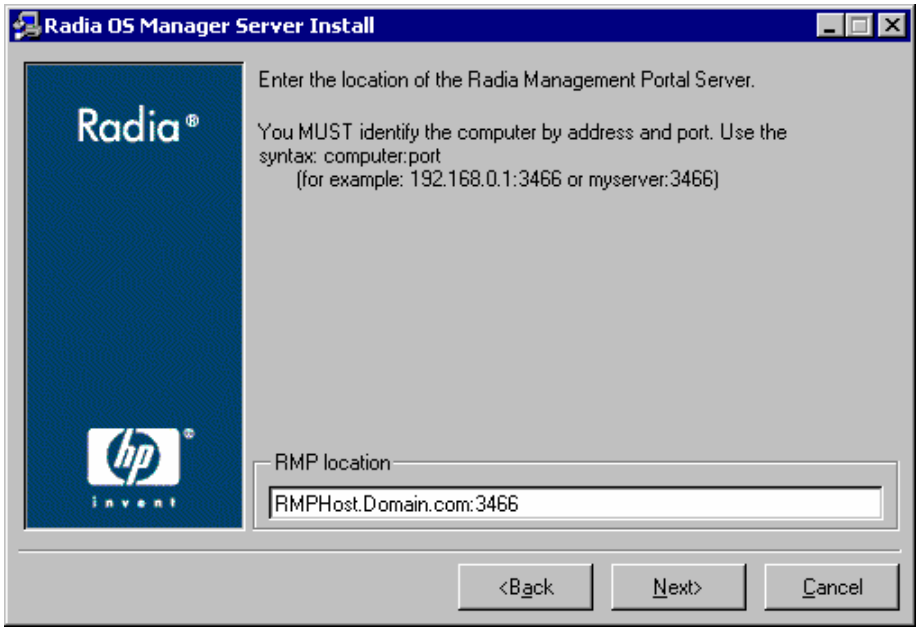
11 Specify the address and port for the Proxy Server. You may include the company name and domain, but it is not required.

The Proxy Server can be co-located with the Configuration Server. Refer to the *Proxy Server Guide* for more information about installing this server and how to co-locate it with the Configuration Server.

You cannot type localhost or 127.0.0.1 in this field, because the target machine will be unable to locate the appropriate server.

12 Click **Next**.

The RMP Server Location window opens.

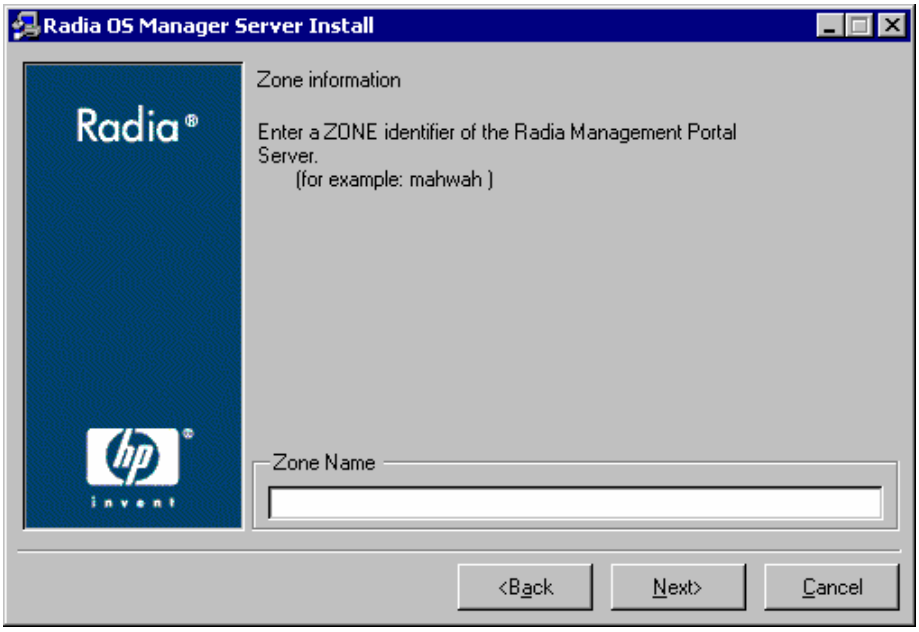


13 Specify the address and port number for the Management Portal. You may include the company name and domain, but it is not required.

This server should be on a separate machine.

14 Click **Next**.

The Management Portal Zone Name window opens.



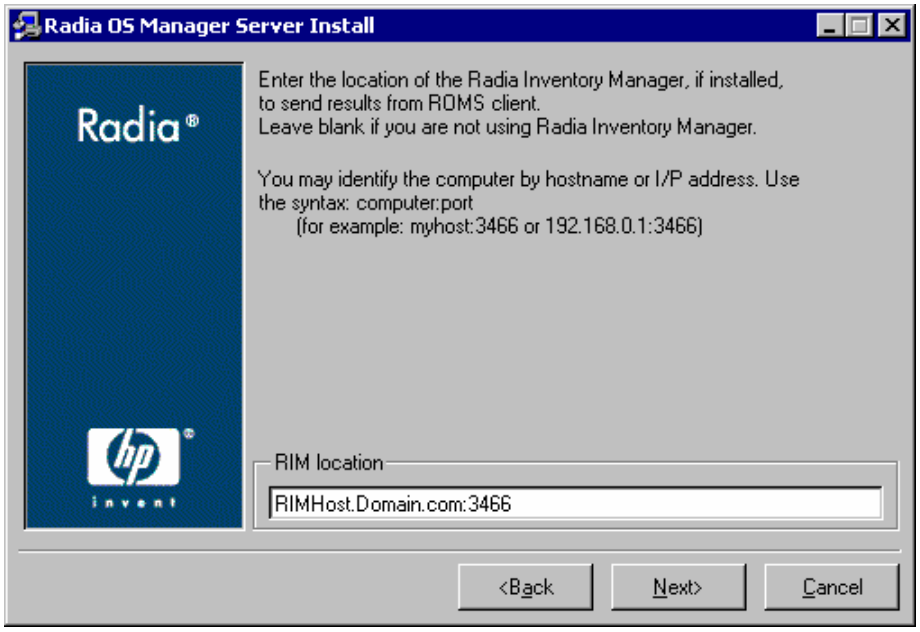
15 Type the name of the Management Portal Zone. Enter a Zone Name up to 64 characters long. Use only letters (a-z and A-Z), numbers (0-9) and the space character. Do not use special characters, such as underscores, commas, or periods.

16 See the *Management Portal Guide* for information about zones.

Note the name of the Management Portal Zone that you enter in this dialog box because you will need to enter this value for the DSML_Zone as "`cn=zone name, cn=radia`" in `edmprof.dat` when you configure the Management Portal Server.

17 Click **Next**.

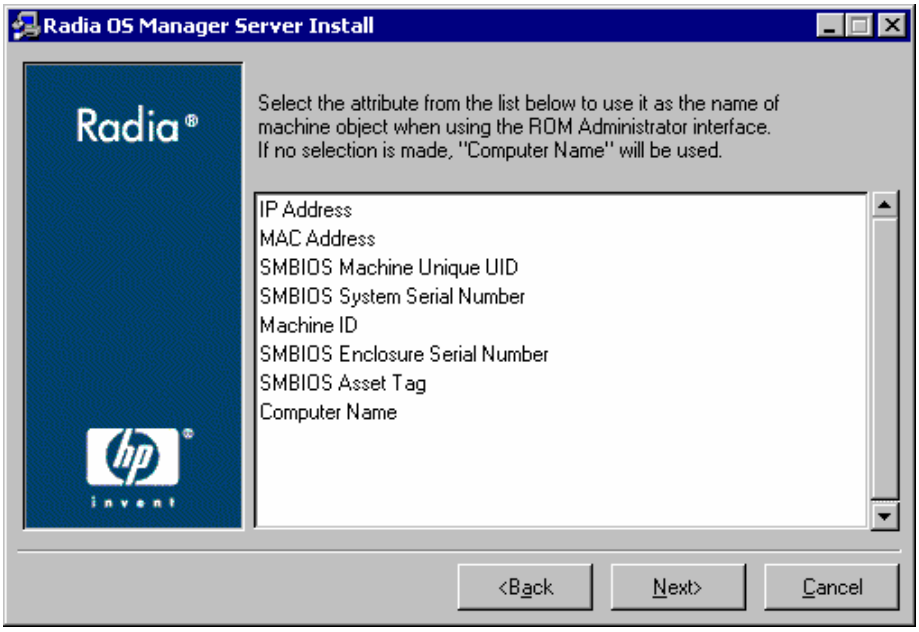
The RIM Location window opens.



18 Specify the address and port number for the Inventory Manager. If you are not using a RIM Server, you can leave this entry blank.

19 Click **Next**.

The Select Attribute window opens.



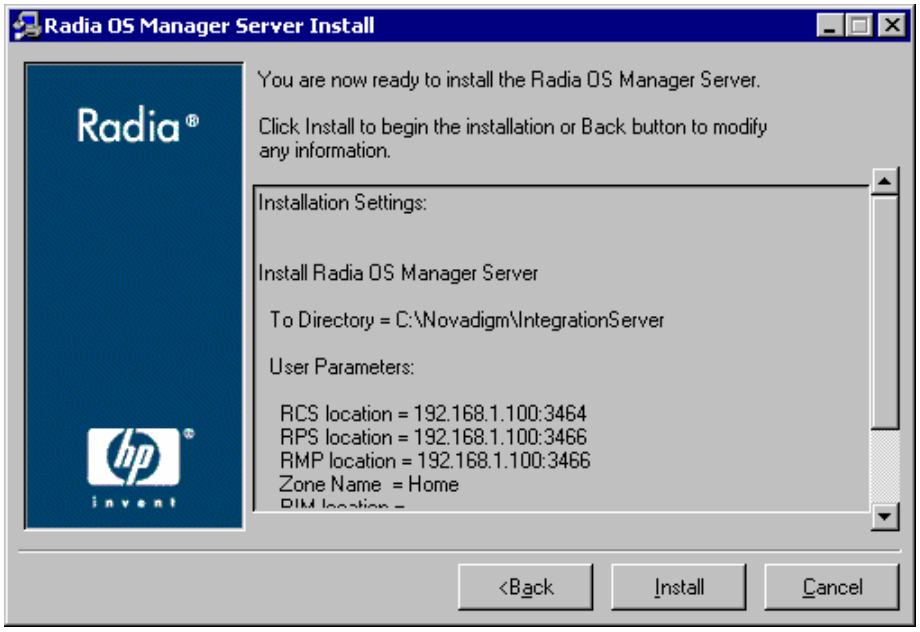
20 Select an attribute to be used to name the machine object. If you do not make a selection, the default attribute, Computer Name, will be used. This name appears in the Management Portal.

If, during a Radia OS Manager Server installation, you select one of the SMBIOS parameters (see the figure above) for the MACHINE object display, these values may not be present or unique on all machines.

- If the value is not present, the machine ID will be used.
- If the value is not unique, multiple machines will be displayed with the same name.

21 Click **Next**.

The Summary window opens.



22 Click **Install** to begin the installation.

23 Click **Finish** when the installation is finished.

About the Boot Server

The Boot Server is the Windows-based PXE (Pre-execution environment) and TFTP (Trivial File Transfer Protocol) server for the Radia OS Manager environment. Note that the TFTP daemon is run in secure mode.

PXE uses DHCP broadcast, multicast, or UDP protocols and receives broadcasts. This means that if broadcast traffic is restricted between subnets, you must place PXE severs in each subnet, enable broadcasts (which may not be an option), or use a DHCP helper function to pass DHCP broadcast traffic. This situation is similar to that of standard DHCP servers and is probably well understood by your network administrator.

The PXE server is a low volume server. The TFTP server volume is slightly higher, but should only be transferring the Radia OS Manager Boot Loader (ROMBL) (less than 64 KB) on every target machine boot and the intermediate Linux OS (approximately 11 MB) *only* when a state change is required (i.e., initial discovery, installation, or change of OS). This transfer will *not* occur for machines in desired state. Therefore, a few strategically placed PXE/TFTP servers should be able to support many clients. They should be accessible, however, on a relatively high-speed connection.

Do *not* configure your DHCP server to preclude the use of the Boot Server.

System Requirements

- PXE Client version 2.2 or higher is recommended.
- Install the Boot Server on a machine separate from your DHCP server. You must do this because both the PXE server and the DHCP server listen on the same DHCP port by default.
- If you have more than one PXE server in your environment, each server must be on a separate segment and the PXE packets should not pass between segments. You can use the Discover Boot Server utility to determine if there are PXE servers in your environment. See Using the Discover Boot Server Utility on page 203.
- A static IP address for the Boot Server, a static IP address and static port for the ROM server is required. If the ROMS IP address or port is ever changed, then the Boot Server ISVR value and the ISVRPORT value in the Boot Server default file must be updated. The default file is typically located in

SystemDrive:\Novadigm\BootServer\X86PC\UNDI\linux-boot\linux.cfg directory.

- Target machines must contain a PXE-compliant NIC card and be set to boot from the network. To determine whether a machine contains a PXE-compliant NIC card, refer to the card's specifications.

  Enabling PXE in your network environment:

  In some network environments (such as those containing Cisco), the client may fail to PXE boot and you may need to modify the network port configuration. For the Cisco switch, use the following:

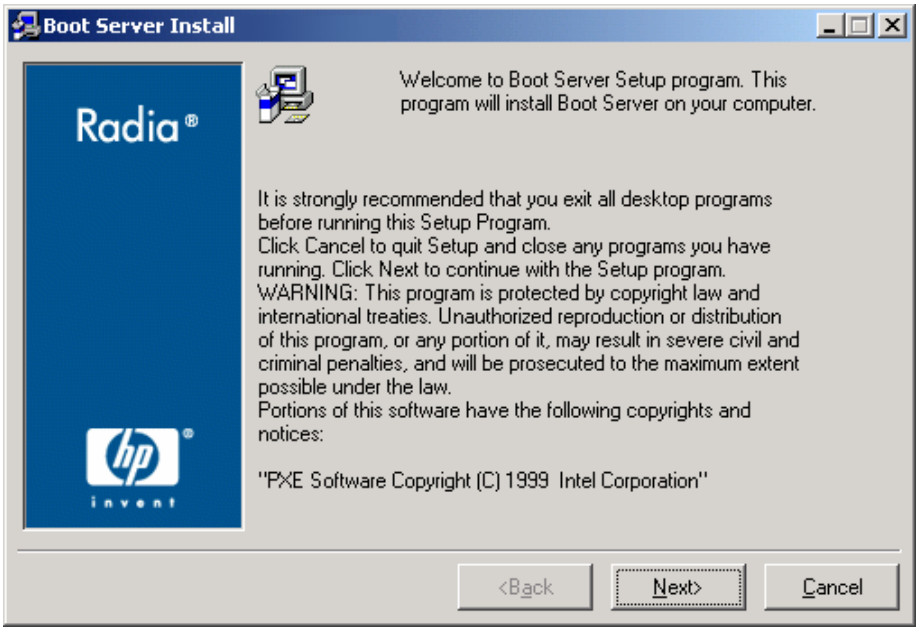
  ```
  set port channel off
  set spantree port fast enable
  ```

  For all other vendors, consult their documentation.

Installing the Boot Server

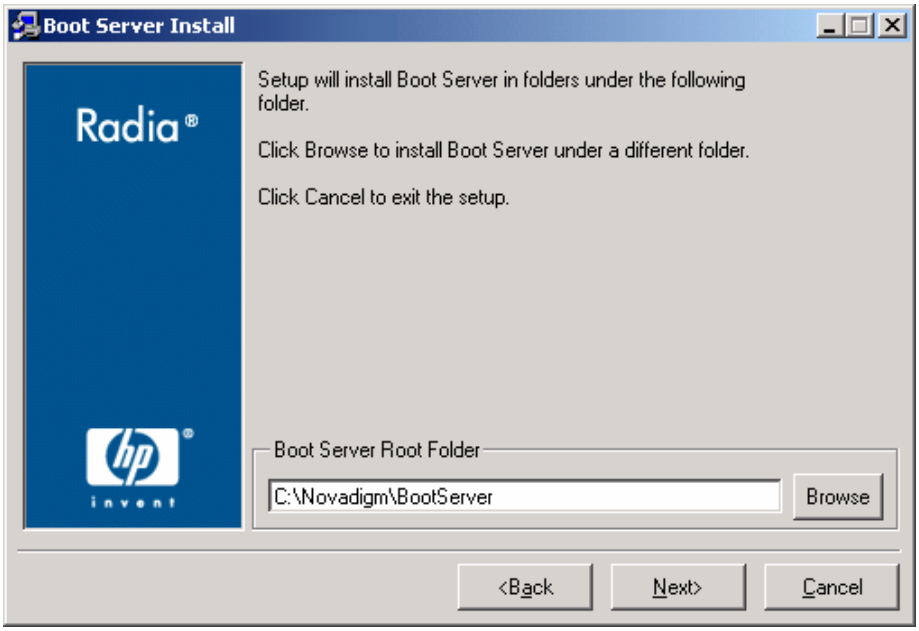
To install the Boot Server

1. On the Radia OS Manager CD-ROM, go to `\boot_server\win32`.
2. Double-click **setup.exe**.
3. The Boot Server Setup window opens.



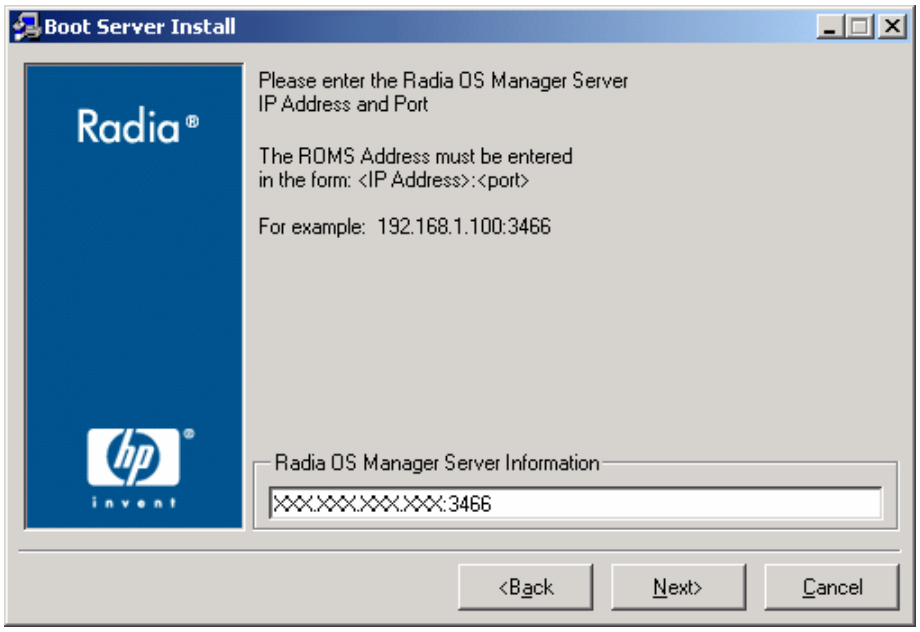
4 Click **Next**.

5 Use the next window to select where you want to install the Boot Server.



6 Click **Next** to accept the default directory of `C:\Novadigm\bootserver`.

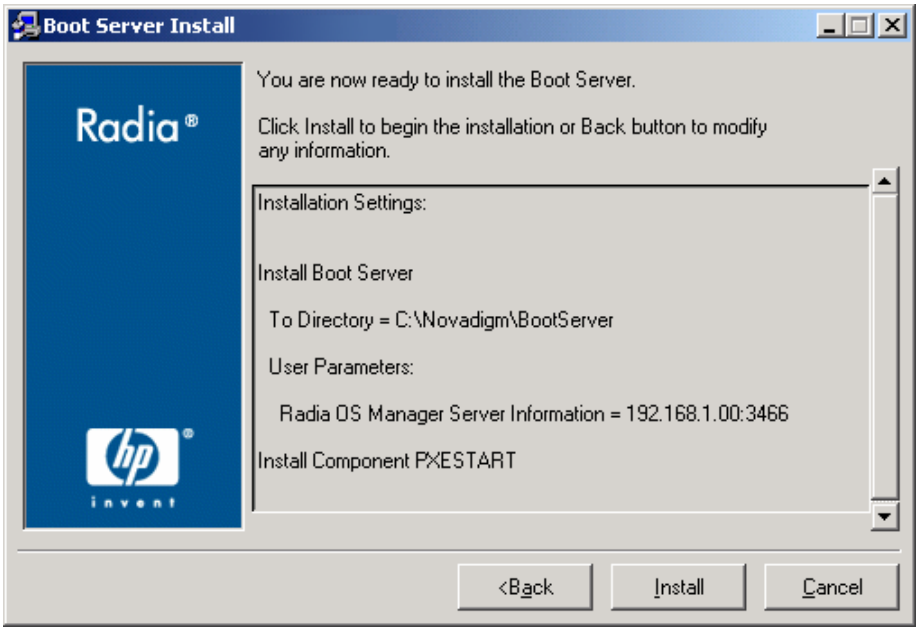
7 Use the next window to specify the IP address and port for the Radia OS Manager Server.



8 Type the IP address and port number for the Radia OS Manager Server. This must be specified in the following format: *xxx.xxx.xxx.xxx*:*port*. You can enter this information even if the ROMS is not yet installed or running. This information is written to a configuration file.

9 Click **Next**.

10 The Summary window opens.



11 Review the installation summary, and then click **Install**.

12 A window opens to indicate that the Boot Server has been successfully installed.

13 Click **Finish**.

If you want to check that the installation was successful:

- Press **CTRL + ALT+ DELETE**, go to Task Manager, and review the list of Processes. `PXE.exe` and `Inetd.exe` should be running.

OR

- Go to the Event Viewer and check the application events. You will see when the process starts. Entries for problems will appear soon after the event starts.

Updating the Configuration Server and Database

Prior to making these changes review them with your Solution Architect to ensure that the changes will not impact your Radia environment's customization.

To use the Radia OS Manager Server, you must update your Configuration Server and Database. When you update your Radia Database, the Local Service Boot (LSB) instance (located in PRIMARY.OS.ZSERVICE) can be used as an alternate method (to PXE) used to determine what OS is on a managed machine. See About Local Service Boot on page 169.

Before you begin the update, make sure you have the following items installed.

- Version 4.5.4 SP 5 or higher of the Configuration Server.
- Version 4.1 or higher of the Radia Database.

To check the version of your Radia Database, use the System Explorer to view the PRIMARY.SYSTEM.DBVER class. The DBVER attribute specifies the current version of your database. See the *Database Reference Manual*.

To check the version of your Configuration Server, go to the bin directory and open `version.nvd`.

For more information about the Configuration Server and the Radia Database, see the *Configuration Server Guide*.

To update the Configuration Server and Database

1. Stop the Configuration Server service.

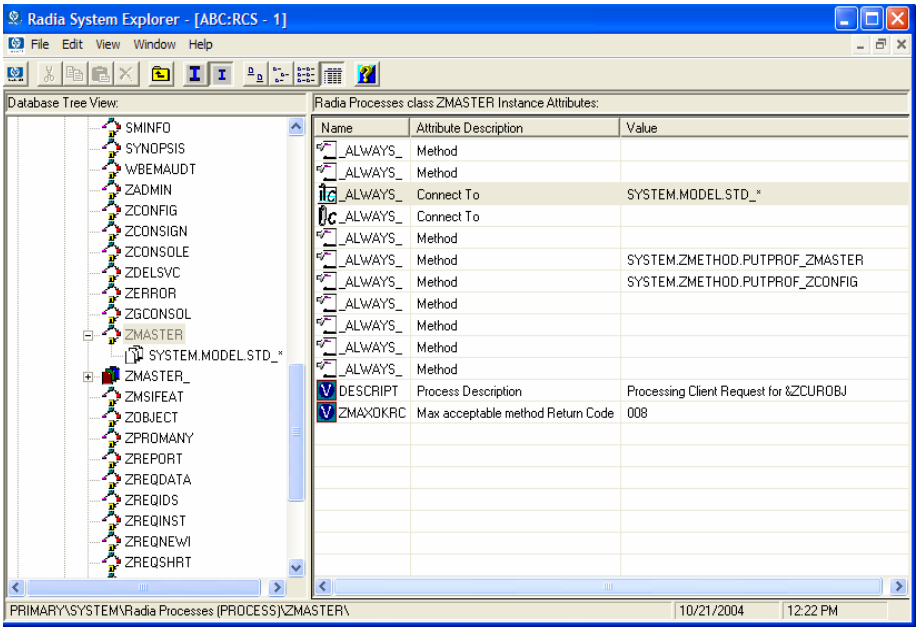
   We recommend backing up your Radia Database before importing new classes.

2. From the Radia OS Manager CD-ROM, go to `\configuration_server\database_decks` and copy `LSBIMPORT.CMD` and `ROMCLIMPORT.CMD` to the Configuration Server `bin` directory. The default location is *`SystemDrive`*`:\Novadigm\ConfigurationServer\bin`.
3. If necessary, close the System Explorer.
4. Run `LSBIMPORT.CMD` from the Configuration Server `bin` directory.
5. Run `ROMCLIMPORT.CMD` from the Configuration Server `bin` directory.

6 Restart the Configuration Server service.

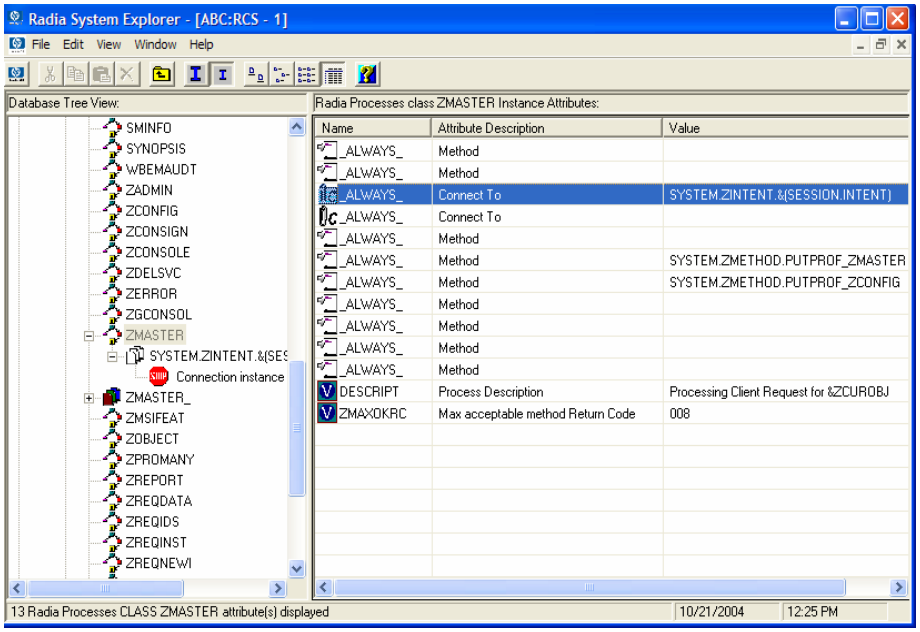
7 You must manually update PRIMARY.SYSTEM.PROCESS.ZMASTER to prevent overwriting any existing connections.

a Use the System Explorer to go to PRIMARY.SYSTEM.PROCESS.ZMASTER and find the connection to **`PRIMARY.POLICY.USER.&(ZMASTER.ZUSERID)`** or **`SYSTEM.MODEL.STD_*`** .



b Replace the connection to `PRIMARY.POLICY.USER.&(ZMASTER.ZUSERID) or SYSTEM.MODEL.STD_*` with the following:

`SYSTEM.ZINTENT.&(SESSION.INTENT)`



Configuring the Management Portal

You must make the following changes to enable the Management Portal.

Be sure that you have the Management Portal 2.1 installed on your machine.

On the machine that houses the Management Portal

1. Stop the Radia Integration Server service.
2. From the Radia OS Manager CD-ROM, copy the files in the`\os_administrator` folder to the`\IntegrationServer\modules` directory. The default location is *`SystemDrive`*`:\Novadigm\IntegrationServer\modules`.
3. Restart the Radia Integration Server service.

Updating the edmprof.dat file

1. Open edmprof.dat in the Configuration Server's bin directory or use the HP Configuration Server Profile Editor.
2. In the [MGR ROM] section
   - Set the **DSML_HOST** to point to your RMP IP address.
   - Set the **DSML_PORT** to point to the RMP port.
   - Change **DSML_ZONE** to the same value that you used when you specified the Management Portal Zone during the Radia OS Manager Server installation. If you want to confirm this value, go to *SystemDrive*:\Novadigm\IntegrationServer\etc, open roms.cfg, and note the value of ZONE.
   - Add **DISPLAYNAME** and set it to the same value as the DISPLAYNAME attribute in *SystemDrive*:\Novadigm \IntegrationServer\etc \roms.cfg. This ensures that the display name for the Machine will be updated when the Radia OS Manager Server interfaces with Management Portal.

```
*-------------------------------------------------------------------*
* Manager Radia OS Manager                                          *
*  DSML_HOST      = Host name or IP address of RMP                  *
*  DSML_PORT      = Port number of RMP                              *
*  DSML_ZONE      = Zone of RMP                                     *
*  DISPLAYNAME    = attribute to use as the machine id display name *
*                                                                   *
*  DSML_ZONE and DISPLAYNAME parameters should match the ZONE and   *
*  DISPLAYNAME parameters in roms.cfg file                          *
*-------------------------------------------------------------------*
[MGR_ROM]
DSML_HOST =  192.168.1.9
DSML_PORT = 3466
DSML_ZONE = cn=Eugene,cn=radia
DISPLAYNAME = Eugene
```

4. Save and close the edmprof.dat file.

About the Proxy Server

The Proxy Server is a web server used to deploy the service containing the gold image to the target machines. The Proxy Server handles the heavy lifting for transferring gold images to target machines. Proxy Servers should be placed and sized to accommodate high volume data transfer. This is consistent with standard Proxy Server recommendations. It is recommended that you pre-load images on the Proxy Server before deploying them to the target machines. Do not download your OS images dynamically because the target machines will experience timeouts indefinitely until the image is downloaded. Where appropriate, separate Proxy Servers may be used for applications and OS file serving.

Refer to the *Proxy Server Guide* for more information about installing this server and how to co-locate it with the Configuration Server.

It is recommended that you install the Proxy Server after installing the Radia OS Manager Server to ensure that the module load statements in the `httpd.rc` file are in the correct order.

If you are prompted to overwrite files during the Proxy Server installation, make sure you choose to keep the latest files.

Configuring the Proxy Server

If you wish to deploy OS images from a Configuration Server, you must co-locate a Proxy Server with the Configuration Server. To do this, make the following changes to the `rps.cfg`, stored by default in *`SystemDrive`*`:\Novadigm\IntegrationServer\etc`:

1. Stop the Radia Integration Server service.
2. Change the -static-type parameter from agent to server.
3. Change the -static-root parameter (which is the source location) to the location of the Radia Database (such as `C:/Novadigm/ConfigurationServer/DB`). Be sure to use forward slashes.
4. Restart the Radia Integration Server service.

These changes are shown in boxes in the excerpt below.

```
rps.cfg example:  (top portion excluded)

rps::init {

    -stager         0
```

```
-stager-port    3461
-stager-trace   0
-httpd          1
-httpd-prefix   "/RESOURCE"
-static-root     "C:/Novadigm/ConfigurationServer/DB"
-static-trace   0
-static-type    server
```

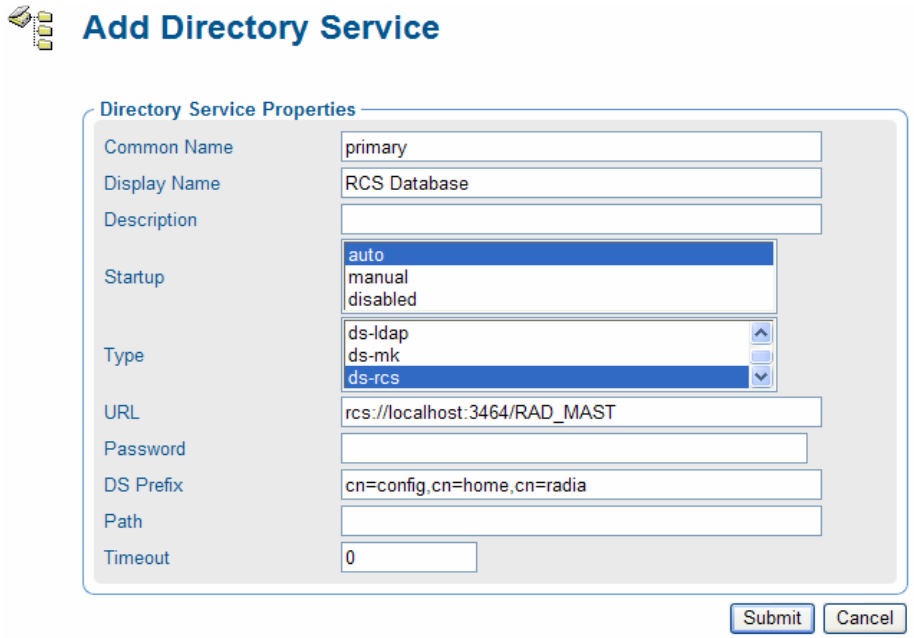
Configuring the Management Portal for ROMS

Adding a Directory Service

If there is not a Configuration Server directory service associated with your Radia Management Portal Zone, then before you can use the Radia OS Manager Administrative tasks, you must add a Configuration Server directory service to your Radia Management Portal Zone. You only have to do this once for your Zone. For detailed information about zones and directory services, see the *Management Portal Guide*.

To add the directory service

1. Open your web browser and go to the Management Portal (`http:// ipaddressORhostname:3466`).
2. Login as the Portal Administrator (by default, the user id is admin and the password is secret).
3. In the workspace, click the appropriate **Zone**.
4. In the workspace, go to **Configuration** and then click **Directory Services**.
5. From the **Model Administration** task group, click **Add Directory Service**.
6. From the **Type** list, select **ds-rcs**.



7 In the **URL** text box, change the value of localhost to the IP address of the Configuration Server that you want to use for ROM administration.

8 Click **Submit**.

9 Log out of the Management Portal.

Specifying the Configuration Server for ROM Administration Tasks

After creating a directory service for the Configuration Server, you must specify it as the Configuration Server to be used for ROM administration tasks. You only need to do this once after you have defined the Configuration Server directory service.

To specify the Configuration Server to be used for ROM administration tasks

1 Open your web browser and go to the Management Portal (`http://`*`ipaddressORhostname`*`:3466`).

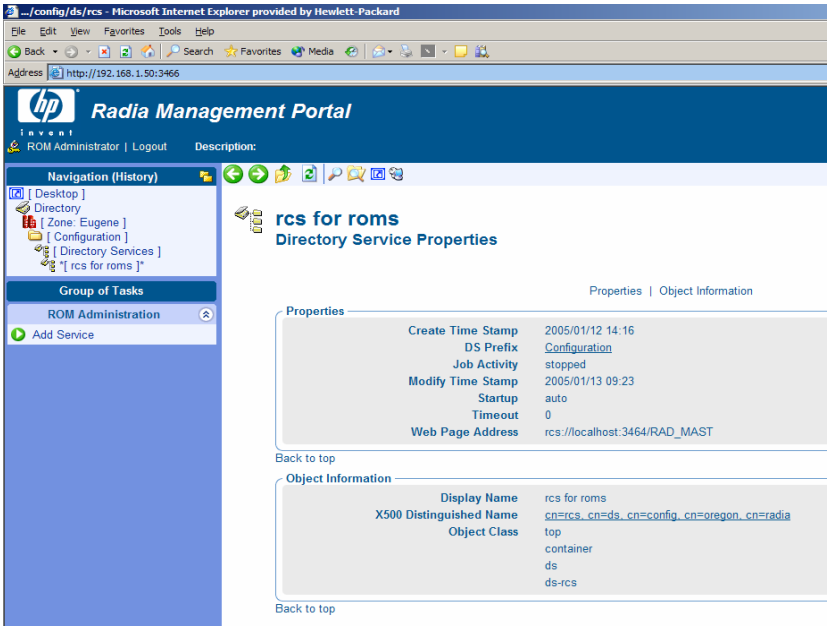
2 Login as the Radia OS Manager Administrator (by default, the user ID is romadmin and the password is secret).

3 In the workspace, click **Zone**.

4 In the workspace, go to Configuration and then click **Directory Services**.

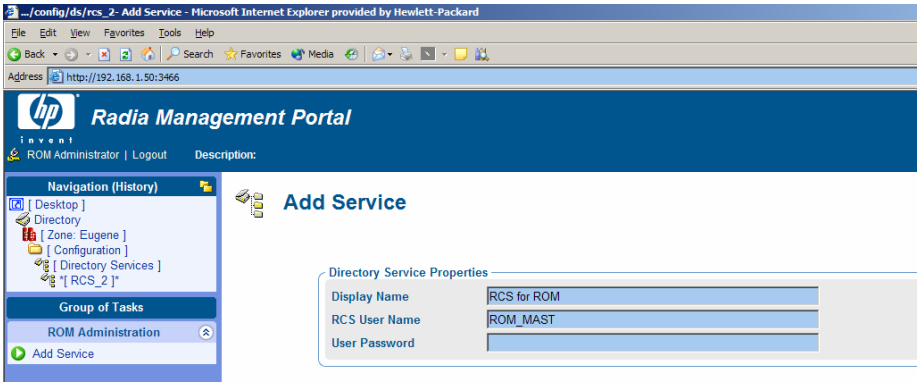
5 Click the Configuration Server Database that you want to use.

The Directory Service Properties window opens.



6 In the **ROM Administration** task group, click **Add Service**.

The Add Service window opens.



10 If necessary, type the User Name and Password for the Radia Database.

The default user is ROM_MAST; a User Name that allows you to log into the Radia Database as a ROM Administrator. This Name provides access to the classes relevant to the Radia OS Manager.

Do not delete the ROM_MAST user.

11 Click **Submit**.

The Radia Database classes appear in the workspace.

Assigning ROM Views to New Users

When adding a new user to ROM, you need to limit what the user can see by assigning the user ROM Views. To create new users see the *Management Portal Guide*. Once the ROM Views are assigned, the appropriate classes for the Radia OS Manager will appear when the user logs in and connects to the Configuration Server.

1 Open your web browser and go to the Management Portal (*http://ipaddressORhostname:3466*).

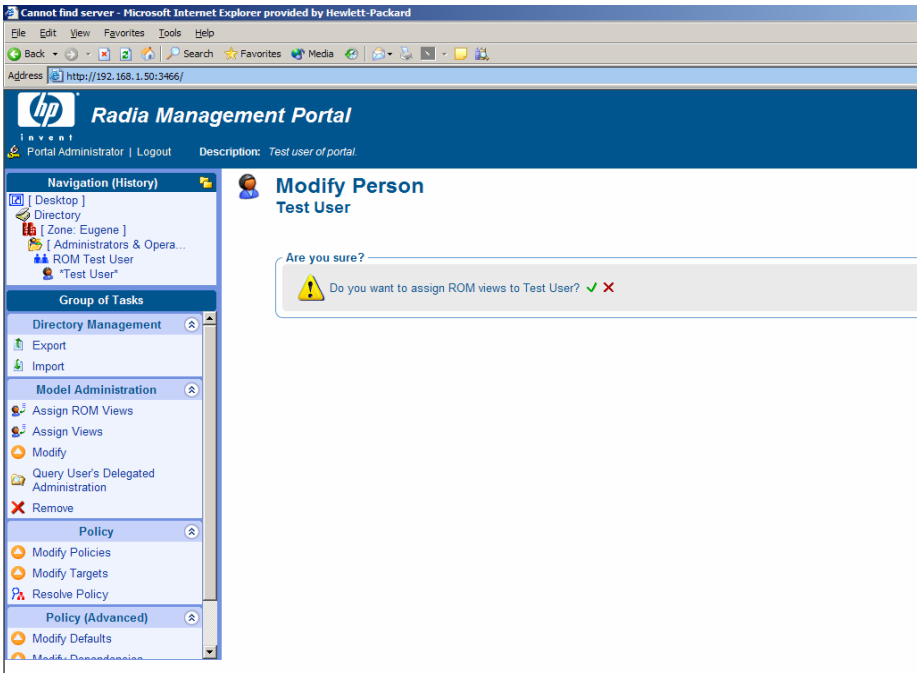
2 Login as the Portal Administrator (by default, the user ID is admin and the password is secret).

3 Click **Administrators and Operators**.

4 Click on the ROM User that you want to assign ROM Views.

5 In the Group of Tasks, click **Assign Rom Views**.

The Modify Person window opens.



6 Click ✓ to confirm that you want to assign ROM Views to this user.

OR

Click ✗ to indicate that you do not want assign ROM Views to this user.

The Properties window opens, showing that the modification is complete.

Configuring the Default Behaviors Instance

You must modify the default Run Once parameter string in the Default Behavior instance to specify the IP address for your Configuration Server. If you do not modify this parameter, your target machine will not be able to successfully run a Radia OS Connect. For more information on the Behaviors class, see Setting Behaviors on page 123.

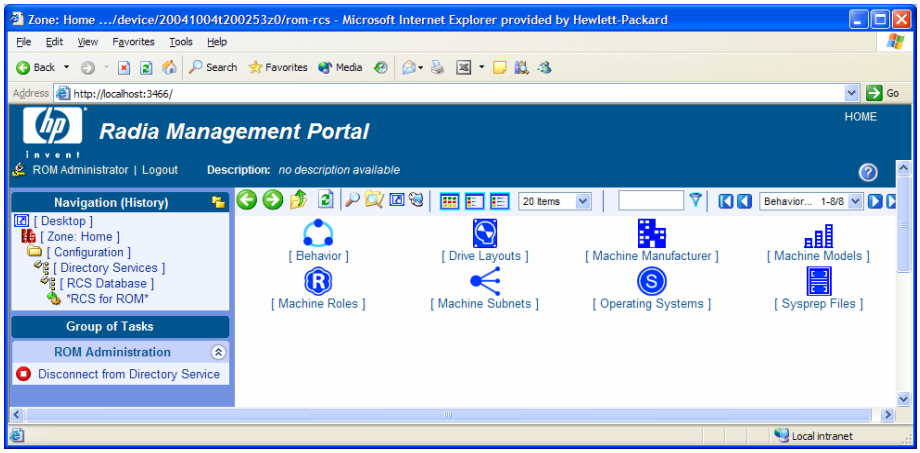
To configure the default Behaviors instance

1 If necessary, log on to the Management Portal as the Radia OS Manager Server administrator. See Logging On on page 113 for more information.

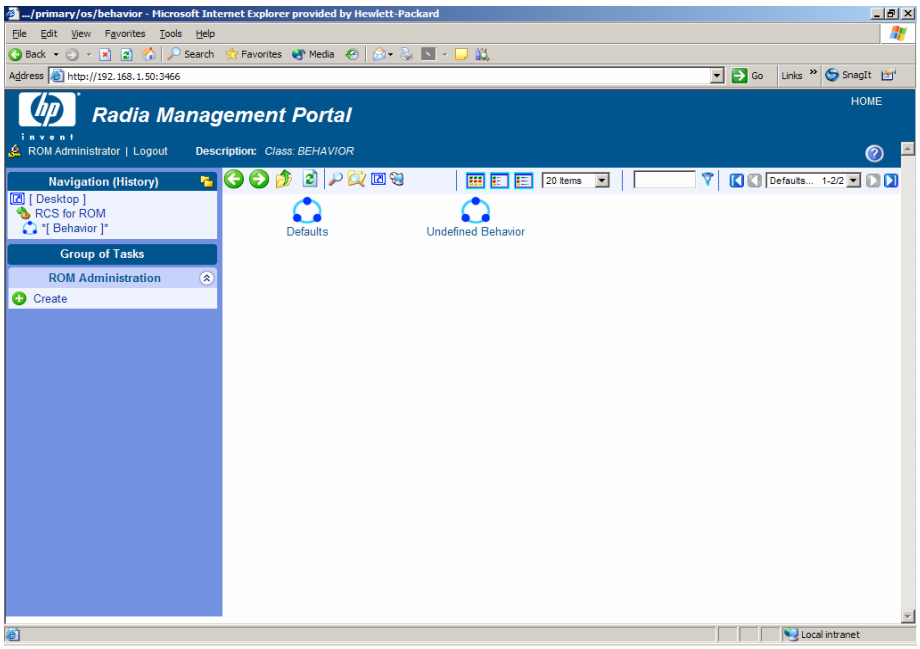
2 In the workspace, click the appropriate **Zone**.

3 Click **Configuration**, **Directory Services** and select the appropriate directory service.

4 Click **Behaviors**.



The Behavior window opens.



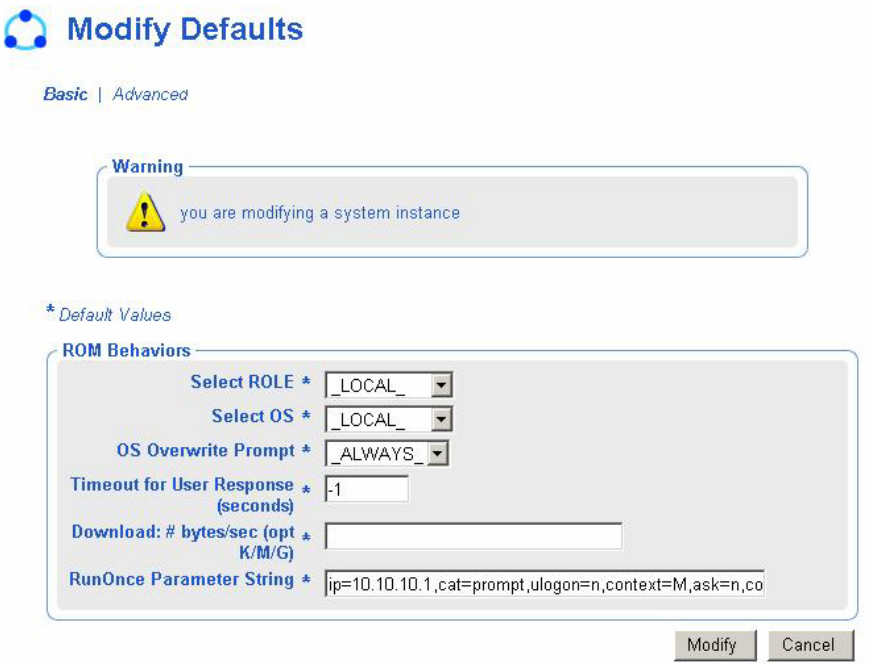
5 Click **Defaults**.

6 In the **ROM Administration** task group, click **Modify**.

7 Modify the RunOnce Parameter String as follows:

— Change IP=10.10.10.1 to reference the appropriate Configuration Server for your environment. In the example below, the value of IP has been changed to 10.10.10.1.

— Confirm that the string contains Dname=OS to specify that this connection is being performed for the Radia OS Manager.



8 Click **Modify** to save the changes.

Now, the Radia OS Manager Server is ready to use Management Portal. See Chapter 5, Operational Overview for information about how to use the interface.

About the Publisher

Use the Publisher to publish the gold image and its associated files, or other files such as `Sysprep.inf` or `Unattend.txt`, to the Radia Database. The Publisher is part of the Administrative Workstation and can be installed from the HP OpenView Configuration Server Infrastructure CD_ROM. For details about installing the Publisher, see the *Publisher Guide* for the Administrator Workstation.

You can install the Publisher on a server machine or on an administrative machine.

About Multicast and the Radia OS Manager

The Radia OS Manager supports guaranteed delivery multicast so that you can rollout large numbers of OS images concurrently with greatly improved performance.

In general, the same concepts apply when using the Multicast Server for the Application Manager or for the Radia OS Manager. For a general understanding of the Multicast Server, see the *Multicast Server Guide* on the HP OpenView support web site.

This topic covers how to use multicasting with the Radia OS Manager.

Spanned images are not supported with Multicast.

Prerequisites

- An understanding of the Multicast Server.

Requirements

- The Multicast Server must be installed on a Windows machine.
- A Guaranteed Delivery Multicast-aware version of ROMA (supported in version 2.0 and higher of the Radia OS Manager).
- Multicast server version 3.1 or higher.

  Note that version 3.0 is compatible with 3.1, but only 3.1 supports Guaranteed Delivery Multicast for the Radia OS Manager.

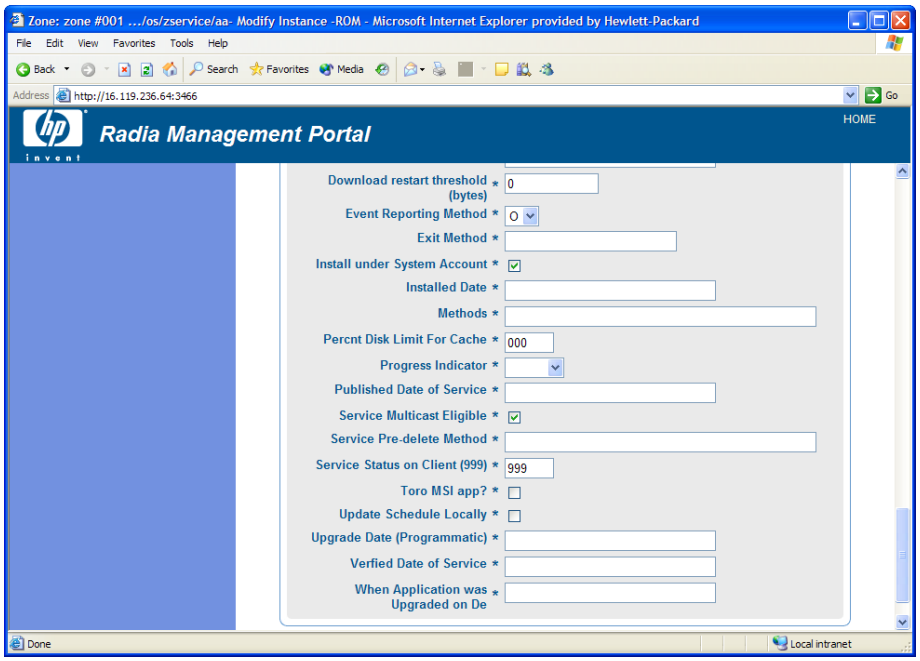
- The image will be downloaded only if the **Service Multicast Eligible** option is selected for the OS Service. To do this, use the RMP administrative interface and go to the appropriate Operating System service.

  a Click **Modify**.

b Click **Advanced**.

c Scroll to the bottom of the screen and make sure that **Service Multicast Eligible** is selected.

- Images must be under 2 GB. If they are not, the image download will fail when using multicast.



Configuring Multicast for ROMS

To configure multicast for use with the Radia OS Manager complete the following steps.

To configure guaranteed delivery multicast

1 Go to the appropriate OS Behavior instance.

2 Click **Advanced** to see the advanced options.

3 Modify the ROMA Parameters field as follows:

```
-multicast multicastIPAddress:3463 -mcastretrycount 1
-mcastretrywait 240
```

Table 1: Description of ROMA Parameters

Parameter	Description
multicastIPAddress	This parameter specifies to the Multicast Server host. You can also use the host name. 3463 is equal to the Multicast Server port
Mcastretrycount	This parameter specifies the number of times that multicast will be retried if there is a failure. The default value is 1.
Mcastretrywait	This parameter specifies how long to wait before starting the retry. The default value is 240 seconds.

4 Modify `SystemDrive:\Novadigm\MulticastServer\etc\mcast.cfg` as needed.

- root
  Specifies the root directory from which the Multicast Server will retrieve resources.
- address
  Specifies a range of multicast IP addresses available for use with dynamic windows. See the *Multicast Server Guide* for more information about dynamic windows.
- Minref
  Specifies the minimum number of clients that are required to contact the server to start a multicast session. By default, minref=1. You may want to change this to take advantage of multicast's functionality.
- Cwindow
  Specifies the length of the collection window; how long to wait for clients to register for a given OS service before finalizing the setup of a multicast session. Change the value for this parameter based on your requirements.

See the *Multicast Server Guide* for more information about the parameters in this file.

5 If you made changes to `mcast.cfg`, restart the Radia Multicast Service to implement your changes.

You may notice a `multicast.rc` file in *`SystemDrive`*`:\Novadigm\Multicastserver\etc`.

Do *not* make any changes to this file.

Additional Configuration Information

In some network environments (such as those containing Cisco), you may need to modify the network port configuration. For the Cisco switch, use the following:

```
set port channel off
set spantree port fast enable
```

For all other vendors, consult their documentation.

3 Installing and Configuring the Image Preparation Architecture

A gold image is an image that will be deployed to your target machines. You will use a reference machine and the administrative tools provided with the Radia OS Manager to create an image of the appropriate Windows operating system (OS) and Radia Client. The image is then uploaded to and stored in the Configuration Server Database. The Radia OS Manager deploys the appropriate gold image to qualifying target machines.

There are two ways that you can create the gold image.

- Image Preparation Wizard
  Use the Image Preparation Wizard to prepare a gold image on the reference machine. The advantage of this tool is that deploying the image to the target machine is quicker because the image has been prepared prior to deployment. Using the Image Preparation Wizard to prepare your image is especially useful when deploying the image to workstations, because often these images are identical.
- Radia Native Install Packager
  Use the Radia Native Install Packager to create an image of the install media for an OS on a drive on the reference machine. Although Native Install Packages may take a bit longer to create, the advantages are:
  - You can install the Radia Native Install Packager to prepare your install media image on any machine regardless of ACPI, PIC, or HAL because the media only contains the install files and not an already installed OS.
  - You only need to create one install media image for each version of Windows and service pack.
  - The operating system media is downloaded as an image so it can be uploaded more quickly, takes up less room on the server and downloads faster when deployed.

  Using the Radia Native Install Packager to prepare your install media image is especially useful when deploying operating systems to servers, which may have varying hardware, configurations, and so forth.

Creating Images with the Image Preparation Wizard

Use the Image Preparation Wizard to prepare a gold image on the reference machine. The reference machine must contain the OS and any service packs, patches, hot fixes, Radia Client 4.0.1, applications, and other Radia-managed content installed. Be sure to download the latest Radia fixes from the HP support web site.

When you run the wizard, it collects inventory information associated with the image, and runs the Microsoft Sysprep utility. The image is sent to the Radia OS Manager `\upload` directory and you can use the Publisher on your administrator machine to promote the image to the Radia Database.

Images should be sent to a Radia OS Manager Server in a non-production lab environment to prevent performance issues.

Requirements for Target Machines

The target machine is a workstation or server on which you want to install, replace, or update a Windows 2000 Professional, Windows 2000 Server, Windows XP Professional, or Windows 2003 operating system. The following requirements must be met.

- Target machines with existing OSs should have the Radia Client already installed.
- Target machines must meet the minimum hardware and BIOS requirements published by Microsoft (or Windows operating systems) and/or the machine manufacturer for running the OS to be deployed by the Radia OS Manager.
- If you want to report on, or make use of the machine's make, manufacturer, and unique identifier for policy, the BIOS must support SMBIOS (for systems management) specification. If a target machine lacks SMBIOS support, the only criterion available for specifying policy on that machine will be the MAC address.
- Have an English, French, or German keyboard.
- Have 128 MB of RAM or more.
- May have multiple CPUs. CPU must be an Intel 386 or higher, or AMD Athlon or Duron.
- If you are using a network (PXE) boot, you must:

— Be able to boot from the Boot Server. To do this, make sure that the BIOS is set to boot from the network before the hard drive.

— Have a network interface card (NIC) that supports PXE, manufactured by Intel or 3Com. Some network cards are PXE capable, but only actually support PXE with the addition of a network boot ROM. These cards must have the network boot ROM installed. Some older 3Com cards require a firmware upgrade to MBA 4.3 and PXE stack version 2.2.

— Be sure that the target machines have the same or a compatible HAL (Hardware Abstraction Layer) as the reference machine in order to use Microsoft Sysprep. Machines with the same version of HAL.DLL share the same Hardware Abstraction Layer. For more information on determining a machine's HAL, see

http://support.microsoft.com/?kbid=237556.

If you cannot check the `HAL.DLL`, consider deploying the image on a target machine in a lab environment to confirm success of the deployment.

- Must have an IDE or SCSI (Adaptec only) boot drive interface.
- Match the reference machine's ACPI characteristics (i.e., ACPI vs. non-ACPI, which is represented in the HAL) and boot drive interface.
- Be compatible with the programmable interrupt controller capabilities represented in the HAL captured on the reference machine (i.e., an Advanced Programmable Interrupt Controller (APIC) HAL will not run on a machine that does not have an APIC; however a PIC (standard on-board Programmable Interrupt Controller) HAL will run on a machine that has an APIC). Newer Compaq computers often come with an APIC.
- Supports NTFS and FAT32 file systems.

Preparing the Reference Machine

Remember, a reference machine is the machine that you will use to create an image of the appropriate Windows operating system. The image created on the reference machine will eventually be deployed to target machines.

Before using the Image Preparation Wizard to create the gold image, do the following:

1 Run the installation for the OS (Windows 2000 Professional, Windows 2000 Server, Windows XP Professional, or Windows 2003) on the reference machine.

The OS must be stored on the C: drive because only the C: drive will be captured

2 Customize the OS as necessary. This may include installing a set of basic or required applications. Be sure to include the latest service pack for the OS and applications.

Windows XP images require Service Pack 1.

We recommend that you change the CD-ROM drive letter to a letter such as Y or Z if you will be using partitions. This allows partitions that are created through policy to have their drive letters adjacent to the boot drive, such as Drive D.

3 The image upload process to ROM server may take several minutes; during which no keyboard or mouse activity is required. Therefore, we recommend that you configure the BIOS power management so that the machine does not power down after a few minutes of keyboard or mouse inactivity before the upload process is finished.

4 HP recommends that the image file size be kept as small as possible. The ideal configuration would be a partition just large enough to fit the OS, plus additional space for the Radia Client application. The Image Preparation Wizard will attempt to resize the partition to a smaller size, when the "Resize partition before OS upload" is enabled.

To do this:

— **Use the minimum partition size.**
When partitioning the drive on your reference machine for OS installation, use the minimal amount of space required.

- Windows 2000 Professional requires an 800 MB partition for installation.
- Windows 2000 Server requires 1 GB.
- Windows XP with SP1 requires 1.5 GB.
- Windows 2003 Server requires 1.5 GB

The additional disk space required for the Radia Client install varies, depending on the OS.

- Windows 2000 requires 50 MB.
- Windows XP requires 100 MB.

- Windows 2003 requires 50 MB.

— **If you are using a laptop, you may want to disable hibernation.**

— **Make the page file as small as possible while preserving OS performance.**

For Windows XP or Windows 2003, consider:

- Turning off System Restore to stop tracking changes.
- Disabling the paging file.

For Windows XP Professional with Service Pack 1 and Windows Server 2003, Standard Edition, the page file will be enabled on the target machine if the KeepPageFile parameter is set to the default value (null) in the Sysprep file. See **http://support.microsoft.com/?kbid=813138** for more information on KeepPageFile.

- Turning off hibernation. The file is deleted.

For Windows Server 2003 and Windows XP SP1, you can use `powercfg.exe` to turn the hibernation file on from a command line. See **http://support.microsoft.com/default.aspx?scid=kb;en-us;q324347.**

For Windows 2000, consider:

- Disabling the paging file by setting it to 0.
- Turning off hibernation. The file is deleted.

— **Create free space.**
We recommend that once you have created the smallest partition with the least amount of free disk space as possible, set the ExtendOemPartition = 1 in the [Unattended] section of `Sysprep.inf`, to allow for the small image to be installed on a target machine with a much larger drive. When the ExtendOemPartition is set to 1, the Microsoft Mini-Setup Wizard will extend the OS installation partition into any available non-partitioned space that physically follows on the disk. The Radia Client can then use the free space on the volume for application installations. See About Microsoft Sysprep on page 69.

Before capturing the image, the OS Image Preparation Wizard can zero the free space at the end of the system drive partition. Note that this is an option offered when you use the OS Image Preparation Wizard. This

increases the compressibility of the captured image, reducing its size. Smaller image files require less disk space to store and less bandwidth to move across the network.

— **Span image files.**
The Image Preparation Wizard provides the option to span your images. This means that the image file is broken into smaller segments. Each segment of a spanned image is restricted to 4 GB. This is helpful so that you can avoid the restriction of whole images needing to be less than 4 GB so that they can be stored in the Configuration Server. If you choose not to use the spanned image option, your images must be less than 4 GB.

5 You must install the ROM-aware client from the Radia client product CD-ROM. se version 4.0 of the Radia Application Manager, which offers the ROM client as a feature. *See* Installing the Radia Client on the Reference Machine on page 68.

6 You must use Microsoft Sysprep to distribute Microsoft operating systems using cloned images. *See* About Microsoft Sysprep on page 69.

7 Set the reference machine to boot from the CD-ROM drive.

You must do this because the Radia OS Manager CD-ROM is bootable. When you run the Image Preparation Wizard from the Radia OS Manager CD-ROM it reboots the machine to the memory-resident Linux environment that boots from the CD-ROM in order to capture the gold image.

8 Make sure the reference machine is using DHCP.

Installing the Radia Client on the Reference Machine

1 Insert the Radia Management Applications 4.1 CD-ROM into your CD drive.

This CD-ROM has autorun enabled and may automatically start the install.

2 If autorun is not enabled, go to your CD-ROM drive and run setup.exe.

3 Be sure to select the ROM feature during the installation.

See the *Application Manager Guide* or the *Software Manager Guide* for detailed instructions.

About Microsoft Sysprep

You must use Microsoft Sysprep to distribute Microsoft operating systems using cloned images.

Review Microsoft documentation for information about how to use Sysprep, how to create a `Sysprep.inf`, and for the parameters available for `Sysprep.inf`. For information on Microsoft Sysprep for Windows XP and Windows 2000, go to `\support\tools \deploy.cab` on the installation media. `Deploy.cab` contains three help files (`Deploy.chm` contains detailed Sysprep information).

In the last step of gold image creation, the Radia OS Manager Image Preparation Wizard runs Microsoft Sysprep for you. It strips out all of the security identifiers in the gold image and resets the image.

After the gold image is delivered to the target machine, the Microsoft Mini-Wizard will run automatically when the target machine is started. After using the answers provided by the `Sysprep.inf`, the Microsoft Mini-Wizard deletes the Sysprep directory on the target machine.

To set up Sysprep

1 Copy the Microsoft Sysprep files from the appropriate operating system CD-ROM to `C:\SysPrep` and make sure the directory and files are not set to read-only.

The Microsoft Sysprep files can be found in `DEPLOY.CAB` in the `SUPPORT\TOOLS` folder of the Microsoft Operating System installation CD-ROM. See their documentation for details.

Be sure that you are using Sysprep version 5.02195.2104r or higher. If you use an older version, you may receive the following error:

```
Invalid Sysprep version error. Please install Sysprep
version 5.02195.2104r and re-run the Wizard. Click OK
to terminate.
```

If you do not have the appropriate version of Sysprep, you can download it from the Microsoft web site.

Even if you have administrator rights, make sure that you have the appropriate user rights set to run Sysprep. See the article *#270032 "User Rights Required to Run the Sysprep.exe Program"* on the Microsoft web site. If you do not have the appropriate user rights, when Sysprep runs, you will receive the following error:

```
You must be an administrator to run this
application.
```

The Image Preparation Wizard will exit and once you set up the appropriate user rights you will need to run the wizard again.

2 Be sure that the reference machine is part of a WORKGROUP in order to use the Microsoft Sysprep.

In order to use Microsoft Sysprep, the machine must be a member of a workgroup not a domain.

3 Create a `Sysprep.inf` and save it to `C:\Sysprep`. See Creating a Sysprep.inf below.

Creating a Sysprep.inf

The `Sysprep.inf` file can be delivered with the operating system image or it can be delivered as a package that is connected to the operating system image. Either way, you must create the file. You can create the file manually or use the Microsoft Setup Manager (`Setupmgr.exe`) to create Sysprep files. The Setup Manager can be found in the `Deploy.cab` file contained in the SUPPORT\TOOLS folder of a Microsoft OS distribution CD-ROM. See Microsoft documentation for more information.

Sample `Sysprep.inf` files are available on the Radia OS Manager product CD-ROM in:

CDDrive`:\documentation\samples\sysprep\`

The `Sysprep.inf` file should not be greater than 800 KB in size.

Below are a few tips to consider when creating the `Sysprep.inf` file:

- Adjust the TimeZone value for your enterprise.
- Set up the AdminPassword.
- Make sure to include a product key so that the user will not need to enter this at the target machine.
- In order to have an unattended installation, you must include UnattendMode = FullUnattended in the [Unattended] section.
- Set ExtendOemPartition to 1, so that Microsoft Sysprep will extend the OS partition into any available non-partitioned space that physically follows on the disk.
- If JoinDomain is present in `Sysprep.inf`, then `Sysprep.inf` has to have the Admin User ID and Password of an account in the domain that has the rights to join the computer to the domain. Note that JoinDomain is case sensitive.
- ComputerName is also case sensitive.

Prioritizing Sysprep Files

Sysprep.inf files are prioritized in the following order:

1. Sysprep embedded in the image (lowest priority).
2. Override Sysprep (a Sysprep file that is separate from the gold image. See Connecting a Sysprep File on page 154 for details).

   Only one override `Sysprep.inf` will be resolved.

3. Sysprep attached to policy criteria (highest priority).

   To attach a Sysprep file to policy, you must use the System Explorer to manually connect the Sysprep instance to the appropriate Policy instance.

4. ComputerName (COMPNAME) and JoinDomain (COMPDOMN) are set in `Sysprep.inf`.

Using the Radia Image Preparation Wizard

Use the Radia Image Preparation Wizard to prepare a gold image. The Image Preparation Wizard will perform the following tasks:

1. Check whether there is enough free disk space on the machine and verify that the Radia OS Client is installed. See Preparing the Reference Machine on page 65. If there is not enough space, the Image Preparation Wizard displays a message and terminates.
2. Create an object that contains information (including hardware and BIOS capabilities) about the reference machine.
3. Run Microsoft Sysprep.
4. Restart the reference machine into Linux (booted from the Radia OS Manager CD-ROM). The Linux-based portion of the OS Manager Image Preparation Wizard runs to collect the image and its associated files.
5. Create and copy the following files to

   SystemDrive:\Novadigm\IntegrationServer\UPLOAD on the Radia OS Manager Server.

   While these files are transferred, network speed will be less than optimal as the OS image is compressed during transfer.

   — ImageName.IMG
   This file contains the gold image. This is a compressed, sector-by-sector copy of the boot partition from the hard drive system that may be very large. The file contains an embedded file system that will be accessible when the image is installed.

   — ImageName.MBR
   This file contains the master boot record file of the reference machine.

   — ImageName.PAR
   The file contains the partition table file of the reference machine.

   — ImageName.EDM
   This file contains the object containing inventory information.

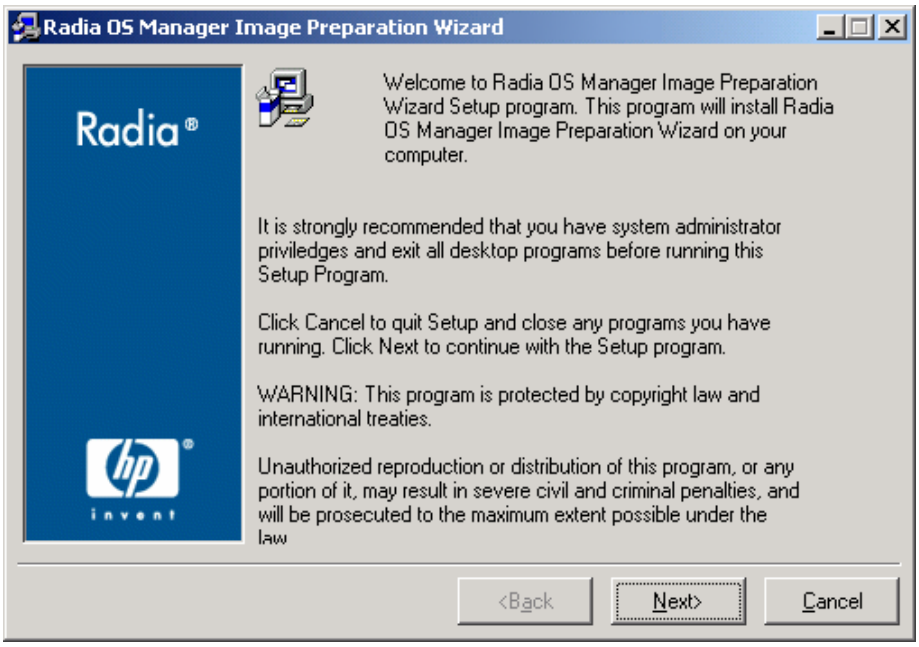
   A comprehensive log (*machineID*.log) is also available in this directory after the image is deployed.

To use the Radia OS Image Preparation Wizard

1 Insert the Radia OS Manager CD-ROM into the CD-ROM drive of the reference machine.

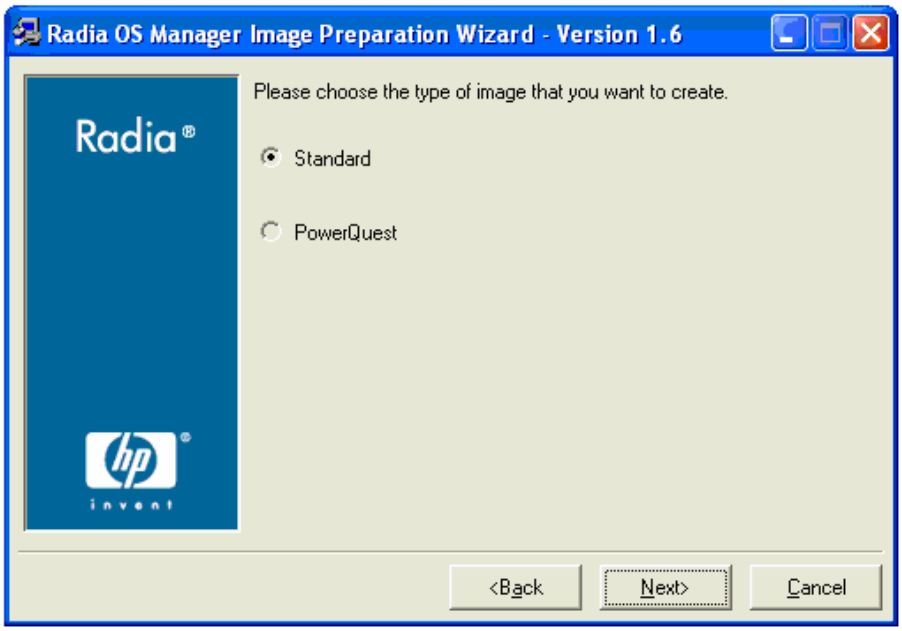
2 Go to `\os_manager_image_preparation_wizard\win32` and double-click **prepwiz.exe**. The Image Preparation Wizard verifies that the `C:\Sysprep` folder exists and that Radia Client is installed before continuing.

The Radia OS Manager Image Preparation Wizard opens.



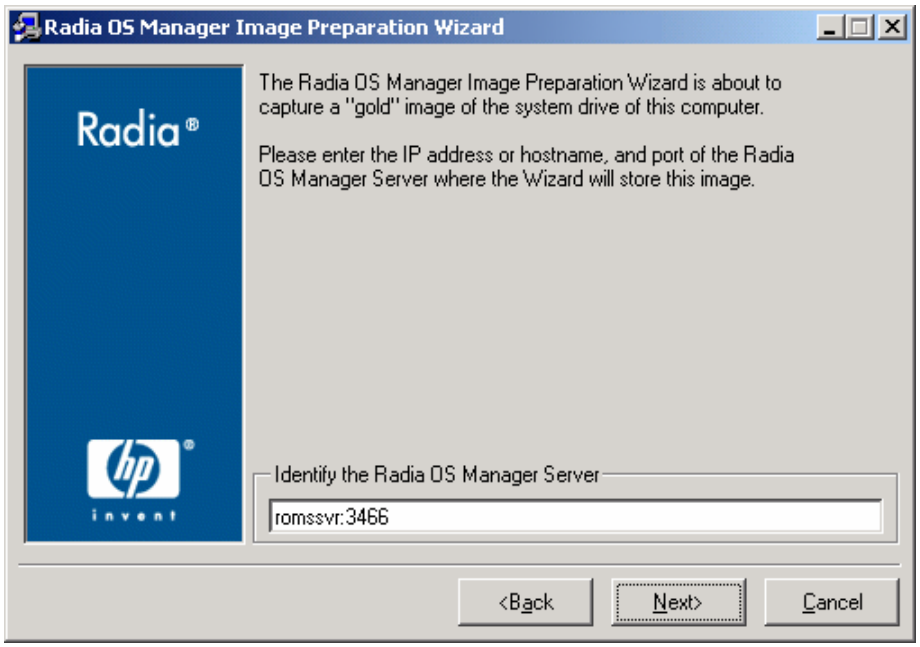
3 Click **Next**.

The Type of Image Selection window opens.



4 Choose the type of image to create and then click **Next**.

The Identify the Radia OS Manager Server window opens.



5 Type the IP address or host name and port for the Radia OS Manager Server. This must be specified in the following format: *xxx.xxx.xxx.xxx:port*.

If the Image Preparation Wizard cannot connect to the Radia OS Manager Server, a message opens and you must:

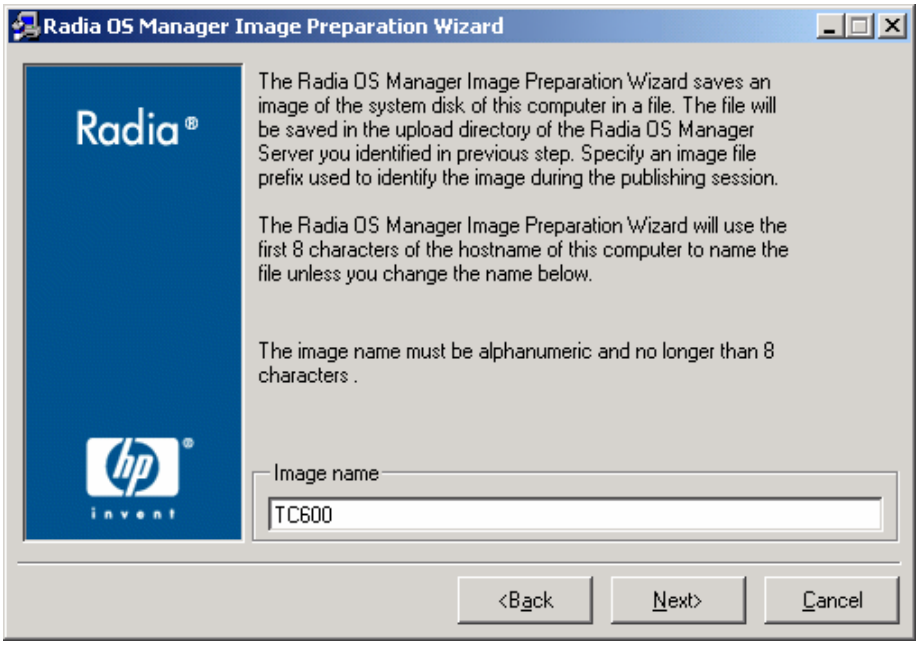
— Click **Yes** to continue anyway.

— Click **No** to modify the host name or IP address.

— Click **Cancel** to exit the Image Preparation Wizard.

6 Click **Next**.

The Image Name window opens.

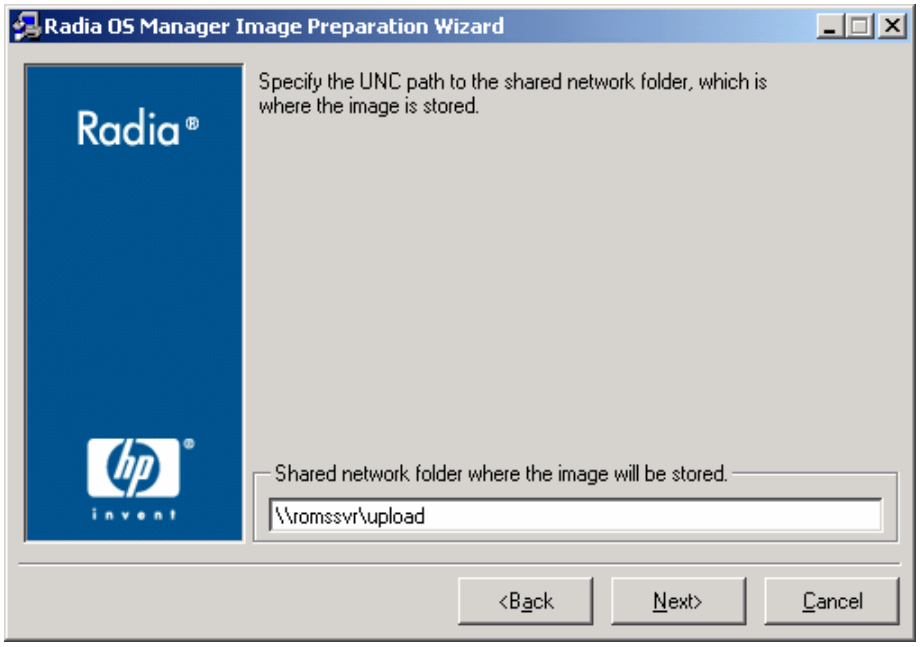


7 Type a name for the image file.

8 Click **Next**.

If you chose to create a standard image, skip to step 14 on page 78.

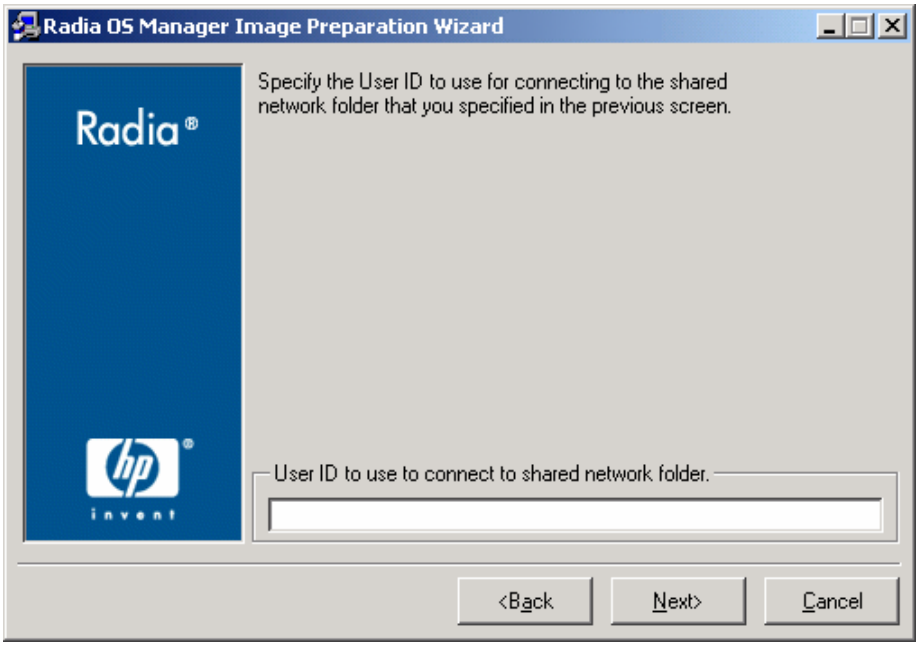
If you chose to create a PowerQuest image, specify where the image will be stored.



9 If you chose to create a PowerQuest image, type the UNC path to the Radia OS Manager Server upload directory, which is where the image is stored.

10 Click **Next**.

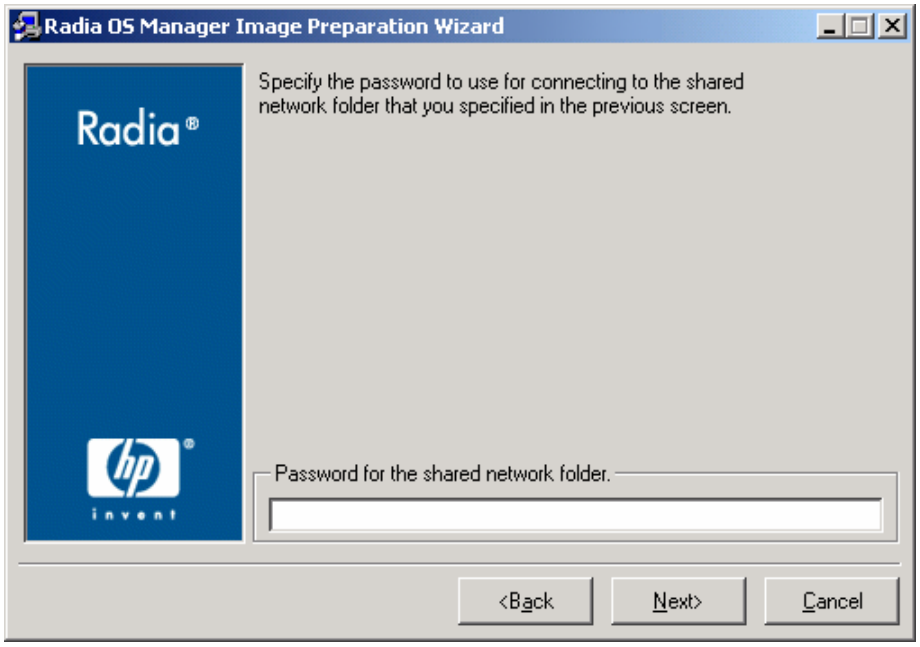
If you chose to create a PowerQuest image, the User ID window opens.



11 For PowerQuest images, type the User ID in the format of *DomainName\UserID*.

12 Click **Next**.

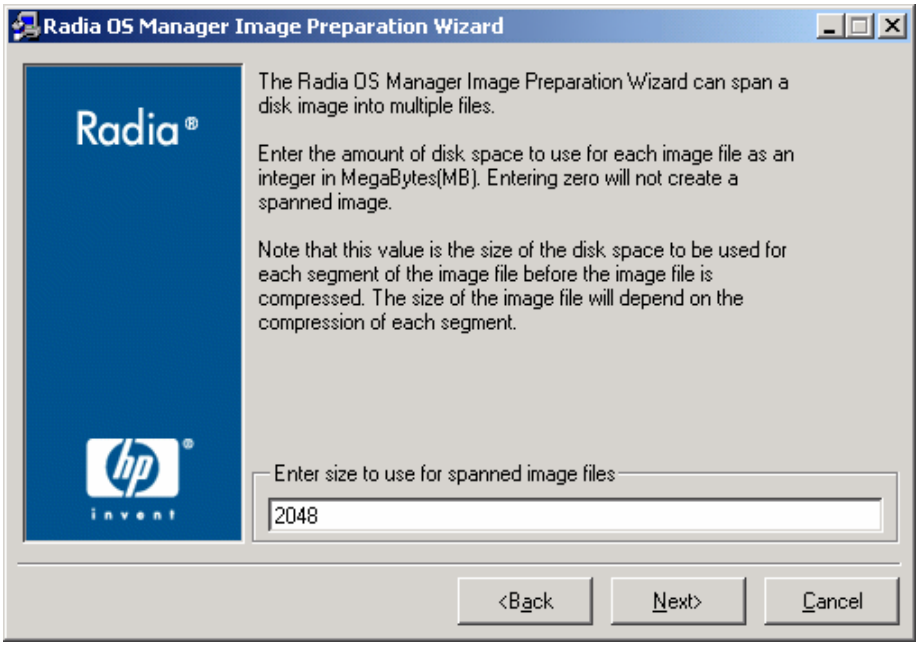
If you chose to create a PowerQuest image, the Password window opens.



13 For PowerQuest images, in the Password for the shared network folder box, type the password, which is DES encrypted.

14 Click **Next**.

The Span Disk Image window opens.

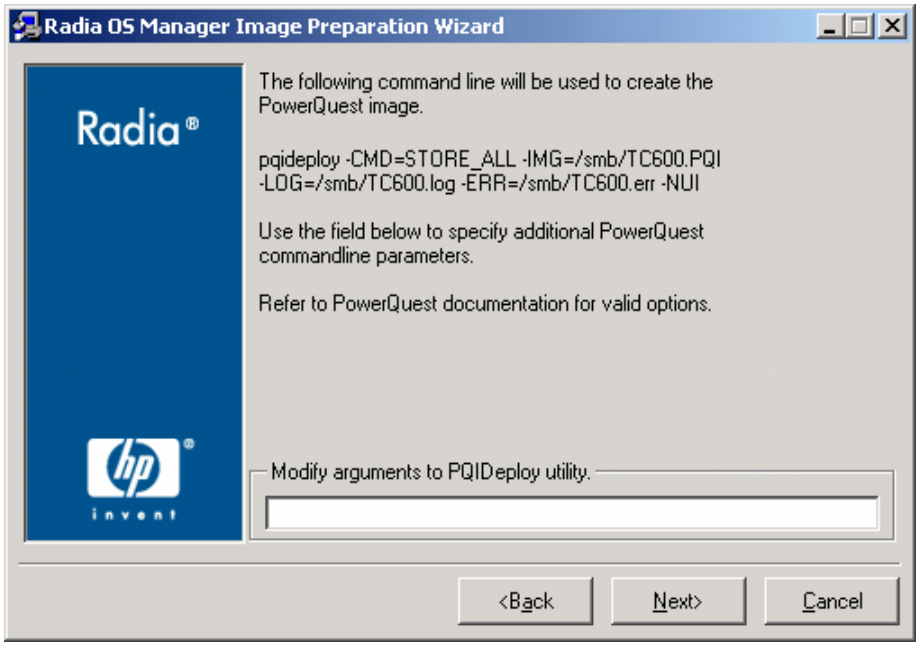


15 Type the amount of the total uncompressed disk space (in MB) to use for each image file. Type **0** (zero) if you do not want to create a spanned image.

Use spanned images to break the image file into smaller segments. This is helpful so that you do not have to be concerned with your images being less than 4 GB so that they can be stored in the Configuration Server. If you choose not to use the spanned image option (by typing zero), your images must be less than 4 GB.

16 Click **Next**.

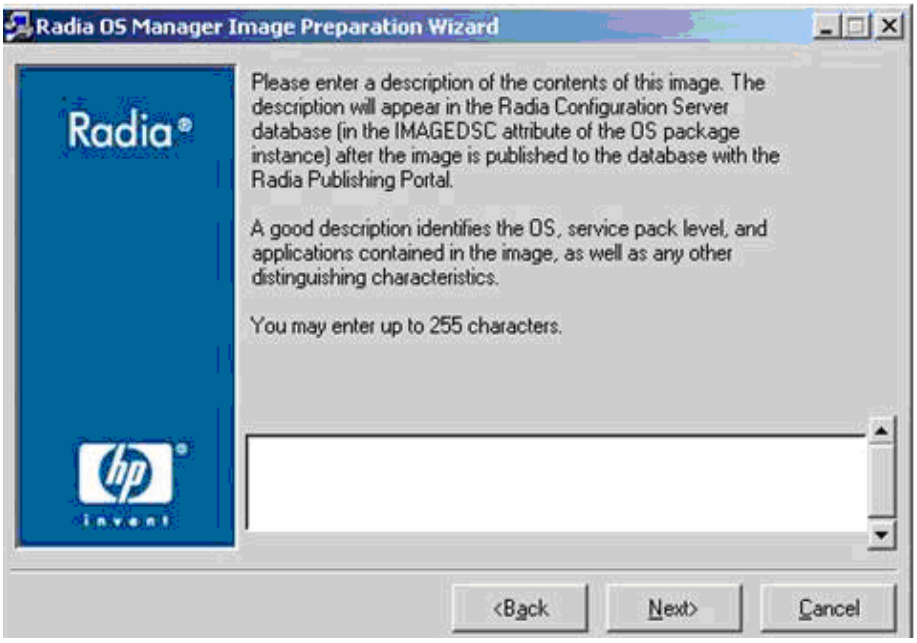
If you chose to create a PowerQuest image, the arguments window opens.



17 Specify any additional PowerQuest command line parameters necessary. Refer to the PowerQuest documentation for valid options.

18 Click **Next**.

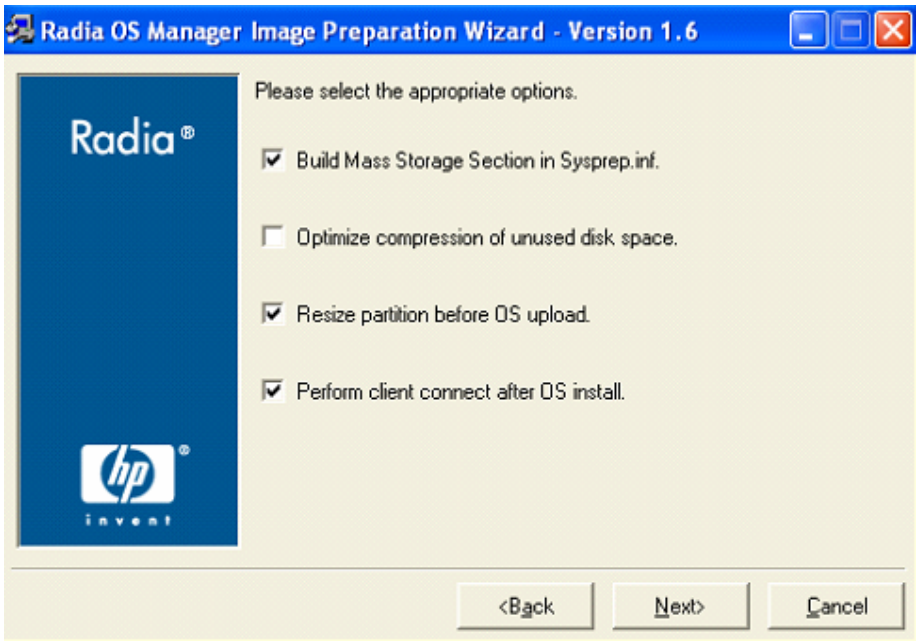
A window opens so you can enter a description for the image.



19 Type a description for the image file.

20 Click **Next.**

The Options window opens.



21 Select the appropriate options.

— Build Mass Storage Section in `Sysprep.inf`.
Select this check box to build a list of the Mass Storage drivers in the [SysprepMassStorage] section of the `Sysprep.inf` for Windows 2000 and above.

> The list of Mass Storage Drivers is installed in the registry. This takes about 15-20 minutes, but provides fundamental mass storage device drivers to ensure success of image deployment across machine models and manufacturers.
>
> If there are any errors in these entries, subsequent Sysprep execution can fail.

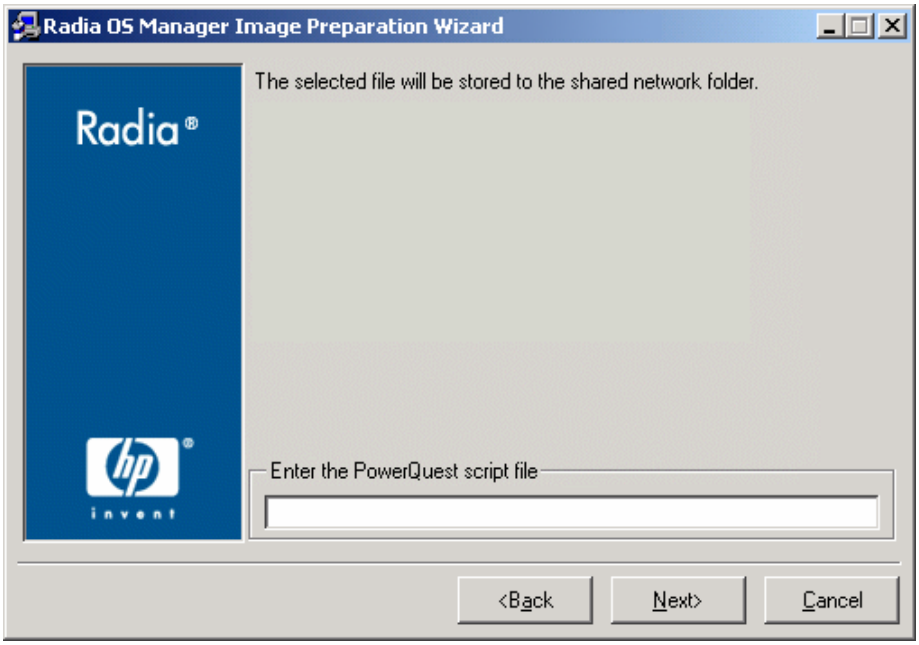
— Optimize compression of unused disk space.
Select this check box to optimize compression of unused disk space. This adds zeroes up to the end of the disk. Note that this may take some time depending on the size of the hard drive.

— Resize partition before OS upload.
Select this check box to resize the partition to make it as small as possible. If you do not select this check box, make sure that your partition is sized appropriately. See Use the minimum partition size on page 66.

— Perform client connect after OS install.
Select this check box to perform a Radia OS Connect after the OS is installed. If this is not selected, the Radia OS Connect will not occur automatically after the OS is installed. This check box allows you more granular control over the migration from unmanaged target machines to managed machines.

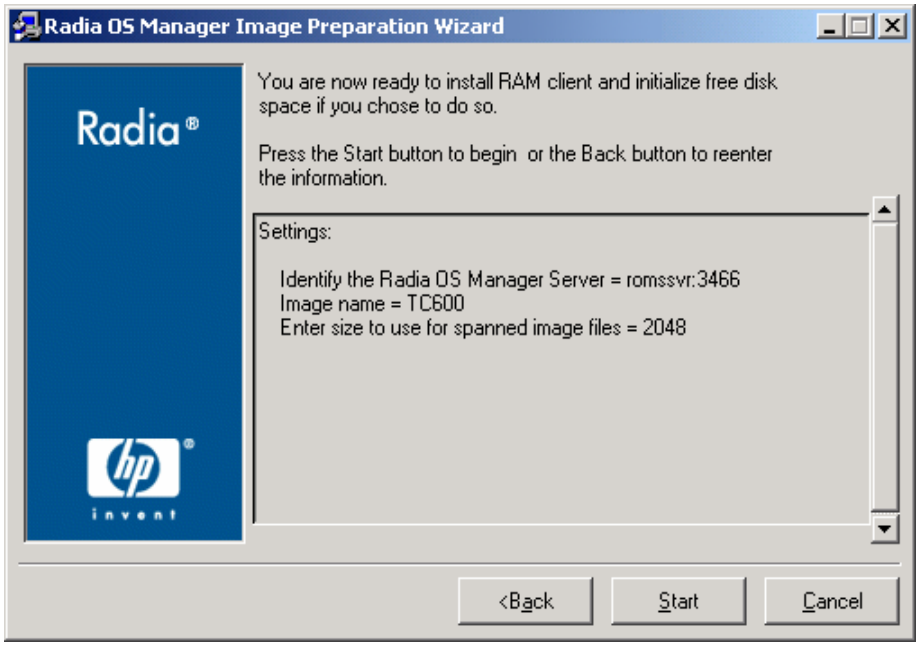
22 Click **Next**.

The PowerQuest Script File window opens.



23 Select the PowerQuest script file.

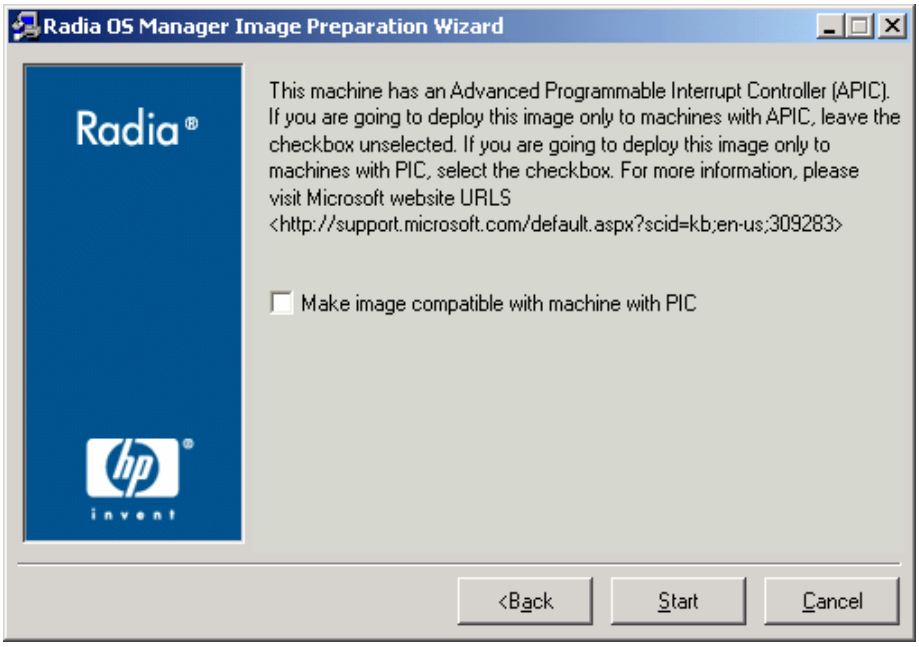
The Summary window opens.



24 Click **Start**.

25 Click **Finish**.

If you are working with an APIC machine, the Make image compatible with PIC window opens.

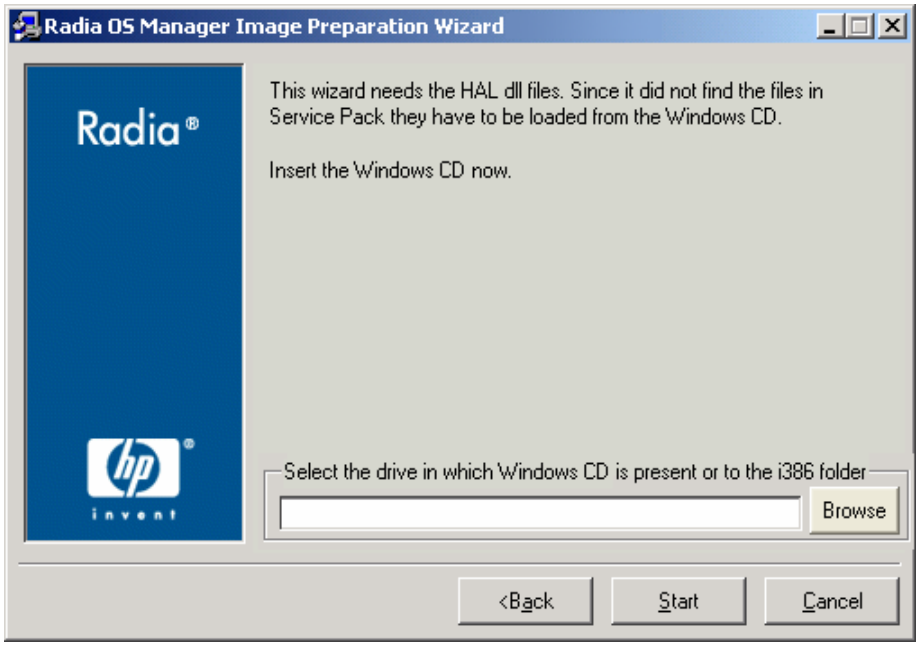


26 If necessary, select the check box in the figure above.

Microsoft does not recommend this. Be sure to see their web site for more information before making this selection.

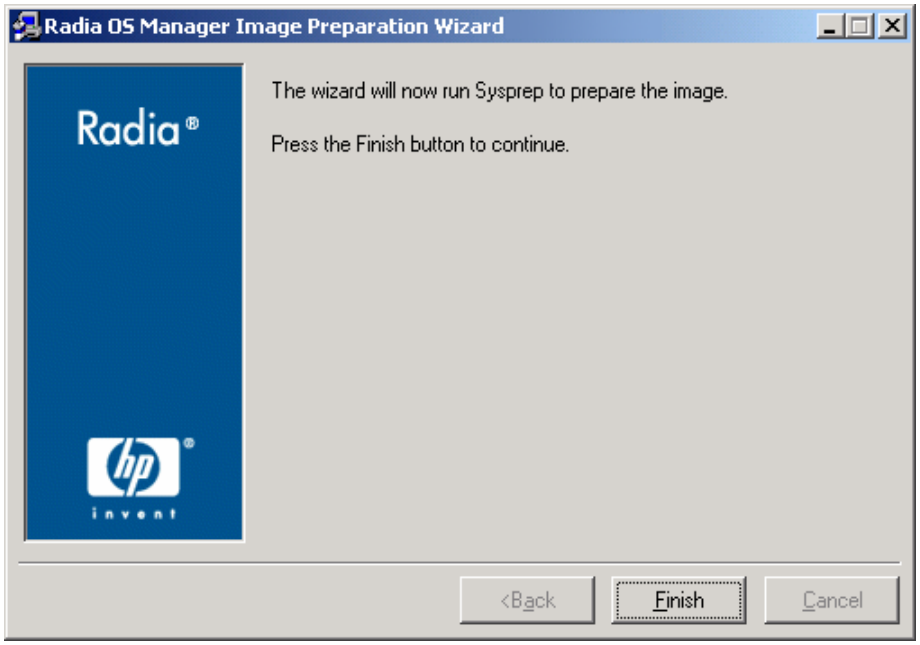
27 Click **Next**.

If you selected the check box in the figure above, the Select Windows CD window opens.

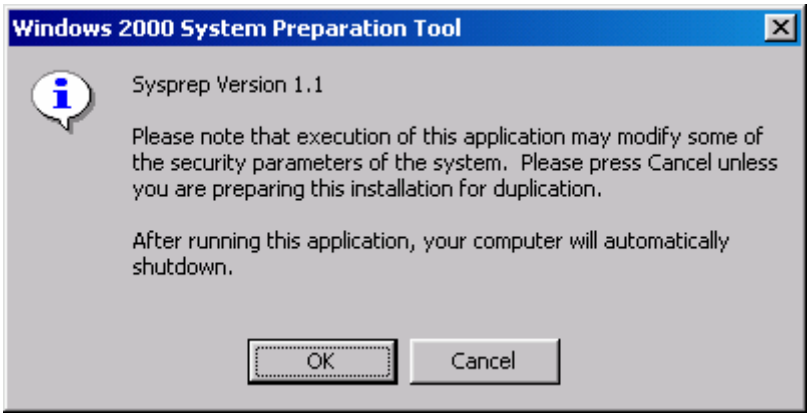


28 Browse to the Windows CD-ROM.

29 Click **Next**.



30 Click Finish to run Sysprep.



If you are using Windows 2000, you may not see any indication that Sysprep is running, such as an hourglass.

31 Click **OK** to restart the reference machine.

After restarting, the machine will boot to the CD-ROM, connect to the network, and store the gold image on the Radia OS Manager Server.

When the machine restarts, you will notice that the screen says Fedora Core and looks similar to the following:

```
To specify options manually, type sos opt1=xxx opt2=xxx
enter
Some quick boot specifications with preset options are
SOS for PREPWIZ or ROMA, default after a few seconds
TESTMODE - TESTMODE=1
DEBUG - runs in debug mode, SOSDEBUG=1 (no drivers
loaded)
```

Wait a few seconds to continue or press **Enter**, causing the machine to boot.

The options mentioned on screen should typically be used only if instructed by Technical Support.

The upload of the gold image may seem to take a long time. However, it is not the upload that is taking a long time, but rather the compression of the image and the optimization for compression of the unused disk space (especially if there is a lot of free disk space). This happens during the transfer of the image and therefore, the network pipe is not a bottleneck. Transfer speeds will be approximately 30-400 Kbps but may vary depending upon processor speeds and your network environment.

You may want to create copies of the files stored in the `\upload` directory so that you can retrieve them if necessary.

Creating Images with the Native Install Packager

Use the Radia Native Install Packager to create an image of an OS on a hard drive partition on the reference machine. The resulting image has completed the file copy phase of a Windows installation and contains the Radia Client source. The image is sent to the Radia OS Manager `\upload` directory and you can use the Publisher to publish the image to the Radia Database.

When the intermediate OS deploys the image to a target machine, the target machine reboots and the Windows Native Install setup resumes the setup. This contains two additional phases—text mode setup phase, followed by the GUI phase—that are controlled by `Unattend.txt`, and allows for a completely unattended setup.

Requirements for the Reference Machine

The following are the requirements for the reference machine when using the Radia Native Install Packager.

- Connectivity to a Radia OS Manager Server.
- The Radia OS Manager product CD-ROM.
- When you create the image, the size of the partition must be large enough to contain the deployed OS.
- A machine with the following:

— A target drive that will be reformatted and is at least 1.5 GB. If the target drive is larger, it will take more processing time when the drive is imaged or the image may be larger than necessary depending on how the "Optimize Compression of Unused Disk Space" check box is set in the Image Preparation Wizard.

All data on the target drive will be lost.

— A separate drive (to increase speed) with the following:

  – Radia Native Install Packager software already installed.

  – The i386 directory from your OS CD-ROM.
  You can slipstream any necessary service packs into this directory. See the `readme.txt` file associated with each service pack for more information about how to do this.

Windows setup will not let you run the setup for an older version of Windows. For example:

- If your machine is running Windows XP, you cannot use the i386 directory for Windows 2000
- If your machine is running Windows 2003, you cannot use the i386 directory for Windows 2000 or Windows XP.

— `Unattend.txt`
You can create the file manually or use Windows Setup Manager on your Windows CD-ROM. Sample files are available on the product CD-ROM in `\windows_native_installer\win32\media`.

About Unattend.txt

Unattend.txt automates the installation of the OS so that no user input is necessary. The `unattend.txt` file *must* match the release of Windows specified in the i386 directory. These files may vary slightly depending on the version of Windows being installed.

The `Unattend.txt` file should not be larger than 800 KB.

The following are some tips about creating the `unattend.txt` file to be stored with the image:

- The settings in the file should be as generic as possible so that the file can be used with any machine in your environment.

- Include the statements AutoLogon=YES and AutoLogonCount=1 in the [GuiRunOnce] section of this file. You must use the [GuiRunOnce] section, rather than `$OEM$\cmdlines.txt`, because the Radia Client setup uses Windows installer to install the Radia Client on the target machine and `$OEM$\cmdlines.txt` cannot run the Windows Installer. The AutoLogon and AutoLogonCount statements ensure that the Radia Client is installed during the first user logon after the operating system is installed.
- Include the statement Extendoempartition=1 in the [Unattended] section of this file. This causes Windows to extend the file system and partition to include any unused space that follows the partition. If the target partition is too small, it is possible that the copy phase of the installation will work (the phase run on the administrator machine), but when the image is deployed the text mode phase will fail or install the OS on some other partition.

  If you use a large target partition, the process that zeroes unused space on the file runs for a long time.
- You can also create separate `unattend.txt` files for any necessary customizations. You can use the Publisher to publish these files to the SYSPREP class in the Configuration Server Database and then you can connect them to the appropriate OS image. Use the Connect Sysprep File task in the ROM Administration task group. When the image is deployed, the customized unattend.txt will be merged with the original file.

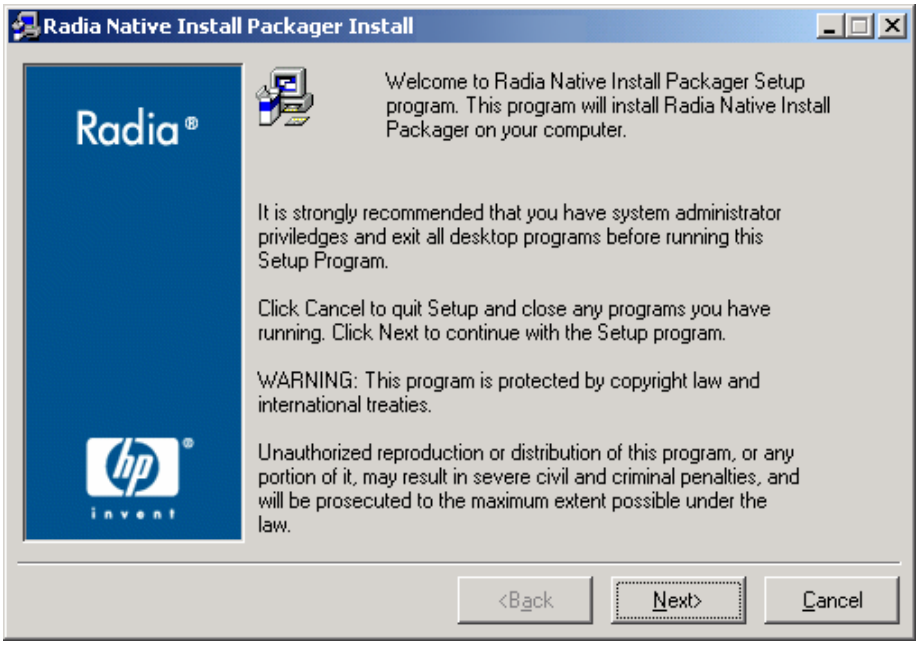
  

  See Using the Publisher on page 99 for information about the Publisher. When publishing `Unattend.txt` files, follow the instructions as if you were publishing a `Sysprep.inf` file.

Installing the Radia Native Install Packager

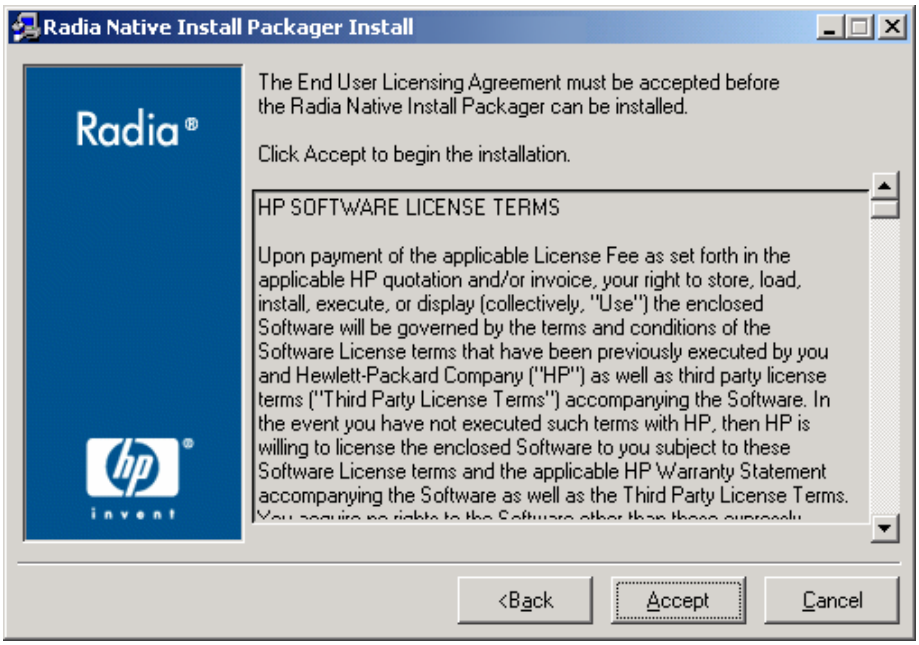
1 On the product CD-ROM, go to `\windows_native_installer\win32` and double-click **setup.exe**.

  The Welcome window opens.



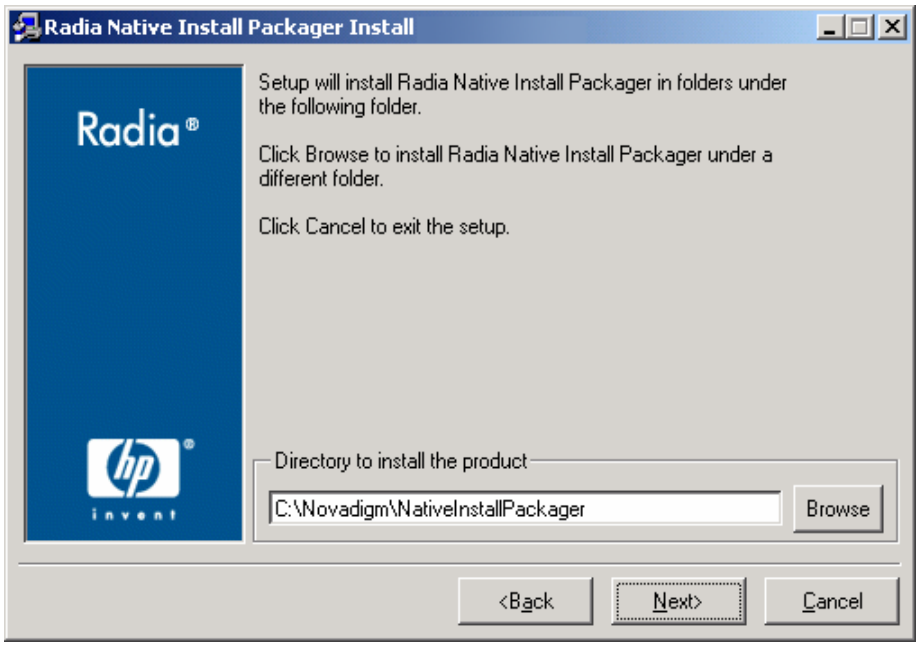
2 Click **Next**.

The End User Licensing Agreement window opens.



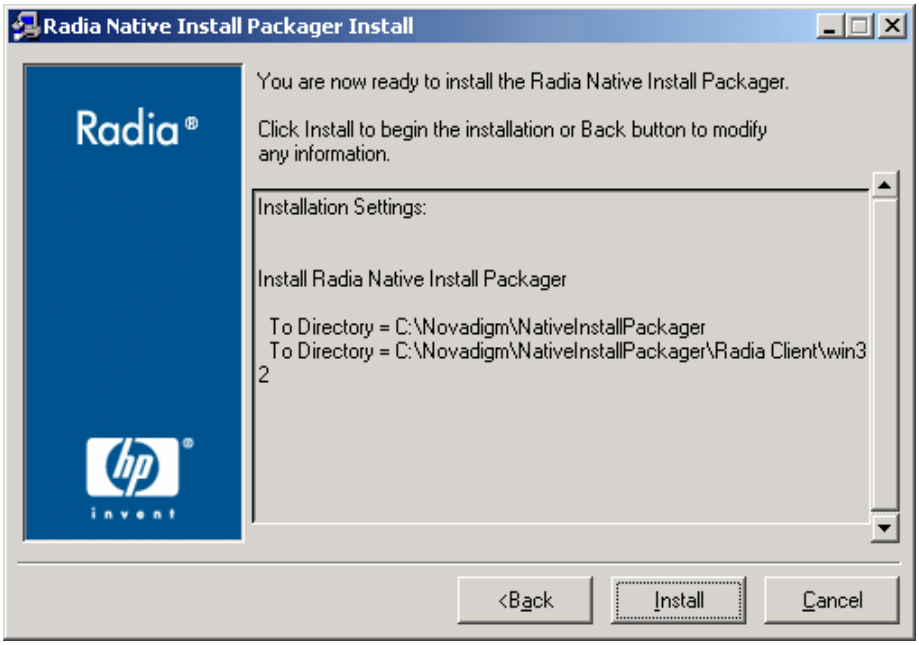
3 Review the terms and click **Accept**.

The Directory to install the product window opens.



4 Select the appropriate directory and then click **Next**.

The Summary window opens.



5 Click **Install**.

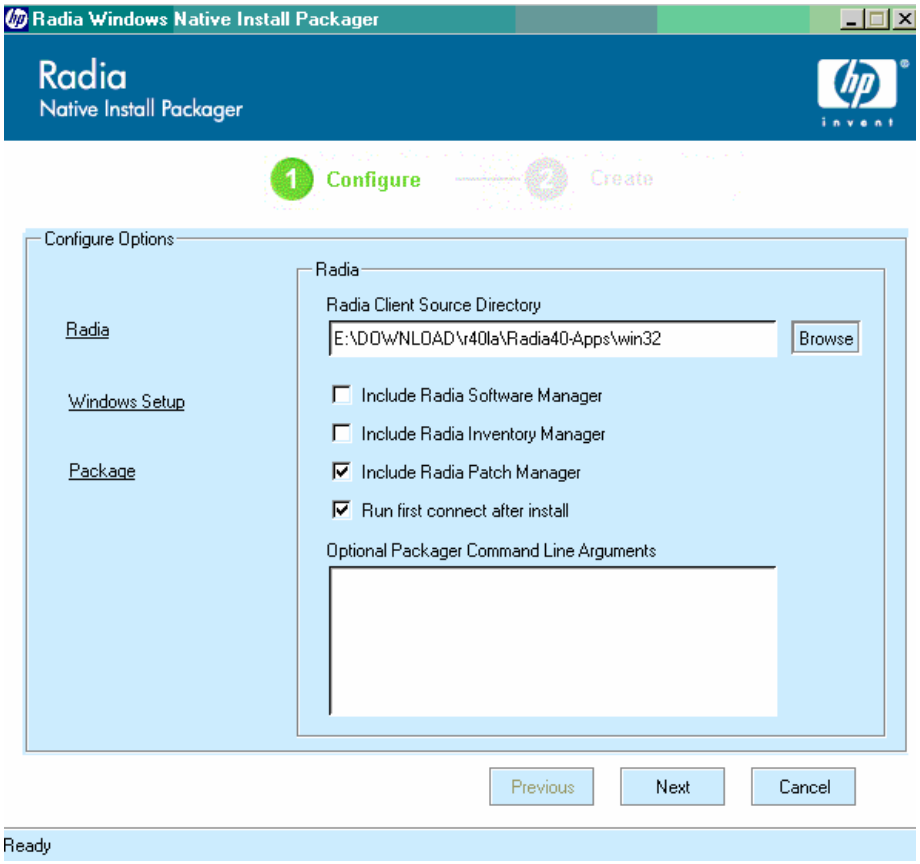
When the installation is done, click **Finish**.

Using the Radia Native Install Packager

To use the Radia Native Install Packager

1 Double-click the Radia Native Install Packager icon on the desktop.

The Configure Options window opens.



You must complete the information on each of the three windows – Radia, Windows Setup, and Package.

- The **Radia** area contains options used to set up options related to Radia products.
- The **Windows Setup** area gathers information needed to perform the OS installation.
- The **Package** area gathers information needed by Radia about the package that you are creating.

If you click **Next** before completing the required fields on each of these windows, you will receive a message prompting you to complete the fields.

2 Select the Radia products' check boxes that you want installed.

3 Select the **Run first connect after install** check box to perform a Radia OS Connect after the OS is installed. If this is not selected, the Radia OS Connect will not occur automatically after the OS is installed. This allows you more granular control over the migration from unmanaged target machines to managed machines.

4 In the **Optional Packager Command Line Arguments** box, type parameters to be used by the WNI application. The options can be placed all on one line or on several lines. Specify the options in the keyword-value format, such as

```
-trace_level  9
```

The keyword must always begin with a dash (-).

Usually you will use the **Optional Packager Command Line Arguments** text box only when directed by Technical Support.

There are many parameters that can be used to create logs. The following example describes how to create a file called `C:\temp\nvdwni.log`.

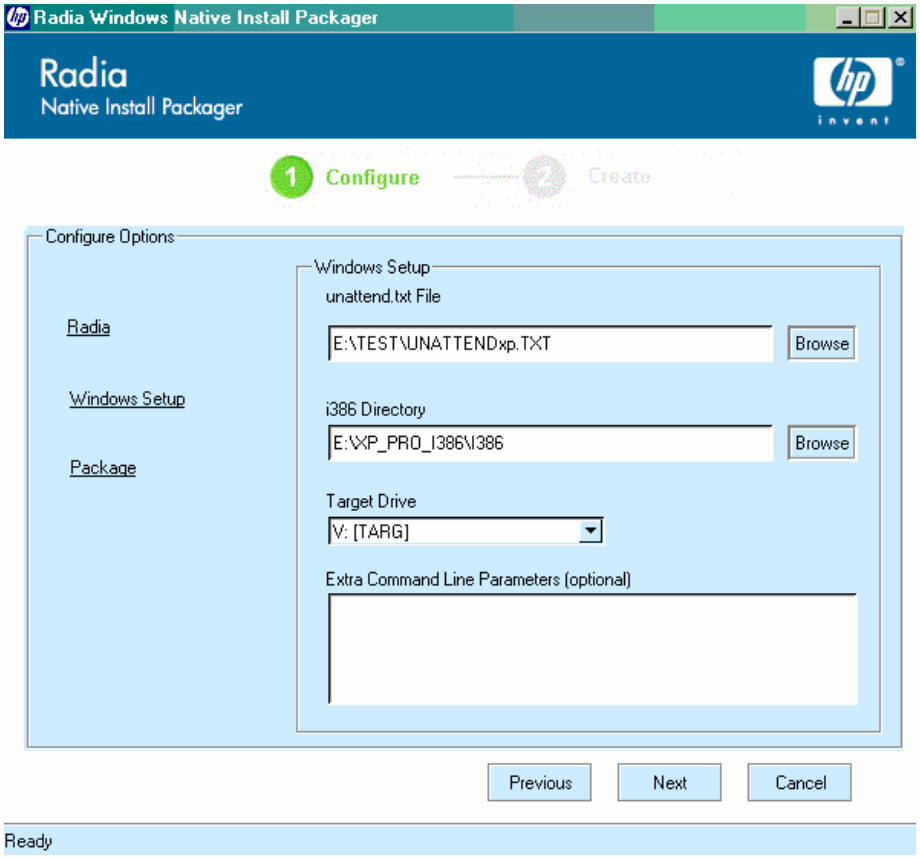
- `-trace_level  99`
- `-trace_dir  c:\temp`

If you want to create a log with a different name, you can use the following:

- `-trace_file filename.log`

5 Click **Next**.

The Windows Setup window opens.



6 In the **unattend.txt File** box, browse to the appropriate `unattend.txt` file.

Select a generic `unattend.txt` file to be stored in the image. This file should contain options that are applicable for all machines that the image may be applied to. Later, you can attach a separate unattend.txt file to the image to make any necessary customizations.

The `Unattend.txt` file must match the release of Windows specified in the i386 directory. These files may vary slightly depending on the version of Windows being installed.

7 In the **i386 Directory** text box, select the Windows source distribution directory provided by Microsoft on its distribution CD-ROM. You can use the Microsoft slipstream process to incorporate service packs and other fixes. See the `readme.txt` file associated with the service pack for more information about how to do this.

Be sure to copy the i386 from the Windows CD-ROM to another location. If you use the CD-ROM, Windows setup assumes you will have the CD-ROM loaded on the target system and will not copy all of the necessary files.

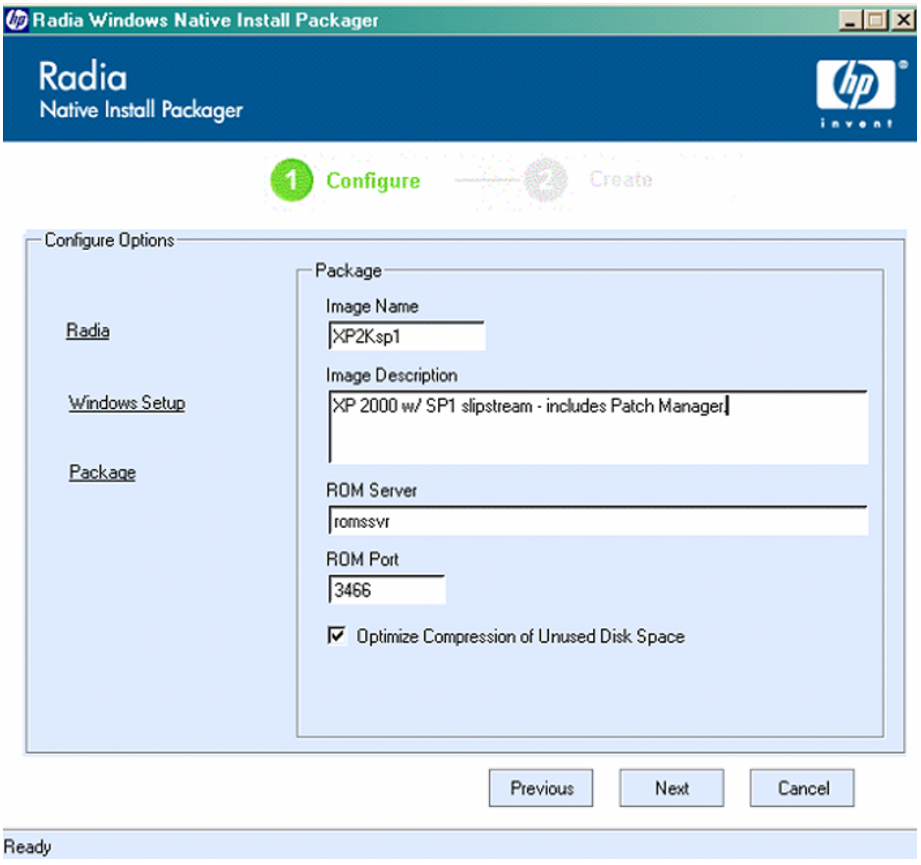
8 In the **Target drive** drop-down list, select the drive where the native install package will be created.

All existing data found on this drive will be lost

9 In the **Extra Command Line Parameters** box, type any parameters that you want to pass to the Windows Setup program when it is run. See the Microsoft web site for more information about the parameters.

10 Click **Next**.

The Package window opens.



11 In the **Image Name** box, type the name of the package that will be stored in the `\upload` directory on the ROM server. This name has a maximum length of eight characters and should be composed of alphanumeric characters only.

12 In the **Image Description** box, type a description of the image (up to 255 characters).

13 In the **ROM Server** box, specify the IP address or host name for the ROM Server where the image should be uploaded.

14 In the **ROM Port** box, specify the port for the ROM Server.

15 Select the **Optimize Compression of Unused Disk Space** check box to null all unused disk space on the target drive before imaging it. This reduces the size of the image but causes the Image Preparation Wizard to run longer.

16 Click **Next**.

17 Review the Summary and then click **Create**.

After clicking **Create on a Windows 2000 machine**, Windows Setup may prompt you to reboot the system. Click **Cancel** to avoid the reboot. The reboot is not necessary, however nothing will be harmed if the reboot does happen.

Windows Setup runs and then returns to the Radia Native Install Package.

18 When the Radia Native Install Package is done, a message prompts you to reboot using the Linux CD-ROM. This refers to the Radia OS Manager Product CD-ROM.

19 Insert the Radia OS Manager Product CD-ROM, and then click **OK**.

20 Click **Finish**.

21 Reboot the machine and the image is uploaded to your Radia OS Manager Server's `\upload` directory.

22 When a message appears that the OS Image has been successfully sent to the Radia OS Manager Server, you can remove the CD-ROM from the drive and reboot your machine.

23 Next, you must use the Publisher to publish the image to the Radia Database.

4 Publishing to the Radia Database

Once you have used the Radia OS Manager Image Preparation Wizard or the Native Install Packager to create your gold image, you must publish it to the Radia Database. Use the Publisher located on your Administrator Workstation to do this.

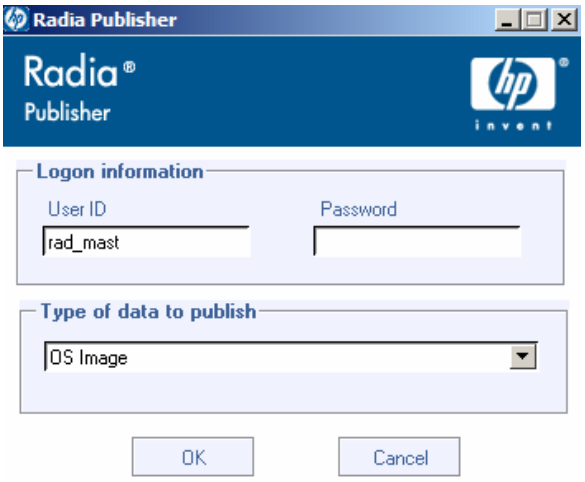
Publishing is an administrative task that should be done in a non-production lab environment.

For more information about the Publisher, see the *Publisher Guide*.

Using the Publisher

To use the Publisher

1 Double-click the Publisher icon on your desktop.



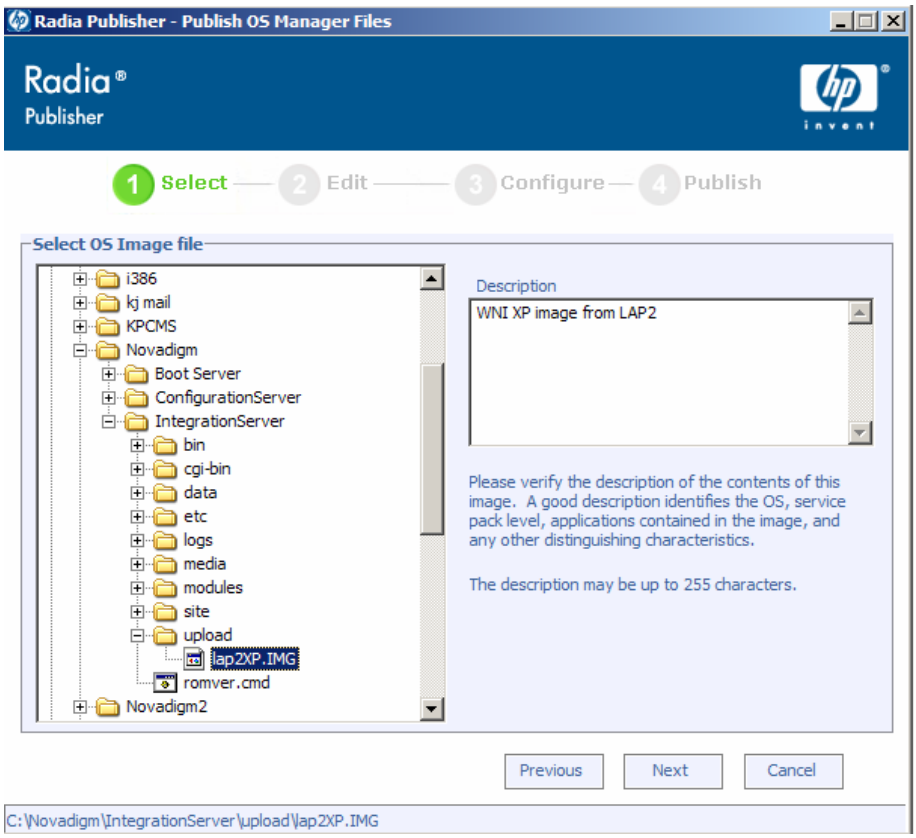
2 In the **User ID** box, type your Radia Administrator user ID.

3 In the **Password** box, type your Radia Administrator password.

4 From the **Type of data to Publish** drop-down list, select OS Image if you are publishing an operating system (OS) image, `Sysprep.inf` file, or `Unattend.txt` file.

5 Click **OK**.

The Select window opens.



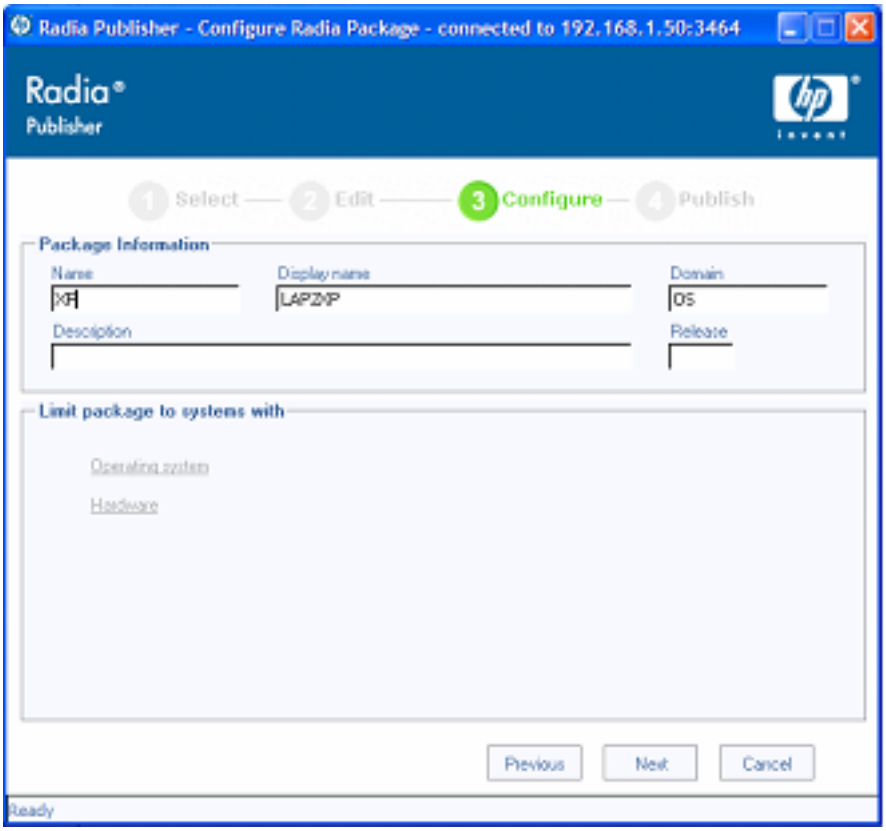
6 Use the Select window to find and select the file you want to publish (typically stored in the upload directory on the Radia Integration Server). Only supported file types appear in the window.

If you select a `sysprep.inf` file or a `unattended.txt` file, a field appears where you must type the instance name. When you click Next, you will skip directly to the final step because you will not be creating a service for these files. Sysprep and unattended text files are published to the SYSPREP class in the OS domain of the Radia Database. Use the Management Portal to view your published instances and then connect them to the appropriate OSs.

7 Use the information in the **Description** box to verify that you have selected the correct file before you continue. You can also add information to the description if you choose.

8 Click **Next**.

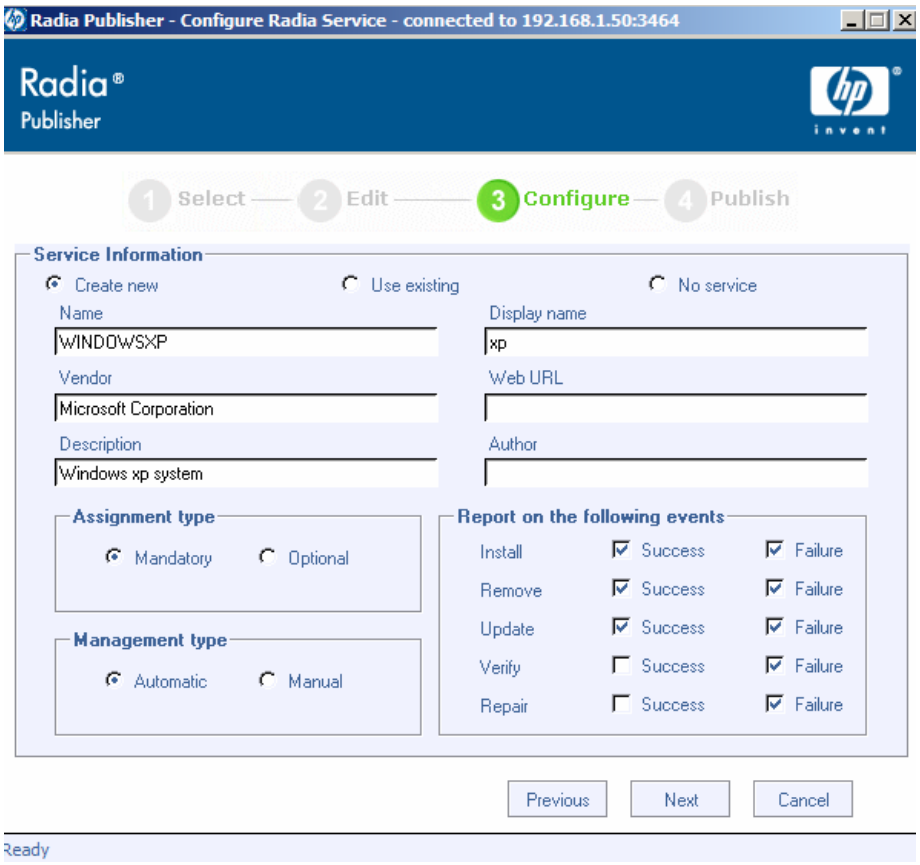
The Configure – Package Information window opens.



9 Use the **Package Information** section to enter the Radia package information. Note that the Limit package to systems with section is not available when publishing OS images.

10 Click **Next**.

The Configure – Service Information window opens.



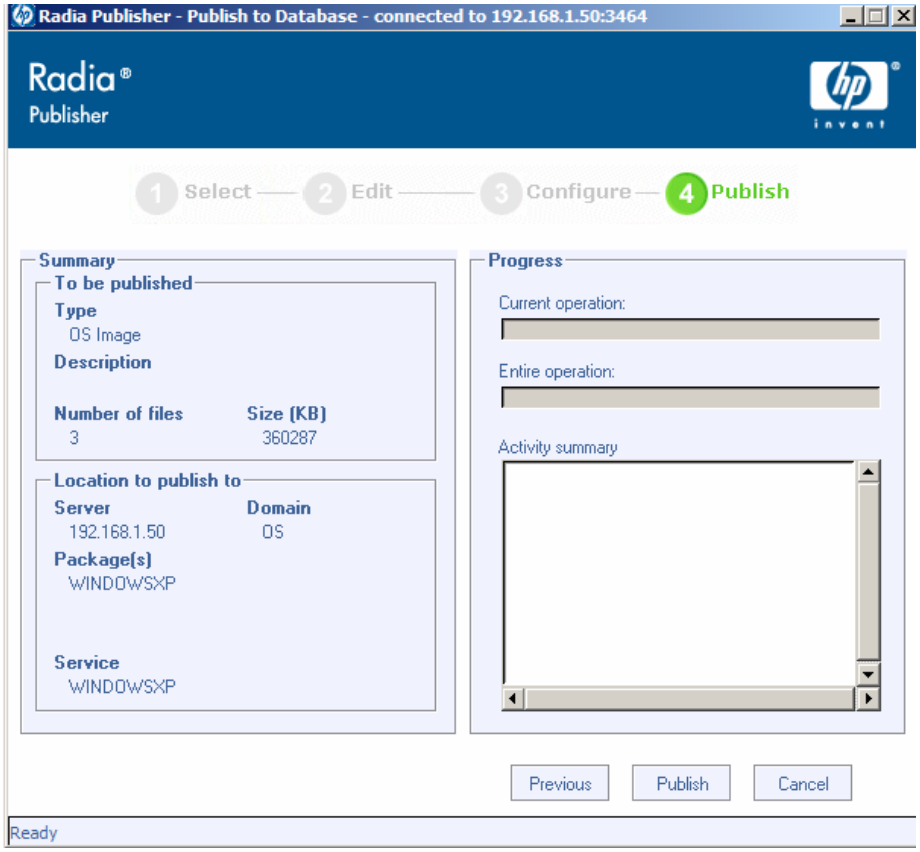
11 Select **Create new**.

12 Enter the appropriate information in the rest of the fields.

13 In the **Assignment type** group box, select whether the service is mandatory or optional. By default, Mandatory is selected, which will distribute this service to all available subscribers. Optional services are only available if you are using the Software Manager client. Refer to the *Application Manager Guide* or the *Software Manager Guide* for more information about mandatory versus optional services.

14 Click **Next**.

The Publish window opens.

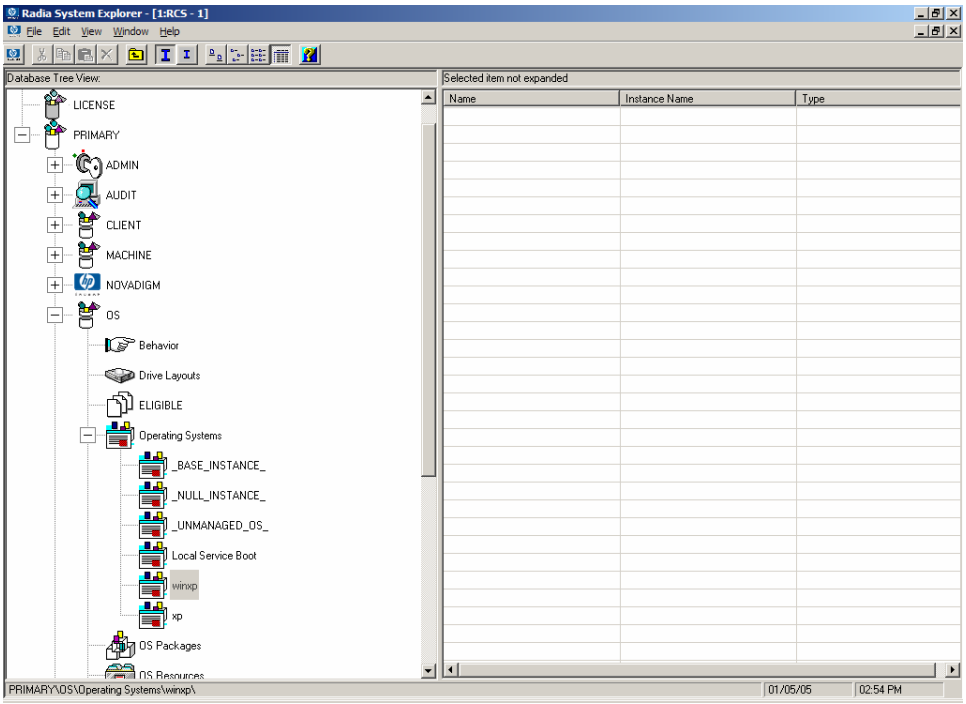


15 Review the **Summary** section to verify the package and service information you provided during the previous steps. When you are satisfied, click **Publish**.

16 Click **Finish** to exit the Publisher.

Use the System Explorer to view your package and service.

Remember, Sysprep files are published to the SYSPREP class in the OS domain of the Radia Database. Use the System Explorer to view your published instances and then connect them to an OS service. Each Sysprep can only be connected to one OS service. At this time OS services cannot share Sysprep instances.



There are some default connections to all OS services that come from the BASE instance. These must not be changed.

5 Operational Overview

This chapter provides information on how to use the Radia OS Manager and Management Portal to prepare your operating system (OS) images for deployment to the appropriate target machines.

About Machine Discovery

When a target machine boots, it communicates with the Radia OS Manager Server, which determines whether a DEVICE object exists. This process is called discovery. If a DEVICE object does not exist, one will be created the first time the target machine communicates with the Radia OS Manager Server. Once a DEVICE object is established in the Radia Management Portal Zone, the Radia OS Manager Server and the target machine can communicate. Use the Management Portal to view the DEVICE object. See About the ROM Administration Classes on page 113.

If a DEVICE object *does* exist, what happens depends on several factors, such as whether the machine has an OS installed, how policy is defined and so on. The following table provides several scenarios and the results that you can expect under varying conditions.

In order to implement any changes to your operating system based on policy, a Radia OS Connect must run before the target machine reboots.

Table 2: Expected Results on Target Machine

If the target machine...	Then...
is a bare metal machine (has no OS installed) and no policy is assigned	nothing will happen until policy is assigned. Note: The default behavior is to prompt the user for workstation or role. However, if no policy is assigned, no OS can be installed. The user will be informed of this and instructed to press **Enter**. The machine shuts down.

If the target machine...	Then...
is a bare metal machine (has no OS installed) and policy is assigned	the appropriate OS is installed, a MACHINE object is created and the machine is considered to be under Radia management.
has an OS (that was not installed by the OS Manager) and no policy is assigned	the Radia OS Manager discovers the machine but considers it *unmanaged* and a MACHINE object is created; however, the installed OS remains on the machine.
has an OS (that was not installed by the OS Manager) and the ROM-aware client, and policy is defined	after the next Radia OS Connect a DEVICE instance will be created. The behavior settings will determine how and when the installation will take place (e.g., whether the resolved OS is installed or not, whether a user is prompted or not).
has a corrupted partition table and PMDISCRV=_CONFIRM_	the target machine shuts down so that the administrator can recover data from the target machine.
has a corrupted partition table and PMDISCRV=_AUTO_	the appropriate OS is re-installed.

Once machines are under Radia management, the OS will be changed if a machine is not in the desired state. A machine may not be in the desired state due to one of the following issues:

- There is a change in policy.
  When policy is modified, the current OS on a machine may no longer be applicable. In other words, the list of OS services returned as a result of policy resolution does not include the currently installed OS. This will trigger installation of an OS so that the machine's OS is in the desired state.

  You typically use policy to manage your OSs.

  An example of this occurs during an upgrade where the desired OS changes from Windows 2000 to Windows XP.
- It doesn't have a local OS (bare metal).
- There is administrator intervention.
  In some cases, you may wish to install an OS regardless of what is

currently on the machine e.g., when a machine has a corrupted local hard drive which can no longer successfully boot the local OS.

About Policy

The Radia OS Manager introduces several new policy classes — machine manufacturers (MANUFACT), machine models (MODEL), machine roles (ROLE), and machine subnets (SUBNET)—which are resolved in the following order: ROLE, MANUFACTURER, MODEL, SUBNET. *This order is subject to change.* See Determining Policy Assignments below for important information about implementing policy,

Manufacturer, model, and subnet are based on attributes related to a machine. Role is *not* based on a machine's attributes. It is simply a grouping of machines, similar to how you might assign policy based on departments. You can set policy based on a machine's assigned role—such as server or workstation.

Role is the only criterion that you can use to allow an end user to determine the OS that is installed on the machine. Note that to allow end user selection of an OS, you need to set the system behaviors accordingly (see Setting Behaviors on page 123). Once a role is selected by the end user, only you, the administrator, can reset it to a different value, or to empty, so that the end user may select the role again.

Determining Policy Assignments

We recommend that you select a single criterion for policy.

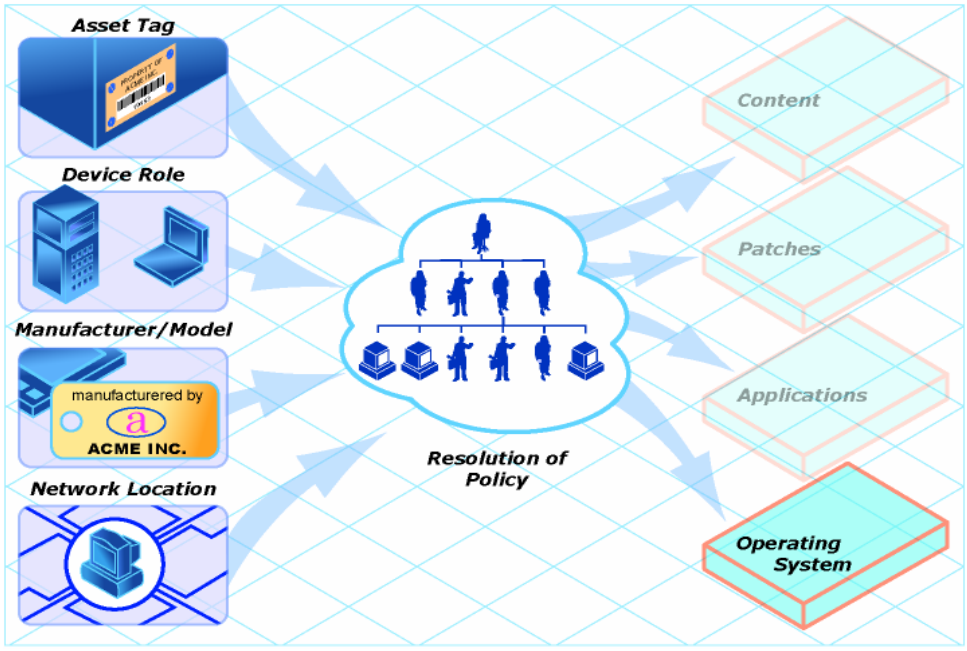


Figure 2: Resolution of Policy.

In order to determine which criterion to use, look at your overall environment. In general, you will probably most often assign policy by subnet or role.

- If your environment is divided by subnets, you may choose to use the SUBNET criterion. For example, server farms are typically defined by subnets.
- If your environment is a build center, it may make sense to use the ROLE criterion so that end users can select what OS should be installed.
- If your environment is standardized by hardware, then you may choose to use the MANUFACTURER or MODEL criterion. For example, one vendor makes all the laptops in your environment and a different vendor makes all of the workstations in your environment, you may decide to use the manufacturer class. These criteria will probably be used less often than the others because it may be unusual to use a certain model or manufacturer throughout your environment.

In general, you should use policy to determine the OS to be installed. Occasionally, you may want to assign a specific OS directly to a machine. This can be useful for testing purposes, however it should be considered the exception to the rule. This is not recommended. Remember—policy rules.

If you have followed the recommendation to use one criterion to determine policy, your OSs will deploy as expected.

Ambiguities in Policy Resolution

At times, you may find that more than one OS has been resolved for a machine. We call this an **ambiguity**. You may need to use the behavior settings to arbitrate the ambiguity if more than one criterion was used to determine policy. See Setting Behaviors on page 123 for more information about determining who is responsible for selecting the appropriate OS.

In some situations, you may intend to cause an ambiguity. An example of this would be if you have a test lab that is on its own subnet, yet you want end users to have the option to rebuild the machines frequently, choosing from one of three OSs. You would assign policy by subnet and role, but you would also have to set the behavior to prompt the end user to select the role.

Below is an overview of how the classes relate in order to determine what OS is installed on a target machine.

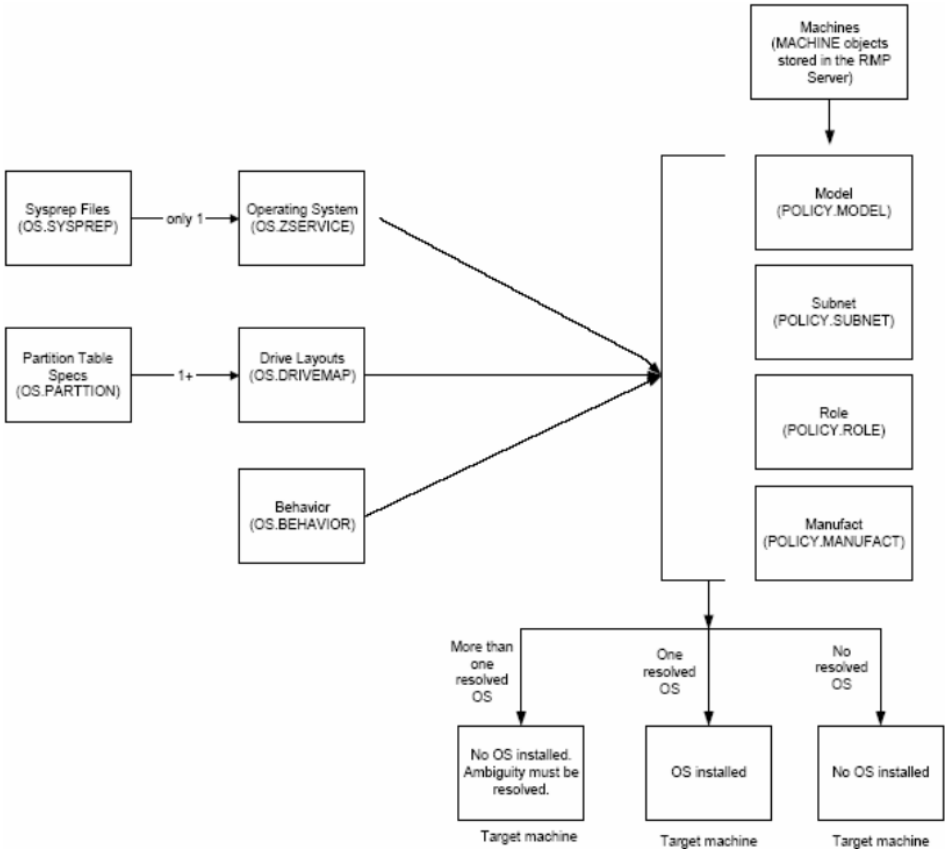


Figure 3: Class relationships.

Overview of the Management Portal and Zone Objects

You should become familiar with the Management Portal interface before you need to access the key areas of the infrastructure that you want to manage. First you must be familiar with the objects represented in a Zone in the Management Portal.

A tree view is used to organize these objects. The tree consists of the following icons, which represent the Zone Directory objects.

- **Zone** 
  The Zone Directory contains all devices, infrastructure, and software that is managed and administered by the Management Portal at this location. Other Radia Management Portal Zones are accessed from the connections available from the Zone Access Points container.
- **Directory** 
  A directory, such as an Active Directory, is configured for access by a Management Portal Administrator appears at the Directory level in the Workspace.
- **Primary file** 
  The Primary file is a Primary file on a Radia Database on a Configuration Server. Use the Configuration Server Administration Tasks from the Management Portal to perform instance-level tasks on the Radia Database.
- **Devices**  .
  A Device is a physical device that exists in the Devices container of the Zone, and is being managed from this Zone. Devices can be servers or computers that exist in your infrastructure.

What is a Zone?

A **zone** is a logical set of devices, infrastructure, and software that is represented and managed in directory services and administered by the Management Portal.

A zone is created whenever the Management Portal is installed, and all objects in the zone include the high-level qualifier of the zone name. The first installed zone is called the Master Zone and others are called Subordinate

Zones. The properties for the Zone object, itself, include the URL information needed to access the zone.

The Zone Directory Structure

Every Radia Management Portal Zone has the same directory structure and same-named containers at the highest levels.

Directory Size of a Single Zone

The Portal Directory loads all configuration and entitlement information for the Management Portal as well as devices, groups, managed infrastructure, job status, network and mounted services information.

A single Radia Management Portal Zone has an absolute limit of 10,000 devices. We recommend limiting the number of devices managed by a single zone.

It is highly recommended to have a maximum of 10,000 devices per Radia Management Portal Zone. Between 5,000 and 7,000 is the advised value.

Multiple Radia Management Portal Zones can be installed to meet the needs of enterprises of any size.

Performing Administrative Tasks in the Management Portal

Use the ROM Administration tasks in the Management Portal to prepare your OSs and then initiate deployment. Remember, you must be familiar with the Management Portal to complete these tasks.

Logging On

To log on to the Management Portal

1 Open your web browser.

2 In the Address bar, type **`http://`***`IP_AddressForRMPserver`***`:3466`**.

3 In the **User Name** box, type **`ROMADMIN`** to log in as the Radia OS Manager administrator.

4 In the **Password** box, type a password. The password is case-sensitive.

The pre-defined password is *secret*.

Be sure to change your password before moving the RMP with the Radia OS Manager Server Administration tasks into your production environment.

5 Click **Login** or press **Enter**.

About the ROM Administration Classes

To access the ROM Administration classes

1 Navigate to the appropriate Configuration Server service for ROM.

2 In the workspace, the following icons appear.

— Behaviors
Lists the settings for how the Radia OS Manager behaves. You can assign different system behaviors to different targets. See Setting Behaviors on page 123.

— Drive Layouts
Lists the types of partitions that you can add or copy, and allows you to configure new partitions. See Defining Drive Layouts on page 145.

— Machine Manufacturers
Used to set policy based on the machine's manufacturer.

— Machine Models
Used to set policy based on the machine's model.

— Machine Roles
Used to set policy based on the machine's role.

— Machine Subnets
Used to set policy based on the machine's subnet.

— Operating Systems
Stores the OS services to be deployed to your target machines.

— Sysprep Files
Lists the Sysprep files and unattend.txt files stored in your database. See Connecting a Sysprep File on page 154.

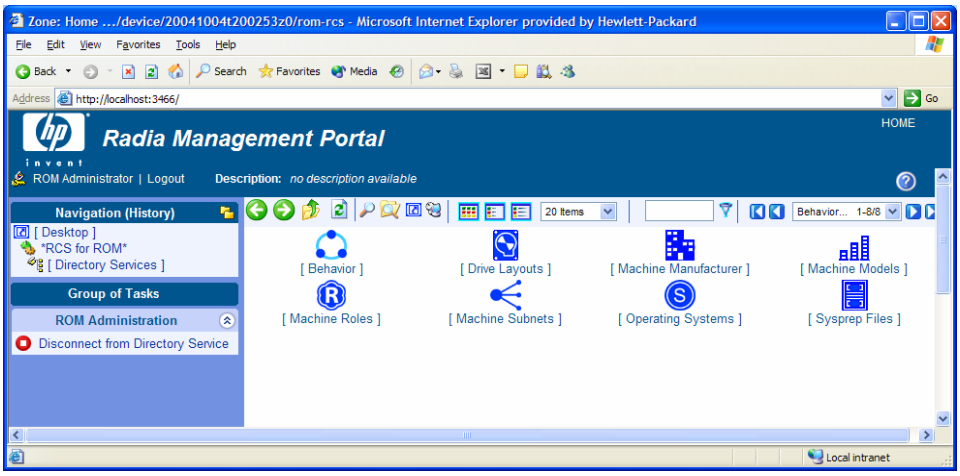


Figure 4: ROM Administration classes.

Using the ROM Administration Tasks

Use the Radia OS Manager Server Administration task group to manage the various criteria as well as define policy structures.

Before you begin using the individual tasks, it is recommended that you review some typical scenarios and the procedures that you might follow when preparing to deploy OSs to your target machines. The table below provides

sample scenarios and a summary of the tasks that you can use in each of these situations. See the referenced descriptions listed with the individual tasks to learn how to use the Radia OS Manager Administrative Interface to complete the tasks.

To use the scenarios below, you must be logged into the Management Portal as a ROM administrator.

Table 3: Administrative Procedures

If you want to...	Then...
Install an OS on a bare metal machine Note: This does not apply to Local Service Boot implementations.	1 Create any necessary policy instances, such as subnet or role. See Creating an Instance on page 130. 2 Connect the policy instances to the OS service. See Connecting Operating Systems on page 133. 3 If you do not want to use the default behavior (the Undefined instance in the Behavior class), you can modify the behaviors. See Setting Behaviors on page 123. 4 Boot the target machine. When the machine boots up, the appropriate OS (according to policy) is installed and a MACHINE object is created.

Table 3: Administrative Procedures

If you want to...	Then...
Bring an unmanaged machine with an installed OS under Radia management. Reminder: The target machine must have the ROM—aware Radia Client installed. See Updating the Configuration Server and Database on page 44.	1 Boot the target machines so that discovery occurs. 2 If necessary, use the Filter Machines task to determine which machines are unmanaged. See Filtering Machines on page 136. 3 Run a Radia OS Connect for the machines that you want to bring under management. This deploys the unmanaged service to the target machine. 4 If necessary, create policy instances, such as department, machine, model, or subnet. See Creating an Instance on page 130. 5 Connect the policy instances to the OS service. See Connecting Operating Systems on page 133. 6 Bring the unmanaged machines under management. See Bringing Machines under Management on page 143. 7 Run a Radia OS Connect (via Notify or Scheduler), which starts the migration of the OS.
Force a re-installation of the the current OS without retaining any existing data.	1 Use the Force OS Install task. See Forcing an OS Installation on page 140 2 Reboot the target machine.
Force the installation of a valid OS that you choose without retaining any existing data.	1 Assign policy so that the new OS that you want to install is the *only* OS connected to policy. 2 Use the Force OS InstallForce OS Install task. See Forcing an OS Installation on page 140. 3 Reboot the target machine. 4 Run a Radia OS Connect. 5 Reboot the target machine.

Table 3: Administrative Procedures

If you want to...	Then...
Initiate the installation of a different OS.	1 Set the Select OS (PMSLCTOS) behavior to _CENTRAL_ to give the administrator control over policy. See Setting Behaviors on page 123. 2 Assign policy so that the new OS that you want to install is the *only* OS connected to policy. 3 Run a Radia OS Connect. 4 Use the Re-evaluate/install OS task to re-evaluate the state of the OS and install a new one based on policy. See Re-evaluating the Operating System on page 138. 5 Run another Radia OS Connect and the machine will reboot and install the new OS. Note that if you do not set the Behavior to CENTRAL, the user will be prompted to confirm whether they want to reinstall the OS.
Allow the user to decide which OS to install.	1 Verify that your policy will result in more than one OS available for the target machines. 2 Set the Select OS (PMSLCTOS) behavior in the Undefined behavior to _LOCAL_. See Setting Behaviors on page 123. 3 Run a Radia OS Connect. 4 Use the Re-evaluate/install OS task to re-evaluate the state of the OS and install a new one based on policy. See Re-evaluating the Operating System on page 138. 5 Reboot the target machine.
View a list of machines that have more than one resolved OS and then select the OS to be installed.	• Use the Select OS for pending machines task. See Selecting an Operating System on page 135.
The following are additional options that can be used in many scenarios	

Table 3: Administrative Procedures

If you want to...	Then...
Use an override Sysprep file.	• Connect a Sysprep instance to the operating system instance. See Connecting a Sysprep File on page 154. When the OS is deployed to the target machine, the override Sysprep file will be merged with the Sysprep file that is embedded in the OS.
Add partitions.	1 Use the Drive Layouts class to specify the type of partition. See Defining Drive Layouts on page 145. 2 Add a partition. See Adding Partitions on page 147. All existing data will be lost. 3 Assign the appropriate drive layouts to your target machines. See Connecting Drive Layouts on page 147.
Create a replace, cache, or merge type partition.	1 Use the Drive Layouts class to specify the type of partition. See Defining Drive Layouts on page 145. 2 Assign the appropriate drive layouts to your target machines. See Connecting Drive Layouts on page 151.

Viewing the DEVICE Object

Earlier you learned that the DEVICE object is created when a machine is discovered by the Radia OS Manager Server and then is stored in the Radia Management Portal Zone. For more information review the topic About Machine Discovery on page 105. In order to perform many of the tasks to prepare an OS for deployment, you must have a DEVICE object.

To view a DEVICE object, from the desktop select the appropriate Zone and then click on Device. Then select the ROM device you want to view. The Device Properties window opens.

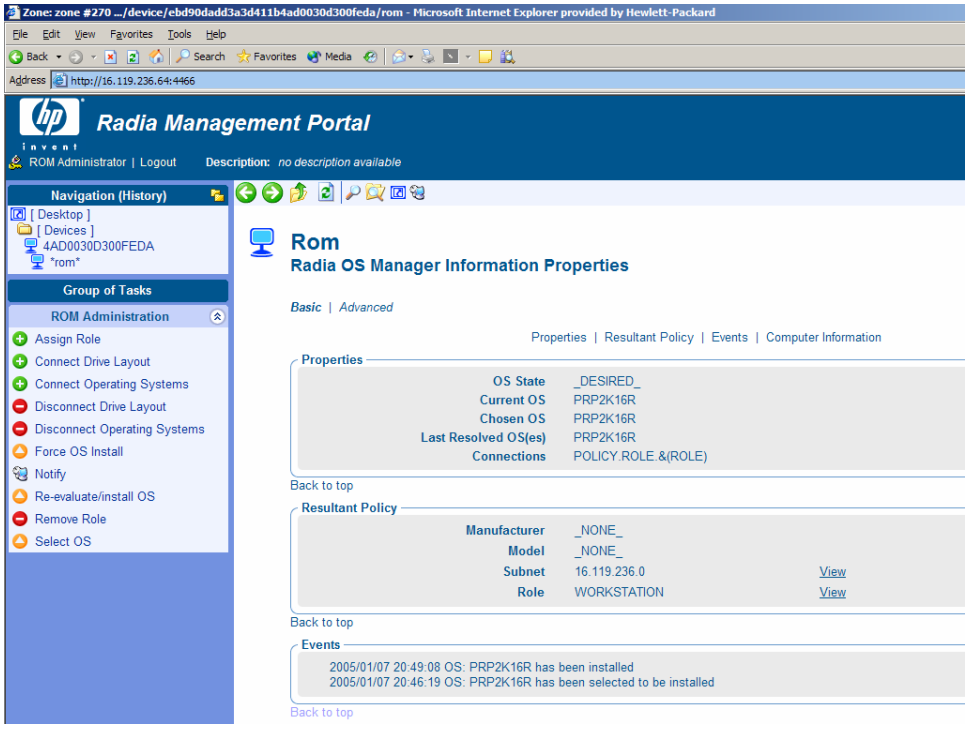


Figure 5: ROM Information Properties window.

This window is separated into three sections: The **Properties** section displays the ROM-specific attributes for the machine.

Table 4: DEVICE Object Attributes - Properties

Field	Description
OS State	Indicates the state of the OS on the target machine. • _INVALID_ – OS Manager will install a valid, managed OS. • _DESIRED_ – The client is already a managed machine with a valid OS. • _INCONSISTENT_ – The machine is managed, but the OS must be repaired. • _INSTALLED_ – A temporary state after the Gold Image has been installed and before a connection with the Radia OS Manager Server. After the connect, the correct OS will be installed and the OS state will change to _DESIRED_. Default: _INVALID_
Current OS	Indicates the OS that is successfully installed on the machine. This represents the ZSERVICE instance in the OS class. Default: _NONE_
Chosen OS	Indicates the OS to be installed on this machine. Default: _NONE_
Last Resolved OSs	Indicates the OSs resolved for this machine. Default: _NONE_
Connection	Service connection.

The Resultant Policy section displays policy for the machine. If policy does not already exist, you can click **Create** to create a policy instance. If policy does exist, you can click **View** to see the existing policy assignments.

Table 5: DEVICE Object Attributes – Resultant Policy

Field	Description
Manufacturer	Manufacturer reported by SMBIOS.
Model	Model reported by SMBIOS.

Field	Description
Subnet	Current subnet.
Role	Specifies the role selected for this machine by the local user or the administrator (depending on the PMROLE setting in the BEHAVIOR class of the OS domain). Default: _NONE_

The **Computer Information** section displays all of the DEVICE attributes that contain values. These values are stored in the Configuration Server.

Table 6: DEVICE Object Attributes – Computer Information

Field	Description
Display Name	The friendly name for the MACHINE object.
Computer Name	Computer Name. If the MACHINE object exists and the Radia OS Connects, this attribute will be updated with the computer's current information.
ACPI BIOS?	Indicates whether the machine has ACPI BIOS. • Y – indicates the machine is ACPI-compliant. • N – indicates the machine is not ACPI-compliant.
APIC	Indicates whether the machine has an Advanced Programmable Interrupt Controller.
Mass Storage Interface	Indicates the mass storage interface - IDE or SCSI.
Boot drive disk space (MB)	Disk space on the boot drive in MB.
Number of CPUs	Number of CPUs in the target machine.
CPU Speed (MHz)	CPU speed in MHz.
Current IP Address	Current IP address.
MAC Address	MAC address is a unique identifier derived from the NIC card.

Field	Description
Memory (MB)	Computer's total memory.
Sys Locator Enclosure Name	(Compaq-specific) EnclosureName field from the SMBIOS Locator structure. For HP-Compaq blades, this might be the user-defined enclosure name.
Sys Locn Enclosure Sys Bay	(Compaq-specific) EnclosureSystemBay field from the SMBIOS Locator structure. For Compaq blades, the relative location of this blade is in the enclosure.
Baseboard Location in Chassis	LocationInChassis field from the SMBIOS BaseBoardInformation structure. Note: For Dell and IBM blades, this stores the relative location of this blade inside the enclosure. Also for Dell and IBM blades, the enclosure name might be found in the SerialNumber field of the SMBIOS SystemEnclosure structure; it will be in SMINFO under the name SNENCLOS. The format of all of those four raw information fields is entirely manufacturer/model specific.
Subnet	The current subnet.
Manufacturer Derived from SMBIOS	Manufacturer reported by SMBIOS.
Model Derived from SMBIOS	Model reported by SMBIOS.
Current Subnet Mask	Current subnet mask.
SMBIOS Enclosure S/N	System Enclosure Serial Number from the SMBIOS.
SMBIOS Manufacturer	Manufacturer.
SMBIOS Product	System Product (model number) from the SMBIOS.
SMBIOS System S/N	System Serial Number.

Field	Description
SMBIOS Machine Unique UID	Machine Unique ID from the SMBIOS.

Setting Behaviors

You can assign system behaviors to your target machines based on policy. If you do not assign a behavior to policy, the Undefined Behavior (_NULL_) instance is the default.

For example, you may want to configure some managed machines to require that the user acknowledge that his OS is about to change, while others may not require user acknowledgement.

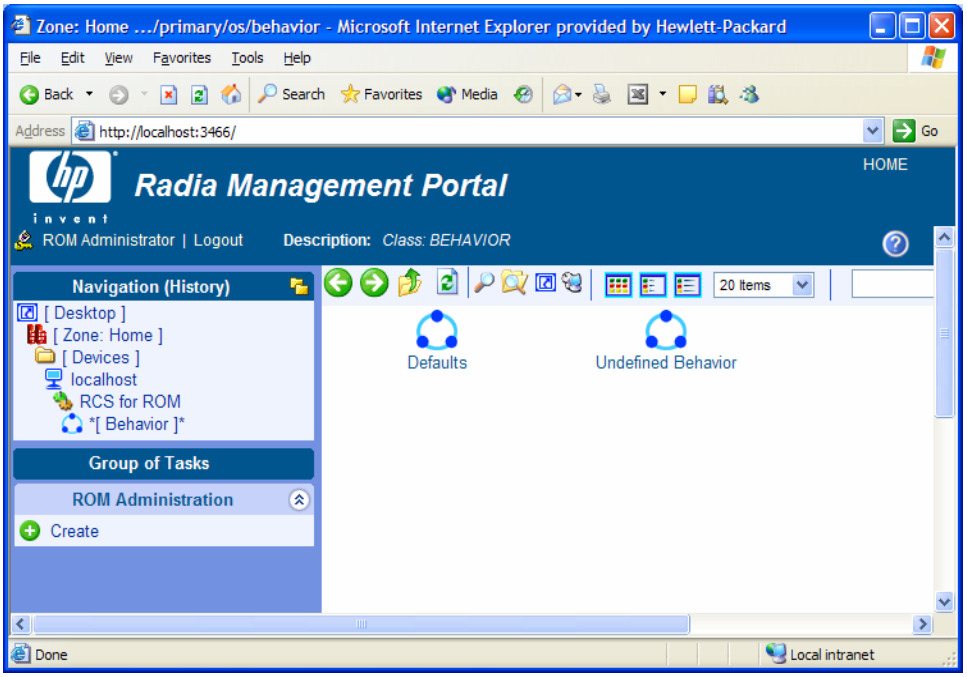
You must be very careful if you are using more than one Behavior instance, because these instances determine the behavior of the system. You may have unintended consequences if this is not performed properly. For example, if you set the wrong policy, you may inadvertently allow users to make policy changes, or an unattended machine may become stuck at a prompt.

It is highly recommended that you connect one Behavior instance to one Policy instance only.

One potential way to prevent errors would be to connect Behavior instances to mutually exclusive instances of different policies.

To set the behaviors

1. Use the navigation aid to select the appropriate Configuration Server.
2. In the workspace, click **Behavior**.



3 Create a new instance.

OR

Click an instance in the workspace and then click **Modify** to make changes to an existing instance.

If you do not know how to create or modify instances, refer to the *Management Portal Guide* or follow the steps in Creating an Instance on page 130 or Modifying Instances on page 144.

The table Attributes of the BEHAVIOR Class on page 125 describes the attributes for the Behavior class.

Table 7: Attributes of the BEHAVIOR Class

Field	Attribute in Database	Description
Select ROLE	PMROLE	Indicate whether the user is allowed to select a machine role. • _LOCAL_ displays a user interface so a user at the target machine can select a role for the machine. The list of available roles, determined from the instances in the POLICY.ROLE class in the Radia Database, is displayed. • _CENTRAL_ does not display the user interface. The administrator can assign a role, if necessary. A role selection remains in effect until you (the administrator) void or overrule the selection. Default: _LOCAL_
Select OS	PMSLCTOS	Indicates whether the user or administrator is responsible for action if policy resolves more than one OS for the target machine. • _LOCAL_ displays a choice of OSs so the user can make a selection. Note: If a machine prompts the user to make a selection even though it already contains a managed OS, it will also give the user the option to use the existing OS. For example, this would occur if a machine is managed, but the DEVICE object was deleted from the database. This option allows the user to preserve the existing data and applications. • _CENTRAL_ delays installation until the administrator specifies the

Field	Attribute in Database	Description
		Chosen OS. (SLCTDOS). An OS selection remains in effect until you (the administrator) void or overrule the selection or policy changes. Default: _LOCAL_
OS Overwrite Prompt	PMACKOVW	Indicates whether to prompt the user before overwriting or modifying the OS. If the prompt is displayed, it will ask the user to select "install," "use," or in some cases (where you have a valid OS with minor changes), "refresh." • "Install" creates a DEVICE object and installs the OS on the machine. • "Use" creates a DEVICE object, does not install the OS and considers the machine to be unmanaged. • "Refresh" reinstalls the existing OS, but includes updates to the OS made using the Administrative Interface. Use one of the following to set PMACKOVW. • _ALWAYS_ (Default) Prompts the user only if there is a valid file system (including a valid Master Boot Record) on the machine. • _NEVER_ Does not prompt the user, but installs the OS. • Caution: NEVER is designed for use in bare metal machines or kiosk situations. Use this option with caution, as the user will not be prompted before the OS is overwritten.

Field	Attribute in Database	Description
		• _VALID_ Prompts the user only if the current installation is valid. If there is a valid OS on the machine where an OS is to be installed, the user will be prompted to overwrite the OS. IF there is no valid OS, the user will not be prompted and the OS will be installed without user intervention.
Timeout for user response (seconds)	USERTO	Specifies how long a message displays to the user before continuing. • Set USERTO = -1 to wait indefinitely for input by the user. • Set USERTO = *number of seconds* to wait the specified length of time before continuing.
Download: # bytes/sec (opt K/M/G)	BANDWITH	The bandwidth throttle used by each target machine. For example, 1000K. • If this attribute is left empty, the download process will run at the maximum speed of the network interface. • You can specify bandwidth throttle in Kbs (K), MB/sec (M), or GB/sec (G). The default definition is in bytes/sec. The default value is blank (no bandwidth limitation).
Run-once parameter string	RUNPARAM	You must modify this parameter to specify the IP address for your Configuration Server. If you do not modify this parameter, your target machine will not be able to successfully run a Radia OS Connect.

Field	Attribute in Database	Description
		Specifies the parameters that are appended to the radskman command line. This command line will run after the OS has been installed, and will install the target machine's applications. For additional parameters, refer to the *Application Manager Guide* and the HP OpenView support web site. • For the IP parameter value, enter your Configuration Server IP address or DNS name. • The cop=y parameter must included to meet the requirement that COP must be enabled to use the Radia OS Manager.
Action on existing OS upon Machine Discovery	PMINITL	Specifies whether an OS should be installed over an existing file system on a recently discovered, but unmanaged machine. • _LOCAL_ Prompts the user. • _KEEP_ Does not prompt the user and keeps the current OS if the machine has a valid operating system. If the machine does not have a valid operating system and there is a resolved OS, it will be installed. • _REINSTALL_ (default) Does not prompt the user and reinstalls the operating system, regardless of what exists. The installation occurs only if there is no `rombl.cfg` on the machine. If there is a `rombl.cfg`, this indicates that the machine is already under management and

Field	Attribute in Database	Description
		nothing will happen.
Ack Timout ROLE/OS (seconds)	ACKTMOUT	Specifies how long ACKTMOUT waits before assigning the default AUTOROLE. • Set ACKTMOUT = 0 to disable the timeout. • Set ACKTMOUT = *number of seconds* to wait the specified length of time before continuing.
Default value for a ROLE	AUTOROLE	The ROLE that is assigned if a timeout occurs.
Keybd Language Support	KBDMAP	Sets the keyboard mappings: • en (default) – loads English keyboard mappings • fr – loads French keyboard mappings • de – loads German keyboard mappings
ROMA Parameters	ROMAPARM	This field has several uses. Typically, you should use this only if instructed by Technical Support. Also used in conjunction with the TESTMODE flag.
Send AppEvent To	EVNTDEST	Indicates where to send the AppEvent objects.

Field	Attribute in Database	Description
Action taken on damaged master boot record	PMDISRCV	Specifies the action to be taken when the master boot record is found to be damaged. • If PRDISRCV = _CONFIRM_ then the target machine shuts down so that the administrator can recover data from the target machine. • If PRDISRCV = _AUTO_ then the appropriate OS is re-installed.

4 When you are done making changes, click **Modify**.

The Defaults for the Behavior Properties window opens again.

Creating an Instance

The following is an example of how to create a subnet instance. Use these steps to create an instance in any class over which you have the appropriate authority.

Note that if you want to create an instance for a machine manufacturer or machine model, you should use the manufacturer or model information that is stored in the MACHINE object that was created when the machine was discovered.

The reason for this is that the instance name must correspond with the data derived from SMBIOS. For example, Hewlett-Packard would be HEWLETT_PA. You cannot use spaces and are restricted to ten characters.

Also, remember that you can create policy instances directly from the MACHINE instance, as described in Viewing the DEVICE Object on page 118.

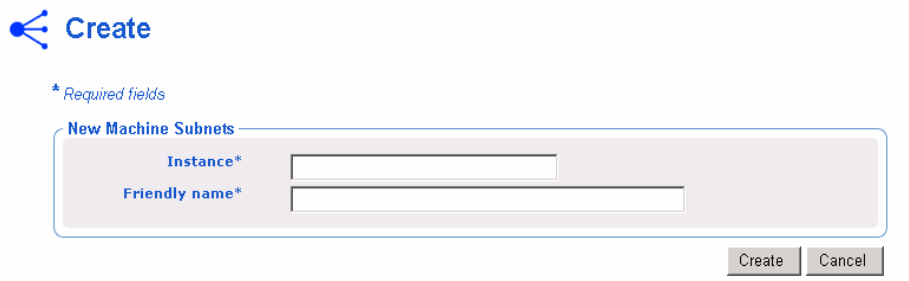
To create a subnet instance

1 Use the navigation aid to select the appropriate Configuration Server.

2 In the workspace, select the appropriate class, such as Machine Subnets.

3 In the **ROM Administration** task group, click **Create**.

The Create window opens.

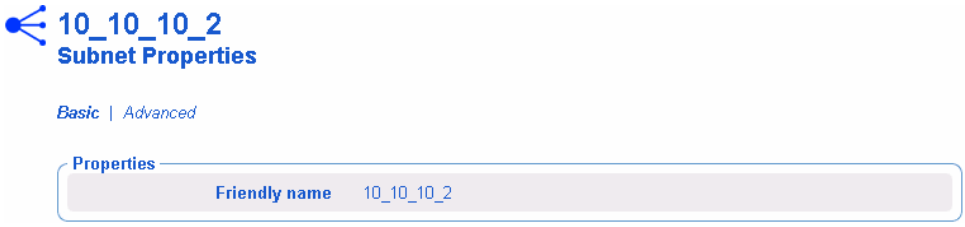


4 In the **Instance** box, type the name of the instance that represents the subnet. Remember that when specifying the subnet, you must use underscores (_), not periods (.).

5 In the **Friendly name** box, type a friendly name.

6 Click **Create**.

The Subnet Properties window opens.



Assigning Roles

Use the Assign Role task to assign the appropriate role to the target machine. HP includes the following sample roles – SERVER and WORKSTATION.

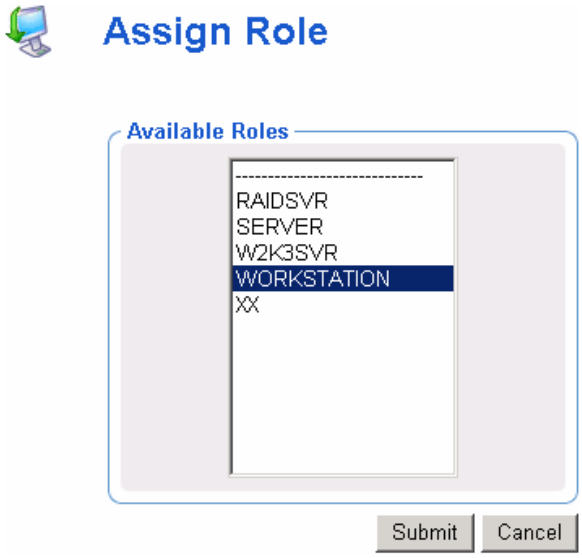
To assign roles

1 Use the navigation aid to go to the appropriate DEVICE object.

2 Click **ROM**.

3 In the ROM Administration task group, click **Assign Role**.

The Assign Role window opens.



4 Select a role from the list of Available Roles.

5 Click **Submit**.

The Radia OS Manager Information Properties window opens.

Removing Roles

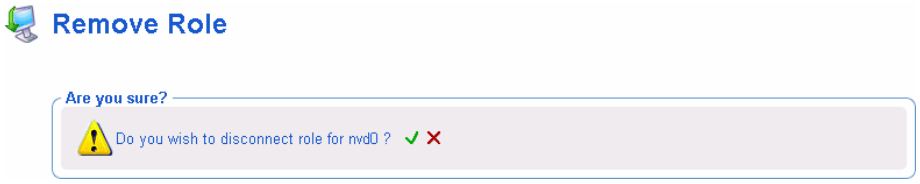
Use the Remove Role task to remove the assigned role from the target machine.

To remove a role

1 Use the navigation aid to go to the appropriate DEVICE object.

2 In the **ROM Administration** task group, click **Remove Role**.

The Remove Role window opens.



3 Click ✓ to confirm that you want to remove the role.

OR

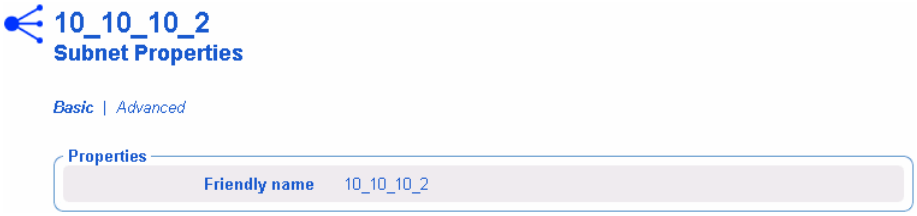
Click ✗ to indicate that you do not want to remove the role.

Connecting Operating Systems

Use the Connect Operating Systems task to assign the appropriate OSs to your target machines based on policy such as machine type, manufacturer, model, role or subnet.

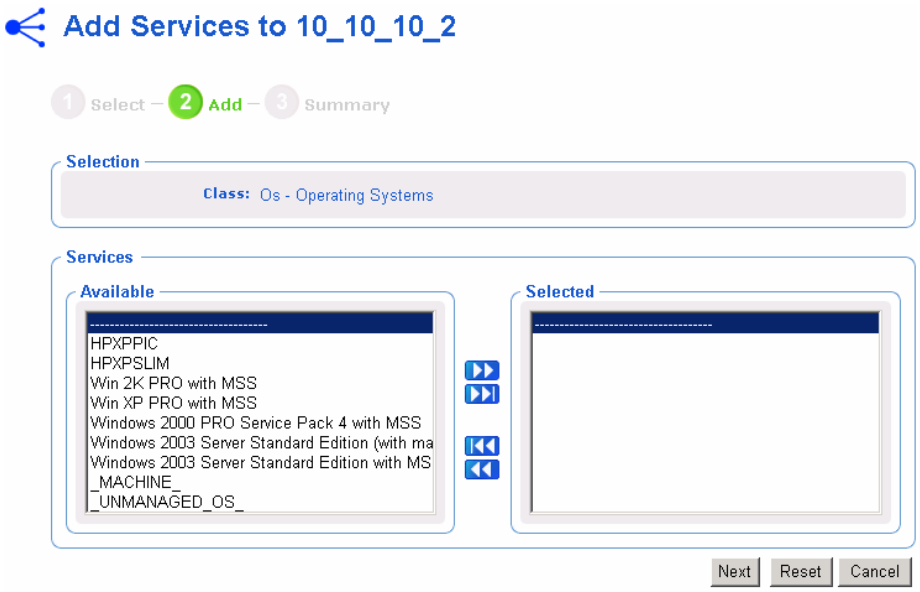
To connect operating systems

1 Use the navigation aid to go to the appropriate POLICY instance, such as a SUBNET instance.



2 In the **ROM Administration** task group, click **Connect Operating Systems**.

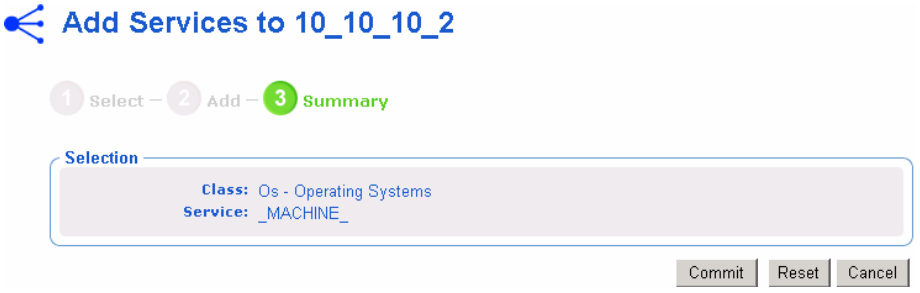
The Add Services window opens.



4 From the **Available** list, select the OSs that you want to assign to the POLICY instance and then click to add your selections to the **Selected** list.

5 Click **Next**.

The Summary window opens.



6 Click **Commit**.

The Properties window for the selected POLICY instance opens.

Disconnecting Operating Systems

Use the Disconnect Operating Systems task to remove assignments between OSs and the target machines based on the selected criteria.

To disconnect operating systems

1. Use the navigation aid to go to the appropriate POLICY instance.
2. In the **ROM Administration** task group, click **Disconnect Operating Systems**.
3. From the **Available** list, select the images that you want to disconnect.
4. Click  .
5. Click **Next**.
6. The Summary window opens.
7. Click **Commit**.

   The Properties window for the selected POLICY instance opens.

Selecting an Operating System

Use the Select OS task to assign the appropriate OS to the selected target machine. This task may be useful if:

- a device has more than one resolved OS (for example, if the DEVICE attribute RSLVDOS = WIN2K WINXP).
- the user was offered a list of OSs to choose from, and selected the wrong one. To resolve this situation, you (the administrator) must set the current OS to NONE. Then, you can use the Re-evaluate/install OS task to allow the user to select the appropriate OS. Of course, you can also change the behavior settings so that the user no longer receives a list of options, and the OS of your choice is installed.

Note that:

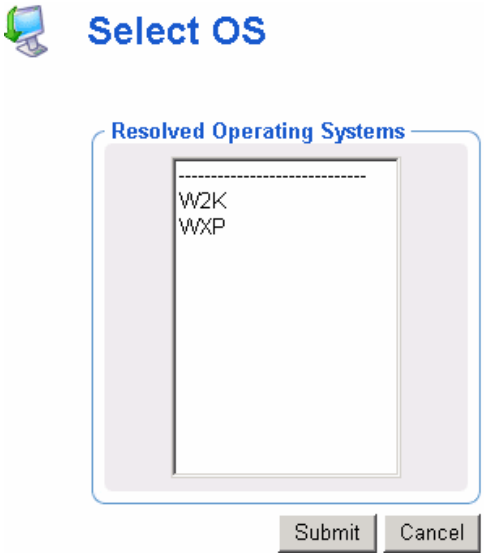
- The Chosen OS (SLCTDOS) must be in a pending state (_SLCTOS_PENDING_).
- This task does not initiate the installation of the OS; it simply allows you to select the OS that you want to install.

To use the Select OS task

1. Use the navigation aid to go to the appropriate Zone.

2 Click **Devices** and select the appropriate device.

3 In the **ROM Administration** task group, click **Select OS**.



4 Select the operating system that you want to install from the list.

5 Click **Submit**. The Chosen OS (SLCTDOS) attribute contains the name of the OS that you selected. You may use this task in conjunction with the Force OS Install task to force the installation of the selected OS.

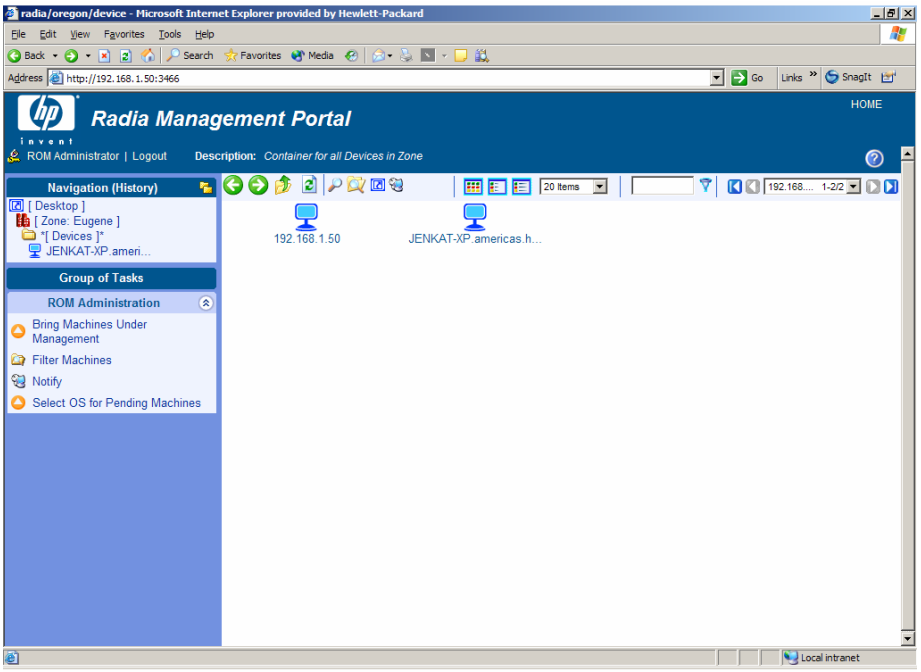
Filtering Machines

Use the Filter Machines task to query for machines with an invalid OS state, unmanaged machines with no resolved OS, or machines that have more than one eligible OS.

To use the Filter Machines task

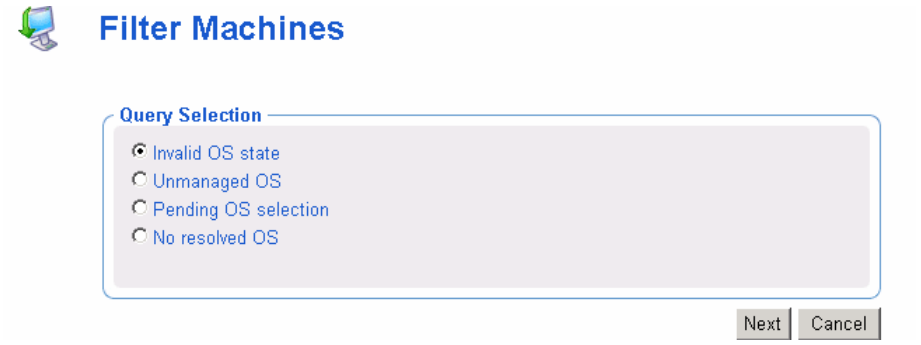
1 Use the navigation aid to go to the appropriate Zone.

2 Click **Devices**.



3 In the **ROM Administration** task group, click **Filter Machines**.

The Query Selection window opens.



4 Select the type of query that you want to perform.

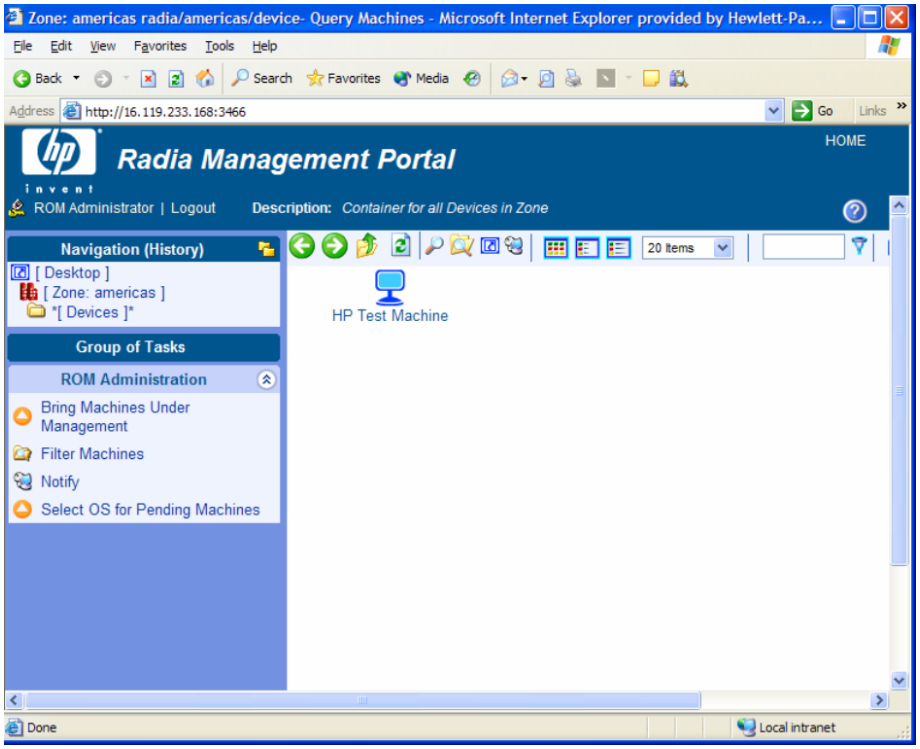
— Select **Invalid OS** state to find machines whose current OS is invalid. The OS State (OSSTATE) is set to _INVALID_.

— Select **Unmanaged OS** to find machines with an OS installed, but which the Radia OS Manager does not manage. An unmanaged

machine is a machine whose Current OS (CURROS) is set to _UNMANAGED_OS_.

— Select **Pending OS selection** to find machines that have no OS currently installed, but also have more than one eligible OS and are waiting for you (the administrator) to make a selection. A machine is pending OS selection if the Chosen OS (SLCTDOS) is _SLCTOS_PENDING.

— Select **No resolved OS** to find machines that have no resolved OSs; in other words, no policy has been assigned to the machine. A machine has no resolved OS if RSLVDOS is empty.



Re-evaluating the Operating System

Use the Re-evaluate/install OS task to change the currently installed operating system (Chosen OS) to a different operating system. The list of potential operating systems is stored in the Last Resolved OS field in the DEVICE object. See Viewing the DEVICE Object on page 118. Depending on your behavior settings, the user will be prompted to select an operating

system or you (the administrator) will use the Select OS for Pending Machines task to make the selection.

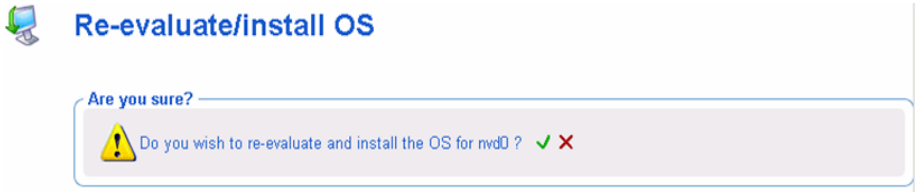
Use of this task requires that the target machine is already under management and has the ability to perform a Radia OS Connect. After selecting this task, you must perform a Radia OS Connect in order to initiate the policy change.

When the Radia OS Connect occurs, the data capture exit point is executed so that any user data or settings can be captured. The machine then reboots and resolution continues as normal. If the behavior is set to prompt the user, he will select the appropriate OS from the list displayed. The new OS is installed and the data restore exit point will be executed so that any user data or settings can be restored. See Addressing Requirements for Capturing, Recovering, and Migrating Data on page 187.

If you want to completely re-evaluate the existing installation, and the Select Role attribute in ROM Behaviors is set to LOCAL, you may consider setting the Role assigned to the machine to NONE so that the user is prompted for a role on the next reboot. See Assigning Roles on page 131 for information about how to set the role for a machine.

To use the re-evaluate/install OS task

1. Use the navigation aid to go to the appropriate Configuration Server.
2. Click **Machines** and select the appropriate machine.
3. Click the ROM object.
4. In the **ROM Administration** task group, click **Re-evaluate/install OS**.



5. Click ✓ to continue.

   OR

   Click ✗ to cancel this procedure.

6 If you click ✓, the MACHINE attribute value Chosen OS (SLCTDOS) is set to NONE and Current OS (CURROS) is set to NONE until the new OS is installed.

Forcing an OS Installation

Use the Force OS InstallForce OS Install task to force the installation of the resolved OS over any previously existing operating system.

Use this task only in situations where you have no other choice, such as if something unrecoverable happened to a drive.

Data capture/restore exit points will *not* be executed. All data and settings will be lost. See Addressing Requirements for Capturing, Recovering, and Migrating Data on page 187.

Typically, you should modify policy to change a machine's OS.

Note that if a cached partition exists, the image will be obtained from the partition. See Defining Drive Layouts on page 145.

To force an OS installation

1 Use the navigation aid to go to the appropriate Zone.

2 **Navigate to Machine Models** and select the appropriate machine.

3 Click the ROM object.

4 In the **ROM Administration** task group, click **Force OS Install**.

5 Click ✓ to continue.

OR

Click ✗ to cancel this procedure.

6 If you click ✓, the DEVICE attribute value OS State (OSSTATE) is set to INVALID, which is to be used as a last resort option. The OS will be re-

installed on the next boot. If the next boot happens before the next Radia OS Connect data/restore capture, backups and so on will not be executed.

Selecting the OS for Pending Machines

Use the Select OS for pending machines task to return a list of machines that have more than one resolved OS and then select the OS to be installed.

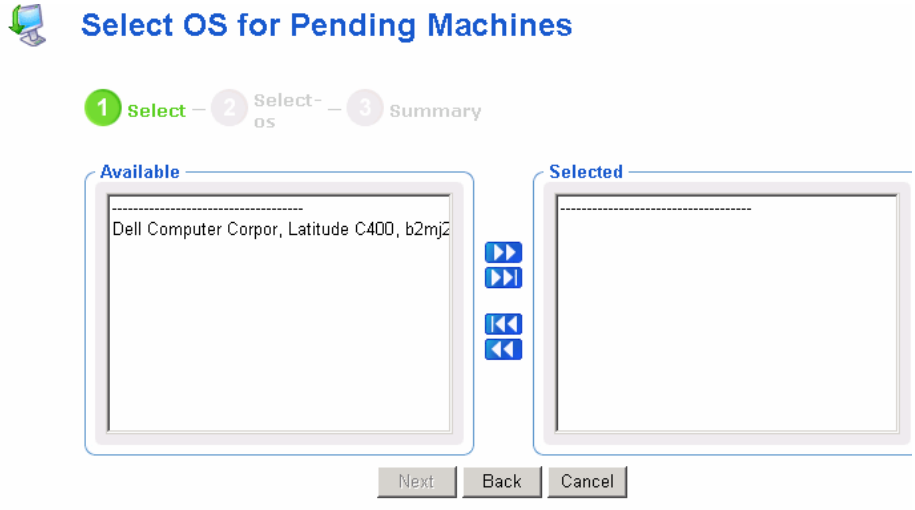
To return a list of machines in pending state

1 Use the navigation aid to go to the appropriate Zone.

2 Click **DEVICES**.

3 In the **ROM Administration** task group, click **Select OS for Pending Machines**.

A list of machines opens. A machine is in pending state if Chosen OS (SLCTDOS) is set to _SLCTOS_PENDING_.



4 From the **Available** list, select the machines whose OSs you want to set, and then click  to add your selections to the **Selected** list.

5 Click **Next**.

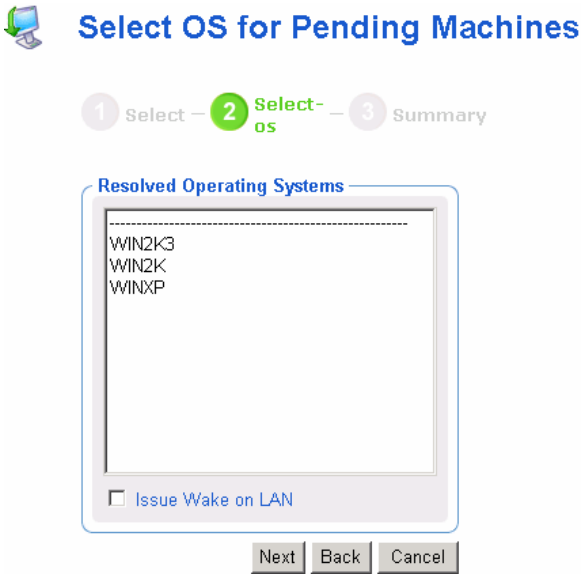
A list of the resolved OSs opens. Note that if you select multiple machines, this list is limited to the OSs that are eligible for all of the selected machines.

For example, if you have two machines:

— MACHINE A's eligible OSs are Win2k and WinXP, and

— MACHINE B's eligible OS is Win2k.

The list in this window will only contain Win2k.

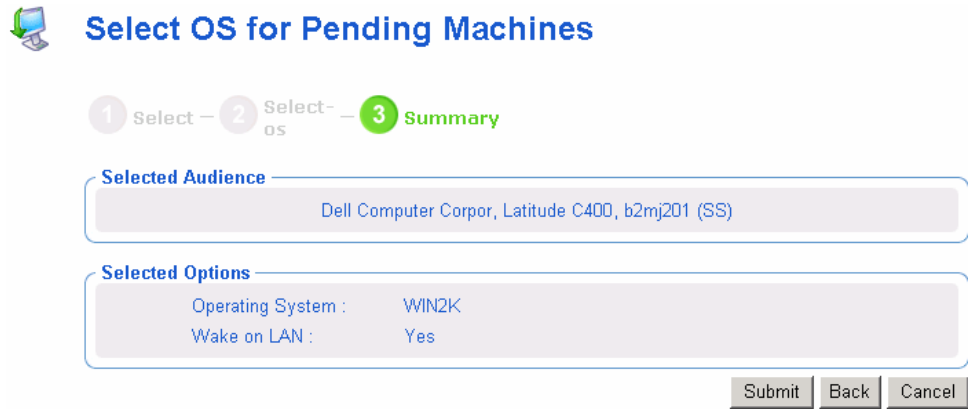


6 From the **Resolved Operating Systems** list, select the OS that you want to specify for the selected machines.

7 If you want to "wake" the target machines, select the Issue Wake on LAN check box.

8 Click **Next**.

The Summary window opens.



9 Click **Submit**. The Chosen OS (SLCTDOS) is set according to your selection.

Bringing Machines under Management

If there is an existing OS on a machine when it is discovered, the Current OS attribute will be set to indicate that the machine is unmanaged (_UNMANAGED_OS_). After a Radia OS Connect runs, the _UNMANAGED_OS_ service will be installed on the target machine. You must assign policy and then use the Bring Machines Under Management task. Note that the Current OS attribute will continue to indicate that the machine is unmanaged until another Radia OS Connect occurs and the resolved OS is installed.

A typical scenario would be to filter the machine to find all of the unmanaged machines, assign policy, and then use the Bring Machines Under Management task to remove the unmanaged OS and install the new, resolved, OS. If you have not set policy, no change will occur. Note that the data capture/restore exit points will be executed so that any user data or settings can be captured and restored. See Addressing Requirements for Capturing, Recovering, and Migrating Data on page 187.

This task should not be used as the way to change OSs on a daily basis. Typically, you should modify policy to change a machine's OS.

To bring machines under management

1 Use the navigation aid to go to the Devices.

2 In the **ROM Administration** task group, click **Bring machines under management**.

3 From the **Available** list, select the machines that you want to bring under management, and then click  to add your selections to the **Selected** list.

4 Click **Next**.

The Summary window opens.

5 Click **Submit**.

The workspace displays a list of the machines that are under management. The next time the target machines boot, they will follow the typical boot process and the appropriate OS will be installed. Until the machines boot, the value of Current OS remains set to _NONE_.

Removing Instances

Use the Remove task to remove the selected object.

To remove an object

1 Use the navigation aid to go to the appropriate instance, such as a Manufacturer instance.

2 In the ROM Administration task group, click **Remove**.

3 Click ✓ to confirm that you want to remove the instance.

OR

Click ✗ to indicate that you do not want to remove the instance.

Modifying Instances

Use the Modify task to change the selected object.

To modify an object

1 Use the navigation aid to go to the appropriate instance.

2 In the **ROM Administration** task group, click **Modify**.

3 Make any necessary changes.

4 Click **Modify**.

The Properties window for the selected instance opens.

Defining Drive Layouts

Radia OS Manager Server supports the ability to:

- Create one or more data partitions in addition to the boot partition.

  OR

- Create a copy of your new OS image and its supporting files on a hidden partition to be used for recovery.

Use the Drive Layouts class to specify the type of partition. Partitioning is supported for the boot drive only.

We strongly recommend that you connect a Drive Layout instance to only one Operating System or Policy instance to prevent conflicting definitions. Doing otherwise may cause unpredictable results.

It is possible that multiple Drive Layout instances may be resolved for an installation. Only the first resolved instance will be used. Any other instances will be ignored.

To specify a drive layout

1. Use the navigation aid to go to the appropriate Configuration Server.
2. Click **Drive Layouts**.
3. In the **ROM Administration** task group, click **Create**.
4. In the **Instance name** box, type the name of the instance.
5. In the **Friendly name** box, type a friendly name.
6. In the **Type** drop-down list, select the type of partition you want to create.

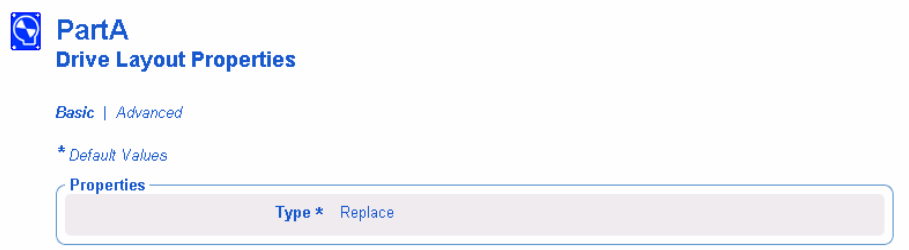
Table 8: Types of Partitions

Type	Description
Add	Creates one or more extended partitions at the end of the hard disk.

Type	Description
Replace (default)	Replaces the current mappings on the target machine with the partition that is defined with the OS image being installed. If there are no DRIVEMAP instances connected to the OS being installed, this is the default method. Important: If you use Replace, *all existing data will be lost.*
Cache	Creates a hidden back-up partition at the end of the target drive. The size of the partition will be dynamically determined by the size of the OS installation image. All files necessary to reinstall the OS will be saved (in compressed form) in this partition. Note that during the reinstallation, the name and size of the image are confirmed. Important: If you use the Cache type, *all existing data will be lost.* See Restoring from a Local Image on page 183 for information about restoring this image.
Merge	Use for migration purposes. Replaces or updates an OS on a machine where existing data needs to be preserved. Merge will overlay only the existing boot partition and will not touch data on any other partitions. • If the boot partition to be installed is larger than the space already defined for the partition, the installation will fail. The starting point of the existing partition will be used and the boot partition will be placed at the beginning of the drive segment defined in the partition. • If the target drive does not contain existing partitions, the boot partition definition will be used to partition the target drive.

7 Click **Create**.

The Drive Layout Properties window opens.



Adding Partitions

You can create a new layout that contains a boot partition and one or more logical data partitions at the end of the hard disk in a single, extended partition. These partitions are in addition to the OS boot partition. Partitions are added from the "back" of the disk to the "front."

All existing data will be lost.

There is a limit of four *physical* partitions on a hard drive and only one partition may be an extended partition (which may contain any number of logical drives).

Also, if you start with a single physical drive such as:

PARTITION	LOGICAL DRIVE
Primary	C
Extended	D
	E
	F

and then add a second hard drive, the drive letter mappings are reassigned so that the primary partitions are in alphabetical sequence. See the example below.

Drive 1

PARTITION	LOGICAL DRIVE
Primary	C
Extended	E
	F
	G

Drive 2

Primary	D
Extended	H
	I
	J

The partition will be added after the boot partition. Make sure you allow enough space for the OS. Note that if the total requested space would exceed the capacity of the drive where the OS is being installed, the installation will fail.

To add partitions

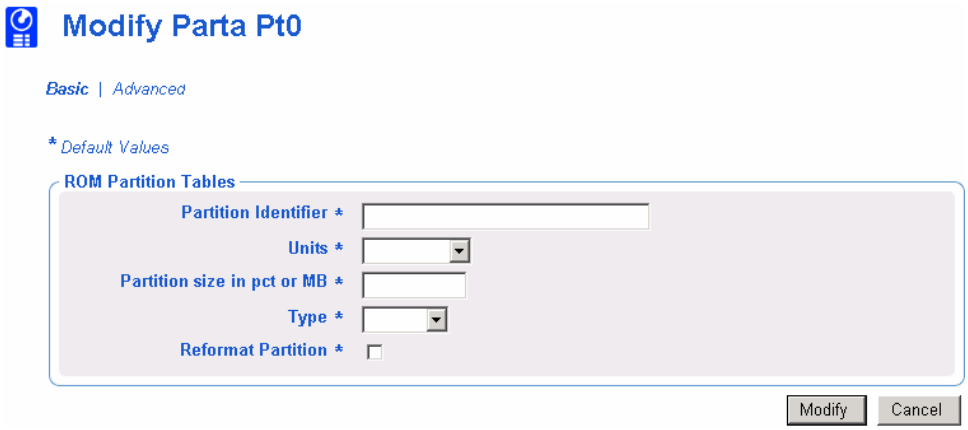
1. Use the navigation aid to go to the appropriate Zone.
2. Click **Drive Layouts.**
3. Select the appropriate drive layout instance.
4. Make sure the type is set to Add. Remember, *all existing data will be lost*.
5. If you need to modify the partition type, use the Modify task, otherwise, skip to step 8.

6 From the **Type** drop-down list, select **Add**. See Table 9 below.

7 When you are done making changes, click **Modify**.

8 In the **ROM Administration** task group, click **Add Partition**.

The Modify window opens.



9 Specify the options in the ROM Partition Tables area. Note that an instance is created in the OS.PARTTION class for each partition that you add.

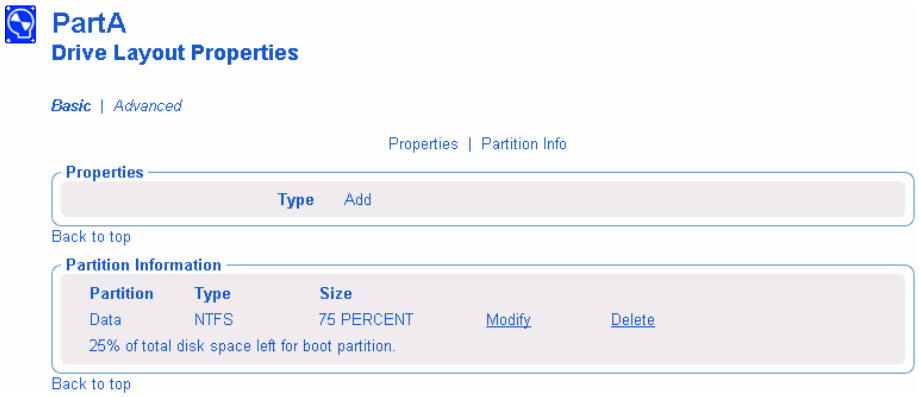
Table 9: PARTTION Class Attributes

Field	Attribute in the Database	Description
Partition Identifier	PARINFO	Identifies the name of the partition.

Field	Attribute in the Database	Description
Units	UNITS	Indicates whether the partition size is being specified as a percentage or in megabytes.
Partition Size in pct or MB	SIZE	Specifies the partition size specified as a percentage of the hard drive or in MB. These values equal the total hard drive space.
Type	PARTYPE	Indicates the type of partition – NTFS, FAT32, EXT2, EXT3, or QNTFS. Note that QNTFS performs a quick format without zeroing out the partition.
Reformat drive	FORMAT	Specifies whether to format the drive.

10 Click **Modify** when you are done defining the partition information.

The Drive Layout Properties window opens.



11 In the **Partition Information** area, you can use the Modify or Delete hyperlinks to make changes to the defined partition. If you make changes to the partition, you will be returned to this window when you are done.

Connecting Drive Layouts

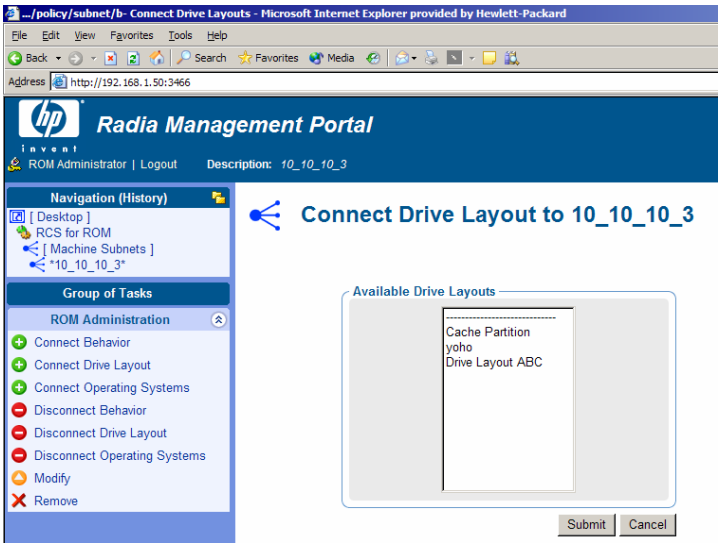
Use the Connect Drive Layout task to assign the appropriate drive layouts to your target machines based on policy such as machine manufacturer, model, role, or subnet.

To connect drive layouts

1 Use the navigation aid to go to the appropriate POLICY instance, such as a SUBNET instance.

2 In the **ROM Administration** task group, click **Connect Drive Layout**.

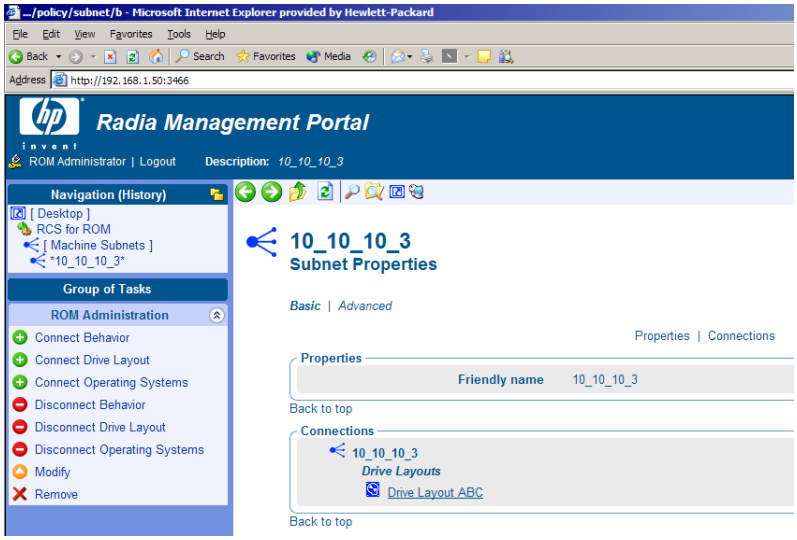
The Connect Drive Layout to window opens.



3 From the **Available Drive Layouts** list, select the appropriate drive layouts, and then click Submit.

Remember that you can add partitions *or* merge, replace, or cache partitions. You cannot do both.

The Properties window opens.



Disconnecting Drive Layouts

Use the Disconnect Drive Layouts task to remove assignments between drive layouts and the target machines based on the selected criteria.

To disconnect drive layouts

1. Use the navigation aid to go to the appropriate POLICY instance.
2. In the **ROM Administration** task group, click **Disconnect Drive Layout**.
3. When the Are You Sure? Window opens, click ✓ to accept to continue.

   OR

   Click ✗ to cancel this procedure.

   The Properties window for the selected POLICY instance opens.

Connecting Behaviors

Use the Connect Behavior task to assign the appropriate behaviors to your target machines based on policy. Connect only one behavior instance per policy instance.

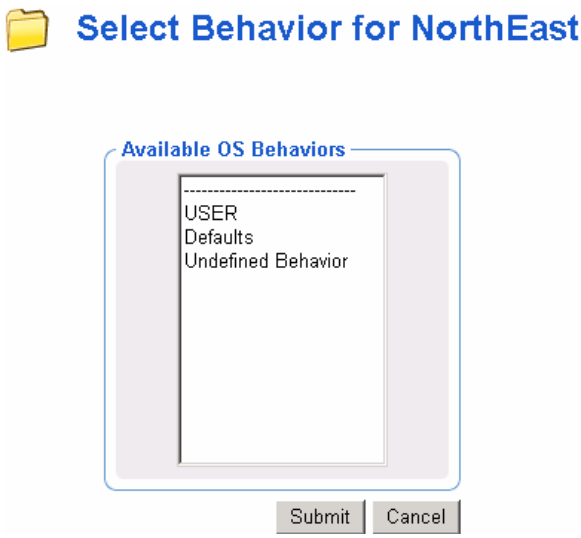
A behavior instance defines system behaviors that can be assigned to targets based on policy.

To connect behaviors

1 Use the navigation aid to go to the appropriate POLICY instance, such as a SUBNET instance.

2 In the ROM Administration task group, click **Connect Behavior**.

The Select Behavior window opens.



3 From the **Available OS Behaviors** list, select the appropriate behavior.

4 Click **Submit**.

The Properties window opens.

Disconnecting Behaviors

Use the Disconnect Behaviors task to remove the behavior assignment.

To disconnect behaviors

1 Use the navigation aid to go to the appropriate POLICY instance.

2 In the **ROM Administration** task group, click **Disconnect Behavior**.

3 When asked if you are sure that you want to disconnect the behavior, click ✓ to continue.

OR

Click ✕ to cancel this procedure.

The Properties window for the selected POLICY instance opens.

Connecting a Sysprep File

Use the Connect Sysprep File task to assign a `Sysprep.inf` that is separate from the gold image to allow the same image to be set up differently on target machines. The override `Sysprep.inf` will be merged with the embedded `Sysprep.inf`. Therefore, the values in the override `Sysprep.inf` will take priority; however any values not specified in the override file will remain as is in the original file.

The `Sysprep.inf` file should not be greater than 800 KB in size.

To create an override Sysprep.inf

1. Modify `Sysprep.inf` to contain the appropriate information.
2. Use the Publisher to publish the new `Sysprep.inf` file to the OS domain, Sysprep Files (SYSPREP) class.

   In the Publisher, from the **Type of Data to Publish** drop-down list, you must select **OS Image**. Then, you can select the appropriate `Sysprep.inf` file that you want to use. See Using the Publisher on page 99.
3. Use the Connect Sysprep File in the **ROM Administration** task group to connect the Sysprep file to the appropriate OS. You can only attach one Sysprep file to an OS. If the OS does not have this connection, the embedded `Sysprep.inf` file will be used.

   Currently, the COMPNAME and DOMAIN from the MACHINE object will be used in `Sysprep.inf`, whether `Sysprep.inf` was embedded in the image or published separately.

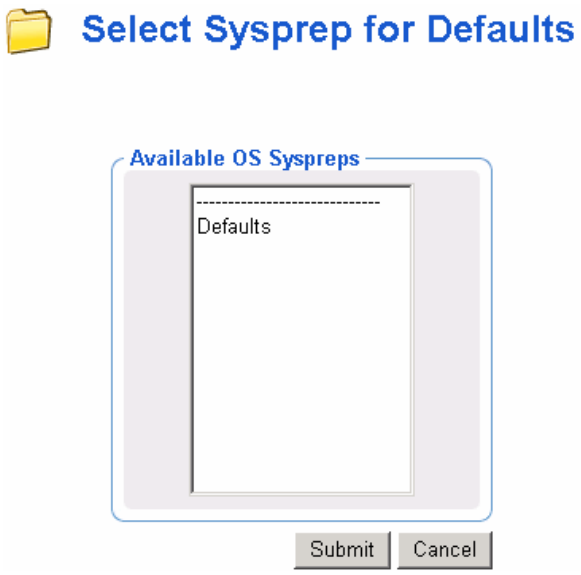
Consider running a manual test of `Sysprep.inf` to verify the accuracy of the file prior to using the Image Preparation Wizard. Remember that if you run Sysprep and have extendoempartition = 1, the partition will be extended after Sysprep runs.

If you want to deliver the same OS with varying setup behaviors, you can create multiple OS services. Each OS service can contain the same OS image, yet each may have a different `Sysprep.inf` attached to it.

To connect a Sysprep file to an OS instance

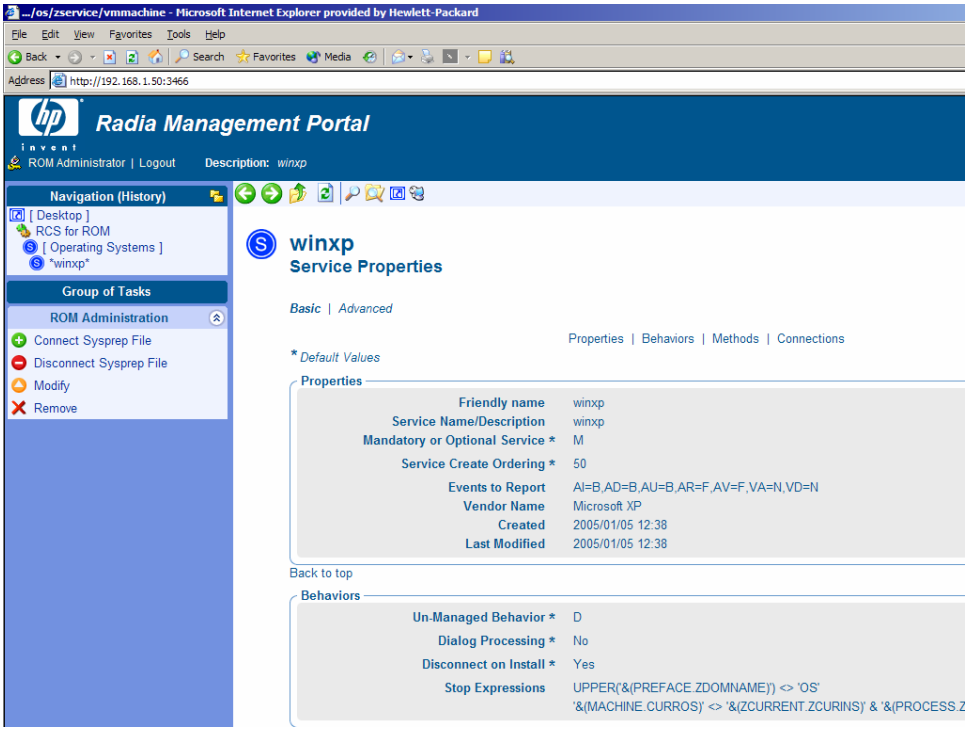
1. Use the navigation aid to go to the appropriate OS instance.
2. In the **ROM Administration** task group, click **Connect Sysprep File**.

   The Select Sysprep File window opens.



3. From the **Available OS Sysprep** list, select the appropriate Sysprep file.
4. Click **Submit**.

   The Properties window opens.



Disconnecting a Sysprep File

Use the Disconnect Sysprep File task to remove an assignment between OSs and a Sysprep file. If you disconnect the override Sysprep file, the next time that the OS is installed, the Sysprep file that is embedded in the OS image will be used.

To disconnect a Sysprep file

1. Use the navigation aid to go to the appropriate operating system instance.
2. In the **ROM Administration** task group, click **Disconnect Sysprep File**.
3. When asked if you are sure that you want to disconnect the Sysprep file, click ✓ to continue.

   OR

   Click ✗ to cancel this procedure.

   The Properties window for the selected OS opens.

Downloading Resources

Use the Download Resources task to save the resource files for OS services or Sysprep files to a target directory on the Radia OS Manager Server. Then, you can burn a CD-ROM or DVD-ROM with this data. Do not span your resources over multiple CD-ROMs or DVD-ROMs. Typically, this is meant for use with DVDs to store multiple images.

You must use Client Operations Profiles (COP) to specify where Radia OS Manager Server should retrieve the image. See the *Radia OS Manager Server Release Notes* on the HP OpenView web site for more information about the capabilities and limitations of the Radia OS Manager Server-specific extension before proceeding.

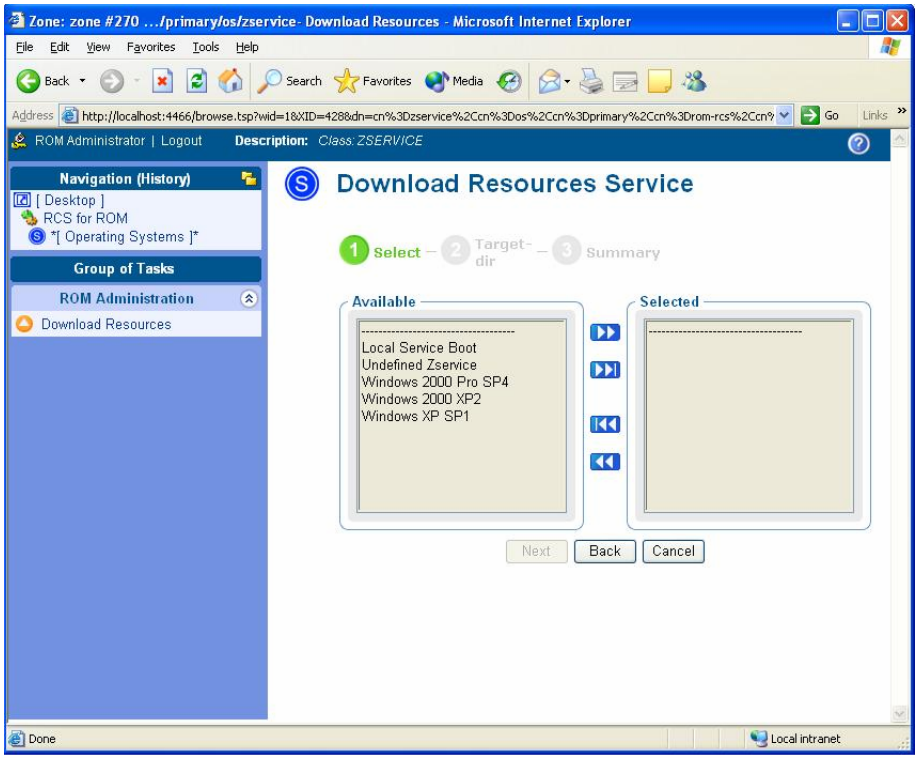
Your CD-ROM must be in Joilet format.

To download resources to a target directory

1 Use the navigation aid to go to the appropriate class — Operating Systems or SysPrep Files.

2 In the **ROM Administration** task group, click **Download Resources**.

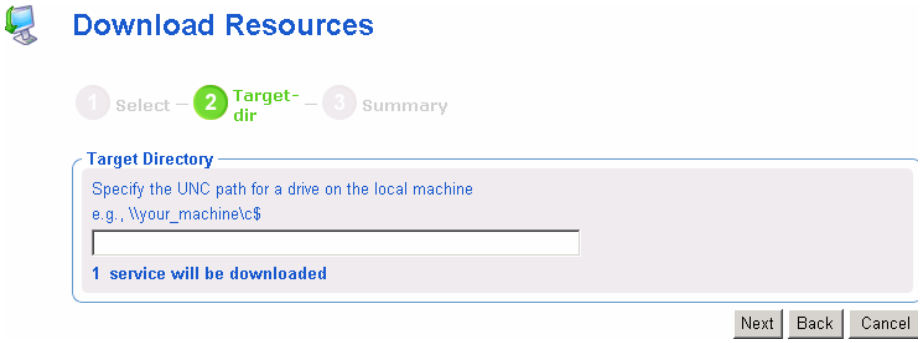
The Select window opens.



4 From the **Available** list, select the operating system services that you want to download.

5 Click **Next**.

The Target Directory window opens. Notice that this window displays the number of services that you have selected to download.

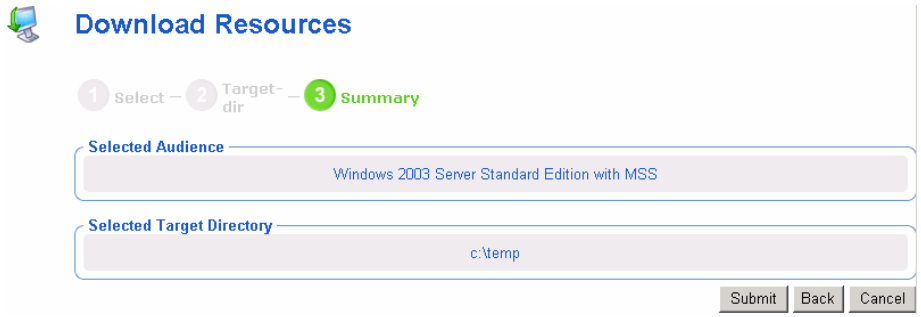


6 Type the name of the directory on your Radia OS Manager Server to which you want to download your resources. If the directory does not exist, it will be created.

If your browser is not running on Radia OS Manager Server, specify a UNC path to the target directory.

7 Click **Next**.

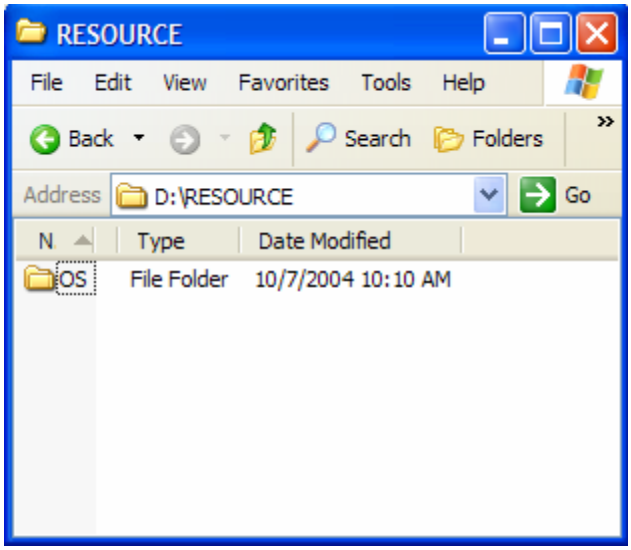
The Summary window opens.



8 Click **Submit**.

The workspace returns to the class you were viewing. However, if you use Windows Explorer, you will notice that your files have been downloaded to the target directory that you specified.

Be sure that your CD writer software does not change the case of the directories or files that you are copying. If it does, then be sure to change it back to match the file structure that was created using this task.



9 Be sure to copy the entire RESOURCE directory to the CD-ROM or DVD-ROM.

Now that you have the RESOURCE directory stored appropriately, use Client Operations Profiles (COP) to specify where Radia OS Manager Server should retrieve the image. See the *Radia OS Manager Server Release Notes* on the HP OpenView web site for more information about the capabilities and limitations of the Radia OS Manager Server-specific extension before proceeding.

Retrieving the OS image from a CD-ROM

If you have used the Download Resources task, the following is an example of how to use a CD-ROM or a DVD-ROM to install an OS to a target machine.

See *Configuring Client Operations Profiles* in the *Software Manager Guide* and then see the *Radia OS Manager Server Release Notes* for details on how to use COP with ROM.

1 Create a CLIENT.LOCATION instance to specify your network.

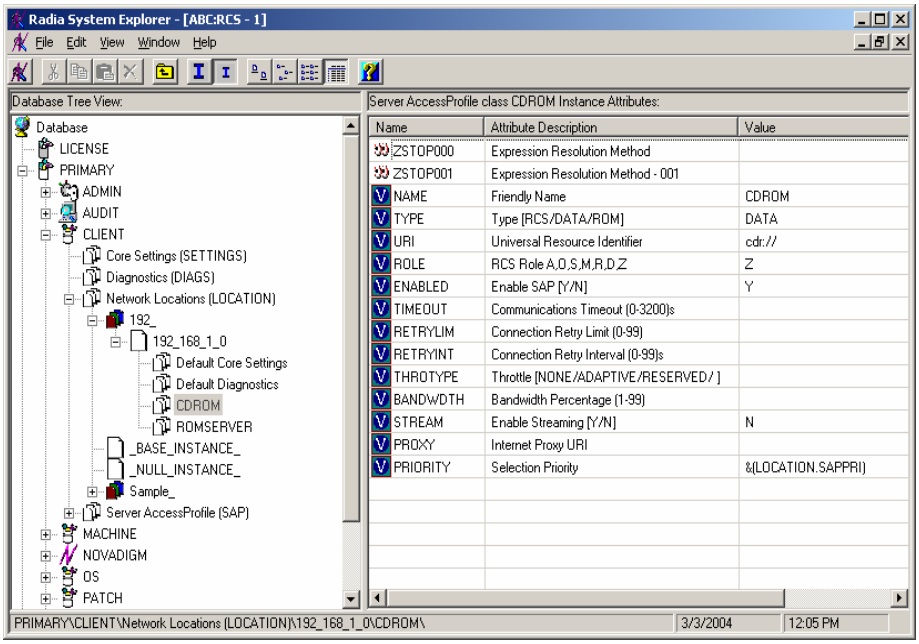
2 Create a CLIENT.SAP instance for the CD-ROM. Be sure to specify the following:

— Set TYPE to DATA.

— Set URI to cdr://.

— Set ROLE to Z.

3 Use the System Explorer to connect the SAP instance to the LOCATION instance.



4 Insert the CD-ROM or the DVD-ROM into the target machine.

5 Boot the machine. When the machine boots, it does a COP resolution and installs the OS image from the CD-ROM or the DVD-ROM.

Notifying Target Machines

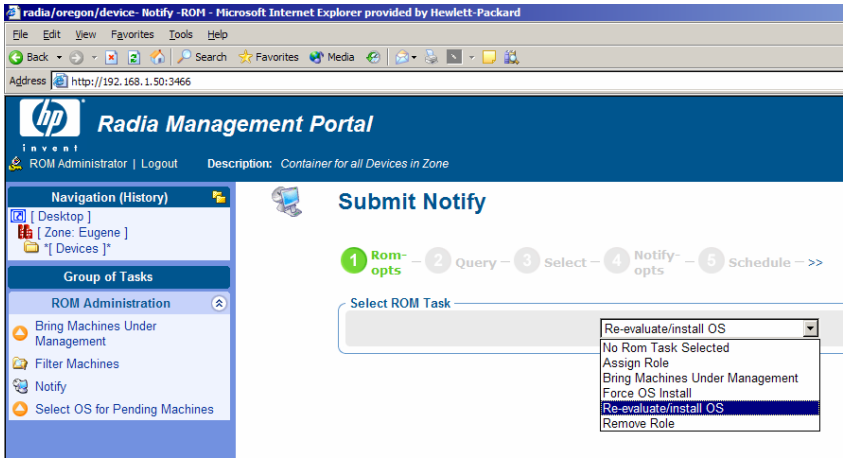
Use the Notify task to perform an action on a target device that you select. For more information, see the *Management Portal Guide for Windows*.

To notify a target machine

1 Use the navigation aid to go to the Device class under the appropriate Zone.

2 In the ROM Administration task group, click **Notify**.

The ROM Opts window opens.



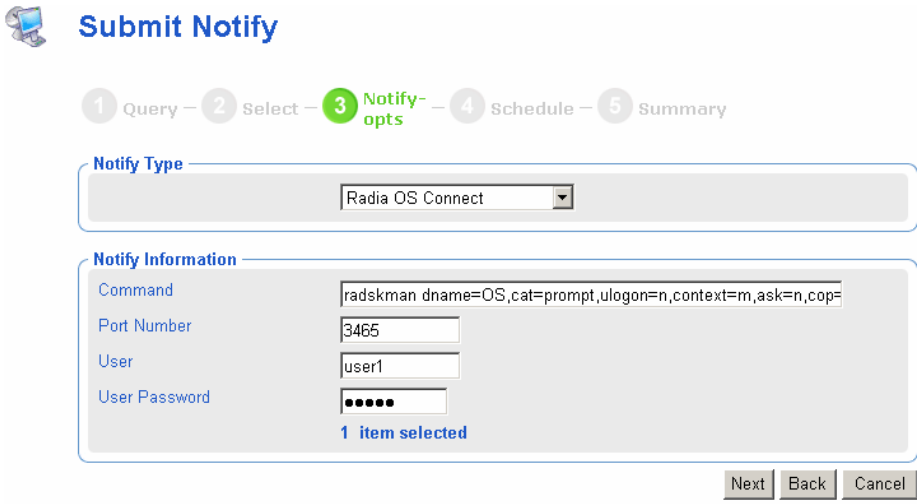
3 Select the ROM task type and then click **Next**.

The Query window opens.

4 Complete the Query Constraints that you want.

5 Click **Next**.

The Notify Options window opens.



6 From the **Notify Type** drop-down list, select **Radia OS Connect** to indicate that this connection is being performed for the Radia OS Manager.

The **Command** box changes, based on your selection.

7 In the **Command** box, modify the command line as necessary. For example, the **Command** box is pre-filled with the following command line:

```
radskman dname=OS,cat=prompt,ulogon=n,context=m,ask=n,
cop=y,catexp=ZOBJDOMN:OS,ver=y,ip=|mgr_ip|,
port=|mgr_port|
```

You must replace information between the pipes (|) with the necessary information to perform the notification. For example, you might modify the command line above to read:

```
radskman dname=OS,cat=prompt,ulogon=n,context=m,ask=n,
cop=y,catexp=ZOBJDOMN:OS,ver=y,ip=10.10.10.1,port=3464
```

If you repeat a Notify operation often, you may want to modify the appropriate Notify task so that it has default options that pertain to your organization. Refer to the *Management Portal Guide for Windows*.

8 In the **Port number** box, type the port number that the Notify daemon will be listening on. By default, the port number is 3465.

9 If necessary, in the **User** box, type the user name for the target machine.

10 If necessary, in the **User Password** box, type the password for the target machine.

11 Click **Next**.

The Schedule dialog box opens.

12 In the Schedule dialog box, specify when you want this job to run.

13 Click **Next**.

The Summary dialog box opens.

14 Click **Submit**.

The Job Status dialog box opens with list of the jobs. This dialog box automatically refreshes every 60 seconds.

— Click  to refresh the dialog box to display the latest status.

— Click  to view detailed information, such as the status of the installation.

15 When you are done viewing the job status, click  to close the Job Status dialog box, and return to the Management Portal.

6 Implementing Radia OS Manager Server in your Environment

Once you have successfully installed your Radia OS Manager infrastructure, consider how you want to implement the OS Manager in your environment. We recommend that you work with Professional Services to determine what is best for your unique situation. This chapter is intended to help you understand your options. They are:

- Installations initiated by the network
  This refers to the PXE-based environment. The Radia OS Manager can assume management of the operating system (OS) on target machines that are booted from the network.
- Installations initiated locally
  This refers to the Local Service Boot (LSB). The Radia OS Manager can assume management of the OS on target machines that are not booted from the network.

We strongly recommend that you choose one method – Local Service Boot (LSB) or network (PXE) boot for a particular target machine. If you have a bare metal machine or a machine that needs disaster recovery, you *must* use PXE.

About the PXE-Based Environment

The PXE-based environment allows the Radia OS Manager to assume management of the OS on target machines that are booted from the network. Typically, we recommend that you use the PXE-based environment because it provides a fully automated solution for all scenarios.

If you cannot use PXE in your environment, you can start with the Local Service Boot. See *About Local Service Boot* on page 169.

Once your machines are under OS Management, you can switch to a PXE-based environment. To do this, use the System Explorer to remove the connection from the BASE instance in the MACHINE class to the LSB service (LSB).

Best Practices for PXE-Based Implementations

If you already have Radia implemented in your environment and want to use a PXE-based environment for the OS Manager, we recommend the following:

1. Install the Radia OS Manager Server infrastructure before making any changes to your target machines. See Chapter 2, Installing and Configuring the Server Architecture.
2. Your existing Radia Clients will continue running any previously scheduled Client Connects. The OS Manager will not make any changes to the machine until you assign policy.
3. Once your infrastructure is installed and stable, enable PXE as the primary boot device on your target machines
4. When PXE is enabled, a DEVICE object will be created on the Radia Management Portal Zone the next time the machine boots. The Radia OS Manager Server and the target machine use the DEVICE object to communicate.

At this point, the OS Manager has discovered the target machine, but its OS is still unmanaged. The target machine will continue to boot into its existing OS until you assign policy.

Networking Boot with PXE

Figure 6 below and the text following it, give an overview of the boot process.

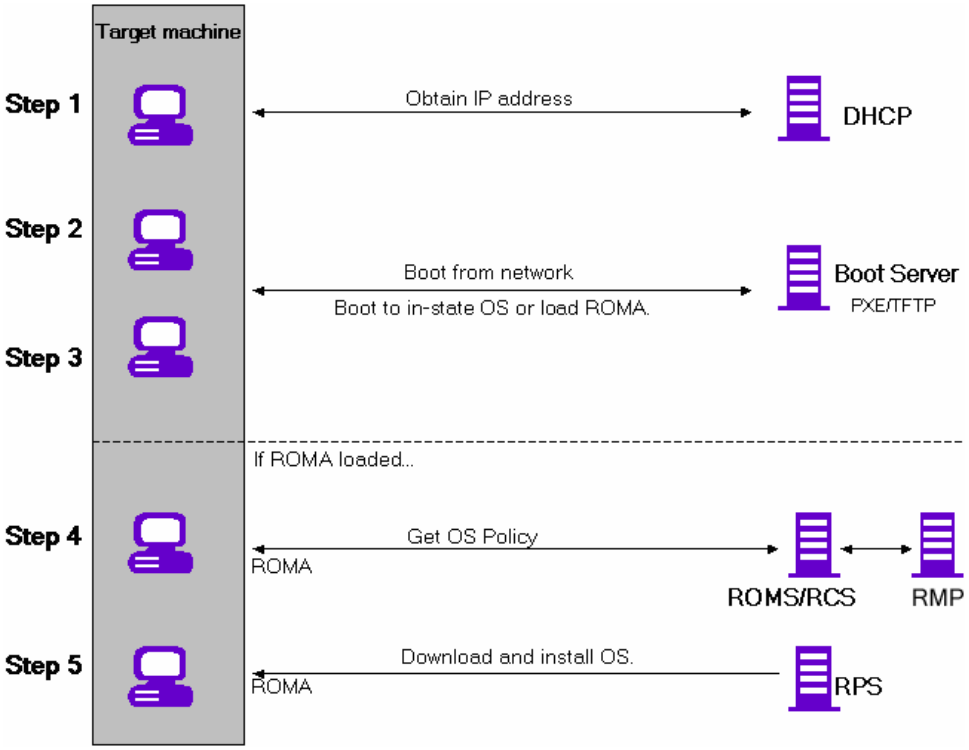


Figure 6: Networking boot with PXE process flow.

1. The target machine obtains an IP address from a DHCP server.
2. The (managed) target machine boots from the network (via the PXE server), and the TFTP server delivers the Radia OS Manager Boot Loader (ROMBL) to the target machine.
3. The Radia OS Manager Boot Loader looks at the Management Portal to see if a DEVICE object exists.
   - If there is no DEVICE object, an object is created in the Management Portal.
   - If there is a DEVICE object, it must be decided whether there is a valid OS or not.

4 If there is a valid OS on the machine, it boots to the existing OS located on the machine's system drive.

OR

If there is not a valid OS on the machine, the boot process continues by loading the Radia OS Management Agent (ROMA) from the TFTP server to the target machine.

5 The Radia OS Management Agent and the Configuration Server communicate through the Radia OS Manager Server to handle policy resolution of the correct OSs for the target machine.

6 The Radia OS Management Agent downloads the appropriate images from the Proxy Server and installs them on the target machine.

Check the HP OpenView support web site for product updates and release notes.

About Local Service Boot

The Local Service Boot is an alternate method (to PXE) that allows the Radia OS Manager to assume management of the OS on machines that are not booted from the network.

The advantages of Local Service Boot are that existing machines do not need to be PXE-enabled and the boot order does not need to be configured locally in the BIOS for each target machine. This option is also less network-intensive because the Radia OS Management Agent (ROMA) is only downloaded when the LSB service is downloaded to the target machine. Since this intermediate OS is local, it does not need to be downloaded again unless there is an update. In a PXE environment, the ROMA is downloaded every time it is needed.

If you have a bare metal machine or a machine that needs disaster recovery, you *must* use PXE.

Local Service Boot is available for machines running:

- Windows NT 4.0 (Service Pack 6 or higher)
- Windows 2000 Professional (Service Pack 2 or higher)
- Windows XP Professional (Service Pack 1 or higher)
- Windows 2003

The Radia OS Manager cannot manage Windows 9.x operating system machines using the Local Service Boot. If you want to use the Local Service Boot to manage these machines, use the Radia Client to deploy a standard Radia service that will cause the machines to reboot, which will cause the machine to boot into service Linux and run ROMA to change the OS.

Prerequisites

- Update the Radia Database as described in Updating the Configuration Server and Database on page 44. This ensures that the LSB service is in the Radia Database and the components for the ROM-aware client will be installed during Client self-maintenance.
- You must be using Client Operations Profiles as configured for Radia OS Manager Server and it must be enabled. See the *Radia OS Manager*

Server Release Notes on the HP OpenView web site for more information about the capabilities and limitations of the Radia OS Manager Server-specific extension.

The Radia OS Image Preparation Wizard sets up COP, and when the image is deployed, COP is enabled. However, if you want to use the Local Service Boot on a machine where the OS has not been deployed by Radia OS Manager Server, you must enable COP. To do this, use COP=Y on the radskman command line. See *Configuring Client Operations Profiles* in the *Software Manager Guide*.

Best Practices for Using Local Service Boot

If you already have Radia implemented in your environment and want to use the Local Service Boot for the OS Manager, we recommend that you:

1. Install the Radia OS Manager Server infrastructure. See Chapter 2, Installing and Configuring the Server Architecture.
2. Use Client Operations Profiles to specify the IP address and port of the Radia OS Manager Server in the form of a Service Access Profile (SAP) instance.

   When you set up the SAP, be sure to:

   - Set TYPE to ROM to identify this SAP as a Radia OS Manager Server server.
   - Set ROLE to Z.
   - Set URI to specify the fully qualified IP address (or hostname) and port of the Radia OS Manager Server that serves the Radia Clients on the subnet. For example:

     `http://romssvr.domain.com:3466`.

     The value of the URL must be in lowercase text; otherwise the Local Service Boot will fail.

     You must create a LOCATION instance and an SAP instance and connect them.
3. Set up policy to use the Radia Client to install the Local Service Boot service (LSB) on your target machines. Local Service Boot (LSB) must be distributed based on subnet, model or manufacturer.

4 Once the LSB service is installed on the target machines (which creates the `Rombl.cfg` file on the root of the drive), they will reboot and be discovered.

With Local Service Boot, you will not encounter a situation where the machine must prompt the end user because it does not know whether to install a new OS or to keep the existing OS (as is possible in the PXE-based environment) because `Rombl.cfg` is created when the LSB service is installed.

At this point, the OS Manager has discovered the target machine, but its OS is still unmanaged. The target machine will continue to boot into its existing OS until you assign policy.

Booting with Local Service Boot

Figure 7 on page 172, and the text following it, give an overview of the boot process.

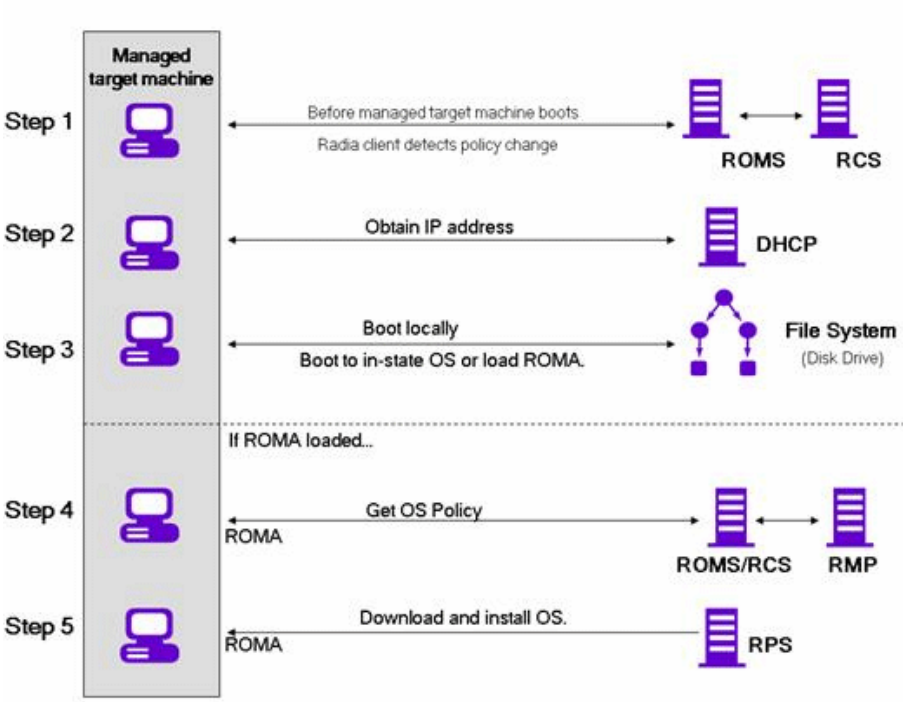


Figure 7: Booting with Local Service Boot.

1. After the Local Service Boot service is installed on a target machine, the Radia Client is responsible for detecting OS policy changes on the managed target machine.
2. The target machine obtains an IP address from a DHCP server.
3. When the machine restarts, the machine boots into the intermediate Linux service OS and runs the Radia OS Management Agent (ROMA).
4. During this first boot after installation of the Local Service Boot service, a DEVICE object for the target machine is created in the Radia Management Portal Zone (if one does not already exist). A DEVICE object will exist only if the machine was previously under Radia OS Manager management.
5. During every subsequent reboot, the Radia OS Manager Boot Loader (ROMBL) will be loaded from the local file system.
6. If the Radia OS Connect detected a change in OS policy before the reboot, ROMBL will load the intermediate Linux service OS, from the local file

system, containing the ROMA. ROMA processes the installation of the new OS, according to policy.

7 If no OS policy exists for this machine, ROMA will install the _UNMANAGED_OS_ service (located in PRIMARY.OS.ZSERVICE). This special OS instance indicates that the machine is under OS management, but that no OS has been selected for the machine by policy.

Check the HP OpenView support web site for product updates and release notes.

Managing Your Machines

Whether your machines are in a PXE-based environment or Local Service boot environment, once your existing machines are discovered and set to be unmanaged, nothing will happen until you take action.

If you want to change the OS, you must:

1 Specify policy.

2 Select the appropriate machines and use the Bring Machines under OS Management task (available in the Management Portal Administrative Task tray).

3 This removes the unmanaged service (which was connected to your machines) and the machine is considered managed.

4 Run a Radia OS Connect so the target machine can detect the policy changes.

5 If necessary, reboot the target machine.

This completes the description of migrating to an environment in which the Radia OS Manager manages your machines. The next few chapters will cover how to use the tools to make all of this happen.

We recommend that you work with Professional Services to determine what is best for your environment.

7 About OS Manager Support for HP Blades

The Radia OS Manager Agent (ROMA) captures and reports all specific blade SMBIOS information to the Management Portal. Using the Management Portal, you can assign operating system, drive layout and hardware configuration policies based on enclosures, racks, slots or enclosure configurations. To do this, you can use the Radia OS Administration tasks **Connect Operating System**, **Connect Hardware Configuration** and **Connect Operating System** which are available for Blade.

For more information of Blade Management in Management Portal see the *HP-OpenView Management Portal Using Radia, Version 2.1 for Windows*.

Enabling Policy Configurations for Blades, Enclosures and Racks

To enable resolution of policy for the objects related to blades, you must update the `rmp.cfg`.

To enable policy configurations for blades, enclosures and racks

1 Open *`SystemDrive`*`:\IntegrationServer\etc\rmp.cfg` and add the following entry:

```
rmp::init{

   LINKS{ enclosureslotnumberdn enclosuremodeldn
enclosureconfigdn rackdn osdevicearchitecturedn }

 }
```

The specific set of links to include in the entry will vary for each enterprise, depending on which entities and containers have been used for policy. Table 10 on page 176 describes the policy link that is enabled in the entry above. For example, if you have not assigned policy to the rack instances in your Zone, you may omit `rackdn` from the entry shown above.

Table 10: Policy Resolution Links to Define in RMP.CFG

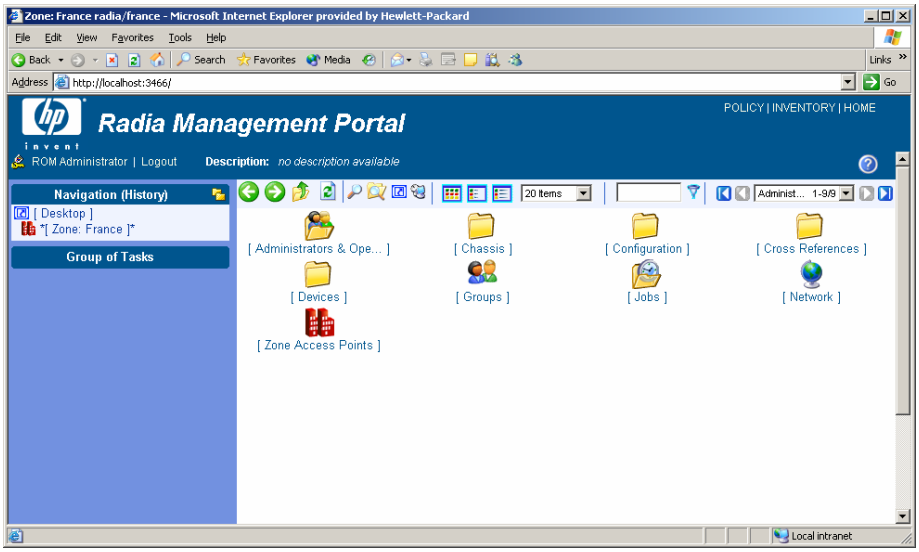
LINKS Parameter	Description
enclosureslotnumberdn	Links the blade device to the enclosure slot.
enclosuremodeldn	Links the blade device to the enclosure model.
enclosureconfigdn	Links the enclosure to its enclosure configuration.
osdevicearchitecturedn	Links the device to its device architecture (which is added by default).
rackdn	Links the enclosure to its rack (when policies are assigned to racks).

About HP Blade discovery

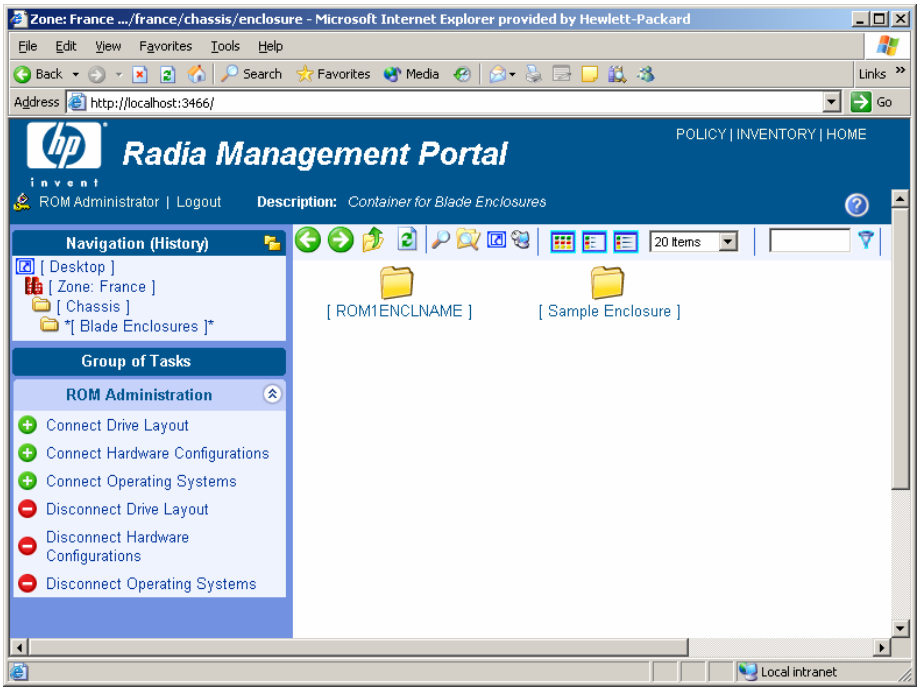
Every time the Radia OS Manager is launched, SMBIOS information (such as enclosure name and slots) from HP blades is sent to Management Portal through the Radia OS Manager Server. The Management Portal will automatically create all related Blade information in the Chassis container.

To view the blade information stored in the Chassis container

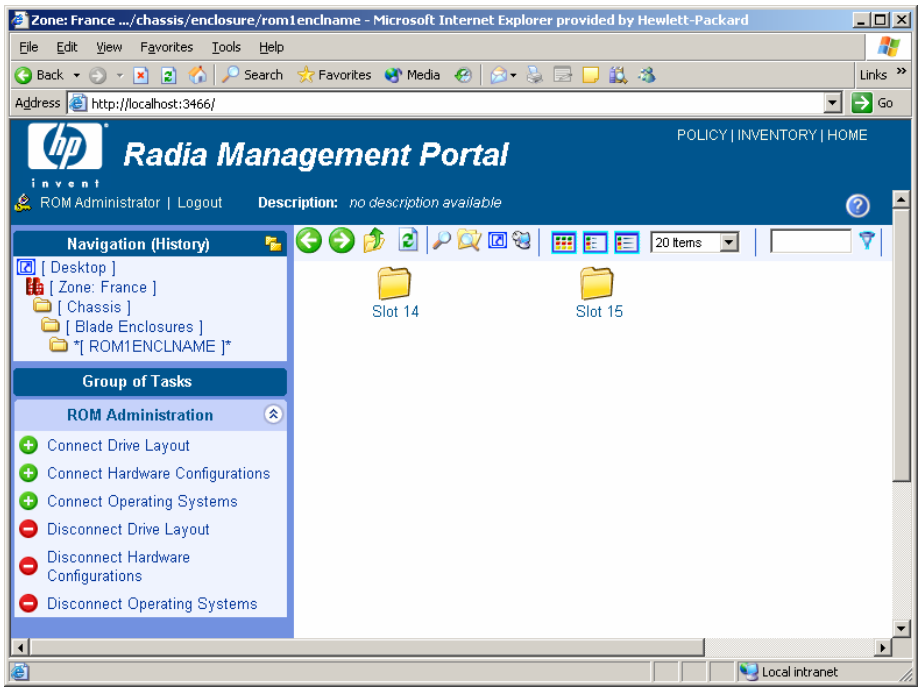
1. Log onto the Management Portal 2.1.
2. Go to your Zone and you can see the Chassis container.



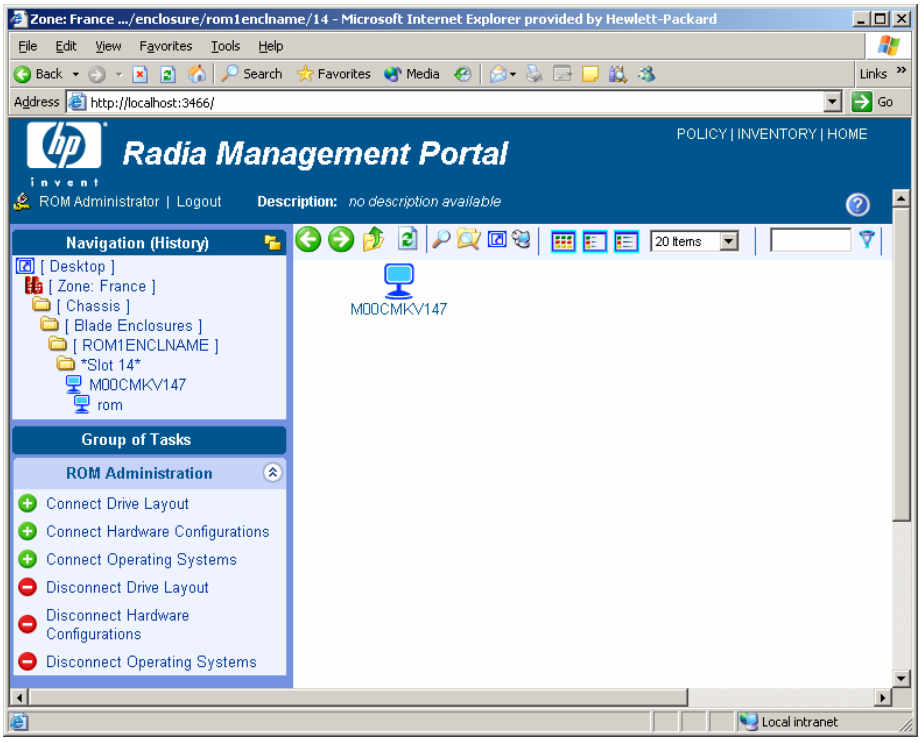
3 Click **Chassis** then **Blade Enclosures** to see the discovered enclosures such as **ROM1ENCLNAME.**



4 Click an enclosure name such as **ROM1ENCLNAME** to display the slots discovered by the Radia OS Manager.



5 Click a slot, such as Slot 14, to display the discovered hardware device plugged into this slot.



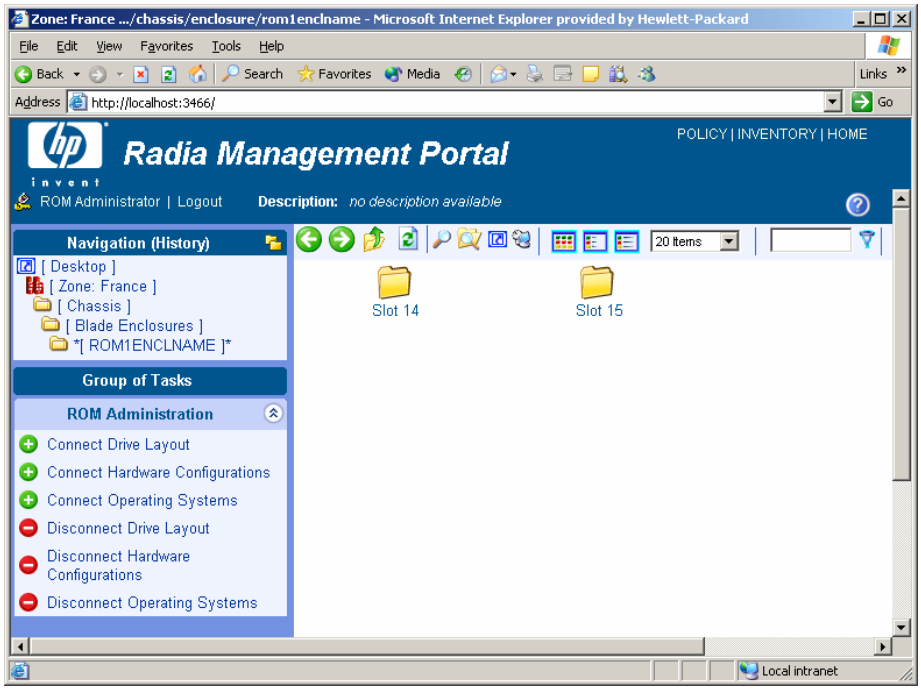
About HP Blade OS Policy Assignment

Using the Management Portal, you can assign operating system, drive layout and hardware configuration policies based on enclosures, racks, slots or enclosure configurations.

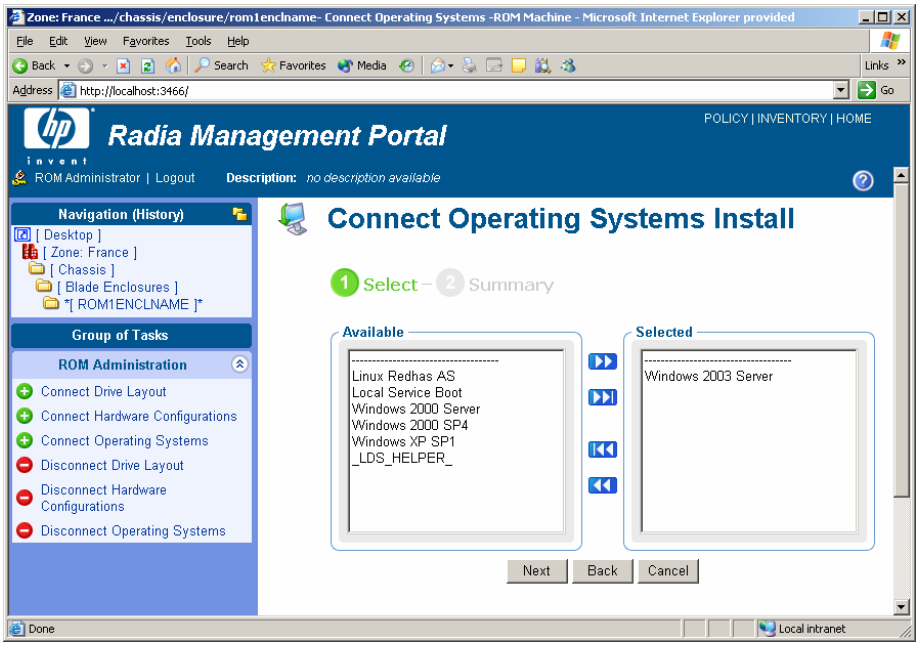
In this example, we will ….

To assign operating system, drive layout or hardware configuration policies

1 In the Management Portal, browse to the desired enclosure, racks, slots or enclosure configurations. For this example, browse to the **enclosure name**.



2 From the **ROM Administration** task group, select **Connect Operating System**. In this example, Slot 14 and Slot 15 will be assigned the same operating system.

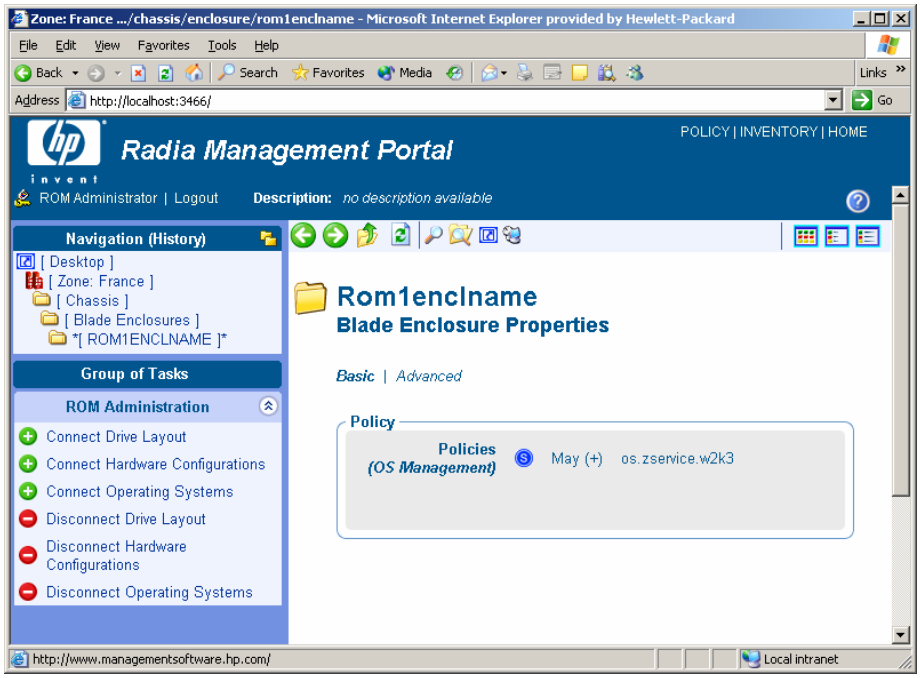


3 From the **Available** list, select the desired OS.

4 Click **Next**.

The operating system is assigned to the selected enclosure name.

5 If you want to see the operating system assigned to enclosure, go to the enclosure and click **View Properties** .


Zone: France .../chassis/enclosure/rom1enclname - Microsoft Internet Explorer provided by Hewlett-Packard
File Edit View Favorites Tools Help
Back Search Favorites Media Links
Address http://localhost:3466/ Go
Radia Management Portal
invent
POLICY | INVENTORY | HOME
ROM Administrator | Logout
Description: no description available
Navigation (History)
[Desktop]
[Zone: France]
[Chassis]
[Blade Enclosures]
[ROM1ENCLNAME]
Group of Tasks
ROM Administration
Connect Drive Layout
Connect Hardware Configurations
Connect Operating Systems
Disconnect Drive Layout
Disconnect Hardware Configurations
Disconnect Operating Systems
Rom1enclname
Blade Enclosure Properties
Basic | Advanced
Policy
Policies
(OS Management)
May (+)
os.zservice.w2k3
http://www.managementsoftware.hp.com/
Local intranet

8 Advanced Features

This chapter covers several advanced features available with the Radia OS Manager. These features are for use by those who are extremely comfortable with Radia.

Restoring Operating Systems

Restoring from a Local Image

Radia OS Manager Server provides the ability to restore your operating system (OS) if you have no network connectivity. This is for use in last resort situations only, such as when your active partition becomes corrupted. Your OS will be reinstalled, but *you will lose all data*.

If the machine contains two partitions—one with the OS and applications and the other with application data—you can create a cache partition that contains the OS and any business critical applications. If necessary, the OS or applications could be restored from the cache partition, leaving the data partition untouched.

Prerequisites

You must have:

- The Radia OS Manager product CD-ROM.
- You must have previously created a cache type partition. See Table 8 on page 145.

To re-install the operating system

This will cause you to lose all existing data.

1. Insert the Radia OS Manager Product CD-ROM.
2. Reboot the machine. When the machine reboots, it will boot from the product CD-ROM into Linux.

3 At the bash prompt, type the following and then press **Enter**:

`#./installosfromcache`

The following message appears:

```
This utility will install an operating system from the
cached partition. You will lose all data in current
partition. Do you want to proceed? [Yes/No]
```

4 If you want to proceed, type **`Yes`**.

5 Press **Enter**. The OS will be re-installed from the cache partition.

6 When complete, it returns to a bash prompt. Remove the CD-ROM and reboot your machine.

If you are using the Inventory Manager, you can check completion status after the next Radia OS Connect. An APPEVENT is generated that indicates that the OS was successfully installed.

Restoring from a CD-ROM

Radia OS Manager Server provides the ability to restore your OS from a CD-ROM if you are using Local Service Boot. This is for use in last resort situations only. Your OS will be reinstalled, but *you will lose all data.*

Prerequisites

- Use the `.iso` in the `\Service` CD folder on the product CD-ROM to burn a CD-ROM to carry with you.
- You must be connected to a network.

To recover your operating system

1 Insert the CD-ROM that you created from the .iso in the `\service cd` folder on the product CD-ROM.

2 Boot the target machine.

3 If DHCP is found, you will be prompted for the Radia OS Manager Server's IP address and then the appropriate OS image will be installed to your machine.

OR

If DHCP is not found, you will be prompted for network information such as the following and then the appropriate OS image will be installed to your machine:

- IP address for the target machine
- Default gateway
- Subnet
- Subnet mask
- DNS address
- Radia OS Manager Server IP address

You may choose to store the network information on a floppy disk. To do this, prepare the following `.ini` files:

- `romsinfo.ini`
  This includes information about the Radia OS Manager Server. It should be ordered from the top down with the most-specific information to the least-specific information. When a match to the Radia OS Manager Server s found on the left, the information on the right will be used.

  In the sample romsinfo.ini file below:

  ```
  [ROMSInfo]

  192.128.1.99=192.168.123.*, 192.168.124.*, 192.128.125.*

  roms.usa.novadigm.com=192.168.*

  roms.novadigm.com=*
  ```

  - The first line looks at the machine to see if it falls within one of the subnets listed (192.168.123.*, 192.168.124.*, 192.128.125.*). The asterisk is used as a wildcard. If there is a match, then the machine will use the Radia OS Manager Server with the IP address specified on the left (e.g., 192.128.1.99).
  - If no match is found, then the second line of the file is used. This one looks at the machine to see if it falls within a subnet that begins with 192.168.*. If so, the machine will use roms.usa.novadigm.com to find the Radia OS Manager Server.
  - If no match is found again, the third line of the file is used. This one indicates that roms.novadigm.com should be used to find the Radia OS Manager to be used by the machine, no matter what subnet it is part of.

— `netinfo.ini`
This includes the networking information. If there is more than one section (such as a [SubnetDisplayName2], you will be prompted about which information to use.

You can use addr to specify a range of IP addresses. This allows you to create one floppy disk that will be useful for multiple machines.

```
[SubnetDisplayname1]
addr=192.168.123.50-192.168.123.69
gateway=192.168.123.254
subnet=192.168.1.0
netmask=255.255.255.0
dns=192.168.123.1
```

If you do not know the DNS, leave the keyword dns= in the `.ini` file.

Insert your recovery CD-ROM and then insert the floppy disk shortly after the machine begins to boot. When configuration is complete, you will see the message "Network configuration successful."

Addressing Requirements for Capturing, Recovering, and Migrating Data

If you want to capture, recover, or migrate user data and settings (such as personality information), we provide the ROM Client method (`ROMSClientMethod.tcl`), which has two exit points. The client method is stored in the client's IDMSYS directory (by default, *`SystemDrive`*`:\Program Files\Novadigm`).

The exit points call two optional scripts—`Novapdc.cmd` (data capture) and `Novapdr.cmd` (data restore)—that must be also stored in the IDMSYS directory on the client. You can use these scripts to customize data capture, recovery, and restoration for any product that you would like to use.

Capturing, recovering and migrating data relies on the ROM-aware Radia Client because data can be captured only when the OS is running. Radia Client senses the change a machine's desired state and triggers the data capture, if the `Novapdc.cmd` is available in IDMSYS. Then, the target machine reboots and the new operating system is installed. If `Novapdr.cmd` is available, ROM Client method begins the restore process after the OS has been installed on the target system.

Sample Command Lines

The following is a sample of a command line used to capture data using OV Settings Migration Manager's DDNA.

```
Path\desktopdna.exe -t Path\filename.dtf -o
Path/optionsfile.dox -d Path\filename.dna -m –ux
```

The following is a sample of a command line used to restore data using OV Settings Migration Manager's DDNA.

```
Path\desktopdna.exe -t Path\filename.dtf -o
Path/optionsfile.dox -a Path\filename.dna -m -ux
```

See OV Settings Migration Manager's documentation for more details.

Return Codes for HP Exit Points

The following return codes are returned from the HP exit points `Novapdc.cmd` and `Novapdr.cmd`. The values may vary depending on the software that you are using with these exit points. If the return value of the

method is not equivalent to the following, use the standard batch error level conditional processing and the exit command to make them correspond to the following:

Table 11: HP Exit Point Return Codes

Code	Description
0	Successful.
1	An error occurred and will be logged, but processing will continue. The log is located in *SystemDrive*:\Program Files\Novadigm\Logs\romsclimth.log.
2	For Novapdc.cmd (capture): • A fatal error has occurred and will be logged. The log is located in *SystemDrive*:\Program Files\Novadigm\Logs\romsclimth.log. Processing of the service has ended. For Novapdr.cmd (restore): • An error has occurred and will be logged. The log is located in *SystemDrive*:\Program Files\Novadigm\Logs\romsclimth.log. The service is flagged but at the next Radia OS Connect, RAM will attempt to install the service again.

Using Radia Client Operations Profiles with ROM

Radia Client Operations Profiles allow you to dynamically assign and select a client computer's available Radia servers based on network location, network speed, or other criteria. For example, you may want to use this capability to assign Proxy Servers to your ROMS clients or designate fail-over Proxy Servers. The ability to specify Service Access Points (SAPs) so that ROM clients can access alternate sources for image download is a ROMS-specific extension to Client Operations Profiles.

When using COP with the Radia OS Manager, ROMS uses only the RCS specified in `roms.cfg`. Therefore, fail-over for multiple Configuration Servers is not supported.

If you are already using COP, you must perform the following tasks to be properly configured for ROMS. Note that if COP is already being used in your production environment, the COP objects will be updated (date and time) once you modify the SAP class template.

Requirements

If you are using the COP for ROMS, you must use the same Configuration Server for both application deployment and operating system deployment.

You must observe the following constraints:

- Name instances in PRIMARY.CLIENT.LOCATION only by subnet.
- Specify only one Configuration Server.
- The ROLE attribute in the PRIMARY.CLIENT.SAP instance must be set to A.
- If you are using ROM, COP cannot be used in a fail-over scenario.
- COP can only be used to redirect the Radia Client and/or ROMS to an alternate image data source.
- If the TYPE attribute in the PRIMARY.CLIENT.SAP instance is set to DATA, then the ROLE attribute in this instance must be set to Z to limit its usage exclusively to ROM.
- If you are using Local Boot Service (a non-PXE environment), each Radia Client must resolve only one SAP with the TYPE attribute set to ROM.

This SAP's URI attribute will point to the ROM Server (http://*servernameORIpAddress:port*) and must be specified in lowercase.

Editing the Server Access Profile (SAP) Class

Before configuring Client Operations Profiles for use with the Radia OS Manager, you must edit the PRIMARY.CLIENT.SAP class template to add some ROM-specific items.

Before you make any changes, be sure to back up your Radia Database.

To edit your class template

1. Open the System Explorer.
2. Go to **PRIMARY.CLIENT.SAP** and right-click **SAP**.
3. Select **Edit Class**.
4. Select the **TYPE** attribute and add **ROM** as a valid option. The description should read as follows:

   `Type [RCS/DATA/ROM]`

   `Type` specifies the type of Radia server. The value `ROM` has been added for use only with Local Service Boot (LSB). You must specify the URI so that Local Service Boot can locate the ROM Server.

   Additional urls for the Universal Resource Identifier are:

   - URI=cdr://
     Indicates the client's local CD/DVD drive. The first CD/DVD drive detected is used.
   - URI=smb://username=*username*,password=*password* //romssvr/c$
     Indicates a windows share that will be mounted. SMB (Server Message Block) is the Windows protocol used to mount shares.
   - URI=nfs://hostname/directory
     Indicates a network file share.

   See About the Local Service Boot on page 46 for more information.
5. Select the ROLE attribute and add Z as a valid option. The description should read as follows:

   `RCS Role A,O,S,M,R,D,Z`

This field is a free-form entry, so this change to the class template is not required, but is recommended.

Specifies the role of the SAP. The value Z has been added for ROMS-only usage. The client process ignores any SAP that has this value in ROLE.

6 Click **OK**, and then click **Yes** to confirm the changes.

Using Local Service Boot and COP

If you are using the Local Service Boot, create an SAP instance with the following settings:

- ROLE=ROM
- TYPE=Z

Using the Proxy Server with ROMS and COP

If you have a Proxy Server that contains OS images and applications, you would set up your SAP instances as follows:

- For the Proxy Server that contains OS images, create an SAP instance with the following settings:
  - ROLE=DATA
  - TYPE=Z
- If there is a Proxy Server that contains the all other data (such as applications), create the SAP instance with the following settings:
  - ROLE=DATA
  - TYPE=D

9 Troubleshooting

Radia OS Manager Server Logs

The Radia OS Manager Server writes several logs, which can be used to track progress and diagnose problems. The log files for the Radia OS Manager Server are:

- `httpd-port.log`
  This is the main log, stored by default in *`SystemDrive`*`:\Novadigm\IntegrationServer\logs`. It contains information about the actions that you perform, as well as version and build numbers.

  Replace *`port`* with your port number, for example, `httpd-3466.log`.

  Each time you start the web server a new log is written. The old log is saved as `httpd-port.nn.log`.

- `httpd-port.YY.MM.DD.log`
  This log, stored by default in *`SystemDrive`*`:\Novadigm\IntegrationServer\logs`, contains the web server activity for each day. If the log is empty, it means that there was no activity that day.

- `httpd-port.error.txt`
  This log, stored by default in *`SystemDrive`*`:\Novadigm\IntegrationServer\logs`, contains messages written to any logs that contain the prefix ERROR. This allows you to view all errors in a single location.

- `machineID.log`
  This log, stored by default in *`SystemDrive`*`:\Novadigm\IntegrationServer\upload`, is a comprehensive log that is written after ROMA is executed. You will find one log for each machine object that you have defined. Open this log with WordPad, rather than Notepad.

  This log may be named `macAddress.log` if the machine instance has not been created.

  The following example from this log shows that the Configuration Server and Proxy Server address are in use, which confirms a successful image deployment.

```
20030703 10:10:01 Info: ::HOSTINFO(RADIA CONFIGURATION
SERVERHOST)
:10.10.10.2:3464

20030703 10:10:01 Info: ::HOSTINFO(RPSHOST)
:10.10.10.2:3466
```

Configuration Server and Database Logs

- `Nvdmr000.log`
  This log displays detailed information including version information and information about Radia OS Connects and is stored by default in *`SystemDrive`*`:\Novadigm\ConfigurationServer\log`.
- `import.log`
  This log displays the results of the database import and is stored by default in *`SystemDrive`*`:\Novadigm\ConfigurationServer\bin`.

Image Preparation Wizard Log

- `setup.log`
  This log is created if there is an error while the Image Preparation Wizard is running in Windows. It is located in the directory specified by the user's TEMP environment variable. It may be in a location similar to `c:\winnt\temp\setup.log`.

  `osclone.log`
  This log is created only if an error occurs when the Image Preparation Wizard reboots to Linux. This log to uploads to the `\upload directory` as *`imagename`*`.log`.

Client Logs and Objects

Use the client logs (*`SystemDrive`*`:/Program Files/Novadigm/Logs`) and client object information (*`SystemDrive`*`:/Program Files/Novadigm/LIB`) on the client machine to confirm that the following Radia OS Manager Server services have installed successfully during the first Client Connect:

- Operating System Service
- Radia OS Manager Server client files

If policy dictates that the Local Service Boot service is installed, you can also confirm that the LSB service has been installed.

You may want to review the following Client logs located in *SystemDrive*:\Program Files\Novadigm\Logs:

- Connect.log
- Romsclimth.log
  This log stores information about operating system (OS) service resolution.
- LSB.log
  This log contains information about LSB installation.

You may want to review the following client object information (located in *SystemDrive*:\Program Files\Novadigm\LIB):

- OS/ZSERVICE/MASTER.edm
  Review the ZMASTER object for the OS Service.

Capturing, Migrating, or Recovering Data

If you use this capability, logs will be available in C:\Program Files\Novadigm on the client machine.

Basic Infrastructure Tests

Once you have installed your Radia OS Manager Server infrastructure, the following tests may help you to determine whether your environment is properly configured.

Test 1: For use in an environment without bare metal machines

If you can answer yes to all of the following questions:

- Are you able to boot (via PXE) to a machine that has not been discovered by Radia OS Manager Server and does not have an OS that is managed by Radia OS Manager Server)?
- Does a MACHINE object get created in the Configuration Server when a machine is discovered?

- When a machine is discovered, is a log uploaded to the Radia Integration Server's `\upload` directory?

Then the following are working correctly:

- DHCP, PXE, Configuration Server, and TFTP are working correctly.
- The Configuration Server is correctly forwarding methods, processes, and the MACHINE class' NULL instance to the Radia Integration Server.
- The Configuration Server has the files needed to handle Radia OS Manager Server objects.
- The Linux kernel supports the hardware in the machine.
- Radia OS Manager Server appears to be configured correctly.

Test 2: For use in an environment with bare metal machines

If you can answer yes to all of the following questions:

- Are you able to boot a bare metal machine via PXE?
- Does a MACHINE object get created in the Configuration Server when a machine is discovered?
- When a machine is discovered, is a log uploaded to the Radia Integration Server `\upload` directory?
- Is an OS installed on the machine?

Then:

- DHCP, PXE, Configuration Server, Proxy Server and TFTP are working correctly.
- The Configuration Server is correctly forwarding methods, processes, and the MACHINE class' NULL instance to the Radia Integration Server.
- The Configuration Server has the necessary files to handle Radia OS Manager Server (COP) objects.
- Linux kernel supports the hardware in the machine.
- Radia OS Manager Server appears to be configured correctly.
- OS Policy correctly chose one OS.
- The OS State for the MACHINE instance is set to DESIRED.

Test Results

If any of the tests failed, you may have some problems with your infrastructure. Be sure to collect the following information:

- How are you trying to set up the infrastructure?
- In what order did you install the components?
- Gather the necessary logs related to your problem.

Collecting Information for Technical Support

If you need to contact Technical Support for assistance, be sure to review the latest release notes and confirm that you have installed any fixes. If you still need assistance, then collect the following information:

- Hardware information (including manufacturer, model, BIOS/firmware version for the NIC card, hard drive controller card and hard drive).
- Gather the following files or folders:
  - `SystemDrive:\Novadigm\IntergrationServer\upload\machineID.log`
  - *`SystemDrive`*`:\Novadigm\IntegrationServer\logs` directory

    OR

    `SystemDrive``:\Novadigm\IntegrationServer\RomVer.log`
  - *`SystemDrive`*`:\Novadigm\ConfigurationServer\log\nvdmr000.log`
  - If specifically requested, gather the .MBR and .PAR files from *`SystemDrive`*`:\Novadigm\IntegrationServer\UPLOAD` on the RPS\RIS server
- What results you were expecting, what actually happened, and any other related details.
- Whether the problem can be reproduced. If so, specify the exact steps (providing detailed information) to reproduce the issue.
- Specify whether the issue occurs on more than one machine.
- Indicate whether the image was ever successfully deployed. If so, what has changed since the successful deployment?

- If deployment of an image stops and goes to a bash prompt, be sure to collect the `OSSELECT.log` file. Use the following command to copy the `OSSELECT.log` to the RIS \upload folder:

```
curl -T osselect.log
http://$ISVR:$ISVRPORT/upload/osselect.log
```

Gathering Version Information

Radia OS Manager Server Components

To determine the versions of the Radia OS Manager components, go to *SystemDrive*:\Novadigm\IntegrationServer and run `Romver.cmd`. The log is created in the same directory.

Radia OS Manager Administrator Components

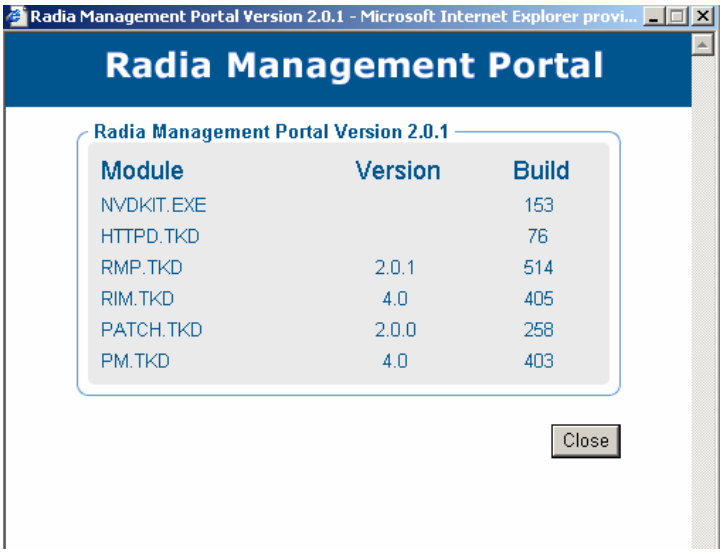
To determine the versions of the Radia OS Administrator components, go to *SystemDrive*:\Novadigm\IntegrationServer and run `Romadver.cmd`. The log is created in the same directory.

To determine the versions of the Configuration Server, go to *SystemDrive*:\Novadigm\IntegrationServer and run `Rcsver.cmd`. The log is created in the same directory.

NVDKIT.EXE and .TKD Files

There are several ways to view version and module information for `nvdkit.exe` and the various `.tkd` files.

- In the banner area of the Management Portal, click  . Below is a sample of the information you will see.



- Open a command prompt and navigate to the location of `nvdkit.exe` (by default, *`SystemDrive`*`:\Novadigm\IntegrationServer`. Then, type the following to get the corresponding module and version information:

  a `nvdkit.exe`
  Type **`nvdkit version`** and press **Enter**.

  b `expandsmbios.tkd`
  Type **`nvdkit version modules\expandsmbios.tkd`** and press **Enter**.

  c `roms.tkd`
  Type **`nvdkit version modules\roms.tkd`** and press **Enter**.

  d `roms_udp.tkd`
  Type **`nvdkit version modules\roms_udp.tkd`** and press **Enter**.

- See the `httpd-port.log` for version and build information.

Configuration Server

To check the version of your Configuration Server:

- Go to *`SystemDrive`*`:\Novadigm\ConfigurationServer\bin` and open `version.nvd`.

  OR

- Go to *SystemDrive*:\Novadigm\ConfigurationServer\log and open nvdmr000.log.

  OR

- Go to *SystemDrive*:\Novadigm\ConfigurationServer\bin and run Rcsver.cmd.

Radia Database

To check the version of your Radia Database, use the System Explorer to view the PRIMARY.SYSTEM.DBVER class. The DBVER attribute specifies the current version of your database. See the *Database Reference Manual*.

ROMA

To determine the version of the Radia OS Management Agent that you are running, you can use a text editor to open *SystemDrive*:\Novadigm \IntegrationServer\upload\ machineID.log. The line will read similar to the following:

```
20030905 19:02:35 Info: ROMA Version 1.3.1 Build 2 running
```

ROMBL

The version of ROMBL is displayed during the boot sequence. This information is not written to a log. Therefore, to find out the version number, you should do a PXE boot and one of the first lines will contain the version number.

Frequently Asked Questions

- Can I upgrade from my previous version?
  Yes, an upgrade process is available for upgrading from version 1.6 to 2.0.
- Are all OSs eligible for deployment?
  The eligible OS's are Windows 2000 Professional, Windows 2000 Server, Windows XP Professional, and Windows 2003 operating system.
- Can you use varying versions and builds of the Radia OS Manager Server modules?
  Mixing and matching Radia OS Manager Server modules is not supported.
- Will my data partitions be captured with the system partition during the Image Preparation process?
  Multiple partitions on the source image may cause image deployment failures. Use only one partition on the source. The partition should contain only 100 MB of free space.
- Are dynamic disks supported with Radia OS Manager Server?
  Not yet.
- What if I want to kick off a batch file to execute a backup program before sending a new image to a machine?
  Use the exit point (`Novapdc.cmd`). Rename your batch file (which contains the backup program) to `Novapdc.cmd` and store it on the target machine's IDMSYS directory. This will run before the new OS is deployed.
- What is the best way to size down a partition on a source machine?
  Use the option in the Image Preparation Wizard. If you do not use this you can use Partition Magic or another vendor's non-destructive partitioning. You can also Fdisk the partition to the correct size prior to installation of OS.
- Do I need to restart the Radia Integration Server?
  If the Radia OS Manager Server is being added to a RIS process that is already running another product (RIM for example) then the `Roms.tkd` must either be explicitly loaded or the RIS restarted. However, for the current release you should avoid running the Radia OS Manager Server in the same RIS process with other products. The RIS should be dedicated to OS Manager components, which include RPS, ROMAD, RMP, EXPL, and Radia OS Manager Server (`.tkd`).

Changes made to the Radia Integration Server .cfg files require a restart to implement the changes.

- What protocol is used to download the Linux service OS in a PXE-based implementation?
  The Linux service OS is served by the TFTP server using TFTP protocol.
- What protocol is used to download an OS image?
  HTTP.
- What must be enabled in a router to allow PXE to traverse subnets?
  The DHCP helper, which allows traversal of broadcast traffic on the DHCP ports, since broadcast is typically turned off on routers.
- What are the conditions in which ROMA will be booted on a machine?
  - If ROMBL decides it must continue the boot process because there is no OS or it is invalid.
  - If NEXTBOOT = _SVC_LINUX_ in `Rombl.cfg`.
  - If the OSState variable for the target machine has been set to _INVALID_ in the Radia OS Manager Administrative Interface.
- Why is my TFTP server shutting down after starting?
  You may have another TFTP server running on the same computer.
- How can I check that the Boot Server is successfully installed?
  Press **Ctrl** + **Alt** + **Delete**, go to Task Manager, and review the list of Processes. `PXE.exe` and `Inetd.exe` should be running.

  OR

  Go to the Event Viewer and check the application events. You will see when the process starts. Entries for problems will appear soon after the event starts.

  OR

  In Windows 2003, go to a command prompt and type netstat /all. If you find boot.ps and tftp, the installation was successful.
- How do I know if the appropriate port is listening?
  From the command prompt netstat –a,
  you will receive a list of the ports and an indication of whether they are listening.
- What do I do if I receive a message that says "Checking Machine Status Times Out" or "Cannot find ROMS infrastructure?"
  You may receive this message if you're blocking ports or using a firewall.

Verify that your ports are open, in particular ports 3466 and 2074. Be aware that you must be using both UDP and TCP.

Using the Discover Boot Server Utility

Use the following command to send out a DHCP discover request in order to identify the PXE servers that are in the environment. This is an essential command when trying to determine if a machine is able to access the PXE server.

```
./discoverbootserver.sh
```

Note that the results may be complicated to read. Contact Technical Support for more information.

A AppEvents

The following AppEvents are stored in the MACHINE object and can be sent to the Inventory Manager. To ensure that they are sent to RIM, you must specify the address for Inventory Manager and Radia OS Manager Server during the Radia OS Manager installation.

Table 12: AppEvents Sent to RIM

Event Type	Message	Description
INFO	Previous install without Machine Object	An OS was installed by Radia OS Manager Server, but the MACHINE object has been deleted.
ADMIN	UNMANAGED_OS_ resolved	An _UNMANAGED_OS_ was resolved for the machine and administrative action is required.
ADMIN	No OS resolved	No OS was resolved for the machine and administrative action is required.
ADMIN	No OS selected	No OS was selected for this machine and administrative action is required. This can occur when multiple OSs resolve and the behaviors are configured for CENTRAL selection. The administrator must arbitrate the OS.
ADMIN	No OS resolved, unusable, shutdown	Machine does not have a valid Operation System. No OS was resolved so the machine cannot be used.

Event Type	Message	Description
ADMIN	Multiple OS resolved and central control	Multiple OS's were resolved for this machine and administrative action is required because the user was not given the option to select the OS.
ADMIN	No to install	A valid OS exists on the machine and the user responded "No" to the prompt to perform an OS installation.
INSTALL	CD install, no CD drive	A CD-based installation was requested but no CD-ROM drive exists on the machine.
INSTALL	Partition Error	ROMA was unable to retrieve Partition information (File retrieval problem).
INSTALL	Boot Partition problem	ROMA was unable to determine the Boot Partition after the disk was partitioned.
INSTALL	Error Installing Image	ROMA received an error while installing the OS image.
INSTALL	Error Installing MBR	ROMA encountered an error while installing the Master Boot Record (MBR).
INSTALL	Missing PQ script file	A PowerQuest image is to be deployed but the required script file is not present.
INSTALL	unattend.txt error	The `Unattend.txt` file could not be retrieved from the server.
INSTALL	Sysprep.inf error	The `Sysprep.inf` file could not be retrieved from the server.

Event Type	Message	Description
INSTALL	PQ install - cannot load pqdeploy	The program pqdeploy that is required to deploy a PowerQuest image cannot be loaded.
INSTALL	Successful	OS was successfully installed.

Use the Radia OS Manager Administrative Interface to view the following AppEvents which are displayed in the ROM object for the MACHINE, in the Events area. These AppEvents are not sent to RIM.

Table 13: AppEvents displayed in the Radia OS Manager Administrative Interface

Event	Description
No OS has been resolved - RSLVDOS set to _NONE_	No policy has been assigned to this machine and nothing will happen until policy is assigned.
Admin activity required - No OS has been selected	During policy resolution, no eligible OS was found for the machine. The machine may have no local OS or it may have a machine that is managed but the OS must be repaired (_INCONSISTENT_OS). The machine is unusable and the OS Manager does not know how to proceed. Therefore, the machine has been turned off until the administrator changes policy and sends a WOL to the machine.
OS: *NameOfOperatingSystem* has been installed	The selected OS has been installed successfully.

Event	Description
Admin activity recommended - OSSTATE set to _INCONSISTENT_	On a managed machine that was in its desired state, `Rombl.cfg` was lost. This may indicate serious corruption and therefore, the Radia OS Manager changed the value of OS State to _INCONSISTENT_ and will allow the machine to be used "as is". If possible, during the next Radia OS Connect, `Rombl.cfg` will be recreated. If this does not happen, the administrator should force a reinstall of the OS..
Admin activity required - _UNMANAGED_OS_ is selected where an OS is to be installed	_UNMANAGED_OS was resolved for the machine because it has no OS or because the machine is managed but the OS must be repaired (_INCONSISTENT_OS). The machine is unusable and the OS Manager does not know how to proceed. Therefore, the machine has been turned off until the administrator changes policy and sends a WOL to the machine.
OSSTATE has been set to _DESIRED_	The OS has been installed according to policy.
Admin activity required - no eligible OS, unusable machine, machine shutdown	During policy resolution, no eligible OS was found for the machine. The machine may have no local OS or it may have a machine that is managed but the OS must be repaired (_INCONSISTENT_OS). The machine is unusable and the OS Manager does not know how to proceed. Therefore, the machine has been turned off until the administrator changes policy and sends a WOL to the machine.
SLCTDOS has been set to _UNMANAGED_OS_	During policy resolution, no eligible OS was found for the machine, which has an existing valid, but unmanaged, OS. The machine has been set to _UNMANAGED_OS_ to allow the machine to be used as is until admin changes policy.

Event	Description
Admin activity required - Multiple OS resolved and central control	During policy resolution, several eligible OSs were found for the machine. However, the behavior setting does not allow for user selection of the OS. Therefore, the administrator must intervene and determine what OS should be installed on the machine. Until then, the machine is usable as long as the OSSTATE is not set to INVALID.
OS: *NameOfSelectedOS* has been selected to be installed	Displays the OS that has been selected to be installed on the machine.

B User Messages

The following messages may be displayed to the user. If the message does not require a response from the user, the message displays for the number of seconds specified in the USERTO attribute in the BEHAVIOR class and then the machine will shut down. If USERTO is set to –1, then the machine will wait for a user response indefinitely.

Table 14: Messages for Timeouts

Messages	User Action
This system contains a Radia OS Manager (ROM)-aware factory pre-imaged hard drive. Networking problems prevent ROMA from connecting to the ROM infrastructure to configure this machine. The machine cannot be used. The system will retry after a while.	N/A
The local machine does not contain a usable OS. Networking problems prevent ROMA to connect to the ROM infrastructure to install this machine. The machine cannot be used. The system will retry after a while.	N/A
The local machine contains a usable OS. Networking problems prevent ROMA to connect to the ROM infrastructure to determine policy for this machine. The machine will be booted to the local OS.	N/A
This system is new to the Radia OS Manager (ROM). It contains a local partition but no management marker (ROMBL.CFG). It cannot be determined whether it should be re-installed according to policy or kept "as is" for now. Please select "install" or "use."	Select **install** to install the resolved OS, or select **use** to continue to use the existing OS.
This system is new to Radia OS Manager (ROM). The attempt to register this machine with the manager (Machine ID object creation) failed. The machine is not allowed to be used. The system will retry after a while.	N/A
This machine is to be re-installed according to policy. The administrator asks you to select the intended role for this machine out of the following list of available roles.	Select a role.

Messages	User Action
This machine is to be re-installed because there is no local OS or the local OS is invalid. Policy resolution did not return any eligible OSs. Please verify that the OSs selected for this machine have the following characteristics: • ACPI: $::acpi • APIC: $::apic • Minimum CPU speed: $::cpuspeed • Minimum RAM size: $::mem • Boot Hard Drive Type: $::boottype • Minimum Hard Drive Size: $::hdsize The machine cannot be used. The system will be turned off until the administrator changes policy and does a WOL.	N/A
This machine is to be re-installed because there is no local OS or the local OS is invalid. Policy resolution did return multiple eligible OSs. The machine cannot be used. The system will be turned off until the administrator selects an eligible OS and does a WOL.	N/A
This machine is to be re-installed according to policy. The administrator asks you to select the intended OS for this machine out of the following list of available OSs.	Select an OS.
This machine is to be re-installed because there is no local OS or the local OS is invalid. Policy resolution only returned _UNMANAGED_OS_, which is not applicable for this machine. The machine cannot be used. The system will be turned off until the administrator changes policy and does a WOL.	N/A
This machine is to be re-installed because there is no local OS or the local OS is invalid. There was an error during resolution for this machine. The OS for this machine cannot be determined at this time. The machine cannot be used. The system will be turned off until the administrator changes policy and does a WOL.	N/A

Messages	User Action
This machine is to be re-installed according to policy. The administrator asks you to confirm the installation of a new OS on this machine. Is it OK to re-install the OS now?	Indicate whether it is okay to continue the installation.
This machine is to be re-installed according to policy. The selected OS is the same as the currently installed OS. Do you want to use the current installation or do you want to refresh the OS?	Specify whether to use the existing installation or to refresh the current OS.

C Using Dynamic Maintenance

The Radia OS Manager provides dynamic maintenance that is typically used to update `ROMA.tkd` and `PREPWIZ.tkd`. If new or updated files are found in `IntegrationServer/sos-maint` directory, they will be downloaded to the running Service OS and will replace existing modules.

This is an advanced task.

To set up dynamic maintenance

1. Use a text editor such as Wordpad to open *SystemDrive*:\Novadigm\BootServer\X86PC\UNDI\linux-boot\linux.cfg\default file.

   ```
   DEFAULT bzIage

   APPEND initrd=rootfs.gz root=/dev/ram0 rw ISVR=192.168.1.9
   ISVRPORT=3466
   ```

2. Append the following options to the APPEND statement shown in the image above.

   — LSVR = *IP address or name of the Linux Maintenance Server*

   Note that HP recommends that the Linux Maintenance Server is the ROM server.

   The default value is ISVR.

   If this is not defined, then the maintenance process is skipped.

   — LSVRPORT = *port number for the Linux Maintenance Server*

   If the ISVRPORT is specified, this is used as the default value for LSVRPORT. If ISVRPORT is not specified, the default for LSVRPORT is 3466.

   OR

   — You can specify LSVR = *IP address or name:port of the Linux Maintenance Server*

D Storing Multiple Logs

Typically, logs stored on the ROMS server after an OS installation for a machine are rewritten with each installation. Now, you have the option to store multiple logs per machine on the ROM server.

To store multiple logs on the ROM server

1. Use a text editor to open `SystemDrive:\novadigm\integrationserver\etc\put.cfg`.

```
# ------------------------------------------------------------------
# - RIS Put Server - for file uploads
#
#   Put::cfg array is used by the PutEnter proc to allow a user-specified
#   number of previous files with the identical name to be saved.
#       -ROLLOVER is the max number of files to keep, each file has the
#           same root name with the suffix of .1, .2, etc.
#       -TYPELIST may include any number file extensions: e.g., ".log .txt .edm"
#   The default of -ROLLOVER is 0 (zero) and only the current version is stored.
# ------------------------------------------------------------------

file mkdir [set dir $Config(ROOT)/upload]

Put_AddRoot /upload $dir

namespace eval Put {
    array set cfg [list \
        -ROLLOVER   0   \
        -TYPELIST   ".log"
    ]
}
```

2. Set -ROLLOVER to the number of logs that you want to be able to store. For example, if you set –ROLLOVER to 3, you will be able to store and review the previous three actions performed on the target machine.

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