Tivoli® Tivoli Configuration Manager

IBM

SC32-2578-02

Version 4.3.1

User's Guide for Operating System Deployment Solution

Tivoli® Tivoli Configuration Manager

Version 4.3.1

User's Guide for Operating System Deployment Solution

Contents

Figures

Tables

About this guide

The purpose of this guide is to describe how you can implement an operating system imaging solution. This solution is delivered with IBM® Tivoli® Configuration Manager, Version 4.3.1.

Who should read this guide

This guide is intended for IT specialists and administrators who want to implement an operating system imaging solution.

Readers should be familiar with the following topics:
- Windows® operating systems
- Tivoli environment
- IBM Tivoli Configuration Manager environment
- Supported database architectures and concepts
- Microsoft® Windows Server Update Services (WSUS)

What this guide contains

This guide contains the following chapters and appendixes:
- Chapter 1, "Overview," on page 1
- Chapter 2, "Planning and installing your environment," on page 5
- Chapter 3, "Creating a system profile in a development environment using Tivoli Provisioning Manager for Operating System Deployment," on page 19
- Chapter 4, "Implementing the operating system imaging solution," on page 21
- Chapter 5, "Scenarios," on page 47
- Appendix A, "Tivoli Provisioning Manager for Operating System Deployment," on page 51
- Appendix B, "Uninstalling," on page 53
- Appendix C, "Troubleshooting," on page 55
- Appendix D, "Support information," on page 57

Publications

This section lists publications in the IBM Tivoli Configuration Manager library and related documents. It also describes how to access Tivoli publications online and how to order Tivoli publications.

IBM Tivoli Configuration Manager library

The following documents are available in the IBM Tivoli Configuration Manager library:
- *IBM Tivoli Configuration Manager: Introducing IBM Tivoli Configuration Manager*, GC23-4703

  Provides an introduction to the product.
- *IBM Tivoli Configuration Manager: Planning and Installation*, GC23-4702

  Describes how to plan for installing Tivoli Configuration Manager components and how to perform the installation.

- *IBM Tivoli Configuration Manager: User's Guide for Software Distribution*, SC23-4711

  Provides user information about how to use the Software Distribution component of Tivoli Configuration Manager.
- *IBM Tivoli Configuration Manager: Reference Manual for Software Distribution*, SC23-4712

  Provides advanced information about how to use and customize the Software Distribution component of Tivoli Configuration Manager.
- *IBM Tivoli Configuration Manager: User's Guide for Deployment Services*, SC23-4710

  Provides information about the different services provided as part of Tivoli Configuration Manager.
- *IBM Tivoli Configuration Manager: Database Schema Reference*, SC23-4783

  Provides information about the configuration repository of Tivoli Configuration Manager.
- *IBM Tivoli Configuration Manager: User's Guide for Inventory*, SC23-4713

  Describes the Inventory component and the management tasks that you can perform.
- *IBM Tivoli Configuration Manager: Messages and Codes*, SC23-4706

  Describes the messages issued by Tivoli Configuration Manager, its components, and its services.
- *Patch Management User's Guide*, SC23-5263

  Describes how you can implement an automated patch management solution in a Windows environment.
- *IBM Tivoli Configuration Manager: Guide for Microsoft Active Directory Integration*, SC32-2285

  Describes how you can integrate the Microsoft Active Directory environment with the Tivoli environment.
- *IBM Tivoli Configuration Manager: License Management Extension*, SC32-2260-01

  Describes how you can implement IBM Tivoli License Compliance Manager, Version 2.3 fix pack 3 license management facilities in your IBM Tivoli Configuration Manager version 4.3.1 environment.
- *IBM Tivoli Configuration Manager: Release Notes*, GI11-0926

  Provides late-breaking information about Tivoli Configuration Manager, its components, and its services.

Related publications

The following documents also provide useful information:

- *Tivoli Management Framework: Planning for Deployment Guide,* GC32-0803

  Explains how to plan for deploying your Tivoli environment.
- *Tivoli Management Framework: User's Guide,* GC32-0805.

  Describes the concepts and procedures for using Tivoli Management Framework services.
- *Tivoli Management Framework: Reference Manual* GC32-0806

  Provides in-depth information about Tivoli Management Framework commands.
- *Deployment Guide Series: Tivoli Provisioning Manager for OS Deployment*

  Provides in-depth technical information and procedures for installing, configuring and using Tivoli Provisioning Manager for Operating System Deployment.

The following documents are useful for information about Tivoli Provisioning Manager, on which the Automation Server technology is based:

- *Tivoli Intelligent ThinkDynamic Orchestrator Installation Guide*
- *Tivoli Intelligent ThinkDynamic Orchestrator Migration Guide*
- *Tivoli Intelligent ThinkDynamic Orchestrator Release Notes*
- *Tivoli Intelligent ThinkDynamic Orchestrator Problem Determination Guide*

The Tivoli Intelligent ThinkDynamic Orchestrator library can be found at http://publib.boulder.ibm.com/tividd/td/IBMTivoliProvisioningManager2.1.html. The product documentation is also available in the online help, which can be launched from the Automation Server administrative console Web interface.

The *Tivoli Software Glossary* includes definitions for many of the technical terms related to Tivoli software. The *Tivoli Software Glossary* is available at the following Tivoli software library Web site:

http://www.ibm.com/software/tivoli/library/

Access the glossary by clicking the **Glossary** link on the left pane of the Tivoli software library window.

Accessing terminology online

The *Tivoli Software Glossary* includes definitions for many of the technical terms related to Tivoli software. The *Tivoli Software Glossary* is available at the following Tivoli software library Web site:

http://publib.boulder.ibm.com/tividd/glossary/tivoliglossarymst.htm

The IBM Terminology Web site consolidates the terminology from IBM product libraries in one convenient location. You can access the Terminology Web site at the following Web address:

http://www.ibm.com/software/globalization/terminology

Accessing publications online

The product CD contains the publications that are in the product library. The format of the publications is PDF, HTML, or both. To access the publications using a Web browser, open the infocenter.html file. The file is in the appropriate publications directory on the product CD.

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli software information center Web site. Access the Tivoli software information center by first going to the Tivoli software library at the following Web address:

http://www.ibm.com/software/tivoli/library/

Click **Tivoli product manuals**. In the Tivoli Technical Product Documents Alphabetical Listing window, click **IBM Tivoli Configuration Manager** to access your product library at the Tivoli software information center.

Note: If you print PDF documents on other than letter-sized paper, set the option in the **File ″ Print** window that allows Adobe Reader to print letter-sized pages on your local paper.

Ordering publications

You can order many Tivoli publications online at the following Web site:

http://www.elink.ibmlink.ibm.com/public/applications/ publications/cgibin/ pbi.cgi

You can also order by telephone by calling one of these numbers:

- In the United States: 800-879-2755
- In Canada: 800-426-4968

In other countries, contact your software account representative to order Tivoli publications.

Tivoli technical training

For Tivoli technical training information, refer to the following IBM Tivoli Education Web site:

http://www.ibm.com/software/tivoli/education

Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

- Searching knowledge bases: You can search across a large collection of known problems and workarounds, Technotes, and other information.
- Obtaining fixes: You can locate the latest fixes that are already available for your product.
- Contacting IBM Software Support: If you still cannot solve your problem, and you need to work with someone from IBM, you can use a variety of ways to contact IBM Software Support.

For more information about these three ways of resolving problems, see Appendix D, "Support information," on page 57.

Conventions used in this guide

This guide uses several conventions for special terms and actions, operating system-dependent commands and paths, and margin graphics.

Typeface conventions

This guide uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**, and **Operating system considerations**:)
- Keywords and parameters in text

Italic

- Words defined in text
- Emphasis of words (words as words)
- New terms in text (except in a definition list)
- Variables and values you must provide

Monospace

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

Operating system-dependent variables and paths

This guide uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace **$***variable* with **%***variable***%** for environment variables and replace each forward slash (/) with a backslash (\) in directory paths. The names of environment variables are not always the same in Windows and UNIX®. For example, %TEMP% in Windows is equivalent to $tmp in UNIX.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.

About this guide

Chapter 1. Overview

The operating system imaging solution is based on an IBM Tivoli Configuration Manager and Tivoli Provisioning Manager for Operating System Deployment environment and addresses a set of requirements for large financial institutions. With this solution you can manage workstation images containing operating systems and a software stack of applications, in a more consistent, automated, and controlled way, providing a set of well-defined steps you perform to easily build and maintain a workstation image whenever needed.

The proposed solution focuses on extending the Activity Plan component in Tivoli Configuration Manager using a new plug-in called the Tivoli Provisioning Manager for Operating System Deployment integration. To address these needs, the proposed solution will use the partnership between Tivoli Configuration Manager and Tivoli Provisioning Manager for Operating System Deployment.

Tivoli Provisioning Manager for Operating System Deployment, version 5.1.1, build 054.42 or later
> Tivoli Provisioning Manager for Operating System Deployment software is a comprehensive management solution for the remote management of desktop and notebook computers by providing the ability to configure, clone, deploy, and restore computers in large network environments.

Tivoli Configuration Manager
> Tivoli Configuration Manager Tivoli Provisioning Manager for Operating System Deployment can use Tivoli Configuration Manager's scalability and adaptive bandwidth control for image synchronization across the enterprise. In this way Tivoli Configuration Manager uses the PXE or boot technology to install operating systems.

Benefits

The operating system imaging solution is designed to help a team of IT administrators deploy the following Microsoft operating systems as well as other applications to computers across an organization quickly and reliably:

- Windows 2000
- Windows 2003
- Windows XP Professional

The main purpose of this solution is to describe a deployment plan for an improved workstation imaging process in large enterprises, to manage the most common requests related to a workstation life cycle, without requiring any on-site visit, thus reducing the Total Cost of Ownership (TCO) of each managed system. This guide provides information on developing and deploying Tivoli Configuration Manager and Tivoli Provisioning Manager for Operating System Deployment as an operating system imaging solution.

The overall benefits of using this solution are:

- Allows management of workstation or server images in a more consistent, automated, and controlled way.
- Allows the variable connectivity that is available (between the branch and the enterprise) for management tasks during a typical day.

- Allows remote management of the workstations or servers, providing flexibility to staffing in large organizations. For instance, if the imaging or remote location where the images need to be installed, has no one with specialized IT skills, the administrator can now create images locally and replicate those images in remote locations.
- Accounts for the operations in the branches being of a mission-critical nature, by providing a set of well-defined steps to be performed to easily build and maintain a workstation image whenever needed, with limited impact on the business.

Components of an operating system imaging solution

This section provides an overview of the components that are part of the operating system imaging solution and also an example of a typical architecture of an organization using an imaging solution. The different components that are required for this solution are:

Tivoli Management Framework
> Tivoli Management Framework is the software infrastructure for Tivoli Configuration Manager.

Tivoli Configuration Manager
> Tivoli Configuration Manager controls software distribution and asset management inventory in a multi-platform environment.

Tivoli Provisioning Manager for Operating System Deployment
> Tivoli Provisioning Manager for Operating System Deployment is a comprehensive management solution that significantly increases an IT manager's ability to remotely manage desktop and notebook computers. See Appendix A, "Tivoli Provisioning Manager for Operating System Deployment," on page 51 for more information.
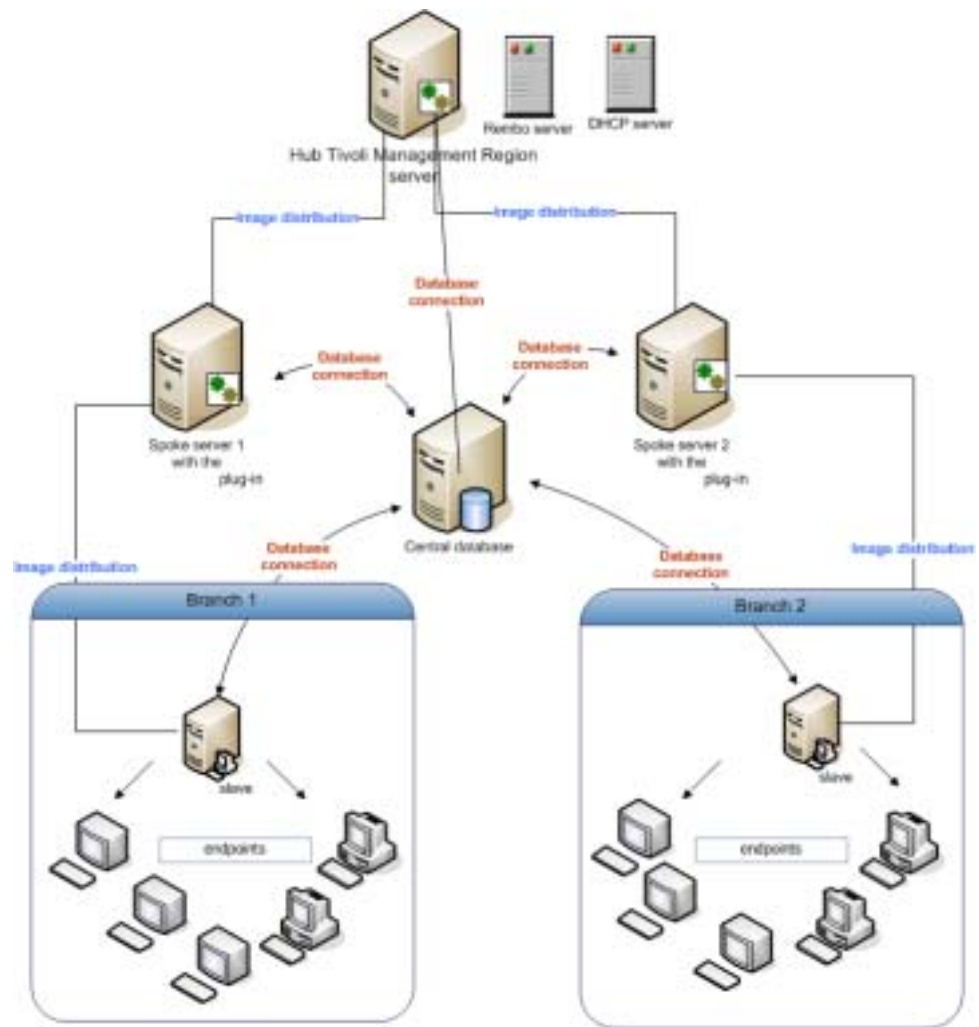
Figure 1. Operating system deployment solution environment

The operating system imaging solution environment is very similar to the Tivoli Management Framework environment, with the additional feature of having the Tivoli Provisioning Manager for Operating System Deployment integration deployed on the Hub Tivoli region and on all the Spoke Tivoli regions to allow parallel management.

Here are some highlights of this environment:

IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level

> The IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level is also known as the IBM Tivoli Provisioning Manager for Operating System Deployment master server. You must install the IBM Tivoli Provisioning Manager for Operating System Deployment master server on a managed node of the Hub Tivoli region. The IBM Tivoli Provisioning Manager for Operating System Deployment master server is used as the input node for all the actions related to importing images, creating snapshots, creating and deploying differential images to the rest of the infrastructure.

> To implement this solution, a new Configuration Manager component, the Tivoli Provisioning Manager for Operating System Deployment integration

component, must be installed on the Hub Tivoli server and on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level.

Note: You must install the Tivoli Configuration Manager Software Distribution Server component on the managed node where the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level runs. This managed node must be configured as source host and repeater. For the repeater configuration, use the Tivoli Management Framework **wrpt** command.

IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level
The IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level is also known as the IBM Tivoli Operating System Deployment slave server.

To implement this solution, the Configuration Manager Tivoli Provisioning Manager for Operating System Deployment integration component must be installed on each Spoke Tivoli server and IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level. It is used to submit activities related to the specific Spoke sub-tree. These servers are loaded with the proper differential image and communicate back to the IBM Tivoli Provisioning Manager for Operating System Deployment master server, the status of processing that image.

Note: The IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level must be a managed node and endpoint. The `config.csv` file contains a line for the IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level. The ″Description″ field of this line must contain a name equal to the label of the endpoint installed on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level.

Branch IBM Tivoli Provisioning Manager for Operating System Deployment server
The Branch IBM Tivoli Provisioning Manager for Operating System Deployment server acts as a gateway between the workstations to be installed and the rest of the Tivoli environment. Use the Branch IBM Tivoli Provisioning Manager for Operating System Deployment server to decrease the network traffic or if you have sub-LANs.

Note: The Branch IBM Tivoli Provisioning Manager for Operating System Deployment server must be only an endpoint.

Tivoli Provisioning Manager for Operating System Deployment database server
There is only one central database, that stores the data from the Tivoli Provisioning Manager for Operating System Deployment servers. As an alternative to a central database, you could have a database for the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level, for each IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level, and for each branch Tivoli Provisioning Manager for Operating System Deployment server. A Tivoli Provisioning Manager for Operating System Deployment mechanism of synchronization allows data to be replicated between the databases.

Chapter 2. Planning and installing your environment

You can accomplish a successful Tivoli deployment in many ways. Many of the decisions that need to be made are based on your environment. The considerations that apply to planning a Tivoli environment, as described in Tivoli Management Framework Planning for Deployment, apply to planning a configuration management environment. This chapter provides additional considerations that might require changes to your overall deployment plan. Depending on the contents of your overall deployment plan, different installation and upgrade procedures might be required to create or maintain your Tivoli environment.

Required prerequisite software

This section provides information on the software required to implement this branch-office solution and guidelines for choosing where to install the components.

You require the following software to implement the branch office solution:

MS SQL or IBM DB2® Universal Database™
> Install MS SQL or IBM DB2 Universal Database Enterprise Edition version 9.5 in the production environment. See Chapter 3, "Creating a system profile in a development environment using Tivoli Provisioning Manager for Operating System Deployment," on page 19 for details about the difference between production and development environments.

Tivoli Management Framework
> Install Tivoli Management Framework version 4.3.1 in the production environment.

Tivoli Configuration Manager
> Install Tivoli Configuration Manager version 4.3.1 in the production environment.

Tivoli Provisioning Manager for Operating System Deployment, version 5.1.1
> Install build 054.42 or later.

Tivoli Provisioning Manager for Operating System Deployment integration, version 4.3.1
> Install Tivoli Provisioning Manager for Operating System Deployment integration, version 4.3.1.

Before installing the Tivoli Provisioning Manager for Operating System Deployment integration, version 4.3.1 and IBM Tivoli Configuration Manager, you need to decide where to install the different components and services of IBM Tivoli Configuration Manager as well as Tivoli Provisioning Manager for Operating System Deployment integration, version 4.3.1. You must install these components on the Tivoli server before you can install them on a managed node or before you can install the associated gateway component on a gateway.

Note: The IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level is used as input node for all the actions related to importing system profiles, taking snapshots, creating and deploying differential system profiles to the rest of the infrastructure. The IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level, as well as the Branch IBM Tivoli Provisioning Manager for Operating

System Deployment server, is loaded with the proper differential system profile and communicates back the status of processing that system profile to the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level. The real deployment to hosts is driven at the spoke level.

The following sections provide guidelines for determining where to install these components and services:

Tivoli Configuration Manager components
Install Activity Planner, Inventory, and Software Distribution components on the Tivoli server and on the managed node on which the IBM Tivoli Provisioning Manager for Operating System Deployment servers are installed:

Activity planner component
Install the APM component on the Tivoli server and the managed node on which the IBM Tivoli Provisioning Manager for Operating System Deployment servers are installed.

Software distribution component
Install the Software Distribution components on the Tivoli management region and managed node on which the IBM Tivoli Provisioning Manager for Operating System Deployment servers are installed.

Inventory component
Install the inventory components on the Tivoli server.

Installing the Tivoli Provisioning Manager for Operating System Deployment integration

This section describes where to install the Tivoli Provisioning Manager for Operating System Deployment integration and the actions you can perform from the installed workstations.

Before installing the Tivoli Provisioning Manager for Operating System Deployment integration on a workstation, where you have already installed a previous version of this plug-in, remove the old plug-in using the `wuninst` command.

You must install the Tivoli Provisioning Manager for Operating System Deployment integration component on the following servers:

Hub Tivoli server and on the managed node where the Tivoli Provisioning Manager for Operating System Deployment Master is installed
You install the plug-in component to perform the following Tivoli Provisioning Manager for Operating System Deployment Master server operations from Activity Planner:
- Importing images
- Taking snapshots
- Generating differential Tivoli Provisioning Manager for Operating System Deployment files
- Updating slaves

Spoke Tivoli server and on the managed nodes where the IBM Tivoli Provisioning Manager for Operating System Deployment servers are installed

On the spoke server, you install the Tivoli Provisioning Manager for Operating System Deployment integration to perform the following Tivoli Provisioning Manager for Operating System Deployment slave server operations:

- Backing up user settings
- Registering workstations
- Refreshing a workstation
- Installing a new workstation
- Restoring user settings

You can use the Tivoli desktop or Tivoli command line to install the Tivoli Provisioning Manager for Operating System Deployment integration on the Tivoli server or any managed node in your environment. By installing the component on the managed nodes you can use the command line from such managed nodes.

The following sections provide information on how to install the Tivoli Provisioning Manager for Operating System Deployment integration.

Requirements for the installation

The solution is designed to work on IBM Tivoli Configuration Manager version 4.3.1. Therefore, all the software and hardware prerequisites required by Tivoli Configuration Manager are required by this solution. For information on the software and hardware prerequisites required by IBM Tivoli Configuration Manager, refer to *IBM Tivoli Configuration Manager: Planning and Installation*.

Before you begin:

The Tivoli Provisioning Manager for Operating System Deployment integration provides the capability to back up and restore user settings. For this purpose the suggested tool is the User State Migration Tool (USMT) from Microsoft. This command-line tool collects information about the user settings on the endpoints before deploying a new operating system image. The tool then helps restore the settings after the installation.

To download this tool:
1. Go to http://www.microsoft.com/downloads/details.aspx?familyid= 0CAA294C-29D9-4449-81D5-4B69B97DF7AE&displaylang=en. This tool is used to collect information on the user settings on Windows 2000 machines and restores the settings after the migration.
2. Refer to the download instructions on the page.

The downloaded file is a self-extracting executable (.exe) file. By running the file, you install the tool and documentation on your computer.

You can find an example based on USMT, version 2.6 in the *Deployment Guide Series: Tivoli Provisioning Manager for OS Deployment*. IBM Redbooks publications are available at the following link: http://www.redbooks.ibm.com/.

Tivoli desktop installation

The Tivoli desktop can install the same product on multiple machines sequentially. The basic procedure for using the Tivoli Desktop to install the Tivoli Provisioning Manager for Operating System Deployment integration is as follows:

1. From the Tivoli desktop, select **Install** -> **Install Product** from the **Desktop** menu.
2. From the Install Product window, click **Select Media**, and the File Browser window opens.
3. In the File Browser window, browse to the Tivoli Provisioning Manager for Operating System Deployment integration image directory and click **Set Path**.
4. Click **Set Media & Close.**
5. From the Install Product window, select **Tivoli Provisioning Manager for Operating System Deployment integration, Version 4.3.1** and the managed nodes you are installing on.
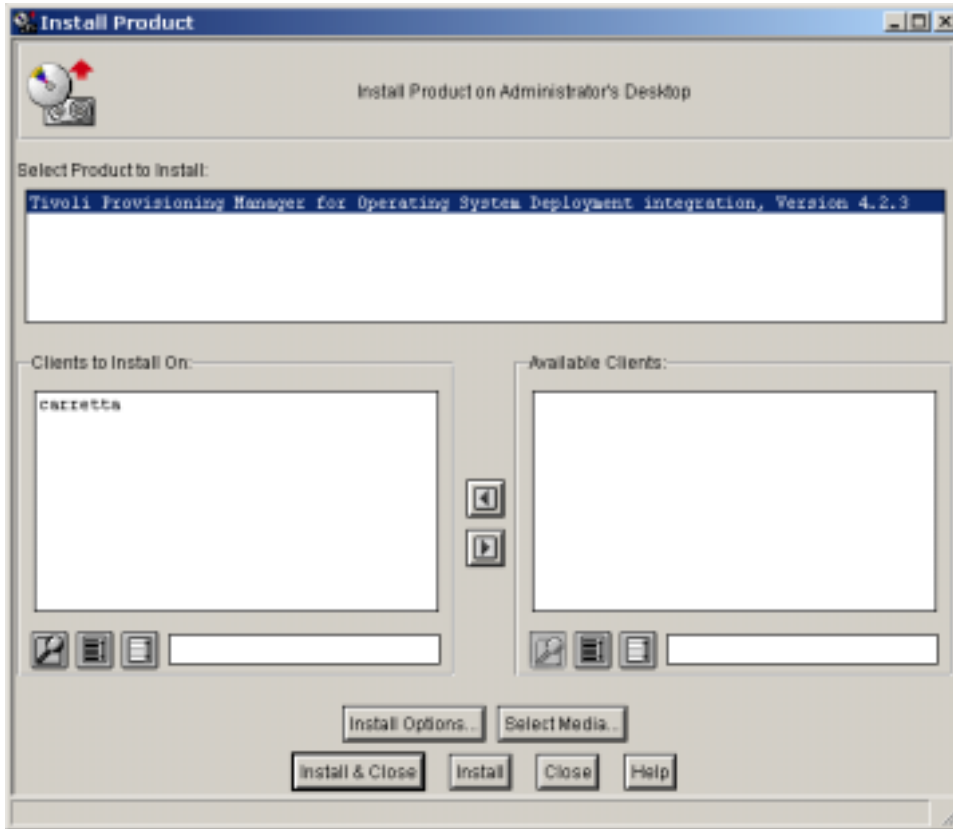
Figure 2. Installing the Tivoli Provisioning Manager for Operating System Deployment integration

6. The Install Options dialog opens.
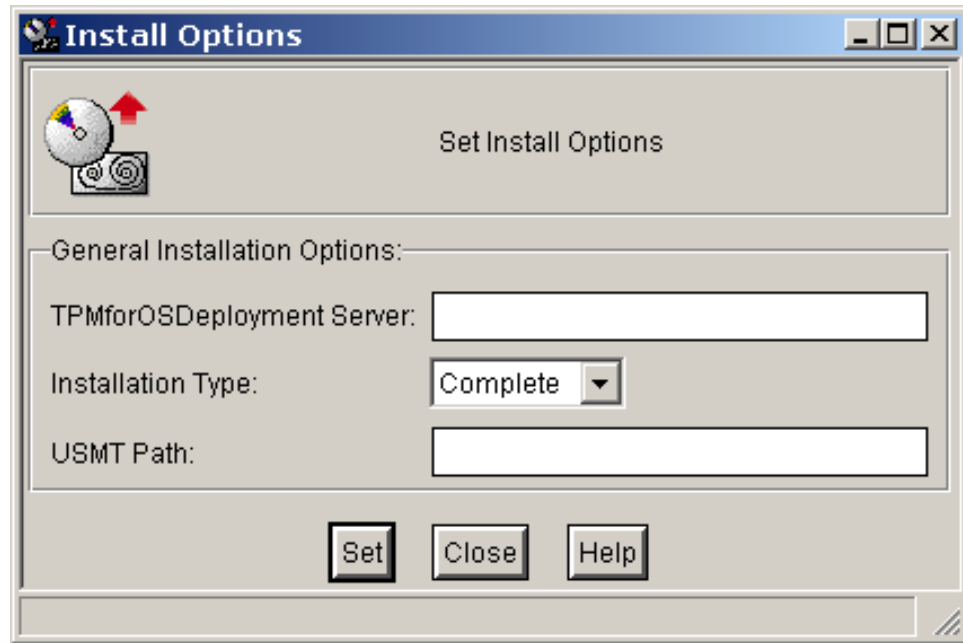
Figure 3. Setting the installation options

Fill in the required information:

TPMforOSDeployment Server
Type the name of the client on which the Tivoli Provisioning Manager for Operating System Deployment server of the Tivoli region is installed.

Installation Type
From the drop-down menu, select one of the following installation types:

Complete
You can perform all the Tivoli Provisioning Manager for Operating System Deployment activities

Master
You can perform the plug-in operations related to the Tivoli Provisioning Manager for Operating System Deployment Master server.

Slave   You can perform the plug-in operations related to the Tivoli Provisioning Manager for Operating System Deployment slave server.

USMT Path
Provide the path of the Tivoli Provisioning Manager for Operating System Deployment server where you downloaded and extracted the USMT.

7. The product installation summary page is displayed. Review the information and continue with the installation, click **Continue Install**.

8. Click **Install** -> **Close**.

Registering the Tivoli Provisioning Manager for Operating System Deployment integration

To register the Tivoli Provisioning Manager for Operating System Deployment integration, run the following script:

```
$BINDIR/TME/APM/SCRIPTS/reg_TPMforOSDeployment_plugin.sh
```

Verifying the installation

When the installation process is finished, you should see the Tivoli Provisioning Manager for Operating System Deployment integration icon when you launch the Activity Plan Editor on the server. Figure 4 shows the icon on the furthest right corner of the Activity Plan Editor.
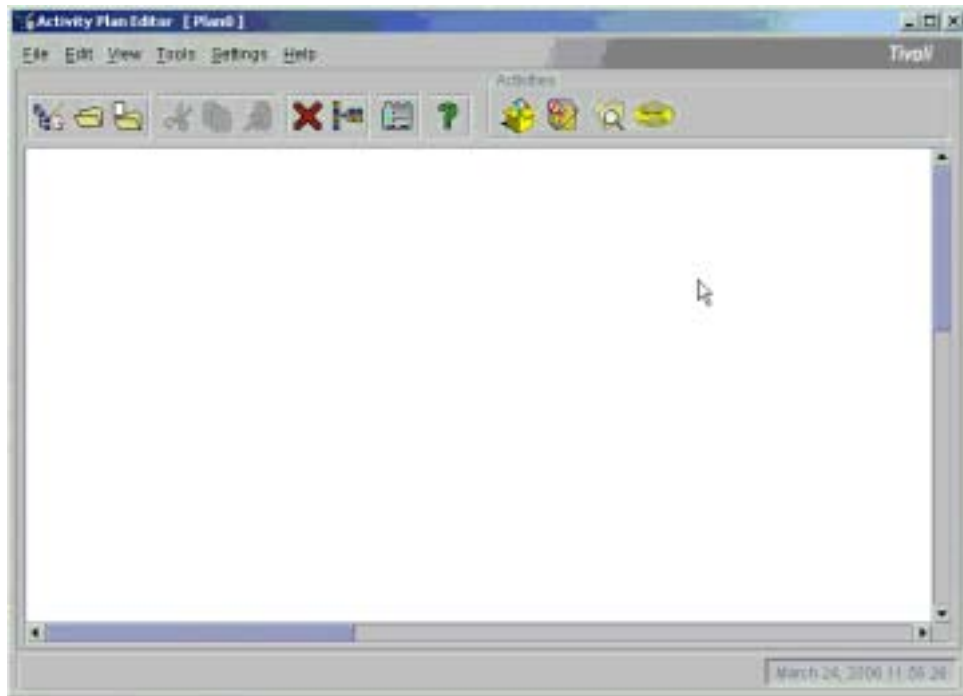

Figure 4. Tivoli Provisioning Manager for Operating System Deployment integration displayed in the Activity Plan Editor

Configuring the Rembo.ini file

You can customize the Tivoli Provisioning Manager for Operating System Deployment integration installation by modifying the rembo.ini configuration file as follows:

Table 1. Server configuration parameters, [SERVER_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`installation_type`	You can choose the type of Tivoli Provisioning Manager for Operating System Deployment integration installation. Choose from the following options: **Complete** This installs all the plug-in operations. **Master** This installs the plug-in operations related to the Tivoli Provisioning Manager for Operating System Deployment Master server. **Slave** This installs the plug-in operations related to the Tivoli Provisioning Manager for Operating System Deployment slave server.
`main_server=`*remboserver*	Enter the name of the Tivoli Provisioning Manager for Operating System Deployment server. In this case, main_server=*remboserver* is the name of the Tivoli Provisioning Manager for Operating System Deployment Master server.
`rbagentpath=C:\program files\common files\IBM Tivoli` (or `C:/Program Files/Common Files/Rembo Technology` for Tivoli Provisioning Manager for Operating System Deployment previous versions)	This is the `rbagent.exe` path.
`serverpath=C:\TPMfOS files\import` (or `C:/Rembo Files/import` for Tivoli Provisioning Manager for Operating System Deployment previous versions)	The Tivoli Provisioning Manager for Operating System Deployment installation, creates a directory called import in the *drivename*`:/TPMfOS files` directory, by default. This directory will contain the `.RAD` files that you generate in the development environment and that you want to import into your production environment.
`local_temp_dir=C:/Tivoli/db/REMBOM~1.DB/tmp/`	This is the directory that is used to store temporary files on the Tivoli server. You can change the default directory provided in the configuration file.
`remboserver_temp_dir=C:/Tivoli/db/REMBOM~1.DB/tmp/`	This is the directory that is used to store temporary files on the Tivoli Provisioning Manager for Operating System Deployment server. You can change the default directory provided in the configuration file.
`timeout_for_rembo_execution=300`	Enter the timeout value, by which the Tivoli Provisioning Manager for Operating System Deployment agent should respond to the Tivoli Provisioning Manager for Operating System Deployment integration invocation. The default value is 300.

Table 1. Server configuration parameters, [SERVER_CONFIGURATION] section (continued)

Parameter used in the Rembo.ini file	Definition of the parameter
`timeout_for_distribution_submission=1800`	Enter the timeout value, by which the software distribution should respond to the Tivoli Provisioning Manager for Operating System Deployment integration invocation. The default value is 1800.
`tasklibrary=TPMforOSDeployment-`*remboserver*`-region`	This is the name for the Tivoli task library that contains tasks for the Tivoli Provisioning Manager for Operating System Deployment integration.
`task_for_system=TPMforOSDeployment_ system-`*remboserver*`-region`	This is the name of the Tivoli task used by the Tivoli Provisioning Manager for Operating System Deployment integration. **Do not modify this value.**
`task_for_reboot=TPMforOSDeployment_ reboot-`*remboserver*`-region`	This is the name of the Tivoli task used by the Tivoli Provisioning Manager for Operating System Deployment integration to perform a reboot. **Do not modify this value.**

Table 2. Parameters to generate a differential RAD, [GENDIFF_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`split=256`	This parameter provides the option to split the differential file that is generated, if it is very large. For example if the RAD file is greater than 2 GB, it is split into .dat files of 256 MB. **Note:** The default value is 256 MB. The minimum value is 64 MB and the maximum value is 2000 MB.

Table 3. Parameters to update the Tivoli Provisioning Manager for Operating System Deployment servers at Spoke level, [UPDATE_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`profile_manager=TPMforOSDeployment-`*remboserver*`-region`	This parameter specifies the name of the Tivoli profile manager, used by the plug-in to create the temporary software packages.
`destination_path=C:\TPMfOS files\import\auto (or C:/Rembo Files/import/auto for Tivoli Provisioning Manager for Operating System Deployment previous versions)`	This parameter specifies the name of the destination directory to import the system profiles (.RAD) on the Tivoli Provisioning Manager for Operating System Deployment slave and branch servers.

Table 4. Parameters to deploy the system profiles, [DEPLOY_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`software_package=TPMforOSDeployment-`*remboserver*`-region.1`	This parameter specifies the name of the Tivoli software package that is used by the Tivoli Provisioning Manager for Operating System Deployment integration to start the deployment on the specified target machine.

Table 4. Parameters to deploy the system profiles, [DEPLOY_CONFIGURATION] section (continued)

Parameter used in the Rembo.ini file	Definition of the parameter
`destination_path=TPMforOSDeployment-integration`	This parameter specifies the name of the destination directory to perform deployment Tivoli Provisioning Manager for Operating System Deployment integration operations on the endpoints.

Table 5. Parameters to restore user settings, [RESTORE_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`software_package=TPMforOSDeployment-BR-`*`remboserver`*`-region.1`	This parameter specifies the name of the Tivoli software package that is used by the Tivoli Provisioning Manager for Operating System Deployment integration to restore the user settings.
`destination_path=TPMforOSDeployment-integration`	This parameter specifies the name of the destination directory to perform restore Tivoli Provisioning Manager for Operating System Deployment integration operations on the endpoints.

Table 6. Parameters to back up user settings, [BACKUP_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`software_package=TPMforOSDeployment-BR-`*`remboserver`*`-region.1`	This parameter specifies the name of the Tivoli software package that is used by the Tivoli Provisioning Manager for Operating System Deployment integration to back up the user settings.
`destination_path=TPMforOSDeployment-integration`	This parameter specifies the name of the destination directory to perform back-up Tivoli Provisioning Manager for Operating System Deployment integration operations on the endpoints.

Table 7. Optional parameters, [DEPLOY_CONFIGURATION] section

Parameter used in the Rembo.ini file	Definition of the parameter
`fail_on_reboot_failure=yes`	After the deployment process is started on a target machine, it is rebooted. During this reboot phase, the activities are in a Started state and are only marked successful after the end of the deployment process. If for any reason the reboot fails, the activities that were running on that machine, remain in a started state. You can choose to fail the activity if the reboot is not successful. You are provided with two options: **No** This is the default option and the activity will not fail, even if the reboot is not successful. **Yes** The activities will fail, if the reboot is not successful.

Table 7. Optional parameters, [DEPLOY_CONFIGURATION] section (continued)

Parameter used in the Rembo.ini file	Definition of the parameter
`reboot_timeout=10`	Enter the timeout value, by which, the reboot on the target machine should complete. The default value is 10 seconds. You can also provide a value of 0, for the target machine to reboot immediately.
`reboot_message="reboot in progress..."`	Enter the descriptive message to be displayed when the reboot is in progress. A Windows panel opens with the message that you provide here.

After you customized the `rembo.ini` file, you must stop and start the Activity Planner engine by running the following commands from the Tivoli server bash shell:

```
wstopapm
wstartapm
```

Downloading the plug-in

After plug-ins have been installed and registered on the server, they can be automatically downloaded to the machines where the Activity Planner GUIs are installed.

Information about the installed plug-ins is maintained locally on each machine, and every time the Activity Planner GUIs start, a check is performed on the server to verify whether a new plug-in has been installed, or if the currently installed plug-ins have been updated or removed. If a change is detected, the new files are sent to the Activity Planner and local information is updated.

Installation requirements for Tivoli Provisioning Manager for Operating System Deployment

This section provides information on the installation requirements for Tivoli Provisioning Manager for Operating System Deployment.

Server system requirements:

To use Tivoli Provisioning Manager for Operating System Deployment, you need to set up a DHCP server and a Tivoli Provisioning Manager for Operating System Deployment server. Both can reside on the same machine. ODBC support must be available on the host running the Tivoli Provisioning Manager for Operating System Deployment server.

Two additional packages that enhance the standard features of Tivoli Provisioning Manager for Operating System Deployment and perform the actions required by Tivoli Configuration Manager. The packages are named `sync.pak` and `radtcm.pak`. These files are available on the installation CD 5, in the /rad directory. You can also download them as Opal packages from:

http://www-01.ibm.com/software/brandcatalog/portal/opal/details?catalog.label=1TW10OS04

Hardware requirements:

A typical configuration for the IBM Tivoli Provisioning Manager for Operating System Deployment master server includes at least:
- CPU: `dual-Xeon`
- Networking: Gigabit
- RAM memory: 1 GB
- Hard disk: 20 GB

Note: You might want to store Tivoli Provisioning Manager for Operating System Deployment files on a large hard disk if you plan to create many hard-disk images, and you might want to use a fast CPU if you want to minimize the time spent creating these images. The Tivoli Provisioning Manager for Operating System Deployment server is multithreaded and therefore greatly benefits from servers with multiple CPUs.

DHCP server requirements:

There is no special requirement for the DHCP server. If the DHCP server and the Tivoli Provisioning Manager for Operating System Deployment server are running on the same host, the DHCP server should support the definition of the Class identifier DHCP option (option 60).

Tivoli Provisioning Manager for Operating System Deployment can work with almost any RFC- compliant DHCP server, including:
- Windows 2003 DHCP server
- Windows 2000 DHCP server
- ISC DHCP server
- Solaris DHCP server
- NetWare 5 DHCP server

Operating System Requirements:

The Tivoli Provisioning Manager for Operating System Deployment servers must be installed on Windows platforms only.

Client system requirements:

The remote-boot clients should be equipped with a *PXE-compliant bootrom*, either version 2.00 or above. Most recent computers with on-board network adapters have built-in PXE support. The network cards suggested to work with Tivoli Provisioning Manager for Operating System Deployment are Intel® adapters.

Other client computer requirements are:
- Minimum CPU: Pentium® type level.
- Minimum RAM memory: 512 MB.
- VESA compliant (release 2.0 or later) Video BIOS to get ″high″ resolution (VGA fallback is always possible in case of incompatibility). However Tivoli Provisioning Manager for Operating System Deployment can also work on headless machines.
- Either a legacy ATA drive (with Ultra DMA support if speed is required) or a BIOS-supported hard drive.
- DMI support for collecting hardware information, such as model and serial number.
- Tivoli Provisioning Manager for Operating System Deployment is also known to work properly with VMWare Workstations.

How to set up Tivoli Provisioning Manager for Operating System Deployment

This section describes how to set up Tivoli Provisioning Manager for Operating System Deployment to integrate it to Tivoli Provisioning Manager for Operating System Deployment integration, Version 4.3.1.

To set up this configuration, perform the following steps:
1. On all the Tivoli Provisioning Manager for Operating System Deployment servers in your production environment create the following directories:
   version 5.1.1

   ```
   c:\program files\common files\IBM tivoli\packages
   ```
   Previous versions

   ```
   c:\program files\common files\rembo technology\packages
   ```
2. Copy `sync.pak` in the previous directory.
3. Copy `radtcm.pak` in the previous directory for the Tivoli Provisioning Manager for Operating System Deployment servers at Hub and Spoke level.
4. On all the Tivoli Provisioning Manager for Operating System Deployment servers in your production environment create one of the following directories:
   - **version 5.1.1**:

     ```
     c:\TPMfOS files\global\rad
     ```
   - **Previous versions**:

     ```
     c:\rembo files\global\rad
     ```
5. Customize the config.csv file according to the guidelines described in: http://www-01.ibm.com/support/docview.wss?rs=3176&context=SS3HLM &dc=DB560&dc=DB520&uid=swg21247014&loc=en_US&cs=UTF-8&lang=en

&rss=ct3176tivoli and in http://www-01.ibm.com/support/ docview.wss?uid=swg21247013. See "Example of a config.csv File" for an example of the file.

6. Store a copy of the file in the directory you created in step 4 on page 16 for all the Tivoli Provisioning Manager for Operating System Deployment servers in your production environment.

7. Stop and start the **Rembo Server** service to load the customized config.csv file.

   Note: Whenever you edit the config.csv file, manually stop and start the **Rembo Server** service and ensure that the service restarts correctly.

8. Assign to the **Rembo Server** service Administrator credentials (on Windows systems) and one of the following Tivoli authorization roles:
   - super
   - senior

9. Launch the Tivoli Provisioning Manager for Operating System Deployment setup.

After performing these steps, the Tivoli Provisioning Manager for Operating System Deployment server is installed and ready to run tasks required by the Tivoli Provisioning Manager for Operating System Deployment integration plugin.

Example of a config.csv File

The following example shows a config.csv file:

```
HostName";"Interfaces";"DbName";"DbUser";"DbPass";"MasterIP";
"MasterDbName";"MasterDbUser";"MasterDbPass";"BinDir";"Description";"Reporting";"AutoSync";
"PollInterval""fra-tcm423";"192.168.87.143";"AUTODEPLOY";;;"SELF";AUTODEPLOY;;;
"C:/Program Files/Tivoli/bin/w32-ix86/bin/";;"ud";;1
```

For more information on this file, refer to *Deployment Guide Series: Tivoli Provisioning Manager for OS Deployment*. IBM Redbooks publications are available at the following link: http://www.redbooks.ibm.com/.

Configuring the plug-in to import operating system images

To configure the plug-in for importing operating system images, perform the following steps:

1. Insert the installation CD 5, browse to the /rad directory and locate the `RAD\tivoli_packages_and_schemas.rad` file.

2. Copy this file to the Tivoli Provisioning Manager for Operating System Deployment directory or subdirectories, such as, `C:\TPMfOS files\import` on the IBM Tivoli Provisioning Manager for Operating System Deployment master server.

3. Import the `tivoli_packages_and_schemas.rad` by following the procedure described in "Importing operating system images" on page 21.

Chapter 3. Creating a system profile in a development environment using Tivoli Provisioning Manager for Operating System Deployment

This chapter describes how you can create and test a system profile in a development environment, before deploying it in a production environment.

Setting up a test facility

The main purpose of keeping the production environment separate from the test facility is to ensure stability and availability of the production server. Host machines in the test facility should not be part of the production environment, and the production host database should not be filled with records that are not part of the managed workstations.

The test facility should contain:
- A development environment
  - A stand-alone Tivoli Provisioning Manager for Operating System Deployment server with its own database
  - A number of workstations booting on the development server and which are identical to those located on the production environment
- A pre-production environment
  - One Tivoli Provisioning Manager for Operating System Deployment server with Tivoli Configuration Manager
  - Databases of the same type as the ones in the production environment, and linked to the Tivoli Provisioning Manager for Operating System Deployment servers as in the production environment
  - Booting workstations

The pre-production environment should be very similar to the production environment, but on a much smaller scale.

The components to be tested in the test facility are all components which are new or need to be modified before they are released to the production environment. These include:
- New operating system images created using the Tivoli Provisioning Manager for Operating System Deployment console, to be installed on remote workstations
- New software program images to be installed with the operating system using Tivoli Provisioning Manager for Operating System Deployment.
- RAD archive exportation and importation
- New workstation hardware
- New Tivoli Provisioning Manager for Operating System Deployment binaries

The main purpose of Tivoli Provisioning Manager for Operating System Deployment is to deploy an operating system on client workstations by replicating a reference system. However, unattended installation of operating systems is also possible. In this case, Tivoli Provisioning Manager for Operating System Deployment does not replicate a reference system, but provides the correct parameters to Windows setup for a fully unattended installation.

Creating system profiles, configurations, and deployment schemes

For details about how to create system profiles, configurations, and deployment schemes, refer to the Tivoli Provisioning Manager for Operating System Deployment Guide, version 5.1.1 which is available at the following Web site: http://publib.boulder.ibm.com/tividd/td/ IBMTivoliProvisioningManagerforOSDeployment5.1.html

Exporting system profiles, configurations, and schemes as a RAD archive

For details about how to export system profiles, configurations, and deployment schemes refer to the Tivoli Provisioning Manager for Operating System Deployment Guide, version 5.1.1 which is available at the following Web site: http://publib.boulder.ibm.com/tividd/td/ IBMTivoliProvisioningManagerforOSDeployment5.1.html

Chapter 4. Implementing the operating system imaging solution

This chapter provides information on how to implement the operating system imaging solution.

Creating activity plans on the Hub Tivoli server

This section describes the operations that are performed by the new Tivoli Provisioning Manager for Operating System Deployment integration on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level.

- "Importing operating system images" on page 21
- "Taking snapshots" on page 23
- "Generating differential Tivoli Provisioning Manager for Operating System Deployment files" on page 25
- "Updating slaves" on page 27

Importing operating system images

The Tivoli Provisioning Manager for Operating System Deployment integration provides the ability to import a new image or system profile on the IBM Tivoli Provisioning Manager for Operating System Deployment master server, as a ″RAD archive″.

This system profile contains *all* the elements needed to be put on the workstations when the operating system is installed. The operation in the Tivoli Provisioning Manager for Operating System Deployment integration that is associated to this activity is called, **Import RAD**.

The first step required to deploy a system profile, that uses Tivoli Provisioning Manager for Operating System Deployment capabilities, is to import the system profile itself into the Tivoli Provisioning Manager for Operating System Deployment repository. This is required to make it available for further processing.

Prerequisites:

Ensure that the following prerequisites are met prior to using this specific operation.

1. Create an image on the Tivoli Provisioning Manager for Operating System Deployment server in the development environment, using the Tivoli Provisioning Manager for Operating System Deployment interface. An image file with an extension `.rad` is created. Ensure that the image is tested in a development environment before you import it into the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level in a production environment.
2. Copy this file to the Tivoli Provisioning Manager for Operating System Deployment directory or subdirectories, such as, `C:\TPMfOS files\import` on the IBM Tivoli Provisioning Manager for Operating System Deployment master server.

Step 1: Create the Import RAD activity plan:

Activities are single operations that are performed on a set of targets at specified times. First, as an administrator, use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Import RAD**.

Figure 5. Importing an image operation

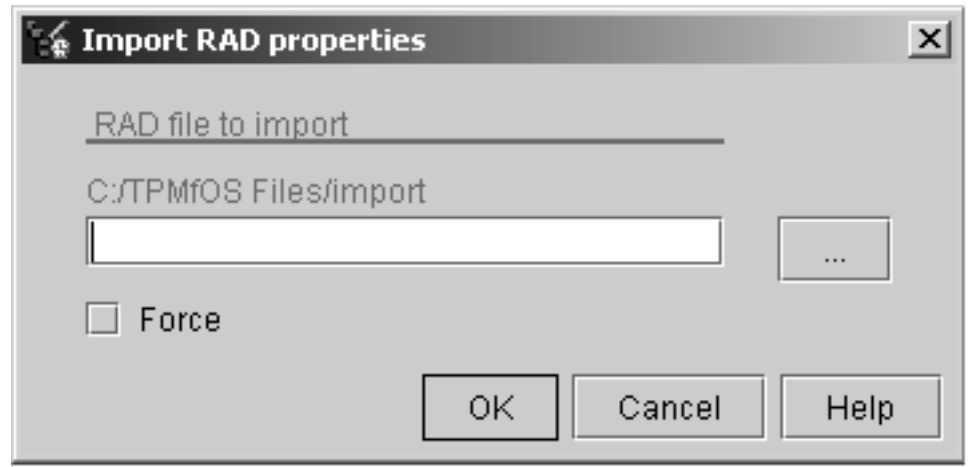2. Click on the **Properties** button to import the image. The properties dialog is displayed

Figure 6. Editing the properties for the import image operation

3. Browse the file system on the Tivoli Provisioning Manager for Operating System Deployment server, to select the proper image to import. Select the RAD archive file that you want to import.

   Note: You can browse to select the image, only if you start the Activity Plan Editor GUI from the Tivoli Provisioning Manager for Operating System Deployment server.

4. After selecting the file, the Import RAD properties panel is displayed again. Click **OK**.

   Note: If you select **Force** the image is reimported.

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the targets. Specify the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level as a target for this activity.
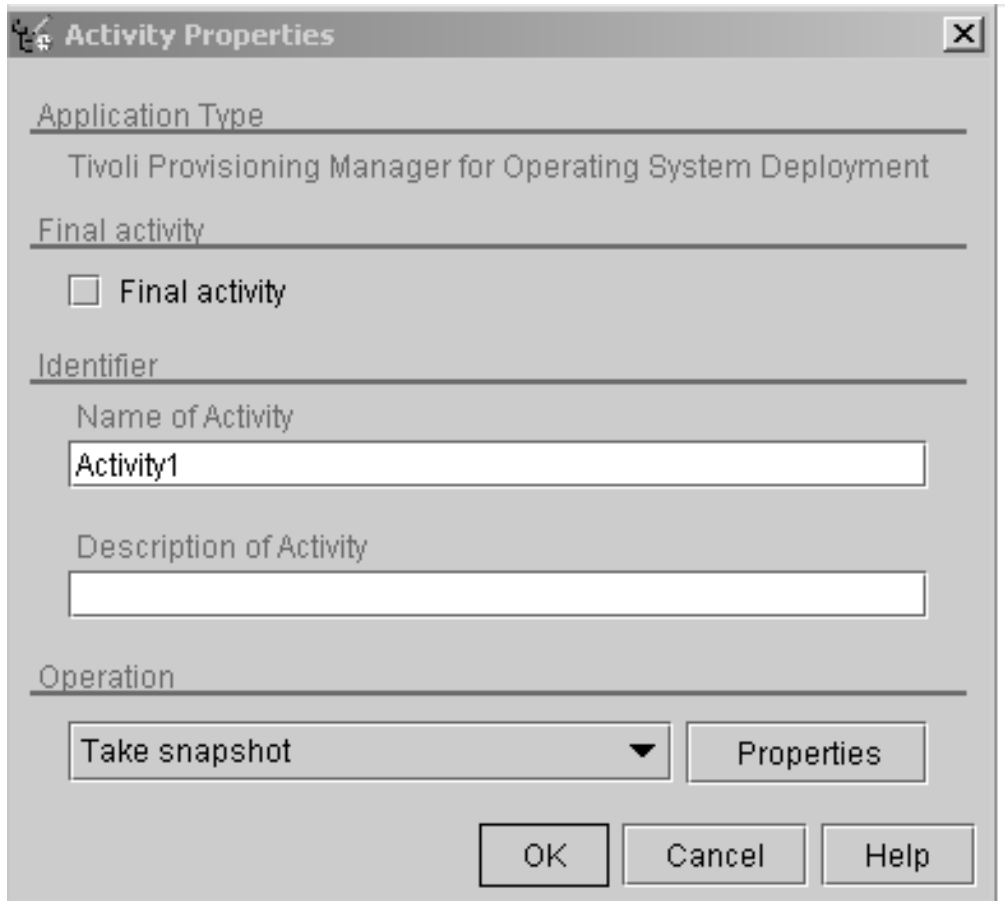
Taking snapshots

When one or more images have been imported on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level, you can decide to generate a differential image to update the servers in the whole enterprise. This step requires that the status on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level is consistent. For this reason, when you decide that the images that have been imported on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level are stable and can be used, you can generate a new snapshot, which will become the new reference level on the server. The initial snapshot is created at installation time and can be the starting point of the differential image.

Step 1: Create the snapshot activity plan

As an administrator, use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Using the Activity Plan Editor, create an activity using the operation, **Take snapshot**.

Figure 7. Taking a snapshot operation

2. Click on the **Properties** button to create the snapshot of the image. The properties dialog is displayed. Enter the name of the new snapshot of the image in the **New snapshot** field and click **OK**. If you select **Auto** a snapshot name is generated automatically. If you select **Force** an existing snapshot is recreated.
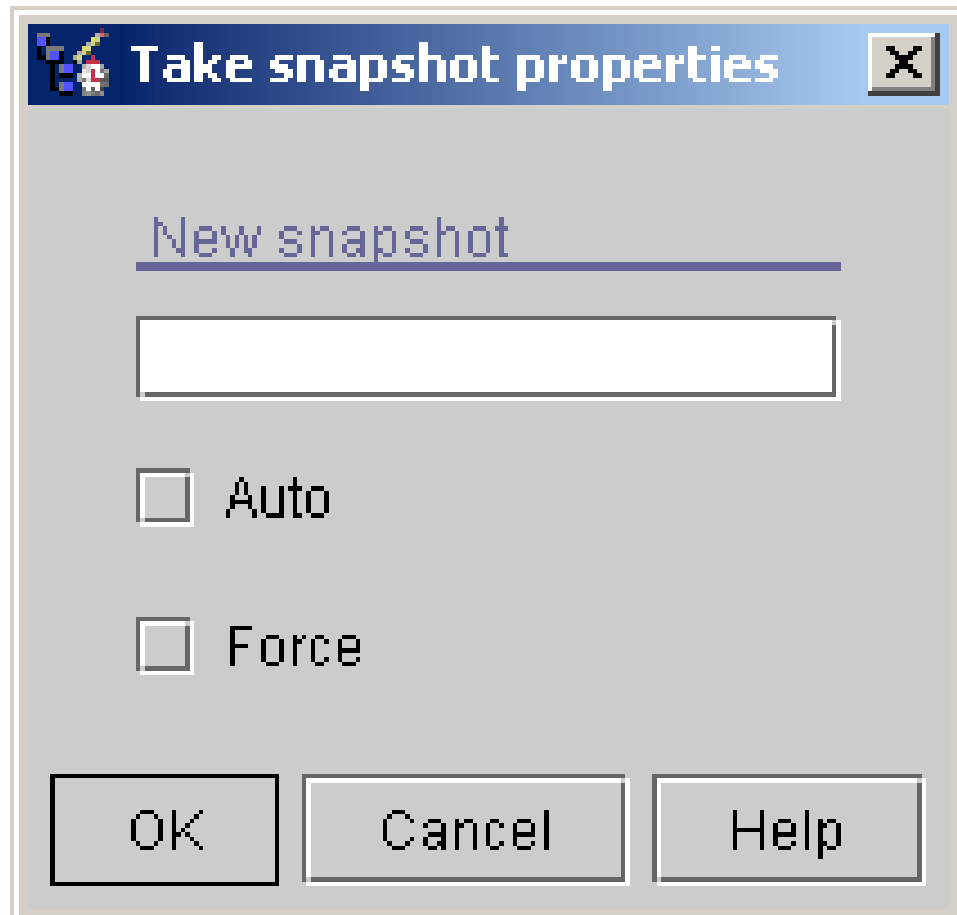
Figure 8. Editing the properties for the Take snapshot operation

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the targets. Specify the IBM Tivoli Provisioning Manager for Operating System Deployment server at Hub level as a target for this activity.

Generating differential Tivoli Provisioning Manager for Operating System Deployment files

To be able to generate the proper differential Tivoli Provisioning Manager for Operating System Deployment files (.rad), you must first provide the starting snapshot that was created through the previous activity and select it as the starting point for the differential process.

This activity generates a *filename*-rad.dsc file. Depending on the *Split* value provided in the `rembo.ini` file, the associated `.rad` file is split up. For example, if the size of the `.rad` file is 512 MB and you had provided a split value of 256, two `.rad` files of size 256 MB are created.

As an example, assuming the name of the file is `genrad`, the following two `genrad` files are created as fragments of the original `.rad` file:

```
genrad-rad-1-of-2.dat
genrad-rad-2-of-2.dat
```

All the files related to the same differential image will be stored in the same folder. A file with an extension, `.dsc` is created. This provides the description of the contents of the folder such as:

- The starting snapshot
- The final snapshot
- The number of fragments
- The names of the fragments

The information in the `.dsc` file will be used in the deployment phase.

Step 1: Generating the Differential RAD activity plan:

As an administrator, use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

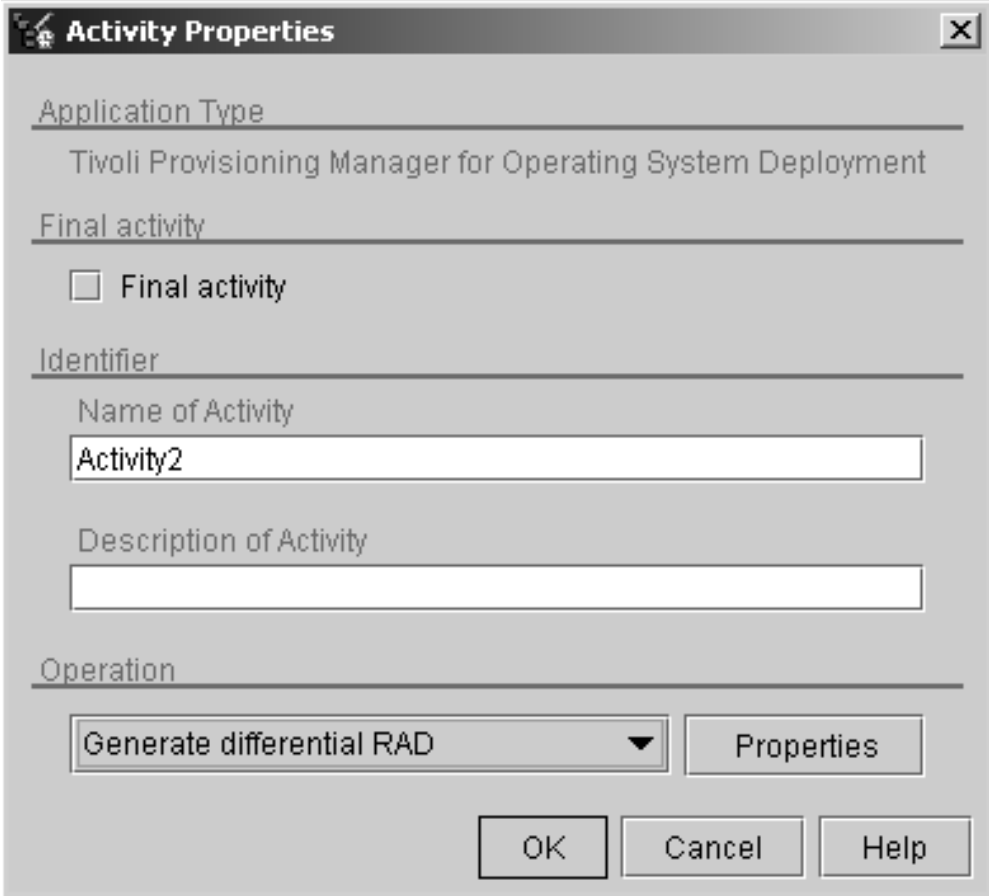1. Create an activity using the operation, **Generate Differential RAD**.

Figure 9. Generating differential Tivoli Provisioning Manager for Operating System Deployment files

2. Click on the **Properties** button to generate a differential RAD file. The properties dialog is displayed.
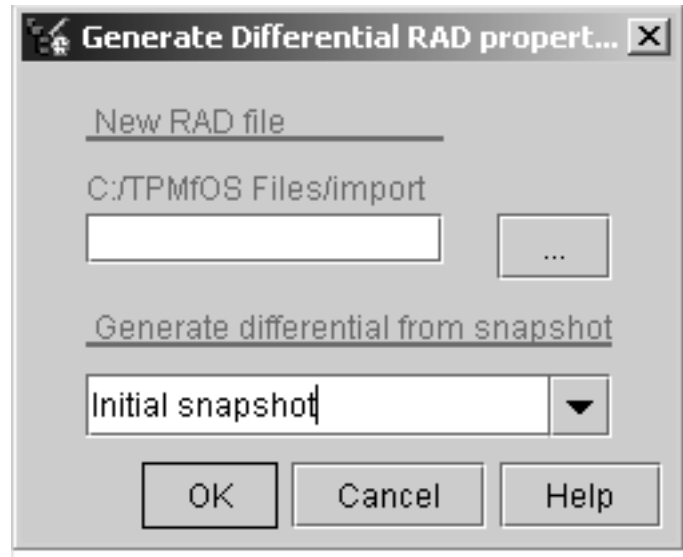
Figure 10. Editing the properties of the gen_diff activity plan

3. Enter a RAD file name that does not include special characters. This is because the **Update Slaves** activity passes the file name to a Tivoli bash script and the Tivoli bash does not support special characters.
4. From the drop-down list, select a starting snapshot.
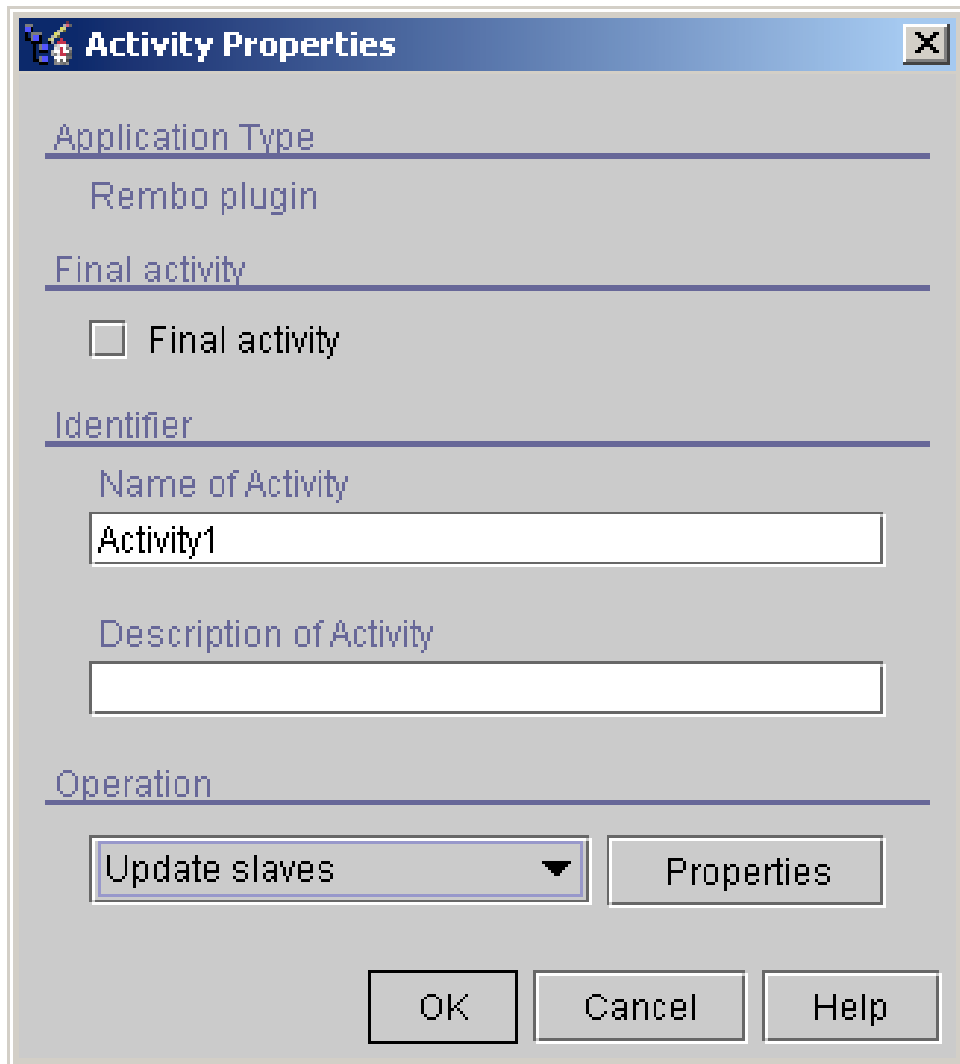5. Click **OK**.

Updating slaves

You must create an activity called **Update slaves** on the hub Tivoli server, to update the Tivoli Provisioning Manager for Operating System Deployment servers in the enterprise. These workstations can be at spoke level and at branch level. Each Tivoli Provisioning Manager for Operating System Deployment server stores configuration images at a specific snapshot level. You can update all of them to be at the latest available level, or at a different intermediate level if needed. You do this by downloading the new differential image to the Tivoli Provisioning Manager for Operating System Deployment server endpoints. Before you run an update of the slaves, ensure the following:

- Target disk space availability.
- An inventory scan must be performed on the targets.

Step 1: Updating the slave activity plan:

As an administrator, use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Update slaves**.

Figure 11. Updating the slave

2. Click on the **Properties** button to update the slaves. The properties dialog is displayed. In the properties window, enter the following information:

RAD file descriptor to distribute
> Browse to select the .dsc file that was created when you generated the differential RAD. This automatically updates the **Update from snapshot** and **To snapshot** fields.
>
> **Note:** The browsing will not work if the .dsc file is on a remote machine. Manually enter the name of the .dsc file and click the **Refresh** button. This automatically updates the **Update from snapshot** and **To snapshot** fields.

Update from snapshot
> Identifies the snapshot that defines the lower level used to generate the differential RAD. This value is taken from the differential descriptor that you specify in the **RAD file descriptor to distribute** field. Selecting the .dsc file automatically updates the information in this field.

To snapshot
> Identifies the snapshot that defines the upper level used to generate the

differential RAD. This value is taken from the differential descriptor that you specify in the **RAD file descriptor to distribute** field. Selecting the .dsc file automatically updates the information in this field. This field represents the last defined snapshot.

Force When the slaves already have the required level, the update activity submission fails. If you want to force the submission of this activity, select **Force**.
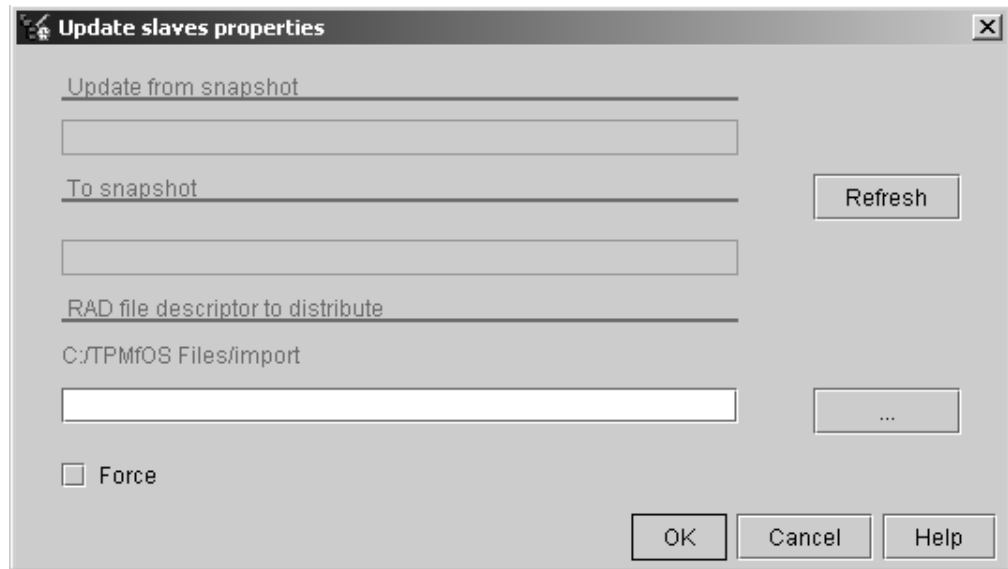

Figure 12. Updating the Tivoli Provisioning Manager for Operating System Deployment servers at Spoke level

3. Click **OK** to create the update slaves activity and close the dialog.

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the Tivoli Provisioning Manager for Operating System Deployment slaves and the Branch Tivoli Provisioning Manager for Operating System Deployment server endpoints as targets.

Note: If an **Update Slaves** operation fails during the phase when packages for distribution are being created on the Hub server, the incomplete set of software packages must be deleted before trying the operation again.

These packages are created under the profile manager specified in the `profile_manager` parameter of the configuration file rembo.ini. The package names have the following format: *timestamp-number*.1 or *timestamp-parent*.1. Locate the packages and delete them before retrying the operation.

Creating activity plans on the IBM Tivoli Provisioning Manager for Operating System Deployment server at Spoke level

The operations you can perform on the Tivoli Provisioning Manager for Operating System Deployment servers at Spoke level, using the Tivoli Provisioning Manager for Operating System Deployment integration, are the following:

- "Backing up user settings"
- "Registering workstations" on page 33
- "Refreshing a workstation" on page 35
- "Restoring user settings" on page 38
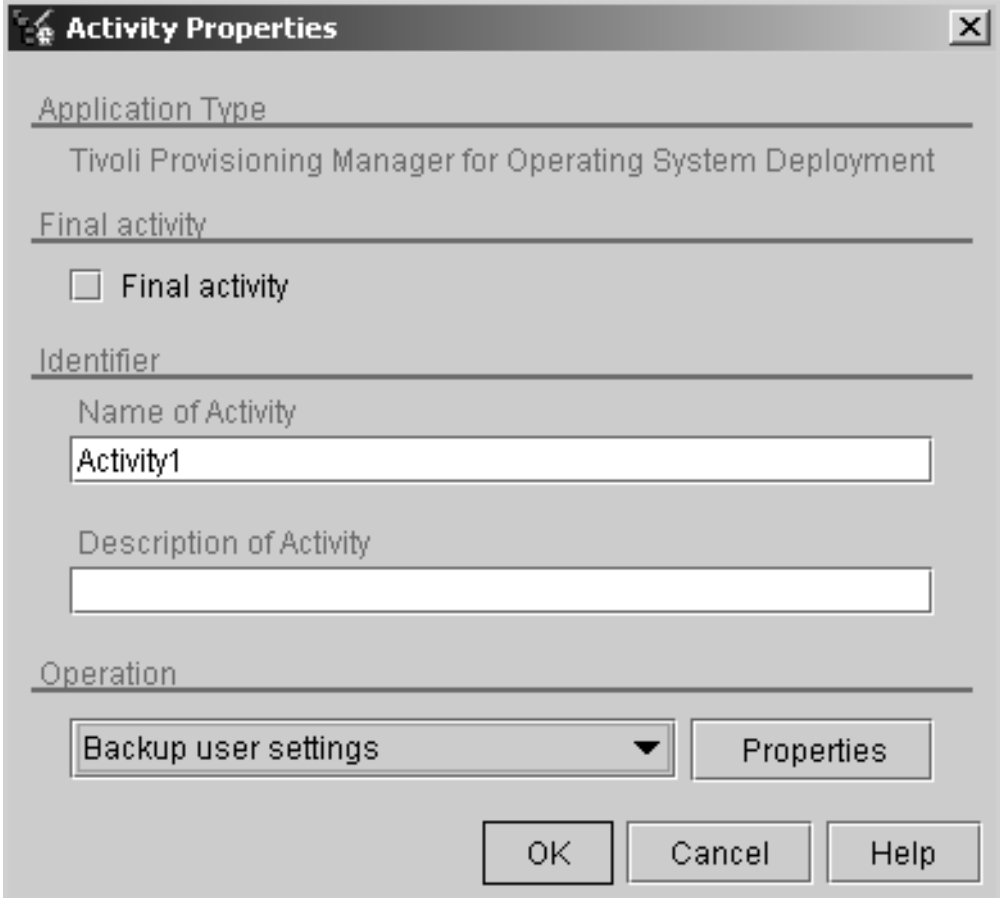- "Installing a new workstation" on page 41

Backing up user settings

You can create copies of the user settings for the workstations that are selected as targets for this operation and store them in a repository. You can later restore the settings using the Restore user settings operation.

Step 1: Backing up user settings activity plan:

As an administrator use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Backup user settings**.

Figure 13. Backup user settings

2. Click on the **Properties** button. The Backup user settings dialog is displayed.

Figure 14. Backup user settings

3. Type the following information:
   - In the **Repository information** fields, define the location and access credentials for the repository where the user settings are to be backed up. It is recommended that you define a network drive as repository location. An example of repository location is the following: \\128.143.71.21\ *shared_directory_name**repository_directory*.

     Note: If a plan that includes the backup activity is defined and imported using an XML file, the password must be specified using the XML tags:
     – RepClearPassword
     – LocClearPassword

     When these tags are used, the specified passwords are recognized as unencrypted values and are encrypted during the import process.

- In the **Local user information** fields, define the target workstation user credentials for accessing the network.
- In the **Backup type** list select the type of backup. This determines how the name of the repository subdirectory for each target workstation is generated. The subdirectory name can also be formed using a custom program. If you select this option, you are prompted to provide the custom program file name and its arguments. Ensure that the specified custom program resides on the target workstation when you submit the backup user settings activity plan.

  If you select **Add environment variables to custom program**, credentials are set as environment variables for the custom program. Table 8 describes the association between the field names of the Backup user settings dialog and the variable names.

Table 8. Custom program environment variables

Field name	Variable name
Repository information **Username**	_TIV_CUSTOM_REMOTE_SHARE_USER_
Repository information **Password**	_TIV_CUSTOM_REMOTE_SHARE_PASSWORD_
Repository information **Repository path**	_TIV_CUSTOM_REMOTE_SHARE_
Local user information **Username**	_TIV_CUSTOM_NETWORK_USER_
Local user information **Password**	_TIV_CUSTOM_NETWORK_PASSWORD_

You can later restore the settings by using the **Restore user settings** action.

4. Click **OK** to create the backup user settings activity.

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the endpoints for which the user settings will be backed up.
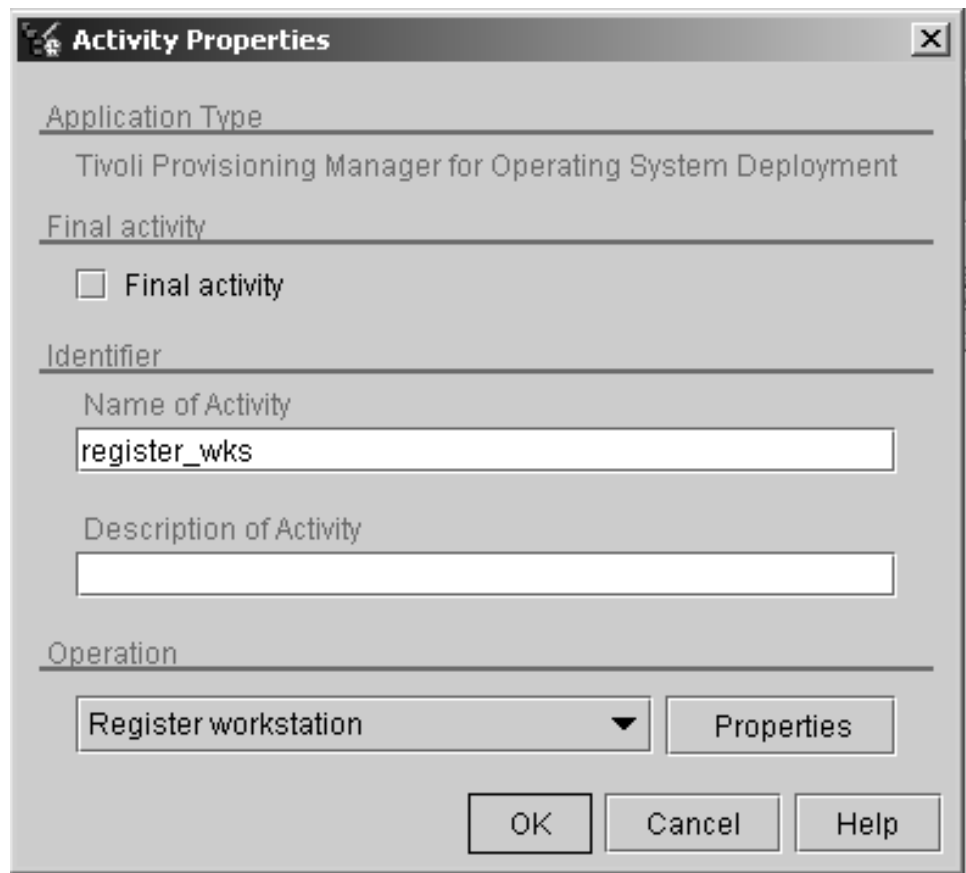
Registering workstations

You can define planned deployments of system profiles on target workstations. You select a system profile that you are planning to deploy to a set of workstations and define a set of actions that are to be performed during the deployment. The deployments can then be performed using the Refresh workstation operation.

Step 1: Registering the workstation activity plan:

As an administrator, use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Registering workstations**.

2. Click on the **Properties** button. The properties dialog is displayed.

Figure 15. Registering the workstations properties

3. Enter the following information to define planned deployments of system profiles:

Available system profiles
    Select a system profile that you are planning to deploy to a set of workstations and define a set of actions that are to be performed during the deployment.

Bind   Select the check box to bind the available system profiles to targets.

Wake up
    Select the check box to use wake-on-lan to remotely power up workstations that are not active when the deployment starts.

Reboot
    Select the radio button to reboot workstations.

Pxeboot
    Select the radio button to use Pxeboot restart workstations.

4. Click **OK** to create the register workstation activity.

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the endpoints to be registered as targets.

Refreshing a workstation

You can create an activity for the installation of a registered system profile on a target workstation. Before installation of the new system profile, the Tivoli endpoint that is installed on the workstation is backed up. It is reinstalled

following the installation of the profile. Before performing this task, you must have registered the planned deployment of the system profile using the Register workstations operation.

Step 1: Refreshing a workstation:

As an administrator use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Refresh workstation**.

Figure 16. Refreshing a workstation

2. Click on the **Properties** button. The properties dialog is displayed.

Figure 17. Refreshing workstation properties

3. Type the following information:

   - In the **Repository information** fields, define the location and access credentials for the repository where the user settings are backed up. It is recommended that you define a network drive as repository location. An example of repository location is the following: \\128.143.71.21\ *shared_directory_name\repository_directory*.

> **Note:** If a plan that includes the restore activity is defined and imported using an XML file, the password must be specified using the XML tags:
> – RepClearPassword
> – LocClearPassword
>
> When these tags are used, the specified passwords are recognized as unencrypted values and are encrypted during the import process.

- In the **Local user information** fields, define the target workstation user credentials for accessing the network.
- In the **Backup type** list select the type of backup. This determines how the name of the repository subdirectory is to be generated.
- Select **Force** if the workstation is to be forced to reboot.

4. Click **OK** to create the refresh workstations activity.

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the endpoints to be refreshed as targets.

Restoring user settings

You can use this activity on endpoints to perform the following tasks:
- Restore user settings on a refreshed workstation
- Restore user settings on a new workstation

Step 1: Restoring user settings activity plan:

As an administrator use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Restore user settings**.

Figure 18. Restore user settings

2. Click on the **Properties** button. The properties dialog is displayed.

Figure 19. Restore user settings properties

3. Type the following information:

- In the **Repository information** fields, define the location and access credentials for the repository where the user settings are backed up.

  Note: If a plan that includes the restore activity is defined and imported using an XML file, the password must be specified using the XML tags:
  - RepClearPassword
  - LocClearPassword

  When these tags are used, the specified passwords are recognized as unencrypted values and are encrypted during the import process.

- In the **Local user information** fields, define local user credentials for accessing the network.
- In the **Backup type** list select the type of backup you want to restore. This is used to identify the repository subdirectory on which the user settings have been previously backed up. The subdirectory name can be also formed using a custom program. If you select this option, you are prompted to provide the

custom program file name and its arguments. Ensure that the specified custom program resides on the target workstation when you submit the restore user settings activity plan.

If you select **Add environment variables to custom program**, credentials are set as environment variables for the custom program. The following table describes the association between the field names of the Restore user settings dialog and the variable names.

Table 9. Custom program environment variables

Field name	Variable name
Repository information **Username**	_TIV_CUSTOM_REMOTE_SHARE_USER_
Repository information **Password**	_TIV_CUSTOM_REMOTE_SHARE_PASSWORD_
Repository information **Repository path**	_TIV_CUSTOM_REMOTE_SHARE_
Local user information **Username**	_TIV_CUSTOM_NETWORK_USER_
Local user information **Password**	_TIV_CUSTOM_NETWORK_PASSWORD_

4. Click **OK** to create the restore user settings activity.

Step 2: Selecting the targets:

Use the Activity Plan Editor to select the endpoints on which the user settings will be restored.

Installing a new workstation

You can create an activity to install system images on workstations that do not yet have any operating system installed. The workstations that can be selected as targets for this activity have previously been configured using the new workstation management tool.

Step 1: Defining the configuration of the workstations to be installed:

Use the Activity Plan Editor to define the configuration of the workstations to be installed. From the **Tools** menu select **New workstation manager**.
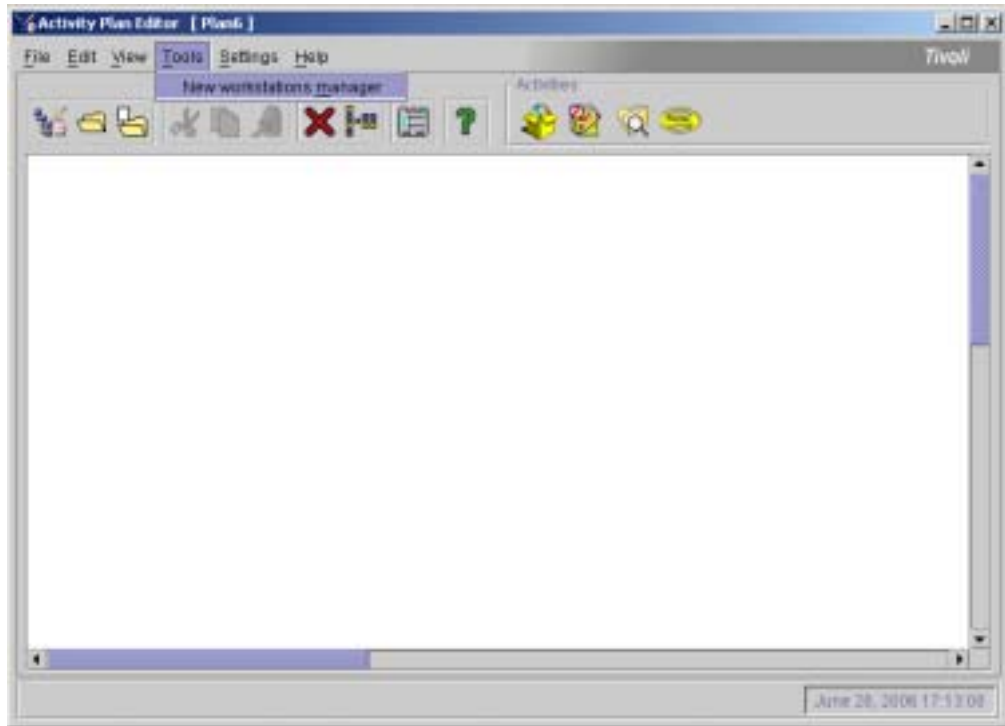
Figure 20. New workstation manager tool

The window shown in Figure 21 on page 43 opens:
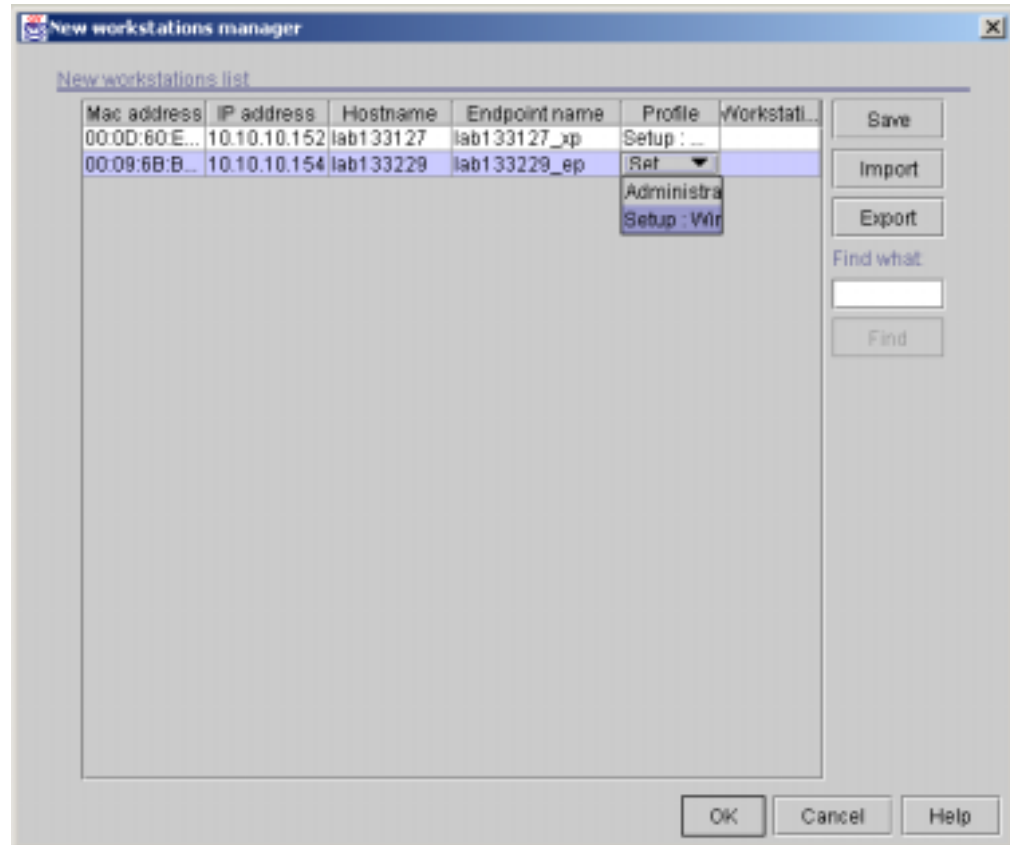
Figure 21. Information for the activity plan

Installation of the Tivoli endpoint is included in this activity, therefore you must provide the following information:
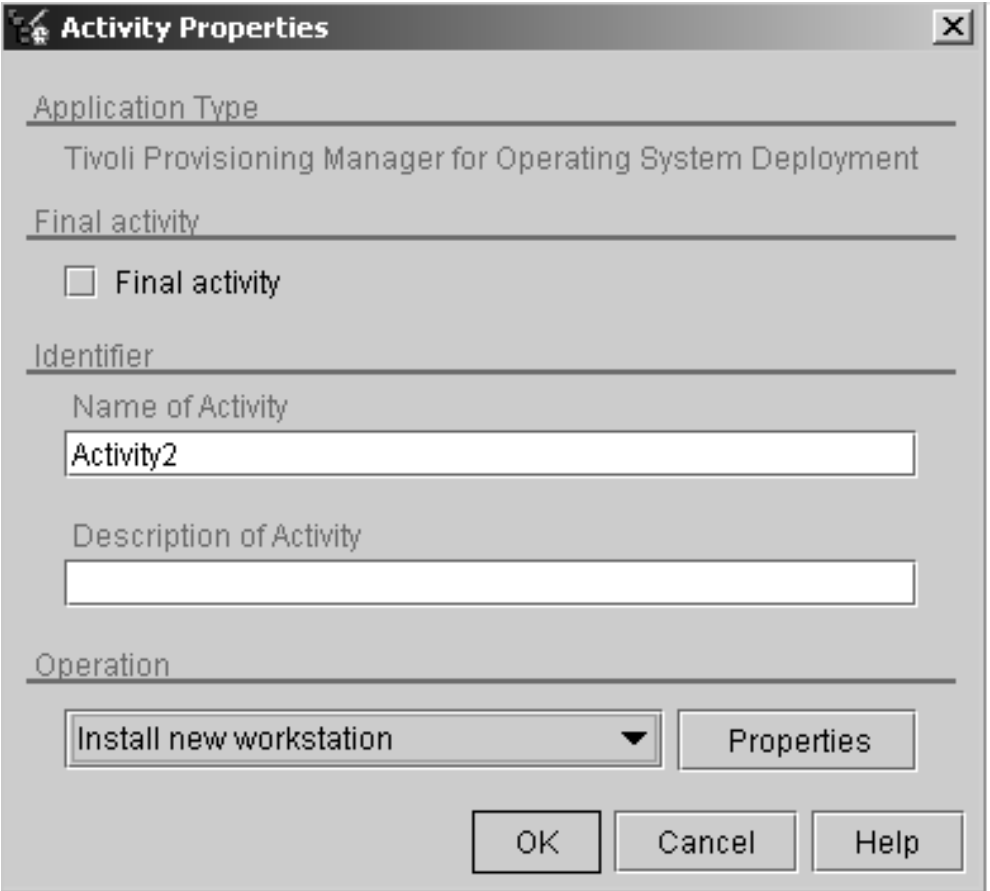
- Endpoint name
- Hostname of the workstation to be installed
- Profile to be deployed for each endpoint

The endpoint installed is at version 4.1.1. After completing the procedure listed in this section, upgrade the endpoint to version 4.3.1.

Step 2: Installing a new workstation:

As an administrator, use the Activity Plan Editor to define the activity. Follow the steps below to define the activity:

1. Create an activity using the operation, **Install new workstation**.

Figure 22. Installing new workstation

2. Click on the **Properties** button. The Install new workstation window is displayed.
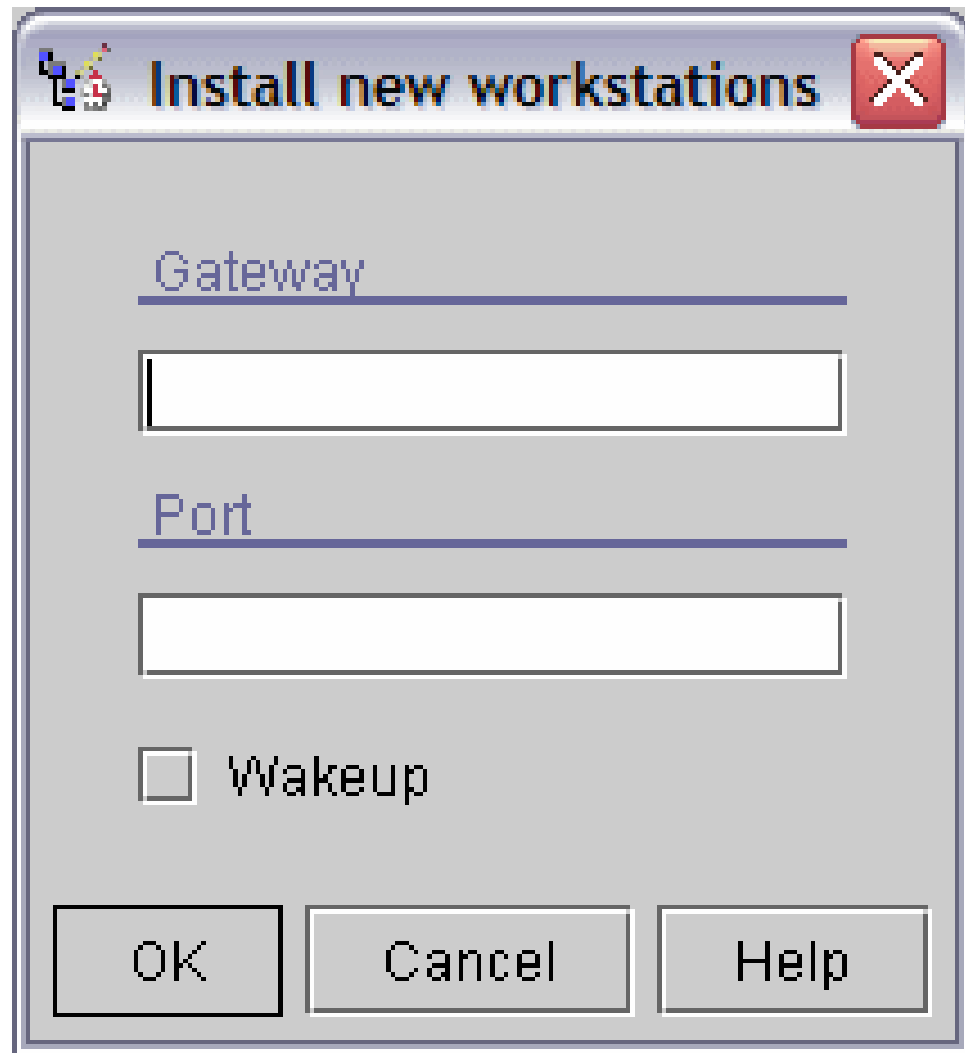
Figure 23. Installing new workstation properties

3. Enter the name and the port of the gateway to be used by the endpoints.
4. Click **OK** to create the activity.

Step 3: Selecting the targets:

Use the Activity Plan Editor to select the endpoints as targets. The workstations that can be selected as targets for this activity have previously been configured using the workstation management tool.

Step 4: Upgrading the endpoint to version 4.3.1:

Use the **wepupgd** *endpoint_name* command to upgrade the endpoint to version 4.3.1, where

endpoint_name
　　　　Specifies the name of the endpoint on which the command runs.

Chapter 5. Scenarios

This chapter contains a series of scenarios that illustrate the main functions of the operating system imaging solution. Using a fictitious company, the XYZ Instruments Corporation, the scenarios describe the different ways in which you can perform Tivoli Configuration Manager operations.

XYZ Financial Corporation is a fictitious financial institution with offices on three continents in six different countries. This financial institution has over 6000 retail images, and 7000 Automatic Teller Machines (ATM). The images range from a single ATM to several ATM machines, not including complete office staff of more than a hundred brokers. It also has over 170,000 machines managed by 370 gateways, which means an average of 450 endpoints per gateway. In a highly-competitive industry, XYZ relies heavily on its network environment to provide and maintain the services required by its staff to produce and sell its products. To this end, XYZ installed Tivoli Configuration Manager.

Given below are some of the scenarios faced by large organizations, using XYZ as an example.

Scenario 1: Building a new computer or refreshing a damaged computer

XYZ, the financial giant, is constantly expanding to new markets further away from the head office, by establishing new images. These major programs and initiatives require deployments of either large groups of desktops or new components deployed to many devices. This means that new workstations need to be built every time a new image is established.

Building a new computer using the operating system imaging solution, provided by Tivoli Configuration Manager involves the following overall process:

Step 1: Transferring the image file from the development environment
Ensure that the image, such as Windows XP is available, as a RAD file. This file should be created and tested in a development environment. Transfer this image file onto the Tivoli Provisioning Manager for Operating System Deployment Master server to the Tivoli Provisioning Manager for Operating System Deployment directory or sub directories such as : `C:\TPMfOS files\import`

Step 2: Creating and submitting the activity plans on the Hub Tivoli server with the following activities:
1. "Importing operating system images" on page 21
2. "Taking snapshots" on page 23
3. "Generating differential Tivoli Provisioning Manager for Operating System Deployment files" on page 25
4. "Updating slaves" on page 27

Step 3: Creating and submitting the activity plans on the Spoke Tivoli server with the following activities:
"Installing a new workstation" on page 41

You can perform the same steps to refresh a damaged computer.

Scenario 2: Refreshing a workstation

In XYZ, the desktop hardware is renewed on a three-year refresh cycle to upgrade both hardware and software on the workstations. Approximately 5000 computers must be refreshed per month, which is approximately sixty thousand computers ever year. Currently, refreshing all these workstations is very time-consuming and very expensive.

Refreshing a workstation involves the following process:

Step 1: Transferring the image file from the development environment
> Ensure that the image, such as Windows XP is available, as a RAD file. This file should be created and tested in a development environment. Transfer this image file onto the Tivoli Provisioning Manager for Operating System Deployment Master server to the Tivoli Provisioning Manager for Operating System Deployment directory or sub directories such as :
> `C:\TPMfOS files\import`

Step 2: Creating and submitting the activity plans on the Hub server with the following activities:
> 1. "Importing operating system images" on page 21
> 2. "Taking snapshots" on page 23
> 3. "Generating differential Tivoli Provisioning Manager for Operating System Deployment files" on page 25
> 4. "Updating slaves" on page 27

Step 3: Creating and submitting the activity plans on the Spoke server with the following activities:
> 1. "Backing up user settings" on page 30
> 2. "Registering workstations" on page 33
> 3. "Refreshing a workstation" on page 35
> 4. "Restoring user settings" on page 38

Scenario 3: Reallocate a workstation

With the ever-changing business needs, XYZ is often faced with a situation of having to reallocate a workstation to a different location. The challenge that this issue brings to the operating system imaging solution is to provide a cost-effective and less time-consuming solution. The solution needs to migrate user settings and re-install the applications necessary for the XYZ employee to do his job. This also requires managing the installation of the operating system and the applications on a bare-metal machine.

Reallocating a workstation using the operating system imaging solution, provided by Tivoli Configuration Manager involves the following overall process:

Step 1: Transferring the image file from the development environment
> Ensure that the image, such as Windows XP is available, as a RAD file. This file should be created and tested in a development environment. Transfer this image file onto the Tivoli Provisioning Manager for Operating System Deployment Master server to the Tivoli Provisioning Manager for Operating System Deployment directory or sub directories such as :
> `C:\TPMfOS files\import`

Step 2: Creating and submitting the activity plans on the Hub server with the following activities:

1. "Importing operating system images" on page 21
2. "Taking snapshots" on page 23
3. "Generating differential Tivoli Provisioning Manager for Operating System Deployment files" on page 25
4. "Updating slaves" on page 27

Step 3: Creating and submitting the activity plans on the Spoke server with the following activities:
1. "Backing up user settings" on page 30
2. "Installing a new workstation" on page 41
3. "Restoring user settings" on page 38

Appendix A. Tivoli Provisioning Manager for Operating System Deployment

Tivoli Provisioning Manager for Operating System Deployment is a database-driven PXE-based deployment solution for Windows, Linux, and Solaris. Tivoli Provisioning Manager for Operating System Deployment is a comprehensive management solution that significantly increases an IT manager's ability to remotely manage desktop and notebook computers. Using ″industry standards″ such as Wake-On-Lan, PXE, ODBC/JDBC, DMI and PCI detection, Microsoft system preparation tool, kickstart, and autoyast, Tivoli Provisioning Manager for Operating System Deployment provides out-of-the-box installation of operating systems and selected software on tens, or even hundreds, of computers simultaneously.

Components

With the Tivoli Provisioning Manager for Operating System Deployment application you can manage operating system images using a three-tier architecture. Tivoli Provisioning Manager for Operating System Deployment is made of server-side components, installed using the usual setup program, of console components, and of client-side applications, automatically installed by the client through the network.

The server-side components include:

Tivoli Provisioning Manager for Operating System Deployment server
> The Tivoli Provisioning Manager for Operating System Deployment server, running in background as a service. This component provides the PXE remote-boot capability and multicast file access to the remote-boot clients.

Deployment database
> A deployment database, accessed using the standard ODBC/JDBC interface, and in some cases using the Tivoli Provisioning Manager for Operating System Deployment TCP-to-ODBC/JDBC Gateway service. This database stores the Bill of Material for every host, including information on what software package should be installed. In this case IBM DB2 Universal Database Enterprise Edition 8.2 was used as the deployment database.

Tivoli Provisioning Manager for Operating System Deployment server console
> The Tivoli Provisioning Manager for Operating System Deployment server console a web-based application used to prepare and supervise. Using the Tivoli Provisioning Manager for Operating System Deployment server console, you can configure the Tivoli Provisioning Manager for Operating System Deployment server, manage objects used during a deployment, create recovery CD-ROMs and DVD-ROMs. Tivoli Provisioning Manager for Operating System Deployment server console is also used to designate clients receiving the ″administrator toolkit″ to create system profiles (OS images).

The console-side application, usually installed on the server, is the Tivoli Provisioning Manager for Operating System Deployment agent, running in background as a service. Optionally, a Tivoli Provisioning Manager for Operating System Deployment agent can be installed on clients, to allow the administrator to take control of them remotely. The Tivoli Provisioning Manager for Operating

System Deployment agent is useful, for example, to restart the computer when a deployment starts, or to perform an operating system inventory. There are two PXE-level client-side applications which are:

- The automated deployment engine, used in production mode, with a graphical user interface.
- The administrator toolkit, used to create images and for other miscellaneous tasks, also with a graphical user interface.

Appendix B. Uninstalling

Before uninstalling the Tivoli Provisioning Manager for Operating System Deployment integration, ensure you delete the plan Tivoli Provisioning Manager for Operating System Deployment containing activities or you might receive an error message. To uninstall the Tivoli Provisioning Manager for Operating System Deployment plug-in perform the following steps:

Step 1 - **Deregister the APM Tivoli Provisioning Manager for Operating System Deployment integration:**

Use the **wapmplugin** command to remove the specified plug-in within Activity Planner. To deregister the APMTivoli Provisioning Manager for Operating System Deployment integration, run the following command:

```
wapmplugin -r plug-in_name
```

Step 2 - **Uninstall the plug-in:**

You can uninstall the plug-in by performing the following steps:
1. From a Tivoli environment run the following command:
   ```
   wuninst rembo server_name -rmfiles
   ```
2. Run the following command to verify uninstallation:
   ```
   wuninst -list
   ```

Appendix C. Troubleshooting

To know what information to gather for analysis or to perform problem determination refer to the following manuals:

- *Tivoli Configuration Manager User's Guide for Deployment Services*
- Tivoli Provisioning Manager for Operating System Deployment Guide, version 5.1.1 which is available at the following Web site:

  http://publib.boulder.ibm.com/tividd/td/ IBMTivoliProvisioningManagerforOSDeployment5.1.html

Appendix D. Support information

If you have a problem with your IBM software, you want to resolve it quickly. This section describes the following options for obtaining support for IBM software products:

- "Searching knowledge bases"
- "Obtaining fixes"
- "Receiving weekly support updates" on page 58
- "Contacting IBM Software Support" on page 58

Searching knowledge bases

You can search the available knowledge bases to determine whether your problem was already encountered and is already documented.

Searching the information center

IBM provides extensive documentation that can be installed on your local computer or on an intranet server. You can use the search function of this information center to query conceptual information, instructions for completing tasks, and reference information.

Searching the Internet

If you cannot find an answer to your question in the information center, search the Internet for the latest, most complete information that might help you resolve your problem.

To search multiple Internet resources for your product, use the **Web search** topic in your information center. In the navigation frame, click **Troubleshooting and support ▶ Searching knowledge bases** and select **Web search**. From this topic, you can search a variety of resources, including the following:

- IBM technotes
- IBM downloads
- IBM Redbooks
- IBM developerWorks
- Forums and newsgroups
- Google

Obtaining fixes

A product fix might be available to resolve your problem. To determine what fixes are available for your IBM software product, follow these steps:

1. Go to the IBM Software Support Web site at http://www.ibm.com/software/support.
2. Click **Downloads and drivers** in the **Support topics** section.
3. Select the **Software** category.
4. Select a product in the **Sub-category** list.
5. In the **Find downloads and drivers by product** section, select one software category from the **Category** list.

6. Select one product from the **Sub-category** list.

7. Type more search terms in the **Search within results** if you want to refine your search.

8. Click **Search**.

9. From the list of downloads returned by your search, click the name of a fix to read the description of the fix and to optionally download the fix.

For more information about the types of fixes that are available, see the *IBM Software Support Handbook* at http://techsupport.services.ibm.com/guides/handbook.html.

Receiving weekly support updates

To receive weekly e-mail notifications about fixes and other software support news, follow these steps:

1. Go to the IBM Software Support Web site at http://www.ibm.com/software/support.

2. Click **My support** in the upper right corner of the page.

3. If you have already registered for **My support**, sign in and skip to the next step. If you have not registered, click **register now**. Complete the registration form using your e-mail address as your IBM ID and click **Submit**.

4. Click **Edit profile**.

5. In the **Products** list, select **Software**. A second list is displayed.

6. In the second list, select a product segment, for example, **Application servers**. A third list is displayed.

7. In the third list, select a product sub-segment, for example, **Distributed Application & Web Servers**. A list of applicable products is displayed.

8. Select the products for which you want to receive updates, for example, **IBM HTTP Server** and **WebSphere Application Server**.

9. Click **Add products**.

10. After selecting all products that are of interest to you, click **Subscribe to email** on the **Edit profile** tab.

11. Select **Please send these documents by weekly email**.

12. Update your e-mail address as needed.

13. In the **Documents** list, select **Software**.

14. Select the types of documents that you want to receive information about.

15. Click **Update**.

If you experience problems with the **My support** feature, you can obtain help in one of the following ways:

Online
Send an e-mail message to erchelp@ca.ibm.com, describing your problem.

By phone
Call 1-800-IBM-4You (1-800-426-4968).

Contacting IBM Software Support

IBM Software Support provides assistance with product defects.

Before contacting IBM Software Support, your company must have an active IBM software maintenance contract, and you must be authorized to submit problems to IBM. The type of software maintenance contract that you need depends on the type of product you have:

- For IBM distributed software products (including, but not limited to, Tivoli, Lotus, and Rational products, as well as DB2 and WebSphere products that run on Windows, or UNIX operating systems), enroll in Passport Advantage in one of the following ways:

  Online
  Go to the Passport Advantage Web site at http://www.lotus.com/ services/passport.nsf/ WebDocs/Passport_Advantage_Home and click **How to Enroll**.

  By phone
  For the phone number to call in your country, go to the IBM Software Support Web site at http://techsupport.services.ibm.com/guides/ contacts.html and click the name of your geographic region.

- For customers with Subscription and Support (S & S) contracts, go to the Software Service Request Web site at https://techsupport.services.ibm.com/ssr/ login.

- For customers with IBMLink, CATIA, Linux, OS/390, iSeries, pSeries, zSeries, and other support agreements, go to the IBM Support Line Web site at http://www.ibm.com/services/us/index.wss/so/its/a1000030/dt006.

- For IBM eServer software products (including, but not limited to, DB2 and WebSphere products that run in zSeries, pSeries, and iSeries environments), you can purchase a software maintenance agreement by working directly with an IBM sales representative or an IBM Business Partner. For more information about support for eServer software products, go to the IBM Technical Support Advantage Web site at http://www.ibm.com/servers/eserver/techsupport.html.

If you are not sure what type of software maintenance contract you need, call 1-800-IBMSERV (1-800-426-7378) in the United States. From other countries, go to the contacts page of the *IBM Software Support Handbook* on the Web at http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region for phone numbers of people who provide support for your location.

To contact IBM Software support, follow these steps:

1. "Determining the business impact"
2. "Describing problems and gathering information" on page 60
3. "Submitting problems" on page 60

Determining the business impact

When you report a problem to IBM, you are asked to supply a severity level. Therefore, you need to understand and assess the business impact of the problem that you are reporting. Use the following criteria:

Severity 1
The problem has a *critical* business impact. You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.

Severity 2
The problem has a *significant* business impact. The program is usable, but it is severely limited.

Severity 3

The problem has *some* business impact. The program is usable, but less significant features (not critical to operations) are unavailable.

Severity 4

The problem has *minimal* business impact. The problem causes little impact on operations, or a reasonable circumvention to the problem was implemented.

Describing problems and gathering information

When describing a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently. To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can you re-create the problem? If so, what steps were performed to re-create the problem?
- Did you make any changes to the system? For example, did you make changes to the hardware, operating system, networking software, and so on.
- Are you currently using a workaround for the problem? If so, be prepared to explain the workaround when you report the problem.

Submitting problems

You can submit your problem to IBM Software Support in one of two ways:

Online

Click **Submit and track problems** on the IBM Software Support site athttp://www.ibm.com/software/support/probsub.html. Type your information into the appropriate problem submission form.

By phone

For the phone number to call in your country, go to the contacts page of the *IBM Software Support Handbook* at http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Software Support provides a workaround that you can implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the Software Support Web site daily, so that other users who experience the same problem can benefit from the same resolution.

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