

HP OpenView Configuration Management

for the AIX, HP-UX, Linux, Solaris, and Windows operating systems

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Documentation Updates

This guide's title page contains the following identifying information:

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To check for recent updates or to verify that you are using the most recent edition, visit the following URL:

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Table 1 contains changes made to this document since the last released edition of this document.

Table 2 contains a history of changes to previous versions of this document.

Table 1 Document Changes

Chapter	Version	Changes
Chapter 2	5.0	Page 43, the CM Portal component of the Integration Server loads as a separate Windows Service called HP OVCM Portal.

Table 2 Document Changes

Chapter	Version	Changes
Chapter 2	4.1	Page 21, The CM Server Management application has been added to Figure 2.
Chapter 2	4.1	Page 25, The CM Server Management application is a significant addition to this release. Be sure to have the appropriate Server License to Use (LTU).
Chapter 2	4.1	Page 26, Application Management Profiles is a component of the Server Management agent. Use this to control deployment of server applications.

Chapter	Version	Changes
Chapter 2	4.1	Page 26, Server Management includes support for Windows Terminal Server and Citrix servers.
Chapter 2	4.1	Page 27, The Configuration Baseline Auditor collects configuration information and reports configuration changes.
Chapter 2	4.1	Page 56, Table 8 has been updated to include CM Server Management.
Chapter 3	4.1	Page 93, The Configuration Baseline Auditor Process section describes how this new component works.
Appendix A	4.1	Page 97, The Configuration Management products and publications table has been updated to include the new guides associated with the Server Management components.

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www.hp.com/go/hpsoftwaresupport

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- Submit and track support cases and enhancement requests
- Download software patches
- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
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To find more information about access levels, go to:

www.hp.com/go/hpsoftwaresupport/access_level

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To register for an HP Passport ID, go to:

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1 Introduction

At the end of this chapter, you will:

- Know the scope and content of this book.
- Be familiar with terminology associated with Configuration Management (CM).

About Configuration Management Technology

Enterprises have tried various software distribution methods to solve the challenge of distributing data. These methods include:

- **Electronic CDs**
Individual users can personalize their own software, but this method lacks the ability to standardize software, and does not allow for synchronized installation.
- **Electronic Software Distribution (ESD) tools**
This method ensures synchronized delivery, but at the price of excessive standardization. Everyone in the organization is forced to get a one-size-fits-all copy of the software, even though each department in an organization may have different software needs.
- **Push Products**
Some companies are attempting to deal with the software management challenge with Internet-based push technology. This method, similar to ESD, ensures synchronized delivery, but does not allow for customization.

CM technology provides high levels of adaptability, flexibility, and automation. Adaptability comes from the embedded intelligence of platform-independent object-oriented technology. Flexibility is provided by the media-independence of CM technology that enables content to be easily revised and customized. And CM solutions automate digital asset management across virtually any kind of network. The following bullets describe each of these distinctive capabilities that are essential to CM technology:

- **The Embedded Intelligence of Object-Oriented Technology**
Object-oriented technology transforms software and content from file-based media into self-aware, platform-independent, intelligent objects that automatically assess the environment into which they are deployed, and personalize, install, update, and repair themselves accordingly. In other words, as intelligent objects, they know what they need for a particular device or user, where to get it, when they need to change, how to change themselves, and how to repair themselves.
- **Revisable Packaging for Revisable Content**
CM technology enables revision and customization of software and content at any midstream point in the publisher-to-subscriber deployment process. Because CM technology transforms software and content into objects, these objects can be easily modified midstream – subtracted from, added to, or reconfigured – simply by packaging them with other objects or new configuration information. With revisable packaging, value-added service providers and IT administrators can

customize standard published software offerings for the needs of their particular users without having to unpack and repackage everything.

- **Self-Managing Infrastructure**

The object-oriented intelligence of CM technology incorporates a self-managing infrastructure. This capability begins with network-independence. CM technology supports any deployment environment, whether client/server, local, wide or virtual area network, intranet, extranet, or the Internet. Furthermore, CM supports whatever distribution media make sense for the target audience and the provider (which might be a software publisher, application service provider (ASP), Internet service provider (ISP), provider of enterprise application integration (EAI) services, e-business integrator, e-commerce component provider, or in-house IT administrator).

In the Internet age in which software is fundamental to the ability of businesses to compete, change is a constant state, and audience diversity has grown beyond the capacity of older technologies to manage. CM technology provides the necessary automation, adaptability, and flexibility to solve the software management challenge.

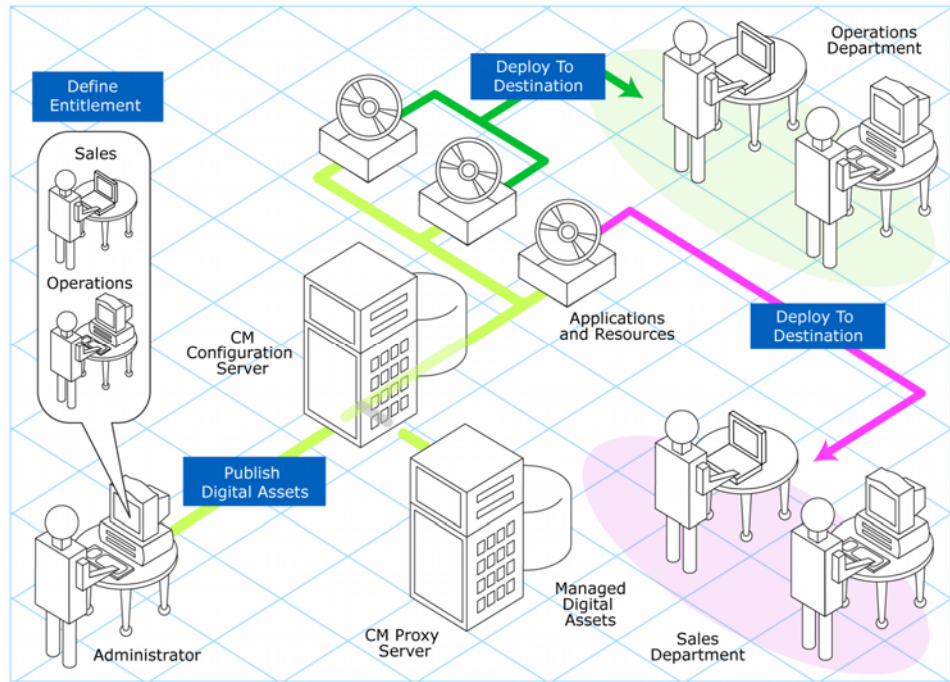
Why Use CM?

CM manages the distribution of data based on your **desired state**. The desired state is the condition of a device defined by configuration parameters set in the CM Configuration Server Database (CM-CSDB).

At a minimum, the desired state includes the following five elements:

- **Users**
The identity of the devices or subscribers being managed.
- **Applications**
The software that is being managed.
- **Application Files**
The components that make up the applications.
- **Deployment Source**
The location where the application components are stored, such as on a CM Proxy Server or CM Configuration Server.
- **Deployment Destinations**
The locations to which the application and its files will be distributed such as desktop computers, PDAs, and laptops.

Figure 1 Elements in the desired state



Use CM to manage all of these components. You will publish **packages** of data, determine entitlement policy, and define how the packages will be deployed.

▶ A package is a unit of distributable software or data.

Scope

The purpose of this guide is to describe essential CM concepts and the benefits of the CM components. For information about the installation and configuration of CM products, go to the HP Software support web site or the appropriate CM publication.

Terminology

The following terms are used frequently in this publication.

administrator

The person who uses the CM Administrator to configure and maintain the CM environment.

agent

The agent software (such as the Application Self-service Manager, Application Manager, Inventory Manager, Patch Manager, or Application Usage Manager) that runs on the managed device and communicates with the CM Configuration Server.

agent computer

A computer (workstation or server) that has the CM agent software installed. It may also be referred to as a device.

CM Administrator

A set of tools (**Error! Reference source not found., Error! Reference source not found., Error! Reference source not found., Error! Reference source not found., Error! Reference source not found.,** and the CM AMP Editor) that you can use to manage the CM environment.

CM agent connect

The process by which a managed device communicates with the CM Configuration Server.

CM Configuration Server

In conjunction with the CM Configuration Server Database, a server that stores, manages, and distributes application package information, and manages policy relationships and information about managed devices. This server is the only product that is mandatory in a Configuration Management environment; without it, the infrastructure will not function.

CM Configuration Server Database (CM-CSDB)

An object-oriented database that stores all the information needed to manage assets on a device, including the software and/or data that CM distributes, the policies determining which users are entitled to which packages, and security and access rules for administrators. It has a hierarchical structure containing four levels: files, domains, classes, and instances.

desired state

The condition of a device as defined by the configuration parameters you set in the CM-CSDB. These parameters include software, operating system, and policy.

device

In this document, a device is a piece of hardware, such as a computer or ATM that may be either a managed device or a target device.

managed device

A computer, ATM, or other piece of hardware, that is managed by CM.

package

A unit of software or data that can be published to the CM-CSDB.

policy

A designation of the services to which a subscriber, an agent computer, or a managed device is entitled.

resolution

The process by which the object attribute values on a managed device are replaced with those that are required to achieve its desired state.

service

A group of related packages, methods, or behaviors organized into manageable units.

target device

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

user or subscriber

The person who uses managed applications on a managed device.

About this Guide

CM Server Management is a significant addition to the CM infrastructure. See CM Server Management on page 25.

The remaining chapters of this book cover the following topics:

- **Chapter 2, CM Products and Benefits**
This chapter discusses CM products, their benefits, and their place in relation to other CM components. CM Server Management has been added to the group of management applications.
- **Chapter 3, Essential Processes**
This chapter describes some of the essential CM processes. It helps you gain an understanding of how CM works.

CM Publications

While this book provides an overview of CM products and processes, it is merely a starting point. You can find more information on all of the CM products from either the HP Software support web site or from the CM publications library. These publications will guide you through the software management cycle to prepare your data for management on your enterprise's computers. See CM Publications on page 97.



Be sure to check the HP Software support web site periodically for new and updated publications.

Summary

- This book introduces you to the various CM products and how they fit into the CM infrastructure.
- After reading this guide, you may want to examine other CM publications that show you how to use the different CM components.

2 Products and Benefits

At the end of this chapter, you will:

- Know the Configuration Management (CM) family of products.
- Understand the benefits of each product.

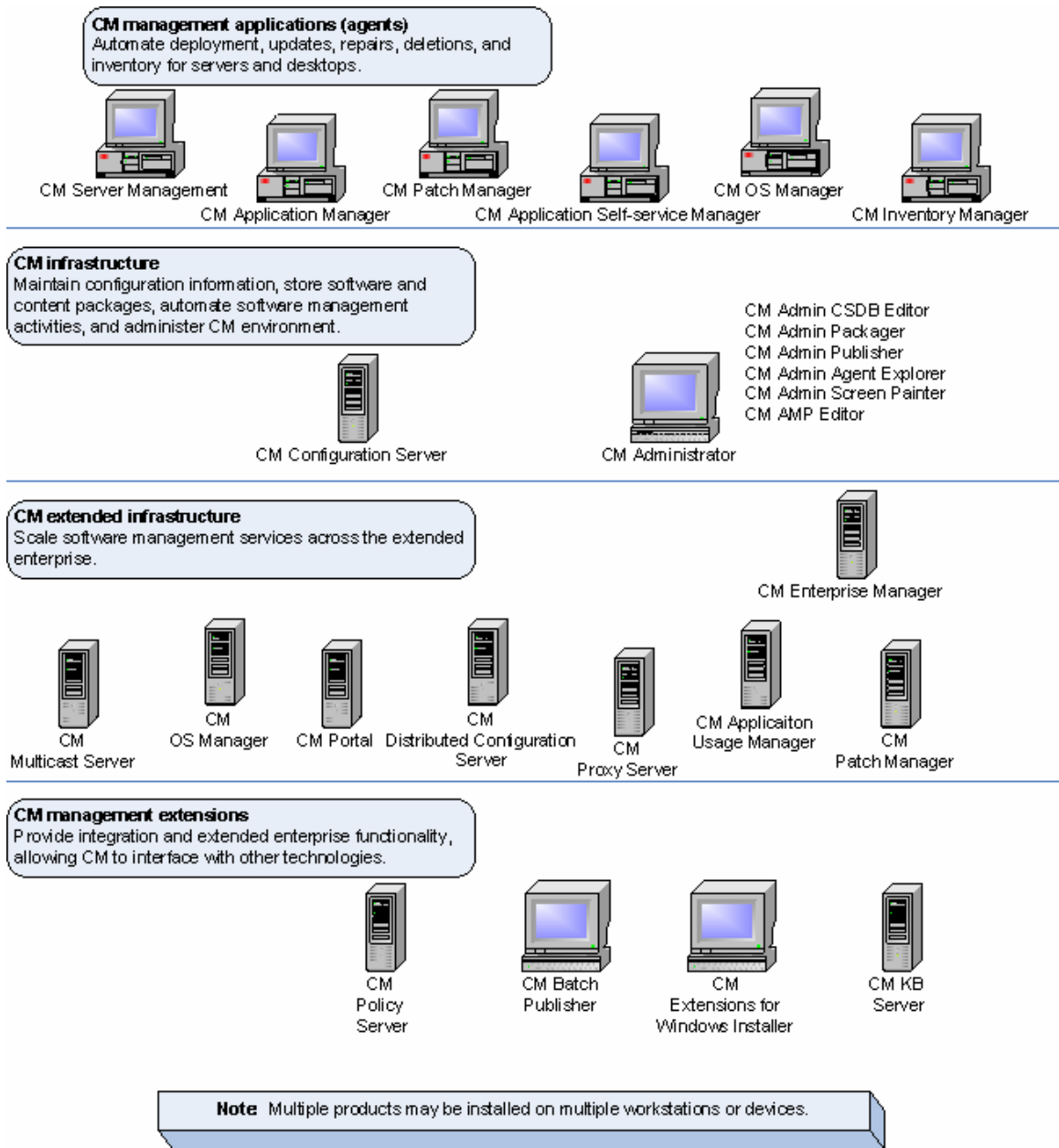
CM Infrastructure

This section contains an overview of the products and components of HP OpenView Configuration Management (CM). Depending on your enterprise's configuration, your infrastructure may use any combination of these products and components. Components are shared among two or more products. In this section, we will give brief descriptions of all of the products and components,

CM products can be divided into four categories.

- HP management applications (agents)
- HP infrastructure
- HP extended infrastructure
- HP management extensions

Figure 2 Infrastructure overview



CM Management Applications

CM management applications are agent-based applications that can be installed on target devices in your enterprise. They communicate with the CM servers to enable you to manage the discovery, deployment, configuration, repair, update, and removal of data on devices such as servers, desktops, mobile devices such as laptops and handhelds, and specialty devices such as ATMs, point-of-sale, and Internet kiosks.

When a management application is installed on a target device, the device becomes a **managed device**.

There are several types of CM agents available for communicating with the CM Configuration Server. The CM Configuration Server stores the configuration parameters and links policies to your managed devices. This server will be discussed in detail later in this chapter. You can install more than one CM agent on a device to combine features.

The table below describes the essential functions of each of the CM agents.

Table 3 CM agent essential functions

CM agent	Use
CM Application Manager	Deploys mandatory services to unattended devices.
CM Application Self-service Manager	Allows users to install the services that they are entitled to.
CM Inventory Manager	Tracks and reports on hardware and software on managed devices.
CM OS Manager	Enables your managed devices to work properly with CM OS Manager for operating system deployment.
CM Patch Manager	Deploys and analyzes vendor's security patches and bulletins.
CM Server Management	Deploys server applications, manages Windows Terminal Server and Citrix applications, and manages configuration baselines and configuration files.

- Not all management applications are available for all operating systems and architectures. Consult the CM 5.00 Release Notes on the HP web site or your HP representative for the most current information on platform availability. This guide is for Windows only.

Figure 3 CM management applications (agents)



CM Application Manager

The CM Application Manager allows you to deploy mandatory data to devices without user intervention. Administrators control deployments, updates, repairs, and removals through policy-based entitlements.

With the CM Application Manager installed on the managed device, the administrator can:

- Deploy mandatory (required) data to unattended devices.
- Install, remove, verify, repair, and update data on a schedule or immediately.
- Control application versions.

Refer to the *HP OpenView Configuration Management Application Manager Installation and Configuration Guide*.

CM Application Self-service Manager

Users can install, remove, or update optional applications that the administrator makes available to them. The CM Application Self-service Manager:

- Enables self-service software and content management for subscribers within the extended enterprise.
- Provides a user interface that the subscribers use to install, remove, verify, and update their *own* elective software and content. The administrator still decides which software and content the subscriber is entitled to.

Refer to the *HP OpenView Configuration Management Application Self-Service Manager Installation and Configuration Guide*.

CM Inventory Manager

This management application, used in conjunction with the CM Messaging Server and CM Reporting Server, allows you to collect hardware and software information for reporting.

The CM Inventory Manager:

- Gathers information about software and hardware configurations automatically, and consolidates the results into Web-based reports.
- Increases manageability of enterprise data by maintaining current inventory information collected across LAN, Internet, and dial-up links, and across a wide array of heterogeneous devices and operating systems.

Refer to the *HP OpenView Configuration Management Inventory Manager Installation and Configuration Guide*.

CM Patch Manager

This management application is used with the CM Patch Manager Server as described on page 39. CM Patch Manager automatically discovers, analyzes, and deploys software patches for Windows, Linux, and UNIX platforms. The IT administrator controls the patch lifecycle, which includes acquisition, testing, conflict analysis, vulnerability assessments, deployment, and ongoing management, through policy-based entitlements.

The CM Patch Manager agent:

- Gathers information about security patches installed on the managed device.
- Manages the deployment of patches.

- Monitors the continued security vulnerability compliance of managed devices.

Refer to the *HP OpenView Configuration Management Patch Manager Installation and Configuration Guide*.

CM OS Manager

The CM OS Manager is comprised of both an agent and a server. See CM OS Manager Server on page 88. These two pieces allow you to provision operating systems on agent devices.

The CM OS Manager:


- Deploys operating systems based on policy assignments.
- Can prompt the user to choose an operating system based on a set of criteria.

Refer to the *HP OpenView Configuration Management OS Manager System Administrator Guide*.

If you install both the CM Application Self-service Manager and CM Application Manager feature sets, you decide if an application is mandatory or optional, and specify who controls the installation of the application. By adding the CM Inventory Manager, you can also discover the hardware and software configurations of the agent computer. CM Patch Manager will allow you to manage security patches for the operating system deployed through CM OS Manager. Use CM Server Management to control server applications.

CM Server Management

CM Server Management is comprised of a number of components. These components allow you to control deployment of server applications, control configuration files, create baselines, and manage terminal server applications. The components are described in the sections below.

-  To use any of the CM Server Management components, you must have the appropriate Server License to Use (LTU). Consult the appropriate guide for each component.

CM Application Management Profiles

CM Application Management Profiles is a set of tools that enables the deployment and management of complex software products that are typically required on servers in a datacenter environment such as Microsoft SQL Server, Oracle, Apache, and Internet Information Server among others. These products often employ their own instrumentation or repositories for deployment and management of their implementation.

Application Management Profiles provides tools to:

- Analyze and parameterize configuration control data for targeted products
- Specify values in the form of a model to be used at deployment time
- Articulate in the model the prerequisites and constraints that qualify the ability to deploy the products
- Publish the control information and required ancillary tools such as utility programs to the CM infrastructure for deployment
- Deploy and configure the software to targeted devices
- Interact with the target environment before and after installation to enhance management of the deployment
- Report on the success of the deployment
- Allow for load balancing for Apache Servers.

Refer to the *HP OpenView Configuration Management Solutions for Servers Application Management Profiles Guide*.

Terminal Server Support

Windows Terminal Services is a thin-client server. With Terminal Services, the processing of one or more applications is moved completely off a user's desktop and onto a centralized server. Only screen, mouse, and keyboard information is passed between the agent and the server.

Terminal Server Support provides the ability to install and manage applications in a Windows Terminal Server environment for applications to be run by Windows Terminal Server agents, and for applications to be run locally on the Windows Terminal server.

As part of the application deployment process, the Terminal Server component of the CM Server Management Agent automatically manages the install and execute modes in which a Windows Terminal Server can install

and maintain applications. Before installing or updating an application, the CM Server Management Agent queries the Windows Terminal Server for active sessions, prompts users to logoff, and, if needed, disconnects user sessions. After completion of the installation, the Windows Terminal Server is brought back online to accept incoming user sessions.

Refer to the *HP OpenView Configuration Management Solutions for Servers Windows Terminal Server and Citrix Support Guide*.

CM Configuration Baseline Auditor

The Configuration Baseline Auditor (CBA) collects configuration information and reports configuration changes. A *baseline* is a state that you select as the standard against which you want to compare other states for the subsystem. Typical uses are to review changes to a device over time, to review differences between devices that should be configured identically, or to review differences between a device and a well-defined baseline configuration.

Configuration Baseline Auditor data are stored in subsystems. A subsystem can be as simple as a single file, as complete as all files and configuration settings on a device, or as well-defined as all of the resources required by specific applications such as SQL Server. When defining a subsystem, you will define collection options and filters used to scan the resources on the device. As you collect information about configuration changes on your device, a state is created within the subsystem. Then, you will use the Configuration Baseline Auditor interface to compare different states within a subsystem.

The Configuration Baseline Auditor:

- Collects detailed file and registry value information
- Collects the subsystem state at regular intervals, such as daily or weekly
- Transfers information about only the configuration changes, which reduces data transfer and database import overhead
- Allows easy definition of the resources that belong to specific subsystems.

Refer to the *for HP OpenView Configuration Management Solutions for Servers Configuration Baseline Auditor Guide*.

CM Application Usage Manager

The CM Application Usage Manager uses parameters that you set in the CM-CSDb to collect data on the patterns of application usage on your managed

devices. These data are reported back to the CM Application Usage Manager Server for reporting and analysis.

For more information, refer to the *HP OpenView Configuration Management Application Usage Manager User Guide*.

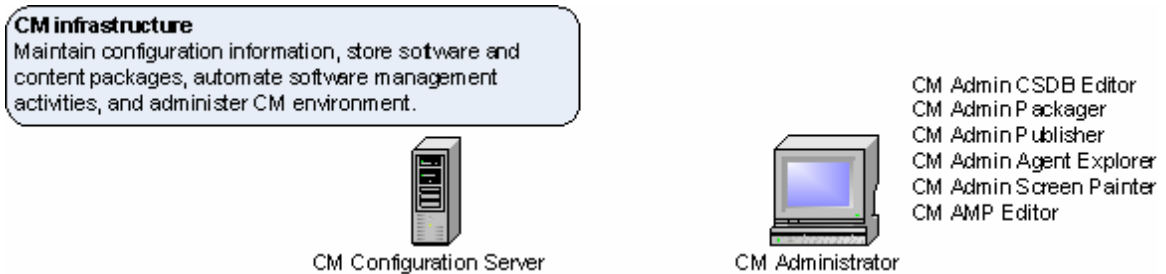
CM Infrastructure

Use the CM infrastructure to maintain desired state information, store data packages, automate software management activities, and administer your environment. The CM Configuration Server and the CM-CSDB are the core of your management infrastructure. Consult the HP Software support web site or your HP representative for the most current information on platform availability.

Table 4 CM infrastructure essential functions

CM infrastructure product	Use
CM Configuration Server	Configures and maintains desired state information for your devices.
CM Configuration Server Database	Stores the desired state configuration in a hierarchical structure. The CM-CSDB resides on the CM Configuration Server.
CM Administrator	Contains tools to configure and maintain your environment.

Figure 4 CM infrastructure



CM Configuration Server

The CM Configuration Server resides on a single server or multiple servers. Applications and information about the users and managed devices are stored in the CM-CSDB on the CM Configuration Server. The CM Configuration Server distributes application packages based on policies that are established by the CM administrator. Refer to the *HP OpenView Configuration Management Configuration Server User Guide*.

The CM Configuration Server:

- Dynamically generates the desired states based on situation-specific data that create a software environment that automatically adapt to changes.
- Synchronizes distributed objects, such as application components, packages, computer configurations and policy relationships across the network, that automatically manages the transfer of objects to and from other CM components.
- Maintains enterprise policies in the CM-CSDB. When a managed device connects to the CM Configuration Server, current policy is automatically transmitted to and updated on the managed device.
- Contacts devices to have them initiate requests to the CM Configuration Server according to a schedule, upon notification from a CM administrator, or when invoked by the user. Managed devices do not poll over the network, conserving network bandwidth.

To synchronize multiple CM Configuration Servers, use the CM Distributed Configuration Server. See CM Distributed Configuration Server on page 34 and refer to the *HP OpenView Configuration Management Distributed Configuration Server Installation and Configuration Guide*.

CM Configuration Server Database (CM-CSDB)

CM administrators maintain an enterprise's policies in the CM-CSDB. A policy defines which services users and managed devices are entitled to. You can use the HP OpenView Configuration Management Portal (CM Portal) to work with the CM-CSDB. More experienced users may use the CM Admin CSDB Editor of the HP OpenView Configuration Management Administrator (CM Administrator) for advanced tasks. The CM-CSDB is stored on the CM Configuration Server.

It includes the following information:

- The data that CM distributes.

- The policies showing which managed devices and users are assigned to which packages.
- Security and access rules for CM administrators.

For more information on the structure of the CM Configuration Server Database, see CM Configuration Server Database on page 64.

CM Administrator

The CM Administrator tools provide centralized control of CM objects and entitlements. Administrators use these tools to manage the CM-CSDB, prepare applications for management, view CM agent objects, and customize their environments. The CM Administrator includes the following tools and capabilities:

CM Administrator Packager

The CM Administrator Packager (CM Admin Packager) provides a graphical interface for packaging all software components for distribution. The packages are promoted to the CM Configuration Server Database. See Publishing and Packaging Process with CM Admin Packager on page 70 for information on the publishing process.

There are two publishing modes, Component Selection Mode and Installation Monitor Mode. Availability of the modes depends on your operating system and architecture. Consult the HP Software support web site or your HP representative for the most current information on platform availability.

- **Installation Monitor Mode**

In Installation Monitor Mode, the CM Admin Packager determines what to package by scanning an administrative computer before and after installing the software. It *differences* the before and after scans to determine what changes were made to the computer. These differences make up the package that you promote to the CM-CSDB.

- **Component Selection Mode**

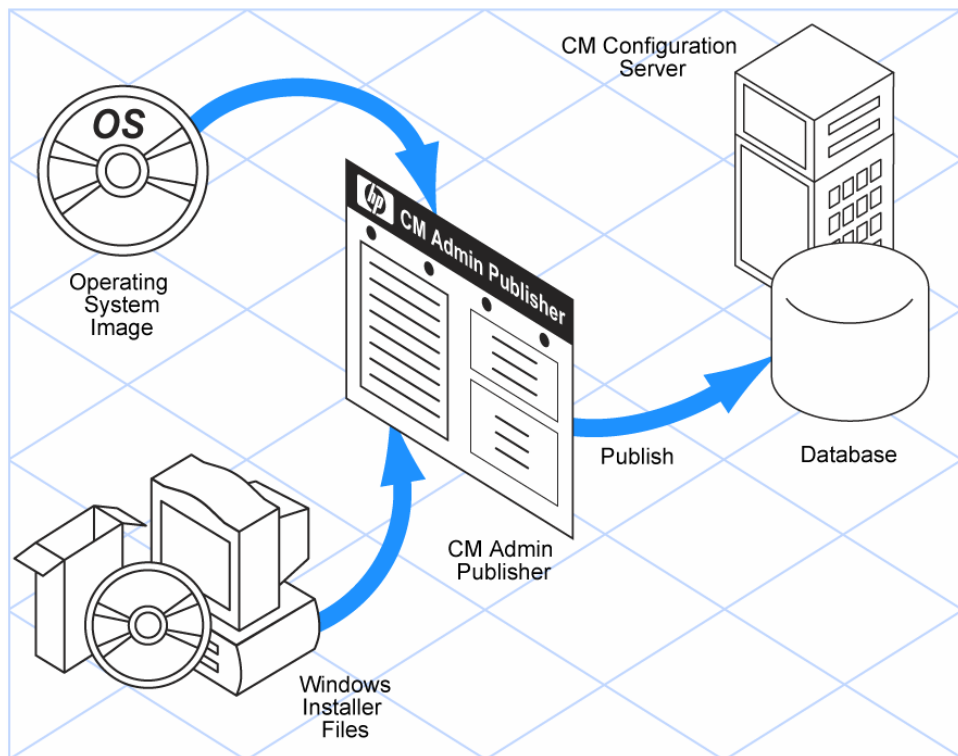
In Component Selection Mode, you select the individual components that make up the package, such as files, directories, registry entries, and links.

Refer to the *HP OpenView Configuration Management Application Manager Installation and Configuration Guide*.

CM Administrator Publisher

The CM Administrator Publisher (CM Admin Publisher) is an administrative tool that facilitates publishing Windows Installer applications and operating system images to your CM-CSDB. It also allows you to publish files in batch mode. Install the CM Admin Publisher to the computer where your administrator will have access to the necessary files for publishing. Note that the CM Admin Packager is similar; it performs the same function for non-Windows Installer applications. Refer to the *HP OpenView Configuration Management Administrator Publisher Guide*.

Figure 5 Publishing process



CM Administrator CSDB Editor

The CM Administrator CSDB Editor (CM Admin CSDB Editor) gives an experienced CM administrator a graphical user interface to configure policy and application services stored in the CM-CSDB. You will usually use the

CM Portal to administer your environment. In addition, the CM Admin CSDB Editor allows administrators to perform the following tasks:

- Modify application packages after the initial publishing process.
- Establish reuse of application components between application services.
- Define application service prerequisites.
- Define policy for application entitlements.
- Control deployment of application versions.
- Centralize control for unattended application service updates, install, and repair.

Refer to the *HP OpenView Configuration Management Administrator Configuration Server Database Editor Guide*.

CM Administrator Agent Explorer

The CM Administrator Agent Explorer (CM Admin Agent Explorer) provides a graphical user interface to view and edit agent objects on managed devices, as well as diagnose issues by viewing error objects. Agent objects represent the current state of the managed device.

CM Administrator Screen Painter

Use the CM Admin Screen Painter to create and design custom dialog boxes.

CM Extended Infrastructure

Use the CM extended infrastructure to scale software management services across your entire enterprise. This gives you the ability to manage devices across multiple network segments. The CM extended infrastructure can be divided into two categories; products and components. Components are shared among two or more products. The software for the components is provided as needed with the products.

Products

Through distributed administrative capabilities, vulnerability assessments, and monitoring of application usage patterns, CM extended infrastructure products provide a complete analysis of your management solution. The CM extended infrastructure contains the following products:

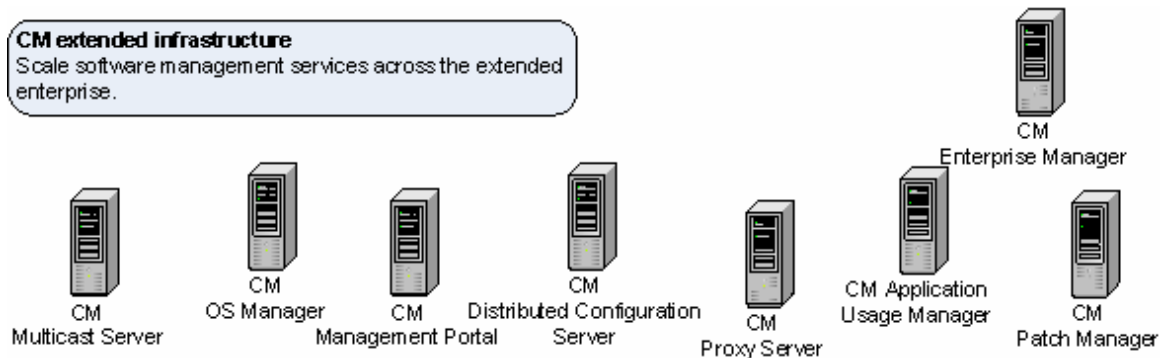
- CM Application Usage Manager
- CM Distributed Configuration Server
- CM Enterprise Manager
- CM Multicast Server
- CM OS Manager
- CM Patch Manager
- CM Portal
- CM Proxy Server

Table 5 Extended infrastructure essential functions

Extended Infrastructure	Use
CM Application Usage Manager	Assesses patterns of application usage in your environment.
CM Distributed Configuration Server	Replicates part or all of your databases across a network of CM Configuration Servers.
CM Enterprise Manager	Web-based, agent management tool that allows you to quickly and easily manage software, patches, and inventory for devices in your environment.
CM Multicast Server	Sends the same resources in one data stream to multiple devices at the same time.
CM OS Manager	Provisions and manages operating systems on target devices.
CM Patch Manager	Deploys and analyzes vendors' security patches and bulletins. Used with the CM Patch Manager Server. The CM Patch Manager has both an agent and server component.

Extended Infrastructure	Use
CM Portal	Manages your infrastructure through a Web browser.
CM Proxy Server	Uses cache management over HTTP or TCP/IP to store and transmit application data dynamically, freeing resources on the CM Configuration Server.

Figure 6 CM extended infrastructure



CM Distributed Configuration Server

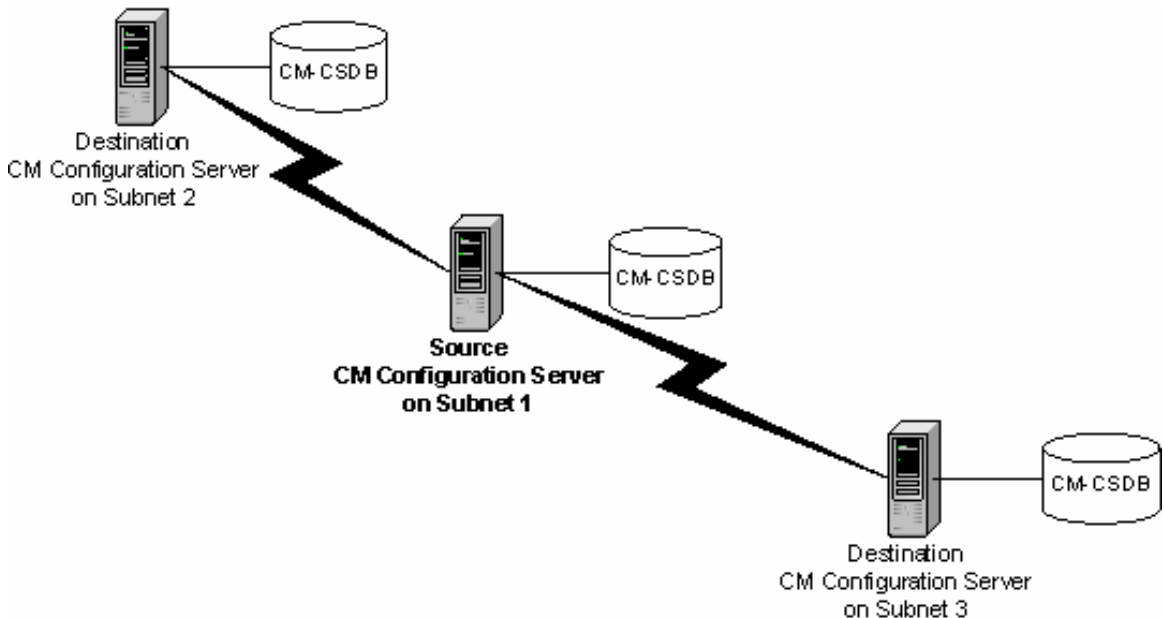
The size or network environment of your enterprise may require more than one CM Configuration Server. The CM Distributed Configuration Server allows multiple CM Configuration Servers to share information about policies and managed data. A CM Distributed Configuration Server synchronization must be configured for two CM Configuration Servers, a source and a destination. Planning, architecture, and configuration are all very important considerations when implementing CM Distributed Configuration Servers in an enterprise environment.

The CM Distributed Configuration Server must be able to communicate with each of the CM Configuration Servers that it is synchronizing. The destination CM Configuration Servers do not need to be able to contact each other nor do they need to share the same operating system.

The CM-CSDB is divided into functional domains. The CM Distributed Configuration Server contacts the selected domains, and then provides the intermediate common facilities to make the source and destination domains

identical. The destination domain is always a replica of the source domain.
See CM Configuration Server Database on page 64.

Figure 7 CM Distributed Configuration Servers communicate



The benefits of the CM Distributed Configuration Server are:

- CM administrators can automatically synchronize distributed CM-CSDBs. This allows managed applications and policy information to be shared across the enterprise.
- The CM Distributed Configuration Server removes any logical limitations to the scale of the software management environment.
- Individual CM Configuration Servers do not need to share a common network protocol or operating system.


Refer to the *HP OpenView Configuration Management Distributed Configuration Server Installation and Configuration Guide*.

CM Enterprise Manager

The HP OpenView Configuration Management Enterprise Manager (CM Enterprise Manager) is a web-based, agent management tool that allows you to manage software, patches, and inventory for devices in your environment.

Before installing the CM Enterprise Manager, you need to have the following installed in your enterprise. If the following are already installed, you need to identify which ones will be used by the CM Enterprise Manager.

- CM Configuration Server
- CM Reporting Server
- CM Portal

 You do not need the CM Reporting Server to use the CM Enterprise Manager. However, if you do not have one identified or installed in your enterprise, you will not be able to access any of the CM Reporting Server features in your CM Enterprise Manager.

CM Portal

The CM Portal is web-based and gives you the ability to manage your entire environment regardless of location or computing platform. Administrative tasks can be distributed to administrators in remote locations based on roles and policies. Some of the tasks allow you to deploy CM agents, detect the status of installed CM services, manage the CM-CSDB, and track the completion status of all CM Portal tasks.

The CM Portal cannot always perform tasks remotely; therefore, the CM Portal Agent, which must be installed on a remote managed device, performs these tasks on behalf of the CM Portal.

Some of the functions the CM Portal can perform are the following:

- Discover and view devices on your network.
- Set policy and configure the desired state.
- Remotely start and stop services.
- Remotely install some of the CM products, such as the CM agents, the CM Portal Agent, and the CM Proxy Server.
- Notify a group of devices to perform an action such as installing software or auditing services.

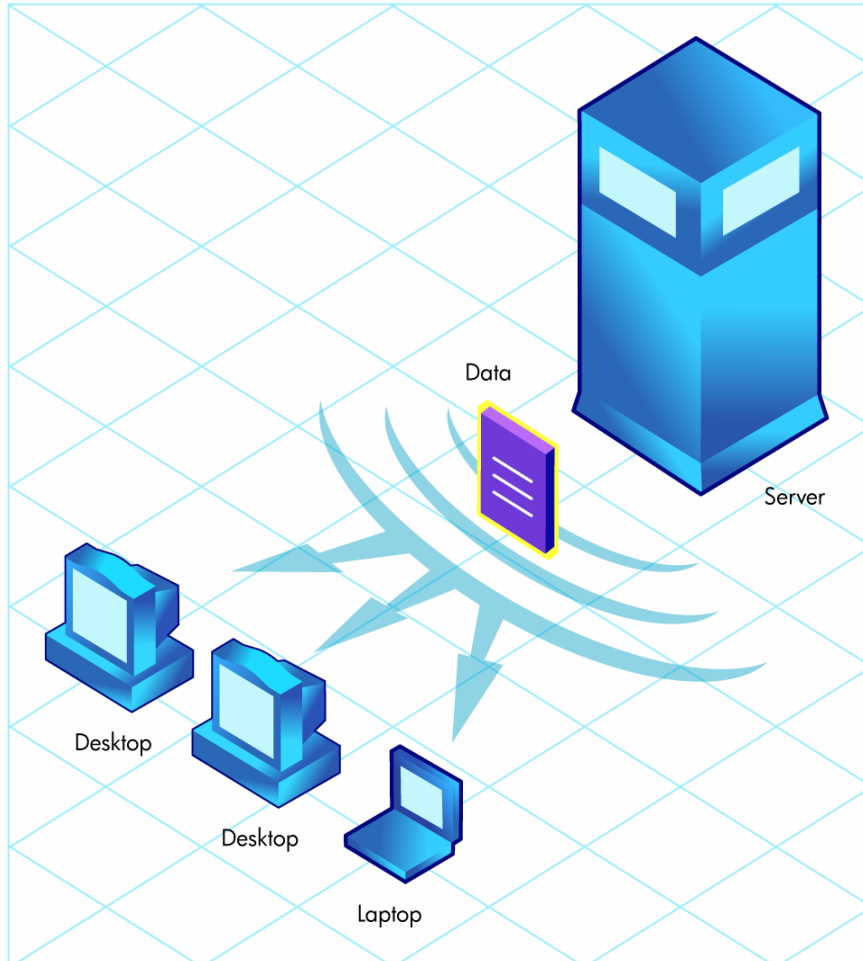
Refer to the *HP OpenView Configuration Management Portal Installation and Configuration Guide*.

CM Multicast Server

The CM Multicast Server reduces the number of transmissions necessary and maximizes the use of network bandwidth. This enhances and simplifies data-transmission technology. Multicasting allows the transmission of the same data stream to many targets, simultaneously. This method of information transmission differs from the usual method of transmission, where a server has to transmit the same information to each of its targets individually.

Most multicast utilities are designed to provide the simplest delivery of a payload that has been statically composed of all files and components for all possible recipients. In this model, every receiver is forced to take all resources bundled into that payload. The CM Multicast Server allows the collection of the sets of resources that are needed by only those receivers that are eligible to participate in a specific multicast transmission. Only data required by the managed devices are sent, and these devices retrieve only the data that they have requested.

Figure 8 Multicast transmissions



The CM Multicast Server provides the following benefits:

- Only data required by the devices are sent.
- Maximizes the utilization of network bandwidth by transmitting a single data-stream to multiple target devices.
- Saves resources of the server by not having to set up separate CM agent connect sessions and then repetitively transmit data to each device individually.

The CM Configuration Server takes part in the multicast process during the CM agent connect, and as the repository for the database files. The CM

Multicast Server accesses the resources needed for transmission during the multicast from the CM-CSDB. The CM-CSDB also contains the information required to:

- Determine whether a managed device is eligible.
- Assign the managed device to a multicast group.
- Inform the managed device of the files it needs in order to match the desired state.

Refer to the *HP OpenView Configuration Management Multicast Server Installation and Configuration Guide*.

CM OS Manager

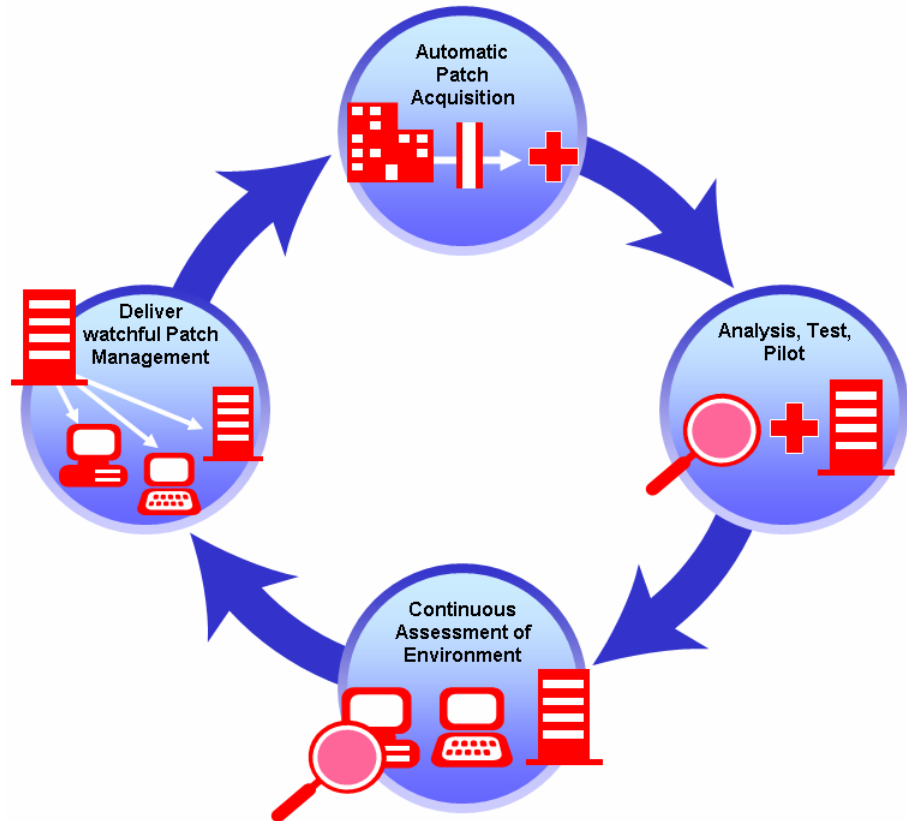
The CM OS Manager allows you to use CM policies to control operating systems. Use the CM OS Manager to build machines from a bare-metal state or to replace existing operating systems, while applying service packs, patches, hot fixes, applications, and other managed data. Benefits of the CM OS Manager include:

- Since it is a fully integrated component of CM, it reduces the learning curve for administrators.
- Automated policy-based management improved speed and reliability of operating system deployment.
- Desired state automation maintains operating systems in the right configuration and thereby increases service levels.
- Reduced IT costs by simplifying and streamlining the OS management process across multiple platforms.

CM Patch Manager

CM Patch Manager eliminates known software vulnerabilities by automating the patch management process including acquisition, impact analysis, pilot testing, discovery, assessment, deployment, maintenance, and compliance assurance. This ensures that managed devices are always configured correctly. With it, you can configure acquisition tools to collect security patches from a vendor's web-based security patch repository, as well as perform impact analysis and pilot testing in order to identify affected applications and devices.

Figure 9 Patch Management life cycle



Features of the CM Patch Manager include, but are not limited to:

- An acquisition tool that can be configured to enable programmatic collection of new security patches directly from a vendor's web-based depository for security patches.
- Ability to perform impact analysis to identify affected applications and devices.
- Automatic and continuous discovery of devices on the network, software products that are installed on each device, the collected security patches that are already applied to each software product, and identification of software products that the device actually executes.

- Policy-based management capabilities that interface directly with a variety of existing policy sources such as Active Directory, LDAP, or SQL databases.
- Monitoring devices and checking policy to see if they are in compliance. If they are not in compliance, devices are automatically updated with the appropriate patches.

CM Proxy Server

The CM Proxy Server allows data to be locally available to managed devices. Managed devices can receive data over the Local Area Network (LAN) instead of across a Wide Area Network (WAN). CM Proxy Servers increase scalability while dramatically reducing traffic over the network. When data are cached on the CM Proxy Server, the demand placed on the CM Configuration Server is decreased, allowing the CM Configuration Server to allocate more resources to other tasks.

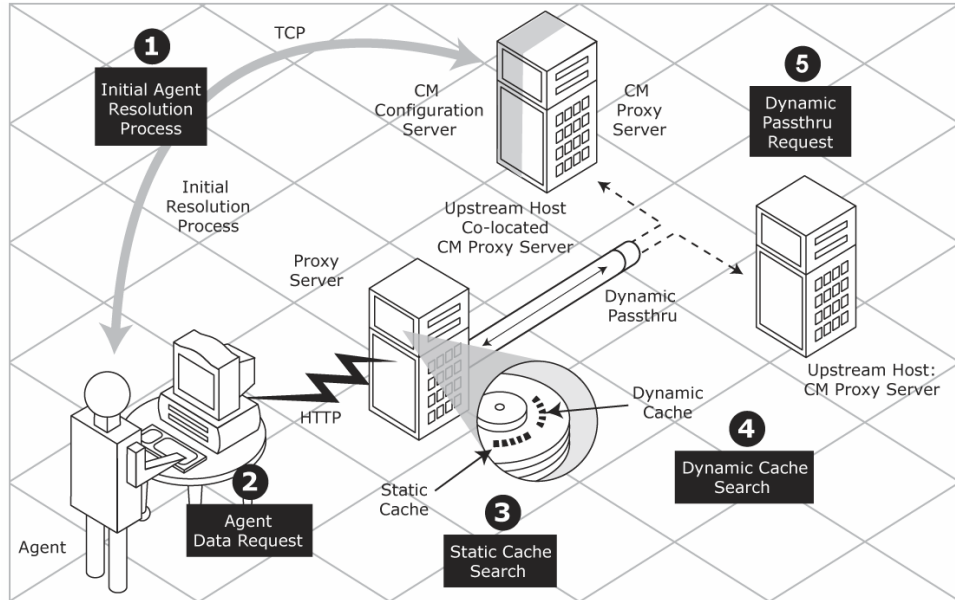
Placing CM Proxy Servers at strategic points in your network increases the efficiency at which data are transferred. The connection between users and the CM Proxy Server may be more efficient than the connection between the users and the CM Configuration Server. The factors that determine the efficiency of a connection between a server and a device include hardware capability, network bandwidth, workload on the servers, network traffic patterns, and the volume of software to be distributed.



The CM Proxy Server is not a generic proxy, but rather a proxy specifically designed to manage and distribute CM data.

The CM Proxy Server can be installed and software can be preloaded using the CM Portal. If the CM Integration Server is not already installed, the CM Proxy Server installation will install the CM Integration Server.

Figure 10 CM Proxy Server caching



The CM Proxy Server, when used, is the primary repository for data to be deployed. After the managed device determines the resources needed for its desired state, the device can request those resources from the CM Proxy Server. The CM Proxy Server provides the following benefits:

- The ability to choose between having requests made using either HTTP (recommended) or TCP/IP.
- The ability to service multiple, concurrent requests from either protocol source.
- The ability to have data automatically loaded onto the CM Proxy Server for distribution when the first request comes in from a managed device. This occurs if the data do not already exist on the CM Proxy Server.
- The ability to automatically send requests to the CM Configuration Server for processing if the CM Proxy Server cannot handle the request.

Refer to the *HP OpenView Configuration Management Proxy Server Installation and Configuration Guide*.

CM Application Usage Manager

You can use the CM Application Usage Manager to assess patterns of application usage in your environment. This allows you to facilitate adherence to license agreements, re-provision licenses if needed, and monitor user productivity.

The CM Application Usage Manager monitors the use of every application on all of your devices. This enables you to:

- Enforce corporate standards by identifying non-standard software and software versions in use in your enterprise.
- Implement license tracking, which gives you the ability to purchase and maintain only those licenses that are needed.
- Enable OS migration support by prioritizing software distribution based on actual usage.
- Use reporting to view the actual use of application resources.

The CM Application Usage Manager can be used in your existing environment whether or not you are currently using CM for data distribution.

Refer to the *HP OpenView Configuration Management Application Usage Manager User Guide*.

Components

Some products share components to consolidate communications and facilitate data flow. Shared components include the CM Integration Server, CM Messaging Server, and the CM Reporting Server.

Table 6 CM shared components essential functions

Component	Use
CM Integration Server	Most products that use the CM Integration Server are loaded from a single Windows service called HP OVCM Integration Server. The CM Portal is loaded from a separate Windows service called HP OVCM Portal. The CM Integration Server is used by the CM Portal, CM Proxy Server, CM Policy Server, and CM Patch Manager.

Component	Use
CM Reporting Server	<p>The web-based CM Reporting Server allows you to use data from SQL or Oracle for reporting.</p> <p>The CM Reporting Server is used by CM Patch Manager, CM Application Usage Manager, CM Inventory Manager, and CM Server Management.</p>
CM Messaging Server	<p>The CM Messaging Server routes data from agent objects to the appropriate CM Infrastructure Server.</p> <p>The CM Messaging Server is used by CM Portal, CM Patch Manager, CM Reporting Server, and CM Server Management.</p>

CM Integration Server

Many of the CM extended infrastructure products use the CM Integration Server, such as the CM Portal, the CM Proxy Server, the CM Policy Server, and the CM Patch Manager Server. Each product is composed of modules that reside in the CM Integration Server modules directory. These components use the same core CM Integration Server files, and run under the same process. The CM Integration Server does not have its own installation. It is loaded if the product needs it, and if it is not already installed in the installation directory.

Benefits of the CM Integration Server are:

- The products that use the CM Integration Server for Windows may be loaded from a single Windows Service.
- When the CM Integration Server starts, it scans its configuration file and attempts to load all the products marked for loading.
- Each product loaded from the CM Integration Server is separately licensed.
- The CM Integration Server provides Web services that may be shared by all loaded modules. This integration provides increased performance, efficiency, and maintenance ease.

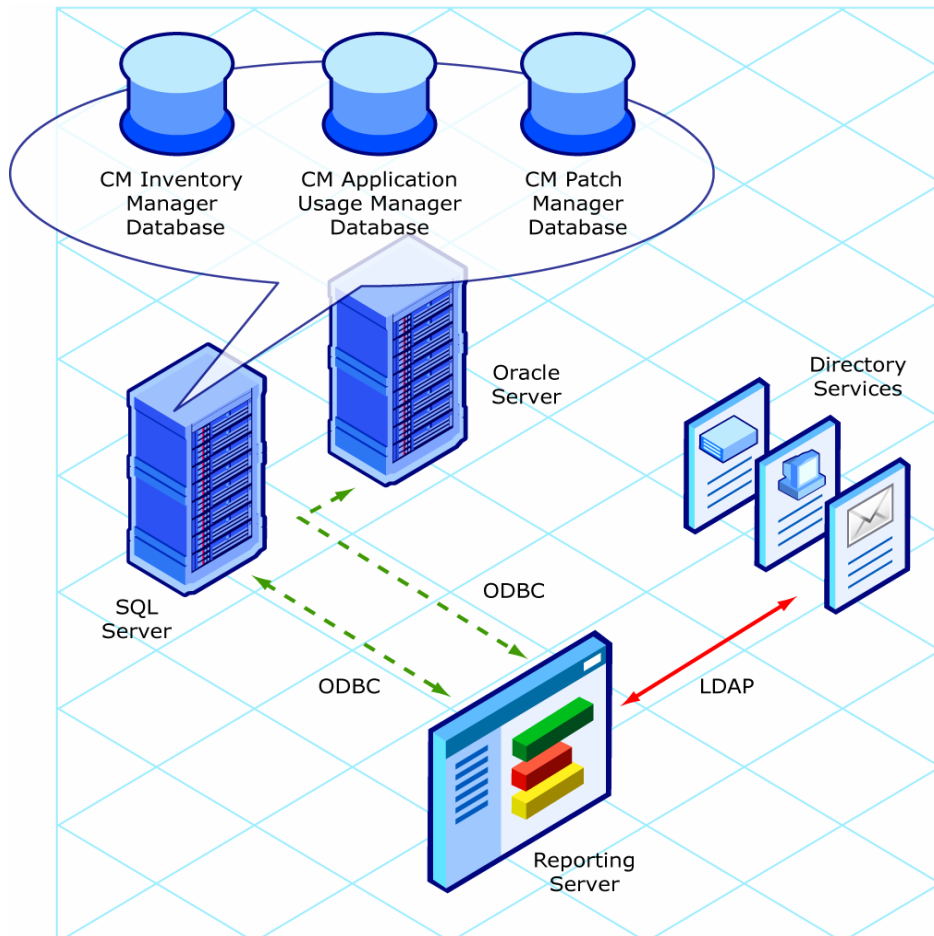
CM Reporting Server

The CM Reporting Server allows you to use SQL data for reporting. As part of the CM extended infrastructure, the web-based CM Reporting Server allows you to query the data in the CM Patch Manager, CM Inventory

Manager, CM Application Usage Manager, and CM Server Management databases and create detailed reports. You may also mount an existing LDAP directory, which allows you to filter your data using your LDAP directory levels.

A sample CM Reporting Server environment is illustrated in Figure 11 below.

Figure 11 Sample CM Reporting Environment



The CM Reporting Server provides the following additional value to the infrastructure:

- **Connections to SQL databases:** The CM Reporting Server can access any SQL database, such as those for CM Inventory Manager, CM Patch Manager, CM Server Management, and CM Application Usage Manager.

However, all SQL databases accessed by the CM Reporting Server must exist on a single SQL or Oracle Server.

- Connections to LDAP directory (optional): The CM Reporting Server supports optional access to an existing LDAP directory in your enterprise. Access to an LDAP directory allows you to filter report data according to the directory entries.

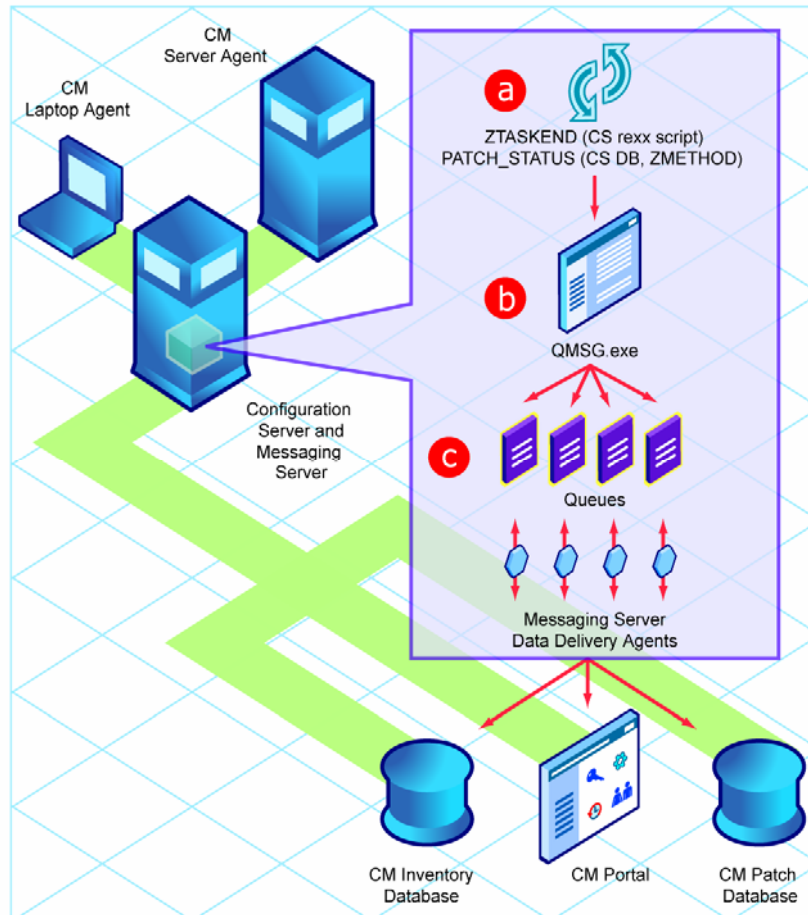
Refer to the *HP OpenView Configuration Management Reporting Server Installation and Configuration Guide*.

CM Messaging Server

The CM Messaging Server is a service that continually monitors a pre-defined location on the server and routes data to external destinations. The CM Messaging Server provides retry, rerouting, and failover capabilities to ensure that all data are transferred efficiently and reliably.

If the CM Messaging Server is installed on the same server as the CM Configuration Server. The CM Messaging Server receives data from managed devices and delivers it to the appropriate ODBC database, the CM Portal directory, or another CM server. For example, if CM Patch Manager data are being transferred, the CM Messaging Server will post the patch data to the appropriate SQL database.

Figure 12 CM Messaging Server routes data



The CM Messaging Server uses Data Delivery Agents (DDAs) to handle the routing of agent objects for patch management, inventory management, server management, and application usage management to the appropriate reporting database. Data delivery agents use HTTPS or HTTP to post data directly to an ODBC database, or, to forward data securely to another directory or server (such as another CM Messaging Server that is used to post the data to a local database).

The CM Messaging Server runs on all Windows and UNIX platforms supported by the CM Configuration Server. The CM Messaging Server can:

- Route a single message to multiple destinations.

- Automatically retry a delivery.
- Re-route messages to a new host after several unsuccessful delivery attempts.

Refer to the *HP OpenView Configuration Management Messaging Server Installation and Configuration Guide*.

CM Management Extensions

CM management extensions provide integration and extended enterprise functionality. They allow CM to interface with other technologies such as **Lightweight Directory Access Protocol (LDAP)** and **Secure Sockets Layer (SSL)**. Similar to the CM extended infrastructure, CM management extensions can be divided into common components, such as the CM KB Server, and products, including CM Extensions for Windows Installer, CM Policy Server, and the CM Batch Publisher.

Figure 13 CM management extensions

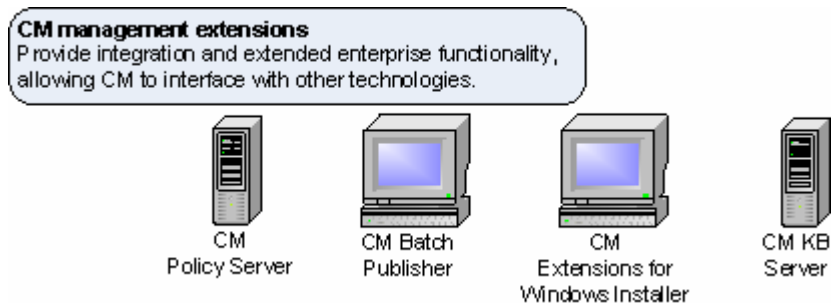


Table 7 CM management extensions essential functions

CM management extension	Use
CM Extensions for WI	Publishes and manages Windows Installer applications.
CM Policy Server	Uses external directory services to implement policy.
CM Batch Publisher	Creates fully automated, unattended updates to application packages.

CM management extension	Use
CM KB Server	Populated with data in the form of state files. State files consist of data that represent the current state of an application

CM Adapter for SSL

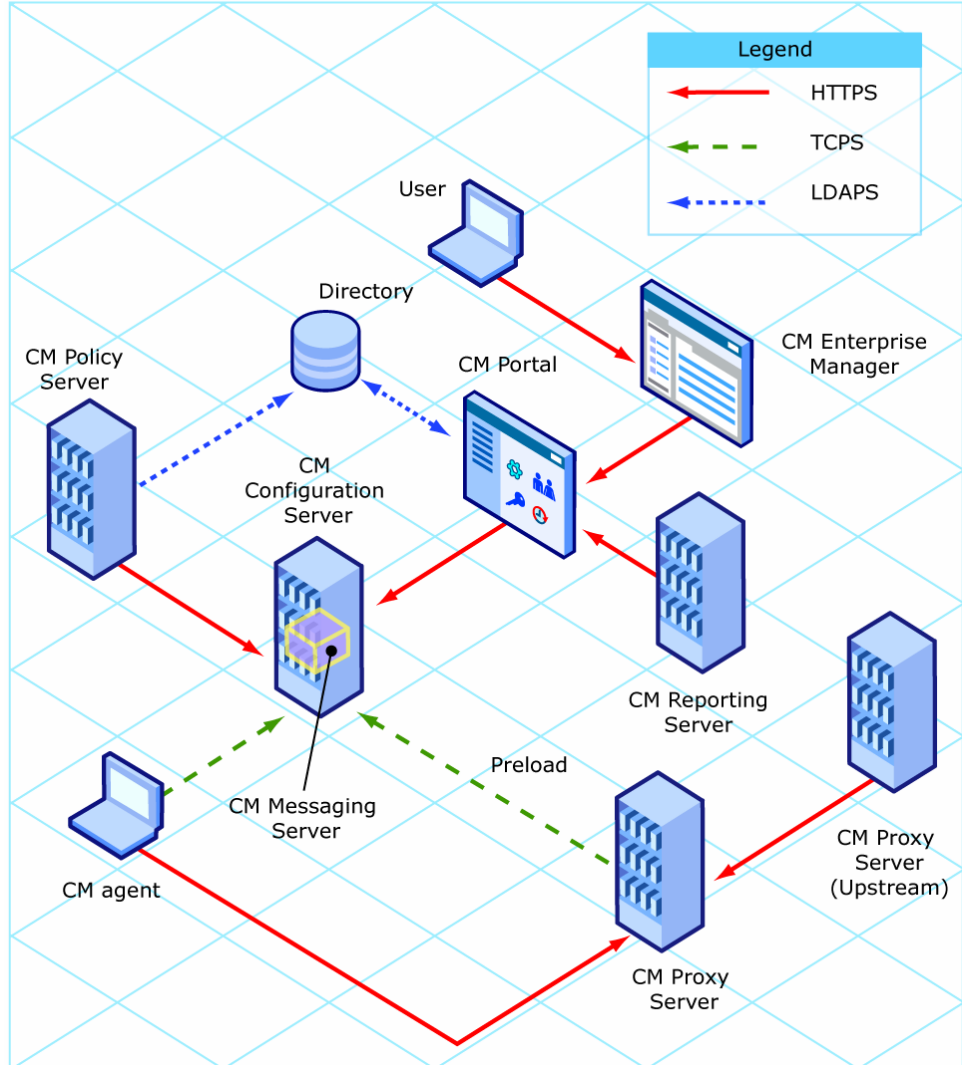
This stand-alone product has been retired from the CM suite of products. SSL functionality is now built into each of the CM products.

The *HP OpenView Configuration Management Adapter for SSL Installation and Configuration Guide* has been replaced by the *HP OpenView Configuration Management SSL Implementation Guide*, which documents the optional **Certificate Generation Utility**. The Certificate Generation Utility is:

- Provided *as-is* and *free of charge*.
- *Not* a supported CM product.
- Used at *your own discretion*; HP Technical Support will *not* address any issues regarding its use or functionality.

Figure 14 on page 50 shows an overview of the various types of communications and relationships that are possible in a CM environment.

Figure 14 Overview of communications



CM Extensions for WI

The CM Extensions for WI is a management system that is designed to automate and simplify the enterprise application integration laboratory process. Use this product to build, test, maintain, deploy, and troubleshoot Windows Installer applications and installation packages.

The **CM Packager for WI** gives you complete control over the resource gathering, analysis, and creation of a Windows Installer package. Complete packaging of an application typically takes less than an hour. Several interfaces allow you to choose the session granularity that you require:

- Use the **CM Packager Menu** to run a typical, unified packaging session or to use one of the custom options for creating a modified package.
- Or, use the **CM Packager Process Menu** to access a comprehensive flowchart of all package creation components that are part of the CM Extensions for WI suite.

The underlying components of the CM Packager for WI include a set of wizards and an editor. These can be launched individually or can be automatically launched from one of the menu options.

- **CM State Wizard**
Create and modify state files.
- **CM Library Wizard**
Create and modify library files.
- **CM Package Wizard**
Build and modify the Windows Installer packages.
- **CM Install Wizard**
Publish packages into a non-CM distribution point, or modify packages using transforms. For publishing Windows Installer packages to the CM-CSDB, refer to the *CM Admin Publisher Guide*.
- **CM Insulation Wizard**
Use application specific resources that are isolated from other applications.
- **CM Configuration Analyzer**
View, store, and compare application data. See CM Configuration Analyzer on page 52 and refer to the *CM Configuration Analyzer Guide*.
- **CM Knowledge Base Server**
Populates the CM Knowledge Base with data in the form of state files.
- **CM MSI Editor - CM MSIEdit**
Allows you direct access to the Windows Installer database tables through an easy to use interface.

Refer to the *CM Extensions for Windows Installer Getting Started Guide* and the *CM Extensions for Windows Installer User Guide*.

CM Configuration Analyzer

The CM Configuration Analyzer administrator console simplifies your view of application management. Backed by a database, imported state files keep a detailed history of all of the resources needed by an application to run successfully. The console can identify conflicts between two or more applications. With this historical and complete set of information, you can determine the impact on your environment of:

- Deploying a new application.
- Upgrading an existing application.
- Adding or modifying modules, registry keys, and data files.

The CM Configuration Analyzer performs integration and management analysis functions. Administrators can profile applications, initiate application comparisons or views, analyze applications, populate the CM Knowledge Base Server, and establish and manage CM Knowledge Base permissions.

To analyze data with the CM Configuration Analyzer, data must be in the form of a state file. State files are generated by different CM products, including the CM Packager for WI, CM Application Usage Manager, CM Patch Manager, and the CM Admin CSDB Editor. Refer to the product guides for more information about how to create state files with each product.

CM KB Server

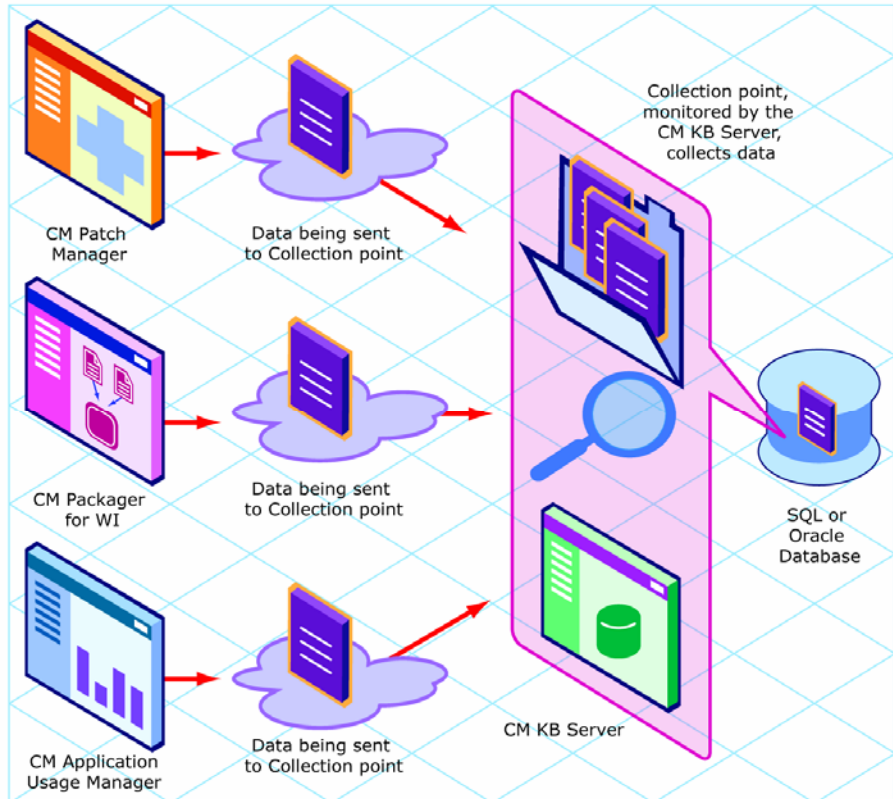
The CM Knowledge Base database may be either a SQL Server or an Oracle database configured in your environment. The CM Knowledge Base is populated with data in the form of state files. State files consist of data that represent the current state of an application. This data is acquired by the CM KB Server from a continuously monitored user-specified directory referred to as a collection point. When data is detected in this collection point, it is automatically transferred to the CM Knowledge Base. The collection point is populated by one or more products including the CM Patch Manager, CM Application Usage Manager, and CM Packager for WI. From here, the CM Configuration Analyzer can analyze the data. Application usage can be viewed with the CM Reporting Server.

The CM KB Server is capable of importing several types of state files including:

- CM Configuration Server Service/Package component extracts
- State files built by the CM Extensions for WI components

- CM Application Usage Manager collection files
- State files built by the CM Patch Manager

Figure 15 CM KB Server process



Refer to the *HP OpenView Configuration Management Knowledge Base Server Installation and Configuration Guide*.

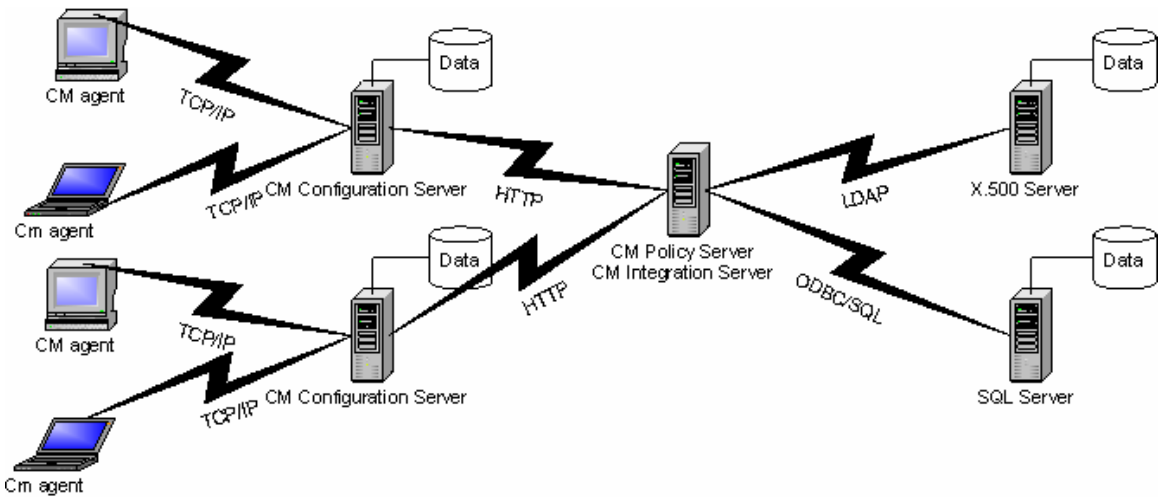
CM Policy Server

The CM Policy Server is a Web server used for administration purposes such as mapping services to users in an external directory tree. Connections made in the CM-CSDB to Lightweight Directory Access Protocol (LDAP) directory

are used to determine what services should be distributed and managed for the user that is currently logged on by querying the CM Policy Server.

The CM Policy Server integrates with external LDAP directory servers and SQL databases to enable single source points of control for user authentication, access policies, and user entitlement. These LDAP directory servers include Microsoft Active Directory, Novell NDS, and other vendor's LDAP servers, as well as Oracle, Sybase and Microsoft SQL-based databases.

Figure 16 CM Policy Server integrates with LDAP and SQL



For more information, refer to the HP Software support web site and the *HP OpenView Configuration Management Policy Server Installation and Configuration Guide*.

CM Batch Publisher

The CM Batch Publisher is a command line driven publishing tool that can easily be integrated with third-party configuration management and packaging products for fully automated, unattended updates to application packages. The CM Batch Publisher provides an alternative to the Component Selection Mode of the CM Admin Packager. The CM Batch Publisher offers an automated, repeatable command-line process, while the CM Admin Publisher must be monitored from start to finish.

The CM Batch Publisher identifies a set of files and components, and publishes them, in a controlled, automated, repeatable manner, to the CM-CSDB where they are stored as objects. Its focus is distributing updates to

content, data, and applications rather than initial application packaging. Digital content, such as file sets, graphics, price lists, and interest rates, are types of managed lists that might require an automated update process such that CM Batch Publisher can provide.

The CM Batch Publisher can:

- Scan for files on multiple drives or file systems
- Scan and publish files from any mapped drive or file system
- Be configured to limit the subdirectories that are scanned
- Include or exclude files at the file level
- Select files by type

The CM Batch Publisher can also accommodate frequent patching of internal applications, as well as publish build versions, and output from HP legacy (PVCS or ClearCase) adapters. Its capacity to revise content material is reliable, and can execute continuously, at designated times, and in pre-determined intervals. It can easily be run from within any script or code capable of calling a command prompt. Refer to the *HP OpenView Configuration Management Batch Publisher Installation and Configuration Guide*.

CM Systems Management Adapters

You can integrate the CM infrastructure with event, security, and performance management, and help desk environments of other vendors' products. The CM Systems Management Adapters allow CM and third-party products to exchange information. There are adapters available for HP OpenView, IBM Tivoli Management Framework and the Tivoli Enterprise Console, Computer Associates Unicenter, Remedy Help Desk, Microsoft SMS and Microsoft Operations Manager, or any SNMP-compliant system. Contact your HP representative for information on available adapters.

Essential Functions

Table 8 on page 56 summarizes the essential functions for each product. For more information on each product, see the product's section in this chapter and the associated publications.

Table 8 CM products and essential functions

Use	To
CM management applications	
CM Server Management Agent	<ul style="list-style-type: none">• Deploy server applications.• Manage Windows Terminal Server and Citrix applications.• Manage baselines.• Manage configuration files.
CM Application Manager Agent	<ul style="list-style-type: none">• Deploy mandatory packages to unattended devices.
CM Inventory Manager Agent	<ul style="list-style-type: none">• Track and report on hardware and software on agent devices. Used with the CM Inventory Manager Server. Note that the CM Inventory Manager has both agent and server components.
CM OS Manager Agent	<ul style="list-style-type: none">• Provision and manage operating systems on agent devices. Used with the CM OS Manager Server. Note that the CM OS Manager has both agent and server components.
CM Patch Manager Agent	<ul style="list-style-type: none">• Deploy and analyze vendor's security patches and bulletins. Used with the CM Patch Manager Server. Note that the CM Patch Manager has both agent and server components.
CM Application Self-service Manager Agent	<ul style="list-style-type: none">• Have subscribers decide when to install the packages that they are entitled to.
CM management infrastructure	
CM Configuration Server	<ul style="list-style-type: none">• Configure and maintain the desired state for your enterprise devices and client computers.
CM Administrator	<ul style="list-style-type: none">• Configure or maintain your CM environment.
CM Extended Infrastructure	
CM Distributed Configuration Server	<ul style="list-style-type: none">• Replicate part or all of your CM-CSDB across a network of CM Configuration Servers.

Use	To
CM Enterprise Manager	<ul style="list-style-type: none"> • Uses Web services to set policy interacting with your directory service and your CM Configuration Server.
CM Portal	<ul style="list-style-type: none"> • Manage your CM infrastructure through a Web browser.
CM Multicast Server	<ul style="list-style-type: none"> • Send the same resources in one data stream to multiple agents at the same time.
CM OS Manager	<ul style="list-style-type: none"> • Provision and manage operating systems on agent devices. Used with the CM OS Manager Server. Note that the CM OS Manager has both agent and server components.
CM Patch Manager	<ul style="list-style-type: none"> • Deploy and analyze vendor's security patches and bulletins. Used with the CM Patch Manager Server. Note that the CM Patch Manager has both agent and server components.
CM Proxy Server	<ul style="list-style-type: none"> • Use cache management over HTTP or TCP/IP to store and transmit application data dynamically, freeing resources on the CM Configuration Server.
CM Application Usage Manager	<ul style="list-style-type: none"> • Assess patterns of application usage in your environment.
CM management extensions	
CM SSL Adapter	<ul style="list-style-type: none"> • Maintain the safety and confidence of transmitted information.
CM Extensions for WI	<ul style="list-style-type: none"> • Publish and manage Windows Installer applications.
CM Policy Server	<ul style="list-style-type: none"> • Use directory services to implement CM policies.
CM Batch Publisher	<ul style="list-style-type: none"> • Create fully automated, unattended updates to application packages.
CM Systems Management Adapters	<ul style="list-style-type: none"> • Exchange data with other vendors' products.

Infrastructure Example

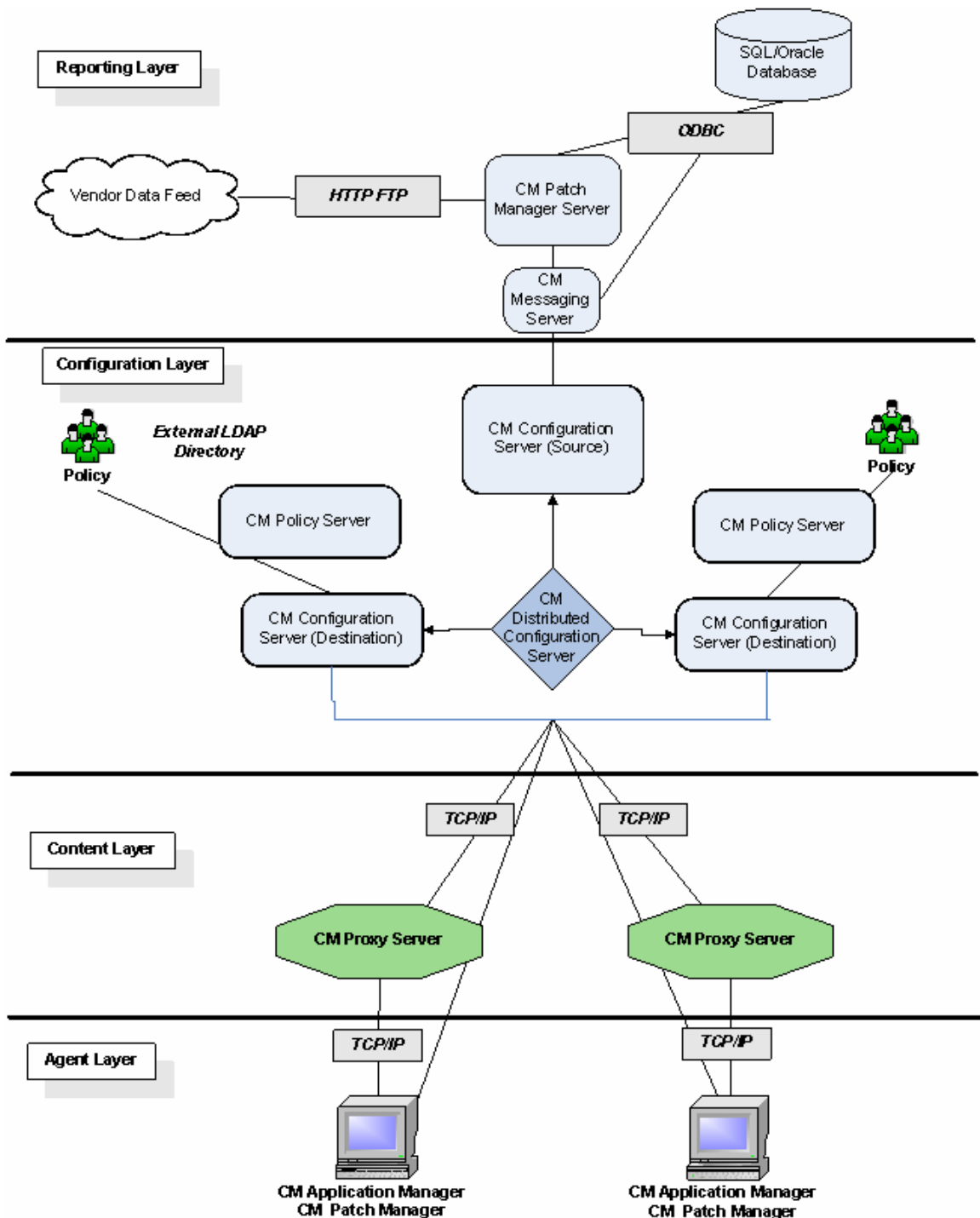
Now that you have some familiarity with CM, the following example shows how these products and components might work together.

Suppose you wanted to be able to do the following:

- Manage mandatory data (CM Application Manager).
- Analyze and manage security vulnerabilities (CM Patch Manager).
- Use your existing external LDAP directory services to create entitlements (CM Policy Server).
- Place servers with your data in network strategic locations to your target devices (CM Proxy Server).
- Distribute management of the devices across your enterprise. (CM Configuration Server and the CM Distributed Configuration Server)

In this case, you would want to combine the functions of the CM Application Manager, the CM Configuration Server, the CM Policy Server, the CM Proxy Server, the CM Distributed Configuration Server, and the CM Patch Manager. A diagram of your network might be similar to Figure 17 on page 59.

Figure 17 Create a CM Patch Manager environment



Summary

- CM products can be divided into four categories: management infrastructure, extended infrastructure, management extensions, and management applications.
- Install the CM management applications on your agent computers and devices to manage and track data.
- The CM management infrastructure represents the core of CM activities.
- Use the CM extended infrastructure to increase scalability of the CM management infrastructure.
- CM management extensions are available to allow you to exchange information between CM and other systems management software.

3 Essential Processes

At the end of this chapter, you will:

- Be familiar with the structure of the CM Configuration Server Database (CM-CSDB) and CM agent objects.
- Know the dynamics of a service.
- Be familiar with the packaging process.
- Understand the CM agent connect process.
- Understand the resolution process.
- Understand the inventory collection process.
- Know the basics of CM Proxy Server processing.
- See the CM OS Manager image deployment architecture.
- Know how the CM Patch Manager acquires security patches.
- Be familiar with how the CM Configuration Baseline Auditor works.

In order to understand the discussions of essential CM processes in this chapter, you must have an understanding of the CM-CSDB and CM agent objects. You should also be familiar with the terms described in Terminology on page 15.

CM Configuration Server Database

The CM-CCSDB, stored on the CM Configuration Server, records your enterprise's desired state model. This model contains the data to be distributed, policies which define the services that users or devices are entitled to, and security and access rules for administrators. Refer to the *HP OpenView Configuration Management Configuration Server Database Reference Guide*.

The database is hierarchically structured as follows:

- **Files** are used to group similar domains. The PRIMARY File is used to define and maintain the desired state.
- **Domains** are logical file partitions that are used to group similar classes. The POLICY Domain contains the classes needed to create users and groups.
- **Classes** are templates that contain the attributes needed to create an instance. A class represents a category of the desired state. The USER Class of the POLICY Domain defines users of managed applications. It defines all of the attributes necessary to identify the managed device.
- **Instances** are actual occurrences of classes. The attributes of a class instance contain data describing one specific entity of that class. For example, a USER instance contains the information needed to identify target devices or user.
- **Attributes** are data elements of a class. The class contains the definition (e.g., the name, data type, description, and length) for each attribute that belongs to the class. Each class instance created from the class contains a value for each of the attributes defined in the class. For example, the NAME attribute of a USER class contains the name of the user.

Default Domains

When you install the CM Configuration Server, LICENSE and PRIMARY are the only two files available. As you use CM, your CM-CSDB may change. Some of the management infrastructure products add other domains. For example, CM Patch Manager adds the PATCHMGR Domain, and CM

Application Usage Manager adds the USAGE Domain. CM OS Manager uses the OS and MACHINE Domains.

- The LICENSE File is read-only and used for CM Configuration Server processing. This file is for HP use, and should not be modified.
- The PRIMARY File is where you will find most information regarding software management. Within the PRIMARY File, there are eight default domains.
 - Use the ADMIN Domain to define administrative rights and rules for connecting classes.
 - Use the APPMGMT Domain to manage CM Application Management Profiles.
 - Use the AUDIT Domain to configure tasks that will inventory managed devices.
 - Use the CLIENT Domain to configure Client Operations Profiles. This includes defining which CM Configuration Servers and CM Proxy Servers the managed devices can use.
 - Use the POLICY Domain to create users and groups, and to assign users to groups.
 - Use the PRDMAINT Domain to store packages for self-maintenance.
 - The SOFTWARE Domain contains information about the software being managed and the methods used to deploy the software.
 - The SYSTEM Domain contains administrative and process control definitions.

As you begin to use CM, the PROFILE File appears. This file contains information that is collected from managed devices. The file appears after the first CM agent has registered with the CM Configuration Server. This information is used to connect to target devices to deploy software managed by CM, and to see the configuration of the managed device.

The NOTIFY File contains information about attempts by the Notify function to update, remove, or e-mail subscribers. This file appears after the first attempted Notify.

In this chapter, you will find the different parts of the CM-CSDB defined in the following ways:

Table 9 CM Configuration Server Database usage

Element	Style	Example
Files (in the CM- CSDB)	All uppercase	PRIMARY
Domains (in the CM- CSDB)	All uppercase	PRIMARY.SOFTWARE May also be referred to as the SOFTWARE Domain in the PRIMARY File.
Classes (in the CM- CSDB)	All uppercase	PRIMARY.SOFTWARE.ZSERVICE May also be referred to as the ZSERVICE Class in the SOFTWARE Domain in the PRIMARY File.

Refer to the *HP OpenView Configuration Management Configuration Server Database Reference Guide*.

CM Agent Objects

When a device connects to the CM Configuration Server, information is exchanged between the CM agent and the CM Configuration Server. This exchange is called resolution. During resolution, the CM agent checks the status of services, and updates the CM Configuration Server with information from objects stored on the device. The resolution process will be described in more detail later in this chapter.

CM agent objects are stored in a directory, called IDMLIB, on the managed device. After installing the CM agent and connecting to the CM Configuration Server, you can use CM agent objects to answer questions such as:

- What is the hardware configuration of the managed device?
- Was the service successfully installed?
- When was the service installed?
- What is the managed device's name, and who was the last user to log on?
- What are the possible data sources for this managed device?

While there are multiple CM agent objects on a managed device at any time, there is a core group of objects that supply information and the status of the current CM agent connect. These objects are referred to in some of the

processes discussed in this chapter. The table below includes information on when one of these objects is created or updated, and a brief summary of what the object includes. There are other objects created during the CM agent connect, only some are noted here. Refer to the *HP OpenView Configuration Management Application Manager Installation and Configuration Guide*.

Table 10 Agent Objects

Object Name	Description
PREFACE	PREFACE is sent to the CM Configuration Server at every phase of a CM agent connect. It contains parameters used for the current connect such as the type of connect, the user name, and if the list of applications is being updated.
ZCONFIG	ZCONFIG is created at the start of the CM agent connect process. It contains basic hardware information for the managed device such as processor, operating system, and drives.
APPEVENT	APPEVENT reports on the status of application events, such as installation, verify, repair, and removal.
ZMASTER	ZMASTER is sent to the CM Configuration Server at the beginning of the CM agent connect. It includes information that is used to identify the managed device to implement policy, such as user identification, operating system, and computer name.

Service Dynamics

Within your enterprise, you have groups (packages) of data and applications that you want to control. A **package** is a data set that is published as an individual entity. It includes the files, desktop shortcuts, and registry entries needed for a particular application, such as Microsoft Word. After you have identified these packages, you can categorize them into services. A **service** allows you to organize a group of related packages, methods, or behaviors into manageable units. One package could be a manageable unit.

For example, you may want to manage an anti-virus application. Usually, you will need the anti-virus software and a data file that holds virus information. Since you would have no use for the data file without the software, you might group these two packages into one service. If for

whatever reason you want to manage them separately, you would associate each of these packages with a separate service.

If you are creating a service for the purpose of managing an application, the service might evolve as follows:

- 1 Use the CM Admin Packager or CM Admin Publisher to create a package. See Publishing and Packaging Process with CM Admin Packager on page 70.
- 2 Use the CM Admin CSDB Editor to create and edit the properties of a service associated with packages.
- 3 Use the CM Admin CSDB Editor to set **policy** for a user or group and, thereby, create your desired state. A policy defines to which applications subscribers and agent computers are entitled.
- 4 The CM agent and the CM Configuration Server use the CM agent connect process and the resolution process, respectively, to create the desired state. See CM Agent Connect on page 74 and Resolution Process on page 79.
- 5 The CM agent completes the updates, removals, installations, and verifications needed to achieve its desired state.

About Packaging and Publishing with CM

Packaging is the process of identifying resources, editing the instance attributes of those resources, defining how they are to be installed, and saving the resources and installation instructions in a machine-readable file format. A package typically contains one or more files and configuration settings.

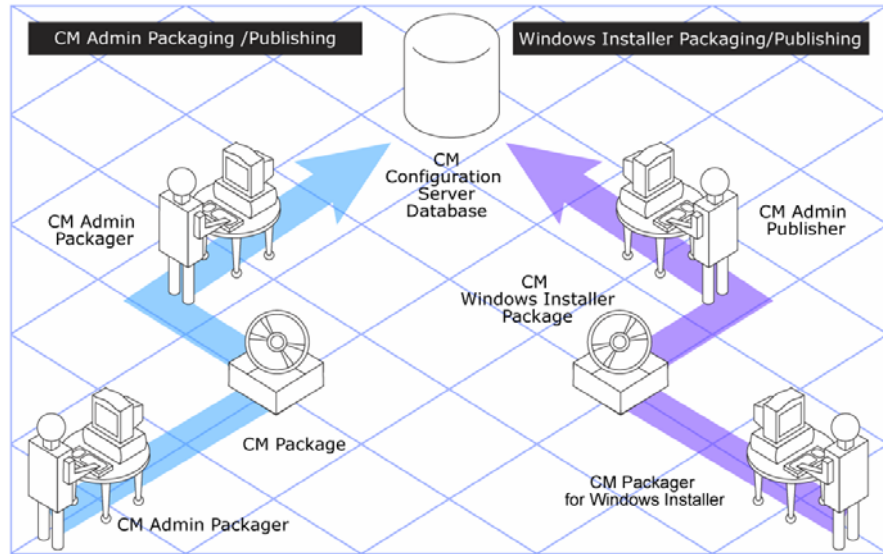
Publishing is the process of importing a package and its imbedded information to the CM-CSDB. A package must be published before its content can be distributed and deployed into your environment.

CM offers many different packaging and publishing options through multiple tools. Note the different types of resource packages that you will create and publish, then choose your CM packaging and publishing products as required.

- If you are packaging Windows Installer files, use the CM Admin Packager for Windows Installer. (Refer to the *HP OpenView Configuration Management Extensions for Windows Installer User Guide*).

- If you are publishing Windows Installer files, use the CM Admin Publisher. (Refer to the *CM Admin Publisher Guide*).
- To package and publish all other types of files and applications, use the CM Admin Packager. (Refer to the *HP OpenView Configuration Management Application Manager Installation and Configuration Guide*).

Figure 18 CM packaging/publishing options

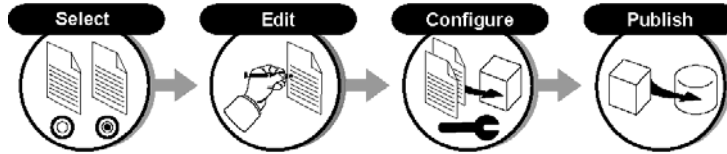


CM Admin Publisher

Use four steps in the CM Admin Publisher to publish files to the CM-CSDB.

- 1 Select**
Select the file or image to be published to the CM-CSDB.
- 2 Edit**
Create the Administrative Installation Point, simulate the application's user interface, edit MSI features and properties, select any transforms, and enable Machine/User parameters (Windows Installer files only).
- 3 Configure**
Provide the information that you need to create a CM package or service that will be published to the database.
- 4 Publish**
Publish to the CM-CSDB.

Figure 19 Publishing steps for CM Admin Publisher



Refer to the *HP OpenView Configuration Management Administrator Publisher Guide*.

Publishing and Packaging Process with CM Admin Packager

The packaging process identifies the components of the software (files, shortcuts, registry entries) and organizes them into packages. Packages are compressed for speedier delivery over limited bandwidth, and can be stored on the CM Configuration Server or on a CM Proxy Server that is closer to the subscribers.

The CM Admin Packager is used to create the packages. To **package** is to bundle a set of related data into a single unit that can be managed by CM. Two packaging modes are available in the CM Admin Packager: Installation Monitor Mode and Component Selection Mode.

- **Installation Monitor Mode (CM Admin Packager)**

In Installation Monitor Mode, the CM Admin Packager scans the computer before and after you install the software to determine what to package. It **differences** the before and after scans to determine what changes were made to the computer. These differences make up the package that you promote to the database.

- **Component Selection Mode (CM Admin Packager)**

In Component Selection Mode, you select the individual components that make up the application, such as files, directories, registry entries, and links.

You can also use the CM Batch Publisher to automate publishing. See CM Batch Publisher on page 54.

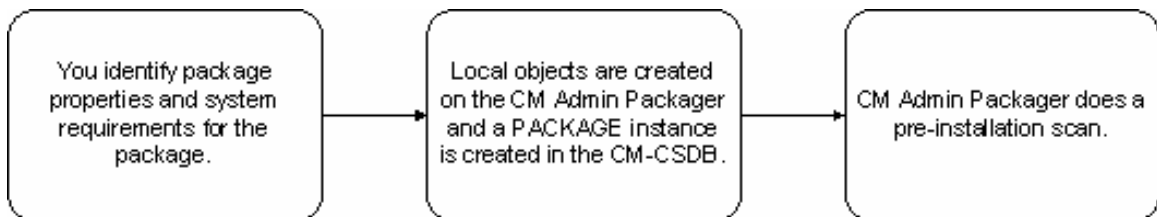
Installation Monitor Mode

In Installation Monitor Mode, the CM Admin Packager scans the computer before and after you install the software. It **differences** the before and after scans to determine what changes were made to the computer. These

differences make up the package that you promote to the CM-CSDB. We recommend this mode for packaging when you do not know all of the components that make up the application.

- 1 Identify the package properties such as package name, description, and version number. A local object that contains this information is created. And an instance that contains this information is created in the PACKAGE Class of the CM-CSDB. A ZSTOP expression, that prevents the application from being deployed before the package creation is complete, is added to the database.
- 2 Select the requirements for operating system, memory, processor speed, and availability.
- 3 Specify the location of the files to scan, and whether or not to also scan registry and desktop items.
- 4 Local objects that include information about the package requirements are created on the CM Admin Packager computer, system, and initialization files to check for differences.
- 5 The CM Admin Packager does a pre-installation scan of the CM Admin Packager computer.

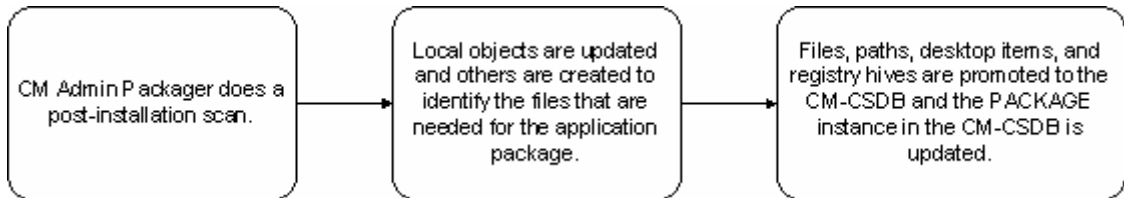
Figure 20 Installation Monitor Mode pre-installation steps



- 6 Install the application that you want to monitor.
- 7 After the installation is finished, CM Admin Packager restarts and performs a post-installation scan. The local CM agent objects are updated to reflect what the CM Admin Packager records as the differences between the pre-installation and post-installation scan.
- 8 Change file, registry, and desktop properties, if needed.
- 9 The CM Admin Packager promotes the data needed to install the application to the CM-CSDB in a compressed format. The PACKAGE Instance in the CM-CSDB is updated with all of the path, registry, file, and desktop instances as described below:
 - One File Resources (FILE) instance for each file in the package.

- One Desktop (DESKTOP) instance for each program group, link, and shortcut in the package.
- One Path (PATH) instance for each unique path to one or more components on the computer where the software is installed.
- One Registry Resources (REGISTRY) instance for each hive in the package.

Figure 21 Installation Monitor Mode post-installation steps



In the tree view of Figure 22 below you see the Stratus Pad package for Windows 2000 and Windows XP with all four types of instances.

Figure 22 Stratus Pad package contains multiple instances

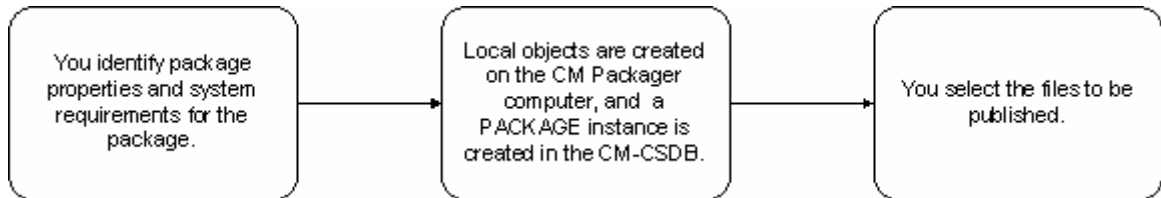
The screenshot displays the Database Tree View for the Stratus Pad package. The tree view on the left shows the package structure for Windows NT/2000/XP and Windows 95/98. The right pane shows the Application class StratusPad Instance Attributes table.

Name	Attribute Description	Value
ZSTOP000	Expression Resolution Method	WORDPOS(I
ZSTOP001	Expression Resolution Method - 001	
ZSTOP002	Expression Resolution Method - 002	
ZSTOP999	Stop Unless Radio Connect	
ZSVCSNAME	Service Name/Description	StratusPad
ZSVCTYP	Application Target Type [A/S]	
ZSVCMO	Mandatory or Optional [M/O/MO/OM]	0
ZSVCCSTA	Service Status on Client (999)	999
ZSVCPRI	Service Create Ordering [01-99]	
C_ALWAYS_	Contains	
C_ALWAYS_	Contains	
C_ALWAYS_	Contains	
C_ALWAYS_	Contains	
I_ALWAYS_	Contains	SOFTWARE
I_ALWAYS_	Contains	SOFTWARE
I_ALWAYS_	Contains	
I_ALWAYS_	Utility Resolution Method	
BCREATE	Service Pre-Installation Method	
ZCREATE	Service Installation Method	
ZINIT	Service Initialization Method	
BDELETE	Service Pre-Delete Method	
ZDELETE	Service Delete Method	
BUPDATE	Service Pre-Update Method	
ZUPDATE	Service Update Method	
ZVERIFY	Service Verify Method	
BREPAIR	Service Pre-Repair Method	

Component Selection Mode

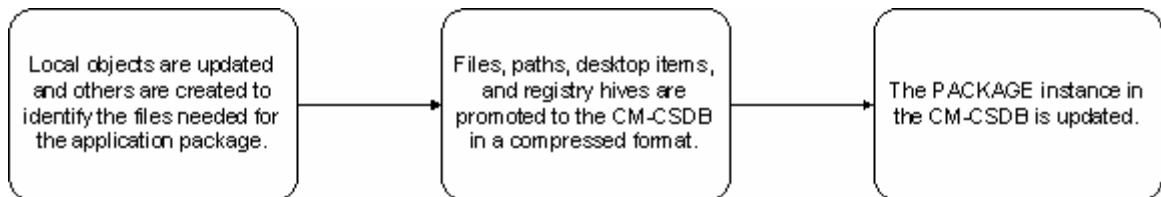
In Component Selection Mode, you select the individual components of the application, such as files, registry entries, and links. We recommend this mode for packaging simple data or applications.

Figure 23 Select components to publish



- 1 Identify the package properties such as package name, description, and version number. A local object that contains this information is created. An instance that contains this information is created in the PACKAGE Class of the CM-CSDB. A ZSTOP expression, that prevents the application from being deployed before the package creation is complete, is added to the database.
- 2 You also choose the requirements for operating system, memory, processor speed, and availability. Local objects that include information on the package requirements are created on the CM Admin Packager computer.
- 3 Select the files that you want to include in the package including exported registry hives and desktop shortcuts. The file formats of the registry and desktop files are transformed so that they are promoted as registry and desktop items rather than as file instances.
- 4 Change file, registry, and desktop properties, if needed.

Figure 24 Selected components are promoted to CM-CSDB



- 5 The CM Admin Packager promotes the data you identified for the application to the CM-CSDB in a compressed format. The PACKAGE

Instance in the CM-CSDB is updated with all of the path, registry, file, and desktop instances as described below:

- One File Resources (FILE) instance for each file in the package.
- One Desktop (DESKTOP) instance for each program group, link, and shortcut in the package.
- One Path (PATH) instance for each unique path to one or more components on the computer where the software is installed.
- One Registry Resources (REGISTRY) instance for each hive in the package.

CM Agent Connect

The purpose of the CM agent connect is to ensure that the device matches its desired state. The desired state embodies the data and entitlements for each device. A model representing the desired state for each device is stored in the CM-CSDB.

The CM agent connect is initiated when a CM agent object is sent to the CM Configuration Server. Typically, this is the ZMASTER object, which contains information about the managed device, such as the device's identity and IP address.

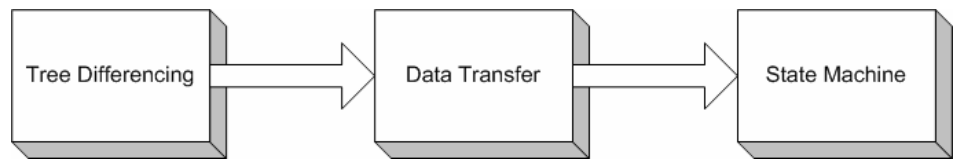
The ZMASTER object can be sent to the CM Configuration Server as a result of one of the following events:

- A scheduled Timer event.
Timers are usually associated with a particular service. Use the CM Application Manager or CM Inventory Manager to trigger timers periodically or randomly within a certain time period.
- A Notify sent by the CM Configuration Server to the device.
A Notify is a message that is sent to the managed device. Use the CM Application Manager or CM Inventory Manager to tell the device to start a CM agent connect.
- A refresh of the Service List on the managed device in the CM Application Self-service Manager.
To manage services, the CM administrator first entitles the services. Then, the user uses the Service List to manage the installation, verification, removal, repair, and update of a service.

The CM agent connect process involves the following three stages.

- 1 **Tree Differencing** to download the new objects from the CM Configuration Server, create the **difference objects** (delta objects), and identify any data that needs to be retrieved.
- 2 **Data Transfer** in which data is downloaded to a temporary location.
- 3 **State Machine** processing to install files from the temporary location to the live location, and create the new desired state objects to manage services.

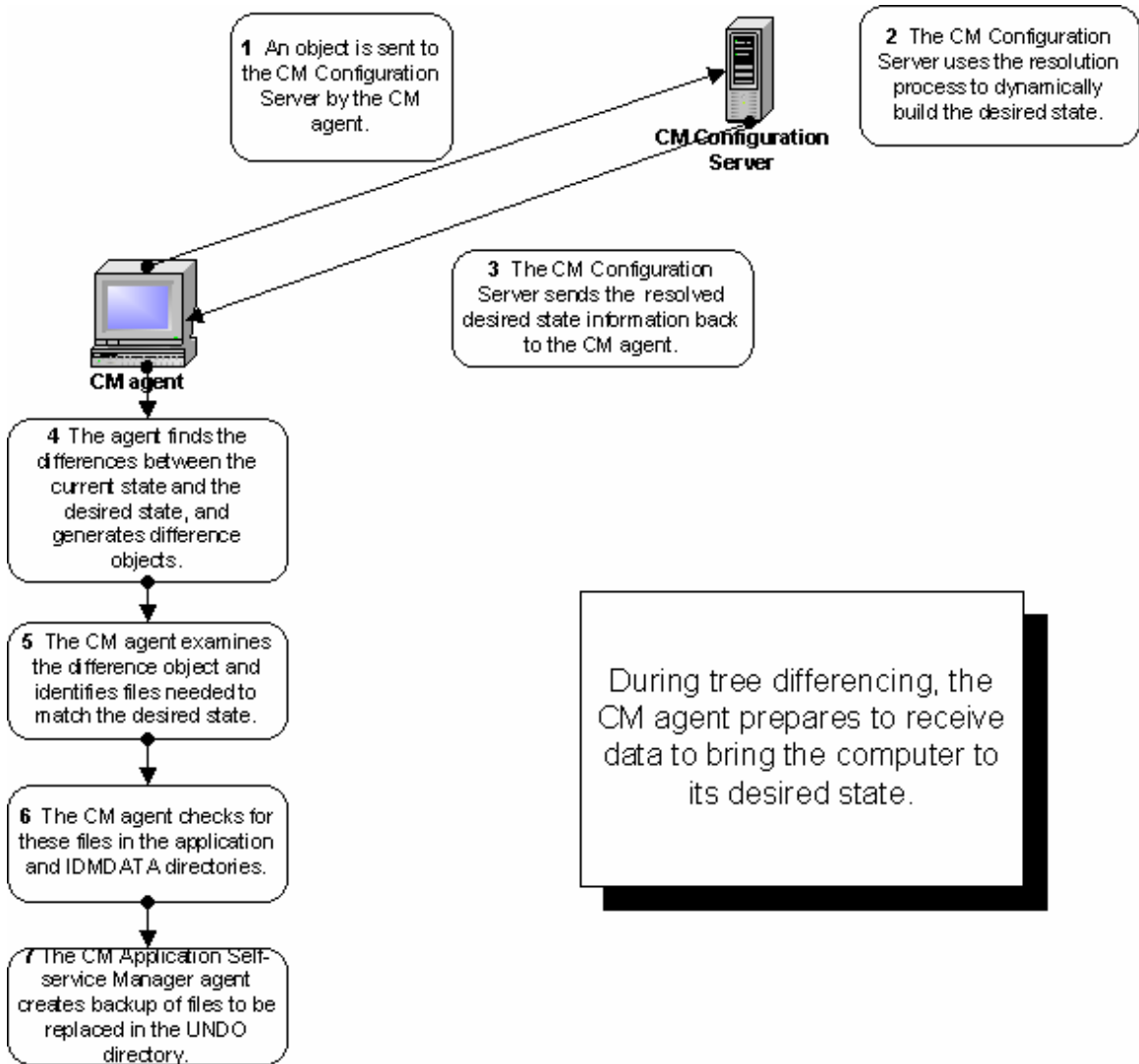
Figure 25 Three phases of CM agent connect process



Tree Differencing

During the Tree Differencing phase of the CM agent connect, the managed device identifies which files it needs to bring the device to the desired state. The CM agent differences the data between the configuration information on the device and the CM Configuration Server. First, the CM agent sends the ZMASTER object to the CM Configuration Server. Then, the CM Configuration Server builds the desired state based on the parameters designated for the user in the ZMASTER object. The desired state is sent back to the device as a new object, where the agent synchronizes the old and new objects between the server and the device. See Figure 26 on page 76.

Figure 26 CM agent completes Tree Differencing process



Tree differencing works by using a reference list, which is like an object dictionary; it stores the different names for a particular class. The reference list is updated whenever a change is detected in the branches or leaves of the tree. The differencing algorithm relies on a name algorithm to generate predictable names for the difference object, the downloaded object, and the branch object.

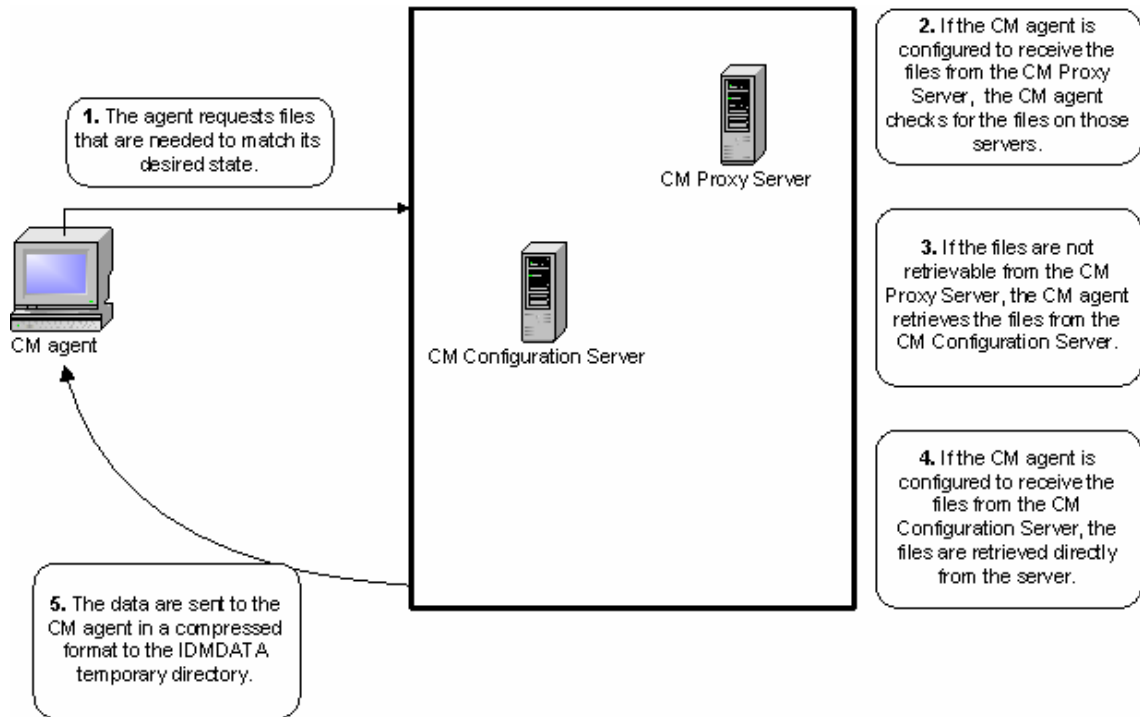
After generating the difference object, the agent determines if it needs to get any data files or install applications to bring the device to its desired state. The CM agent requests and downloads these files from the CM Configuration Server, or CM Proxy Server, during the Data Transfer stage of the CM agent connect.

Data Transfer

The Data Transfer phase of the CM agent connect begins when the agent sends a request for these files to the CM Configuration Server. If the agent is configured to retrieve files from the CM Proxy Server, the CM agent checks those servers for the files it needs. If the files are present, the CM agent downloads them. If any of the files cannot be retrieved from the CM Proxy Server, the CM agent retrieves the files from the CM Configuration Server. If the CM agent is not configured to use the CM Proxy Server, the files are retrieved directly from the CM Configuration Server.

The CM Configuration Server or the CM Proxy Server sends the data to the device in a compressed form and copies it to a pre-defined directory on the device called IDMDATA. The IDMDATA directory is used as a temporary storage location on the managed device for these compressed files. After the files are decompressed and installed on the managed device, the compressed files are erased automatically if configured.

Figure 27 CM agent receives application data

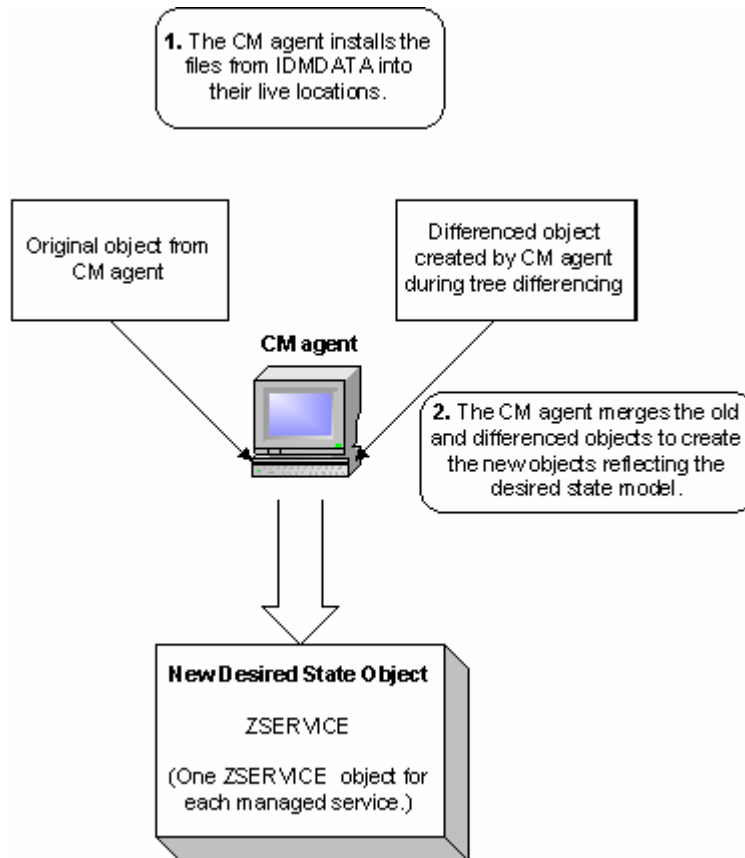


If you have multiple CM Configuration Servers, CM Proxy Servers, or if you want to store files for managing applications on a local CD-ROM, you may want to reconfigure the CM agent before connecting to the CM Configuration Server. Use CM Client Operations Profiles to prioritize and set criteria from where the managed devices should obtain their data. Refer to the *HP OpenView Configuration Management Application Manager Installation and Configuration Guide*.

State Machine

After the CM agent downloads the files that are needed to bring the managed device to its desired state during the Data Transfer phase, the CM agent installs these files from the IDMDATA directory. The CM agent erases the compressed files after they have been installed on the managed device. Then, the CM agent merges the original object from the agent with the differenced object created during Tree Differencing.

Figure 28 State machine processing



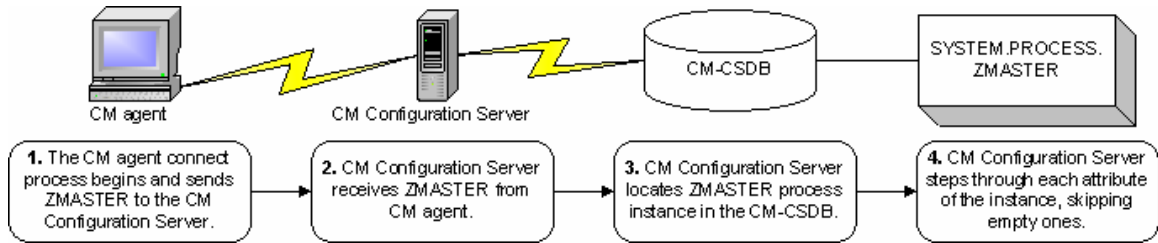
At the end of the CM agent connect the managed device's configuration should match its desired state in the CM-CSDB.

Resolution Process

The CM Configuration Server uses the **resolution process** to accomplish a unit of work in response to a service request. The unit of work is defined by the contents of the CM-CSDB and parameters included in the request. In other words, what the CM infrastructure does depends upon what information is stored in its CM-CSDB and what information accompanies the request for CM to perform some action. For example, the CM agent connect submits service requests to the CM Configuration Server, and the CM

Configuration Server performs a resolution process in response to each request.

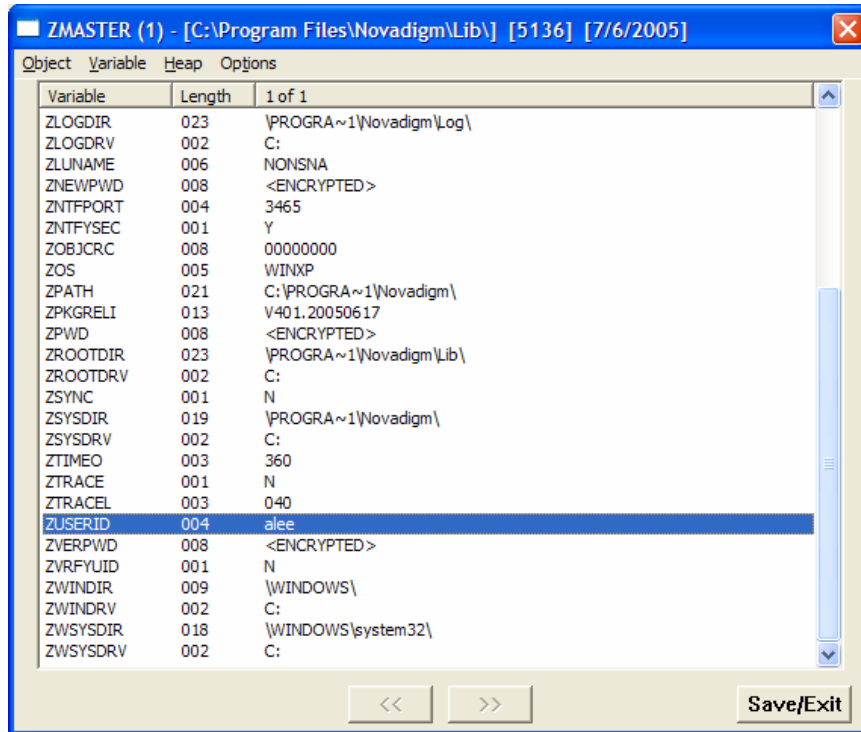
Figure 29 CM Configuration Server performs resolution



The ZMASTER object is sent to the CM Configuration Server during the CM agent connect. The ZMASTER object contains information about the agent computer that is needed to run CM, such as the identity of the subscriber and the IP address of the agent computer.

The CM Configuration Server stores the ZMASTER object in **global memory**. Global memory is a temporary storage area in the CM Configuration Server. The CM Configuration Server maintains global memory's contents for the duration of the resolution process.

Figure 30 Subscriber's local ZMASTER object



After storing ZMASTER in global memory, the CM Configuration Server finds the Process instance for the ZMASTER. This is the **process entry point**. Its location is SYSTEM.PROCESS.ZMASTER.















The CM Configuration Server reads each attribute of SYSTEM.PROCESS.ZMASTER. As a result of an attribute, the CM Configuration Server may:

- Set variable values.
- Evaluate an expression.
- Execute a method.
- Connect to other instances.

If there is a connection to another instance, the CM Configuration Server processes the connected instance. Then, the resolution process resumes in the referring instance at the next attribute after the connection attribute. For example, in Figure 31 on page 82, the first connection instance links to POLICY.USER.&(ZMASTER.ZUSERID). After processing

POLICY.USER.&(ZMASTER.ZUSERID), the resolution process will return to PRIMARY.SYSTEM.PROCESS.ZMASTER, and will process the next attribute which is a connection instance to SYSTEM.ZMETHOD.PUTPROF_ZMASTER.

Figure 31 PRIMARY.SYSTEM.PROCESS.ZMASTER instance

Radia Processes class ZMASTER Instance Attributes:		
Name	Attribute Description	Value
 _ALWAYS_	Method	
 _ALWAYS_	Method	
 _ALWAYS_	Connect To	
 _ALWAYS_	Connect To	POLICY.USER.&(ZMASTER.ZUSERID)
 _ALWAYS_	Method	SYSTEM.ZMETHOD.PUTPROF_ZMASTER
 _ALWAYS_	Method	SYSTEM.ZMETHOD.PUTPROF_ZCONFIG
 _ALWAYS_	Method	
 _ALWAYS_	Method	
 _ALWAYS_	Method	
 _ALWAYS_	Method	
 _ALWAYS_	Method	
 _ALWAYS_	Method	
 DESCRIPT	Process Description	Processing Client Request for &ZCUROBJ
 ZMAXOKRC	Max acceptable method Return Code	008

During resolution the CM Configuration Server performs **symbolic substitution** to set values and to connect to other instances. For example, in SYSTEM.PROCESS.ZMASTER there is a connection to POLICY.USER.&(ZMASTER.ZUSERID). The CM Configuration Server substitutes the value of the ZUSERID from the ZMASTER object that is in global memory. In Figure 30 on page 81, the value of ZUSERID is alee. Therefore, the resolution process will connect to POLICY.USER.ALEE, and resolve that instance.

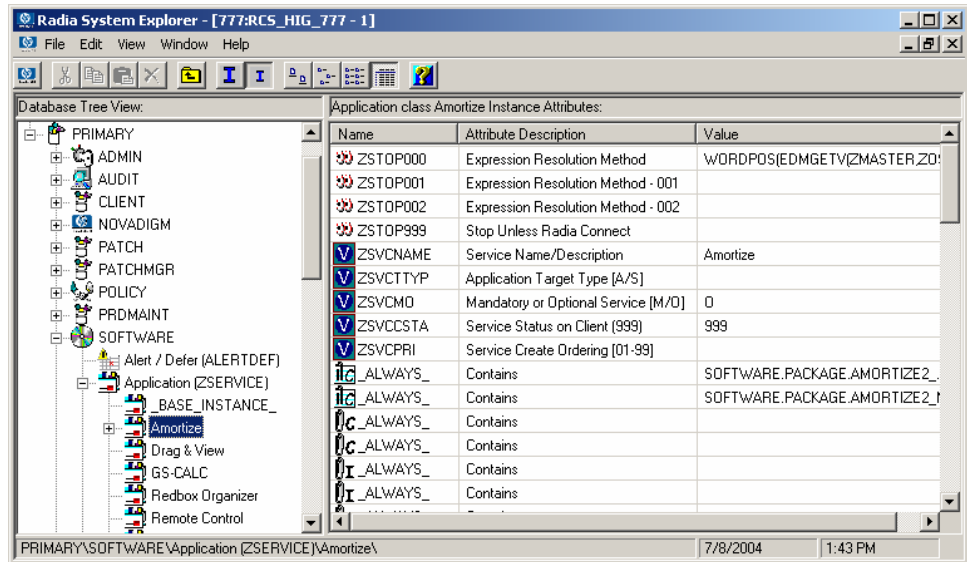
Figure 32 POLICY.USER.ALEE instance

The screenshot shows a database management interface with a tree view on the left and a table of instance attributes on the right. The tree view shows a hierarchy from 'Database' down to 'Users (USER)' and then 'ALEE'. The table on the right, titled 'Users class ALEE Instance Attributes', contains the following data:

Name	Attribute Description	Value
V LNAME	Name	
V ZCONFIG	Collect Hardware Info [Y/N]	Y
V ZSETMSG	Send Message to Audit Resource	DAILY
V ZDLIMIT	Maximum Disk Space	0
V USERID	Enterprise User Id	
V ZTIMED	Client Timeout (Seconds)	240
V ZTRACEL	Trace Log Level [0-999]	040
V ZTRACE	Trace On or Off [Y/N]	N
V ZPRIORITY	Exec. Priority	000
V ZSHOW	Display Status Indicator [Y/N]	N
igc _ALWAYS_	Utility Method	
icg _ALWAYS_	Member of	SOFTWARE.ZSERVICE.AMORTIZE
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	
icg _ALWAYS_	Member of	PRDMAINT.ZSERVICE.MAINT_40
V NAME	Friendly name	ALEE
V ZVERDT	Verify Desktop [Y/D/R/I]	Y
V SELFIND	Self Maintenance Display [Y/N]	N
V SLFINTVL	Self Maintenance Interval (hours)	0
V TYPESEL	Type Selection - Calc. Pack Sizes	Typical
V EMAIL	E-mail Address	
V ZOBJPFUE	Free Unused Pool Elements	Y
V MSITRACE	activates MSI verbose Trace-^vpath	
V ZGRPINFO	Gather Group membership info[Y/N]	N
V ZOBJPTCH	Perform Patching [Y/N]	N

In Figure 32 above, after setting a number of variables, the first connection attribute is to SOFTWARE.ZSERVICE.AMORTIZE. In your implementation, the POLICY instance may connect to a workgroup that connects to a service.

Figure 33 ZSERVICE.AMORTIZE instance



A Service instance links to packages. Figure 33 above begins with a ZSTOP expression variable. An expression variable contains statements that, if evaluated to "true," stop the resolution of the current instance. An expression allows alternative paths to be taken in a given resolution, based upon variable data. In this case, the expression checks to be sure that the operating system of the agent computer is allowed for the Amortize software.

If the agent computer's operating system is Windows 2000, Windows 2003, Windows XP, or Vista, the resolution process continues with this instance, connecting the file instances, registry entries, path instances, and shortcuts. If the agent has a different operating system, resolution returns to SOFTWARE.ZSERVICE.AMORTIZE, and to the next connection instance.

Eventually, the resolution process will return to the User instance, finish resolving it, and will return to the process entry point, SYSTEM.ZPROCESS.ZMASTER. In Figure 31 on page 82, the next attribute connects to the PUTPROF_ZMASTER method. A *method* is a program that performs functions based on certain parameters.

Figure 34 ZMETHOD.PUTPROF_ZMASTER instance

Database Tree View:		Methods class PUTPROF_ZMASTER Instance Attributes:		
Name	Attribute Description	Value		
PUTPROF_ZAUDITD		ZMTHPRMS	Parameters Passed to Method	ZMASTER
PUTPROF_ZAUDITR		ZMHTYPE	Method Type [REXX/ASM/EXE]	ASM
PUTPROF_ZCLIENT		ZMTHNAME	Member Name of Method	EDMMPPRO
PUTPROF_ZCONFIG		DESCRIPT	Method Description	Manager Method & ZMTHNAME
PUTPROF_ZCONFIRM		ZMTHMODE	Mode [INTERNAL] or [EXTERNAL]	EXTERNAL
PUTPROF_ZERROR		ZMTHSYNC	Synchronization Flag [Y] [N]	Y
PUTPROF_ZMASTER		ZMTHDSC1	Method Description 1	Writing Client Identification Information to Profile
PUTPROF_ZRESOURCE		ZMTHDSC2	Method Description 2	
PUTPROF_ZSERVICE		ZMSTRUN	Return Code critical to Resolution?	Y
PUTPROF_ZSTATS				
PUTPROF_ZSVCSTAT				
PUTPROF_ZVDEC				

PRIMARY\SYSTEM\Methods\ZMETHOD\PUTPROF_ZMASTER 7/6/2005 3:02 PM

The CM Configuration Server executes the EDMMPPRO method, passing ZMASTER as a parameter. This causes the contents of the ZMASTER object in global memory to be written to the PROFILE File of the CM-CSDB.

After processing all attributes in the SYSTEM.PROCESS.ZMASTER instance, resolution terminates.

Inventory Collection

The following example of inventory collection shows how the CM Messaging Server and CM Reporting Server work together. The CM Inventory Manager Agent discovers configuration information on the managed device, and reports the results to the CM Messaging Server. The CM Messaging Server posts the information to a SQL database, and then you use the CM Reporting Server to view the results. Web-Based Enterprise Management (WBEM) enables the collection of information such as the amount of RAM in a computer, hard disk capacity, process type, and versions of operating systems from computers, routers, switches, and other networked devices. Windows Management Instrumentation (WMI) is the Microsoft implementation of WBEM for Microsoft Windows platforms.

- 1 The agent communicates with the CM Configuration Server, and sends agent objects to the CM Configuration Server. Some objects are always sent, and others are sent as a result of an inventory audit service being performed. The following information may be sent:
 - The APPEVENT object that describes the most recent service events.
 - The ZCONFIG object that contains information on the device's hardware configuration.
 - If a WBEM audit is performed and the agent is a WBEM consumer, then WBEM objects will be sent.

- 2 The CM Messaging Server posts the objects to the appropriate ODBC data source. All inventory-related and audit objects are posted to the inventory database.
- 3 The CM Reporting Server accesses the data and allows you to view the inventory reports.

Note that the CM Reporting Server allows you to view reports for CM Patch Manager, CM Application Usage Manager, and CM Server Management.

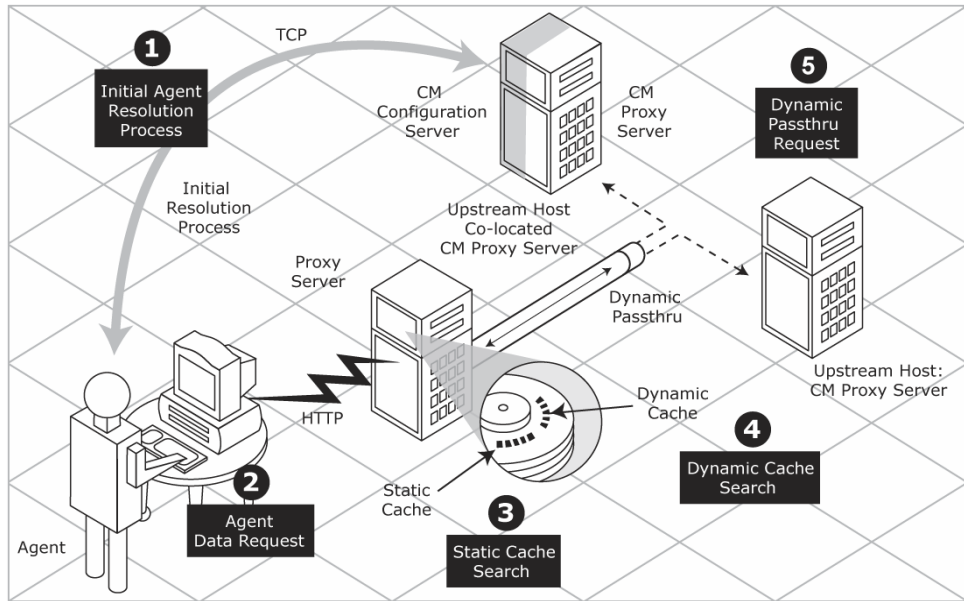
CM Proxy Server Processing

If the agent has been configured to use a CM Proxy Server, then the agent will attempt to retrieve files from the CM Proxy Server when resolving a service. The logical flow for a typical agent request to a CM Proxy Server is as follows (assuming all components are enabled):

- 1 The agent sends a request to the CM Proxy Server.
- 2 The CM Proxy Server protocol front end receives the request.
- 3 This request is validated, and passed to the main cache manager.
- 4 The local static cache is searched, and if the file is found, the request is satisfied.
- 5 If the file is not in the static cache, the dynamic cache is then searched.
- 6 If the file does not reside in the dynamic cache, Dynamic PassThru requests the file from the defined upstream host (typically, the CM Configuration Server). The original request is satisfied, and the file is stored in the dynamic cache for future requests.

Figure 35 on page 87 is a simple overview of the flow, as described above.

Figure 35 CM Proxy Server process



Static and Dynamic Cache

The **static cache** is managed by the Preloader component of CM Proxy Server. This component manages this cache by connecting to the assigned CM Configuration Server, similar to a CM agent. The static cache is typically **preloaded** during the off hours, so the required resources are available when requested. This is the primary cache location for the CM Proxy Server. For performance efficiency, this cache should be preloaded with all resources that are to be distributed by the CM Proxy Server.

The **dynamic cache** is populated on demand by the Dynamic PassThru component of the CM Proxy Server. When a requested resource is not found in the primary (static) cache, the dynamic cache is searched and populated if needed. This cache is viewed as a safety net for requests that fall through the static cache search. The Dynamic PassThru component also manages this cache and removes files that have not been requested in a previously configured number of days. You can define the maximum number of days this cache is defined in the CM Proxy Server configuration file.

Preloader

The Preloader component maintains the static cache by interacting with its defined CM Configuration Server. Required resources are placed into the cache, while resources no longer included in the CM Proxy Server model are removed from the cache. The CM Proxy Server's model is created according to the POLICY Domain on the CM Configuration Server.

Dynamic PassThru

When an agent request is received for a resource that does not exist locally, the CM Proxy Server can request these resources from an upstream host, such as the CM Configuration Server or another CM Proxy Server. These resources are then returned to the requesting agent, as well as stored locally in the dynamic cache for subsequent requests.

CM OS Manager Image Deployment Server

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

- **Machine 1**

- **DHCP Server**

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

- **Machine 2**

- **CM OS Manager Server**

The CM OS Manager Server sends requests for images from the target machine to the CM Configuration Server.

- **CM Configuration Server**

The CM Configuration Server manages the policy information and images for CM OS Manager. Refer to the *HP OpenView Configuration Management Configuration Server User Guide*. The CM-CSDB must be updated, as described in this document, to accommodate the CM OS Manager.

- **CM Proxy Server**

The CM Proxy Server is a web server that is used to deploy the service containing the gold image to the target machines. The CM Proxy Server handles the heavy lifting for transferring gold images to targeted machines. CM Proxy Servers should be placed and sized to accommodate high volume data transfer. This is consistent with standard recommendations. Where appropriate, separate CM Proxy Servers may be used for applications and OS file serving.

- **CM OS Manager Administrative Interface**

The CM OS Manager Administration tasks, which create a CM OS Manager Administrative Interface, are a plug-in to the CM Portal. This provides a graphical user interface for performing OS management tasks.



You can also install the CM Admin Publisher on this machine.

- **Machine 3**

- **Boot Server (PXE/TFTP servers)**

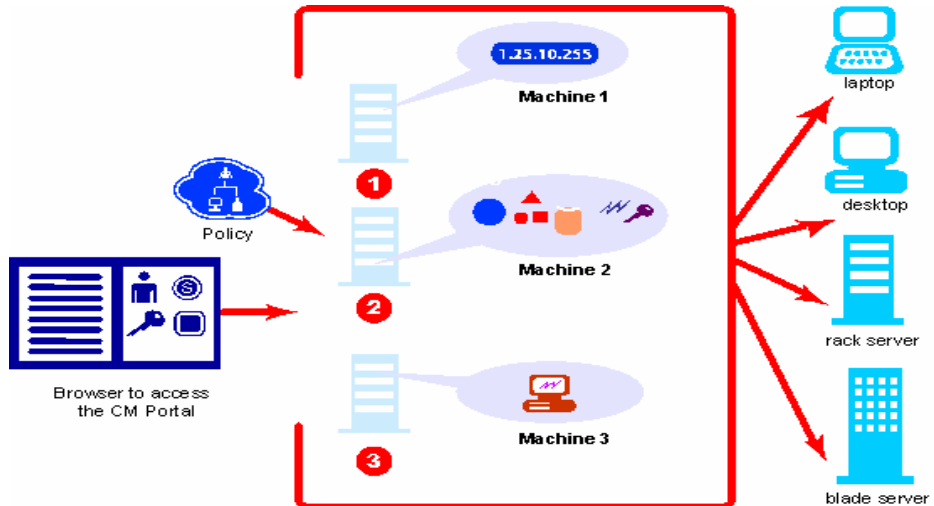
The Boot Server is a Windows-based PXE (Pre-execution environment) server and TFTP (Trivial File Transfer Protocol) server. *Do not install the Boot Server on the same machine as your DHCP server.*

For information about PXE industry standards, see

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

Figure 36 on page 90 illustrates the deployment architecture.

Figure 36 Deployment architecture



CM Patch Manager Acquisition

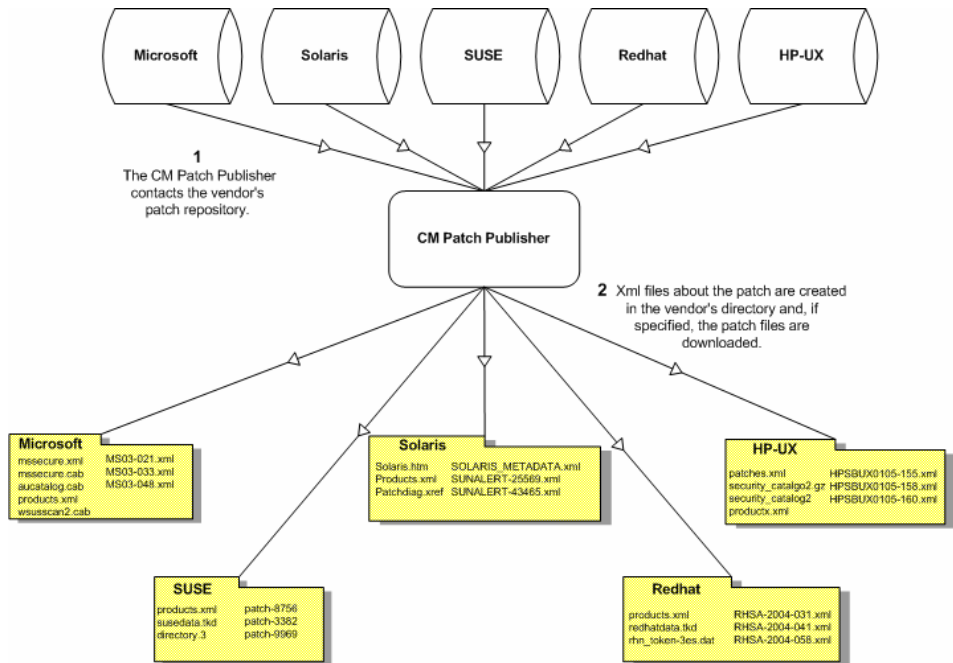
CM Patch Manager acquires security patches and synchronizes the patch's information in the CM-CSDB on the CM Configuration Server with the CM Patch database on an SQL or Oracle Server. During the acquisition, the following things occur:

- The vendor's web site is contacted to prepare for the acquisition of bulletins.
- Either the information about the security bulletins and service packs and the actual patch files, or only the information about the patches is downloaded. The information downloaded contains, but is not limited to, detailed data about each patch, such as supercedence, reboot requirements, and probe information.
- An XML file is created for each security bulletin that is acquired and is put in the vendor's folder in the CM Integration Server directory. These files are called patch descriptor files.

- The PATCHMGR Domain is populated with this information
- Services are created in the PATCHMGR Domain for each of the bulletins acquired.
- The PATCHMGR Domain is synchronized with the SQL database you created.

If you have already performed an acquisition, only instances that are different are updated.

Figure 37 Vendor's patch repository is contacted

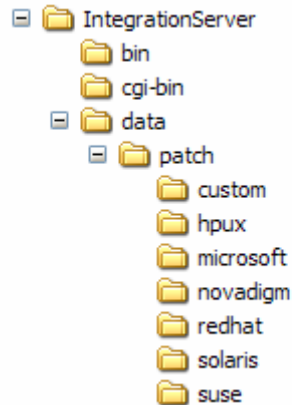


Patch Descriptor Files

When security patches are acquired, an XML file (patch descriptor file) that contains information about the patch is created and placed in the vendor's directory. The vendor directories are located by default in \\Hewlett-Packard\CM\IntegrationServer\Data\Patch. For example, patch descriptor files for Microsoft bulletins would be in \\Hewlett-Packard\CM\IntegrationServer\Data\Patch\Microsoft. The security bulletin number is the file name with an XML extension. If the bulletin is identified as MS03-051, then the patch descriptor will be named MS03-

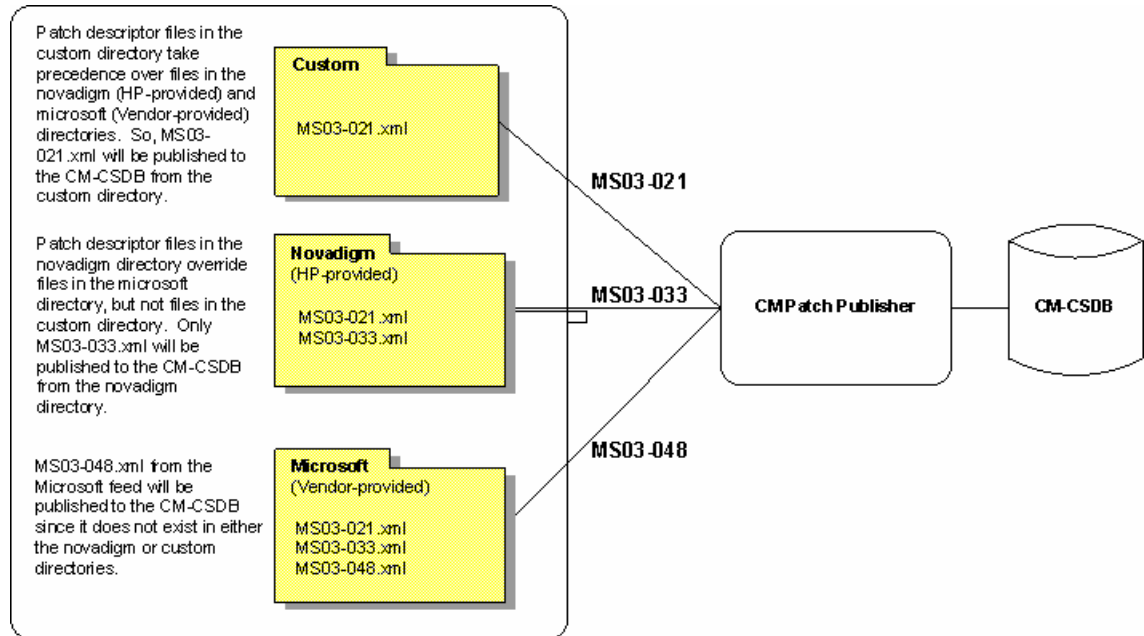
051.xml. If you also acquired the actual files associated with the bulletin, a folder is created with the name of the bulletin that contains the patch files.

Figure 38 View acquired patch descriptor file directory structure



Some of the information acquired from the vendor may need to be altered before the patch can be managed. Therefore, there are two other subdirectories in `\\Hewlett-Packard\CM\IntegrationServer\Data\Patch`. HP provides some additional patch descriptor files that are located in the `novadigm` subdirectory. The HP-provided patch descriptor files override patch descriptor files in the `microsoft` directory. You can also create or modify your own custom patch descriptors that will override both the HP-provided files and those in the `microsoft` directory. Use a text editor to make the changes, name the file *exactly* as it is named in the vendor's directory, and place these XML files in the `custom` subdirectory.

Figure 39 Security patch descriptor files in custom override



Configuration Baseline Auditor Process

Configuration Baseline Auditor processes can be divided into three categories.

1 Defining Subsystems

The CM Configuration Server contains a BASELINE Domain that is used to define subsystems. It also contains a scanning script, known as the Configuration Baseline Scanner.

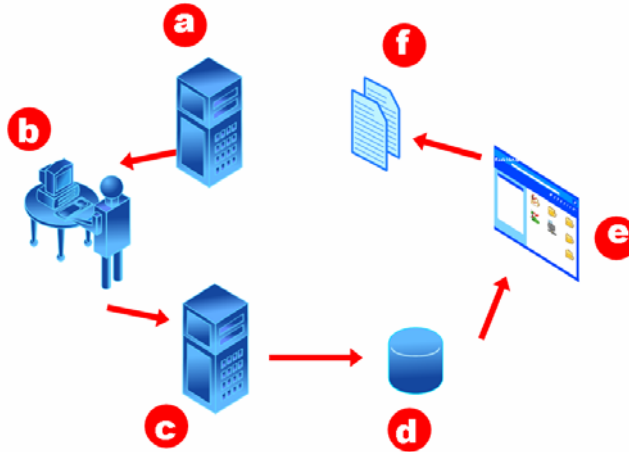
2 Collecting and Importing Data

A CM agent connect or timer initiates the Configuration Baseline Scanner. The scanner scans the device and creates a set of files (compressed XML files) that are sent to the CM Integration Server. The CM Integration Server stores the XML files from the device in a directory that you specify during the installation. The Configuration Baseline Importer component reads the XML files and imports them into a Microsoft SQL Server database.

3 Reporting

Use the Configuration Baseline Auditor or the CM Reporting Server to view the results of the collection. These reports can be exported into multiple formats.

Figure 40 Configuration Baseline Auditor process flow



Legend

- a** The CM Configuration Server contains the BASELINE Domain. Use this domain to define subsystems, configure your filters, and specify collection options.
- b** A CM agent connect or timer initiates the Configuration Baseline Scanner which is a script stored in the BASELINE Domain.
- c** When the scan is complete, XML files that contain the collected subsystem information are created and stored in a pre-determined directory (typically the HP OpenView data directory).
- d** The Configuration Baseline Importer retrieves the XML files from the pre-determined directory and imports them into the Microsoft SQL Server database.
- e** Use the Configuration Baseline Auditor or CM Reporting Server to view and compare subsystem states.
- f** You can also use the Configuration Baseline Auditor or CM Reporting Server to export reports of the comparisons into various formats.

Summary

- The CM-CSDB records your desired state.
- The packaging process identifies and organizes software components into packages.
- The CM agent connect process insures that a subscriber's agent computer matches its desired state.
- The CM Inventory Manager Agent, the CM Messaging Server, and CM Reporting Server perform inventory collection.
- You can configure an agent to retrieve files from a CM Proxy Server instead of a CM Configuration Server.

A CM Publications

HP has a large CM library. The following table helps you find more information about CM products. Check the HP Software support web site for new publications and updates to current publications.

Table 11 Configuration Management products and publications

Learn	Read
Management Applications	
Application Manager	<ul style="list-style-type: none"> • Application Manager Guide • Management Applications Messages and Codes Guide • REXX Programming Guide
Application Self-service Manager	<ul style="list-style-type: none"> • Application Self-service Manager Guide • Management Applications Messages and Codes Guide • REXX Programming Guide
Inventory Manager	<ul style="list-style-type: none"> • Inventory Manager Guide • Messaging Server Guide • Management Applications Messages and Codes Guide
OS Manager	<ul style="list-style-type: none"> • OS Manager Guide
Patch Manager	<ul style="list-style-type: none"> • Patch Manager Guide • Messaging Server Guide
Server Management	<ul style="list-style-type: none"> • Application Management Profiles Guide • Windows Terminal Server and Citrix Support Installation and Configuration Guide • Messaging Server Guide • Configuration Baseline Auditor User Guide

Learn	Read
Management Infrastructure	
Configuration Server	<ul style="list-style-type: none"> • Configuration Server Guide • Configuration Server Messages Guide • Getting Started Guide • REXX Programming Guide • Database Reference Guide
CM Administrator	<ul style="list-style-type: none"> • Configure or maintain your CM environment.
<ul style="list-style-type: none"> • Admin Agent Explorer 	<ul style="list-style-type: none"> • Application Manager Guide • Application Self-service Manager Guide
<ul style="list-style-type: none"> • Admin Packager 	<ul style="list-style-type: none"> • Application Manager Guide • Application Self-service Manager Guide
<ul style="list-style-type: none"> • Admin Publisher 	<ul style="list-style-type: none"> • Publisher Guide
<ul style="list-style-type: none"> • Admin CSDB Editor 	<ul style="list-style-type: none"> • CSDB Editor Guide
Extended Infrastructure	
Distributed Configuration Server	<ul style="list-style-type: none"> • Distributed Configuration Server Guide
Portal	<ul style="list-style-type: none"> • Getting Started Guide • Portal Guide
Multicast Server	<ul style="list-style-type: none"> • Multicast Server Guide
OS Manager	<ul style="list-style-type: none"> • OS Manager Guide
Patch Manager	<ul style="list-style-type: none"> • Patch Manager Guide • Messaging Server Guide

Learn	Read
Proxy Server	<ul style="list-style-type: none"> • Proxy Server Guide
Application Usage Manager	<ul style="list-style-type: none"> • Application Usage Manager Guide • Knowledge Base Server Guide
Management Extensions	
Extensions for Windows Installer	<ul style="list-style-type: none"> • Extensions for Windows Installer Getting Started Guide • Extensions for Windows Installer User Guide • Configuration Analyzer Guide • Knowledge Base Server Guide
Policy Server	<ul style="list-style-type: none"> • Policy Server Guide
Batch Publisher	<ul style="list-style-type: none"> • Batch Publisher Guide
Systems Management Adapters	<ul style="list-style-type: none"> • See the HP OpenView web site for the current list.

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