HP Client Automation

OS Manager

for SUSE AutoYaST and Red Hat Kickstart

Software Version: 8.10

System Administrator Guide

Document Release Date: February 2012

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This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).

This product includes software written by Tim Hudson (tjh@cryptsoft.com).

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Contents

1 Introduction

The HP Client Automation (HP CA) OS Manager (OS Manager) allows you to use policy-driven, real-time, state-based management to configure and deploy operating systems (OSs). Use the OS Manager to install or replace operating systems on a device and maintain the device according to policy. The OS Manager ensures the installation of the appropriate operating system based upon the targeted device's capabilities.

Policy determines the appropriate operating system for a particular target device based upon:

- Grouping in the HPCA Enterprise console or in a directory
- An asset tag or other unique identifier imbedded in the device's BIOS
- The network segment the device is connected to
- The manufacturer of the device
- The model of the device
- The role of the device plays in your IT infrastructure

The OS Manager for HPCA version 8.10 supports Red Hat Linux Kickstart and SUSE AutoYaST, providing you with a simple, automated way to install operating systems on your Linux-related hardware. Using this product, you can build your operating system without having to script configuration files.

Benefits of the OS Manager

- Fully integrated component of HP Client Automation, which reduces the learning curve for your administrators.
- Improves the speed and reliability of OS deployment using policy-based management.
- Provides increased service levels by maintaining operating system configurations using desired-state management.
- Reduces IT costs by simplifying and streamlining the OS management process across multiple platforms.

- You can generate the configuration files for deployment in real-time, based on policy.

Supported Operating Systems

To know the supported operating systems requirements for this release, see the HPCA Support Matrix available at **http://h20230.www2.hp.com/sc/support_matrices.jsp**

Terminology

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

configuration file

A text file used to define the details of the installation and its configuration. Definitions in this file include the target machine's network settings (IP address, hostname, DNS settings), the disk layout and partitioning, and system software and drivers to be installed.

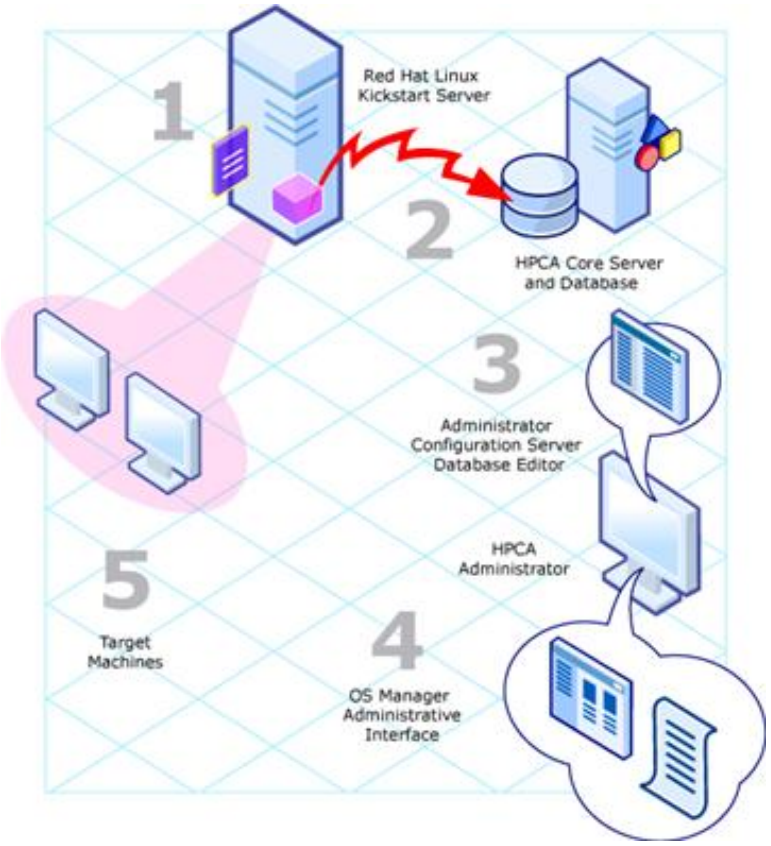
target machine

A machine on which you want to install a new operating system.

Using the OS Manager

Below is a simple, high-level description of how you will use the OS Manager to configure your Linux operating system deployment to your target machines.

Figure 1 OS Manager (Red Hat Linux example scenario)



1 Define the OS unattended installation files for Kickstart or AutoYaST.

2 Use the OS Manager Configuration File Publisher to generate OS services for these configuration files in the CSDB.

3 Use the OS Manager Administrative Interface (Enterprise console) to define policy in preparation for deployment to your target machines. If

needed, use the HPCA Administrator CSDB Editor (CSDB Editor) to view the newly created instances and/or to make configuration changes.

4 Follow the usual procedures for deployment to your target machines, and when finished, use the Enterprise console to review the results.

OS Manager Domains

When the HPCA Core server is installed with the OS Manager option selected, a single OS Manager-specific domain is made available. This OS domain is used to store configuration information populated by the OS Manager. Within this domain, there is a configuration class that contains the general parameters for each operating system image. This class is called UNIXCFG.

About the Product Architecture

As you can see in the topic above, several components are involved in preparing and then deploying operating systems to your target machines. This section describes these components as well as the servers necessary for deploying your operating systems to target machines. The architecture can be divided into two areas; preparation and deployment.

About the Preparation Architecture

The preparation architecture consists of several tools used to prepare your configuration files, publish them, prepare them for distribution, and define policy.

OS Manager Configuration File Publisher

Use the Configuration File Publisher to publish a service that contains a Kickstart or AutoYaST configuration file.

OS Manager Administrative Tasks

Use the HPCA Enterprise console and the CSDB Editor to provide a graphical user interface for performing OS Manager administrative tasks.

For general information about how to use the Enterprise console, see the *HP Client Automation Core and Satellite Enterprise Edition User Guide*.

For information about the OS Manager-specific tasks, see the *HP Client Automation OS Management Reference Guide*.

Information about using the CSDB Editor is contained within the *HP Client Automation Administrator Installation and User Guide.*

HPCA Administrator CSDB Editor

Use the CSDB Editor to perform administrative tasks to update and prepare a service for distribution.

About the Deployment Architecture

The OS Manager deployment architecture involves a set of servers designed to manage and deploy operating systems to a set of target machines based on pre-defined criteria. During deployment, the following server components are used:

- **Red Hat Linux Kickstart or SUSE AutoYaST server**

  This server handles network booting and file sharing duties for the target machines and operating system installations respectively.

- **OS Manager Server for Linux/SUSE**

  The OS Manager Server sends requests for desired state information on behalf of the target machines to the HPCA Core server. It is installed on the Kickstart or AutoYaST server.

- **HPCA Core server**

  The HPCA Core server does the following things to support OS management:

  — Manages the policy information and configuration files for the OS Manager.

— Provides a graphical user interface (the HPCA Enterprise console) for performing OS Manager administrator tasks.

— Stores the information about the devices in your environment in a single location that can be shared by all of HPCA.

Refer to the *HP Client Automation Core and Satellite Enterprise Edition User Guide* for more information about the HPCA Core server.

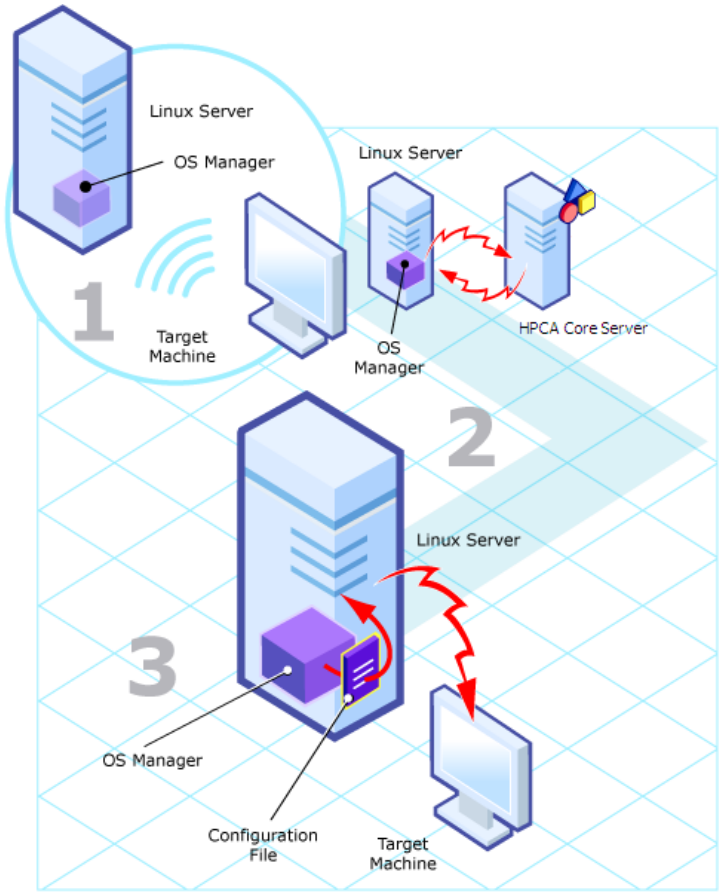
About the Target Machines

Target machines should meet the hardware requirements as required for Linux Kickstart or SUSE AutoYaST.

Flow of an Operating System Installation

An operating system installation consists of the three primary steps shown in Figure 2 below.

Figure 2 Operating system installation process flow



The following steps take place when deploying the operating system on a target machine or client.

1. A network boot is initiated on the target machine.

   The Linux server (Kickstart or AutoYaST) sends pre-installation scripts to the client. These scripts comprise standard functionality to collect basic system and hardware information, as well as a custom HPCA boot control script.

2. The HPCA boot control script initiates contact with the OS Manager Server via http and requests generation of the appropriate configuration file.

   - The OS Manager Server then connects to the HPCA Core server to resolve policy on behalf of the requesting target machine, also sending the system and hardware information collected from the target machine.
   - The Configuration Server resolves the policy for the target machine based on different parts of the target's system and hardware information (based on collected information from the HPCA Core) resulting in a set of persistent objects which, as a whole, define all information necessary to generate a (Kickstart or AutoYaST) configuration file.
   - Once the OS Manager server has generated the configuration file for the target machine, it updates the network boot information for the target machine to point to the newly generated configuration file. Control is handed back to the control script.
   - The control script reboots the device and a second network boot is initiated.

3. A second network boot is initiated on the target machine

   The Linux server (Kickstart or AutoYaST) sends pre-installation scripts to the client. It now uses the configuration information that has been generated specifically for the target machine. The generated configuration file contains information to install the operating system and to perform post-processing.

4. The operating system is installed using Kickstart or AutoYaST

5. The HPCA OS post-processing runs:

   - Copies and installs the HPCA Agent.

— Signals the end of the OS installation and the OS Manager server, as a result of this, updates the network boot information so any subsequent network boot for the target machine leads to a local boot.

6 The target machine is restarted and boots locally in the newly installed OS. Depending on the installation technology used (Kickstart/AutoYaST) there may be additional system boots before the OS is completely installed and configured.

7 The HPCA Agent Connect process runs as part of the first real OS boot for the newly installed machine and it signals the end of the OS installation cycle for this machine.

2 Configuring the OS Manager Environment

Prerequisites

The following sections describe prerequisite information for creating your OS Manager environment.

Before You Begin

OS management on Linux requires at least a minimal (but preferably a good) knowledge of:

- Red Hat Enterprise and SUSE Linux
- Kickstart and/or AutoYaST
- Basic overall Linux knowledge
- System setup, navigation, command prompt familiarity
- Knowledge of the TFTP (trivial), HTTP, FTP and NFS server is needed
- SElinux configuration may be required

Before Installing the OS Manager for Linux

Before incorporating OS Manager into your environment, be sure to test your specific native operating system installation configuration (Kickstart or SUSE) by creating a configuration file and deploying an operating system into your environment. This will allow you to ensure your configuration and procedures for operating system installation are working properly.

Both platforms keep a record of the options select during installation so it is possible to build a reference system and then simply collect the resulting configuration file from the system for use during the configuration file publishing phase.

Refer to the *HP Client Automation OS Manager System Administrator Guide* for more information about installing and configuring Kickstart or AutoYaST, respectively.

Platform Support

For detailed information about supported platforms, see the Platform Support document that accompanies this release.

Infrastructure Prerequisites

- A SUSE AutoYaST or Red Hat Linux Kickstart server configured for use with the OS Manager.
- **HP Client Automation Management OS Manager Server** is supported on Red Hat Linux and SUSE Linux operating systems. See the platform support document that accompanies this release for details.
- **HP Client Automation Core Server for Windows** (version 8.10)

The security for a Microsoft Internet Explorer browser used to access the HPCA Core server must be set no higher than medium.

You will need your HPCA installation media in order to get the OS Manager Server installation media (see Installing the OS Manager Server for Linux).

Target Machine Requirements

- Target machines must meet any hardware requirements as per Kickstart or AutoYaST.
- In order to reach DESIRED state, deployed Linux systems require libX11.so.6. Please refer to your distribution's log file containing the output from init(1) scripts for specific names and information.

Installation Checklist

HP recommends that you do the installation in the following order:

1 Set up a working AutoYaST or Kickstart server.

2 Install the OS Manager Server.

3 Configure the OS Manager server.

4 Install the OS Manager Configuration File Publisher.

This assumes you have already installed and configured a working HPCA Core environment.

Setup SUSE AutoYaST / Red Hat Kickstart

The OS installation environment that HPCA leverages is either AutoYaST or Kickstart. This means that a base working environment must be established. It is a good idea to have a working AutoYaST or Kickstart environment before starting with the installation of the HPCA components.

Install a Linux server running Red Hat Linux or SUSE Linux. Refer to the *Supported Operating Systems* section.

On top of the standard installation, the following packages should be installed, including their dependencies:

- tftp-server
- syslinux
- nfs-utils
- dhcp or the provided pxe
- optionally: httpd (preferred) or ftpd

A working AutoYaST or Kickstart server consists of the following components:

- A Linux server running either SUSE or Red Hat Linux.
- Network booting capabilities enabled and working. This means that when target devices network boot, they must be able to start a Linux OS from this Linux server.

  Network booting requires two services to be provided through you Linux server:

  - PXE: This can be handled by a DHCP server or through a separate PXE server.
  - TFTP: On Linux systems this is always handled through the TFTP service provided through xinetd.
- PXE/TFTP configuration to start either an AutoYaST or a Kickstart installation when a target machine performs a network boot.
- NFS file sharing enabled and 2 NFS shares: one for the client's area (containing target machine specific files) as well as the OS installation media.

Refer to the OS manufacturer's documentation on how to setup AutoYaST or Kickstart environments.

After you have a working AutoYaST or Kickstart OS installation environment, you can proceed with the installation of the OS Manager server. In preparation for that, collect the following data:

- IP address of the HPCA Core server.
- IP address of your AutoYast/Kickstart server
- Directory containing the OS installation media, generally in the form of: `/opt/<type>/<os>/<version>/<architecture>`

  Examples: `/opt/kickstart/rhes/54/32`

  `/opt/autoyast/sles/10/32`
- Directory containing the “default” file that drives the network boot for a device into either an AutoYaST or Kickstart install.

  The location depends on how you have setup network booting, generally it is a subdirectory below `/tftpboot`.

  Examples: `/tftpboot/X86PC/UNDI/pxelinux/pxelinux.cfg`

  `/tftpboot/pxelinux.cfg`

  Note that `pxelinux.cfg` is a directory, not a file.
- Directory containing the client's configuration data

  Examples: `/var/opt/autoyast/clients`

  `/var/opt/kickstart/clients`

Installing the OS Manager Server for Linux

The OS Manager Server for Linux must be installed as root.

To install the OS Manager Server

1. On the OS Manager media, go to the appropriate `os_manager_server` platform sub-directory, and run `./setup`.

   For example, to install to a Red Hat Linux device, go to `/os_manager_server/linux/redhat`

   The Welcome to OS Manager Server Setup window opens.

2. Click **Next**. The HP End-User License Agreement window opens.
3. Review the HP Software License Terms and click **Accept**.
4. Select the folder where you want to install the OS Manager Server.
5. Click **Next**. The UNIX Media Location and Client Configuration Location window opens.
6. Enter the location for the Client Configuration files and installation media.
   - Client configuration files location is the directory where OS Manager will create the individual target device configuration directories.

     The client configuration files location must be NFS shared before starting the OS Manager.

   - Linux installation media location is the directory where an ISO image of a release to be deployed is located.

     This location must be NFS shared before starting the OS Manager.

   - Pxelinux configuration files location is the directory where OS Manager will create individual network booting instruction configuration files.

     You will have created this location as part of the network booting setup when you set up the AutoYaST or Kickstart server.

7 Click **Next**. The License File window opens.

8 Enter the location of your license file (`license.nvd`) or click **Browse** to navigate to your license file.

9 Click **Next**. The Portal Credentials window opens.

10 Enter a valid user ID and password for the HPCA Core server (ROMADMIN/secret), and click **Next**. The Configuration Server location window opens.

11 Specify the address of the HPCA Core server and port 3464, and click **Next**. The Portal Location window opens.

12 Specify the address of the HPCA Core server and port 3466. You may include the company name and domain, but it is not required.

13 Click **Next**. The Zone Information window opens.

14 Type **hp** in the Zone Name box. Do not use any other value.

15 Click **Next**.

16 Enter the Linux distribution type (Red Hat or SUSE).

17 Click **Next**. The OS Manager Server IP address window opens.

18 Enter the IP address for the OS Manager server and click **Next**. The Machine Object Name attribute select window opens.

19 Select the Computer Name attribute from the list or make no selection to use COMPNAME.

20 Click **Next**. The Summary window opens.

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

22 A window opens asking to start the OS Manager Server. Select **No**.

(i) Some additional changes need to be made first, so click **No.** You will then need to start the server when you're finished making any changes. See Starting the OS Manager Server After Install on page 23 for detailed instructions.

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

Starting the OS Manager Server After Installing

If the OS Manager Server must be started manually, either after installation or if it was stopped for another reason (to install updated modules or if the

machine on which it is located is restarted, for instance) you can manually start it from the command line.

To start the OS Manager Server manually:

1. Go to the `/opt/HP/CM/OSManagerServer` directory.
2. Run the following command:

   `./nvdkit httpd.tkd -config httpd-osm.rc &`

Stopping the OS Manager Server

If you need to stop the OS Manager Server for any reason, follow this process.

To stop the OS Manager Server:

1. Find the process ID for the OS Manager Server by using the following command:

   `ps -ef | grep httpd.tkd`

2. Kill the process using the process ID.

Enabling Communication between the OS Manager and the HPCA Core Server

Access to the HPCA Core server requires passwords, so you must perform the following steps to enable communication between the OS Manager Server and the Core server.

To enable communication between the OS Manager and the HPCA Core server:

1. Stop the Linux OS Manager Server.
2. Change to the `/opt/HP/CM/OSManagerServer` directory.
3. Type **`nvdkit`**, and press **ENTER**.
4. Type the following command:

   `password encrypt` *`yourPassword AES`*

Here, *yourPassword* represents your existing password for your HPCA Core server. This is case sensitive.

Your password will be encrypted and will look something like this:

```
<AES256>kITMqDenvFUpdpBaYt8XBg==
```

5 Copy the encrypted password from the nvdkit command line.

6 Paste the encrypted password into the following file as the value for the ADMINPWD entry:

```
/opt/HP/CM/OSManagerServer/etc/roms.cfg
```

The equal signs (==) and the literal string <AES256> must be included.

7 Change the RAD_MAST value to ADMIN.

8 Start the Linux OS Manager Server.

Installing the OS Manager Configuration File Publisher

The Configuration File Publisher installation media is located in the /unix_configuration_file_publisher/ directory of the OS Manager media. Install the Publisher to your Linux Kickstart or SUSE AutoYaST server.

To install the Configuration File Publisher

1 From the OS Manager media, go to /unix_configuration_file_publisher/*platform*/

2 Type **./install**. The installation begins.

3 Click **Next**. The HP End User License Agreement Window opens.

4 Review the HP Software License Terms and click **Accept**. The Installation Directory Location Window opens.

5 Select the installation folder and click **Next**. The Summary window opens.

6 Click **Install** to begin the installation process.

7 When the installation is complete, click **Finish**.

The Configuration File Publisher is installed to the directory you specified.

To run the Publisher, change to the directory to where you installed the media and type the following command:

`./publisher`

Preparing Agent Installation Media

HPCA agent installation media must be prepared and placed on your server for distribution to your target machines.

HPCA agent installation media is not required if you are preparing Kickstart to deploy a VMware ESX Server only.

Use the HPCA Agent Remote Installation setup option to create the installation package, and then run `pkg_client.sh` (installed with your OS Manager) to complete the agent `tar` file.

The agent installation is available on the HP Client Automation media. For instructions, refer to the "Remote Installation Setup" section in the *HP Client Automation Application Manager and Application Self-service Manager Installation and Configuration Guide*.

You must specify **`remote.cfg`** as the Package Configuration Name.

Running the Remote Installation Setup

Run the HPCA agent installation and select a Remote Installation with the following parameters:

- At a minimum, select to install the Application Manager and OS Manager agents.
- The temporary package location can be any accessible directory, for example `/tmp/agent`.

Make sure the configuration package is named `remote.cfg`.

Running pkg_client.sh

When you have completed the agent installation remote setup, run `pkg_client.sh`, which is installed by default in the following directory:

`/opt/HP/CM/OSManagerServer/pkg`

When prompted, enter the following information:

- Directory location where your remote installation package is stored (the temporary package location specified during the remote installation setup as mentioned in Running the Remote Installation Setup on page 26).

  Example: `/tmp/agent`

- Directory location where you would like to create the agent tar file (`radia.tar`). Default value is CLIENTPATH from `roms.cfg`.

  The OS Manager requires the tar file be located in CLIENTPATH, but it can be created anywhere first, then moved to the CLIENTPATH location.

  After Agent installation, if the home directory of root is moved, the `/.ssh` folder containing the SSH configuration must be moved as well to ensure policy changes occur.

3 Configuring the Linux Server

After the OS Manager and the Configuration File Publisher are installed, some additional files must be manually created and copied onto your server. In addition, server-specific files must be configured to support the OS Manager.

The following sections include platform-specific instructions. Continue with the appropriate sections for modifying files on your server.

- For Kickstart, Configuring Red Hat Linux Kickstart on page 28.
- For AutoYaST, Configuring SUSE AutoYaST on page 33.

Configuring Red Hat Linux Kickstart

Use the following sections to configure Red Hat Linux Kickstart for use with OS Manager.

Modifying Kickstart Files

Modifying /etc/hosts

The `/etc/hosts` file on the Kickstart server must have an entry for itself with the full host name in the following syntax.

```
<host name>.<domain>.com
```

This is required for the OS Manager to self-configure the ROMS Kickstart module with its own IP address.

Modifying the Default PXE Configuration File

The default PXE configuration file must be modified to point to the Kickstart server and Kickstart configuration file specified by keyword `ks`.

Modify the PXE default configuration file to use *`CLIENTPATH`*`/ks-default` as the Kickstart configuration file.

- CLIENTPATH must be NFS shared before ROMS is started.

- Open Source PXE Server and TFTP Server are provided “as is” as defined by the Open Source Licensing model. These components are not maintained by HP; HP is not responsible for any defects related to them.

  Open Source PXE Server and TFTP Server are provided for use in two cases:

  - QA\Testing in Pre-Production Environment.
  - Image Capture on isolated Network.

  HP recommends that you work with your network specialists to use the most appropriate PXE and TFTP server based on your network environment constraints.

Example for Kickstart:

```
default linux

label linux

kernel vmlinuz-rh54server_32

append console=tty0 load_ramdisk=1 initrd=initrd-
rh54server_32.img network
ks=nfs:192.168.0.10:/var/opt/kickstart/clients/ks-default
ksdevice=eth0 ISVR=192.168.0.10
```

This network booting instruction configuration file will:

- Present only once choice when booting, a boot choice called “`linux`”; it will boot straight into this.
- Start a kernel from a file called `vmlinuz-rh54server_32` using a root file system from a file called `initrd-rh54server_32.img`
- Perform a Kickstart install (`ks=`) and use a starting Kickstart installation file located here: `/var/opt/kickstart/clients/ks-default` from a server with IP address `192.168.0.10`
- The Kickstart preferred Ethernet device will be `eth0`
- The `ISVR=` setting points to the IP address of the HPCA OS Manager server

The HPCA OS Manager server comes with a sample default file located in `/var/opt/autoyast|kickstart/clients`. The following file is available after the HPCA OS Manager is installed and running:

ksPxecfg.template

Check the Default Kickstart File ks-default under CLIENTPATH

Open /var/opt/kickstart/clients/ks-default in a text editor, and check the following lines:

nfs --server=<*ip address*> --dir=<*path*>

Example:

nfs --server=192.168.0.10 --dir=/opt/kickstart/rh54_server/32

Make sure that --server points to the Kickstart server and that the --dir path points to the correct Red Hat OS media location.

export ISVR=<*ip address*>

export ISVRPORT=3466

export DISTRO=Red Hat

CLIENTPATH=<*path*>

Example:

export ISVR=192.168.0.10

export ISVRPORT=3466

export DISTRO=Red Hat

CLIENTPATH=/var/opt/kickstart/clients

Make sure that ISVR points to the Linux HPCA OS Manager server.

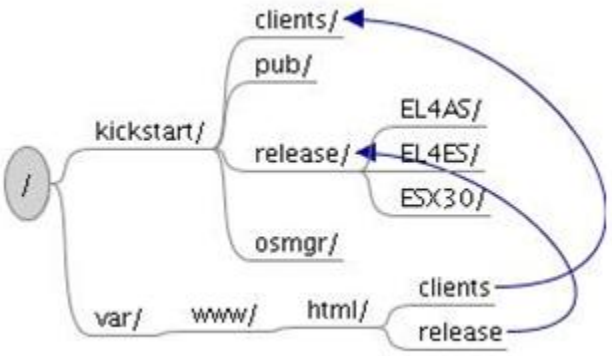
Make sure that CLIENTPATH points to the correct client path.

The ISVRPORT and DISTRO values should be 3466 and Red Hat respectively.

VMware ESX 3.0 and Kickstart

OS Manager provides support for deploying VMware ESX 3.0 systems using Kickstart. The installation media must be available via a web server, which may or may not be running on the Kickstart server. The following figure displays one possible configuration:

Figure 3 Kickstart server configuration



In the example shown in the figure above, the distribution media for multiple releases (Red Hat EL4AS, Red Hat EL4ES and VMware ESX 3.0) are stored within the `/kickstart/release` directory.

- Assuming that the web server in this example is using `/var/www/html` as the HTML document root, a link is required from this directory to the `/kickstart/release` directory, which contains the distribution media.
- Given this configuration, the URL directive in any published Kickstart configuration file would have the form:

  ```
  url --url http://kickstart_server/release/esx
  ```

  where **kickstart_server** is the name or IP Address of the Kickstart / OS Manager Server.

The link `/kickstart/clients` is required to allow the OS Manager to access the generic Kickstart configuration file. In the example above, this file was installed in the `/kickstart/clients` directory, because the CLIENT_PATH was set to `/kickstart/clients` during the OS Manager installation.

The table below describes the requirements for each Kickstart configuration file directive.

Table 1 Kickstart Configuration File Directive Requirements

Directive	Description
install OR upgrade	Standard Red Hat Kickstart directive
auth OR authconfig	Standard Red Hat Kickstart directive
bootloader	Standard Red Hat Kickstart directive

Directive	Description
install OR upgrade	Standard Red Hat Kickstart directive
keyboard	Standard Red Hat Kickstart directive
lang	Standard Red Hat Kickstart directive
langsupport	Standard Red Hat Kickstart directive
mouse	Standard Red Hat Kickstart directive
vmaccepteula	VMware specific directive indicating the user accepts the ESX Server license agreement
vmservconmem	VMware specific directive defines the amount of memory reserved for the console operating system. This VMware directive was deprecated in ESX 3.0.
vmlicense	VMware specific directive defines the license information. Only the –mode=server form of the directive is supported at this time, the –mode=file form is not supported
vmserialnum	VMware specific directive defines the serial number to be assigned to the deployed server. This VMware directive was deprecated in ESX 3.0.
vmpcidivy	VMware specific directive defines device allocation. This VMware directive was deprecated in ESX 3.0.
vmswap	VMware specific directive defines the swap file configuration. This VMware directive was deprecated in ESX 3.0.

The following sample Kickstart Configuration file deploys a VMware ESX Server 3.0 system to be licensed from the central VMware License Server at address 192.168.1.2.

```
# Sample ESX Server 3.0 Kickstart Configuration File
###
install
text
url --url http://192.168.1.1/release/esx
lang en_US.UTF-8
langsupport --default en_US.UTF-8 en_US.UTF-8
keyboard us
```

```
mouse genericwheelps/2 --device psaux
skipx
network --device eth0 --bootproto dhcp
rootpw --iscrypted $1$h9jmdNXw$ebjHd/Don/xJaPrFV1fIv/
reboot
firewall –disabled
authconfig --enableshadow --enablemd5
timezone America/New_York
bootloader --location=mbr
zerombr yes
clearpart --all --initlabel --drives=sda
part swap --size 1024 --ondisk sda
part /boot --fstype ext3 --size 100 --ondisk sda
part /var/log --fstype ext3 --size 500 --ondisk sda
part / --fstype ext3 --size 1500 --ondisk sda
part None –fstype vmkore –size=100 –ondisk=sda
part None –fstype=vmfs3 –size=1000 –grow –ondisk=sda
vmaccepteula
vmlicense --mode=server --server=27000@192.168.1.2 --
edition=esxFull --features=vsmp,backup
%packages
@base
%post
%pre
```

Configuring SUSE AutoYaST

Use the following sections to configure SUSE AutoYaST for use with OS Manager.

Modifying AutoYaST Files

Modifying /etc/hosts

The `/etc/hosts` file on the AutoYaST server must have an entry for itself with the full host name in the following syntax.

```
<host name>.<domain>.com
```

This is required for the OS Manager to self-configure the ROMS AutoYaST module with its own IP address.

Modifying the Default PXE Configuration File

The default PXE configuration file must be modified to point to the AutoYaST server and AutoYaST configuration file specified by keyword `ay`.

Modify the PXE default configuration file to use the following as the AutoYaST configuration file:

CLIENTPATH`/ay-default.xml`.

CLIENTPATH must be NFS shared before ROMS is started.

Open Source PXE Server and TFTP Server are provided “as is” as defined by the Open Source Licensing model. HP does not maintain these components and is, therefore, not responsible for any defects related to them.

Open Source PXE Server and TFTP Server are provided for use in two cases:

- QA\Testing in Pre-Production Environment
- Image Capture on isolated Network

HP recommends that you work with your network specialists to use the most appropriate PXE and TFTP server based on your network environment constraints.

Example for AutoYaST:

```
default

label linux

kernel vmlinuz-sles10

append initrd=initrd-sles10 ramdisk_size=65536
install=nfs://192.168.0.20:/opt/autoyast/sles10/32
```

```
autoyast=nfs://192.168.0.20:/var/opt/autoyast/clients/ay-
default.xml barrier=off
```

This network booting instruction configuration file will:

- Present only once choice when booting, a boot choice called “Linux”; it will boot straight into this.
- Start a kernel from a file called `vmlinuz-sles10` using a root file system from a file called `initrd-sles10`
- Perform an AutoYaST install (`autoyast=`) and use a starting AutoYaST installation file located here: `/var/opt/autoyast/clients/ay-default` from a server with IP address `192.168.0.20`
- Use Linux media from an NFS server with IP address `192.168.0.20` and located here: `/opt/autoyast/sles10/32`

The HPCA OS Manager server comes with a sample default file located in `/var/opt/autoyast|kickstart/clients`. The following file is available after the HPCA OS Manager is installed and running:

`ayPxecfg.template`

Check the Default AutoYaST File ay-default under CLIENTPATH

Open `/var/opt/autoyast/clients/ay-default` in a text editor, and check the following lines:

```
export ISVR=<ip address>
export ISVRPORT=3466
export DISTRO=SuSe
CLIENTPATH=<path>
```

Example:

```
export ISVR=192.168.0.20
export ISVRPORT=3466
export DISTRO=SuSe
CLIENTPATH=/var/opt/autoyast/clients
```

Make sure that `ISVR` points to the Linux HPCA OS Manager server.

Make sure that `CLIENTPATH` points to the correct client path.

The ISVRPORT and DISTRO values should be 3466 and Red Hat respectively.

Deploying 64-bit Versions of Red Hat and SUSE

To deploy 64-bit versions of Red Hat and SUSE Linux, the Linux kernel and initrd as specified in the default PXE configuration file, **must** be a 32-bit system.

For example, to deploy a Red Hat EL4AS 64 bit system:

- If /tftpboot contains:
  - initrd_el4as_64.img (the Red Hat EL4AS 64-bit root file system)
  - vmlinuz_el4as_64 (the Red hat EL4AS 64-bit boot kernel)
  - initrd_el4as_32.img (the Red Hat EL4AS 32-bit root file system)
  - vmlinuz_el4as_32 (the Red hat EL4AS 32-bit boot kernel)
- The default file in /tftpboot/pxelinux.cfg looks as follows:

```
default linux

label linux

kernel vmlinuz_el4as_32

append console-tty0 load_ramdisk=1
initrd=initrd_el4as_32.img network
ks=nfs:192.168.1.1:/opt/HP/CM/clients/ks-default
ksdevice=eth0
```

- The /opt/HP/CM/clients/ks-default would reference the Red Hat EL4AS **32-bit distribution**

  This setup will boot the target machine with the 32-bit Red Hat EL4AS system, which would be used to run the OS Manager pre-installation tools. OS Manager will then create a target-specific Kickstart configuration file and associated PXE configuration to deploy the desired 64-bit system, as defined in the publish Kickstart configuration file.

  During publishing of the Kickstart configuration file, the 64-bit components, initrd_el4as_64.img and vmlinuz_el4ad_64 were supplied as the root file system and kernel. The generated PXE configuration file will reference these 64-bit components for the installation.

These values will be set in the CSDB, for the OS service, in the UNIXCFG class instance representing the operating system in the following attributes:

— OS.UNIXCFG.INITRD

— OS.UNIXCFG.KERNEL

4 Publishing Configuration Files

This chapter covers how to prepare and publish existing configuration files in the OS Manager environment.

Use the OS Manager Configuration File Publisher to publish a service to the Configuration Server Database to publish a service that contains a Kickstart or AutoYaST configuration file.

Using the OS Manager Configuration File Publisher

Before using the Publisher, review the publishing considerations in the following section.

Publishing Considerations

Please refer to the following sections for important information about the configuration files used by the OS Manager.

Both platforms keep a record of the options selected during installation, so it is possible to build a reference system and then simply collect the resulting configuration file from the system for use during the configuration file publishing phase.

Kickstart Configuration Files

Red Hat uses the Anaconda tool for the installation. If you set up the installation automatically, this is referred to as a Kickstart environment. The Kickstart configuration file is a regular text file that contains the answers to installation questions in separate lines.

When installing a Red Hat system, a Kickstart configuration file `anaconda-ks.cfg` will be created in the home directory of the root user (`/root`). This file contains the settings that you entered during the installation. Before using it, you must uncomment the lines containing the partition setup.

You can also create a Kickstart file from scratch. In this case, you would use the tool `system-config-kickstart`. Manual editing of the file is required if you want to set up software RAID or LVM.

When installing to a 64-bit Red Hat Linux platform, published Kickstart configurations require the 32-bit compatibility library (`compat-arch-support`). This package is available with the Red Hat installation media.

AutoYaST Configuration Files

AutoYaST is the tool for automated installations on SUSE Linux. All information needed during installation – for example, partitioning or software selection – is provided by a control file in XML format. No manual intervention is necessary during the installation process.

It is possible to create a control file at installation time if you are installing a reference machine. In the last menu of the installation process, you can check the box Clone This System. This will create an `autoinst.xml` file in the home directory of the root user (`/root`).You can also create the control file using the YaST AutoYaST module.

Configuration File Requirements

- The `<users>` section of the AutoYaST configuration file must be contained within the `<configure>` and `<profile>` sections in order for a SUSE operating system installation to reach desired state.

  Automatic creation of this file may result in the `<users>` section being located elsewhere. Be sure to check the configuration file for proper placement of the `<users>` section before it is published. The easiest way to get a working configuration file is to get the generated configuration files that are created as part of a manual installation of the operating system.

Re-publishing OS Services (migrations, updates to existing)

Before re-publishing an updated OS service to the CSDB, you must first remove previous instance(s). Use the CSDB Editor for this task.

In case of migration from pre-5.1x versions, you should – at a minimum – delete the OS service instance located in the ZSERVICE class in the OS domain.

For example, if you want to migrate a service called RHEL50_32BIT, then you must delete this instance before publishing:

PRIMARY.OS.ZSERVICE.RHEL50_32BIT.

In the case of re-publishing a version 5.1x OS service, you must delete instances from the following classes: ZSERVICE, PACKAGE and UNIXCFG.

For example, if you want to re-publish a service called RHEL50_32BIT, then you must delete the following instances before publishing:

PRIMARY.OS.ZSERVICE.RHEL50_32BIT

PRIMARY.OS.PACKAGE.RHEL50_32BIT

PRIMARY.OS.UNIXCFG.RHEL50_32BIT.

Before deleting the UNIXCFG instance, be sure to note any changes that you may have made after the publishing.

Preparing the Configuration File

Before the configuration file can be published, you must add mandatory substitution parameters. Use a text editor to edit the configuration file, and add the mandatory parameters as well as any optional substitutions you want to include.

Table 2 on page 41 lists the mandatory and optional substitutions to be used in each configuration file.

The Publisher will warn if mandatory substitutions are not present in the file that you want to publish. If desired, you can publish the configuration file without including the mandatory substitutions, but doing so may produce unexpected results during deployment.

Substitutions can be placed anywhere in the file. You can re-use the same substitution multiple times.

Example for AutoYaST:

```
<hosts_entry>
   <host_address>127.0.0.2</host_address>
   <names config:type="list">
      <name><<COMPNAME>>.local <<COMPNAME>></name>
   </names>
</hosts_entry>
```

Example for Kickstart:

```
# Network information
network --bootproto=dhcp --device=eth0 --onboot=on --
hostname=<<COMPNAME>>
```

Simple syntax

```
<<attribute_name>>
```

If the attribute is not found during deployment, the deployment will fail. This will be recorded in the OS Manager Server log.

NULL syntax

```
<<attribute.null>>
```

If the attribute is not found during deployment, a null value (empty string) will be used in its place. The deployment will not fail.

Default syntax

```
<<attribute.default_value>>
```

If the attribute is not found during deployment, the default value you provide will be used in its place. The deployment will not fail.

Examples of substitutions

```
<<COMPNAME>>
<<COMPNAME.null>>
<<COMPNAME.myserver1>>
```

Table 2 Configuration File Substitution Parameters

Operating System	Parameter (* denotes a mandatory substitution)
Red Hat Linux Kickstart	COMPNAME *
	IPADDR

Operating System	Parameter (* denotes a mandatory substitution)
SUSE Linux AutoYaST	COMPNAME *
	IPADDR

Publishing Configuration Files

The Publisher takes the configuration file and creates a service for it in the CSDB.

Table 3 below describes the Publisher command-line options.

Table 3 Publisher Command-Line Options

Option	Description
-h	Displays the available command-line parameters.
-n	Runs the Publisher in No-Publish mode. Available for testing to display what would have been generated in an actual publishing session.
-x	Launches the graphical Publisher.
-d	Run the Publisher in debug mode.

The publisher can be run in either a text or graphical mode. The following sections describe each publishing mode.

- Publishing Using Text Mode on page 42
- Publishing Using Graphical Mode on page 44

Publishing Using Text Mode

Use the following instructions to publish configuration files to the CS Database.

To publish configuration files to the Configuration Server Database

1 Change your directory to where you installed the Configuration File Publisher.

2 Type **`./publisher`** to run the Publisher.

3 Enter the responses at each prompt and then press **Enter**. Default responses are contained within brackets.

The first time you run the Publisher, your responses are stored in a file (`.pub-defaults`). These are used as the default responses the next time the Publisher is run.

- `Configuration / machine type [KICKSTART|AUTOYAST]`
- `Configuration Server Host or IP Address`
- `Configuration Server Port`
- `Configuration Server User Name`
- `Configuration Server Password`
- `Configuration file name`
- `Configuration Server Instance Name`
- `Configuration Server Instance Friendly Name`

If you are publishing for Kickstart or AutoYaST, you are presented with the following additional steps:

- `Initial Root Directory:`
  This is the root file system used by the Initial Boot Kernel, also known as the `rootfs`. This value is used to create the PXE configuration file for the target machine, specifically the "initrd" element. It is important to note that the root file system used must match the Initial Boot Kernel being used.
- `Initial Boot Kernel:`
  This is the file name of the Linux Kernel loaded by PXE which is used to run the native OS deployment process. This value is used to create the PXE configuration file for the target machine, specifically the kernel element. It is important to note that the referenced kernel version must match the OS version being deployed.

If you are publishing for AutoYaST, you are presented with the following additional step:

- `Installation Media Path:`
  This is full path name of the directory containing the SUSE release being deployed.

After you enter the last response and press **Enter**, the objects are sent to your CSDB.

The result is an instance in your database in OS.ZSERVICE. The instance is stored in the CSDB using the name you assigned as the Configuration Server Instance Friendly Name

Publishing Using Graphical Mode

Use the following instructions to publish configuration files using the Publisher's graphical mode.

To publish configuration files to the Configuration Server Database

1. Change your directory to where you installed the Configuration File Publisher.
2. Use the command **`./publisher -x`** to run the Publisher in graphical mode. The Select Type window opens.
3. Select the Configuration file type you are publishing and click **Continue**. The Publish information window opens.
4. Enter the appropriate HPCA Core server and operating system information. Click the help buttons to display information about each parameter. Parameters that are displayed in gray out are not required.
5. Click **Publish**.
6. Enter a password and click **OK**.

   The configuration file is published to the Configuration Server Database.

5 Setting Policy and Deploying Images

Use the OS Manager administrative tasks in the Enterprise console and CSDB Editor to set policy and deploy images. Refer to the *HP Client Automation OS Management Reference Guide* and the *HP Client Automation Core and Satellite Enterprise Edition User Guide* for additional information.

Policy can be assigned on different attributes, including role, manufacturer, model and subnet.

You can only assign a single Linux OS service to a given target device. This does not limit using multiple OS services in the policy model, it just means that at the end of the Configuration Server policy resolution only a single Linux OS service may apply to any given target device.

After completing the configuration tasks required for preparing policy, the configuration files are ready for deployment. Follow the usual Red Hat Linux Kickstart or SUSE AutoYaST procedures for deployment to your target devices.

6 Tips, Tricks, and Troubleshooting

- Copy the HPCA OS installation media locally to the Linux server before installing:
  - Make sure to preserve any file attributes. Failure to do so may lead to the installation not working and/or OS deployment failing:

    ```
    chmod -R u+rx /tmp/my_osm_media
    ```

  - Make sure to copy everything from the media. The installation routines use files from different parts of the installation media. Failure to copy everything could lead to strange installation errors.
- Check the permissions on the executable files under `/var/opt/autoyast|kickstart/clients`. These should include the execute bit:

  ```
  chmod -R u+rx /var/opt/<autoyast|kickstart>|clients
  ```

- Target machine installation local logs and configuration files for AutoYaST can be found here:
  - `/var/log/YaST2`
  - `/var/adm/autoinstall/cache`
  - `/var/adm/autoinstall/logs`
  - `/var/adm/autoinstall/scripts`

    This contains the scripts generated as part of the AutoYaST configuration file generation (for example `chroot.sh`).
  - `/tmp/roms` (normally empty but may contain files in failure cases)
  - `/opt/HP/CM/Agent/log`
- Target machine installation local logs and configuration files for Kickstart can be found here:
  - `/root/install.log`
  - `/root/install.log.syslog`
  - `/root/anaconda-ks.cfg`
  - `/var/log/anaconda*.log`
  - `/var/log/osmgr.log`

- /var/log/boot.log
- /opt/HP/CM/Agent/log
- /tmp/post.log
- /tmp/post.sh
- /tmp/roms (normally empty but may contain files in failure cases)

- Use a fixed IP when setting up the base AutoYaST/Kickstart server.
- A simple Linux DHCPD configuration file for a network xxxx would look like the one shown below.

```
ddns-update-style none;
ignore client-updates;
authoritative;

subnet 192.168.0.0 netmask 255.255.255.0 {
        option subnet-mask      255.255.255.0;
        option domain-name      "hptest.local";
        option domain-name-servers      192.168.0.1;
        range dynamic-bootp     192.168.0.100
192.168.0.100;
        default-lease-time      21600;
        max-lease-time          43200;
        if substring(option vendor-class-identifier, 0,
9) = "PXEClient" {
                next-server     192.168.0.20;
                filename        "pxelinux.0";
        }
}
```

- Depending on what TFTP server you use, the root location may vary. This is not an issue, you simply need to set the PXELINUXCFG option in ROMS.CFG accordingly. Various known paths include but are not limited to /tftpboot, /boot_server/linux, /opt/tftpboot, and others.
- When referenced in this documentation, pxelinux.cfg refers to a **directory** not a file.
- Although called out in this document, a Kickstart server or an AutoYaST server do not exist as such. They are the result of a combination of

components like DHCP/PXE and TFTP, NFS, OS media and configuration.

- If your AutoYaST/Kickstart server uses SELinux for security, check with the network/security administrators so that the NFS shares work properly.
- When installing the OS Manager server, instead of pointing it to a core, you can also use a full service satellite.
- After installing the OS Manager server, remember to edit the `roms.cfg` file and change RAD_MAST to ADMIN and set the admin password for the CS to secret.
- When installing the OS Manager server, make sure the CS port is 3464 and the portal port is 3466.
- When you create the network installation media for the HPCA Agent (**before** you run `pkg_client.sh`) do not forget to include the Client Automation OS Management component.

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