HP Configuration Management

Policy Server

for the HP-UX, Solaris and Windows® operating systems

Software Version: 5.10

Installation and Configuration Guide

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

Table 2 indicates changes made to this document in earlier releases.

Table 1 Document Changes for this Release

Chapter	Version	Changes
2	5.10	Page 18, Verify Installation, revised procedures. After installation, click **Config** and then **Reconnect** to verify you can successfully reconnect to the sample database.
3	5.10	Page 21, Configuring Policy, chapter title and contents revised to remove topics related to 'Administering Policy'. CM Policy Administration tasks are now performed from the Enterprise Manager or the CM Portal. Deleted topics include: • Distributed Administration • Configuring the Service Drop Down • Adding and Removing Policy • Setting Policy Defaults and Overrides • Controlling Policy Scope Locally
3	All 5.xx Apr 2008	Page 26, Table 4, Retry definition updated to include: "This is also the number of attempts to reconnect to the directory if the ping detects the directory to be offline."

3	All Nov 2008	Page 28, Configuring the LDAP Method, modified steps 8 though 11 to show the method name of **RADISH** entered in uppercase, which is required for Configuration Servers running UNIX.
A	All 5.xx Feb 2008	Page 47, Table 9, LDAP Extension URL Namespace, updated the pre-requisite and syntax information for `/admin/ldap/flush?dn=<dn>` and `/admin/ldap/reset`.

Table 2 indicates changes made to this document in earlier releases.

Table 2 Document Changes for Earlier Releases

Chapter	Version	Changes
2	5.00	Page 18, Verify Installation, revised procedures.
3	5.00	Page 33, Connecting to the LDAP Method, modified Step 4 to indicate the _ALWAYS_ Utility Method requires a value of **SYSTEM.ZMETHOD.LDAP_RESOLVE**.
A	5.00	Page 43, Substitution, earlier references to these minimum inbound object attributes were deleted: • `in.os` is not available by default • `in.uid` is now `in.smsystemuuid` • `in.host` is now `in.hostname` Table 6 on page 44 lists the minimum inbound attributes available when using CM Policy Server with LDAP.

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1 Introduction

At the end of this chapter, you will:

- Know the benefits of the HP Configuration Management Policy Server (CM Policy Server).
- Understand CM Policy Server processing.

About CM Policy Server

The CM Policy Server is a web server used for administration purposes such as mapping services to users in the directory tree. It is one of the management extensions in the Configuration Management (CM) infrastructure providing integration and extended enterprise functionality with your directory services. Policy method connections in the CM Configuration Server DB (CM-CSDB) 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 Integration Server service, installed with the CM Policy Server, is a run-time technology that integrates HP infrastructure services. The CM Policy Server leverages your investment in directory services while using CM for software management. This greatly reduces the total cost of ownership of your environment. In other words, directory services handle policy management and CM manages services. This saves you time because you do not have to define or maintain lists of users in the HP Configuration Management Configuration Server (CM Configuration Server).

The CM Policy Server was formerly known as the Policy Manager. As of this printing, the name still remains Policy Manager in some of the configuration windows.

The CM Policy Server integrates with existing Lightweight Directory Access Protocol (LDAP) directory servers and SQL databases in a customer's enterprise to enable single source points of control for user authentication, access policies, and subscriber entitlement. These LDAP directory servers include Microsoft Active Directory, Novell NDS, and other vendor's LDAP servers, as well as Microsoft NT Domain Manager, Computer Associates ACF2 and Top Secret, and Oracle, Sybase and Microsoft SQL-based databases.

Benefits

Our goal is to provide the best policy-based management based upon the latest technologies. The HP vision of the CM Policy Server can be summarized in the following points:

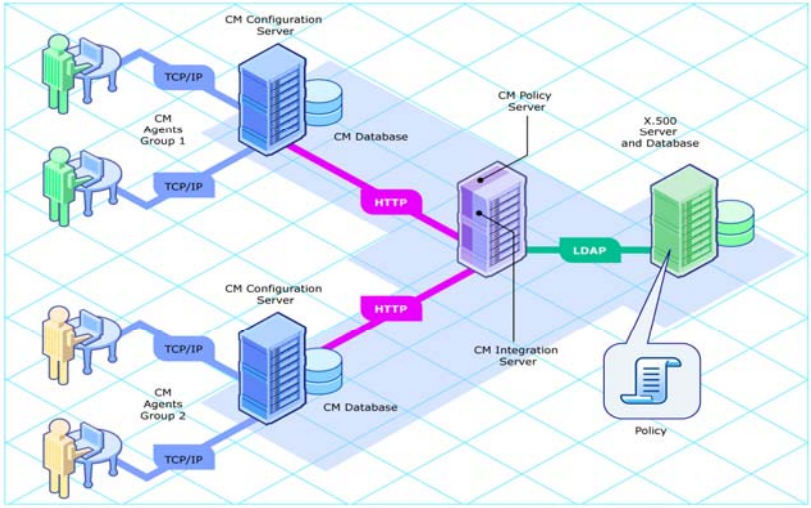
- **Simplicity**
  The model should be no more complex than your policies.

- **Sophistication**
  The model should be capable of expressing even the most subtle or complex policies you need.
- **Clarity**
  Each organizational policy should exist only once in the model, associated directly with the logical object that is the subject of that policy.
- **Investment Protection**
  The model should build upon your existing Directory Services infrastructure.
- **Openness**
  The model should be flexible.

CM Policy Server Processing

The CM Policy Server acts as a bridge between the CM Configuration Server and a directory server. It is a separate component from the CM Configuration Server. Therefore, when a customer has multiple CM Configuration Servers, he may have a single CM Policy Server co-located with his directory server. Figure 1 below provides an overview of CM Policy Server Processing.

Figure 1 CM Policy Server processing



In Figure 1 the following things occur:

1. The CM agent connects to the CM Configuration Server to resolve its **desired state.** The desired state embodies the content that CM manages for a device. The desired state for each device is dynamically created by the CM Configuration Server based on information in the CM Configuration Server DB.
2. The CM Configuration Server contacts the CM Policy Server to perform policy resolution, and builds the agent's desired state using the policy information.
3. The policy method, LDAP_RESOLVE, handles the resolution requests, converting the requests into HTTP queries to the CM Policy Server, and treats the results as a set of objects and attributes to be incorporated into the desired state of the connected agent.
4. The CM Configuration Server completes resolution of the desired state and returns the information to the CM agent.

The CM Policy Server maintains a persistent connection to an LDAP directory server and responds to policy requests by performing a policy resolution against the policy database and returns the set of objects resolved as the result set of the HTTP query.

As of CM Version 5.10, the interface for administering policy information has moved from the CM Policy Server to the CM Enterprise Manager. Refer to the *CM Enterprise Manager User Guide* or online help for more information. For advanced policy administration tasks, also refer to the *CM Portal Installation and Configuration Guide*.

The CM Policy Server can also take input via HTTP POST from multiple CM Configuration Servers. The CM Policy Server can reformat data and insert or update associated database tables. It is also possible to provide HTML-based interfaces for generating operational reports on the current or historical activity of the system.

About the CM Integration Server

The CM Integration Server integrates independent modules, such as the HP Configuration Management Proxy Server (CM Proxy Server), and the CM Policy Server, giving them access to all the functions and resources under the control of the CM Integration Server. The CM Integration Server is *not* a separately installed product. Each module resides in the CM Integration Server's modules directory. These CM components use the same core CM Integration Server files, and run under the same process.

Benefits of the CM Integration Server are:

- All the products using the CM Integration Server for Windows are loaded from a single Service called "HP OVCM Integration Server".
- When the CM Integration Server starts, it will scan its configuration file and try to load all the products marked as loadable.
- Each product is separately licensed.
- The CM Integration Server provides web services that are shared by all loaded modules, resulting in a single entry point for all HTTP (web-based) requests. This integration provides performance, efficiency, and ease of maintenance in an adaptable and cohesive (server) framework.

About this Guide

In addition to this chapter, this book contains the following information:

- **Installation -** This chapter describes how to install the CM Policy Server.
- **Configuring LDAP Policy:** This chapter describes how to configure your CM environment with LDAP services.

Summary

- The CM Policy Server integrates with Lightweight Directory Access Protocol (LDAP) directory servers and SQL databases to enable single source points of control for user authentication, access policies, and subscriber entitlement.
- The CM Policy Server acts as a bridge between the CM Configuration Server and a directory server.
- The CM Policy Server is a module of the CM Integration Server.

2 Installation

At the end of this chapter, you will:

- Know how to install the HP Configuration Management Policy Server (CM Policy Server).
- Be able to verify installation of the CM Policy Server.

This document covers installation information for Windows servers only. Full product documentation is available on the HP Technical Support web site.

CM Policy Server Installation

Before you install the CM Policy Server, identify the server where the CM Policy Server will reside. Administrators usually choose the same physical server that is running the Directory Services or the CM Configuration Server. Review to the reference documentation on the HP Technical Support Web site to help you determine which machine is best suited in your environment for running the CM Policy Server. Install the CM Policy Server from the CM installation media.

License File and Support

Before starting the installation, download your license file from the HP ftp site. This license file must be accessible to install the products that your enterprise purchased.

If you need assistance, contact HP Technical Support.

Tips

- Have the license file easily accessible for your installation.
- Click **Cancel** in any of the windows to exit the installation. If you click **Cancel** accidentally, prompts enable you to return to the installation program.
- Click **Back** at any time to return to previous windows. All the information that you entered thus far will remain unchanged.
- Most windows have associated error messages. If your specifications are invalid, an error message will appear. Click **OK** and enter the correct information.
- This installation program will display default values. We strongly recommend accepting all defaults; however, they can be overridden by specifying the parameters necessary to suit your environment.

Platform Coverage

For information about the platforms that are supported in this release, see the accompanying release notes.

To install the CM Policy Server for Windows

1. From the CM installation media, navigate to the `\Infrastructure\management_extensions\policy_server` directory. Open the folder for your operating system.
2. Double-click **setup**. The CM Policy Server Install window opens.
3. Click **Next**. The License Agreement window opens.
4. Read the license agreement and click **Accept**. The Select the installation folder window opens.
5. Use this window to select the folder where you want to install the CM Policy Server.
   - Click **Next** to accept the default installation folder.

     or
   - Click **Browse** to select a different folder.
6. Click **Next**. The Select License File window opens.
7. Click **Browse** to navigate to the location of your `license.nvd` file, and click **Open**. You will return to the License Information window, and the complete path to your license file will be displayed.
8. Click **Next**. A summary of the installation information opens.
9. Click **Install** to begin the installation. The installation progress window opens.
10. Click **Finish** when the installation is finished.

Verify Installation

Confirm that the CM Policy Server is running by performing the following verifications. You can directly access the CM Policy Server by following the procedure To access the CM Policy Server below.

To access the CM Policy Server

1 Open your Web browser.

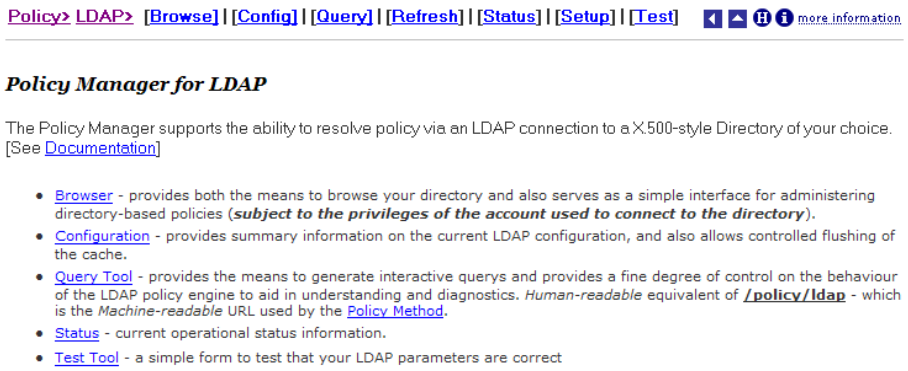
2 In the Address bar, type **http://IP_Address:3466**. This will be referred to as the CM Policy Server page.

The *IP_Address* is the IP address of the computer where the CM Policy Server is installed.

The **CM Integration Server** web page for the CM Policy Server opens.

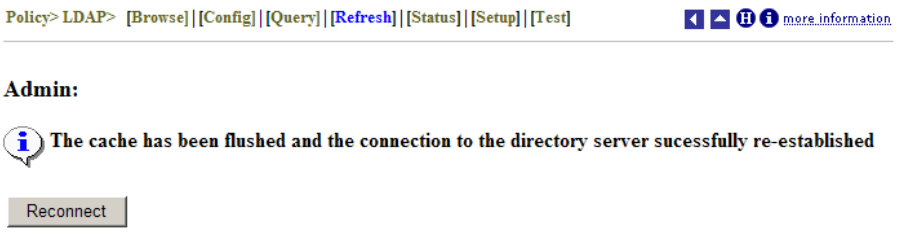
3 Click **Directory Services** on the command bar.

The Policy Manager for LDAP page opens.



4 Click **Config** to go to the current configuration page. This page points to the sample database by default.

5 Click **Reconnect** to verify that you can successfully reconnect to the sample database.


Policy> LDAP> [Browse] | [Config] | [Query] | [Refresh] | [Status] | [Setup] | [Test]
more information
Admin:
The cache has been flushed and the connection to the directory server sucessfully re-established
Reconnect

Summary

- Have the appropriate files ready before installing the CM Policy Server.
- Back up your CM Configuration Server DB before installing the CM Policy Server.
- Verify installation using an Internet browser.

3 Configuring Policy

At the end of this chapter, you will:

- Know what attributes to add to your directory service for use with HP Configuration Management Policy Server (CM Policy Server).
- Understand how to configure the method for resolving LDAP policies in the CM Configuration Server DB.

You must complete the following steps to connect your directory services, the CM Policy Server, and the CM Configuration Server.

1. Add the required attributes for CM Policy Server to your directory service.
2. Configure the CM Policy Server to connect to your directory server.
3. If your CM Configuration Server and CM Policy Server are on two separate computers, you will need to configure them to communicate.
4. Configure the LDAP resolve method on your CM Configuration Server to use your directory server.
5. Connect the LDAP resolve method to a policy instance in your CM Configuration Server DB.

After completing these steps, you can begin to administer policy using the CM Enterprise Manager.

Adding Configuration Management Policy Attributes

The CM Policy Server requires that the LDAP schema of an existing directory implementation be modified before it can be used to manage policy. These attributes are used to manage policy scope, relationships, and assignments. Consult your directory service documentation and your enterprise's directory service administrator to make these changes. Be sure to back up your directory scheme before any modifications.

Changes to the LDAP schema can be risky because modifications to many directory services are not reversible. Be sure you type correctly. Check and double check the values you are entering before saving the changes to each value entered into the directory schema. Consult your directory services administrator and documentation.

Add the following required attributes:

- Add edmFlags as a single-valued, integer attribute with an object ID of 1.3.6.1.4.1.2133.2.1.1. It controls the scope of your policy. This is added as an optional attribute of the nvdObject class.
- Add edmLink as a multi-valued, case-sensitive string with an object ID of 1.3.6.1.4.1.2133.2.1.2. This attribute allows you to create a connection to

a group that is not part of the user's LDAP group membership. This is added as an optional attribute of the nvdObject class.

- Add edmPolicy as a multi-valued, case-sensitive string with an object ID of 1.3.6.1.4.1.2133.2.1.3. Use edmPolicy to assign services to users and groups. This is added as an optional attribute of the nvdObject class.

The following attributes are not mandatory, but you may want to add them.

- Add edmPolicyOverride as a multi-valued, case-exact string with an object ID of 1.3.6.1.4.1.2133.2.1.4. Use edmPolicyOverride to define policy overrides. This is added as an optional attribute of the nvdObject class.
- Add edmPolicyDefault as a multi-valued, case-exact string with an object ID of 1.3.6.1.4.1.2133.2.1.5. Use edmPolicyDefault to assign policy defaults. This is added as an optional attribute of the nvdObject class.

Adding the nvdObject Class

Some directory services, such as Microsoft Active Directory, do not allow adding of attributes to the *top* class. This is the highest level in the schema. If you cannot add attributes to the top class, create a class that will hold the required edmLink, edmFlags, and edmPolicy attributes, and inherit the values included in the *top* class. EdmPolicyOverride and EdmPolicyDefault are not required, but may be added for additional functionality. By creating this class, including its inherited values, we can modify the areas needed to apply CM policies to specific areas of the directory tree. If you can add the attributes to the *top* class, policies can be placed anywhere in the tree.

If you need to create a class, name the class nvdObject. Create it as an auxiliary class with top as its parent class. Set the object ID to 1.3.6.1.4.1.2133.2.1. After creating the nvdObject class, you must add the edmFlags, edmLink, and edmPolicy. To proceed, you must reload your directory schema. Consult your directory service's documentation for instructions on how to do this.

Modifying classes with nvdObject

Once the schema has been re-loaded, the values entered above will show up as a selection, and you can add the nvdObject class to areas of your directory affected by the CM Policy Server.

To complete the modification for Microsoft Active Directory, nvdObject must be added as an Auxiliary class on the **Relationships** tab to all of the Active Directory classes listed below.

- Person
- Container
- DomainDNS
- Organizational Unit
- Group

You have now completed the necessary modifications to your directory schema. See To configure the CM Policy Server for LDAP below for instructions on how to connect CM Policy Server to your directory services.

If you are not able to change the schema, you can use an attribute that already exists in the directory schema.

This feature should only be used when it is *not* possible to make the necessary changes to the schema. See Appendix B, Use Existing LDAP Attributes for instructions on how to do this.

Connection to LDAP

The LDAP extension supports a range of options that are stored in the LDAP start up script. This script is located in the CM Integration Server directory. HP recommends changing the LDAP configuration through the CM Policy Server's Setup page to perform validation of user input.

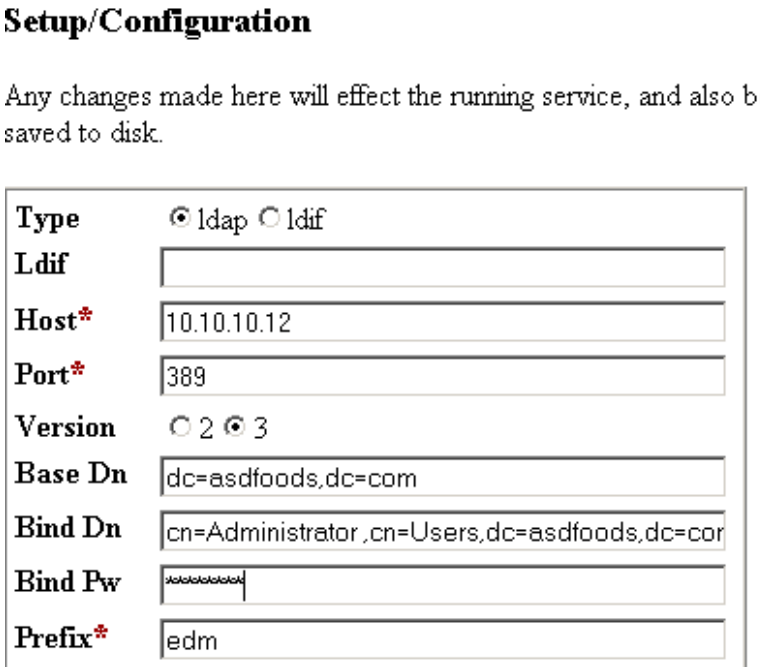
If you make manual changes to `pm.cfg`, you will need to restart the CM Policy Server or CM Integration Server service.

Below is a procedure for setting the LDAP configuration.

For the ability to bind an Active Directory domain and edit Policy objects, the BIND_DN needs to have read access rights to the entire directory and write access rights to the top of the tree to which it will be editing.

To configure the CM Policy Server for LDAP

1 From the CM Policy Server page, click the **Setup** page.



2 For Type, select the **ldap** option.

3 In the **Base Dn** line, type the base domain. This is the highest level of the directory structure. If you leave it blank, the highest level is assumed.

Table 3 BASE_DN and BIND_DN Examples

Item	Microsoft Active Directory	Novell Directory Services
Base Dn	Specifies the base domain. Example: dc=asdfoods, dc=com.	Specifies the base organization. Example: o=asdfoods
Bind Dn	Specifies the fully qualified name of the account that has Active Directory Schema Permissions on the Directory. Example: cn=Administrator , cn=Users, dc=asdfoods, dc=com or administrator@asdfoods.com	Specifies the fully qualified name of the account that has NDS Permissions on the Directory. Example: cn=Admin, ou=Users, o=asdfoods

4 In the **Bind Dn** line, type the fully qualified name of the account that has update authority to the specific OUs and containers to which the edmPolicy attributes will be applied.

5 In the **Bind Pw** line, type in the password of the Account name referred to in the Bind Dn.

6 In the **Host** line, type the hostname or IP address of the Active Directory Server you wish to bind to for resolving policies.

7 Click **Submit** to submit the changes to the CM Integration Server or CM Policy Server service.

Table 4 Configurable Values in the Web Interface

Field	Default	Description
Host	Localhost	Hostname or TCP/IP address of LDAP Server/Gateway.
Port	389	TCP/IP port of LDAP Server/Gateway.
Version	2	LDAP Protocol version to use (2 or 3)
Base Dn		DN of the logical root of the Directory—used to constrain the directory browser. Also used for pinging the directory server periodically to ensure it is up.
Bind Dn		DN of account to use when authenticating (BIND) with directory. If this parameter is not supplied, then an anonymous BIND is performed.
Bind Pw		Password for Bind Dn account. Note: This is stored in plain text in pm.cfg. It is highly recommended that customers secure access to the <root>/etc directory for administrators only.
Cache	1	Enable caching (0 or 1).
Delay	1	The delay in seconds between each retry attempt.
Flush_freq	3600	The delay in seconds between each flush of the cache.
Retry	1	Number of attempts to issue the LDAP request before marking the directory as unavailable. If this occurs, a reconnection attempt will be made when the next ping is performed. This is also the number of attempts to reconnect to the directory if the ping detects the directory to be offline.
Ping_freq	300	The delay between each attempt to search Base Dn (in seconds). This enables the CM Policy Server to reconnect to a directory server than may have been restarted, and also serves as an active monitor of the availability of the directory.
Timeout	120	Timeout (in seconds) for LDAP request.

Support for Multiple LDAP Connections

CM Policy Server supports multiple concurrent LDAP queries. Configure the number of concurrent LDAP queries in the CM Policy Server's configuration file, `pm.cfg`, The default location of this file is *`System Drive`*`:\Program Files\Hewlett-Packard\CM\IntegrationServer\etc`. Use a text editor such as Notepad to edit the file. The table below describes which parameters apply. When you make changes to `pm.cfg`, you will need to restart the CM Integration Server service.

Table 5 Configurable Values for Multiple LDAP Queries

Value	Default	Description
N_workers	2	Specifies number of parallel LDAP directory connections to be created.
PolicyUrl	/policy/ldap	Registers the URL of the CM Policy Server's LDAP. This is required to use the N_WORKERS parameter. The parameter name is case sensitive. If you do not have this line in your pm.cfg, then you will need to add it.

Specifying the CM Configuration Server

If your CM Configuration Server is not on the same computer as your CM Policy Server, you will need to specify the location of the CM Configuration Server. To do this, edit the CM Configuration Server profile file, `edmprof.dat`, and the CM Policy Server configuration file, `pm.cfg`.

To specify the location of the CM Policy Server on the CM Configuration Server

1. On the CM Configuration Server computer, open the Profile Editor. This opens the CM Configuration Server's profile file, `edmprof.dat`, in a text editor.
2. Go to the [MGR_POLICY] section as shown below.

```
* Manager Policy Section                                    *
*  HTTP_HOST      = Host name of Policy Server               *
*         Multiple hosts may be specified (space or comma *
*         separated) for fail over                          *
*  HTTP_PORT      = IP Port number of Policy Server          *
*         NO restart required                               *
*-----------------------------------------------------------*
[MGR_POLICY]
```

```
HTTP_HOST = XXX.XXX.XXX.XXX
HTTP_PORT = 3466
```

3 Type the IP address of the CM Policy Server as the value for HTTP_HOST.

4 Type the port of the CM Policy Server as the HTTP_PORT.

5 Save and close the `edmprof.dat`.

After specifying to the CM Configuration Server where the CM Policy Server is located, you need to specify to the CM Policy Server where the CM Configuration Server is.

To specify the location of the CM Configuration Server to the CM Policy Server

1 Open the CM Policy Server's configuration file, `pm.cfg`, using a text editor. This file is located in the CM Integration Server's etc directory.

2 Type the IP address of your CM Configuration Server as the value for the RCS_CACHE_HOST. If the port is different from the default of RCS_CACHE_PORT, change that value as well.

3 Save and close the modified `pm.cfg`.

4 Stop and restart the CM Integration Server service.

Configuring the LDAP Method

If you are using LDAP, you must create a connection to the LDAP method in the CM Configuration Server DB, and connect the users to the LDAP method. Perform the following two procedures to prepare your CM Configuration Server DB to use the CM Policy Server.

To create the LDAP method in the CM Configuration Server DB

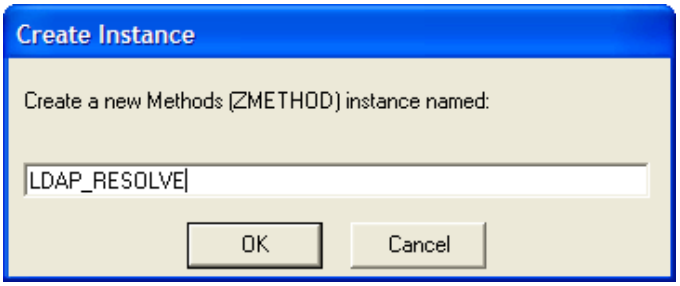
1 In the CM Admin CSDB Editor, go to SYSTEM.ZMETHOD.

2 Right-click **Methods (ZMETHOD)**.

A shortcut menu opens.

3 From the shortcut menu, select **New Instance**.

The Create Instance dialog box opens.



4 Type **LDAP_RESOLVE** in the text box, and click **OK**.

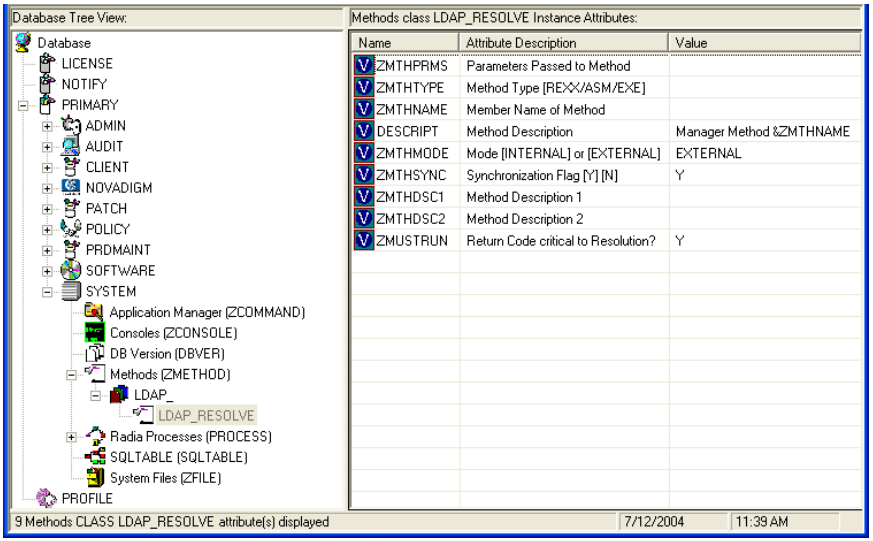
The CM Admin CSDB Editor window opens.

5 Double-click **LDAP_**.

The tree expands.

6 Double-click **LDAP_RESOLVE** in the tree view.

The attributes of LDAP_RESOLVE appear in the list view.



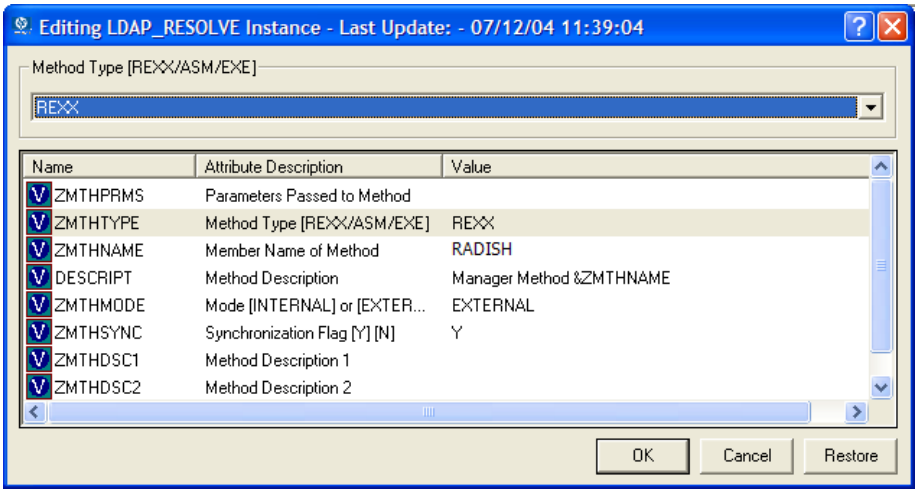
7 Double-click the **ZMTHNAME** attribute in the list view.

The Editing Instance dialog box opens.

8 In the **Member Name of Method** field, type **RADISH**.

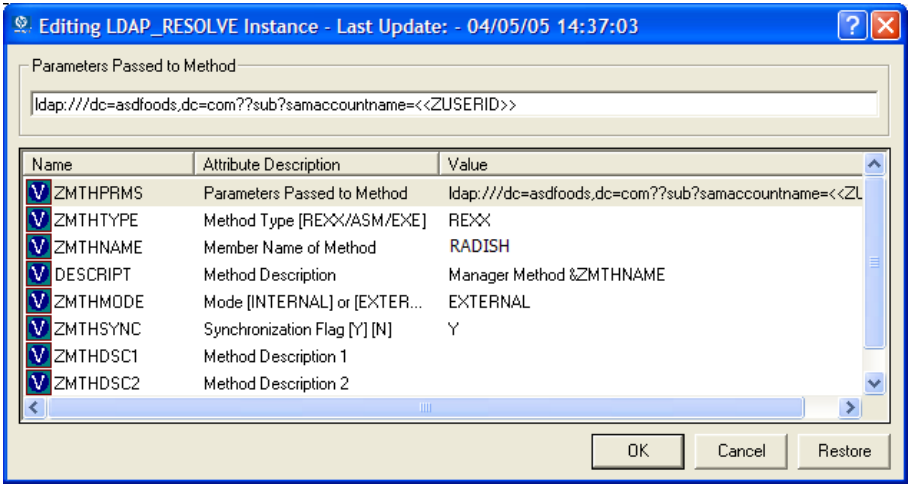
Configuration Servers running on UNIX platforms are case sensitive and require **RADISH** entered in upper case.

9 Click **ZMTHTYPE**.



10 In the **Method Type** drop-down list, select **REXX**.

11 Click **ZMTHPRMS**.



12 In the **Parameters Passed to Method** text box, use the following values.

For HTTP type:

```
http:///policy/ldap?dn=<<ZDN>>&&os=<<ZOS>>
```

For Microsoft Active Directory:

— To manage policies by machine (preferred method):

ldap:///dc=*domainname*,**dc=***forestname*,**dc=com??sub?samaccountname=<<ZUSERID>>$** (If the client uses $MACHINE as the ZUSERID)

http:///policy/ldap?dn=<<COMPDN>>

For example,

ldap:///dc=asdfoods,dc=com??sub?samaccountname=<<ZUSERID>>$

— To manage policies by user:

ldap:///dc=*domainname*,dc=*forestname*,dc=com??sub?samaccountname=<<LOCALUID>>

For example,

ldap:///dc=asdfoods,dc=com??sub?samaccountname=<<LOCALUID>>

For Novell Directory Services (NDS):

— To search the entire NDS tree for policy, type:

ldap:///o=organization??sub?cn=<<ZNTUSER>>

For example,

ldap:///o=cert??sub?cn=<<ZNTUSER>>

— To search NDS with a specified Distinguished Name, type:

http:///policy/ldap?dn=<<ZMASTER.DN>>

For Netscape iPlanet:

— To manage policies by user type:

ldap:///dc=com??sub?uid=<<ZUSERID>>

13 Click **OK**.

The Instance Edit Confirmation dialog box opens.

14 Click **Yes** to confirm the changes. The CM Admin CSDB Editor window opens.

Now, whenever a managed device connects to the CM Configuration Server, the null instance calls the policy method, and will point to the appropriate services for that user.

Specifying the Distinguished Name

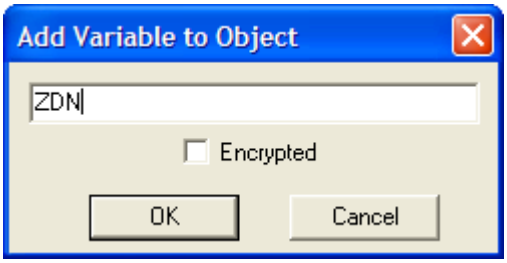
If there is no way to search the LDAP directory for a unique attribute, such as **samaccountname** in Active Directory, you will need to specify the

distinguished name for each subscriber on each client computer (in the ZMASTER object). This must be done because there is no lookup from the Configuration Management Application Self-service Manager logon screen to the distinguished name in LDAP due to a limitation in LDAP.

To specify the distinguished name (dn)

1. Go to **Start → Programs → HP OVCM Administrator** and click **CM Admin Agent Explorer**.
2. Go to *SystemDrive*:\Program Files\Hewlett-Packard\CM\Agent\Lib.
3. Double-click **ZMASTER**.
4. From the **Variable** menu, click **Add**.

   The Add Variable to Object dialog box opens.



5. In the text box, type a name for the variable, such as **ZDN**.
6. Click **OK**.

   The Change Variable dialog box opens.

7. Type the distinguished name information, such as **cn=gretchen schorter, ou=people, o=acme.com.**
8. Click **OK**.
9. Click **Save/Exit**.

Connecting to the LDAP Method

You must connect the LDAP method to an instance in the POLICY domain for policy resolution.

To connect the user to the LDAP method

1 Open the CM Admin CSDB Editor.

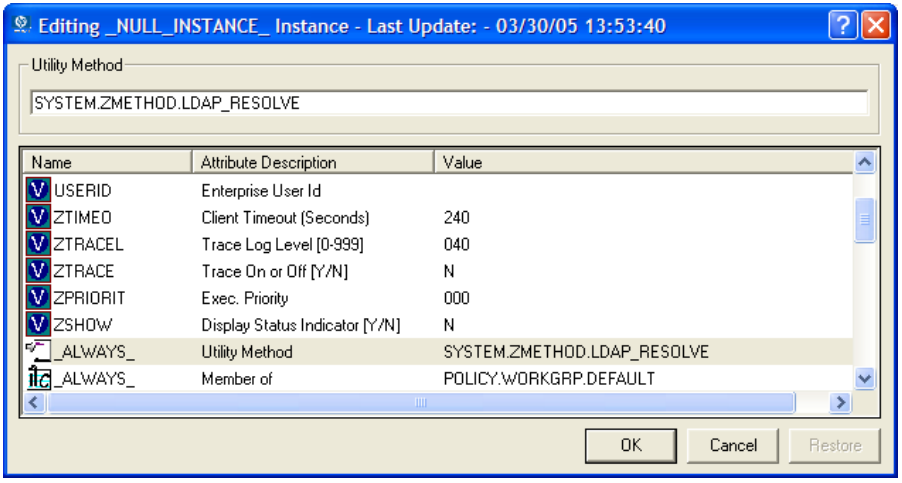
2 Navigate to PRIMARY.POLICY.USER.

3 Double-click the null instance.

> If the null instance is connected to the Default workgroup, change the name of the instance from Default to _NONE_.

4 In the list view, double-click on the _**ALWAYS**_ **Utility Method** line.

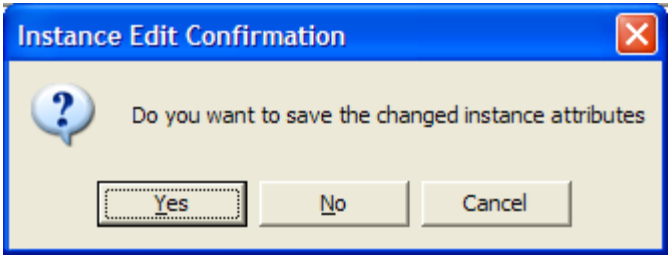
The Editing Instance dialog box opens.



5 In the **Utility Method** text box, type **`SYSTEM.ZMETHOD.LDAP_RESOLVE.`**

6 Click **OK**.

The Instance Edit Confirmation opens.



7 Click **Yes**.

The LDAP_RESOLVE method is connected to the Null User instance.

Policy Scope

By default, a subscriber inherits the policy from the parent of any groups it is linked to. This link can be through either the subscriber's directory service membership or through the use of the edmLink attribute. Figure 2 on page 34 shows a part of the Acme organization. It has three organizational units, Computers, Development, and People. **Computers** holds the Laptop container. **Development** includes the Product, QA, Research, and Support organizational units. **People** includes the actual users of the enterprise.

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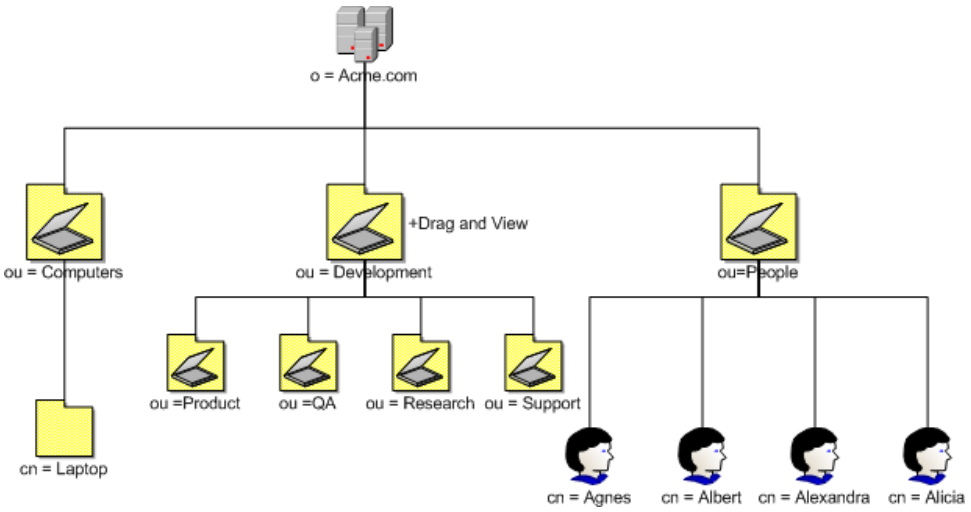
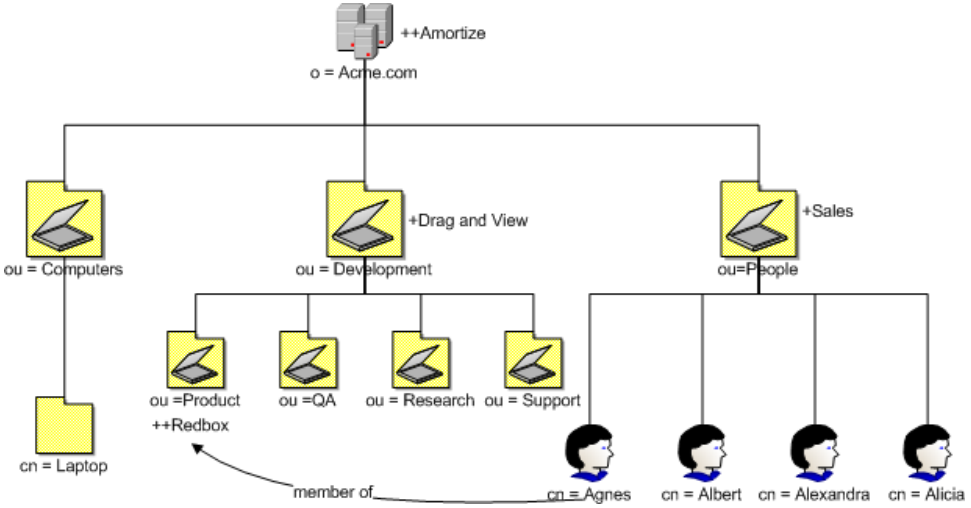
Figure 2 Acme organization directory structure



In this figure, Agnes will inherit the policy of the People organizational unit and the Acme organization.

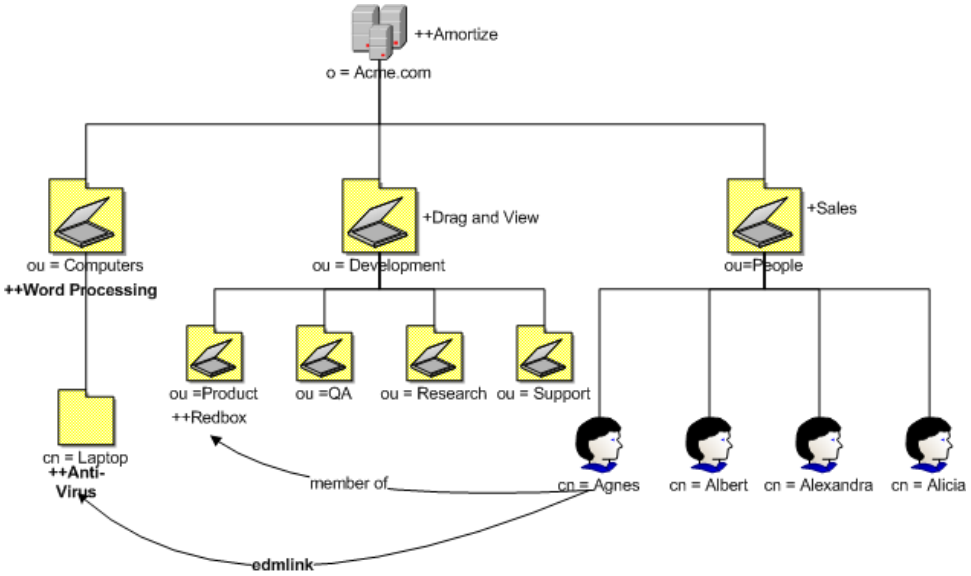
Figure 3 Agnes is a member of Product organizational unit



If Agnes is a member of the Product organizational unit, she will also inherit the policy from that unit and the Development organizational unit. In Figure 3 above, Agnes would get Sales and Amortize because she is a part of the People organizational unit. Because Agnes is a member of the Product organizational unit, she would *also* inherit Redbox *and* Drag and View.

Suppose that you need Agnes to receive the services associated with the laptop container, but she is not linked to that container through directory services. Use edmLink to connect her to that container.

Figure 4 Agnes is linked to the laptop container



In Figure 4, above, Agnes will receive Anti-Virus because she has been linked to the laptop container. Since laptop is part of the Computers organizational unit, she will also get Word Processing. Now, she has a total of six applications.

Managing Policy Scope

If you do *not* want to inherit the policy from the parent objects, you can limit the CM Policy Server's scope of resolution. You can do this either globally for the entire directory structure or for only specific objects. Manage the scope globally by modifying the CM Policy Server configuration file. Control policy scope for one object by using the edmFlags attribute.

Be sure that you have a thorough understanding of your directory structure. When designing a change to the scope of policy resolution, anticipate the result of your modifications *before* making the modifications.

Controlling Policy Scope Globally

The VIEW option allows you to control whether or not to continue up the directory tree to assign policy. Modify the VIEW option in the CM Policy Server configuration file, `pm.cfg`, to control the scope.

The syntax for the VIEW option is:

```
VIEW {
    <attr> {view}
    }
```

Where *attr* is one of the attributes listed in the LINKS configuration option in `pm.cfg`, and *view* is a list of LINKS the CM Policy Server is allowed to see. An empty list means that there is no view when visiting an object from the specified attribute. This would result in following that link and not continuing. You can list as many or as few attributes as needed.

The default values for the LINKS configuration option are: edmLink, memberof, groupmembership and aliasedobjectname. When you look at a particular object such as a group or user through the CM Policy Server interface, you will see only these attributes for that object. If you do not want CM Policy Server to inherit the policy for any parents of an edmLink attribute, modify the VIEW option in `pm.cfg` like this:

```
VIEW {
    edmLink {  }
    }
```

This configuration with the empty brackets tells CM Policy Server to follow edmLink, but not to inherit from any parents or any links contained within the object from that branch of the directory tree.

Looking back at the Acme organization example, suppose you want Agnes to receive policy for the laptop container, but not inherit any policy from the Computers organizational unit. In Figure 4 on page 36 Agnes will receive Anti-Virus because she has been linked to the laptop container, but she will *not* inherit Word Processing when edmLink is configured with empty brackets to not inherit from any parents.

Similarly, if we wanted to follow a memberof attribute, and then not inherit from the parent objects, we would replace edmLink with memberof. The VIEW option would look like this:

```
VIEW {
    memberof {  }
    }
```

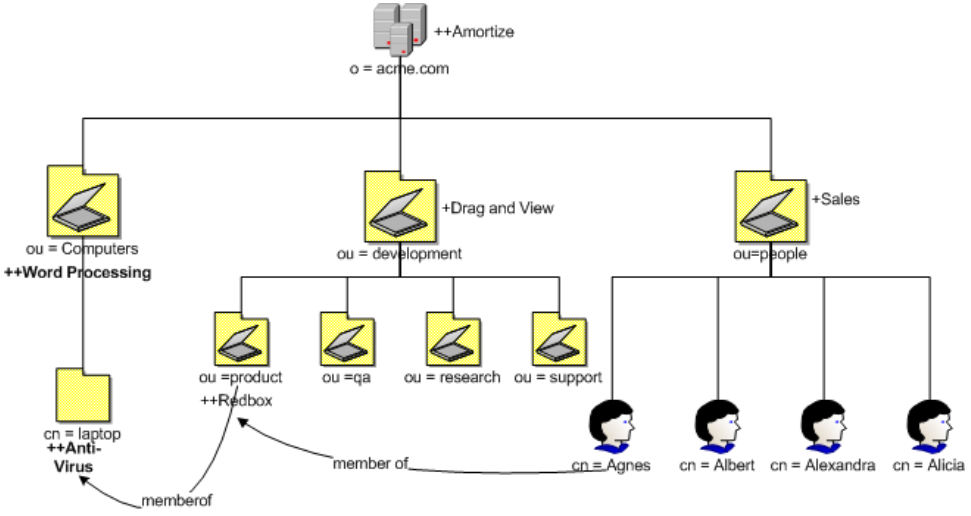
This configuration with the empty brackets tells CM Policy Server to follow memberof, but not to inherit from any parents from that branch of the directory tree or any links contained within the object.

Finally, suppose that we only want to follow memberof relationships. The VIEW option would look like this:

```
VIEW {
    memberof {memberof}
    }
```

This configuration with the memberof in quotes tells CM Policy Server to follow memberof, but not to inherit from any parents from that branch of the directory tree. When we follow a memberof relationship, we will continue to follow memberof relationships until we reach an object that does not contain a memberof relationship. In Figure 5 below, Agnes will get Sales, Amortize. Then she will get Redbox because she is a member of Product. Since Product is a memberof laptop, she will get Anti-Virus. If Laptop had any memberof relationships, she would follow those relationships, too. Agnes will not follow any relationships other than memberof.

Figure 5 Product is a member of the laptop container



Log Files

To troubleshoot your CM Policy Server, you may need to examine the log file. Within the logs directory for your CM Integration Server, examine `httpd-3466.log`. This log is created when the CM Integration Server starts up. It contains useful information if errors occur.

Summary

- Configure the CM Policy Server to connect to your directory services.
- Modify your directory schema to include the CM policy attributes that allow you to manage policy scope, relationships, and assignments.
- Configure your CM Configuration Server to use the LDAP method.
- You can control the scope of policy resolution globally using the VIEW option in the CM Policy Server configuration file.
- Following CM Policy Server configuration, use the Enterprise Manager to add, administer, and query policy entitlements in your LDAP policy store.

A LDAP Discussion

This appendix provides more information on directory services for policy administrators needing additional information. It also includes descriptions of LDAP terminology, the use of substitution and expressions, and URLs used for HP Configuration Management Policy Server (CM Policy Server).

LDAP Background

An LDAP directory is a hierarchically named tree of objects, where each object has a class (type) or classes, and contains potentially many named attributes, appropriate to its classes. Each attribute may contain multiple values.

It is outside the scope of this document to describe in any detail what an LDAP directory means. As a rapidly growing force in the systems management industry, many excellent sources exist for further background.

The CM Policy Server is not concerned with such differences in interpretation—our only requirement is that the directory supports either the LDAP v2 or LDAP v3 protocols.

CM Policy Server and LDAP

The LDAP Policy Extension, in conjunction with the CM Policy Server, is intended to provide a scalable policy infrastructure, leveraging your existing investment in directories. The LDAP Policy Extension was developed to provide "Low Cost of Entry" to policy-based management, allowing you to start with a very simple policy model and incrementally grow the model as your policies mature. The LDAP Policy Extension provides a clean integration with the standard repository for enterprise management information (LDAP), and allows an organization to leverage the information represented in its directories to deliver sophisticated policy-management to the many computing devices in its enterprise.

CM Policy Server aimed at customers who have a detailed understanding of LDAP/X.500 directories, and an established directory infrastructure. The CM Policy Server uses the LDAP protocol (version 2 or 3) (over TCP/IP) to speak to the customer's directory. This protocol encompasses all major directory products on the market, including the latest offerings from companies such as Novell, Microsoft, and Netscape.

The LDAP Policy Extension extends the CM Policy Server with a number of features that enable you to represent your software management policy within your existing directory infrastructure and have this policy drive your Configuration Management infrastructure to provide a comprehensive and sophisticated software management solution.

The extension makes policy resolution available via a URL utilizing the standard CM Policy Server policy framework. It maintains a persistent LDAP connection to your corporate directory, and provides online HTML documentation. From the Enterprise Manager, there are a number of interactive tools for discovering or diagnosing the policy outcome for target objects (typically users or machines) in your directory.

It is anticipated, but not required, that the CM Policy Server hosting this extension be co-located on or near the directory to keep network latency to a minimum and enhance performance and manageability.

The LDAP Policy Extension understands the standard relationships that exist in a directory between different objects (parent-child, memberOf). In addition to these standard relationships, three additional attributes may be used:

- <pfx>Flags
  controls various subtle aspects of the policy resolution.
- <pfx>Link
  allows you to specify additional, potentially dynamic or conditional relationships.
- <pfx>Policy
  allows you to define resultant strings that will be netted out during policy resolution.

By default the prefix used is `edm`, but alternatives may be used to allow your directory to support multiple concurrent policy frameworks for different purposes.

The LDAP Policy Extension starts at the specified DN, and walks the entire tree of relationships that the object has with other objects, accumulating policy attributes. Then it evaluates all conditional policies, and finally

resolves any conflicting policies, using a straightforward should/may, grant/deny model.

Terminology

Before using directory-based policy management with CM Policy Server, it is important to establish some terminology that is used throughout this discussion.

- **Should**
  This is used to describe a mandatory or **required** policy.
- **May**
  This is used to describe a desired or **advisory** policy.
- **Policy**
  This is a string that is used to **represent** a **desired** outcome. The CM Policy Server does not impose any particular interpretation upon this. When used in conjunction with the LDAP Adapter, the adapter will *interpret* this as the name of an application defined within Configuration Management.
- **Relationship (link)**
  Two directory objects are said to be **related** if one can be reached from the other, directly or indirectly. Examples of relationship include parent-child, and group membership (a user is **related** to the group he is a member of). Relationships are unidirectional.
- **MemberOf**
  This is used to describe a **relationship** between two objects. Many common directories support an attribute called **memberOf** that embodies this relationship, typically between users and groups.

Substitution

Two forms of substitution are provided:

- Current Object Attributes: <<nameOfAttr>, or
- Inbound Object Attributes: <<in.nameOfAttr>>

The former allows you to construct expressions based upon the value of another attribute in the current object (same one that contains the edmLink or edmPolicy), for example,

```
edmLink: cn=<<homePC>>, cn=Computes, o=Acme.
edmLink: cn=wnt001, cn=Computers, o=Acme ; <<homePC>> ==
"wnt001".
```

The latter allows you to reference attributes that were supplied as input to the policy resolution, for example:

```
edmPolicy: ++SOFTWARE/STRATUS_PAD; <<in.hostname>> ==
"XKEZ01$"
```

Currently the minimum attributes that will exist are listed in Table 6, below.

Table 6 Default Inbound Object Attributes <<in.nameOfAttr>>

Attribute Name	Sample Value
context	{}
dn	{cn=su61er, cn=computers, dc=acme, dc=com}
dname	software
domain	{ACMEWEST\XKEZ01$}
hostname	{XKEZ01$}
ipaddress	192.168.0.100
mtime	{2007-06-22 18:54:35}
nvdipnetworknumber	192.168.0.0
nvdsubnet	255.255.255.0
smenclosureserialnumber	CNU0123456
smsystemproductname	{HP Compaq nc6000 (DU655C)}
smsystemmanufacturer	Hewlett-Packard
smsystemserialnumber	CNU0123456
smsystemuuid	27494E2D171E11DB09906D9908020929

Expressions

The expressions are implemented as Tcl (**www.scriptics.com**) expressions, where instead of using $myVar you would use <<myAttribute>>. A simplified summary of valid expressions is provided below. Most of the standard C language expression operators are valid.

Table 7 Expressions

Expression	Meaning
A && B	Logical AND
A || B	Logical OR
!A	Logical NOT
<<myAttr>> == "Hello"	Test for equality (case-sensitive)
<<myAttr>> != "Hello"	Test for inequality
<<myAttr>> < 55	Numerical comparison for less than
<<myAttr>> >= "Hello"	Dictionary comparison for greater than or equal to (C locale)

There are also a small number of specialized functions.

Table 8 Specialized Function Example

Example	Meaning
[memberOf "ou=Accounting, o=Acme"]	Yields TRUE if the DN specified is part of your policy model.
[parent <<dn>>] == <<aSpecialDN>>	Yields TRUE if the parent DN of the current object is the same as the "aSpecialDN".

The LDAP Extension URL Namespace

The LDAP extension provides the following special purpose URLs:

Table 9 LDAP Extension URL Namespace

URL	Description
/policy/ldap?<x-url encoded query>	Perform machine-readable policy resolution. The query arguments should be an attribute value list of inbound attributes, formatted in accordance with the X-URL encoding specification. The following attributes are currently supported and interpreted by the LDAP Policy Extension: • **dn -** the distinguished name or LDAP URL to perform policy resolution upon. (REQUIRED) • **phase -** the value may be specified as "1", "2", or "3", to view the intermediate stages of policy resolution. (default=3) • **prefix -** the value is the prefix to use when searching the directory for policy related attributes, i.e., <pfx>Policy or <pfx>Link. (default=edm) • **debug** - the value is the log level to use for this single query, a value of 9 or above will generate detailed logging in the CM Policy Server log file. (no default)
/status/ldap	Return an overview of the current status of the extension.
/status/ldap/all	Return all available status information on extension.
/status/ldap/cache	Return information on cache.
/status/ldap/stats	Return statistics on usage of extension.

URL	Description

/admin/ldap/flush?dn=<dn>	Force a flush of the cache. If no dn, or an empty dn, is supplied, then the entire cache is flushed. Otherwise, just the specified dn is flushed. Encode any special characters in the <dn> value using their ASCII equivalents, as shown in the Syntax Example below.
	Pre-requisite:
	Uncomment this line in the `httpd.rc` file:
	`#Admin_Url /admin`
	and restart the service for the CM Integration Server.
	
	Syntax Example:
	To flush the cache of the dn:
	`dc=test,dc=com`
	encode the <dn> value by replacing the equal signs (=) with **`%3d`**, and the comma (,) with **`%2c`**:
	The resulting URL to flush the cache of this dn is:
	`/admin/ldap/flush?dn=dc%3dtest%2cdc%3dcom`

/admin/ldap/reset	Reset connection to directory (forces a flush and reconnect). **Pre-requisite:** Uncomment this line in the `httpd.rc` file: `#Admin_Url /admin` and restart the service for the CM Integration Server.
/ldap/config.tsp	Summary configuration page, and interactive controls for resetting cache and connection.
/ldap/browse.tsp?dn=<dn>	Directory Browser and Policy Editor.
/ldap/query.tsp?dn=<dn>	Interactive Policy Resolver—simple diagnostic page allowing you to interactively submit policy requests and see the policy outcome, as well as the steps that led to that outcome, in a friendly formatted HTML page.
/ldap/test.tsp?dn=<dn>	This URL can be used to test connections to arbitrary directory servers, and is useful when diagnosing problems with authentication and directory access.

B Use Existing LDAP Attributes

The goal of this feature is to allow Configuration Management customers to implement the CM Policy Server without requiring schema changes. This can be accomplished by using an existing directory service attribute to embed the required attributes and their values.

Do not implement this feature with a directory that already has the necessary attributes. The feature will *not* function properly. See Adding Configuration Management Policy Attributes on page 22 before using an existing LDAP attribute.

This feature should *only* be used when it is *not* possible to make the necessary LDAP schema changes as shown in Adding Configuration Management Policy Attributes *on page 22*.

To use this feature, you must have an unused multi-valued LDAP attribute that already exists in the directory schema that can exist in *any* object that will have policy assignments. Use the EMBED configuration option in the CM Policy Server configuration file, `pm.cfg`. The value of EMBED must be the name of an attribute that already exists in the schema of your LDAP directory. The attribute should be one that is allowed to exist in all objects for which policy will be assigned.

The attribute should be multi-valued and of type string. The embedded data will be stored in multiple values of the attribute – one embedded policy per value. The original contents will be maintained along with any policies assigned to the object.

Suppose you are going to use an already existing attribute called "displayname". Add the following line to `pm.cfg`:

```
EMBED           {displayname}
```

By default, the EMBED options assumes that the displayname attribute is multi-valued.

C Domain Filtering

If you are using the CM Policy Server to create entitlements in your enterprise, you can filter out which domains the CM Policy Server will assign services from based on connect parameters.

If you are using CM Policy Server with HP Configuration Management Patch Manager (CM Patch Manager), you will want to separate resolution of regular software services from those for CM Patch Manager. CM Policy Server filters services based on the dname passed on the radskman command line. The CM Policy Server configuration file, `pm.cfg`, contains filter settings in format:

```
DNAME=<DOMAIN NAME>    { rule }
```

Where the DOMAIN NAME is the value passed in dname by RADISH. In the case of a CM Patch Manager agent, this will be the dname parameter of radskman. Dname should be patch. If the filter name passed in dname is not found in `pm.cfg`, then the filter DNAME=* will be used. The minimum version requirement for CM Policy Server is version 3.2.1.

The default configuration for these filters is shown in below:

```
DNAME=*           { * !PATCHMGR !OS }

DNAME=PATCH       { PATCHMGR }

DNAME=OS          { OS }
```

In this configuration the default rule (*) will ignore PATCHMGR and OS domains and allow everything else as denoted by the use of an exclamation point (!). PATCH and OS rules allow only policies for PATCH and OS domains respectively. If for instance, we wanted to allow any policies for OS manager resolution we would change the last filter to: DNAME=OS { * }.

D Product Name Changes

If you have used Radia in the past, and are not yet familiar with the newly rebranded HP terms and product names, Table 10 below will help you identify naming changes that have been applied to the Radia brand.

Table 10 Product Name and Term Changes

New Name/Term	Old Name/Term
HP Configuration Administrator	Radia Administrator Workstation
HP Configuration Management	Radia
HP Configuration Management Admin CSDB Editor	Radia System Explorer
HP Configuration Management Application Manager	Radia Application Manager
HP Configuration Management Application Self-service Manager	Radia Software Manager
HP Configuration Management Configuration Server	Radia Configuration Server
HP Configuration Management Configuration Server Database	Configuration Server Database, Radia Database
HP Configuration Management Integration Server	Radia Integration Server
HP Configuration Management Patch Manager	Radia Patch Manager
HP Configuration Management Policy Server	Radia Policy Server
HP Configuration Management Proxy Server	Radia Proxy Server

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