CA Identity Manager

Configuration Guide

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CA Technologies Product References

This document references the following CA products:

- CA Identity Manager
- CA SiteMinder®
- CA Directory
- CA User Activity Reporting Module (UARM)
- CA Role & Compliance Manager

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Chapter 1: Introduction to Identity Manager Environments

This section contains the following topics:

Identity Manager Environment Components

A *CA Identity Manager Environment* is a view of a management namespace that lets *CA Identity Manager* administrators manage objects like users, groups, and organizations with a set of associated roles and tasks. The *CA Identity Manager* Environment controls the management and graphical presentation of a directory.

A single user store can associate multiple CA Identity Manager Environments (see page 14) to define different views of the directory. However, an Identity Manager Environment is associated with only one user store.

Identity Manager environments contain following elements:

Directory

Describes a user store to Identity Manager. Directory element includes:

- A pointer to a user store, which stores managed objects such as users, groups, and organizations.
- Metadata that describes how managed objects are stored in the directory and its representation in *CA Identity Manager*.

Provisioning Directory (optional)

Stores data relevant to the Provisioning Server to manage additional accounts in managed endpoints. Only one Provisioning Directory can be associated with an Environment.

Note: For more information about the Provisioning Server or the Provisioning Directory, see the *Installation Guide*.

User Console

Enables *CA Identity Manager* administrators to perform tasks in a *CA Identity Manager* Environment.

Task and role definitions

Determine user privileges in *CA Identity Manager* and other applications. These task and role definitions are initially available in the *CA Identity Manager* Environment where they can be assigned to users.

You can customize the default roles and tasks using the User Console.

Self-service

Lets users create and maintain their own accounts for accessing resources, such as a customer web site. Self-service also lets users request a temporary password in case of forgetting the current password.

Workflow definitions

CA Identity Manager includes default workflow definitions that automate approval and notification of user management tasks, such as creating user profiles or assigning users to roles or groups. You can modify the default workflow processes in *CA Identity Manager* to support each enterprise requirements.

Skins

Determine the appearance of the *CA Identity Manager* user interface.

Custom features

You can modify *CA Identity Manager* to suit your business requirements using the Identity Manager APIs. See the *Programming Guide for Java*.

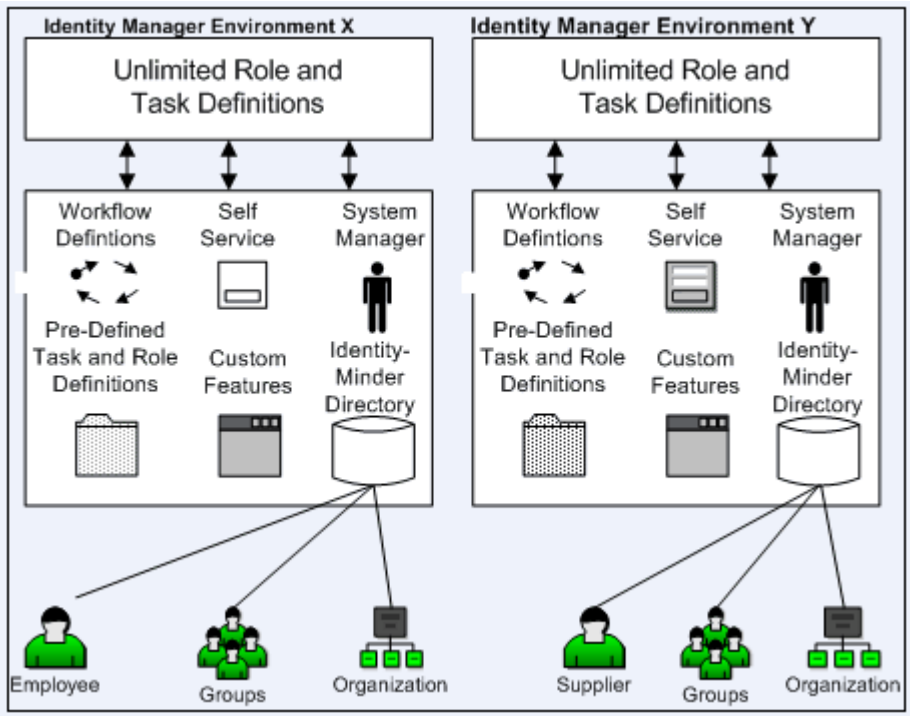
Each *CA Identity Manager* environment requires one or more system managers to customize the initial roles and tasks using the User Console. Once a system manager creates the initial roles and tasks, that manager can grant administrative privileges to users in that environment. These users become administrators who manage users, groups, and organizations. See the *Administration Guide*.

Multiple Identity Manager Environments

Create multiple Identity Manager environments when you want to:

- Manage additional user stores—You can manage users in different types of user stores. For example, your company store all of its user profiles in a Sun Java System LDAP directory. You enter into a joint venture with a partner that uses an Oracle database to store user information. You would want a different Identity Manager environment for each set of users.

- Manage objects with different LDAP object classes— Consider Identity Manager is managing an LDAP directory. Within the same directory, you can manage objects of the same type along with different object classes and attributes. For example, the following illustration shows a directory that contains two types of users:
  - Employees, who have an employee ID number.
  - Suppliers, who are identified with a supplier number.



Identity Manager Management Console

As a Identity Manager system administrator, your responsibilities include:

- Creating an Identity Manager Directory
- Configuring a Provisioning Directory
- Configuring an Identity Manager environment
- Assigning a system manager
- Enabling custom features for initial use

To configure an Identity Manager environment, use the Management Console, a web-based application.

The management console is divided into the following two sections:

- Directories—Use this section to create and manage Identity Manager Directories and Provisioning Directory, which describe user stores to Identity Manager.
- Environments—Use this section to create and manage Identity Manager environments, which control the management and graphical presentation of a directory.

How to Access the Identity Manager Management Console

To access the Management Console, enter the following URL in a browser:

http://*hostname:port*/iam/immanage

hostname

Defines the fully qualified domain name or IP address for the server where Identity Manager is installed.

Note: If you are accessing the Management Console using Internet Explorer 7 and the hostname includes an IPv6 address, incorrect display of the Management Console is expected. To prevent this issue, use the fully qualified hostname or an IPv4 address.

port

Defines the application server port.

Note: If you are using a Web Agent to provide advanced authentication for Identity Manager, you do not need to specify the port number.

Note: Enable Javascript in the browser that you use to access the Management Console.

Example paths to the Management Console:

- For Geologic Weblogs:

  http://myserver.mycompany.org:7001/iam/immanage

- For JBoss:

  http://myserver.mycompany.org:8080/iam/immanage

- For WebSphere:

  http://myserver.mycompany.org:9080/iam/immanage

Provisioning in an Identity Manager Environment

You can configure provisioning for a Identity Manager Environment to provide accounts in other systems, called endpoints, to users managing Identity Manager. Accounts provide users with access to additional resources, such as an email account. You provide these additional accounts by assigning provisioning roles, which you create through Identity Manager. Provisioning roles are associated with account templates that define accounts that users can receive.

When you assign a provisioning role to a user, the user receives the accounts according to the account templates in the role. The account templates also define how user attributes are mapped to accounts. The accounts exist in managed endpoints is according to the account templates.

Note: For full details on using a provisioning in Identity Manager, see the *Administration Guide*.

How to Create an Identity Manager Environment

To create a Identity Manager environment, you complete the following steps in the Management Console:

1. Use the Directory Configuration Wizard (see page 138) to create a Identity Manager Directory.
2. If your environment includes provisioning, use the Directory Configuration Wizard again to create a Provisioning Directory (see page 152).
3. Create a Identity Manager Environment (see page 169).
4. Access the Environment (see page 173) to verify that it is running.

Chapter 2: Sample Identity Manager Environment

This section contains the following topics:

Overview of Sample Identity Manager Environment

Identity Manager includes a sample environment that you can use to learn about and test Identity Manager.

The sample environment is based on a car trading company named NeteAuto. NeteAuto administrators use Identity Manager to manage employees, suppliers, and regional dealerships.

User store configurations to use sample NeteAuto environments are:

- LDAP user stores that support organizations
- LDAP user stores that do not support organizations.
- Relational Database user stores that support organizations
- Relational Database user stores that do not support organizations.

Note: Provisioning capabilities are unavailable since this environment has no provisioning directory.

How to Configure the NeteAuto Sample with Organization Support

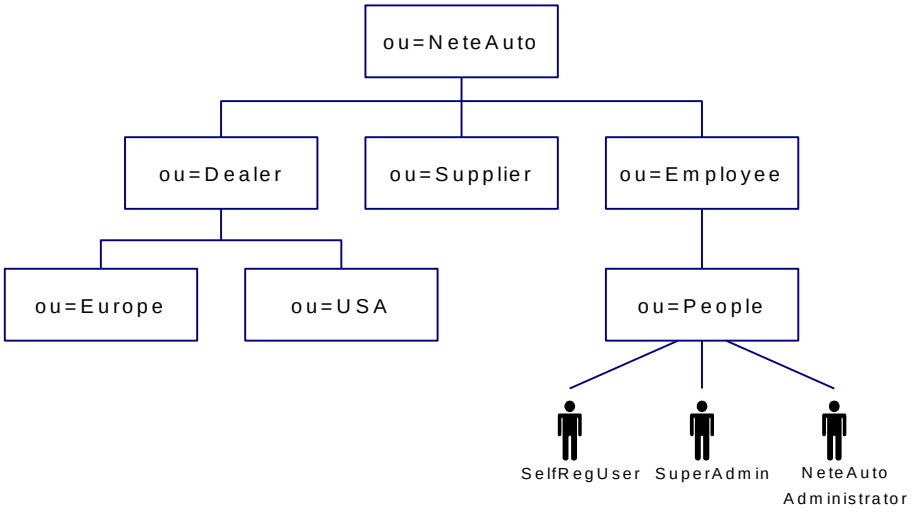
Configuring the NeteAuto sample with organization support involves the following steps:

- Installing the prerequisite software
- Installing the sample Identity Manager environment

- Configuring an LDAP user directory
- Configuring a relational database
- Creating the Identity Manager directory
- Creating the NeteAuto Identity Manager environment

LDAP Directory Structure for NeteAuto

The following illustration describes the NeteAuto sample for LDAP directories:



The sample Identity Manager Environment includes the following users:

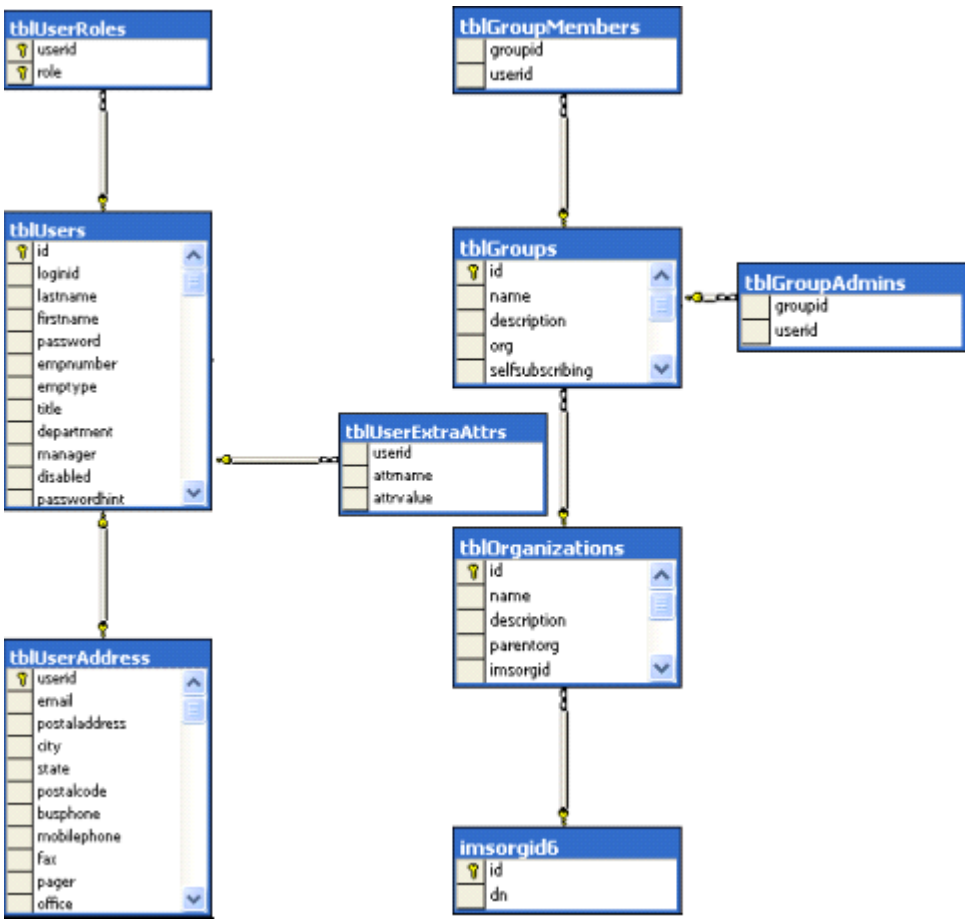
- Superadmin is the administrator account with the System Manager role for this Identity Manager Environment. As superadmin, you can perform all default admin tasks.

  Note: For a description of the default admin tasks, see the *Administration Guide*.

- SelfRegUser is the administrator account that Identity Manager uses to enable self-registration for this Identity Manager Environment.
- NeteAuto Administrator does not have any privileges when you install the NeteAuto environment. However, you can assign Group Manager as a user role, as described in Assign the Group Manager Role.

Relational Database for NeteAuto

The following illustration describes the relational database for the NeteAuto sample including an organization table:



Prerequisite Software for NeteAuto

The NeteAuto Identity Manager environment has the following prerequisites:

- Install Identity Manager as described in the *Installation Guide*. Be sure to install the Identity Manager Administrative Tools.
- You must have access to a Sun Java system (Sun ONE or iPlanet) Directory Server or a Microsoft SQL Server database.

Installation Files for the NeteAuto Environment

Identity Manager includes a set of files that you can use to set up a sample Identity Manager environment. Identity Manager environment is a view of a management namespace that enables Identity Manager administrators to manage objects such as users, groups, and organizations. These objects are managed along with a set of associated roles and tasks. Identity Manager environment controls the management and graphical presentation of a directory.

The sample Identity Manager environment includes:

- Sample objects, such as users and organizations
- Role, task, and screen definitions

  Tasks appear in the User Console when you click a tab, such as Users or Groups. Based on the assigned roles, the associated tasks appear when the user logs in.

  Note: For more information about roles and tasks, see the *Administration Guide*.
- A sample skin that customizes the User Console for NeteAuto users.
- A directory configuration file that you use to create an Identity Manager directory.

The files for creating the sample Identity Manager environment are installed in the following location:

admin_tools\samples\NeteAuto

In this path, *admin_tools* refers to the Administrative Tools. The Administrative Tools are placed in the following default locations:

- **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
- **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

Install the NeteAuto Environment

Perform the following process to install the NeteAuto environment.

To install the NeteAuto environment

1. Make sure that the prerequisite software is installed (see page 21).
2. Configure the user store and import the sample data.
   - For LDAP users: Configure an LDAP User Directory (see page 23)
   - For relational database users: Configure a Relational Database

3. Create the NeteAuto Identity Manager directory.
4. Create the NeteAuto Identity Manager environment.
5. Configure the look and feel of the Identity Manager user interface for NeteAuto users (see page 38).

Configure an LDAP User Directory

LDAP directory is available depending upon your installation. You can use the following procedure to check whether the directory exists or to create the directory.

To configure an LDAP user directory:

1. In the directory server console, create a new instance of LDAP with the following root:

   ```
   dc=security,dc=com
   ```

   Write down the port number for future reference.

2. Import the NeteAuto.ldif file to the directory server from samples\NeteAuto in the Administrative Tools.

   The Administrative Tools are installed in the following default locations:

   - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

Note: If you experience problems importing the LDIF file or creating the Identity Manager directory, add the following text to the beginning of the LDIF file:

```
dn: dc=security, dc=com
objectClass: top
objectClass: domain
dc: security
```

Save the file and repeat steps 1 and 2.

Configure a Relational Database

Perform the following procedure to configure a relational database.

To configure a relational database

1. Create a database instance named NeteAuto.

2. Create a user named neteautoadmin with the password test. Grant neteautoadmin rights (such as public and db_owner rights) to NeteAuto by editing the properties of the user.

   Note: To create a NeteAuto database, neteautoadmin role must have at least minimum (select, insert, update, and delete) permissions for all the tables that are created by.sql script. Also, neteautoadmin must be able to execute all of the stored procedures, if any, defined in these scripts.

3. When you edit user properties, make NeteAuto the default database for neteautoadmin.

4. Run the following scripts in the order in which they are listed:

   - *db_type*-rdbuserdirectory.sql—Configures the tables for the NeteAuto sample, and creates the user entries.
   - ims_*db_type*_rdb.sql—Configures support for organizations

     db_type

     Defines the Microsoft SQL or Oracle depending on the type of database that you are configuring.

   These script files are located in the *admin_tools*\samples\NeteAutoRDB\Organization folder. In this example, *admin_tools* refers to the Administrative Tools, which are installed in the following default locations:

   - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

5. Define a JDBC data source named neteautoDS that points to the NeteAuto database.

   The procedure for configuring a data source depends on the type of application server where Identity Manager is installed. The section How to Create a JDBC Data Source (see page 97) includes application server-specific instructions for creating a JDBC data source.

Create the Identity Manager Directory

Perform the following procedure to create a Identity Manager directory.

To create the Identity Manager directory

1. Open the Management Console by entering the following URL in a browser:

   http://*im_server:port*/iam/immanage

   im_server

   Defines the fully qualified domain name of the server where Identity Manager is installed.

   port

   Defines the application server port number.

2. Click Directories.

   Identity Manager directories screen appears.

3. Click New to start the Identity Manager directory wizard.

4. Browse for the appropriate directory configuration .xml file, and click Next.

   The directory configuration file is located in the following folders:

   - For Sun Java System Directory Server user directories:

     admin_tools\samples\NeteAuto\Organization\directory.xml

   - For relational databases:

     admin_tools\samples\NeteAutoRDB\Organization*db_type* directory.xml

     admin_tools

     Defines the installed location of the Administrative Tools.

     The Administrative Tools are installed in the following default locations:

     Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools

     UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

     db_type

     Specifies the type of database that you are configuring: Microsoft SQL or Oracle.

   Status information is displayed in the Directory Configuration Output screen.

5. On the second page of the wizard, supply the following values:

   - Sun Java System Directory Server

     Name

     NeteAuto Directory

     Description

     Sample NeteAuto directory

     Connection Object Name

     NeteAuto Users

     Host

     Computer name or IP address of the system where the user store is installed.

     Port

     Port number for the user store

     Search root

     dc=security, dc=com

     Username

     User name for an account that can access the user store.

     Password and Confirm Password

     Password for the user account

   - Microsoft SQL Server and Oracle Databases

     Name

     NeteAutoRDB Directory

     Description

     Sample NeteAuto directory

     Connection Object Name

     NeteAutoRDB

     ODBC Data Source

     neteautoDS

     Username

     Neteautoadmin

     Password

     Test

6. Click Next.
7. Click Finish to exit the wizard.

Create the NeteAuto Identity Manager Environment

Perform the following procedure to create the NeteAuto Identity Manager Environment.

To create the NeteAuto Identity Manager Environment:

1. In the Management Console, click Environments.
2. In the Identity Manager Environments screen, click New.

   The Identity Manager Environment wizard appears.
3. In the first page of the wizard, enter the following values:

   Environment name

   NeteAuto Environment

   Description

   Sample Environment

   Alias

   Neteauto

   The alias is added to the URL for accessing the Identity Manager Environment. For example, the URL for accessing the neteauto environment is:

   http://*server_name*/iam/im/neteauto

   server_name

   Defines the fully qualified domain name of the server where Identity Manager is installed, for example:

   http://myserver.mycompany.org/iam/im/neteauto

   Note: The alias is case-sensitive.

   Click Next.
4. Select the Identity Manager Directory to associate with the Environment that you are creating:

   - For Sun Java System Directory Server, use the NeteAuto Directory.
   - For Microsoft SQL Server or Oracle database, use the NeteAutoRDB Directory.

   Click Next.

5. Configure support for public tasks, such as the self-registration and forgotten password tasks, as follows:
   a. Type the following alias for public tasks:

      Neteautopublic

   b. Enter SelfRegUser as the anonymous user account.
   c. Click Validate to view the user unique identifier.

   Note: Users do not need to log in to use public tasks.

6. Select the tasks and roles to create for the NeteAuto Environment:
   a. Select Import roles from the file.
   b. Browse to one of the following locations:
      - For a Sun Java System Directory Server user store:

        admin_tools\samples\NeteAuto\RoleDefinitions.xml

      - For a Microsoft SQL Server user store:

        admin_tools\samples\NeteAutoRDB\Organization\mssqlRoleDefinitions.xml

      - For an Oracle user store:

        admin_tools\samples\NeteAutoRDB\Organization\oracleRoleDefinitions.xml

      admin_tools refers to the Administrative Tools, which are installed in the following location by default:

      Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools

      UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

7. Specify a user to serve as the System Manager for this environment and click Next:
   a. Type SuperAdmin in the System Manager field.
   b. Click Add.

      Identity Manager adds the unique identifier of the Superadmin user to the list of users.

   c. Click Next.

8. Review the settings for the environment, and do the following tasks:
   - (Optional) Click Previous to modify.
   - Click Finish to create the Identity Manager Environment with the current settings.

     The Environment Configuration Output screen shows the progress of the environment creation.
9. Click Continue to exit the Identity Manager Environment wizard.
10. Start the Identity Manager Environment.

Once you create the NeteAuto Environment, you can:

- Create a skin for this Identity Manager environment (see page 38).
- Access the environment (see page 36)

How to Configure the NeteAuto Sample without Organization Support

Configuring the NeteAuto sample without organization support involves the following steps:

- Installing the prerequisite software (see page 21)
- Installing the sample Identity Manager environment
- Configuring the database
- Creating a JDBC data source
- Creating the Identity Manager directory
- Creating the NeteAuto Identity Manager environment

Sample Identity Manager Environment Description

For Microsoft SQL Server and Oracle databases, Identity Manager includes a version of the NeteAuto environment that does not include organizations. This Identity Manager environment includes the following three users:

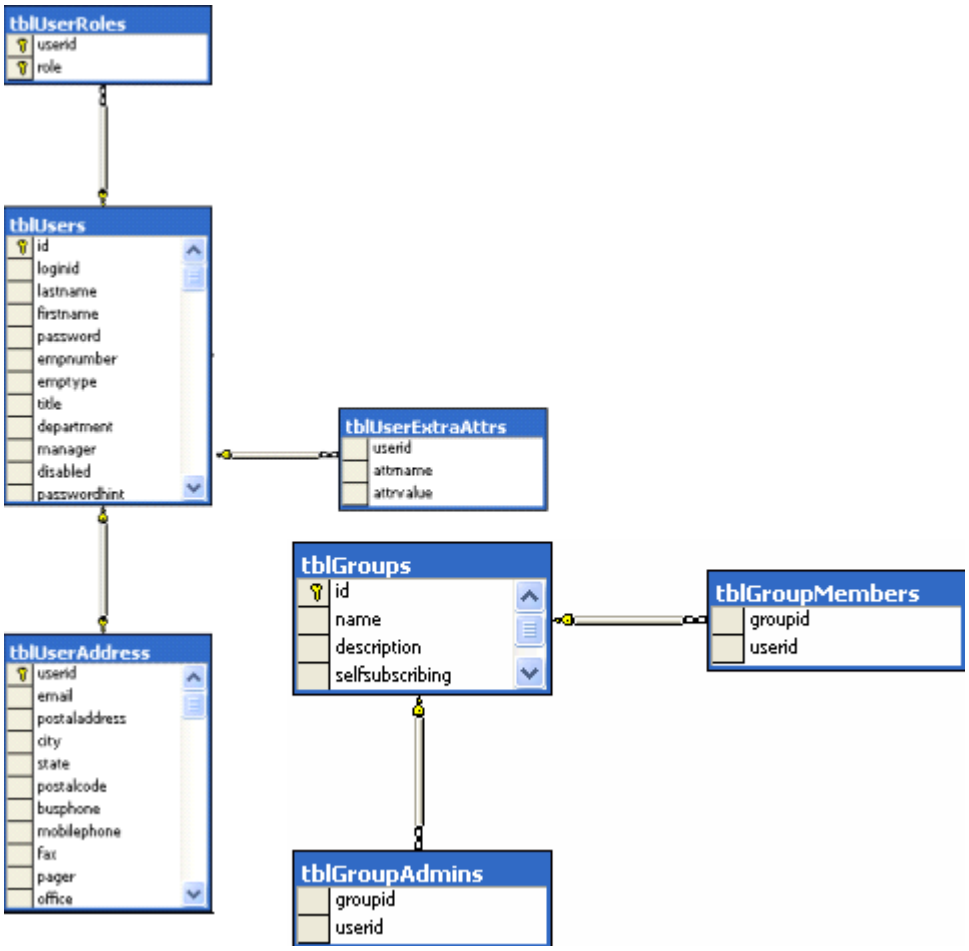
- Superadmin is the administrator account with the System Manager role for this Identity Manager environment. As Superadmin, you can perform all of the default admin tasks.

  Note: For a description of the default admin tasks, see the *Administration Guide*.
- SelfRegUser is the administrator account that Identity Manager uses to enable self-registration for this Identity Manager environment.

- NeteAuto Administrator does not have any privileges when you install the NeteAuto environment.

  However, you can assign the Group Manager role to the NeteAuto Administrator account.

The following illustration describes the NeteAuto sample for a relational database, without organizations:



Installation Files for the Neteauto Environment

Identity Manager includes a set of files that you can use to set up a sample Identity Manager environment. An Identity Manager environment is a view of a management namespace that enables Identity Manager administrators to manage objects. These objects such as users and groups are with a set of associated roles and tasks. An Identity Manager environment controls the management and graphical presentation of a user store.

The sample Identity Manager environment includes:

- Sample users
- Role, task, and screen definitions

  Tasks appear in the User Console when you click a category, such as users or groups. The tasks that appear are based on the roles which are assigned to the user.

  Note: For more information about roles and tasks, see the *Administration Guide*.
- A sample skin that customizes the User Console for NeteAuto users.
- A directory configuration file that you use to create an Identity Manager directory.

The files for creating the sample Identity Manager environment are installed in the following location:

admin_tools\samples\NeteAutoRDB\NoOrganization

In this path, *im_admin_tools_dir* refers to the Administrative Tools.

The Administrative Tools are placed in the following default locations:

- **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
- **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

How To Install the NeteAuto Environment—No Organization Support

Perform the following process to install the NeteAuto environment.

To install the NeteAuto environment

1. Verify that the prerequisite software (see page 32) is installed.
2. Configure the database (see page 23).
3. Create the Identity Manager Directory. (see page 33)
4. Create the NeteAuto Identity Manager Environment (see page 34).
5. Configure the look and feel of the Identity Manager user interface (see page 38) for NeteAuto users.

Prerequisite Software

The NeteAuto Identity Manager environment has the following prerequisites:

- Install CA Identity Manager as described in the *Installation Guide*. Verify to install the Identity Manager Administrative Tools.
- You must have access to a Microsoft SQL Server or Oracle database.

Configure a Relational Database

Perform the following procedure to configure a relational database.

To configure a relational database

1. Create a database instance named NeteAuto.
2. Create a user named neteautoadmin with the password test. Grant neteautoadmin rights (such as public and db_owner rights) to NeteAuto by editing the properties of the user.

   Note: To create a NeteAuto database, neteautoadmin role must have at least minimum (select, insert, update, and delete) permissions for all the tables that are created by.sql script. Also, neteautoadmin must be able to execute all of the stored procedures, if any, defined in these scripts.
3. When you edit user properties, make NeteAuto the default database for neteautoadmin.
4. Run the following scripts in the order in which they are listed:
   - *db_type*-rdbuserdirectory.sql—Configures the tables for the NeteAuto sample, and creates the user entries.
   - ims_*db_type*_rdb.sql—Configures support for organizations

     db_type

     Defines the Microsoft SQL or Oracle depending on the type of database that you are configuring.

   These script files are located in the *admin_tools*\samples\NeteAutoRDB\Organization folder. In this example, *admin_tools* refers to the Administrative Tools, which are installed in the following default locations:

   - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

5. Define a JDBC data source named neteautoDS that points to the NeteAuto database.

   The procedure for configuring a data source depends on the type of application server where Identity Manager is installed. The section How to Create a JDBC Data Source (see page 97) includes application server-specific instructions for creating a JDBC data source.

Create the Identity Manager Directory

Perform the following procedure to create the Identity Manager directory.

To create the Identity Manager directory

1. Open the Management Console by entering the following URL in a browser:

   http://*im_server*:*port*/iam/immanage

   im_server

   Defines the fully qualified domain name of the server where Identity Manager is installed.

   port

   Defines the application server port number.

2. Click Directories.

   The Identity Manager directories screen appears.

3. Click New to start the Identity Manager directory wizard.

4. Browse for one of the following directory configuration XML files, and click Next:

   - Sun Java Systems:

     admin_tools\samples\NeteAuto\NoOrganization\directory.xml

   - SQL Server databases:

     admin_tools\samples\NeteAuto\NoOrganization\mssql-directory.xml

   - Oracle databases:

     admin_tools\samples\NeteAuto\NoOrganization\oracle-directory.xml

   admin_tools refers to the Administrative Tools, which are installed by default in the following location:

   - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

   Status information is displayed in the Directory Configuration Output screen.

5. In the second page of the wizard, supply the following values:

   Name

   NeteAutoRDB Directory

   Description

   Sample NeteAuto directory with no organization support

   Connection Object Name

   NeteAutoRDB

   JDBC Data Source

   neteautoDS

   Username

   neteautoadmin

   Password

   test

6. Click Next.
7. Click Finish to exit the wizard.

Create the NeteAuto Identity Manager Environment

Perform the following procedure to create the NeteAuto Identity Manager environment.

To create the NeteAuto Identity Manager environment:

1. In the Management Console, click Environments.
2. In the Identity Manager environments screen, click New.

   The Identity Manager environment wizard opens.

3. In the first page of the wizard, type the following values:
   - Environment name—NeteAuto environment
   - Description—NeteAuto is a sample environment.

- Alias—neteautoRDB

  The alias is added to the URL for accessing the Identity Manager environment. For example, the URL for accessing the neteauto environment is:

  `http://domain/iam/im/neteautoRDB`

  In this path, *domain* defines the fully qualified domain name of the server where Identity Manager is installed, as in the following example:

  `http://myserver.mycompany.org/iam/im/neteautoRDB`

  Note: The alias is case-sensitive.

Click Next.

4. Select the NeteAutoRDB Directory Identity Manager directory to associate with the environment you are creating and click Next.
5. Configure support for public tasks, such as the self-registration and forgotten password tasks.

   Note: Users do not need to log in to access public tasks.

   a. Type the following alias for public tasks:

      neteautoRDBpublic

   b. Type SelfRegUser as the anonymous user account.

   c. Click Validate to view the user unique identifier (2, in this case).
6. Select the tasks and roles to create for the NeteAuto environment:
   - Select Import roles from the file.
   - Browse to the following location:

     im_admin_tools_dir\samples\NeteAutoRDB\NoOrganizations\RoleDefinitions.xml

     In this path, *im_admin_tools_dir* defines the installed location of the Identity Manager administrative tools.
7. Specify a user to serve as the System Manager for this environment, and click Next:

   a. Type SuperAdmin in the System Manager field.

   b. Click Add.

   c. Click Next.
8. Review the settings for the environment.
   - Click Previous to modify.
   - Click Finish to create the Identity Manager environment with the current settings.

     The Environment Configuration Output screen shows the progress of the environment creation.

9. Click Finish to exit the Identity Manager environment wizard.
10. Start the Identity Manager environment.

Once you created the NeteAuto environment, you can:

- Create a skin for this Identity Manager environment as described in Setup the NeteAuto Skin (see page 38).
- Access the environment as described in Using the NeteAuto Identity Manager environment

How to Use the NeteAuto Identity Manager Environment

You can use the NeteAuto Identity Manager Environment to manage self-service tasks and users.

Self-Service Task Management

The self-service tasks include:

- Registering as a new user
- Logging in as a self-registered user
- Using the forgotten password feature

Register as a New User

Perform the following procedure to register as a new user.

To register as a new user:

1. Type the following URL in a browser:

   `http://hostname/iam/im/neteautopublic/index.jsp?task.tag=SelfRegistration`

   hostname

   Defines the fully qualified domain name of the system where Identity Manager is running.

   Note: If you did not configure the Neteauto skin (see page 38), you can omit imcss from the URL as follows:

   http://*hostname*/iam/im/neteautopublic/index.jsp?task.tag=SelfRegistration

This URL directs you to the default ca console.

At the Self-Registration: End-User License Agreement page, Identity Manager displays the CA website.

Note: You can configure the default Self-Registration task to display custom End-User License Agreement. For instructions, see the *Administration Guide*.

2. Click Accept to proceed.
3. In the Profile tab, provide the following details:
   a. Type values for the required fields, indicated with an asterisk (*).
   b. Type password hints and answers.

      For a forgotten password case, Identity Manager provides the password hint and requests the answer. If the answer is correct, Identity Manager prompts the user to specify and confirm a new password.
4. Leave the Groups tab unchanged.
5. Click Submit.

Log In as a Self-Registered User

Perform the following procedure to log in as a self-registered user.

To log in as a self-registered user

1. Type the following URL for the NeteAuto Identity Manager Environment in a browser:

   `http://hostname/iam/im/neteauto/imcss/index.jsp`

   hostname

   Defines the fully qualified domain name of the system where Identity Manager is running.
2. Log in using the username and password you specified when you registered.

Set Up the NeteAuto Skin

To set up the NeteAuto skin, you create a SiteMinder response in the SiteMinder Policy Server.

To set up the NeteAuto skin:

1. Log in to one of the following interfaces as an administrator with Domain privileges:
   - For CA SiteMinder Web Access Manager r12 or higher, log in to the Administrative UI
   - For CA eTrust SiteMinder 6.0 SP5, log in to the Policy Server User Interface

   Note: For information on using these interfaces, see the documentation for the version of SiteMinder that you are using.
2. Open the neteautoDomain.
3. Under neteautoDomain, select Realms.

   The following realms appear:

   neteauto_ims_realm

   Protects the Identity Manager environment.

   neteauto_pub_realm

   Enables support for public tasks, such as self-registration and forgotten password tasks.
4. Create a rule in each of the realms. Specify the following details:
   - Resource: *
   - Actions: GET, POST

   To simplify the administration, include the NeteAuto skin in the rule name.
5. Create a response for the domain with the following response attributes:
   - Attribute: WebAgent-HTTP-Header-Variable

     This attribute adds new HTTP header to the response.
   - Attribute Kind: Static
   - Variable Name: skin

     Variable Value: neteauto

6. Modify the policy that Identity Manager created in the neteautoDomain. Specify the following details:
   - Users
     - For LDAP: Select ou=People, ou=Employees, ou=NeteAuto in Available Members and add it to Current Members. Click OK.
     - For relational databases: Search for users where the id attribute equals *. Select all the users in Available Members and add them to Current Members. Click OK.
   - Rules:
     - Add the rules that you created in Step 4.
     - For each rule, click Set Response. Associate each rule with the response that you created in Step 5.

Note: The neteauto skin is based on the imcss console. To view the skin, append /imcss/index.jsp to the URL for the NeteAuto Identity Manager Environment as follows:

http://*hostname*/iam/im/neteauto/imcss/index.jsp

Access the NeteAuto Identity Manager Environment (see page 40) provides complete instructions for accessing the Neteauto environment.

Use the Forgotten Password Feature

Perform the following procedure to use the forgotten password feature.

To use the forgotten password feature:

1. Type the following URL in a browser:

   `http://hostname/iam/im/neteautopublic/index.jsp?task.tag=ForgottenPasswordReset`

   hostname

   Defines the fully qualified domain name of the system where Identity Manager is running.

2. Type the unique identifier for the self-registered user that you created in Register as a New User (see page 36), and click Next.
3. Each time when you are prompted, answer the verification question. The answer is the one which you have provided during registration.

   Note: A correct response is required for each question. Canceling the task or closing the browser counts as a failed attempt.
4. Click Submit.

   Identity Manager prompts you to supply a new password.

User Management

User management includes the following operations:

- Accessing the NeteAuto Identity Manager environment
- Modifying a user
- Assigning the Group Manager role
- Creating a group
- Managing self-registered users

Access the NeteAuto Identity Manager Environment

Perform the following procedure to access the NeteAuto Identity Manager environment.

To access the sample Identity Manager environment:

1. Type the following URL in a browser:

   `http://`*`hostname`*`/iam/im/neteauto/imcss/index.jsp`

   hostname

   Defines the fully qualified domain name, as in the following example:

   http://myserver.mycompany.com/iam/im/neteauto/imcss/index.jsp.

   Note: If you did not configure the Neteauto skin, you can use the following URL to access the Neteauto environment:

   http://*hostname*/iam/im/neteauto

2. In the login screen, type the following credentials:

   User Name

   SuperAdmin

   Password

   test

Modify a User

Perform the following procedure to modify a user.

To modify a user

1. Log in the NeteAuto environment as SuperAdmin using the password test.
2. Select Users, Manage Users, Modify User.

   The Select User screen appears.

3. Click Search.

   Identity Manager displays a list of users in the NeteAuto environment.

4. Select the NeteAuto administrator, as follows:

   - For LDAP directories, NeteAuto Administrator
   - For relational databases, NeteAuto Admin

   Click Select. Identity Manager displays the profile for the NeteAuto administrator.

5. In the Title field, type Manager. Click Submit.

   Identity Manager confirms the task submission.

6. Click OK to return to the main screen.

Assign the Group Manager Role

The group manager role must be assigned.

To assign the group manager role:

1. As SuperAdmin, select the Roles and Tasks tab, then select Admin Roles, Modify Admin Roles.
2. Select the Group Manager role, and click Select.

   The profile for the Group Manager role appears.

3. Click the Members tab, and click Add under Member Policies.

   The Member Policy screen appears.

4. Under Member Rule, click the down arrow in the Users field.

   From the drop-down list, select where <user-filter>.

   The Users field changes to let you enter a filter for the rule.

5. Enter a membership rule as follows:

   a. In the first field, select Title from the drop-down list.

   b. In the second field, make sure the equal sign (=) is selected.

   c. In the third field, type Manager.

6. In the Scope Rules section, define rules for the users, groups, and organizations (when supported) as follows:

   a. In the Users field, click the down arrow to see a list of options. Select (all) from the list.

   b. Repeat Step 'a' in the Group and Organization fields (when supported).

   c. Leave the Access Tasks field blank.

7. Click OK.

   Identity Manager displays the member policy that you created.

8. Click Submit.

   Identity Manager confirms the task submission.

9. Click OK to return to the main screen.

10. Close Identity Manager.

Create a Group

Perform the following procedure to create a group.

To create a group

1. Log in to Identity Manager as the NeteAuto administrator, as follows:

   - For LDAP directories, type the user name NeteAuto Administrator and the password test.
   - For relational databases, type the user name NeteAuto Admin and the password test.

   The list of tasks that the NeteAuto administrator can perform appears. Because the NeteAuto administrator can perform only a limited number of tasks, Identity Manager lists the tasks instead of categories.

2. Click Create Group.

3. Verify that Create a new group is selected, and click OK.

4. Implement one of the following steps that fits your case:

   - If the NeteAuto environment supports organizations:

     a. In the Org Name field, click the ellipsis symbol (...) to select the organization where Identity Manager creates the group.

     b. At the bottom of the Select Organization screen, expand NeteAuto.

     c. Select the Dealer organization.

   - If the NeteAuto environment does not support organizations, go to the next step.

5. Type the following information for the group:

   - Group Name: Dealer Administrators
   - Group Description: Administrators for NeteAuto dealerships.

6. Click the Membership tab and click the Add a user.

   The Select User screen appears.

7. Click Search.
8. Select the NeteAuto administrator, and click Select.
9. Click Submit to create the group.

Manage Self-Registered Users

Perform the following procedure when you want to manage self-registered users.

To manage self-registered users

1. Log in to Identity Manager as a NeteAuto administrator, using the following credentials:
   - For LDAP directories:

     Username

     NeteAuto Administrator

     Password

     test
   - For relational databases:

     Username

     NeteAuto Admin

     Password

     test

   The list of tasks that the NeteAuto administrator can perform appears on the left side of the User Console. Because the NeteAuto administrator can perform only a limited number of tasks, Identity Manager lists the tasks instead of the categories.
2. Click Modify Group.
3. Click Search.

   Identity Manager displays a list of groups.
4. Select Dealer Administrators, and click Select.
5. Click the Membership tab, and click Add a user.

   The Select User screen appears.
6. Click Search.
7. In the User Search screen, select the user that you typed in Register as a New User (see page 36). Click Select.

8. Click Submit.

   Identity Manager confirms the task submission.

9. Click OK to return to the main screen.

To confirm that the user is a member of the created group, use the View Group task.

How to Configure Additional Features

Once you have installed the NeteAuto sample and practiced basic Identity Manager functionality, use the NeteAuto environment to practice and test additional Identity Manager features, including email notifications and workflow.

Note: For more information about these features, see the *Administration Guide*.

SiteMinder Login Name Restriction for Global User Name

If a user is required to log in to the SiteMinder Policy Server, the following characters or character strings cannot be part of a global user name:

&
*
:
()

Workaround

Avoid using these characters in the global user name.

Chapter 3: LDAP User Store Management

This section contains the following topics:

Identity Manager Directories

A *Identity Manager directory* describes how objects such as users, groups, and organizations are stored in the user directory and how it is represented in Identity Manager. A Identity Manager directory is associated with one or more Identity Manager environments.

How to Create an Identity Manager Directory

Creating a Identity Manager directory for an LDAP user store involves the following steps:

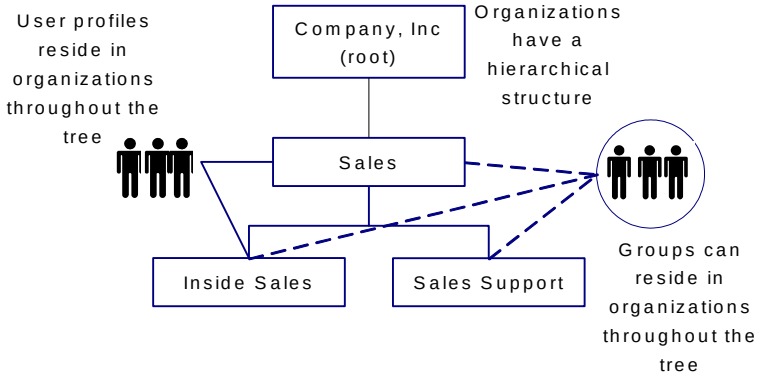
1. Determining the directory structure
2. Describing the objects in the user store by modifying a directory configuration file (directory.xml) (see page 50)
3. Importing the directory configuration file and creating the directory (see page 137)

Note: When using SiteMinder, verify that you have applied the policy store schema prior creating a Identity Manager Directory. For more information on specific policy store schemas and how to apply them, see the *Installation Guide*.

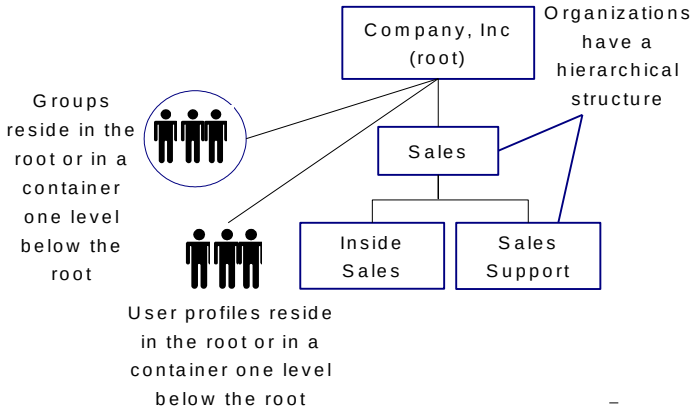
Directory Structure

Identity Manager supports the following directory structures:

- Hierarchical—Contains a parent organization (root) and suborganizations. The suborganizations can also have suborganizations, which creates a multilevel structure, as shown in the following illustration:

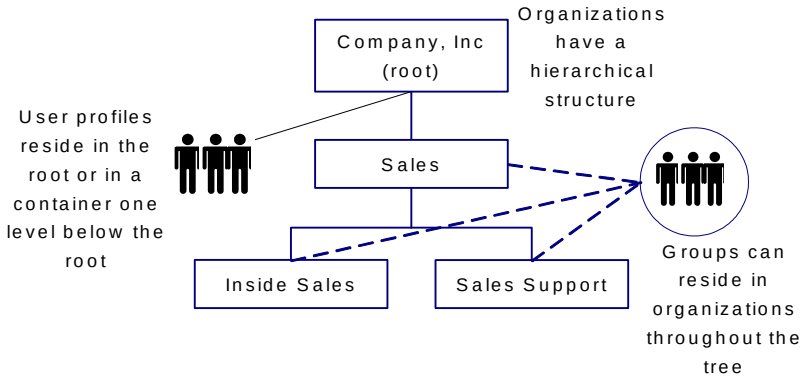


- Flat—User and groups are stored at the search root or in a container one level below the search root. Organizations have a hierarchical structure, as shown in the following illustration of a flat directory structure:



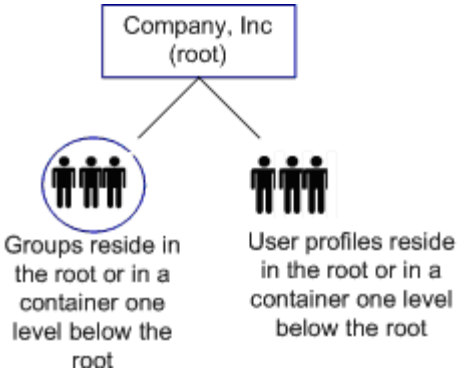
To facilitate user management and delegation in flat directory structures, users and groups belong to logical organizations. The logical organization is stored as an attribute in user and group profiles.

- Flat User—Organizations and groups are stored hierarchically, but users are stored at the search root or in a container one level below the search root. Illustration of a flat user directory structure is shown in the following diagram:



  In flat user directory structures, users belong to logical organizations. The logical organization of a user is stored as an attribute in a user profile.

- No organizations—The directory does not include organizations. Users and groups are stored at the search root or in a container one level below the search root. A no-organizations directory structure is shown in the following illustration:



Note: A directory can contain more than one type of structure. For example, user profiles can be stored in a flat structure in one part of the directory and hierarchically in another. To support a hybrid directory structure, create multiple Identity Manager environments.

Directory Configuration File

To describe structure of a user directory to Identity Manager, create a directory configuration file.

The directory configuration file contains one or more of the following sections:

Identity Manager Directory Information

Contains information about the Identity Manager directory.

Note: Do not modify information in this section. Identity Manager prompts you to provide this information when you create a Identity Manager directory in the Management Console.

Attribute Validation

Defines the validation rules that apply to the Identity Manager directory.

Provider Information

Describes the user store that Identity Manager manages.

Directory Search Information

Enables you to specify how Identity Manager searches the user store.

User Object

Describes how users are stored in the user store and how it is represented in Identity Manager.

Group Object

Describes how groups are stored in the user store and how it is represented in Identity Manager.

Organization Object

Describes how organizations are stored and how it is represented in Identity Manager. Organization object provides details only when the user store includes organizations.

Self-Subscribing Object

Configures support for groups that self-service users can join.

Directory Groups Behavior

Specifies whether the Identity Manager directory supports dynamic and nested groups.

To create a directory configuration file, you modify a configuration template.

How to Select a Directory Configuration Template

Identity Manager supplies directory configuration templates that support different directory types and structures. To create a Identity Manager directory, modify the template that most closely matches your directory structure.

The templates described in the following table are installed with the Administrative Tools:

admin_tools\directoryTemplates*directory_type*\

The Administrative Tools are placed in the following default locations:

- **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
- **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

The types of directories and the corresponding configuration templates are shown in the following table:

Directory Type	Template
Active Directory (ADSI) LDAP directory with a hierarchical structure	ActiveDirectory\directory.xml
Microsoft ADAM Directory with a hierarchical structure	ADAM\directory.xml
IBM Directory Server directory with a hierarchical structure	IBMDirectoryServer\directory.xml
Novell eDirectory user directory with a hierarchical structure	eDirectory\directory.xml
Oracle Internet Directory with a hierarchical structure	OracleInternetDirectory\directory.xml
Sun Java System (SunOne or iPlanet) LDAP directory with a hierarchical structure	IPlanetHierarchical\directory.xml
Sun Java System (SunOne or iPlanet) LDAP directory with a flat structure	IPlanetFlat\directory.xml
Sun Java System (SunOne or iPlanet) LDAP directory that does not include organizations.	IPlanetNoOrganizations\directory.xml
CA Directory user store with a hierarchical structure	eTrustDirectory\directory.xml

Directory Type	Template
Provisioning Directory This template configures the Provisioning Directory for an Identity Manager environment. **Note:** You can use this configuration template as installed. You do not need to modify this template.	ProvisioningServer\directory.xml
Custom directory	Use the template that most closely resembles your directory.

Copy the configuration template to a new directory or save it with a different name to prevent overwriting it.

How to Describe a User Directory to CA Identity Manager

To manage a directory, Identity Manager must understand the structure and content of a directory. To describe the directory to Identity Manager, modify the directory configuration file (directory.xml) in the appropriate template directory.

The directory configuration file has the following important conventions:

- ##—Indicates required values.

  To provide all the required information, locate all double pound signs (##) and replace them with appropriate values. For example, ##DISABLED_STATE indicates that you must supply an attribute to store the account status of a user.

- @—Indicates values that Identity Manager populates. Do not modify these values in the directory configuration file. Identity Manager prompts you to supply the values when you import the directory configuration file.

Before you modify the directory configuration file, you need the following information:

- LDAP object classes for the user, group, and organization objects
- List of attributes in user, group, and organization profiles

How to Modify the Directory Configuration File

Perform the following steps to modify the directory configuration file.

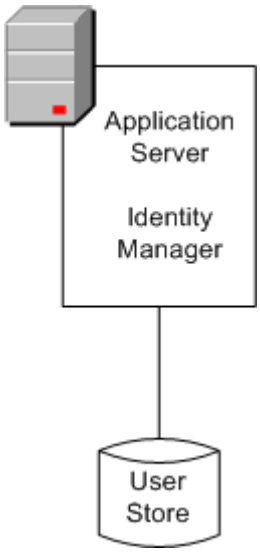
Note: Steps that are required are noted accordingly.

1. Limit the size of search results (see page 55).
2. Modify the default user, organization, or group managed objects.
3. Change the default attribute descriptions.
4. Modify well-known attributes (see page 74). (required)

   Well-known attributes identify special attributes, such as the password attribute, in Identity Manager.
5. Configure Identity Manager for your directory structure (see page 80) (required).
6. Enable users to subscribe to groups (see page 81).

Connection to the User Directory

Identity Manager connects to a user directory to store information such as a user, group, and organizational information as shown in the following illustration:



A new directory or database is not required. However, the existing directory or database must be on a system that has a fully qualified domain name (FQDN).

For a list of supported directory and database types, see the Identity Manager support matrix on the CA Support Site.

You configure a connection to the user store when you create a Identity Manager directory in the Management Console.

If you export the directory configuration after creating a Identity Manager directory, the user directory connection information is displayed in the Provider element of the directory configuration file.

Provider Element

Configuration information is stored in the Provider element and its subelements in the directory.xml file.

Note: If you are creating a Identity Manager directory, you do not need to provide directory connection information in the directory.xml file. You provide connection information in the Identity Manager Directory wizard in the Management Console. Modify the Provider element for updates only.

The Provider element includes the following subelements:

LDAP

Describes the user directory to which you are connecting.

Credentials

Provides the user name and password for accessing the LDAP user store.

Connection

Supplies the host name and port for the computer where the user store is located.

Provisioning Domain

Defines the Provisioning Domain that Identity Manager manages (for provisioning users only).

A completed Provider element resembles the following code:

```
<Provider type="LDAP" userdirectory="@SMDirName">
   <LDAP searchroot="@SMDirSearchRoot" secure="@SMDirSecure" />
   <Credentials user="@SMDirUser"
     cleartext="true">@SMDirPassword</Credentials>
   <Connection host="@SMDirHost" port="@SMDirPort" />
   <eTrustAdmin domain="@SMDirETrustAdminDomain" />
</Provider>
```

The Provider element includes the following parameters:

type

Specifies the type of the database. For all LDAP user stores, specify LDAP (default).

userdirectory

Specifies the name of the user directory connection.

Note: Do not specify a name for the user directory connection in the directory.xml file. Identity Manager prompts you to supply the name when you create the Identity Manager directory in the Management Console.

Note: The parameters are optional.

LDAP Subelement

The LDAP subelement includes the following parameters:

searchroot

Specifies the location in an LDAP directory that serves as the starting point for the directory—typically, an organization (o) or organizational unit (ou).

secure

Forces a Secure Sockets Layer (SSL) connection to the LDAP user directory, as follows:

- True—Identity Manager uses a secure connection.
- False—Identity Manager connects to the user directory without SSL (default).

Note: The parameters are optional.

Credentials Subelement

To connect to an LDAP directory, Identity Manager must provide valid credentials. The credentials are defined in the Credentials subelement, which resembles the following code:

```
<Credentials user="@SMDirUser" cleartext="true">
  "MyPassword"
</Credentials>
```

If you do not specify a password in the Credentials subelement prompts for the password, when you create the Identity Manager directory in the Management Console.

Note: We recommend specifying the password in the Management Console.

If you specify the password in the Management Console, Identity Manager encrypts the password for you. Otherwise, If you do not want the password to appear in clear text, encrypt the password using the password tool that is installed with Identity Manager.

Note: You can specify only one set of credentials. If you define multiple directories, as described in Connection Subelement, the credentials that you specify must apply to all the directories.

The Credentials subelement includes the following parameters:

user

Specifies the login ID for an account that can access the directory.

For provisioning users, the user account that you specify must have the Domain Administrator profile or an equivalent set of privileges in the Provisioning Server.

Note: Do not specify a value for the user parameter in the directory.xml file. Identity Manager prompts you to supply the login ID when you create the Identity Manager Directory in the Management Console.

cleartext

Determines whether the password is displayed in clear text in the directory.xml file, as follows:

- True—The password is displayed in clear text.
- False—The password is encrypted (default).

Note: The parameters are optional.

Connection Subelement

The Connection subelement describes the location of the user store that Identity Manager manages. This subelement includes the following parameters:

host

Specifies the host name or IP address of the system where the user directory is located.

Note: If the connecting system has an IPv6 address, enclose the IP address within the brackets ([ ]) as follows:

<Connection host="[2::9255:214:22ff:fe72:525a]" port="20389"

failover="[2::9255:214:22ff:fe72:525a]:20389"/>

port

Specifies the port number for the user directory.

failover

Specifies the host name and IP address of the system where redundant user stores exist, in case the primary system is unavailable. When the primary system becomes available again, the failover system continues to be used. If you need to return to using the primary system, restart the secondary system. If multiple servers are listed, Identity Manager attempts to connect to the systems in the listed order.

Specify the host name and IP address in the failover attribute in a *space-separated* list, as follows:

failover="IPaddress:port IPaddress:port"

For example:

<Connection host="123.456.789.001" port="20389"

failover="123.456.789.002:20389 123.456.789.003:20389"/>

Note: Port 20389 is the default port for the Provisioning Server.

Note: The parameters are optional.

Provisioning Subelement

If Identity Manager environment includes provisioning, define the Provisioning Domain as follows:

```
<eTrustadmin domain="@SMDirProvisioningDomain" />
```

The Provisioning subelement includes the following parameter:

domain

Contains the name of the Provisioning Domain that Identity Manager manages.

When you create the Identity Manager directory in the Management Console, you are prompted for the domain name. So, verify that you specify a value for the domain parameter in the directory configuration file (directory.xml).

Directory Search Parameters

You can set the following search parameters in the DirectorySearch element:

maxrows

Specifies the maximum number of objects that Identity Manager can return when searching a user directory. When the number of objects exceeds the limit, an error is displayed.

By setting a value for the maxrows parameter, you can override the settings in the LDAP directory that limit search results. When conflicting settings apply, the LDAP server uses the lowest setting.

Note: The maxrows parameter does not limit the number of objects that are displayed on a Identity Manager task screen. To configure display settings, modify the list screen definition in the Identity Manager User Console. For instructions, see the *User Console Design Guide*.

maxpagesize

Specifies the number of objects that can be returned in a single search. If the number of objects exceeds the page size, Identity Manager performs multiple searches.

Note the following points when specifying maxpagesize:

- To use the maxpagesize option, the user store that Identity Manager manages must support paging. Some user store types require additional configuration to support paging. For more information, see How to Improve Performance for Large Searches (see page 90).
- If the user store does not support paging and also a value for maxrows is specified, Identity Manager uses only the maxrows value to control search size.

timeout

Determines the maximum number of seconds that Identity Manager searches a directory before terminating the search.

Note: The DirectorySearch element is optional. However, the directory supports paging (see page 90), we recommend specifying the DirectorySearch element.

More Information:

How to Improve Directory Search Performance (see page 89)
How to Improve Performance for Large Searches (see page 90)

User, Group and Organization Managed Object Descriptions

In a Identity Manager, you manage the following types of objects that correspond to entries in a user directory:

Users

Represent users in an enterprise. A user belongs to a single organization.

Groups

Represent associations of users who have something in common.

Organizations

Represent business units. Organizations contain details such as users, groups, and other organizations.

An object description contains the following information:

- Information about the object (see page 106), such as the LDAP object class and the container in which objects are stored.
- The attributes that store information about an entry (see page 111). For example, the pager attribute stores a pager number.

Note: A Identity Manager environment supports only one type of user, group, and organization object. For example, all user objects have the same object class.

Managed Object Descriptions

A managed object is described by specifying object information in the User Object, Group Object, and Organization Object sections of the directory configuration file.

Note: When using the configuration template (directory.xml file) for those user directories that do not support organizations, there is no Organization Object section.

Each of these sections contains ImsManagedObject elements, such as the following example:

```
<ImsManagedObject name="User" description="My Users"
objectclass="top,person,organizationalperson,inetorgperson" objecttype="USER">
```

Optionally, the ImsManagedObject element can include a Container element, such as the following example:

```
<Container objectclass="top,organizationalUnit" attribute="ou" value="people" />
```

Specify Object Information

Object information is specified by supplying values for various parameters.

To specify object information

1. Locate the ImsManagedObject element in the User Object, Organization Object, or Group Object section.

2. Supply values for the following parameters:

name

Specifies a unique name for the managed object.

Note: This parameter is required.

description

Contains a description of the managed object.

objectclass

Specifies the name of the LDAP object class for the object type (user, group, or organization). The object class determines the list of available attributes for an object.

If attributes from multiple object classes apply to an object type, list the object classes in a comma-delimited list. For example, if an object contains attributes from the person, organizationalperson and inetorgperson object classes, add these object classes as follows:

objectclass="top,person,organizationalperson,inetorgperson"

Each LDAP directory includes a set of predefined object classes. See directory server documentation for information about predefined object classes.

Note: This parameter is required.

objecttype

Specifies the type of the managed object. The valid values are as follows:

- User
- Organization
- Group

Note: This parameter is required.

maxrows

Specifies the maximum number of objects that Identity Manager can return when searching a user directory. When the number of objects exceeds the limit, an error is displayed.

By setting a value for the maxrows parameter, you can override the settings in the LDAP directory that limit search results. When conflicting settings apply, the LDAP server uses the lowest setting.

Note: The maxrows parameter does not limit the number of objects that are displayed on a Identity Manager task screen. To configure display settings, modify the list screen definition in the Identity Manager User Console. For instructions, see the *User Console Design Guide*.

maxpagesize

Specifies the number of objects that can be returned in a single search. If the number of objects exceeds the page size, Identity Manager performs multiple searches.

Note the following points when specifying Search Page Size:

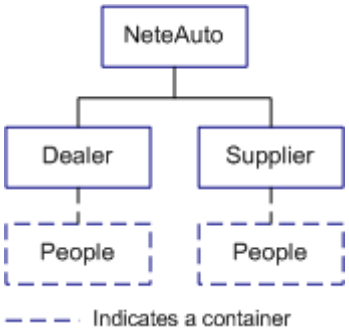
- To use the Search Page Size option, the user store that Identity Manager manages must support paging. Some user store types require additional configuration to support paging. For more information, see How to Improve Search Performance (see page 90).
- If the user store does not support paging and also a value for maxrows is specified, Identity Manager uses only the maxrows value to control search size.

3. Optionally, supply container information.

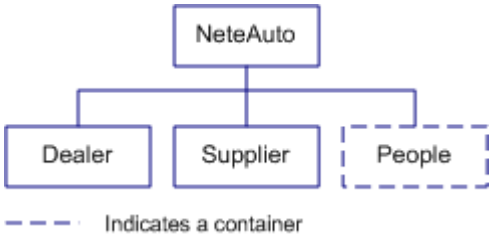
Containers

To simplify administration, you can group objects of a specific type in a container. When you specify a container in the directory configuration file, Identity Manager manages only entries in the container. For example, if you specify a user container named People, Identity Manager manages users in the People container, as shown in the following illustrations:

- Hierarchical Directory



- Flat Directory



In these examples, all users exist in the People containers.

When you specify a container, note the following points:

- If no container exists in an organization, Identity Manager creates the container as soon as the first entry is added. For a hierarchical directory, Identity Manager creates the container in the organization where the entry is added. For flat directories and directories not supporting organizations, Identity Manager creates the container under the search root, which you specify when you create the Identity Manager directory.
- Identity Manager ignores entries that are not in the specified container. For example, when you specify the People container, you cannot manage users existing outside of the People container.

  Note: To manage users who are not in the specified container, you can create another Identity Manager environment.

Containers and Well-Known Attributes

Well-known attributes are attributes that have special meaning in Identity Manager. When Identity Manager manages a user store including containers, the following well-known attributes identify information about the container:

%ORG_MEMBERSHIP%

Identifies the attribute that stores the full name (DN) of the container.

For example, the full name resembles as:

ou=People, ou=Employee, ou=NeteAuto, dc=security, dc=com

%ORG_MEMBERSHIP_NAME%

Identifies the attribute that stores the user-friendly name of the attribute.

For example, the user-friendly name of the container in the previous example is People.

These well-known attributes appear in the attribute descriptions in the User Object and Group Object sections of the directory.xml file, as follows:

```
 <ImsManagedObjectAttr physicalname="someattribute" description="Organization"
displayname="Organization" valuetype="String" required="true"
wellknown="%ORG_MEMBERSHIP%" maxlength="0" permission="WRITEONCE"
searchable="false" />
```

For hierarchical user store structures, the physicalname and wellknown parameters are mapped to the well-known attribute as follows:

```
<ImsManagedObjectAttr physicalname="%ORG_MEMBERSHIP%" description="Organization"
displayname="Organization" valuetype="String" required="true"
wellknown="%ORG_MEMBERSHIP%" maxlength="0" permission="WRITEONCE"
searchable="false" />
```

The example indicates that Identity Manager automatically derives the container DN and user-friendly name from other information in the directory.xml file.

For flat user store structures, supply the physical attribute names.

Note: See How to Describe a Flat User Directory Structure (see page 81) for instructions.

Specify a User or Group Container

Perform the following procedure to specify a user or group container.

To specify a user or group container:

1. Locate the Container element in the User Object or Group Object section.
2. Supply values for the following parameters:

   objectclass

   Determines the LDAP object class of the container where objects of a specific type are created. For example, the default value for the user container is "top,organizationalUnit," which indicates that users are created in LDAP organizational units (ou).

   When you are managing dynamic or nested groups, be sure to specify an objectclass supporting these group types (see page 82).

   Note: This parameter is required.

   attribute

   Specifies the attribute that stores the container name, for example, ou.

   The attribute is paired with the value to form the relative DN of the container, as in the following example:

   ou=People

   Note: This parameter is required.

value

Specifies the name of the container.

Note: This parameter is required.

Note: You cannot specify containers for organizations.

Attribute Descriptions

An attribute stores information about an entry, such as a telephone number or address. An entry attribute determines its profile.

In the directory configuration file, attributes are described in ImsManagedObjectAttr elements. In the User Object, Group Object and Organization Object sections of the directory configuration file, you can do the following actions:

- Modify default attribute descriptions to describe the attributes in your user store.
- Create new attribute descriptions by copying an existing description and modifying values as needed.

For each attribute in user, group, and organization profiles, there is one ImsManagedObjectAttr element. For example, an ImsManagedObjectAttr element is described as a user ID.

An ImsManagedObjectAttr element resembles the following code:

```
<ImsManagedObjectAttr physicalname="uid" displayname="User ID" description="User
ID" valuetype="String" required="true" multivalued="false" wellknown="%USER_ID%"
maxlength="0" />
```

The ImsManagedObjectAttr has the following parameters:

physicalname

This parameter must contain one of the following items:

- The name of the LDAP attribute where the profile value is stored. For example, user ID is stored in the uid attribute in the user directory.

  Note: To improve performance, index LDAP attributes that are used in search queries in the User Console.

- A well-known attribute (see page 74). When you supply a well-known attribute, Identity Manager computes the value automatically. For example, on specifying a well-known attribute %ORG_MEMBERSHIP%, Identity Manager determines the organization to which the entry belongs, based upon the DN of an entry.

description

Contains the description of the attribute

displayname

Specifies a unique name for the attribute.

In the User Console, the display name appears in the list of attributes that are available to add to a task screen. This parameter is required.

Note: Do not modify the displayname of an attribute in the directory configuration file (directory.xml). To change the name of the attribute on a task screen, you can specify a label for the attribute in the task screen definition. For more information, see the A*dministration Guide*.

valuetype

Specifies data type of the attribute. The valid values are as follows:

String

The value can be any string.

This is the default value.

Integer

The value must be an integer.

Note: Integer does not support decimal numbers.

Number

The value must be an integer. The number option supports decimal numbers.

Date

The value must parse to a valid date using the pattern:

MM/dd/yyyy

ISODate

The value must parse to a valid date using the pattern yyyy-MM-dd.

UnicenterDate

The value must parse to a valid date using the pattern YYYYYYYDDD where:

YYYYYYY is a seven number representation for a year beginning with three zeros. For example: 0002008

DDD is the three number representation for the day beginning with zeros, as needed. Valid values include in range from 001 to 366.

Structured

This type of attribute consists of structured data that enables a single attribute value to store multiple related values. For example, a structured attribute contains values such as First Name, Last Name, and Email Address values.

Certain endpoint types use these attributes but are managed through Identity Manager.

Note: Identity Manager can display structured attributes in a table in the User Console. When users edit values in the table, the values are stored in the user store, propagating back to the endpoint. For more information about displaying multi-valued attributes, see the *Administration Guide*.

required

Indicates whether the attribute is required, as follows:

- True—The attribute is required.
- False—The attribute is optional (default).

Note: If an attribute is required for an LDAP directory server, set the required parameter to true.

multivalued

Indicates whether the attribute can have multiple values. For example, the group membership attribute is multi-valued to store the user DN of each group member. The valid values are as follows:

- True—The attribute can have multiple values.
- False—The attribute can have only a single value (default).

Important! The Group Membership and Admin Roles attributes in the User object definition must be multivalued.

wellknown

Defines the name of the well-known attribute.

Well-known attributes have a specific meaning in Identity Manager (see page 74). They are identified in the syntax:

%ATTRIBUTENAME%

maxlength

Defines the maximum length that a value of an attribute can have. Set the maxlength parameter to 0 to specify an unlimited length.

Note: This parameter is required.

permission

Indicates whether the value of an attribute can be modified in a task screen. The valid values are as follows:

READONLY

The value is displayed but cannot be modified.

WRITEONCE

The value cannot be modified once the object is created. For example, a user ID cannot be changed after the user is created.

READWRITE

The value can be modified (default).

hidden

Indicates whether an attribute appears in Identity Manager task forms. The valid values are as follows:

- True—The attribute is not displayed to users.
- False—The attribute is displayed to users (default).

Logical attributes use hidden attributes.

Note: For more information, see the *Programming Guide for Java*.

system

Specifies only Identity Manager used attributes. Users in the User Console not to modify the attributes. The valid values are as follows:

- True—Users cannot modify the attribute. The attribute is hidden in the Identity Manager user interface.
- False—Users can modify this attribute. The attribute is available to add to task screens in the Identity Manager user interface. (default)

validationruleset

Associates a validation rule-set with the attribute.

Verify that the validation rule set that you specify is defined in a ValidationRuleSet element in the directory configuration file.

objectclass

Indicates the LDAP auxiliary class for a user, group, or organization attribute when the attribute is not part of the primary objectclass specified in the ImsManagedObject element.

For example, assume that the primary object class for users is top, person, and organizationalperson, which defines the following user attributes:

- common name (cn)
- surname (sn)
- user id (uid)
- password (userPassword)

To include the attribute employeeID, which is defined in the Employee auxiliary class, you would add the following attribute description:

```
<ImsManagedObjectAttr physicalname="employeeID" displayname="Employee ID"
description="Employee ID" valuetype="String" required="true" multivalued="false"
maxlength="0" objectclass="Employee"/>
```

Specify Attribute Descriptions

Describing attributes involves the following steps:

1. Read the relevant sections among the following topics:
   - CA Directory Considerations (see page 72)
   - Microsoft Active Directory Considerations (see page 72)
   - IBM Directory Server Considerations (see page 73)
   - Oracle Internet Directory Considerations (see page 74)
2. In the User Object, Group Object and Organization Object sections of the directory configuration file, do the following:
   - Modify default attribute descriptions to describe your directory attributes.
   - Create new attribute descriptions by copying an existing description and modifying values as needed.

   Note: Assume that a new attribute description is created and a physical attribute is specified. Be sure that the physical attribute must exist in the object class (or classes) that you specified for the object type.
3. (Optional) Change the display settings (see page 69) for the attribute to prevent displaying sensitive information, such as passwords or salaries, in the User Console.
4. (Optional) Configure a default sort order.
5. If you are managing a directory with a Flat or Flat User structure or a directory that does not include organizations, go to Describe the User Directory Structure (see page 80).

Managing Sensitive Attributes

Identity Manager provides the following methods for managing sensitive attributes:

- Data classifications for attributes

  Data classifications allow you to specify display and encryption properties for attributes in the directory configuration file (directory.xml).

  You can define data classifications that manage sensitive attributes as follows:

  - Display the value of an attribute as a series of asterisks in Identity Manager task screens.

    For example, you can display passwords as asterisks instead of displaying them in clear text.

  - Hide the attribute value in View Submitted Task screens

    This enables you to hide attributes, such as salary, from administrators who need to view task status in Identity Manager but do not need to view salary details.

  - Ignore certain attributes when creating a copy of an existing object.

  - Encrypt an attribute

- Field styles in task profile screens

  If you do not want to modify an attribute in the directory.xml file, you can set the display property for the attribute in screen definitions where the sensitive attribute appears.

  The field style enables you to display attributes, such as passwords, as a series of asterisks instead of clear text.

  Note: For more information about the field style for sensitive attributes, see the *Administration Guide* and the User Console online help.

Data Classification Attributes

The Data Classification element provides a way to associate additional properties with an attribute description. The values in this element determine how CA Identity Manager handles the attribute. This element supports the following parameters:

- sensitive

  Causes CA Identity Manager to display the attribute as a series of asterisks (*). This prevents the attribute from appearing in clear text.

  For example, you may configure the password attribute as sensitive.

  If you create a copy of an existing user in the User Console, this parameter also prevents the attribute from being copied to the new user.

- vst_hide

  Hides the attribute in the Event Details screen for the View Submitted Tasks tab. Unlike sensitive attributes, which are displayed as asterisks, vst_hidden attributes are not displayed.

  You can use this parameter to prevent changes to an attribute, such as salary, from displaying in View Submitted Tasks.

- ignore_on_copy

  Causes CA Identity Manager to ignore an attribute when an administrator creates a copy of an object in the User Console. For example, if you specify ignore_on_copy for the password attribute on a user object, CA Identity Manager does not apply the current user's password to the new user profile, which is created as a copy of the current user's profile.

- attributelevelencrypt

  Encrypts attribute values when they are stored in the user store. Identity Manager uses RC2 encryption or FIPS 140-2 encryption, if CA Identity Manager is FIPS 140-2 enabled.

  The attributes appear in clear text during runtime.

  Note: For more information about FIPS 140-2 support in CA Identity Manager, see the *Administration Guide*.

- previouslyencrypted

  Causes CA Identity Manager to detect and decrypt any encrypted values in the attribute when it accesses the object in the user store.

  You use this data classification to decrypt any previously encrypted values.

  The clear text value will be saved to the store when you save the object.

Configure Data Classification Attributes

To configure data classification attributes

1. Locate the attribute in directory configuration file.
2. After the attribute description, add the following:

   <DataClassification name="*parameter*">

   parameter

   Represents one of the following parameters:

   sensitive

   vst_hide

   ignore_on_copy

   attributelevelencrypt

   previouslyencrypted

   For example, an attribute description that includes the vst_hide data classification attribute resembles the following:

```
<ImsManagedObjectAttr physicalname="salary" displayname="Salary"
description="salary" valuetype="String" required="false" multivalued="false"
maxlength="0">
    <DataClassification name="vst_hide"/>
```

Attribute-Level Encryption

You can encrypt an attribute in the user store by specifying an AttributeLevelEncypt data classification for that attribute in the directory configuration file (directory.xml). When attribute-level encryption is enabled, Identity Manager encrypts that attribute's value before storing it in the user store. The attribute is displayed as clear text in the User Console.

Note: Managing Sensitive Atttributes (see page 67) describes methods for displaying sensitive data in the User Console.

The attribute is encrypted using RC2 encryption or FIPS 140-2 encryption, if FIPS 140-2 support is enabled.

Before implementing attribute-level encryption, note the following:

- CA Identity Manager cannot find encrypted attributes in a search.

  If an encrypted attribute is added to a member, admin, or owner policy, or an identity policy, CA Identity Manager will not be able to correctly resolve the policy because it cannot search the attribute.

  Consider setting the attribute to searchable="false" in the directory.xml file—For example:

  <ImsManagedObjectAttr physicalname="title" description="Title" displayname="Title" valuetype="String" maxlength="0" searchable="false">

  <DataClassification name="AttributeLevelEncrypt"/>

  </ImsManagedObjectAttr>

- In implementations where the Identity Manager uses a shared user store and Provisioning Directory, do not encrypt attributes that are used by the Provisioning Server.
- If you enable attribute-level encryption for a user store that is used by applications other than Identity Manager, the other applications will not be able to use the encrypted attribute.

How To Add Attribute-Level Encryption

When you add attribute-level encryption to an Identity Manager directory, Identity Manager automatically encrypts existing clear text attribute values when you save the object associated with the attribute. For example, if you encrypt the password attribute, Identity Manager encrypts the password when it saves a user's profile.

Note: To encrypt the attribute value, the task that you use to save the object must include the attribute. To encrypt the password attribute in the previous example, the password field must be added to the task you use to save the object, such as the Modify User task.

All new objects are created with encrypted values in the user store.

To add attribute-level encryption to an existing user store, you complete the following steps:

1. Complete one of the following:
   - Create a new Identity Manager directory
   - Update an existing directory by exporting the directory settings
2. Add the data classification, AttributeLevelEncrypt, to the attribute that you want to encrypt in the directory.xml file.

   For example:

   ```
   <ImsManagedObjectAttr physicalname="salary" displayname="Salary"
   description="salary" valuetype="String" required="false" multivalued="false"
   maxlength="0" searchable="false">
   <DataClassification name="AttributeLevelEncrypt"/>
   ```

3. If you created a new Identity Manager Directory, associate the directory with an environment.
4. To force Identity Manager to encrypt all values immediately, modify all objects using the Bulk Loader.

   Note: For more information about the Bulk Loader, see the *Administration Guide*.

How to Remove Attribute-Level Encryption

If you have an encrypted attribute in the Identity Manager Directory and then choose to store that attribute's values as clear text, you can remove the AttributeLevelEncrypt data classification.

Once the data classification has been removed, Identity Manager stops encrypting the new attribute values. Existing values are decrypted when you save the object associated with the attribute.

Note: To decrypt the attribute value, the task that you use to save the object must include the attribute. For example, to decrypt a password for an existing user, you save the user object with a task that includes the password field, such as the Modify User task.

To force Identity Manager to detect and decrypt any encrypted values that remain in the user store for the attribute, you can specify another data classification, PreviouslyEncrypted. The clear text value is saved to the user store when you save the object.

Note: Adding the PreviouslyEncrypted data classification adds extra processing on every object load. To prevent performance issues, consider adding the PreviouslyEncrypted data classification, loading and saving each object associated with that attribute, and then removing the data classification.This method automatically converts all stored encrypted values to stored clear text.

To remove attribute-level encryption from an existing user store, you complete the following steps:

1. Export the directory settings for the appropriate Identity Manager Directory.
2. In the directory.xml file, remove the data classification, AttributeLevelEncrypt, from attributes that you want to decrypt.
3. If you want to force Identity Manager to remove previously encrypted values, add the PreviouslyEncrypted data classification attribute.

   For example:

   ```
   <ImsManagedObjectAttr physicalname="salary" displayname="Salary"
   description="salary" valuetype="String" required="false" multivalued="false"
   maxlength="0" searchable="false">
   <DataClassification name="PreviouslyEncrypted"/>
   ```

4. To force Identity Manager to decrypt all values immediately, modify all objects using the Bulk Loader.

   Note: For more information about the Bulk Loader, see the *Administration Guide*.

CA Directory Considerations

When you describe attributes for a CA Directory user store, note the following:

- Attribute names are case-sensitive.
- Using the seeAlso attribute as the attribute that indicates a self-subscribing group may cause errors when administrators create groups.
- Using the photo attribute as the attribute that indicates a user account's status (enabled or disabled) may cause errors when an administrator creates a user.

Note: For additional information about CA Directory requirements, see the CA Directory documentation.

Microsoft Active Directory Considerations

When you describe attributes for Active Directory, note the following:

- The case of the attributes specified in attribute descriptions must match the case of the attributes in Active Directory. For example, when you select the unicodePwd attribute as the attribute that stores user passwords, you must specify unicodePwd (with a capital P) in the directory configuration file.
- For user and group objects, you must include the sAMAccountName attribute.

IBM Directory Server Considerations

When you describe attributes for an IBM Directory Server user directory, see the following sections:

- Groups in Directory Server Directories (see page 73)
- The Objectclass "Top" in the Organization Object Description (see page 73)

Groups in Directory Server Directories

IBM Directory Server requires groups to contain at least one member. To address this requirement, Identity Manager adds a *dummy user* as a member of a new group when the group is created.

Configure a Dummy User

To configure a dummy user

1. In the Group Object section of the directory configuration file, locate the following elements:

   ```
   <PropertyDict name="DUMMY_USER">
       <Property name="DUMMY_USER_DN">##DUMMY_USER_DN</Property>
   </PropertyDict>
   ```

   Note: If these elements do not exist in the directory configuration file, add them exactly as they appear here.

2. Replace ##DUMMY_USER_DN with a user DN. Identity Manager will add this DN as a member of all new groups.

   Note: If you specify the DN of an existing user, that user will appear as a member of all groups created by Identity Manager. To prevent the *dummy user* from appearing as a group member, specify a DN that does not exist in the directory.

3. Save the directory configuration file.

The Objectclass Top in the Organization Object Description

Important! In the description of the organization object in directory configuration file, do not include the objectclass top.

For example, when the objectclass of the organization object is top, organizationalUnit, specify the objectclass as follows:

```
<ImsManagedObject name="Organization" description="My Organizations"
objectclass="organizationalUnit" objecttype="ORG">
```

Including top may cause unpredictable search results.

Oracle Internet Directory Considerations

When you describe attributes for an Oracle Internet Directory (OID) user store, specify LDAP attributes using lowercase letters only.

Well-Known Attributes for an LDAP User Store

Well-known attributes have special meaning in Identity Manager. They are identified by the following syntax:

%*ATTRIBUTENAME*%

In this syntax, *ATTRIBUTENAME* must be uppercase.

A well-known attribute is mapped to one physical attribute, using an attribute description (see page 111).

In the following attribute description, the attribute userpassword is mapped to the well-known attribute %PASSWORD% so that Identity Manager will treat the value in userpassword as a password as follows:

```
<ImsManagedObjectAttr
        physicalname="userpassword"
        displayname="Password"
        description="Password"
        valuetype="String"
        required="false"
        multivalued="false"
        wellknown="%PASSWORD%"
        maxlength="0" />
```

Some well-known attributes are required; others are optional.

User Well-Known Attributes

A list of user well-known attributes and the items to which they map follows:

%ADMIN_OF%

Maps to the list of groups for which the user is an administrator.

This well-known attribute may improve search performance at sites with many groups. When the %ADMIN_OF% well-known attribute is specified, CA Identity ManagerIdentity Manager looks for the groups that a user can manage in the %ADMIN_OF% attribute instead of checking every group in the user store.

%ADMIN_ROLE_CONSTRAINT%

Maps to the list of an administrator's admin roles.

The physical attribute mapped to %ADMIN_ROLE_CONSTRAINT% must be multivalued to accommodate multiple roles.

We recommend indexing the LDAP attribute that is mapped to %ADMIN_ROLE_CONSTRAINT%.

%CERTIFICATION_STATUS%

Maps to a user's certification status.

This attribute is required to use the user certification feature.

Note: For more information about user certification, see the *Administration Guide*.

%DELEGATORS%

Maps to a list of users who have delegated work items to the current user.

This attribute is required to use delegation. The physical attribute mapped to %DELEGATORS% must be multi-valued and capable of holding strings.

Important! Editing this field directly using Identity Manager tasks or an external tool can cause significant security implications.

%EMAIL%

Maps to a user's email address.

Required to use the email notification feature

%ENABLED_STATE%

(Required)

Maps to a user's status.

Note: This attribute must match the Disabled Flag user directory attribute in the SiteMinder user directory connection.

%FIRST_NAME%

Maps to a user's first name.

%FULL_NAME%

Maps to a user's first and last names.

%IDENTITY_POLICY%

Specifies the list of identity policies that have been applied to a user account.

Identity Manager uses this attribute to determine whether an identity policy should be applied to a user. When the policy has the Apply Once setting enabled, and the policy is listed in the %IDENTITY_POLICY% attribute, Identity Manager does not apply the changes in the policy to the user.

Note: For more information about identity policies, see the *Administration Guide*.

%LAST_CERTIFIED_DATE%

Maps to the date when a user's roles were certified.

Required to use the user certification feature.

Note: For more information about user certification, see the *Administration Guide*.

%LAST_NAME%

Maps to a user's last name.

%MEMBER_OF%

Maps to the list of groups of which the user is a member.

The physical attribute mapped to %MEMBER_OF% must be multivalued to accommodate multiple groups.

Using this attribute will improve response time when searching for a user's groups.

You can use this attribute with Active Directory or any directory schema that maintains a user's group membership on the user object.

%ORG_MEMBERSHIP%

(Required)

Maps to the DN of the organization to which the user belongs.

Identity Manager uses this well-known attribute to determine a directory's structure (see page 80).

This attribute is not required when the user directory does not include organizations.

%ORG_MEMBERSHIP_NAME%

(Required)

Maps to the user-friendly name of the organization in which the user's profile exists.

This attribute is not required when the user directory does not include organizations.

%PASSWORD%

Maps to a user's password.

Note: This attribute must match the Password Attribute in the SiteMinder user directory connection.

%PASSWORD_DATA%

(Required for password policy support)

Specifies the attribute that tracks password policy information.

%PASSWORD_HINT%

(Required)

Maps to a user-specified question and answer pair. The question and answer pair is used if users forget their passwords.

To support multiple question and answer pairs, the %PASSWORD_HINT% attribute must be multi-valued.

Note: If you are using SiteMinder's Password Services feature to manage passwords, the Password Hint attribute must match the Challenge/Response attribute in the SiteMinder user directory.

%USER_ID%

(Required)

Maps to a user's ID.

Group Well-Known Attributes

The following is a list of group well-known attributes:

%GROUP_ADMIN_GROUP%

Indicates which attribute stores a list of groups that are administrators of the group. For example, when group 1 is an administrator of group A, group 1 is stored in the %GROUP_ADMIN_GROUP% attribute.

Note: If you do not specify a %GROUP_ADMIN_GROUP% attribute, Identity Manager stores administrator groups in the %GROUP_ADMIN% attribute.

Note: To add a group as an administrator of another group, see the *Administration Guide*.

%GROUP_ADMIN%

Indicates which attribute contains the DNs of the group's administrators.

The physical attribute mapped to %GROUP_ADMIN% must be multivalued.

%GROUP_DESC%

Indicates which attribute contains a group's description.

%GROUP_MEMBERSHIP%

(Required)

Indicates which attribute contains a list of the group's members.

The physical attribute mapped to %GROUP_MEMBERSHIP% must be multivalued.

The %GROUP_MEMBERSHIP% well-known attribute is not required for Provisioning user directories.

%GROUP_NAME%

(Required)

Indicates which attribute stores a group name.

%ORG_MEMBERSHIP%

(Required)

Indicates which attribute contains the DN of the organization to which the group belongs.

Identity Manager uses this well-known attribute to determine a directory's structure (see page 80).

This attribute is not required when the user directory does not include organizations.

%ORG_MEMBERSHIP_NAME%

Indicates which attribute contains the user-friendly name of the organization in which the group exists.

This attribute is not valid for user directories that do not include organizations.

%SELF_SUBSCRIBING%

Indicates which attribute determines whether users can subscribe to a group (see page 80).

%NESTED_GROUP_MEMBERSHIP%

Indicates which attribute stores a list of groups that are members of the group. For example, when group 1 is a member of group A, group 1 is stored in the %NESTED_GROUP_MEMBERSHIP% attribute.

If you do not specify a %NESTED_GROUP_MEMBERSHIP% attribute, Identity Manager stores nested groups in the %GROUP_MEMBERSHIP% attribute.

To include groups as members of other groups, configure support for nested groups as described in Configuring Dynamic and Nested Groups for instructions.

%DYNAMIC_GROUP_MEMBERSHIP%

Indicates which attribute stores the LDAP query that generates a dynamic group (see page 128).

Note: To extend the available attributes for the Group object to include %NESTED_GROUP_MEMBERSHIP% and %DYNAMIC_GROUP_MEMBERSHIP% attributes, you can use auxiliary object classes.

Organization Well-Known Attributes

The following well-known attributes apply only to environments that support organizations:

%ORG_DESCR%

Indicates which attribute contains an organization's description.

%ORG_MEMBERSHIP%

(Required)

Indicates which attribute contains the DN of an organization's parent organization.

%ORG_MEMBERSHIP_NAME%

Indicates which attribute contains the user-friendly name of the parent organization of an organization.

%ORG_NAME%

(Required)

Indicates which attribute contains the name of the organization.

%ADMIN_ROLE_CONSTRAINT% Attribute

When you create an admin role, you specify one or more rules for role membership. Users who satisfy the membership rules are granted the role. For example, when the membership rule for the User Manager role is title=User Manager, users who have the title User Manager possess the User Manager role.

Note: For more information about rules, see the *Administration Guide*.

%ADMIN_ROLE_CONSTRAINT% enables you to designate a profile attribute to store an administrator's admin roles.

How to Use the %ADMIN_ROLE_CONSTRAINT% Attribute

To use %ADMIN_ROLE_CONSTRAINT% as the constraint for all admin roles, do the following:

- Pair the %ADMIN_ROLE_CONSTRAINT% well-known attribute with a multivalued profile attribute to accommodate multiple roles.

- When you configure an admin role in the User Console, make sure the constraint is as follows:

  `Admin Roles equals role name`

  role name

  Defines the name of the role for which you are supplying the constraint, as in the following example:

  `Admin Roles equals User Manager`

Note: Admin Roles is the default displayname for the %ADMIN_ROLE_CONSTRAINT% attribute.

Configure Well-Known Attributes

Perform the following procedure to configure well-known attributes.

To configure well-known attributes

1. In the directory configuration file, search for the following:

   ##

2. Replace the value that begins with ## with the appropriate LDAP attribute.
3. Repeat Steps 1 and 2 until you have replaced all required values.
4. Map optional well-known attributes to physical attributes, as necessary.
5. Save the directory configuration file.

Describe the User Directory Structure

Identity Manager uses the %ORG_MEMBERSHIP% well-known attribute to determine the structure of a user directory.

The procedure for describing the user directory structure depends on the type of directory structure.

How to Describe a Hierarchical Directory Structure

The directory configuration file is already configured for a hierarchical directory structure. As a result, you do not have to modify the %ORG_MEMBERSHIP% attribute description.

How to Describe a Flat User Directory Structure

To describe a user directory with a flat user structure, do the following:

1. Locate the %ORG_MEMBERSHIP% attribute description in the User Object section of the directory.xml file.
2. In the physicalname parameter, replace %ORG_MEMBERSHIP% with the name of the attribute that will store the organization to which the user belongs

How to Describe a Flat Directory Structure

To describe a flat directory structure, do the following:

1. Locate the %ORG_MEMBERSHIP% attribute description in the User Object section of the directory.xml file.
2. In the physicalname parameter, replace %ORG_MEMBERSHIP% with the name of the attribute that will store the organization to which the user belongs.
3. Repeat Step 1 in the Group Object section.
4. In the physicalname parameter, replace %ORG_MEMBERSHIP% with the name of the attribute that will store the organization to which the group belongs

How to Describe a User Directory that Does Not Support Organizations

Verify that no object descriptions or well-known attributes are defined for organizations in directory.xml.

How to Configure Groups

For configuration, groups can be divided as follows:

- Self-subscribing groups
- Dynamic and Nested groups

Configure Self-Subscribing Groups

You can enable self-service users to join groups by configuring support for self-subscribing groups in the directory configuration file.

When a user self-registers, Identity Manager looks for groups in specified organizations, and displays the self-subscribing groups to the user.

To configure a self-subscribing group

1. In the Self-subscribing Groups section, add a SelfSubscribingGroups element as follows:

   <SelfSubscribingGroups type=*search_type* org=*org_dn*>

2. Add values for the following parameters:

   type

   Indicates where Identity Manager searches for self-subscribing groups as follows:

   - NONE—Identity Manager does not search for groups. Specify NONE to prevent users from self-subscribing to groups.
   - ALL—Identity Manager begins searching for groups at the root. Specify ALL when users can subscribe to groups throughout a hierarchical directory.
   - INDICATEDORG—Identity Manager searches for self-subscribing groups in the user's organization and its suborganizations. For example, when a user's profile is in the Marketing organization, Identity Manager searches for self-subscribing groups in the Marketing organization, and in all suborganizations.
   - SPECIFICORG—Identity Manager searches in a specific organization. Supply the distinguished name (DN) of the specific organization in the org parameter.

   org

   Specifies the unique identifier of the organization where Identity Manager searches for self-subscribing groups.

   Note: You must specify the org parameter when type=SPECIFICORG.

Once support for self-subscribing groups is configured in the Identity Manager directory, Identity Manager administrators can specify which groups are self-subscribing in the User Console.

Note: For more information about managing groups, see the *Administration Guide*.

Configure Dynamic and Nested Groups

If you are managing an LDAP user store, you can configure support for the following types of groups in the directory configuration file:

Dynamic Groups

Enables you to dynamically define group membership by specifying an LDAP filter query in the User Console. With dynamic groups, administrators do not have to search for and add group members individually.

Nested Groups

Enables you to add groups as members of other groups.

You can enable dynamic and nested groups using the directory configuration file.

To configure a dynamic or nested group

1. Map the following well-known attributes (see page 77) to a physical attribute for the Group managed object as needed:
   - %DYNAMIC_GROUP_MEMBERSHIP%
   - %NESTED_GROUP_MEMBERSHIP%

   Note: The physical attribute that you select must support multiple values.
2. In the Directory Groups Behavior section, add the following GroupTypes element:

   `<GroupTypes type=group>`
3. Type a value for the following parameter:

   group

   Enables support for dynamic and nested groups. The valid values are as follows:
   - NONE—Identity Manager does not support dynamic and nested groups.
   - ALL—Identity Manager supports dynamic and nested groups.
   - DYNAMIC—Identity Manager supports dynamic groups only.
   - NESTED—Identity Manager supports nested groups only.

Once support for dynamic and nested groups is configured in the Identity Manager directory, Identity Manager administrators can specify which groups are dynamic and nested in the User Console.

Note: When you set the group type to NESTED or ALL *without* setting the %NESTED_GROUP_MEMBERSHIP% well-known parameter, Identity Manager stores both the nested groups and users in the %GROUP_MEMBERSHIP% well- known parameter. Processing group membership may be slightly slower.

Add Support for Groups as Administrators of Groups

If you are managing an LDAP user store, you can enable groups to serve as administrators of other groups. When you assign a group as an administrator, only administrators of that group will be administrators of the specified group. Members of the administrator group you specify will not have privileges to manage the group.

To configure support for groups as administrators of other groups:

1. Map the %GROUP_ADMIN_GROUP% well-known attribute to a physical attribute that will store the list of groups that serve as administrators.

   Note: The physical attribute that you select must support multiple values.

   Group Well-Known Attributes (see page 77) provides more information about the %GROUP_ADMIN_GROUP% attribute.

   Note:If you set the admin group type to ALL without setting the %GROUP_ADMIN_GROUP% well known, Identity Manager stores administrator groups in the %GROUP_ADMIN% attribute.

2. In the Directory AdminGroups Behavior section, configure the AdminGroupTypes element as follows:

   <AdminGroupTypes type="ALL">

   Note:The default AdminGroupTypes is NONE.

Once support for groups as administrators is configured in the Identity Manager directory, Identity Manager administrators can specify groups as administrators of other groups in the User Console.

Validation Rules

A validation rule enforces requirements on data that a user types in a task screen field. The requirements can enforce a data type or format, or make sure that the data is valid in the context of other data on the task screen.

Validation rules are associated with profile attributes. Before processing a task, Identity Manager makes sure that the data entered for a profile attribute satisfies any associated validation rules.

You can define validations rules and associate them with profile attributes in the directory configuration file.

Additional Identity Manager Directory Properties

You can configure the following additional properties:

- Sort order for search results.
- Search across object classes to verify that a new user does not exist already.
- Wait time to avoid Identity Manager timing out before completion of the replication of data from the master LDAP directory to the slave LDAP directory.

Configure Sort Order

You can specify a sort attribute for each managed object, such as users, groups, or organizations. Identity Manager uses this attribute to sort search results in custom business logic, which you create with the Identity Manager APIs.

Note: The sort attribute does not affect the way search results are displayed in the User Console.

For example, when you specify the cn attribute for the user object, Identity Manager sorts the results of a search for users alphabetically by the cn attribute.

To configure default sort order

1. After the last IMSManagedObjectAttr element in the section for the managed object to which the sort order applies, add the following statements:

```
<PropertyDict name="SORT_ORDER">
    <Property name="ATTR">your_sort_attribute
    </Property>
</PropertyDict>
```

2. Replace *your_sort_attribute* with the attribute on which Identity Manager will sort the search results.

Note: Specify only one physical attribute. Do not specify a well-known attribute.

For example, to sort user search results based on the value of the cn attribute, add the following elements after the last IMSManagedObjectAttr element in the User Object section of the directory configuration file:

```
<!-- ******************* User Object ******************* -->
   <ImsManagedObject name="User" description="My Users"
      objectclass="top,person,organizationalperson,user"
      objecttype="USER">
   .
   .
   .
        <ImsManagedObjectAttr physicalname="departmentnumber"
                displayname="Department" description="Department"
                valuetype="String" required="true"
                multivalued="false" maxlength="0" />
        <PropertyDict name="SORT_ORDER">
                <Property name="ATTR">cn</Property>
        </PropertyDict>
  </ImsManagedObject>
```

Search across Objectclasses

When you create a user, Identity Manager searches the user store to verify that the user does not already exist. This search is limited to users who have the objectclasses specified in the user object definition in the directory configuration file (directory.xml). If no existing user is found in those objectclasses, CA Identity ManagerIdentity Manager tries to create the user.

When a user exists that has the same unique identifier (user ID) but a different objectclass, the LDAP server fails to create the user. The error is reported in the LDAP server, but Identity Manager does not recognize the error. Identity Manager appears to create the user successfully.

To prevent this issue, you can configure a SEARCH_ACROSS_CLASSES property that causes Identity Manager to search users across all objectclass definitions when checking for existing users.

Note: This property affects only searches for duplicate users when performing tasks such as creating a user. For all other searches, objectclass constraints apply.

To search across objectclasses

1. In the directory configuration file (directory.xml), locate the ImsManagedObject element that describes the user object.

2. Add the following PropertyDict element:

```
<PropertyDict name="SEARCH_ACROSS_CLASSES" description="allowing checking an
attribute across classes ">
<Property name="ENABLE">true</Property>
</PropertyDict>
```

Note: The PropertyDict element must be the last element in the ImsManagedObject element, as in the following example:

```
<ImsManagedObject name="User" description="My Users"
objectclass="top,person,organizationalperson,inetorgperson,customClass"
objecttype="USER">
<ImsManagedObjectAttr physicalname="departmentnumber" displayname="Department"
description="Department" valuetype="String" required="true"
multivalued="false" maxlength="0" />
.
.
.
<PropertyDict name="SEARCH_ACROSS_CLASSES" description="allow checking an
attribute across classes ">
<Property name="ENABLE">true</Property>
</PropertyDict>
```

Specify Replication Wait Time

In a deployment that includes replication between master and slave LDAP directories, you can configure the SiteMinder Policy Server to communicate with a slave directory. In this configuration, the Policy Server automatically detects referrals that point to the master directory during operations that write data to the LDAP directory. The data is stored in the master LDAP directory and replicated to the slave LDAP directory according to the replication scheme of your network resources.

In this configuration, when you create an object in Identity Manager, the object is created in the master directory and replicated to the slave directory. A delay may occur during the replication process that causes the create action to fail in Identity Manager.

To prevent this issue from occurring, you can specify the amount of time (in seconds) that Identity Manager waits before "timing out" in the REPLICATION_WAIT_TIME property.

To specify replication wait time

1. In the directory configuration file (directory.xml), locate the ImsManagedObject element that describes the user object.
2. Add the following PropertyDict element:

```
<PropertyDict name="REPLICATION_WAIT_TIME" description="time delay in seconds
for LDAP provider to allow replication to propagate from master to slave">
<Property name=REPLICATION_WAIT_TIME><time in seconds></Property>
</PropertyDict>
```

Note: The PropertyDict element must be the last element in the ImsManagedObject element, as in the following example:

```
<ImsManagedObject name="User" description="My Users"
objectclass="top,person,organizationalperson,inetorgperson,customClass"
objecttype="USER">
<ImsManagedObjectAttr physicalname="departmentnumber" displayname="Department"
description="Department" valuetype="String" required="true"
multivalued="false" maxlength="0" />
.
.
.
<PropertyDict name="REPLICATION_WAIT_TIME" description="time delay in seconds
for LDAP provider to allow replication to propagate from master to slave">
<Property name=REPLICATION_WAIT_TIME>800</Property>
</PropertyDict>
```

When the replication wait time is not defined, the default value 0 is used.

Specify LDAP Connection Settings

To improve performance, you can specify the following parameters in the directory configuration file (directory.xml):

Connection Timeout

Specifies the maximum number of milliseconds that Identity Manager searches a directory before terminating the search.

This property is specified in the directory configuration file as follows:

com.sun.jndi.ldap.connect.timeout

Connection Pool Max Size

Specifies the maximum number of connections that Identity Manager can make to the LDAP directory.

This property is specified in the directory configuration file as follows:

com.sun.jndi.ldap.connect.pool.maxsize

Connection Pool Default Size

Specifies the default number of connections between Identity Manager and the LDAP directory.

This property is specified in the directory configuration file as follows:

com.sun.jndi.ldap.connect.pool.prefsize

To specify LDAP connection settings

1. In the directory configuration file (directory.xml), locate the ImsManagedObject element that describes the user object.
2. Add the following PropertyDict element:

```
<PropertyDict name="LDAP_CONNECTION_SETTINGS" description="LDAP Connection
Settings">
    <Property name="com.sun.jndi.ldap.connect.timeout">5000</Property>
    <Property name="com.sun.jndi.ldap.connect.pool.maxsize">200</Property>
    <Property name="com.sun.jndi.ldap.connect.pool.prefsize">10</Property>
</PropertyDict>
```

3. Save the directory.xml file.

   Identity Manager configures these settings when you create the Identity Manager directory with this file.

How to Improve Directory Search Performance

To improve the performance of directory searches for users, organizations, and groups, do the following:

- Index the attributes that administrators can specify in search queries.

  Note: For Oracle Internet Directory, a search may fail when an attribute in a search query is not indexed.

- Configure page size and maximum row settings (see page 90) to determine how Identity Manager handles large searches.
- Tune the user directory. See the documentation for the user directory that you are using.

How to Improve Performance for Large Searches

When Identity Manager manages a very large user store, searches that return many results can cause the system to run out of memory. To help prevent memory issues, you can define limits for large searches.

The following two settings determine how Identity Manager handles large searches:

- Maximum number of rows

  Specifies the maximum number of results that CA Identity Manager can return when searching a user directory. When the number of results exceeds the limit, an error is displayed.

- Page size

  Specifies the number of objects that can be returned in a single search. If the number of objects exceeds the page size, CA Identity Manager performs multiple searches.

  Note the following when specifying Page Size:

  - To use the Search Page Size option, the user store that Identity Manager manages must support paging. Some user store types require additional configuration to support paging. For more information, see the following topics:

    Configure Sun Java System Directory Server Paging Support (see page 91)

    Configure Active Directory Paging Support (see page 92)

  - If the user store does not support paging, and a value for maxrows is specified, Identity Manager uses only the maxrows value to control search size.

You can configure maximum row limits and page size in the following places:

- User Store

  In most user stores and databases, you can configure search limits.

  Note: For more information, see the documentation for the user store or database that you are using.

- Identity Manager Directory

  You can configure the DirectorySearch element (see page 55) in the directory configuration file (directory.xml) that you use to create the Identity Manager Directory.

  By default, the value for maximum rows and page size is unlimited for existing directories. For new directories, the value for maximum rows is unlimited and the value for page size is 2000.

- Managed object definition

  To set maximum row limits and page sizes that apply to one type of object instead of an entire Directory, configure the *managed object definition* (see page 57) in the directory.xml file that you use to create the Identity Manager Directory.

  Setting limits for a managed object type allows you to make adjustments based on business requirements. For example, most companies have more users than groups. Those companies can set limits for user object searches only.

- Task Search screens

  You can control the number of search results that users see in search and list screens in the User Console. If the number of results exceeds the number of results per page defined for the task, users see links to additional pages of results.

  This setting does not affect the number of results returned by a search.

  Note: For information on setting page size in search and list screens, see the *Administration Guide*.

If maximum row limits and page sizes are defined in multiple places, the most specific setting applies. For example, managed object settings take precedence over directory level settings.

Configure Sun Java System Directory Server Paging Support

Sun Java System Directory Servers support Virtual List View (VLV), a method for delivering search results in a certain order or in certain subsets. This method differs from Simple Paged Results, which Identity Manager expects.

To use VLV, you set permissions and create indexes. Identity Manager includes the following files that you need to configure paging support:

- vlvcntrl.ldif
- vlvindex.ldif
- runvlvindex.cmd, runvlvindex.sh

These files are included as part of the NeteAuto sample in samples\NeteAuto in the Administrative Tools.

The Administrative Tools are installed in the following default locations:

Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager

UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager/

To configure Sun Java System Directory Server to support paging:

1. Add the following parameter to the DirectorySearch element (see page 55) in the directory.xml file for the Identity Manager directory as follows:

   ```
   minsortrules="1"
   ```

   Note: If you are modifying an existing Identity Manager directory, see How to Update a Identity Manager Directory (see page 163).

2. Set permissions for the vlvcntrl.ldif file as follows:
   ```
   ldapmodify -D "cn=Directory Manager" -w password -p port -f
   vlvcntrl.ldif
   ```

3. Import VLV Search and Index definitions as follows:
   ```
   ldapmodify -D "cn=Directory Manager" -w password -p port -f
   vlvindex.ldif
   ```

4. Stop the directory as follows:
   ```
   stop-slapd
   ```

5. Build the indexes using runvlvindex.

6. Start the directory as follows:
   ```
   start-slapd
   ```

Configure Active Directory Paging Support

Active Directory uses 1000 as the default MaxPageSize. If the maxpagesize attribute value in directory.xml is greater than or equal to 1000, Identity Manager fails to display a warning when the number of search results exceeds the maxrows value in directory.xml. In this case, administrators who perform the search are not aware that some search results are not returned.

To prevent this issue, verify that the maxpagesize attribute value for the Directory and each managed object is less than the Active Directory MaxPageSize.

If you are creating a Identity Manager Directory using the template directory.xml file installed with Identity Manager 12.5 SP7 or higher, you do not need to perform any additional steps for paging support. The maxpagesize attribute in directory.xml is set by default.

If you are adding paging support to an existing Identity Manager Directory, be sure that the maxpagesize attribute in directory.xml is less than 1000.

Also, if the Active Directory MaxPageSize is 1000, verify that the maxpagesize attribute is set appropriately for the Identity Manager directory and all managed objects.

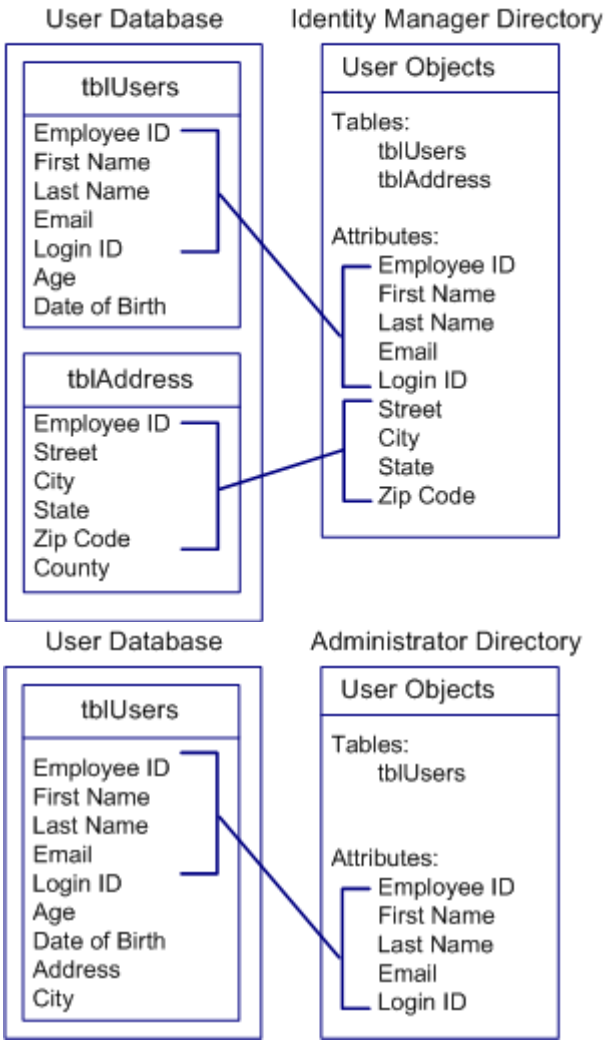
Chapter 4: Relational Database Management

This section contains the following topics:

Identity Manager Directories

An *Identity Manager directory* describes how objects, such as users, groups, and (optionally) organizations are stored in the user store and represented in CA Identity ManagerIdentity Manager. A Identity Manager directory is associated with one or more Identity Manager environments.

The following illustration shows how an Identity Manager directory relates to a user store:



Note: Some user attributes in the database are not part of the Identity Manager directory, and therefore not managed by Identity Manager.

Important Notes When Configuring CA Identity Manager for Relational Databases

Before you configure Identity Manager to manage a relational database, ensure that the database meets the following requirements:

- The database must be accessible through a JDBC driver or an Open Database Connectivity (ODBC) driver (when Identity Manager integrates with SiteMinder). The driver should support outer joins. If more than two tables are used to represent a managed object, the driver should also support nested outer joins.

  Note: If the driver does not support outer joins, Identity Manager uses inner joins when querying the database. This may cause unexpected query results.

- You must be able to uniquely identify each object that Identity Manager manages, such as a user, group, or organization (when supported). For example, the unique identifier for users may be a login ID.

  Note: The unique identifier must be stored in a single column.

- Identity Manager requires some multivalued attributes, which can be stored as a delimited list in a single cell or in multiple rows in a separate table. For example, the following tblGroupMembers table stores the members of a group:

ID	Members
Research	dmason
Research	rsavory
Marketing	dmason
Marketing	awelch

  The ID column contains the unique identifier for a group and the Members column contains the unique identifier for a member of the group. For example, dmason and rsavory are members of the Research group. When a new member is added to that group, another row is added to tblGroupMembers.

- When your environment includes organizations, do the following:
  - Edit and run a SQL script, included with Identity Manager, against the database to configure organization support (see page 130).
  - Identity Manager requires a top level organization, named the root. All other organizations relate to the root organization.

    For more information about organization requirements, see Organizations Management (see page 130).

Create an Oracle Data Source for WebSphere

1. In the WebSphere Administrative Console, navigate to the JDBC provider that you created when you configured the JDBC driver.
2. Create a new data source with the following properties and click Apply:

   Name: User Store Data Source

   JNDI Name: userstore

   URL: jdbc:oracle:thin:@*db_systemname*:1521:*oracle_sid*
3. Configure a new J2C Authentication Data Entry for the User Store Data Source:
   a. Enter the following properties:

      Alias: User Store

      User ID: *username*

      password: *password*

      where *username* and *password* are the username and password for the account you specified when you created the database.

   b. Click OK, then use the navigation links at the top of the screen to return to the data source you are creating.
4. Select the User Store J2C Authentication Data Entry you created from the list box in the following fields:
   - Component-managed Authentication Alias
   - Container-managed Authentication Alias
5. Click OK, then save the configuration.

   Note: To verify that the data source is configured correctly, click Test Connection in the configuration screen for the data source. If the test connection fails, restart WebSphere and test the connection again.

How to Create an Identity Manager Directory

The steps to configure Identity Manager to manage your directory are as follows:

1. If you are using SiteMinder, ensure that you have applied the policy store schema prior to creating a Identity Manager Directory.

   Note: For more information on specific policy store schemas and how to apply them, see the *Installation Guide*.
2. If you are using SiteMinder, create an ODBC data source for use with SiteMinder (see page 103).
3. Create a data source for the user database that Identity Manager will manage.

4. Describe the database to Identity Manager by modifying a directory configuration file (directory.xml). For more information, see How to Describe a Database in a Directory Configuration File.
5. In the Management Console, import the directory configuration file and create the directory.

How To Create a JDBC Data Source

CA Identity Manager requires a JDBC datasource in the application server where Identity Manager is installed to connect to the user store. The instructions for creating a datasource are different for each application server.

Create a JDBC Data Source for JBoss Application Servers

To create a JDBC datasource for JBoss

1. Create a copy of the following file:

   jboss_home\server\default\deploy\objectstore-ds.xml

   jboss home

   The installed location of the Jboss application server where Identity Manager is installed

   The new file should exist in the same location.
2. Rename the file to userstore-ds.xml.
3. Edit userstore-ds.xml as follows:
   a. Locate the <jndi-name> element.
   b. Change the value of the <jndi-name> element from jdbc/objectstore to userstore as follows:

      <jndi-name>userstore</jndi-name>

c. In the <connection-url> element, change the DatabaseName parameter to the name of the database that serves as the user store as follows:

<connection-url>

jdbc:sqlserver://*ipaddress:port*;selectMethod=cursor;DatabaseName=*userstore_name*

</connection-url>

ipaddress

Specifies the IP address of the machine where the user store is installed

port

Specifies the port number for the database

userstore_name

Specifies the name of the database that serves as the user store

4. Perform the following steps if you plan to create a JBoss security realm, which is required for support FIPS:

   a. Rename the security-domain to <security-domain>imuserstoredb</security-domain>.

   b. Save the file.

   c. Omit the remaining steps. Instead, complete the steps in Create a JBoss Security Realm for the JDBC Data Source (see page 99).

5. Make the following additional changes to userstore-ds.xml:

   a. Change the value of the <user-name> element to the username for an account that has read and write access to the user store.

   b. Change the value of the <password> element to the password for the account specified in the <user-name> element.

   Note: The user-name and password appear in clear text in this file. Therefore, you may decide to create a JBoss Security realm instead of editing userstore-ds.xml.

6. Save the file.

Use a JBoss Security Realm for the JDBC Data Source

If you are creating a JDBC data source in a JBoss application server, you can configure the data source to use a user name and password, or configure it to use a security realm.

Important! A JBoss Security Realm option must be used if FIPS is being used.

To configure the JDBC data source to use a security realm

1. Complete the steps in Create a JDBC Data Source for JBoss Application Servers (see page 97).

   Do not specify a user name and password in the userstore-ds.xml as described in step 4.

2. Open login-cfg.xml in *jboss_home*\server\default\conf.

3. Locate the following entry in the file:

```
<application-policy name="imobjectstoredb">
  <authentication>
    <login-module
code="com.netegrity.jboss.datasource.PasswordEncryptedLogin" flag="required">
      <module-option name="userName">fwadmin</module-option>
      <module-option
name="password">{PBES}:gSex2/BhDGzEKWvFmzca4w==</module-option>
      <module-option
name="managedConnectionFactoryName">jboss.jca:name=jdbc/objectstore,service=N
oTxCM</module-option>
    </login-module>
  </authentication>
</application-policy>
```

4. Copy the complete entry and paste it within the <policy> and </policy> tags in the login-cfg.xml file.

5. In the entry you pasted in the file, make the following changes:

   a. Change the name attribute value from imobjectstoredb to imuserstoredb as follows:

      ```
      <application-policy name="imuserstoredb">
      ```

   b. Specify the name of the user used to authenticate against the user store as follows:

      ```
      <module-option name="userName">user_store_user</module-option>
      ```

   c. Specify the password for the user in the previous step as follows:

      ```
      <module-option name="password">user_store_user_password</module-option>
      ```

      Note: To encrypt the user store password, use the password tool (see page 297) (pwdtools) that is installed with Identity Manager.

d. In the <module-option name="managedConnectionFactoryName"> element, provide the correct jdbc.jca:name as follows:

```
<module-option name="managedConnectionFactoryName">
   jboss.jca:name=userstore,service=NoTxCM
</module-option>
```

6. Save the file.
7. Restart the application server.

Create a JDBC Data Source for WebLogic

You create a data source in the WebLogic Administration Console.

Note: See the Oracle WebLogic 11 Documentation for complete information about Weblogic Connection Pools.

To create the data source

1. Create a JDBC Data Source with the following parameters in the WebLogic Administration Console:

   Name: User Store Data Source

   JNDI Name: userstore

2. Create the connection pool for the data source with the following information:

   - For SQL Server 2005 databases, use the following values:

     URL: jdbc:sqlserver://*db_systemName*:1433

     Driver Class Name: com.microsoft.sqlserver.jdbc.SQLServerDriver

     Properties: user=*username*

     databaseName=*user store name*

     selectMethod=cursor

     Password: *password*

   - For Oracle databases, use the following values:

     URL: jdbc:oracle:thin:@*tp_db_systemname*:1521:*oracle_SID*

     Driver Class Name: oracle.jdbc.driver.OracleDriver

     Properties: user=*username*

     Password: *password*

3. After configuration, set the target for the pool to the server instance *wl_server_name*.

   After you deploy the pool, check the console to see if any errors occurred.

   Note: You may see an error that says the data source cannot be created with a non-existent pool. To resolve this error, restart WebLogic.

WebSphere Data Sources

The following sections describe how to create a SQL or Oracle data source for Websphere application servers.

Create a SQL Server Data Source for WebSphere

1. In the WebSphere Administrative Console, navigate to the JDBC provider that you created when you configured the JDBC driver.
2. Select Data Sources in the Additional Properties section.
3. Create a new data source with the following properties and click Apply:

   Name: User Store Data Source

   JNDI Name: userstore

   databaseName: *userstore_name*

   serverName: *db_systemname*

4. Configure the selectMethod property as follows:
   a. Select Custom Properties in the Additional Properties section.
   b. Click the selectMethod custom property.
   c. Enter the following in the Value field:

      cursor

   d. Click OK, then use the navigation links at the top of the screen to return to the data source you are creating.

5. Configure a new J2C Authentication Data Entry for the User Store Data Source:
   a. Select J2EE Connector Architecture (J2C) authentication data entries from the Related Items section.
   b. Click New.
   c. Enter the following properties:

      Alias: User Store

      User ID: *username*

      password: *password*

      where *username* and *password* are the username and password for the account you specified when you created the database.

   d. Click OK, then use the navigation links at the top of the screen to return to the data source you are creating.
6. Select the User Store J2C Authentication Data Entry you created from the list box in the Component-managed Authentication Alias field.
7. Click OK, then save the configuration.

   Note: To verify that the data source is configured correctly, click Test Connection in the configuration screen for the data source. If the test connection fails, restart WebSphere and test the connection again.

Create an Oracle Data Source for WebSphere

1. In the WebSphere Administrative Console, navigate to the JDBC provider that you created when you configured the JDBC driver.
2. Create a new data source with the following properties and click Apply:

   Name: User Store Data Source

   JNDI Name: userstore

   URL: jdbc:oracle:thin:@*db_systemname*:1521:*oracle_sid*
3. Configure a new J2C Authentication Data Entry for the User Store Data Source:
   a. Enter the following properties:

      Alias: User Store

      User ID: *username*

      password: *password*

      where *username* and *password* are the username and password for the account you specified when you created the database.

   b. Click OK, then use the navigation links at the top of the screen to return to the data source you are creating.

4. Select the User Store J2C Authentication Data Entry you created from the list box in the following fields:
   - Component-managed Authentication Alias
   - Container-managed Authentication Alias
5. Click OK, then save the configuration.

   Note: To verify that the data source is configured correctly, click Test Connection in the configuration screen for the data source. If the test connection fails, restart WebSphere and test the connection again.

How to Create an ODBC Data Source For Use with SiteMinder

If CA Identity Manager integrates with SiteMinder, define an ODBC data source on the SiteMinder machine that points to the database. Note the name of the data source for later use. Proceed as follows:

- **Windows:** Configure the ODBC data source as a System DN. See your Windows operating system documentation for instructions.
- **UNIX:** Add an entry specifying the parameters for the ODBC data source in the system_odbc.ini file, located in *policy_server_installation*/db.

How to Describe a Database in a Directory Configuration File

To manage a database, Identity Manager must understand the database structure and content. To describe the database to Identity Manager, create a directory configuration file (directory.xml).

The directory configuration file contains one or more of the following sections:

Identity Manager Directory Information

Contains information about the Identity Manager directory that is used by Identity Manager.

Attribute Validation

Defines the validation rules that apply to the Identity Manager directory.

Provider Information

Describes the user store that Identity Manager will manage.

Directory Search Information

Enables you to specify how Identity Manager searches the user store.

User Object **(see page 105)**

Describes how users are stored in the user store and represented in Identity Manager.

Group Object **(see page 105)**

Describes how groups are stored in the user store and represented in Identity Manager.

Organization Object **(see page 105)**

When the user store includes organizations, describes how organizations are stored and represented in Identity Manager.

Self-Subscribing Groups

Configures support for groups that self-service users can join.

The directory where you installed the administrative tools for Identity Manager includes the following directory configuration file template for relational databases:

admin_tools\directoryTemplates\RelationalDatabase\directory.xml

admin_tools

Defines the installed location of Identity Manager administrative tools, as in the following examples:

- **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
- **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

Note: The directory configuration file template in directoryTemplates\RelationalDatabase is configured for environments that support organizations. To see a directory configuration file for an environment that does not include organizations, you can look at the directory.xml file for the NeteAuto sample, which is located in *admin_tools*\samples\NeteAutoRDB\NoOrganization

Copy the configuration template to a new directory or save it with a different name to prevent overwriting it. You can then modify the template to reflect your database structure.

The directory configuration file has two important conventions:

- ##—Indicates required values.

  To provide all of the required information, locate all double pound signs (##) and replace them with appropriate values. For example, ##PASSWORD_HINT indicates that you must supply an attribute to store a question that a user answers to receive a temporary password in the case of a forgotten password.

- @—Indicates values that Identity Manager populates. Do not modify these values in the directory configuration file. Identity Manager prompts you to supply the values when you import the directory configuration file.

Before you modify the directory configuration file, you need the following information:

- Table names for the user, group, and organization objects (when your structure includes organizations)
- A list of attributes in user, group, and organization profiles (when your structure includes organizations)

Modify the Directory Configuration File

Perform the following procedure to modify the directory configuration file.

To modify the directory configuration file

1. Configure a connection to the database.
2. Specify the amount of time that Identity Manager searches a directory before terminating the search.
3. Define the user and group managed objects that Identity Manager will manage (see page 105).
4. Modify well-known attributes.

   Well-known attributes identify special attributes, such as the password attribute, in Identity Manager.
5. Configure support for self-subscribing groups.
6. If your environment includes organizations, configure organization support.

More information:

Managed Object Descriptions (see page 105)
Well-Known Attributes for a Relational Database (see page 123)
How to Configure Self-Subscribing Groups (see page 128)
Organization Management (see page 130)

Managed Object Descriptions

In Identity Manager, you manage the following types of objects, corresponding to entries in a user store:

- Users—Represent users in an enterprise.
- Groups—Represent associations of users who have something in common.

- (Optional) Organizations—Represent business units. Organizations may contain users, groups, and other organizations.

  Note: Organizations Management (see page 130) provides information about configuring organizations.

An object description contains the following:

- Information about the object (see page 106), such as the tables in which the object is stored.
- The attributes that store information about an entry (see page 111). For example, the pager attribute stores a pager number.

Important! A Identity Manager environment supports only one type of user, group, and organization object.

How to Describe a Managed Object

A managed object is described by specifying object information in the User Object, Group Object, and Organization Object sections (when the database includes organizations) of the directory configuration file.

Each of these sections contains an ImsManagedObject element, such as the following:

```
<ImsManagedObject name="User" description="My Users">
```

The ImsManagedObject element may include the following elements:

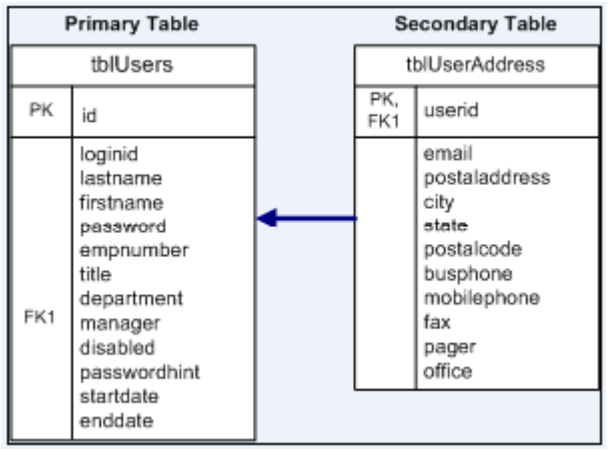
- Table (required)
- UniqueIdentifier (required)
- ImsManagedObjectAttr (required)
- RootOrg (for organization objects only)

Database Tables

Use the Table element in the directory configuration file to define the tables that store information about a managed object.

Each managed object must have one primary table that contains the unique identifier for the object. Additional information may be stored in secondary tables.

The following illustration shows a database that stores user information in a primary and secondary table:



If an object's information is stored in multiple tables, create a Table element for each table. Use the Reference element in the Table element for a secondary table to define its relationship to the primary table.

For example, if basic information about a user is stored in tblUsers and address information is stored in tblUserAddress, the table definitions for the User managed object would resemble the following entries:

```
<Table name="tblUsers" primary="true" />
<Table name="tblUserAddress">
  <Reference childcol="userid" primarycol="id" />
</Table name>
```

Table Elements

The parameters for a table element are as follows:

name

(Required)

Specifies the name of the table that stores some or all of the attributes in a managed object's profile.

primary

Indicates whether the table is the primary table for the managed object. The primary table contains the unique identifier for the object, as follows:

- True—The table is the primary table.
- False—The table is a secondary table (default).

If you do not specify the primary parameter, Identity Manager assumes that the table is a secondary table.

Note: Only one table can be the primary table.

filter

Identifies a subset of the table entries that apply to the managed object if the table stores information for more than one object type.

The filter parameter may resemble the following:

filter="type='USER'"

Note: The filter applies only to queries that Identity Manager generates. If you overwrite a generated query with a custom query, you must specify the filter in the custom query.

fullouterjoin

Indicates whether the outer join is a full outer join.

- True— The outer join is a full outer join. In this case, the condition required to return a valid row must be found in both tables in the join for a row to be returned.
- False—The outer join is a left outer join relative to the primary table. In this case, only the rows in one table in the query need to satisfy the condition (default).

Note: The parameters are optional unless otherwise specified.

The Table parameter can contain one or more Reference elements to link a primary table to secondary tables.

Reference Element

The parameters in the Reference element are as follows:

childcol

Indicates the column in the secondary table (specified in the corresponding Table element) that maps to the column in the primary table.

primarycol

Indicates the column in the primary table that maps to the column in the secondary table.

Note: The parameters are optional unless otherwise specified.

Specify Object Information

Object information is specified by supplying values for various parameters.

To specify object information

1. Locate the ImsManagedObject element in the User Object, Group Object, or Organization Object section.
2. Supply values for the following parameters:

   name

   (Required)

   Provides a unique name for the managed object.

   description

   Provides the description of the managed object.

   objecttype

   (Required)

   Specifies the type of managed object. The valid values are as follows:

   - USER
   - GROUP
   - ORGANIZATION

   The ImsManagedObject element should resemble the following:

   ```
   <ImsManagedObject name="User" description="My  Users" objecttype="USER">
   ```

3. Supply Table information, as described in Database Tables (see page 106).
4. Specify the column that contains the unique identifier for the object (see page 117).
5. Describe the attributes that constitute the object's profile (see page 111).
6. If you are configuring an organization object, go to Organizations Management (see page 130).

Custom Operations

You can define custom operations for certain managed objects to do the following:

- Use stored procedures
- Optimize queries for their database structure
- Retrieve a database-generated unique identifier

Custom operations apply only to attributes.

When specifying custom operations, remember the following:

- Users who specify custom operations must be familiar with SQL.
- Identity Manager does not validate custom operations. Syntax errors and invalid queries are not reported until runtime.
- If you specify a custom operation for an attribute, you cannot use that attribute in search filters in Identity Manager tasks.
- Custom operations must conform to XML standards. Represent special characters using XML syntax. For example, specify a single quotation mark (') as '

To specify a custom operation, use the Operation element.

Operation Element

The Operation element defines a SQL statement that executes a custom query or calls a stored procedure to create, retrieve, modify, or delete an attribute. It is a subelement of the IMSManagedObjectAttr element, as shown in the following example:

```
<ImsManagedObjectAttr physicalname="tblUsers.id" displayname="User Internal ID"
description="User Internal ID" valuetype="Number" required="false"
multivalued="false" maxlength="0" hidden="false" permission="READONLY">
  <Operation name="GetDb" value="select @@identity" />
```

Operation element parameters are as follows:

name

Specifies a pre-defined name for an operation. The valid operations are as follows:

- Create
- Get
- Set

- Delete
- GetDB

  The GetDB operation retrieves a unique identifier from the database during a Create task, when the unique identifier is generated by the database or from a stored procedure.

value

Defines the SQL statement or stored procedure to execute. The valid values are as follows:

- INSERT
- SELECT
- UPDATE
- DELETE
- CALL (for stored procedures)

Note: The parameters are optional unless otherwise specified.

The Operation element can contain one or more Parameter elements.

How to Modify Attribute Descriptions

An attribute stores information about a user, group, or organization entity, such as a telephone number or address. An entity's attributes determine its profile.

In the directory configuration file, attributes are described in ImsManagedObjectAttr elements. In the User Object, Group Object and Organization Object sections of the directory configuration file, you can do the following:

- Modify default attribute descriptions to describe your database attributes.
- Create new attribute descriptions by copying an existing description and modifying values as needed.

There is one ImsManagedObjectAttr element for each attribute in user, group, and organization profiles. For example, an ImsManagedObjectAttr element may describe a user ID.

An ImsManagedObjectAttr element resembles the following:

```
<ImsManagedObjectAttr
 physicalname="tblUsers.id"
 displayname="User Internal ID"
 description="User Internal ID"
 valuetype="Number"
 required="false"
 multivalued="false"
 maxlength="0"
 hidden="false"
 permission="READONLY">
```

Note: When you are using an Oracle database, note the following when you configure managed object attributes:

- Oracle databases are case-sensitive by default. The case of the attributes and table names in the directory configuration file must match the case of the attributes in Oracle.

  Be sure to specify a maximum length for String datatypes to prevent truncation. To limit the length of strings, you can create a validation rule that displays an error when a user types a string that exceeds the maximum length.

The ImsManagedObjectAttr parameters are as follows.

Note: The parameters are optional unless otherwise specified.

physicalname

(Required)

Specifies the physical name of the attribute, and it must contain one of the following:

- The name and location where the value is stored.

  Format: *tablename.columnname*

  For example, when an attribute is stored in the id column in the tblUsers table, the physical name for that attribute is as follows:

  tblUsers.id

  You must define each table that contains an attribute in a Table element (see page 106).

- A well-known attribute.

  A well-known attribute can represent a computed value. For example, you can use a well-known attribute to refer to an attribute that is computed by a custom operation (see page 110).

displayname

(Required)

Specifies a unique name for the attribute.

In the User Console, the display name appears in the list of attributes that are available to add to a task screen.

Note: Do not modify an attribute's displayname in the directory configuration file (directory.xml). To change the name of the attribute on a task screen, you can specify a label for the attribute in the task screen definition. For more information, see the *Administration Guide*.

description

Provides the description of the attribute.

valuetype

Specifies the attribute's data type. The valid values are as follows:

String

The value can be any string.

This is the default value.

Integer

The value must be an integer.

Note: Integer does not support decimal numbers.

Number

The value must be an integer. The number option supports decimal numbers.

Date

The value must parse to a valid date using the pattern:

MM/dd/yyyy

ISODate

The value must parse to a valid date using the pattern yyyy-MM-dd

UnicenterDate

The value must parse to a valid date using the pattern YYYYYYYDDD where:

YYYYYYY is a seven number representation for year beginning with three zeros. For example: 0002008

DDD is the three number representation for the day beginning with zeroes, as needed. Valid values include 001 to 366.

When an attribute's valuetype is incorrect, Identity Manager queries may fail.

To make sure that an attribute is stored correctly in the database, you can associate it with a validation rule.

required

Indicates whether a value must be specified for the attribute, as follows:

- True—Required
- False—Optional (default)

multi-valued

Indicates whether the attribute can have multiple values, as follows:

- True— An attribute can have multiple values.
- False— An attribute can have only a single value (default).

For example, the group membership attribute in a user profile is multi-valued to store the groups to which a user belongs.

To store multi-valued attributes in a delimited list instead of in a multi-row table, you must define the delimiter character in the delimiter parameter.

Make sure that the number of possible values and the length of each value that the column enables are sufficient.

Important! The Group Membership attribute in the User object definition must be multi-valued.

wellknown

Provides the name of the well-known attribute.

Well-known attributes have a specific meaning in Identity Manager.

Format: %*ATTRIBUTENAME*%

Note: When a custom operation is associated with an attribute, you must specify a well-known attribute (see page 74).

maxlength

Determines the maximum size of the column.

permission

Indicates whether an attribute's value can be modified in a task screen, as follows:

READONLY

The value is displayed but cannot be modified

WRITEONCE

The value cannot be modified once the object is created. For example, a user ID cannot be changed after the user is created

READWRITE

The value can be modified (default)

hidden

Indicates whether an attribute appears in the Identity Manager task screens, as follows:

- True—The attribute is not displayed to users.
- False—The attribute is displayed to users (default).

Logical attributes use hidden attributes.

Note: For more information about logical attributes, see the *Programming Guide for Java*.

system

Indicates attributes that are used by Identity Manager only, and should not be modified by users in the User Console, as follows:

- True—Users cannot modify the attribute. The attribute will not appear in the User Console.
- False—Users can modify this attribute. It is available to add to task screens in the User Console (default).

validationruleset

Associates a validation rule set with the attribute.

The validation rule set that you specify must be defined in a ValidationRuleSet element in the directory configuration file.

delimiter

Defines the character that separates values when multiple values are stored in a single column.

Important! The multivalued parameter must be set to true for the delimiter parameter to apply.

Note: To prevent displaying sensitive information, such as passwords or salaries, in the User Console, you can specify DataClassification (see page 69) parameters.

Parameter Element

A Parameter element specifies values that are passed to the query. When multiple Parameter elements are defined, the values are passed to the query in the order in which they are listed.

A Parameter element requires the name parameter. The value of the name parameter can be a physical attribute or a well-known attribute (see page 74).

Note: Identity Manager must understand the values that are passed to a query in the Parameter element. For example, the value can be a physical name or a well-known attribute that is defined in the ImsManagedObjectAttr attributes.

When you specify a physical attribute, note the following:

- Use the following syntax to specify a physical attribute:

  tablename.columnname

  - *tablename*

    Provides the name of the table where the attribute is located. The table you specify should be the primary table.

  - *columnname*

    Provides the name of the column that stores the attribute.

- The attribute that you specify must exist in the database and be defined in the directory configuration file, as described in How to Modify Attribute Descriptions (see page 111).

Example: Custom Operations for the Business Number Attribute

In the following example, the Business Number attribute is generated by calling a stored procedure; it is not a physical attribute in the database.

```
<ImsManagedObjectAttr wellknown="%BUSINESS_NUMBER%"     displayname="Business
Number" description="Business Number"     valuetype="String" required="false"
multivalued="false"     maxlength="0">
<Operation name="Get" value="call sp_getbusinessnumber(?)">
    <Parameter name="%USER_ID%"/>
</Operation>
<Operation name="Set" value="call sp_setbusinessnumber(?,?)">
    <Parameter name="%USER_ID%"/>
    <Parameter name="%BUSINESS_NUMBER%"/>
</Operation>
<Operation name="Delete" value="call sp_deletebusinessnumber(?)">
    <Parameter name="%USER_ID%"/>
</Operation>
```

Note the following:

- sp_getbusinessnumber, sp_setbusinessnumber, and sp_deletebusinessnumber are user-defined stored procedures.
- The value returned from the Get operation is mapped to the %BUSINESS_NUMBER% attribute.
- The question mark (?) indicates substitutions that are made at runtime before the query is executed. For example, in the Get operation the %USER_ID% well-known attribute is passed to the sp_getbusinessnumber stored procedure.

How to Specify the Unique Identifier for a Managed Object

Each object that Identity Manager manages must have a unique identifier. The unique identifier must be stored in a single column in the managed object's primary table. Primary tables are described in Database Tables (see page 106).

Use the UniqueIdentifier and UniqueIdentifierAttr elements to define the unique identifier as follows:

```
<UniqueIdentifier>
  <UniqueIdentifierAttr name="tablename.columnname" />
</UniqueIdentifier>
```

The UniqueIdentifierAttr element requires the name parameter. The value of the name parameter is the attribute in which the unique identifier is stored. The value can be a physical attribute or a well-known attribute (see page 74).

When you specify a physical attribute, note the following:

- The attribute that you specify must exist in the database and be defined in the directory configuration file, as described in How to Modify Attribute Descriptions (see page 111). In the attribute description, be sure to specify read-only or write-once permission to prevent the unique identifier from changing during a session.
- Use the following syntax to specify a physical attribute:

  tablename.columnname

  tablename

  Defines the name of the table where the attribute is located. The table you specify should be the primary table.

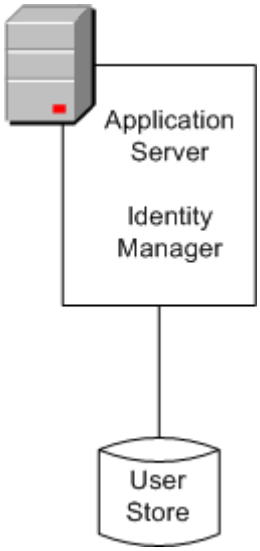
  columnname

  Defines the name of the column that stores the attribute.

- If the unique identifier is generated by the database, you must specify a custom operation for the attribute (see page 110). For example, you may have to specify an operation that fetches the last generated identifier from the database.

Connection to the User Directory

Identity Manager connects to a user directory to store information such as a user, group, and organizational information as shown in the following illustration:



A new directory or database is not required. However, the existing directory or database must be on a system that has a fully qualified domain name (FQDN).

For a list of supported directory and database types, see the Identity Manager support matrix on the CA Support Site.

You configure a connection to the user store when you create a Identity Manager directory in the Management Console.

If you export the directory configuration after creating a Identity Manager directory, the user directory connection information is displayed in the Provider element of the directory configuration file.

Description of a Database Connection

To describe a database connection, use the Provider element and its subelements in the directory.xml file.

Note: If you are creating a new Identity Manager directory, you do not need to provide directory connection information in the directory.xml file. You provide connection information in the Identity Manager Directory wizard in the Management Console.

Modify the Provider element for updates only.

Provider Element

The Provider element includes the following subelements:

JDBC (required)

Identifies the JDBC data source to use when connecting to the user store. Specify the JNDI name you provided when creating the JDBC data source (see page 97).

Credentials (required)

Supplies the username and password for accessing the database.

DSN

Identifies the ODBC data source to use when connecting to the user store.

Note: This subelement only applies when Identity Manager integrates with SiteMinder. In Identity Manager environments that do not include SiteMinder, this subelement is ignored.

SiteMinderQuery

Specifies custom query schemes for locating user information in a relational database.

Note: This subelement only applies when Identity Manager integrates with SiteMinder. In Identity Manager environments that do not include SiteMinder, this subelement is ignored.

A completed database connection resembles the following:

```
<Provider type="RDB" userdirectory="@SMDirName">
        <JDBC datasource="@SMDirJDBCDataSource"/>
        <Credentials user="@SMDirUser"
                cleartext="true">@SMDirPassword</Credentials>
        <DSN name="@SMDirDSN" />
        <SiteMinderQuery name="AuthenticateUser" query="SELECT TBLUSERS.LOGINID
FROM    TBLUSERS WHERE TBLUSERS.LOGINID='%s' AND TBLUSERS.PASSWORD='%s'" />
</provider>
```

The attributes for the Provider element are as follows:

type

Specifies the type of database. For Microsoft SQL Server and Oracle databases, specify RDB (default).

userdirectory

Specifies the name of the user directory connection. This parameter corresponds to the Connection Object name that you supply during directory creation.

If Identity Manager integrates with SiteMinder for authentication, it creates a user directory connection in SiteMinder with the name you specify for the Connection Object during installation. If you want to connect to an existing SiteMinder user directory, enter the name of that user directory when prompted for the Connection Object. Identity Manager will populate the userdirectory parameter with the name you specify.

If Identity Manager does not integrate with SiteMinder, the value of the userdirectory parameter is any name that you give the JDBC connection to the user store.

Note: Do not specify a name for the user directory connection in the directory.xml file. Identity Manager prompts you to supply the name during directory creation.

Database Credentials

To connect to the database, Identity Manager must provide valid credentials to the data source. The credentials are defined in the Credentials element, which resembles the following example:

```
<Credentials user="@SMDirUser" cleartext="true">
  "MyPassword"
</Credentials>
```

If you do not specify a password in the Credentials element, you are prompted for the password when you create the Identity Manager directory in the Management Console.

Note: We recommend specifying the password in the Management Console.

If you specify the password in the Management Console, Identity Manager encrypts the password for you. Otherwise, if you do not want the password to appear in clear text, you must encrypt the password using the password tool installed with Identity Manager. SiteMinder Passwords has instructions on using the password tool.

Note: You can specify only one set of credentials. When you define multiple data sources, the credentials that you specify must apply to all data sources.

The credential parameters are as follows:

user

Defines the login ID for an account that can access the data source.

Do not specify a value for the user parameter in the directory.xml file. Identity Manager prompts you to supply the login ID when you create the Identity Manager directory in the Management Console.

cleartext

Determines whether the password is displayed in clear text in the directory.xml file:

- True—The password is displayed in clear text.
- False—The password is encrypted (default).

Note: These parameters are optional.

Data Source Name (DSN)

The DSN element in the directory.xml file has one parameter—the name of the ODBC data source that Identity Manager uses to connect to the database. The value of the name parameter must match the name of an existing data source.

Note: This element applies only when Identity Manager integrates with SiteMinder. If Identity Manager does not integrate with SiteMinder, this element is ignored.

If the value of the name parameter is @SmDirDSN, you do not have to specify a DSN name in the directory.xml file. Identity Manager will prompt you to supply the DSN name when you import the directory.xml file.

To configure failover, define multiple DSN elements. If the primary data source fails to respond to a request, the next data source defined responds to the request.

For example, suppose you configure the following:

```
<DSN name="DSN1">
<DSN name="DSN2">
```

Identity Manager uses the data source DSN1 to connect to the database. If there is a problem with DSN1, Identity Manager will try to connect to the database using DSN2.

Note: The credentials you specify in the Credentials element (see page 120) must apply to all the DSNs that you define.

SQL Query Schemes

Identity Manager uses query schemes to find user and group information in a relational database.

Note: This element applies only when Identity Manager integrates with SiteMinder. In environments that do not include SiteMinder, this parameter is ignored.

When you create a Identity Manager directory in the Management Console, Identity Manager generates a set of query schemes that are based on the required query schemes in SiteMinder. (For complete information about SiteMinder query schemes, see the *CA SiteMinder Web Access Manager Policy Server Configuration Guide*.) The table and column names in the SiteMinder query schemes are replaced with data that you specify in the directory configuration file.

How to Define Custom Query Schemes

Query schemes are defined in SiteMinderQuery elements in the directory configuration file. A SiteMinderQuery element resembles the following:

```
<SiteMinderQuery name="SetUserProperty" query="update tblUsers set %s =
&apos;%s&apos; where loginid = &apos;%s&apos;" />
```

Note: In the sample query, ' is the XML syntax for the single quote (’).

The SiteMinderQuery element only applies when Identity Manager integrates with SiteMinder.

The query scheme parameters are as follows:

name

Specifies the redefined name of a SiteMinder query scheme.

Do not modify this value.

query

Specifies the SQL statement or stored procedure to execute. The valid values are as follows:

- INSERT
- SELECT
- UPDATE
- DELETE
- CALL (for stored procedures)

Note: These parameters are required for the SiteMinderQuery element.

Before you customize query schemes, you should do the following:

- Become familiar with the default query schemes.

  Note: For more information on SQL query schemes see the *CA SiteMinder Web Access Manager Policy Server Configuration Guide*.

- Acquire extensive experience developing SQL queries.

Modify the Default Query Schemes

Perform the following procedure to modify the default query schemes.

To modify the default query schemes

1. Export the directory configuration file.

   Identity Manager generates a directory configuration file that contains all the current settings for the Identity Manager directory, including the generated query schemes.

2. Save the directory configuration file.

   Note: If you want to create a backup of the original directory configuration file, save the file with a different name or in a different location before saving the exported file.

3. Locate the Identity Manager-generated query scheme that you want to modify.
4. Enter the query scheme or stored procedure to execute in the query parameter.

   Note: Do not modify the query name.

5. After making all your changes, save the directory configuration file.

   Import the file to update the Identity Manager Directory (see page 164).

Well-Known Attributes for a Relational Database

Well-known attributes have special meaning in Identity Manager . They are identified by the following syntax:

%ATTRIBUTENAME%

In this syntax, *ATTRIBUTENAME* must be uppercase.

A well-known attribute is mapped to one physical attribute using an attribute description (see page 111).

In the following attribute description, the attribute tblUsers.password is mapped to the well-known attribute %PASSWORD% so that Identity Manager will treat the value in tblUsers.password as a password:

```
<ImsManagedObjectAttr
        physicalname="tblUsers.password"
        displayname="Password"
        description="Password"
        valuetype="String"
        required="false"
        multivalued="false"
        wellknown="%PASSWORD%"
        maxlength="0" />
```

Some well-known attributes are required; others are optional.

User Well-Known Attributes

A list of user well-known attributes follows:

%ADMIN_OF%

Contains the list of groups for which the user is an administrator.

This well-known attribute may improve search performance at sites with many groups. If the %ADMIN_OF% well-known attribute is specified, CA Identity ManagerIdentity Manager looks for the groups that a user can manage in the %ADMIN_OF% attribute, instead of checking every group in the user store.

%ADMIN_ROLE_CONSTRAINT%

Contains the list of administrator's admin roles (see page 127).

The physical attribute mapped to %ADMIN_ROLE_CONSTRAINT% must be multivalued to accommodate multiple roles.

We recommend indexing the attribute that is mapped to %ADMIN_ROLE_CONSTRAINT%.

%CERTIFICATION_STATUS%

(Required for using the user certification feature)

Contains the user's certification status.

Note: For more information about user certification, see the *Administration Guide*.

%DELEGATORS%

Maps to a list of users who have delegated work items to the current user.

This attribute is required to use delegation. The physical attribute mapped to %DELEGATORS% must be multi-valued and capable of holding strings.

Important! Editing this field directly using Identity Manager tasks or an external tool can cause significant security implications.

%EMAIL%

(Required for enabling the email notification feature)

Stores a user's email address

%ENABLED_STATE%

(Required)

Tracks a user's status.

Note: The data type of the physical attribute mapped to %ENABLED_STATE% must be String.

%FIRST_NAME%

Contains a user's first name.

%FULL_NAME%

(Required)

Contains a user's first and last name.

%IDENTITY_POLICY%

Contains the list of identity policies that have been applied to a user account.

Identity Manager uses this attribute to determine whether an identity policy should be applied to a user. If the policy has the Apply Once setting enabled, and the policy is listed in the %IDENTITY_POLICY% attribute, Identity Manager does not apply the changes in the policy to the user.

Note: For more information about identity policies, see the *Administration Guide*.

%LAST_CERTIFIED_DATE%

(Required for using the user certification feature)

Contains the date when a user's roles were certified.

Note: For more information about user certification, see the *Administration Guide*.

%LAST_NAME%

Contains the user's last name.

%ORG_MEMBERSHIP%

(Required when organizations are supported)

Contains the unique identifier for the organization to which the user belongs.

%ORG_MEMBERSHIP_NAME%

(Required when organizations are supported)

Contains the user-friendly name of the organization to which the user belongs.

%PASSWORD%

Contains a user's password.

%PASSWORD_DATA%

(Required for password policy support)

Specifies the attribute that tracks password policy information.

%PASSWORD_HINT%

(Required)

Contains user-specified question and answer pairs. The question and answer pairs are used in case of forgotten passwords.

%USER_ID%

(Required)

Stores a user's login ID.

Group Well-Known Attributes

A list of group well-known attributes follows:

%GROUP_ADMIN%

Contains a group's administrators.

Note: The %GROUP_ADMIN% attribute must be multivalued.

%GROUP_DESC%

Contains a group's description.

%GROUP_ID%

Contains the unique identifier for a group.

%GROUP_MEMBERSHIP%

(Required)

Contains a list of the group's members.

Note: The %GROUP_MEMBERSHIP% attribute must be multivalued.

%GROUP_NAME%

(Required)

Stores a group's name.

%ORG_MEMBERSHIP%

(Required when organizations are supported)

Contains the unique identifier for the organization to which the group belongs.

%ORG_MEMBERSHIP_NAME%

(Required when organizations are supported)

Contains the user-friendly name of the organization to which the group belongs.

%SELF_SUBSCRIBING%

Determines whether users can subscribe to a group.

%Admin_Role_Constraint% Attribute

When you create an admin role, you specify one or more rules for role membership. Users who satisfy the membership rules have the role. For example, if the membership rule for the User Manager role is title=User Manager, users who have the title User Manager have the User Manager role.

Note: For more information about rules, see the *Administration Guide*.

%ADMIN_ROLE_CONSTRAINT% lets you designate one profile attribute to store all of an administrator's admin roles.

How to Use the %ADMIN_ROLE_CONSTRAINT% Attribute

To use the %ADMIN_ROLE_CONSTRAINT% as the constraint for all admin roles, do the following:

- Pair the %ADMIN_ROLE_CONSTRAINT% well-known attribute with a multivalued profile attribute to accommodate multiple roles
- When you configure an admin role in the Identity Manager user interface, make sure the constraint is the following:

  Admin Roles equals *role name*

  role name

  Defines the name of the role for which you are supplying the constraint.

  For example, Admin Roles equals User Manager

Note: Admin Roles is the default displayname for the %ADMIN_ROLE_CONSTRAINT% attribute.

Configure Well-Known Attributes

Perform the following procedure to configure well-known attributes.

To configure well-known attributes

1. In the directory configuration file, search for the following:

   ##

   Required values are identified by two pound signs (##).

2. Replace the value that begins with ## with the physical name of the attribute you want as it exists in the database. Supply the attribute name using the following format:

   tablename.columnname

   For example, if the password attribute is stored in the password column in the tblUsers table, specify the following:

   `tblUsers.password`

3. Repeat Steps 1 and 2 until you have replaced all required values and included optional values that you want.
4. Map optional well-known attributes to physical attributes, as necessary.
5. Save the directory configuration file.

How to Configure Self-Subscribing Groups

You can enable self-service users to join groups by configuring support for self-subscribing groups in the directory configuration file.

1. In the Self-subscribing Groups section, add a SelfSubscribingGroups element as follows:

   `<SelfSubscribingGroups type=`*search_type* `org=`*org_dn*`>`

2. Type values for the following parameters:

   type

   Indicates where Identity Manager searches for self-subscribing groups. The valid values are as follows:

   - NONE—Identity Manager does not search for groups. Specify NONE to prevent users from subscribing to groups.
   - ALL—Identity Manager searches all groups in the user store. Specify ALL when users can subscribe to all groups.

- INDICATEDORG (*for environments that support organizations only*)—Identity Manager searches for self-subscribing groups in the user's organization and its suborganizations. For example, when a user's profile is in the Marketing organization, Identity Manager searches for self-subscribing groups in the Marketing organization, and in all suborganizations.
- SPECIFICORG (*for environments that support organizations only*)—Identity Manager searches in a specific organization. Supply the unique identifier of the specific organization in the org parameter.

org

Defines the unique identifier of the organization where Identity Manager searches for self-subscribing groups.

Note: You must specify the org parameter if type=SPECIFICORG.

3. Restart the SiteMinder Policy Server if you changed any of the following:
   - The type parameter to or from SPECIFICORG
   - The value of the org parameter

Once support for self-subscribing groups is configured in the Identity Manager directory, Identity Manager administrators can specify which groups are self-subscribing in the User Console.

When a user self-registers, Identity Manager looks for groups in the specified organizations, and then displays the self-subscribing groups to the user.

Validation Rules

A validation rule enforces requirements on data that a user types in a task screen field. The requirements can enforce a data type or format, or make sure that the data is valid in the context of other data on the task screen.

Validation rules are associated with profile attributes. Before processing a task, CAIdentity Manager ensures that the data entered for a profile attribute satisfies any associated validation rules.

You can define validation rules and associate them with profile attributes in the directory configuration file.

Organization Management

For relational databases, Identity Manager has the option to manage organizations. When your database supports organizations, the following is true:

- Organizations have a hierarchical structure.
- All managed objects, such as users, groups, and other organizations belong to an organization.
- When you delete an organization, the objects that belong to that organization are also deleted.

You configure the organization object in the same way that you configure the user and group objects with a few additional steps.

How to Set Up Organization Support

Implement the following steps to set up organization support:

1. Configure Organization Support in the Database (see page 130),
2. Describe the organization object in the ImsManagedObject (see page 106).

   Be sure to configure the Table and UniqueIdentifier subelements.
3. Configure the top-level organization (see page 130).
4. Describe the attributes (see page 111) that constitute an organization.
5. Define the well-known attributes for the organization object (see page 132).

Configure Organization Support in the Database

To configure organization support in the database

1. Open one of the following SQL scripts in an editor:
   - Microsoft SQL Server databases:

     ims_mssql_rdb.sql

- Oracle databases:

  ims_oracle_rdb.sql

  These files are placed in the following location:

  admin_tools\directoryTemplates\RelationalDatabase

  admin_tools refers to the installed location of the Administrative Tools, which are installed by default in one of the following locations:

  Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools

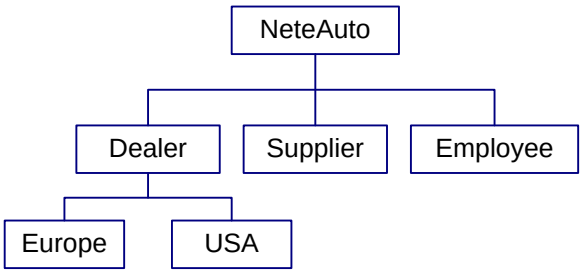
  UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

2. In the SQL script, search for and replace <@primary organization table@> with the name of the primary table for the organization object. Save the SQL script.
3. Run the SQL script against the database.

Root Organization Specification

The root organization serves as the top-level or parent organization in the directory. All organizations relate to the root organization.

In the following illustration, NeteAuto is the root organization. The other organizations are suborganizations of NeteAuto:



A complete root organization definition resembles the following sample:

```
<ImsManagedObject name="Organization" description="My  Organizations"
objecttype="ORG">
   <RootOrg value="select orgid from tblOrganizations where parentorg is null">
      <Result name="%ORG_ID%" />
   </RootOrg>
```

After you define the basic information for the organization object, including the tables that constitute the organization profile and the organization object's unique identifier, specify the root organization in the directory.xml file:

- In the value parameter of the RootOrg element, define the query that Identity Manager uses to retrieve the root organization, as in the following example:

  ```
  <RootOrg value="select orgid from tblOrganizations where parentorg  is null">
  ```

- In the name parameter of the Result element, type the unique identifier of the organization, as in the following example:

  ```
  <Result name="%ORG_ID%" />
  ```

  Note: The value of the name parameter should be the unique identifier for the organization object.

Well-Known Attributes for Organizations

Define well-known attributes for the attributes in an organization's profile as described in Well-Known Attributes (see page 74).

The required and optional organization well-known attributes are as follows:

%ORG_DESCR%

Contains an organization's description.

%ORG_MEMBERSHIP%

(Required)

Contains the organization's parent organization.

Note: See Defining the Organizational Hierarchy for more information about the %ORG_MEMBERSHIP% attribute.

%ORG_MEMBERSHIP_NAME%

(Required)

Contains the user-friendly name of an organization's parent organization (see page 133).

%ORG_NAME%

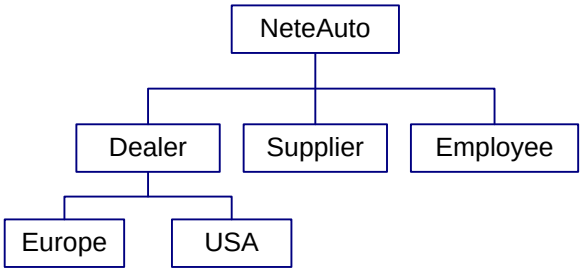
(Required)

Contains the name of the organization.

How to Define the Organizational Hierarchy

In Identity Manager, organizations have a hierarchical structure that includes a root organization and suborganizations. The suborganizations may also have suborganizations.

Each organization, except the root organization, has a parent organization. For example, in the following illustration, Dealer is the parent organization for the USA and Europe organizations:



The unique identifier of the parent organization is stored in an attribute in the organization's profile. Using the information in this attribute, Identity Manager can construct the organization hierarchy.

To specify the attribute that stores the parent organization, use the %ORG_MEMBERSHIP% and %ORG_MEMBERSHIP_NAME% well-known attributes with the physical attribute that stores the name of the parent organization in an attribute description as follows:

```
<ImsManagedObjectAttr physicalname="tblOrganizations.parentorg"
displayname="Organization" description="Parent Organization" valuetype="Number"
required="false" multivalued="false" wellknown="%ORG_MEMBERSHIP%" maxlength="0" />
```

How to Improve Directory Search Performance

To improve the performance of directory searches for users, organization, and groups, do the following:

- Index the attributes that administrators can specify in search queries.
- Override the default directory timeout setting by specifying values for the timeout search parameters in a directory configuration file (directory.xml)
- Tune the user directory. See the documentation for the database that you are using.

Configure database-specific options in the ODBC data source. For more information, see the documentation for the data source.

How to Improve Performance for Large Searches

When Identity Manager manages a very large user store, searches that return many results can cause the system to run out of memory.

The following two settings determine how Identity Manager handles large searches:

- Maximum number of rows

  Specifies the maximum number of results that CA Identity Manager can return when searching a user directory. When the number of results exceeds the limit, an error is displayed.

- Page size

  Specifies the number of objects that can be returned in a single search. If the number of objects exceeds the page size, CA Identity Manager performs multiple searches.

  Note: If the user store does not support paging, and a value for maxrows is specified, Identity Manager uses only the maxrows value to control search size.

You can configure maximum row limits and page size in the following places:

- User Store

  In most user stores and databases, you can configure search limits.

  Note: For more information, see the documentation for the user store or database that you are using.

- Identity Manager Directory

  You can configure the DirectorySearch element (see page 55) in the directory configuration file (directory.xml) that you use to create the Identity Manager Directory.

  By default, the value for maximum rows and page size is unlimited for existing directories. For new directories, the value for maximum rows is unlimited and the value for page size is 2000.

- Managed object definition

  To set maximum row limits and page sizes that apply to one type of object instead of an entire Directory, configure the *managed object definition* (see page 57) the directory.xml file that you use to create the Identity Manager Directory.

  Setting limits for a managed object type allows you to make adjustments based on business requirements. For example, most companies have more users than groups. Those companies can set limits for user object searches only.

- Task Search screens

  You can control the number of search results that users see in search and list screens in the User Console. If the number of results exceeds the number of results per page defined for the task, users see links to additional pages of results.

  This setting does not affect the number of results returned by a search.

  Note: For information on setting page size in search and list screens, see the *Administration Guide*.

If maximum row limits and page sizes are defined in multiple places, the most specific setting applies. For example, managed object settings take precedence over directory level settings.

Chapter 5: Identity Manager Directories

An Identity Manager directory provides information about a user directory that CA Identity Manager manages. This information describes how objects such as users, groups, and organizations are stored in the user store and displayed in Identity Manager.

You create, view, export, update, and delete Identity Manager directories in the Identity Manager directory section of the Management Console.

Note: If CA Identity Manager uses a cluster of SiteMinder Policy Servers, stop all but one Policy Server before creating or updating Identity Manager directories.

This section contains the following topics:

Prerequisites to Creating an Identity Manager Directory

Before you create an Identity Manager Directory, you must do the following:

- Stop all but one Identity Manager node before you create or modify an Identity Manager Directory.

  Note: When you have a cluster of Identity Manager nodes, only one Identity Manager node can be enabled when you make changes in the Management Console.

- Stop all but one Policy Server before creating or updating Identity Manager Directories.

  Note: When you have a cluster of SiteMinder Policy Servers, only one SiteMinder policy server can be enabled when you make changes in the Management Console.

How to Create a Directory

In the Management Console, you create an Identity Manager Directory, which describes the structure and content of the user store, and the Provisioning Directory, which stores information required by the Provisioning Server. These directories are associated with an Identity Manager environment.

You can use one of the following methods to create directories:

- Use the Directory Configuration Wizard

  Guides administrators through the process of creating a directory for their user store. This method helps reduce possible configuration errors.

  Note: Use the Directory Configuration Wizard to create new directories for LDAP user stores only. To create a directory for a relational database, or to update an existing directory, import a directory.xml file directly.

- Use an XML Configuration File

  Allows administrators to select a fully configured XML file to create or modify the user store or Provisioning Server.

  Select this method if you are creating a directory for a relational database, or if you are updating an existing directory.

More Information:

Creating a Directory Using the Directory Configuration Wizard (see page 138)
Create a Directory with an XML Configuration File (see page 150)

Creating a Directory Using the Directory Configuration Wizard

The Directory Configuration Wizard walks administrators through the process of creating a directory for their user store and helps reduce configuration errors. Before launching the wizard, you must first upload an Identity Manager LDAP directory configuration template. These templates are pre-configured with well-known and required attributes. After entering connection details for your LDAP user store or Provisioning Directory, you can select LDAP attributes, map well-known attributes, and enter metadata for the attributes. When you are done mapping attributes, click Finish to create the directory.

Launch the Directory Configuration Wizard

The Directory Configuration Wizard lets an administrator select an Identity Manager template and modify that template for use in your environment.

To launch the Directory Configuration Wizard

1. From the Management Console, click Directories and select Create from Wizard.

   You are prompted to select a directory configuration file to configure the user store.

2. Click Browse to select the configuration file to configure the user store or Provisioning Server from the following default location and click Next.

   `admin_tools\directoryTemplates\directory\`

   Note: admin_tools specifies the directory where the Administrative Tools are installed and directory specifies the name of the LDAP vendor.

   The Administrative Tools are placed in the following default locations:

   - Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

3. On the Connection Details screen, specify connection information for the LDAP directory or Provisioning Server, the directory search parameters, and failover connections information and click Next.

4. On the Configure Managed Object screen, specify the objects to configure and click Next. You can select from the following:
   - Configure User Managed Object
   - Configure Group Managed Object
   - Configure Organization Object
   - Show summary and deploy directory

     Note: Show summary and deploy directory should only be chosen once you have finished configuring the directory.

   a. On the Select Attribute screen, view and modify the structural and auxiliary classes as needed and click Next.

   b. On the Select Attributes: Mapping Well-Knowns screen, map the Identity Manager well-known aliases to selected LDAP attributes and click Next.

   c. (Optional) On the Describe User Attributes screen, view and modify the attribute definitions and click Next. You can modify the display name and description.

   d. (Optional) On the User Attribute Details screen, define the metadata for each selected attribute to be managed and click Next.

      The Managed Object Selection Screen appears.

      If you need to configure Groups or Organizations, select the managed object and click Next to walk through Attributes screens for these objects.

5. Select Show summary and deploy directory from the list and click Next.

   The Confirmation Screen Appears.

6. View the directory details.

   If there are any errors, click the Back button to make changes on the appropriate screens. If all changes have been made, or there are no additional changes, click Finish.

   CA Identity Manager validates the configuration and create the directory. You are then taken back to the Directories listing screen where you can view the new directory.

Select Directory Template Screen

Use this screen to select a directory XML file for LDAP to configure a user store or Provisioning Server.

Click the Browse button to select the configuration file to configure the user store or Provisioning Server from the following default location:

```
admin_tools\directoryTemplates\directory\
```

Note: admin_tools specifies the directory where the Administrative Tools are installed and directory specifies the name of the LDAP vendor.

The Administrative Tools are placed in the following default locations:

- Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
- UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

After selecting you directory XML file, click Next to continue to the Connection Details Screen.

Connection Details Screen

Use this screen to enter the configuration credentials for your user store. You can also enter the directory search parameters, and add failover connections. After you enter connection information, click Next to select the objects to manage.

Note: The fields that appear on this screen depend on the type of user store, and whether you are creating the connection using the directory configuration wizard or directly importing an XML file.

The following fields are available in this screen:

Name

Specifies the name of the user directory to which you are connecting.

Description

Specifies a description of the user directory.

Host

Specifies the host name for the computer where the user store is located.

Port

Specifies the port for the computer where the user store is located.

User DN

Specifies the user domain name for accessing the LDAP user store.

JDBC Data Source JNDI Name

Specifies the name of an existing JDBC data source that CA Identity Manager uses to connect to the database.

Username

Specifies the username for accessing the Provisioning Server.

Note: For Provisioning Servers only.

Domain

Specifies the domain name for accessing the Provisioning Server.

Note: For Provisioning Servers only.

Password

Specifies the password for accessing the LDAP user store/Provisioning Server.

Confirm Password

Confirms the password for accessing the LDAP user store/Provisioning Server.

Secure Connection

When selected, forces a Secure Sockets Layer (SSL) connection to the LDAP user directory.

Search Root

Specifies the location in an LDAP directory that serves as the starting point for the directory—typically, an organization (o) or organizational unit (ou).

Note: For LDAP user stores only.

Search Maximum Rows

Specifies the maximum number of results that CA Identity Manager can return when searching a user directory. When the number of results exceeds the limit, an error is displayed.

Setting maximum rows can override the settings in the LDAP directory that limit search results. When conflicting settings apply, the LDAP server uses the lowest setting.

Search Page Size

Specifies the number of objects that can be returned in a single search. If the number of objects exceeds the page size, CA Identity Manager performs multiple searches.

Note the following when specifying Search Page Size:

- To use the Search Page Size option, the user store that CA Identity Manager manages must support paging. Some user store types may require additional configuration to support paging. For more information, see the *Configuration Guide*.
- If the user store does not support paging, and a value for Search Maximum Rows is specified, CA Identity Manager uses only the Search Maximum Rows value to control search size.

Search Timeout

Specifies the maximum number of seconds that CA Identity Manager searches a directory before terminating the search.

Failover Host

Specifies the host name of the system where a redundant user store or an alternate Provisioning Server exists, in case the primary system is unavailable. If multiple servers are listed, CA Identity Manager attempts to connect to the systems in the order in which they are listed.

Failover Port

Specifies the port of the system where a redundant user store or an alternate Provisioning Server exists, in case the primary system is unavailable. If multiple servers are listed, CA Identity Manager attempts to connect to the systems in the order in which they are listed.

Add Button

Click to add additional failover host name and port numbers.

Configure Managed Objects Screen

Use this screen to select an object to configure.

The fields in this screen are listed below:

Configure User Managed Object

Describes how users are stored in the user store and represented in CA Identity Manager.

Configure Group Managed Object

Describes how groups are stored in the user store and represented in CA Identity Manager.

Configure Organization Managed Object

If the user store includes organizations, describes how organizations are stored and represented in CA Identity Manager.

Show Summary and Deploy Directory

Specifies that all managed objects have been defined and you want to deploy the directory. After selecting Show summary and deploy directory, click Next and you are taken to a summary page.

Save Button

Click to save your xml file.

Back Button

Click to go back to the Connection Details screen to make any changes.

Next Button

Click to continue to the Select Attributes screen to select the user, group, or organization attributes to configure.

Select Attributes Screen

Use this screen to change or add structural and auxiliary classes for your User, Group, or Organization objects. This screen is pre-configured with values based on common directory schemas and best practices for the type of directory you are using. An administrator can change the structural class by selecting a new class from the drop-down menu. Selecting a class updates the table with attributes belonging to the new structural class.

An auxiliary class can be added by selecting one from the drop-down menu. Selecting an auxiliary class updates the table with attributes belonging to the new auxiliary class.

The fields in this screen are listed below:

Structural Class Name

Specifies the structural class of the attribute to be configured.

Change Button

Click to change the structural class.

Auxiliary Class Name

Specifies the auxiliary class of the attribute to be configured.

Add Button

Click to add an auxiliary class to configure.

Object Class

Specifies the container object class.

ID

Specifies the container ID.

Name

Specifies the container name.

Attributes Table

Specifies the physical name, object class, whether the attribute is multi-valued, and the data type of the selected attributes. Attributes in this table can be sorted by Selected, Object Class, Multi-Valued, and Data Type.

Back Button

Click to go back to the Configured Managed Objects screen.

Next

Click to continue to the Well-Known Mapping screen to map the required and optional well-known aliases.

Well-Known Mapping Screen

Use this screen to map Identity Manager well-known attributes to selected LDAP attributes. An administrator can add to the list of well-known attributes (if they are required for custom code) by typing a new well-known attribute into the text field and clicking the Add button. This refreshes the screen so you can continue adding as many well-known attributes as needed.

The fields in this screen are listed below:

Required Well-Knowns

Specifies the well-known attributes for Users, Groups, or Organizations (if applicable) that are required to be mapped to LDAP attributes.

Optional Well-Knowns

Specifies the well-known attributes for Users, Groups, or Organizations (if applicable) that can be mapped optionally.

New Well-Known

Specifies a well-known attribute as referenced by custom code.

Add Button

Click to add a new well-known attribute to the Optional Well-Knowns table.

Back Button

Click to go back to the Select User Attributes screen to select more attributes. The mappings you have already made are saved and available when you return to this screen.

Next Button

Click to continue to the Basic Object Attribute Definition screen to specify basic attribute definitions.

More information

Well-Known Attributes for an LDAP User Store (see page 74)
User Well-Known Attributes (see page 74)
Group Well-Known Attributes (see page 77)
Organization Well-Known Attributes (see page 79)

Basic Object Attribute Definition Screen

Use this screen to view and modify the commonly defined definitions: Display Name and Description.

The fields in this screen are listed below:

Managed Object Table

Specifies the display name, physical name, well-known name, and description of the managed object. Use the drop-down menu to change the description, if needed. Once you have made your changes, click Next to continue.

Back Button

Click to go back to the Well-Known Mapping screen to make any changes needed to the mappings.

Next Button

Click to continue to the Detailed Object Attribute Definition screen where you can specify additional attribute definitions.

Detailed Object Attribute Definition Screen

Use this screen to specify other attribute definitions. An administrator can define the metadata for each selected attribute by modifying the display name, how the attribute is to be managed in the User Console screens, the data type of the value, the maximum length, and the validation rule set. Once you are through specifying attribute definitions, click Next to continue.

The fields in this screen are listed below:

Display Name

Specifies the unique name for the managed object attribute. This is the name that is displayed in the User Console.

Tags

Specifies the data classification tags for the managed object attribute value. The tags are all optional and all default to false except for searchable. The following tags can be selected:

Required

Indicates the attribute is mandatory when creating objects.

Multiple Values

Indicates the attribute appears as multi-valued.

Hidden

Indicates the attribute is hidden.

System

Indicates the attribute is a system attribute and is not added to the task screens.

Searchable

Indicates the attribute is added to search filters. Defaults to true.

Sensitive Encrypt

Indicates the attribute is sensitive and is displayed as a series of asterisks (*).

Hide in VST

Indicates the attribute is hidden in the Event Details screen for View Submitted Tasks.

Do not copy

Indicates the attribute should be ignored when an administrator creates a copy of an object.

Previously encrypted

Indicates the attribute being accessed in the user store was previously encrypted and needs to be decrypted. The clear text value is saved to the user store when the object is saved.

Untagged encrypted

Indicates the attribute was previously encrypted in the user store and does not have the encryption algorithm tagname at the beginning of the encrypted text.

Data Type

Specifies the data type of the value for the managed object attribute in the User Console. You can select from the following:

- READONLY
- WRITEONCE
- READWRITE

Maximum Length

Specifies the maximum length of the value for the managed object attribute

Default: 0

Validation Rule Set

Specifies the validation rule sets to validate the value of the managed object attribute. You can select from the following:

- User Validation
- Phone Format
- International Phone Format

Back Button

Click this button to go back to the Basic Object Attribute Definition Screen to make any changes needed.

Next Button

Click this button to continue to the Configure Managed Objects Screen. From there you can select the next managed object to configure or if finished configuring your managed objects, select Show summary and deploy directory to view your directory information and deploy the directory.

More information

Managing Sensitive Attributes (see page 67)

Confirmation Screen

This screen shows a summary of the directory details.

The fields on this screen are listed below:

Connection Details

Specifies the connection details for the user directory.

User/Group/Organization Details

Specifies the changes made to the directory.xml

Back Button

Click to make any changes needed in the wizard.

Save Button

Click to save your selections.

Finish Button

Click if all of the directory details are correct to exit the wizard.

The configuration is validated and the directory is created. You are then taken back to the Directories listing page where the new directory is listed. To edit or export the new directory, select it from the directory list.

Create a Directory with an XML Configuration File

You can create or update an Identity Manager Directory by importing a completed directory.xml file in the Management Console.

Note: If you are creating a directory using a directory.xml file instead of using the Directory Configuration Wizard, you must modify a default configuration template. For more information, see the *Configuration Guide*.

To create an Identity Manager Directory with an XML Configuration File

1. Open the Management Console by typing the following URL in a browser:

   http://*hostname*:*port*/iam/immanage

   hostname

   Defines the fully qualified domain name of the server where CA Identity Manager is installed

   port

   Defines the application server port number.

2. Click Directories.

   The Identity Manager Directories window appears.

3. Click Create or Update from XML.

4. Type the path and filename of the directory configuration XML file for creating the Identity Manager Directory, or browse for the file. Click Next.

5. Supply values for the fields in this window as follows:

   Note: The fields that appear in this window depend on the user store type and the information you provided in the directory configuration file in Step 4. If you provided values for any of these fields in the directory configuration file, CA Identity Manager does not prompt you to supply these values again.

   Name

   Determines the name of the Identity Manager Directory that you are creating.

   Description

   (Optional) Describes the Identity Manager Directory.

   Connection Object Name

   Specifies the name of the user directory that the Identity Manager Directory describes. Enter *one* of the following:

   - If CA Identity Manager does not integrate with SiteMinder, specify any meaningful name for the object that CA Identity Manager uses to connect to the user store.
   - If CA Identity Manager integrates with SiteMinder and you want to create a new user directory connection object in SiteMinder, specify any meaningful name. Identity Manager creates the user directory connection object in SiteMinder with the name you specify.
   - If CA Identity Manager integrates with SiteMinder and you want to connect to an existing SiteMinder user directory, specify the name of the SiteMinder user directory connection object exactly as it appears in the Policy Server user interface.

   JDBC Data Source JNDI Name (for relational directories only)

   Specifies the name of an existing JDBC data source that CA Identity Manager will use to connect to the database.

   Host (for LDAP directories only)

   Specifies the host name or IP address of the system where the user directory is installed.

   For CA Directory user stores, use the full domain name of the host system. Do not use localhost.

   For Active Directory user stores, specify the domain name, not the IP address.

Port (for LDAP directories only)

Specifies the port number of the user directory.

Provisioning Domain

Provisioning Domain that CA Identity Manager manages.

Note: The Provisioning Domain name is case-sensitive.

Username/User DN

Specifies the user name for an account that can access the user store.

For Provisioning user stores, the user account you specify must have the Domain Administrator profile, or an equivalent set of privileges for the Provisioning Domain.

Password

Specifies the password for the user account that you specified in the Username (for Relational Databases) or User DN field (for LDAP directories).

Confirm Password

Enter the password that you typed in the Password field again for confirmation.

Secure Connection (for LDAP directories only)

Indicates whether CA Identity Manager uses a secure connection.

Be sure to select this option for Active Directory user stores.

Click Next.

6. Review the settings for the Identity Manager Directory. Click Finish to create the Identity Manager Directory with the current settings or click Previous to make changes.

   Status information is displayed in the Directory Configuration Output window.

7. Click Continue to exit.

   CA Identity Manager creates the directory.

Enable Provisioning Server Access

You enable access to the Provisioning Server by using the Directories link in the Management Console.

Note: A prerequisite to this procedure is to install the Provisioning Directory on CA Directory. For more information, see the *Installation Guide*.

To enable Provisioning Server Access

1. Open the Management Console by typing the following URL in a browser:

   `http://hostname:port/iam/immanage`

   hostname

   Defines the fully qualified host name of the system where the Identity Manager server is installed

   port

   Defines the application server port number.

2. Click Directories.

   The Identity Manager Directories window appears.

3. Click Create from Wizard.

4. Type the path and filename of the directory XML file for configuring the Provisioning Directory. It is stored in the directoryTemplates\ProvisioningServer in the Administrative Tools folder. The default location of that folder is:

   - Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

   Note: You can use this directory configuration file as installed with no modification.

5. Click Next.

6. Supply values for the fields on this window as follows:

   Name

   Is a name for the Provisioning Directory associated with the Provisioning Server that you are configuring.

   - If CA Identity Manager does not integrate with SiteMinder, specify a meaningful name for the object used by CA Identity Manager to connect to the user directory.
   - If CA Identity Manager integrates with SiteMinder, you have two choices:

     If you want to create a user directory connection object in SiteMinder, specify any meaningful name. CA Identity Manager creates this object in SiteMinder with the name you specify.

     If you want to connect to an existing SiteMinder user directory, specify the name of the SiteMinder user directory connection object exactly as it appears in the Policy Server user interface.

   Description

   (Optional) Describes the Identity Manager Directory.

Host

Specifies the host name or IP address of the system where the user directory is installed.

Port

Specifies the port number of the user directory.

Domain

Specifies the name of the provisioning domain that CA Identity Manager will manage.

The name must match the name of the provisioning domain that you specified during installation.

Note: The domain name is case sensitive.

Username

Specifies a user that can log into the Provisioning Manager.

The user must have the Domain Administrator profile, or an equivalent set of privileges for the Provisioning Domain.

Password

Specifies the password for the global user that you specified in the Username field.

Confirm Password

Enter the password that you typed in the Password field again for confirmation.

Secure Connection

Indicates whether CA Identity Manager uses a secure connection.

Be sure to select this option for Active Directory user stores.

Directory Search Parameters

maxrows defines the maximum number of results that CA Identity Manager can return when searching a user directory. This value overrides any limit set in the LDAP directory. When conflicting settings apply, the LDAP server uses the lowest setting.

Note: The maxrows parameter does not limit the number of results that are displayed on an Identity Manager task screen. To configure display settings, modify the list screen definition in the Identity Manager User Console. For instructions, see the *User Console Design Guide*.

timeout determines the maximum number of seconds that CA Identity Manager searches a directory before terminating the search.

Failover Connections

The hostname and port number of one or more optional systems that are alternate Provisioning Servers. If multiple servers are listed, CA Identity Manager attempts to connect to the systems in the order in which they are listed.

The alternate Provisioning Servers are used if the primary Provisioning Server fails. When the primary Provisioning Server becomes available again, the alternate Provisioning Server continues to be used. If you need to return to using the Provisioning Server, restart the alternate Provisioning Servers.

7. Click Next.
8. Select the objects to manage, such as Users or Groups.
9. After configuring the objects as needed, click Show summary deploy directory and review the settings for the Provisioning Directory.
10. Click one of these actions:
    a. Click Back to make changes.
    b. Click Save to save the directory information if you want to come back later to deploy.
    c. Click Finish to complete this procedure and start configuring an environment with provisioning (see page 174).

View an Identity Manager Directory

Perform the following procedure to view an Identity Manager Directory.

To view an Identity Manager directory

1. In the Identity Manager Management Console, click Directories.
2. Click the name of the Identity Manager directory to view. The Directory Properties window appears, showing the Identity Manager directory properties.

Identity Manager Directory Properties

The Identity Manager Directory properties are as follows:

Note: The properties that are displayed depend on the type of database or directory that is associated with the Identity Manager directory.

Name

Defines the unique name of the Identity Manager Directory.

Description

Provides a description for the Identity Manager Directory.

Type

Defines the type of directory provider.

Connection Object Name

Displays the name of the user directory that the Identity Manager Directory describes.

If CA Identity Manager integrates with SiteMinder, the connection object name matches the name of the SiteMinder user directory connection.

Root Organization (for user stores that include organizations)

Specifies the entry point into the user store.

For LDAP directories, the root organization is specified as a DN. For relational databases, the unique identifier for the root organization is displayed.

JDBC Data Source

Specifies the name the JDBC data source that CA Identity Manager uses to connect to the database.

URL

Provides the URL or IP address of the user store.

Username

Specifies the user name for an account that can access the user store.

Search Maximum Rows

Indicates the maximum number of rows returned as the result of a search.

Search Page Size

Specifies the number of objects that can be returned in a single search. If the number of objects exceeds the page size, CA Identity Manager performs multiple searches.

Note: The user store that CA Identity Manager manages must support paging. Some user store types may require additional configuration to support paging. For more information, see the *Configuration Guide*.

Supports Paging

Indicates that the directory supports paging.

Search Timeout (For LDAP directories only)

Specifies the maximum number of seconds that CA Identity Manager searches a user store before terminating the search.

Provisioning Domain (For Provisioning Server directories only)

Provisioning Domain that CA Identity Manager manages.

Identity Manager Directory Properties Window

General information about an Identity Manager directory is presented in the properties window for the directory that you select. The Directory Properties window is divided into the following sections:

- Directory Properties—Basic properties for the Identity Manager directory, including the associated Provisioning Domain, if Provisioning is enabled for the Environment.
- Managed Objects (see page 158)—Descriptions of the type of user store objects that Identity Manager manages.
- Validation Rule Sets (see page 162)—List of validation rule sets that apply to the Identity Manager directory.
- Environment(s)—The Identity Manager environments associated with the Identity Manager directory. An Identity Manager directory may be associated with multiple Identity Manager environments.

  To view more information about an Identity Manager environment, click the name of the environment.

  To modify properties in an Identity Manager directory, import a directory configuration file as described in Update an Identity Manager Directory (see page 164).

How to View Managed Object Properties and Attributes

A managed object describes a type of entry in the user store, such as a user, group, or organization. The properties and attributes that apply to a managed object apply to all entries of that type. For example, a user profile will have all the properties and attributes of the User managed object.

To view the details of a managed object, click the object's name to open the Managed Object Properties window.

Managed Object Properties

The Managed Object Properties window describes the properties and attributes for a type of managed object.

The information about the Managed Object Properties window depends on the type of user store you are managing. A managed object's properties are as follows:

Description

Provides a description of the managed object.

Type

Indicates the type of entry that the managed object represents. An object's type can be one of the following types:

- User
- Group
- Organization

Object Class (for LDAP directories only)

Specifies the object classes for the managed object. A managed object may have multiple object classes.

Sort Order (for LDAP directories only)

Specifies the attribute that Identity Manager uses to sort search results in custom business logic. It does not affect the order of search results in the User Console.

For example, when you specify the cn attribute for the user object, Identity Manager sorts the results of a search for users alphabetically by the cn attribute.

Primary Table (for relational databases only)

Specifies the table that contains the unique identifier for the managed object.

Maximum Rows

Specifies the maximum number of results that CA Identity Manager can return when searching for objects of this type. When the number of results exceeds the limit, an error is displayed.

Setting maximum rows can override the settings in the LDAP directory that limit search results. When conflicting settings apply, the LDAP server uses the lowest setting.

Page Size

Specifies the the number of objects that can be returned in a single search.If the number of objects exceeds the page size, CA Identity Manager performs multiple searches.

Note: The user store that CA Identity Manager manages must support paging. Some user store types may require additional configuration to support paging. For more information, see the *Configuration Guide*.

Container Properties (for LDAP Directories Only)

In an LDAP directory, a *container* groups objects of a specific type. When a container is specified, Identity Manager handles only entries in the container. For example, when you specify the container ou=People, Identity Manager handles only users who exist in the People container.

Note: Users and groups that exist in the LDAP directory but not in the defined container may appear in the User Console. You may experience problems when managing those users and groups.

Containers group users and groups only. You cannot specify a container for organizations.

The properties of a container are as follows:

objectclass

Specifies the LDAP object class of the container where objects of a specific type are created. For example, the default value for the user container is "top,organizationalUnit," which indicates that users are created in LDAP organizational units (ou).

ID

Specifies the attribute that stores the container name, for example, ou. The attribute is paired with the Name value to form the relative DN of the container, as in the following example:

ou=People

Name

Specifies the container name.

Secondary Table Properties (for Relational Databases Only)

Secondary tables contain additional attributes for a managed object. For example, a secondary table named tblUserAddress may contain the street, city, state, and ZIP code attributes for the User managed object.

The following properties are displayed for secondary tables:

Table

Specifies the name of the table.

Reference

Describes the mapping between the primary table and the secondary table.

The reference is displayed using the following format:

primarytable.attribute=secondarytable.attribute

For example, tblUsers.id = tblUserAddress.userid indicates that the id attribute in the primary table, tblUsers, maps to the userid attribute in the tblUserAddress table.

Attribute Properties in the Managed Object Properties Window

The following properties are displayed for attributes in the Managed Object Properties window:

Display Name

The user-friendly name of the attribute. This name appears in the list of available attributes when you design a task window for a particular task in the User Console.

Physical Name

The name of the attribute in the user store.

Well-Known Name

Well-known names indicate attributes that have special meaning in Identity Manager, such as the attribute used to store user passwords.

Attribute Properties in the Attribute Properties Windows

You can see additional details about an attribute by clicking its name to open the Attribute Properties window.

The following attribute properties are displayed in the Attribute Properties window:

Description

Provides a description for the attribute.

Physical Name

Specifies the name of the attribute in the user store.

Object Class (for user, group, and organization attributes in LDAP directories only)

The LDAP auxiliary class for a user attribute, when the attribute is not part of the primary object class specified for the User object.

You can specify an auxiliary object class for the User and Group objects only.

Well-Known Name

Indicates attributes that have special meaning in Identity Manager, such as the attribute used to store user passwords.

Required

Indicates whether a value is required for the attribute, as follows:

- True indicates that the attribute must have a value.
- False indicates that a value is optional.

Read Only

Indicates the permission level for an attribute, as follows:

- True indicates that the attribute cannot be modified.
- False indicates that the attribute can be modified.

Hidden

Indicates whether an attribute can be displayed in a task window for a particular task.

Hidden attributes are often used in logical attribute schemes.

Note: For more information, see the *Programming Guide for Java*.

Supports Multiple Values

Indicates whether the attribute can have multiple values, as follows (for example, the attribute used to store the members of a group is multivalued):

- True indicates that the attribute can support multiple values.
- False indicates that the attribute can have only a single value.

Multiple Value Delimiter (for relational databases only)

The character that separates values when multiple values are stored in a single column.

System Attribute

Indicates whether the attribute is used only by Identity Manager, as follows:

- True indicates that the attribute is a system attribute. The attribute is not available to add to task windows.
- False indicates that the attribute can be used by users. The attribute may appear on task windows.

Data Type

Specifies the attribute's data type. The default value is String.

Maximum Length

Specifies the maximum length that an attribute value can have. If set to 0, there is no limit on the value's length.

Validation Rule Set

Specifies the name of a validation rule set, when the attribute is associated with one.

Validation Rule Sets

A validation rule enforces requirements on data that a user types in a task window field. The requirements can enforce a data type or format, or ensure that the data is valid in the context of other data in the task window.

One or more validation rules are grouped in a validation rule set. A validation rule set is then associated with a profile attribute. For example, you can create a validation rule set that contains a Format Date validation rule, which enforces a date format of mm-dd-yyyy. You can then associate the validation rule set with the attribute that stores an employee's start date.

Note: You create validation rules and rule sets in the directory configuration file or in the User Console.

The Managed Object Properties window displays a list of validation rule sets that apply to the Identity Manager directory. To view the details of a validation rule set, click the rule set's name to open the Validation Rule Set Properties window.

Validation Rule Properties

The following information is displayed in the Validation Rule Properties window:

Name

Provides the name of the validation rule.

Description

Provides a description of the rule.

Class

Provides the name of the Java class that implements the validation rule.

This field does not appear unless the validation rule is defined in a Java class.

Filename

Provides the name of the file that contains the JavaScript implementation of the validation rule.

This field does not appear unless the validation rule is defined in a file.

Regular Expression

Provides the regular expression that implements the validation rule.

This field does not appear unless the validation rule is defined as a regular expression.

Validation Rule Set Properties

The following information is displayed in the Validation Rule Set Properties window:

Name

Specifies the name of the validation rule set.

Description

Provides a description for the validation rule set.

The Validation Rule Set Properties page also includes a list of validation rules in the set. You can click the name of the validation rule to open the Validation Rule Properties window.

How to Update Settings for an Identity Manager Directory

To view the current settings of an Identity Manager directory, you must export it and save it as an XML file.

After you export the directory settings, you can modify and re-import the XML file to update the directory, or you can import the XML file to another directory to configure the same settings for that directory.

Export an Identity Manager Directory

Perform the following procedure to export an Identity Manager directory.

To export an Identity Manager directory

1. Click Directories.

   The list of Identity Manager directories appears.

2. Click the name of the directory to export.

   The Properties for the Identity Manager directory window appears.

3. At the bottom of the properties window, click Export.
4. When prompted, save the XML file.

Update an Identity Manager Directory

The purpose of updating an Identity Manager directory is the following:

- Adding or changing managed object definitions, including an object's attributes
- Setting search parameters
- Changing directory properties

Note: Identity Manager does not delete object or attribute definitions.

The directory configuration file can contain only the changes that you want to make. You do not have to include properties or attributes that are already defined.

Note: When you have a cluster of Identity Manager nodes, only one Identity Manager node can be enabled when you make changes in the Management Console. Stop all but one Identity Manager node before you create or modify an Identity Manager directory.

To update an Identity Manager directory in the Management Console

1. Export the current Identity Manager directory settings to an XML file.
2. Modify the XML file to reflect your changes.
3. Click Directories.

   The list of Identity Manager directories appears.

4. Click the name of the directory to update.

   Properties for the Identity Manager directory appear.

5. At the bottom of the properties window, click Update.

6. Type the path and file name of the XML file for updating the Identity Manager directory, or browse for the file. Click Finish.

   Status information is displayed in the Directory Configuration Output field.

7. Click Continue.

Delete an Identity Manager Directory

Before you delete an Identity Manager Directory, you must delete any Identity Manager Environments associated with it.

To delete an Identity Manager Directory

1. In the Management Console, click Directories.

   The list of Identity Manager Directories appears.

2. Select the check box to the left of the directory (or directories) to delete.
3. Click Delete.

   A confirmation message appears.

4. Click OK to confirm the deletion.

Chapter 6: Identity Manager Environments

This section contains the following topics:

Identity Manager Environments

An Identity Manager environment is a view of a user store. In an Identity Manager environment, you can manage users, groups, organizations, tasks, and roles. You can also give users accounts in managed endpoints, such as email accounts or other applications.

Using the Management Console, you can do the following:

- Create, modify, or delete an Identity Manager environment
- Export and import an Identity Manager environment
- Configure advanced settings
- Import roles and tasks
- Reset the System Manager account

Prerequisites to Creating an Identity Manager Environment

Before you begin, use the worksheet in the following table to collect the information that you will need:

Identity Manager Environment Configuration Worksheet	
Required Information	**Value**
A meaningful Identity Manager environment name that you choose For example: MyEnvironment	
A base URL, which Identity Manager uses to form the Redirect URL for the default password policy for the environment For example: http://server.yourcompany.org	
An alias that is added to the URL for accessing protected tasks in the environment For example: http://server.yourcompany.org/iam/im/alias	
An alias that is added to the URL for accessing public tasks, such as self-registration and forgotten password tasks For example: http://server.yourcompany.org/iam/im/public_alias/index.jsp?task.tag=SelfRegistration **Note:** When your environment does not include public tasks, you do not need to specify a public alias.	
If you supplied a public alias, the name of an existing user who will serve as the public user. Identity Manager uses the public user's credentials in place of user-supplied credentials when accessing public tasks.	
The name of an Identity Manager directory (see page 93)	
The name of the provisioning directory, when the Identity Manager environment supports provisioning	

Identity Manager Environment Configuration Worksheet	
Required Information	**Value**
The unique identifier for an existing user who will administer the Identity Manager environment For example: myadmin	
The name of the SiteMinder agent or agent group that will protect the Identity Manager environment, if CA Identity Manager integrates with SiteMinder	

Create an Identity Manager Environment

Identity Manager environments let you manage objects in a directory with a set of roles and tasks. Use the Identity Manager environment wizard to guide you through the steps to create an Identity Manager environment.

Note the following before creating an Identity Manager environment:

- If you are using an LDAP user store, and you configured a user container such as ou=People, in the directory configuration file (directory.xml) for your Identity Manager directory, verify that the users you select when you create the Identity Manager environment exist in that container. Selecting a user account that does not exist in the user container may cause failures.
- When you configure an Identity Manager environment to manage an LDAP user directory with a flat or flat user structure, the profile for the user that you select must include the organization to which the user belongs. To help ensure that the user's profile is configured correctly, add the name of the user's organization to the physical attribute that corresponds to the %ORG_MEMBERSHIP% well-known attribute in the directory.xml file (see page 80). For example, when the physical attribute description is mapped to the %ORG_MEMBERSHIP% well-known attribute in the directory.xml file, and the user belongs to the Employees organization, the user's profile should contain the attribute/value pair description=Employees.

To create an Identity Manager environment

1. If CA Identity Manager uses a cluster of Policy Servers, stop all but one Policy Server.
2. If you have a cluster of Identity Manager nodes, stop all but one Identity Manager node.
3. In the Management Console, click Environments.

4. Click New.

   The Identity Manager environment wizard opens.

5. Supply the following information:

   - **Environment name**

     Specifies a unique name for the environment

   - **Description**

     Describes the environment

   - **Protected alias**

     Specifies a unique name that is added to the URL for accessing protected tasks in the Identity Manager environment. For example, when the alias is employees, the URL for accessing the employee environment is http://my*server.mycompany.com*/iam/im/employees

     Note: The alias is case sensitive and cannot contain spaces. We recommend using lowercase letters without punctuation or spaces when you specify the alias.

   - **Base URL**

     Specifies the URL for CA Identity Manager. Do not include the alias, for example, http://*myserver.mycompany.com*/iam/im.

     If you are using a Web Agent, the Base URL should be changed to reflect the URL of the Web Agent.

     Note: If you are using a Web Agent to protect Identity Manager resources, do not specify a port number in the Base URL field. If you are using a Web Agent and the Base URL contains a port number, the links to Identity Manager tasks will not work properly.

     For more information about protecting Identity Manager resources, see the *Installation Guide* for your application server.

     Click Next.

6. Select an Identity Manager directory to associate with the environment you are creating, and click Next.

7. When the Identity Manager environment supports provisioning, select the appropriate provisioning server to use.

   Note: You are not prompted to select a provisioning server if you selected a Provisioning directory as the Identity Manager directory.

8. Configure support for public tasks. Typically, these tasks are self-service tasks, such as self-registration or forgotten password tasks. Users do not need to log in to access public tasks.

   Note: To enable users to use self-service tasks, configure public task support.

   a. Specify a unique name that is added to the URL for accessing public tasks.

      Example: You would use the following URL to access the default self-registration task:

      http://*myserver.mycompany.com*/iam/im/*alias*/index.jsp?task.tag=SelfRegistration

      In this URL, *alias* is the unique name that you supply.

   b. Specify one of the following existing user accounts that will serve as the public user account. CA Identity Manager uses this account to allow unknown users to access public tasks without having to supply credentials.

      - LDAP users enter the unique identifier or relative DN of the public user account. This value must be mapped to the %USER_ID% well-known (see page 74). For example, if the user's DN is uid=Admin1, ou=People, ou=Employees, ou=NeteAuto, type Admin1.
      - Relational database users type the value that is mapped to the %USER_ID% well-known attribute in the directory configuration file, or the unique identifier for the user.

   Click Validate to view the user's full identifier.

9. Select the tasks and roles to create for this environment. You can do the following:

   - **Create default roles**

     Creates a set of default tasks and roles that are initially available in the environment. Administrators can use these tasks and roles as templates for creating new tasks and roles in the User Console.

   - **Create only the system manager role**

     Creates only the System Manager role and the tasks associated with it.

     The System Manager role is required to access the environment.

     A System Manager can create new tasks and roles in the User Console.

   - **Import roles from the file**

     Imports a role definition file that you exported from another Identity Manager environment.

     Note: To use the Identity Manager environment, the role definitions file must include at least the System Manager role or a role that includes similar tasks.

     Select the Import roles from the file option button, and type the path and filename of the role definitions file or browse for the file to import.

10. Select Role Definitions files to create sets of default tasks for your environment, and click Next.

    Role Definitions files are XML files that define a set of tasks and roles required to support specific features. For example, if you need to manage Active Directory and UNIX NIS endpoints, select those Role Definitions files.

    Note: This step is optional. If you do not want to create additional default tasks to support new functionality, skip this screen.

11. Define a user to serve as the System Manager for this environment as follows:

    a. In the System Manager field, type the value that is mapped to the %USER_ID% well-known attribute in the directory configuration file, or specify one of the following user accounts:

       - LDAP users enter the unique identifier or relative DN of the user. For example, if the user's DN is uid=Admin1, ou=People, ou=Employees, ou=NeteAuto, type Admin1.
       - Relational database users type the unique identifier for the user.

    b. Click Add.

       CA Identity Manager adds the complete identifier of the user to the list of users.

    c. Click Next.

    Note the following when specifying the System Manager:

    - The System Manager should *not* be the same user as the administrator of the user store.
    - You can specify multiple System Managers for the Environment; However, you can only specify the initial System Manager in the Management Console. To specify additional System Managers, assign the System Manager role to the appropriate users in the User Console.

12. In the Inbound Administrator field, specify an Identity Manager administrator account that can execute admin tasks that are mapped to inbound mappings.

    The user must be able to execute all those tasks on any user. The Provisioning Synchronization Manager role contains the provisioning tasks that are included in the default inbound mappings.

    A page summarizing the settings for the environment appears.

13. Review the settings for the environment. Click Previous to make changes or click Finish to create the Identity Manager environment with the current settings.

    The Environment Configuration Output screen displays the progress of the environment creation.

14. Click Continue to exit the Identity Manager environment wizard.
15. Start the Environment.
16. If you stopped any Policy Servers in Step 1, restart them now.

How to Access an Identity Manager Environment

After you have created an Identity Manager environment, you can access it by typing a URL in a browser.

Note: Enable Javascript in the browser that you use to access the Management Console.

The format of the URL depends on how you configured the environment and the type of task that you want to access.

- To access protected tasks from the User Console, use the following URL:

  `http://`*`hostname`*`/iam/im/`*`alias`*

  hostname

  Defines the fully qualified domain name of the server where CA Identity Manager is installed—for example, myserver.mycompany.com

  alias

  Defines the environment's alias, for example, employees.

  Log into the Identity Manager Environment with a privileged administrator account, such as the System Manager account that you created for the Identity Manager Environment.

  Note: All Identity Manager tasks are protected unless you configure public tasks.

- To access public tasks, which do not require users to provide credentials, use a URL with the following format:

  `http://`*`hostname`*`/iam/im/`*`alias`*`/index.jsp?task.tag=`*`tasktag`*

  hostname

  Defines the fully qualified domain name of the server where CA Identity Manager is installed, for example, myserver.mycompany.com.

alias

Defines the alias for public tasks, for example, self-service.

task_tag

Defines the tag for the task to invoke.

You specify the task tag when you configure a task in the User Console.

The task tags for the default self-registration and forgotten password reset tasks are SelfRegistration and ForgottenPasswordReset.

Note: For more information, see the *Administration Guide*.

How to Configure an Environment for Provisioning

You can configure an environment for provisioning after you have enabled access to the Provisioning Server (see page 152).

Then, you create a special Identity Manager user, called the Inbound Administrator, create a connection to the Provisioning Server, and configure inbound synchronization in Provisioning Manager.

Note: Whenever you make changes to provisioning properties for an environment, you need to restart the application server for the changes to take effect.

Configure the Inbound Administrator

For inbound synchronization to work, you create a special Identity Manager user called the *inbound administrator*. At previous releases of CA Identity Manager, the inbound administrator was called the *corporate user*. No user logs into this user account; instead, it is used internally by Identity Manager. However, you need to create this user account and give it the appropriate tasks.

To configure the inbound administrator

1. Log into the Identity Manager environment as the user with the System Manager role.
2. Create a user. You might name the user **inbound** as a reminder of its purpose.

3. Choose Admin Roles, Modify Admin Roles and select a role that contains the tasks you use for synchronization.
   - Provisioning Create User
   - Provisioning Enable/Disable User
   - Provisioning Modify User

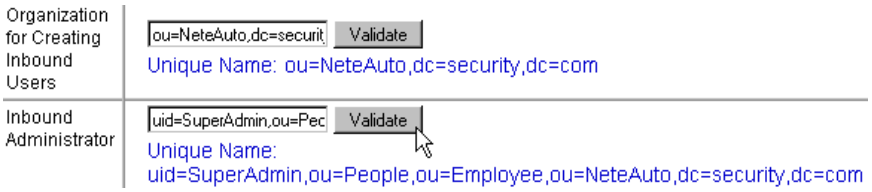
   Note: If you have made no changes to the default synchronization tasks, use the Provisioning Synchronization Manager role.

4. On the Members tab, add a member policy that includes the following:
   - A member rule that the new user meets.
   - A scope rule that provides access to all users who are affected by provisioning directory changes that trigger inbound synchronization.

5. In the Management Console:
   a. Select the Environment.
   b. Select Advanced Settings, Provisioning.
   c. Complete the Organization for Creating Inbound Users field if the Identity Manager directory includes an organization.

      This organization is where users are created when inbound synchronization occurs. For example, when a user is added to the provisioning directory, Identity Manager adds the user to this organization.

   d. Complete the Inbound Administrator field with the User ID of the user that you created in Step 2.
   e. Click Validate to confirm the user ID is accepted as shown in the following example where the complete user ID appears below the user ID entered.



f. Make changes to other fields on this screen. No changes are required.

   If you do make changes, be sure that you understand how the fields interact. For details on each field, click the Help link on the screen.

Connect an Environment to the Provisioning Server

To connect an environment to the Provisioning Server

1. In the Management Console, click Environments.

   A list of existing environments appears.

2. Click the name of the environment that you want to associate with the Provisioning Server.

3. Click the right arrow icon in the Provisioning Server field.

   The Provisioning Properties screen opens.

4. Select the Provisioning Server.

5. Click Save at the bottom of the screen.

6. Configure Synchronization in the Provisioning Manager (see page 176).

Configure Synchronization in the Provisioning Manager

Inbound synchronization keeps Identity Manager up to date with changes that occur in the provisioning directory. Changes include those made using Provisioning Manager and changes in endpoints for which the Provisioning Server has a connector. Each Provisioning Server supports a single environment. However, you can configure backup environments on different systems in a cluster in case the current environment is unavailable.

To configure synchronization for an environment

1. Choose Start, CA, Identity Manager, Provisioning Manager.

2. Click System, Identity Manager Setup.

3. Complete the Host Name field with the name of the system where the Identity Manager Server is installed.

4. Complete the Port field with the application server port number.
5. Complete the Environment name field with the alias for the environment.
6. Select Secured Connection if you want the HTTPS protocol to communicate with the Identity Manager server instead of using HTTP and encrypting the individual notifications.
7. Click Add.
8. Repeat steps 3-6 for each a backup version of the environment.

   CA Identity Manager fails over to a backup environment if the application server for the current environment is unavailable. You can reorder the current and backup environments to set the failover order.
9. If this is the first environment, fill in the Shared Secret fields using the password entered during CA Identity Manager installation for the user for embedded components.

   Note: These fields do not apply if FIPS is enabled in this installation.
10. Set the Log Level as follows:
    - No Log--No information is written to the log file.
    - Error--Only error messages are logged.
    - Info--Error and information messages are logged (default).
    - Warning--Error, warning, and information messages are logged.
    - Debug--All information is logged.
11. Restart the application server before you log in to the environment.

Note: For a log of inbound synchronization operations and any problems encountered during synchronization, see the following file:

PSHOME\logs\etanotify<date>.log

Import Custom Provisioning Roles

When you create the environment, you have the choice to use the default roles or a custom role definition file you create. If you import custom roles definitions, you must *also* import the Provisioning Only role definitions. After creating the environment, import the role definitions from the ProvisioningOnly-RoleDefinitions.xml file, which is in one of these folders:

admin_tools/ProvisioningOnlyRoleDefinitions/Organization
admin_tools/ProvisioningOnlyRoleDefinitions/NoOrganization

The default location for *admin_tools* is:

- **Windows**: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
- **UNIX**: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

Account Synchronization for the Reset User Password Task

Before you enable provisioning for an Identity Manager environment, the account synchronization setting for the Reset User Password task is set to On Task Completion. However, when you import the ProvisioningOnly-RoleDefinitions.xml configuration file, which creates the roles and tasks for user provisioning, account synchronization is disabled.

To use the Reset User Password to trigger account synchronization, change account synchronization for this task back to On Task Completion.

Modify Identity Manager Environment Properties

The Identity Manager Environment Properties screen in the Management Console lets you do the following:

- View the current settings for the environment
- Modify the description, base URL, and protected and public aliases
- Import an existing Identity Manager Environment after an upgrade

  Note: For more information on importing existing Identity Manager Environments, see the upgrade section of the *Installation Guide*.
- Start and stop the Environment

- Access pages for configuring the following:
  - **Advanced Settings**

    Configures advanced features, including features built using the Identity Manager APIs.
  - **Role and Task Settings**

    Import a role definition file that you exported from another Identity Manager Environment.
  - **System Manager**

    Assigns system manager roles.

To modify environment properties

1. If CA Identity Manager uses a cluster of SiteMinder Policy Servers, stop all but one Policy Server.
2. If you have a cluster of Identity Manager nodes, stop all but one Identity Manager node.
3. Click Environments.

   The Identity Manager Environments screen appears with a list of Identity Manager Environments.
4. Click the name of the Identity Manager Environment to modify.

   The Identity Manager Properties screen appears and displays the following properties:

   OID

   Defines a unique identifier for the Environment. CA Identity Manager generates this identifier when you create an Identity Manager environment.

   You use the OID when you configure task removal from a task persistence database. See the *Installation Guide*.

   Name

   Specifies the unique name of the Identity Manager Environment.

   Description

   Provides a description of the Identity Manager Environment.

   Identity Manager Directory

   Specifies the Identity Manager directory with which the Environment is associated.

Enable Verbose Log Output

Controls how much information CA Identity Manager records and displays in the Environment log when you import an Environment. The Environment log is displayed in the status window in the Management Console when you import an Environment or other object definitions from a file.

Note: Selecting this check box can significantly impact performance.

The verbose log includes validation and deployment messages for each object (task, screen, role and policy) and its attributes in the Environment.

To see the verbose log, select this check box and save the Environment properties. When you import roles or other settings from a file, the additional information appears in the log.

Provisioning Server

Specifies the Provisioning directory used as the provisioning user store.

Click the right arrow button to configure the provisioning directory in the Provisioning Properties page.

Version

Defines the version number of CA Identity Manager.

Base URL

Specifies the portion of the Identity Manager URL that does not include the protected or public alias for the environment.

CA Identity Manager uses the base URL to form the Redirect URL to point to the Password Services task in the default password policy for the environment.

Protected Alias

Defines the name appended to the base URL for accessing protected tasks in the User Console for an Identity Manager environment.

Public Alias

Defines the name appended to the base URL for accessing public tasks, such as the self-registration and forgotten password tasks.

Public User

Defines the user account that CA Identity Manager uses in place of user-supplied credentials to access public tasks.

Job Timeout

Determines the amount of time that CA Identity Manager waits after a task is submitted before displaying a status message.

This value is set in the User Console page in Advanced Settings.

Status

Stops or restarts the Identity Manager Environment.

Migrate Task Persistence Data from Identity Manager 8.1

Migrates data from an Identity Manager 8.1 task persistence database to an Identity Manager [assign the value for rn in your book] task persistence database.

For more information, see the *Installation Guide*.

Note: The Migrate Task Persistence Data from Identity Manager 8.1 button is only visible in environments that were created in previous versions of CA Identity Manager and migrated to CA Identity Manager [assign the value for rn in your book].

5. Modify the description, base URL, or protected or public alias, as needed.
6. If you modified any Environment properties, restart the Identity Manager Environment.
7. If you stopped any Policy Servers in Step 1, restart them now.

Environment Settings

Environment-specific information is stored in three environment settings files:

- *alias*_environment_roles.xml
- *alias*_environment_settings.xml
- *alias*_environment.xml

Note: *alias* refers to the alias for the environment. You specify the alias when you create the environment.

You generate a ZIP file containing these files, which reflect the current configuration, when you export the environment settings.

After exporting the environment settings, you can import them to accomplish one of the following tasks:

- Manage multiple environments with similar settings. In this case, you create one environment with the settings you need, import those settings to other environments, and then customize the settings in each environment, as needed.
- Migrate an environment from a development system to a production system.
- Update an existing environment after upgrading to a new version of CA Identity Manager.

Export an Identity Manager Environment

To deploy an Identity Manager environment on a production system, you export the environment from a development or staging system and import that environment to the production system.

Note: When you import a previously exported environment, CA Identity Manager displays a log in a status window in the Management Console. To see validation and deployment information for each managed object and its attributes in this log, select the Enable Verbose Log Output field on the Environment Properties page *before* you export the environment. Be aware that selecting the Enable Verbose Log Output field can cause significant performance issues during the import.

To export an Identity Manager environment

1. Click Environments in the Management Console.

   The Identity Manager environments screen appears with a list of Identity Manager environments.

2. Select the environment that you want to export.
3. Click the Export button.

   A File Download screen appears.

4. Save the ZIP file to a location that is accessible to the production system.
5. Click Finish.

The environment information is exported to a ZIP file that you can import into another environment.

Import an Identity Manager Environment

You can import Identity Manager environment settings to accomplish one of the following tasks:

- Manage multiple environments with similar settings. In this case, you create one environment with the settings you need, import those settings to other environments, and then customize the settings in each environment, as needed.
- Migrate an environment from a development system to a production system.
- Update an existing environment after upgrading to a new version of CA Identity Manager.

To import an Identity Manager environment

1. Click Environments in the Management Console.

   The Identity Manager environments screen appears with a list of Identity Manager Environments.

2. Click the Import button.

   The Import Environment screen appears.

3. Browse for the ZIP file required to import an environment.
4. Click Finish.

The environment is imported into CA Identity Manager.

Restart an Identity Manager Environment

To start an Identity Manager environment

1. Click Environments in the Management Console.

   The Identity Manager environments screen appears with a list of Identity Manager environments.

2. Click the name of the Identity Manager environment to start.

   The Identity Manager Environment Properties screen appears.

3. Select one of the following options:

   Restart Environment

   Stops and starts an Environment.

   Stop

   Stops an Environment that is currently running.

   Start

   Starts an Environment that is not currently running.

Delete an Identity Manager Environment

Use this procedure to remove an Identity Manager Environment.

Note: If CA Identity Manager integrates with SiteMinder for advanced authentication, CA Identity Manager also deletes the SiteMinder policy domain that protects the environment and the default authentication schemes created for the environment.

To delete an Identity Manager Environment

1. In the Environments screen, select the check box for the Identity Manager Environments to delete.
2. Click Delete.

   CA Identity Manager displays a confirmation message.
3. Click OK to confirm the deletion.

Optimize Policy Rule Evaluation

Policy rules, which dynamically identify a set of users, are used in the evaluation of role member, admin, and owner policies, and identity policies. The evaluation of these rules can take significant time in large CA Identity Manager implementations.

Note: For more information about member, admin, owner, and identity policies, see the *Administration Guide*.

To reduce the evaluation time for rules that include user-attributes, you can enable the in-memory evaluation option. When the in-memory evaluation option is enabled, CA Identity Manager retrieves information about a user to be evaluated from the user store and stores a representation of that user in memory. CA Identity Manager uses the in-memory representation to compare attribute values against policy rules. This limits the number of calls CA Identity Manager makes directly to the user store.

You enable the in-memory evaluation option for an environment in the Management Console.

To enable the in-memory evaluation option

1. Open the Management Console.
2. Select Environments, *Environment Name*, Advanced Settings, Miscellaneous.

   The User Defined Properties page opens.
3. Enter the following text in the Property field:

   UseInMemoryEvaluation
4. Enter *one* of the following numbers in the Value field:

   0

   In-memory evaluation is disabled.

   1

   In-memory evaluation is enabled. When this option is specified, the attribute comparison is case-sensitive.

   3

   In-memory evaluation is enabled. When this option is specified, the attribute comparison is not case-sensitive.
5. Click Add.

   CA Identity Manager adds the new property to the list of existing properties for the environment.
6. Click Save.

Role and Task Settings

From the Role and Task Settings screen in the Management Console, you can import or export screen, tab, role and task settings in an XML file, called a Role Definitions file. CA Identity Manager provides predefined Role Definitions files that create screens, tabs, roles, and tasks for a set of functionality. For example, there is a Role Definitions file that supports Smart Provisioning, and other files that support endpoint management screens.

Additionally, you can use a Role Definitions file to apply the settings from one environment to multiple environments. To do this, you must perform the following:

- Configure screen, tab, task and role settings in one environment
- Export these settings to an XML file
- Import the XML file to the required environment

Export Role and Task Settings

Perform the following procedure to export role and task settings.

To export role and task settings

1. In the Management Console, click Environments.

   A list of Identity Manager environments appears.

2. Click the name of the appropriate Identity Manager environment.

   The Properties screen for that environment appears.

3. Click Role and Task Settings, and click Export.
4. Click Open to view the file in a browser window or Save to save the settings in an XML file.

Import Role and Task Settings

Role and task settings are defined in XML files, named Role Definitions files. You can import predefined Role Definitions files to support specific sets of CA Identity Manager functionality (for example, Smart Provisioning) or import Role Definitions files from one environment to another.

Note: You can also import role definitions for custom connectors created with Connector Xpress. You create these role definitions files with the Role Definitions Generator. For more information, see the *Connector Xpress Guide*.

Perform the following procedure to import role and task settings.

To import role and task settings

1. In the Management Console, click Environments.

   A list of Identity Manager environments appears.

2. Click the name of the Identity Manager environment where you want to import the role and task settings.

   The Properties screen for that environment appears.

3. Click Role and Task Settings, and click Import.

4. Complete one of the following actions:

   - Select one or more Role Definitions files to create default roles and tasks for the environment.

     To select all available Role Definitions files, click Select/Deselect All

   - Type the path and file name for the role definitions file to import or browse for the file. Then click Finish.

5. Click Finish.

   The status is displayed in the Role Configuration Output window.

6. Click Continue to exit.

How to Create Roles and Tasks for Dynamic Endpoints

Using Connector Xpress, you can configure dynamic connectors to allow provisioning and management of SQL databases and LDAP directories. For each dynamic connector, you can use the Role Definitions Generator to create task and screen definitions for account management screens that appear in the User Console.

After you run the Role Definitions Generator, you import the resulting Role Definitions file (see page 186) in the Management Console.

Note: For more information about the Role Definitions Generator, see the *Connector Xpress Guide*.

Modify the System Manager Account

A system manager is responsible for setting up and maintaining an Identity Manager environment. Typically, a system manager's tasks include the following:

- Creating and managing the initial environment
- Creating and modifying admin roles
- Creating and modifying other administrator accounts

You create a system manager account when you create an Identity Manager environment. If this account is "locked out," for example, if the system manager forgets his or her password—you can re-create the account using the System Manager wizard.

The System Manager wizard guides you through the steps to assign a system management role to a user.

Note the following before modifying the System Manager account:

- If you are using an LDAP user store, and you configured a user container such as ou=People, in the directory configuration file (directory.xml) for your Identity Manager directory, ensure that the users you select when you configure the system manager exist in that container. Selecting a user account that does not exist in the user container may cause failures.
- When the Identity Manager environment manages a user directory with a flat or flat user structure, the profile for the user that you select must include the organization to which the user belongs. To ensure that the user's profile is configured correctly, add the name of the user's organization to the physical attribute that corresponds to the %ORG_MEMBERSHIP% well-known attribute in the directory.xml file (see page 80). For example, when the physical attribute description is mapped to the %ORG_MEMBERSHIP% well-known attribute in the directory.xml file, and the user belongs to the Employees organization, the user's profile should contain the attribute/value pair description=Employees.

To specify the system manager

1. At the Identity Manager environments screen, click the name of the appropriate Identity Manager environment.

   That environment's properties screen appears.

2. Click System Manager.

   The System Manager wizard appears.

3. Type the unique name for the user that will have the System Manager role as follows:

   - For relational database users, type the unique identifier for the user or the value that is mapped to the %USER_ID% well-known attribute in the directory configuration file.

- For LDAP users, type the relative DN of the user. For example, if the user's DN is uid=Admin1, ou=People, ou=Employees, ou=NeteAuto, type Admin1.

Note: The System Manager should *not* be the same user as the administrator of the user store.

4. Click Validate to display the user's full identifier.
5. Click Next.
6. In the second page of the wizard, select a role to assign to the user as follows:
   - If you want to assign the System Manager role, do the following:
     a. Select the radio button next to System Manager role.
     b. Click Finish.
   - If you want to assign a role other than the System Manager role, do the following:
     a. Select a condition in the first list.
     b. Type a partial or complete role name or an asterisk (*) in the second list box. Click Search.
     c. Select the role to assign from the search results list.
     d. Click Finish.

   The System Manager Configuration Output screen displays status information.
7. Click Continue to close the System Manager wizard.

Access the Status of an Identity Manager Environment

CA Identity Manager includes a status page that you can use to verify the following:

- The Identity Manager directory is loaded correctly
- CA Identity Manager can connect to the user store
- The Identity Manager Environment loads correctly

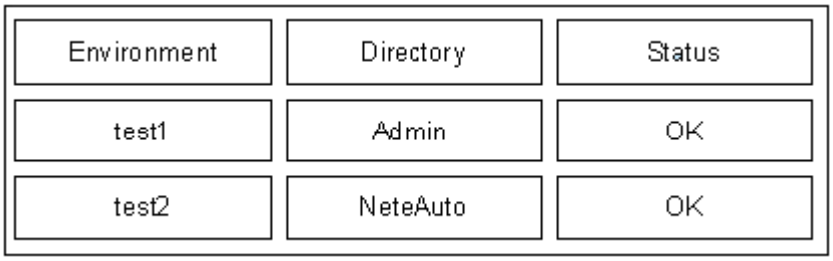
To access the status page, type the following URL in a browser:

`http://hostname/iam/im/status.jsp`

hostname

Determines the fully qualified domain name of the server where CA Identity Manager is installed, for example, myserver.mycompany.com.

If the Identity Manager Environment starts correctly and all of the connections are running successfully, the status page resembles the following illustration:



The status page also indicates whether the environment is FIPS 140-2 compliant.

Troubleshooting Identity Manager Environments

The following table describes possible error messages and the troubleshooting process:

Message	Description	Troubleshooting
Not Loaded	The Identity Manager Directory associated with the environment was not loaded when Identity Manager started.	1. Verify that the user store is running. If Identity Manager integrates with SiteMinder, verify that SiteMinder can connect to the user store.
Not OK	Identity Manager cannot connect to the Identity Manager Directory.	In the Policy Server user interface, you can verify the connection by opening the properties page for the SiteMinder User Directory connection associated with the user store, and clicking the View Contents button. If you can see the contents of the user store, SiteMinder can connect successfully. For more information about the Policy Server, see the CA *SiteMinder Web Access Manager Policy Server Configuration Guide*. 2. Restart Identity Manager and the Policy Server.

Message	Description	Troubleshooting
SM connection is not OK	Identity Manager cannot connect to the SiteMinder Policy Server (for implementations that include SiteMinder)	1 Verify the following: ■ The Policy Server is running. ■ The Web agent is protecting resources. You can verify that the Web agent is running correctly by accessing the Policy Server user interface. If you are prompted for credentials, the Web agent is functioning correctly. 2. Restart Identity Manager and the Policy Server.
IMS is not available now	An error has occurred in Identity Manager.	Check the application server log for error details.
Windows 500 error message	The status page is not displayed when it is accessed while removing the connectivity with the LDAP user directory.	Set the Internet browser option "Show friendly error message" to off to view the status page.

Chapter 7: Advanced Settings

The Advanced Settings window in the Management Console lets you do the following:

- Access screens for configuring advanced settings
- Import and export advanced settings as described in Import/Export Custom Settings (see page 207)

This section contains the following topics:

Auditing

Auditing logs maintain records of the operations performed in an Identity Manager environment. You can use the data in audit logs to monitor system activity.

Identity Manager audits *events*. An event is an operation that is generated by an Identity Manager task. A task can generate multiple events. For example, the CreateUser task may generate the CreateUserEvent and the AddToGroupEvent events.

By default, Identity Manager exports all event information to the audit database. To control the type and amount of event information that Identity Manager records, you can do the following:

- Enable auditing for Identity Manager admin tasks.
- Enable auditing for some or all of the Identity Manager events generated by admin tasks.
- Record event information at specific states, for example, when an event completes or is cancelled.
- Log information about attributes involved in an event. For example, you can log attributes that change during a ModifyUserEvent.
- Set the audit level for events and attributes.

More information:

Audit Data (see page 209)
How to Configure Auditing (see page 209)

Business Logic Task Handlers

A Business Logic Task Handler performs custom business logic before an Identity Manager task is submitted for processing. Typically, the custom business logic validates data. For example, a business logic task handler may check a group's membership limit before Identity Manager adds a new member to the group. When the group membership limit is reached, the business logic task handler displays a message informing the group administrator that the new member could not be added.

You can use predefined business logic task handlers or create custom handlers using the Business Logic Task Handler API.

Note: For information about creating custom business logic, see *Programming Guide for Java*.

The Business Logic Task Handlers screen contains a list of existing global business logic task handlers. The list includes predefined handlers shipped with Identity Manager and any custom handlers defined at your site. Identity Manager executes the handlers in the order in which they appear in this list.

Global business logic task handlers can be implemented only in Java.

Enable Clear Password Fields on Reset User Password Task

You can now display clear password fields in the Password field in the Reset User Password task in the Identity Manager User Console, instead of asterisks.

To enable clear password fields on Reset User Password task

1. Start the Identity Manager Management Console.
2. Select the environment you want to manage, then click Advanced Settings.

   The Advanced Settings page appears.
3. Click Business Logic Task Handlers, BlthPasswordServices.

   The Business Logic Handler Properties page appears.
4. Select the ClearPwdIfInvalid check box and enter true.
5. Select the PwdConfirmAttrName checkbox and enter the following:
   `|passwordConfirm`
6. Verify that ConfirmPasswordHandler settings are as follows:
   - Object type – User
   - Class – ConfirmPasswordHandler
   - ConfrmationAttributeName = |passwordConfirm|
   - OldPasswordAttributeName = |oldPassword|
   - passwordAttributeName = %PASSWORD%

   The Reset User Password task now displays clear password fields instead of asterisks.

Event List

Admin tasks include *events*, actions that Identity Manager performs to complete the task. A task may include multiple events. For example, the Create User task may include events that create the user's profile, add the user to a group, and assign roles.

Identity Manager audits events, enforces customer-specific business rules associated with events, and, when events are mapped to workflow processes, requires approval for events.

Use this page to view a list of the events that are available in Identity Manager.

Email Notifications

Identity Manager can send email notifications when a task or event completes, or when an event under workflow control reaches a specific state. For example, an email can inform an approver that an event requires approval.

To specify the content of email notifications, you can use predefined email templates or customize the templates to suit your needs.

Using the Management Console, you can do the following:

- Enable email notifications for an Identity Manager environment
- Specify the template sets for creating email messages
- Indicate the events and tasks for which email notifications are sent

Event Listeners

An Identity Manager task is made up of one or more actions, named events that Identity Manager performs during the execution of the task. For example, the Create User task may include the following events:

- CreateUserEvent—Creates a user profile in an organization
- AddToGroupEvent—(Optional) Adds the user as a member of a group
- AssignAccessRole—(Optional) Assigns an access role to the user

An *event listener* "listens" for a specific event, and then performs custom business logic at a specific point in the event's lifecycle. For example, after a new user is created in Identity Manager, an event listener may add the user's information to a database used by another application.

Note: For more information on configuring event listeners, see the *Programming Guide for Java*.

Identity Policies

An identity policy applies a set of business changes to users who meet certain rules or conditions. You can use identity policies to do the following:

- Automate certain identity management tasks, such as assigning roles and group membership, allocating resources, or modifying user profile attributes
- Enforce segregation of duties. For example, you can create an identity policy that prohibits members of the Check Signer role from having the Check Approver role.

- Enforce compliance. For example, you can audit users who have a certain title and make more than $100,000.

You create and manage identity policy sets in the User Console. For more information on identity policies, see the *Administration Guide*.

Before you use identity policies, use the Management Console to do the following:

- Enable identity policies for an Identity Manager environment
- Set the recursion level (optional)

Logical Attributes Handlers

Identity Manager logical attributes let you display user store attributes (named *physical attributes*) in a user-friendly format on task screens. Identity Manager administrators use task screens to perform functions in Identity Manager.

Logical attributes do not exist in a user store. Typically, they represent one or more physical attributes to simplify presentation. For example, the logical attribute *date* can represent the physical attributes *month*, *day*, and *year*.

Logical attributes are processed by logical attribute handlers, which are Java objects that are written using the Logical Attribute API. For example, when a task screen is displayed, a logical attribute handler might convert physical attribute data from the user store to logical attribute data, which is displayed in the task screen.

You can use predefined logical attributes and logical attribute handlers included with Identity Manager or create new ones using the Logical Attribute API.

Note: For more information, see the *Programming Guide for Java*.

Miscellaneous

User-defined properties defined on this screen apply to the entire Identity Manager environment. They are passed as name/value pairs to the init() method of every custom Java object that you create with the Identity Manager APIs. A custom object can use this data in any way that the object's business logic requires.

When any user-defined properties are also defined for a particular custom object, for example, when user-defined properties are defined in the Properties screen for an event listener named MyListener, the object-specific user-defined properties and the environment-wide properties defined in the Miscellaneous screens are passed in a single call to MyListener.init().

To add a user-defined property, specify a property name and value, and click Add.

To delete one or more user-defined properties, select the check box next to each name/value pair to delete, and click Delete.

When finished making changes, click Save. You need to restart the application server for the changes to take effect.

Note: All miscellaneous properties are case-sensitive. Therefore, if you define a property named SelfRegistrationLogoutUrl and another property named selfregistrationlogouturl, both properties are added.

Notification Rules

A notification rule determines which users receive email notification when a task completes or when an event in a task reaches a certain state, such as pending approval, approved, or rejected.

Note: For more information about the email notification feature, see the *Administration Guide*.

Identity Manager includes the following predefined notification rules:

ADMIN_ADAPTER

Sends an email message to the administrator who initiates the task

USER_ADAPTER

Sends an email message to the user affected by the task

USER_MANAGER

Sends an email to the manager of the user in the current context

To create custom notification rules, use the Notification Rule API.

Note: For more information about notification rules, see the *Programming Guide for Java*.

Organization Selectors

An organization selector is a custom logical attribute handler that determines where Identity Manager creates the profile of a self-registered user, based on information the user provides during registration. For example, the profile for users who provide a promotional code when they register may be added to a Promotional Users organization.

Provisioning

Use this screen when you are using Identity Manager with provisioning.

Note: A more detailed procedure, setting up provisioning for an Identity Manager environment (see page 174), provides step by step instructions.

The Provisioning Properties options are as follows:

Enabled

Specifies the use of two user stores, one for Identity Manager and a separate user store (called the Provisioning Directory) for provisioning accounts. If this option is disabled, only the Identity Manager user store is used.

Use Session Pool

Enables the use of a session pool.

Session Pool Initial Sessions

Defines the minimum number of sessions that are available in the pool at startup.

Default: 8

Session Pool Maximum Sessions

Defines the maximum number of sessions in the pool.

Default: 32

Enable Password Changes from Endpoint Accounts

Defines the setting for the Enable Password Synchronization Agent for each user in the Provisioning Server. This will allow password synchronization between Identity Manager users and associated endpoint accounts.

Enable Accumulation of Provisioning Role Membership Events

If enabled, this checkbox ensures that Identity Manager executes the events related to provisioning role membership in a specific order. All Add actions are combined into a single operation and sent to the Provisioning Server for processing. Once processing of the Add actions completes, Identity Manager combines the Remove actions into a single operation and sends that operation to the Provisioning Server. A single event, called AccumulatedProvisioningRoleEvent, is generated to execute the events in this order.

Note: For more information about the AccumulatedProvisioningRoleEvent, see the *Administration Guide*.

Organization for Creating Inbound Users

Defines the fully qualified path to the user store used by Identity Manager. This field appears only when the user store includes an organization.

Inbound Administrator

Defines an Identity Manager administrator account that can execute tasks mapped to inbound mappings. These tasks are included in the Provisioning Synchronization Manager role. The administrator must be able to execute each task on any Identity Manager user.

Provisioning Directory

The Provisioning Directory is a repository for provisioning information including domain, global users, endpoint types, endpoints, accounts, and account templates. When you select it, other options appear for mapping the Identity Manager user store to the Provisioning Directory.

Enable Session Pooling

To improve performance, Identity Manager can pre-allocate a number of sessions to be pooled when communicating with the Provisioning Server.

If the Session Pools option is disabled, Identity Manager will create and destroy sessions as needed.

For a new environment, Session Pools are enabled by default. For existing environments, you can enable Session Pools.

To enable Session Pooling

1. In the Management Console, choose Advanced Settings, Provisioning.
2. Select Use Session Pool.
3. Define the minimum number of sessions in the pool at startup.
4. Define the maximum number of sessions in the pool.
5. Click Save.
6. Restart the Application Server.

   The Session Pool is enabled per the defined settings.

Enable Password Synchronization

The Provisioning Server allows password synchronization between Identity Manager users and associated endpoint user accounts. This means when a user who has provisioning roles is created or modified in Identity Manager, the provisioning user will be set to allow password changes from endpoint accounts.

Note: When you enable this feature in the Management Console, *all* users in the environment will be set to allow password changes from endpoint accounts.

To enable password synchronization

1. In the Management Console, choose Advanced Settings, Provisioning.
2. Check Enable Password Changes from Endpoint Accounts.
3. Click Save.
4. Restart the Application Server.

Attribute Mappings

Attribute mappings associate the user attributes in provisioning-related admin tasks, such as Provision Create User, with the corresponding attributes in the Provisioning Server. A single provisioning attribute can be mapped to multiple attributes in the Identity Manager user store.

Default mappings exist for the attributes in the default tasks, which are listed in the Inbound Mappings section. If you modify one of these admin tasks, so that different attributes are used, update the attribute mappings as needed.

Inbound Mappings

Inbound mappings map events, generated by the Provisioning Server, to an admin task. These mappings are preset and cannot be modified.

Outbound Mappings

Outbound Mappings associate events, which are generated by admin tasks, with events that are applied to the Provisioning Directory. Default mappings exist for the events that affect user attributes.

Reporting

Use this screen to enable reporting in Identity Manager. Default reports and reporting tasks will be added to Identity Manager when you enable reporting. To add the connection to the IAM Report Server, provide the following IAM Report Server settings:

- Business Objects Server Name and Port—hostname and port number of the system where Business Objects is installed.
- Business Objects Reports folder—location of the installed Identity Manager reports in Business Objects.

  Default: IM Reports
- Business Objects Web Server—Non-IIS (Tomcat) or IIS
- Business Objects Username—user created for the Business Objects Server.
- Business Objects User Password—password for the user created in the Business Objects Server.

Note: After you provide the settings, click the Test Connection button to verify the connection to your IAM Report Server.

User Console

You access a Identity Manager Environment using the User Console, a web application that allows users to perform admin tasks. You define certain properties for the User Console that administrators use to access an Environment in the User Console page in the Management Console.

The User Console page includes the following fields:

General Properties

Define properties that apply to an Environment.

Show Recently Completed Tasks

Determines whether Identity Manager displays a status message when a task completes.

When this option is selected, users must click OK to clear the status message that Identity Manager displays.

To disable the message and prevent users from having to click OK when each status message appears, clear this option.

Show About Link

Determines whether an About link appears in the lower right corner of the User Console. When this option is selected, Identity Manager users can click the About link to view version information for Identity Manager components.

Enable Language Switching

Determines whether Identity Manager includes a Choose Language drop-down list in the login screen and in the User Console. When this field is selected, Identity Manager users can change the language in the User Console by selecting a new language from the list.

Note: To display the Choose Language field, the Enable Language Switching field must be selected, *and* Identity Manager must be configured to support multiple languages.

See the *User Console Design Guide* for more information.

Job Timeout

Determines the amount of time that Identity Manager waits after a task is submitted before displaying a status message.

When the task completes within the specified amount of time, Identity Manager displays the following message:

"Task has been submitted for processing on *current date*"

If the task takes longer to complete or is under workflow control, Identity Manager displays the following message:

Task has been submitted for processing on *current date*

Note: Changes may not take effect immediately.

Theme Properties

Let you customize the icon and title of the User Console in an Environment. For example, you can add a company logo and the company name to User Console screens.

Theme properties include the following settings:

Icon (URI)

Defines the icon using a URI to an image available to the application server.

Example: http://myserver.mycompany.com/images/front/logo.gif

Title

Specifies custom text, which is displayed next to the icon at the top of the User Console.

Note: If you defined a custom skin, you can specify an icon or title by referencing a properties file for the skin. For example, if the entry for the icon image in the properties file for a custom skin is image/logo.gif, you can enter that same string in the Icon field.

Login Properties

Specify the authentication method and location of the login page to which users are directed when they access an Environment.

Authentication Provider module class name

Specifies the class name of the authentication provider module.

Login Page

Specifies the page to which users are directed when they access an Environment.

Web Services

The Identity Manager Task Execution Web Service (TEWS) enables third-party client applications to remotely submit Identity Manager tasks to Identity Manager for execution.

The Web Services Properties screen lets you configure the TEWS for an environment. On this screen, you can do the following:

- Enable TEWS for an Identity Manager environment
- Generate task-specific Web Services Definition Language (WSDL) documents
- Configure SiteMinder to secure the web services URL, if Identity Manager integrates with SiteMinder
- Specify Web Security Services Username token authentication as an alternative to authentication by SiteMinder.

For information on issuing remote requests to Identity Manager through the Task Execution Web Service, see the *Programming Guide for Java*.

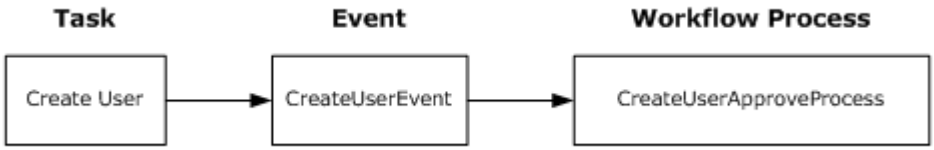
Workflow Properties

If enabled, the workflow feature controls the execution of a Identity Manager task that is associated with a workflow process.

A workflow process is a set of steps that are performed to accomplish a business objective, such as creating a new user account. Typically, one of these steps involves approving or rejecting the task.

A Identity Manager task is associated with one or more events, which may trigger one or more workflow processes. After the workflow processes complete, CA Identity ManagerIdentity Manager performs or rejects the task based on the results of the workflow processes.

The following illustration shows the relationship between a Identity Manager task, an associated event, and a workflow process:



Workflow Properties

Use the check box to enable or disable workflow for the Identity Manager Environment.

Event Mappings

Use this section to map Identity Manager events to workflow processes.

Important: These are global mappings. The mapped workflow process executes whenever the corresponding event is generated by any task in the Environment.

Note: For more information about workflows and event mappings, see the *Administration Guide*.

Global Process to Event Mapping

The mapping of a workflow process to an event at a global level can be non-policy based or policy-based.

For more information on how to map an event to a workflow process using policy-based workflow, see Global Event Policy-Based Workflow Mapping.

This table shows the default global workflow process and event mappings, specified in the Management Console.

Important: These are global mappings. The mapped workflow process executes whenever the corresponding event is generated by any task in the environment.

Workflow Process	Mapped Event
CertifyRoleApproveProcess	CertifyRoleEvent
CreateGroupApproveProcess	CreateGroupEvent
CreateOrganizationApproveProcess	CreateOrganizationEvent
CreateUserApproveProcess	CreateUserEvent
DeleteGroupApproveProcess	DeleteGroupEvent
DeleteOrganizationApproveProcess	DeleteOrganizationEvent

Workflow Process	Mapped Event
DeleteUserApproveProcess	DeleteUserEvent
ModifyAccessRoleMembershipApproveProcess	AssignAccessRoleEvent RevokeAccessRoleEvent
ModifyAdminRoleMembershipApproveProcess*	
ModifyGroupMembershipApproveProcess*	
ModifyOrganizationApproveProcess	ModifyOrganizationEvent
ModifyObjectApproveProcess	ModifyObjectEvent
SelfRegistrationApproveProcess	SelfRegisterUserEvent

Note: Workflow processes marked with an asterisk (*) are not mapped to events by default.

Work Item Delegation

If enabled, work item delegation allows a participant (the delegator) to specify that another user (the delegate) be allowed to approve tasks in the delegator's work list. A participant can assign work items to another approver during periods when the delegator is “out of the office.” Delegators retain full access to their work items during the delegation period.

Delegation uses the following well-known attribute:

%DELEGATORS%

This well-known attribute stores the names of users who are delegating to the user with the attribute, as well as the time when the delegation was created.

Note: For more information about work item delegation, see the *Administration Guide*.

Workflow Participant Resolvers

The activities in a workflow process, such as approving or rejecting a task, are performed by *participants.*

You use the Workflow Participant Resolvers screen to map a custom participant resolver to a fully qualified participant resolver Java class.

A custom *participant resolver* is a Java object that determines a workflow activity's participants and returns a list to Identity Manager. Identity Manager then passes the list to the workflow engine.

Typically, you write a custom participant resolver only if none of the standard participant resolvers can provide the list of participants that an activity requires.

Note: For information about developing custom participant resolvers, see the *Programming Guide for Java*. For information about standard participant resolvers, see the *Administration Guide*.

Import/Export Custom Settings

From the Advanced Settings screen in the Management Console, you can apply advanced settings to multiple environments, as follows:

- Configure advanced settings in one environment.
- Export the advanced settings to an XML file.
- Import the XML file to the required environments.

Java Virtual Machine Out-of-memory Errors

Symptom:

I receive JVM out-of-memory errors during stress or high load periods that affect the functionality of the Identity Manager Server.

Solution:

We recommend that you set JVM debugging options so that you are alerted when out-of-memory conditions occur.

Note: For more information about setting JVM debugging options, see Debugging Options in Java HotSpot VM Options at http://www.oracle.com.

Chapter 8: Auditing

This section contains the following topics:

Audit Data

To audit an Identity Manager environment, configure Identity Manager to log audit data. Audit data provides a historical record of operations that occur in an Identity Manager environment. Some examples of audit data include the following:

- System activity for a specified period of time
- The tasks that a specific user performs
- A list of objects that were modified during a specific period of time
- The roles assigned to a user
- The operations performed for a particular user account

Audit data is generated for Identity Manager *events*. An event is an operation that is generated by an Identity Manager task. For example, the Create User task may include an AssignAccessRoleEvent event.

Note: For more information about events, see the *Administration Guide*.

How to Configure Auditing

The steps to configure auditing are as follows:

1. Configure an audit settings file (see page 210).
2. Enable auditing (see page 220) for the tasks that Identity Manager will audit.

Note: Using SiteMinder, you can also monitor access control data. See the *CA SiteMinder Web Access Manager Policy Server Configuration Guide*.

Configure Audit Settings

You configure audit settings in an audit settings file. An audit settings file determines the amount and type of information that Identity Manager audits. You can configure an audit settings file to do the following:

- Enable auditing for an Identity Manager environment.
- Enable auditing for some or all of the Identity Manager events generated by admin tasks.
- Record event information at specific states, such as when an event completes or is cancelled.
- Log information about attributes involved in an event. For example, you can log attributes that change during a ModifyUserEvent event.
- Set the audit level for attribute logging.

To configure audit settings

1. Export the current audit settings to an audit settings XML file.
2. Configure audit settings in the XML file (see page 210) that you exported in the previous step by adding, modifying or deleting elements in the file or changing the level of information that is recorded for each event.
3. Import the modified audit settings XML file.

Note: For more information, see the Management Console Online Help.

Audit Settings File

The audit settings file is an XML file that you create by exporting audit settings. The file has the following schema:

```
<Audit enabled="" auditlevel="" datasource="">
  <AuditEvent name="" enabled="" auditlevel="">
    <AuditProfile objecttype="" auditlevel="">
      <AuditProfileAttribute name="" auditlevel="" />
    </AuditProfile>
    <EventState name="" severity=""/>
  </AuditEvent>
</Audit>
```

The schema contains the following elements:

- Audit (see page 211)
- AuditEvent (see page 212)
- AuditProfile
- AuditProfileAttribute
- EventState (see page 218)

Audit Element

Audit elements define general audit settings. The Audit element contains one or more AuditEvent elements.

An Audit element includes the following parameters:

- enabled—Determines the status of auditing in the current environment. The valid values are as follows:
  - True—Auditing is enabled for this environment.
  - False—There is no auditing for this environment.

  Note: Use lowercase letters when you specify true or false.
- auditlevel—Indicates the type of information recorded for attributes involved in the task or event.

  The audit level that you specify for the Audit element applies to all attributes, unless a different audit level is defined in the AuditEvent (see page 212), AuditProfile, or AuditProfileAttribute elements. Audit levels set in these elements override the audit levels defined in an Audit element.

  datasource—Specifies the name of the datasource for the audit database. It should be one of the following:

  iam/im/jdbc/auditDbDataSource

  For more information about the audit database, see the *Installation Guide*.

AuditLevel Values

The valid values for AuditLevel are as follows:

- NONE—No attribute information is recorded.
- OLD—For modification events, Identity Manager records the value of an attribute before the modification event occurs. Identity Manager audits the attribute whether or not the value is directly affected by the event.

  For other types of events, such as CreateUserEvent, no information is recorded.

- OLDCHANGED—For modification events, Identity Manager records the value for an attribute before the modification event only when the value changes to a new value.

  For other types of events, such as CreateUserEvent, no information is recorded.

- NEW—For modification events, Identity Manager records the value of an attribute *after* the modification event occurs. Identity Manager audits the attribute whether or not the value is directly affected by the event.

  For other types of events, Identity Manager records existing values.

- NEWCHANGED—For modification events, Identity Manager records the value for an attribute after the modification event only when the value changes to a new value.

  For example, during a ModifyUserEvent event, a user's title changes from Assistant Manager to Manager. Identity Manager audits the value Manager, but does not audit the user's name and address, which did not change.

- BOTH—For modification events, Identity Manager records the value of an attribute before and after a modification event, whether or not that value is affected by the modification event.

- BOTHCHANGED—For modification events, Identity Manager records the old and new value for an attribute after the modification event only when the value changes to a new value.

- datasource—The JNDI name for the data source configured in the application server that points to the audit database.

  Specify the following JNDI name:
  `auditDbDataSource`

AuditEvent Element

Audit Event elements specify events to audit. For a list of Identity Manager events, see the *Administration Guide*.

The AuditEvent element may contain multiple AuditProfile and AuditProfileAttribute elements. The database stores member, administrator, and owner policies in compiled XML format. This format is different from the user interface where each policy appears as an expression element.

The AuditEvent element includes the following parameters:

name

Defines the name of the event to audit.

To audit or exclude an attribute for all events, specify ALL for the event name. For example, to prevent passwords from being audited, regardless of the event, specify the following:

```
<AuditEvent name="ALL" auditlevel="">
  <AuditProfile objecttype="User"      auditlevel="">
  <AuditProfileAttribute name="%PASSWORD%" auditlevel="NONE"/>
</AuditProfile>
</AuditEvent>
```

enabled

Determines whether the event is audited. The valid values are as follows:

- True indicates that Identity Manager audits this event
- False indicates that Identity Manager does not audit this event.

Note: Use lowercase letters when you specify true or false.

auditlevel

Indicates the type of information recorded for an attribute in the audit event.

AuditLevel Values (see page 211) lists the valid values for the AuditLevel element.

Note: Settings in the AuditProfile and AuditProfileAttribute elements take precedence over global settings in the AuditEvent element.

AuditProfile Element

AuditProfile elements indicate the type of objects involved in the events to audit. For example, if you enable auditing for the PARENTORG object in a CreateUserEvent event, Identity Manager logs information about the organization in which the user is created.

The AuditProfile element can contain multiple AuditProfileAttribute elements.

The AuditProfile element includes the following parameters:

objecttype

Defines the type of object for which to record audit information. Object types are as follows:

- ACCESS ROLE
- ACCESS TASK
- ADMINISTRATIVE ROLE

- ADMINISTRATIVE TASK
- GROUP
- ORGANIZATION
- PARENTORG
- RELATIONSHIP

  The RELATIONSHIP object describes container relationships, when an object includes one or more objects. Examples of container relationships include nested groups, group and role membership, and hierarchical organizations.

  In the RELATIONSHIP object the parent object and the objects contained in the parent object are represented.
- USER
- NONE

auditlevel

Indicates the type of information recorded for an attribute in the object's profile.

The audit level that you specify for the AuditProfile element applies to all attributes in the object's profile unless a different audit level is defined in an AuditProfileAttribute element. Audit levels set in these elements override the audit levels defined in an AuditProfile element.

AuditLevel Values (see page 211) lists the valid values for the AuditLevel element.

AuditProfileAttribute Element

AuditProfileAttribute elements indicate the attributes that Identity Manager audits. The attributes apply to the object specified in the AuditProfile element.

Note: If there are no audit profile attributes specified, all the attributes for the object specified in the AuditProfile element are logged.

The AuditProfileAttribute element includes the following parameters:

name

Defines the name of the attribute to audit.

Specify a profile attribute for the object in the corresponding AuditProfile element. For example, if the AuditProfile element specifies the Organization object, specify the name of an organization attribute as the value for the name parameter.

Note: You must define the profile attribute in the directory configuration file for the Identity Manager directory.

auditlevel

Indicates the type of information recorded for an attribute.

AuditLevel Values (see page 211) lists the valid values for the AuditLevel element.

The following table shows the valid attributes for Identity Manager object types:

Valid Attributes for Identity Manager Object Types

Object Type	Valid Attributes
ACCESS ROLE	■ name—User-visible name for the role ■ description—An optional comment about the purpose of the role ■ members—The users who can use the role ■ administrators—The users who can assign role member or administrators ■ owners—The users who can modify the role ■ enabled—Indicates whether or not the role is enabled ■ assignable—Indicates whether the role can be assigned by an administrator ■ tasks—The access tasks associated with the role
ACCESS TASK	■ name—User-visible name for the task ■ description—An optional comment about the purpose of the task ■ application—The application that is associated with the task ■ tag—The unique identifier for the task ■ reserved1, reserved2, reserved3, reserved4—The values of the reserved fields for the task

Valid Attributes for Identity Manager Object Types	
Object Type	**Valid Attributes**
ADMINISTRATIVE ROLE	■ name—User-visible name for the role ■ description—An optional comment about the purpose of the role ■ members—The users who can use the role ■ administrators—The users who can assign role member or administrators ■ owners—The users who can modify the role ■ enabled—Indicates whether or not the role is enabled ■ assignable—Indicates whether the role can be assigned by an administrator ■ tasks—The tasks associated with the role

Valid Attributes for Identity Manager Object Types	
Object Type	**Valid Attributes**
ADMINISTRATIVE TASK	■ name—User-visible name for the task ■ description—An optional comment about the purpose of the task ■ tag—The unique identifier for the task ■ category—The category in the Identity Manager user interface where the task appears ■ primary_object—The object on which the task operates ■ action—The operation performed on the object ■ hidden—Indicates whether the task does *not* appear in menus ■ public—Indicates whether the task is available to users who have not logged in to Identity Manager ■ auditing—Indicates whether the task enables the recording of auditing information ■ external—Indicates whether the task is an external task ■ url—The URL where Identity Manager redirects the user when an external task executes ■ workflow—Indicates whether the Identity Manager events associated with the task trigger workflow ■ webservice—Indicates whether the task is one for which Web Services Description Language (WSDL) output can be generated from the Identity Manager Management Console
GROUP	Any valid attribute that is defined for the GROUP object in the directory configuration file (directory.xml)
ORGANIZATION	Any valid attribute that is defined for the Organization object in the directory configuration file (directory.xml)
PARENTORG	

Valid Attributes for Identity Manager Object Types	
Object Type	**Valid Attributes**
RELATIONSHIP	■ %CONTAINER%—Unique identifier of the parent object. For example, if the RELATIONSHIP object describes role membership, the container would be the role. ■ %CONTAINER_NAME%—User-visible name of the parent group ■ %ITEM%—Unique identifier of the object that is contained in the parent object. For example, if the RELATIONSHIP object describes role membership, the items would be the role members. ■ %ITEM_NAME%—User-visible name for the nested group
USER	Any valid attribute that is defined for the USER object in the directory configuration file (directory.xml)
NONE	No attributes

Note: The following applies to the preceding table:

- Enabled, assignable, auditable, workflow, hidden, webservice, and public are logged as true or false.
- When auditing tasks for roles, the user visible name is logged.
- The database stores member, administrator, and owner policies in compiled XML format. This format is different from the user interface where each policy appears as an expression

EventState Element

EventState elements indicate when to record information about events. Identity Manager can log information at several points, or *states,* during an event's life cycle.

The EventState element includes the following parameters:

name

Defines the name of the event state to audit. The event states that you can specify are the following:

AUDIT

Records special events that exist only to audit information. These events only go to the AUDIT state and do not execute.

BEGIN

Audits the set of attributes populated by the user interface and custom handlers, including business logic task handlers, logical attribute handlers and attribute validation implementations.

This state also audits attributes populated by TEWS.

PRE

Audits attributes that are affected by event listeners that execute during the BEGIN state.

APPROVED

Audits changes to attributes during the approval process.

REJECTED

Records status information when an event under workflow control is rejected.

Note: After an event is rejected, it proceeds to the Cancelled state.

EXECUTE

Records information when an event executes.

POST

Audits any changes that an event listener makes to an attribute in the POST state.

INVALID

Records status information when Identity Manager encounters an invalid event.

PENDING

Records status information when an event is in a pending state.

COMPLETE

Records status information when an event completes.

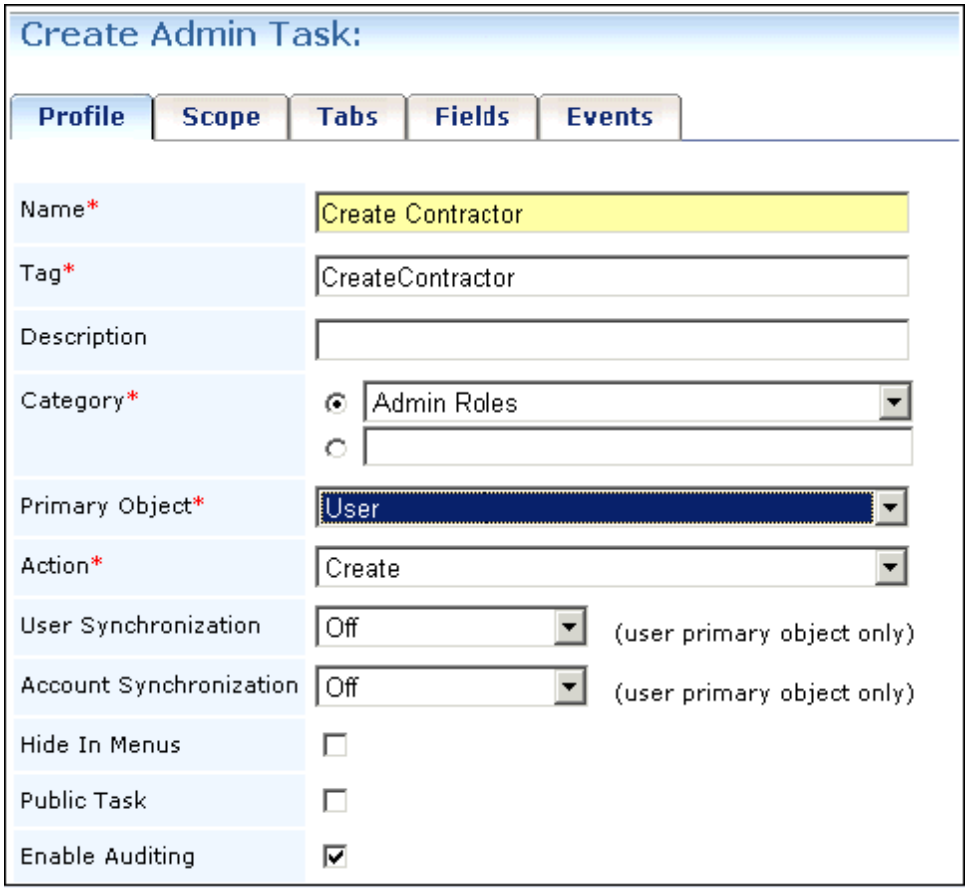
CANCELLED

Records status information when an event is cancelled.

Note: Specify the value of the name parameter using capital letters only.

How to Enable Auditing For a Task

Once you have configured auditing for Identity Manager, you can decide which tasks should log auditing data. To generate audit data for a task, create or modify the task in the User Console, and select the Enable Auditing check box, as shown in the following illustration:



Clean Up the Audit Database

The auditing database may eventually accumulate records that are no longer necessary. To remove these records, execute the following database procedure in the db\auditing directory:

`garbageCollectAuditing125` *`environment-name MM/DD/YYYY`*

environment-name

Defines the name of the Identity Manager environment

MM/DD/YYYY

Defines the date before which the auditing records should be removed.

Chapter 9: Production Environments

This section provides step by step functional descriptions to migrate specific pieces of functionality. It should only be used if limited changes were made in the development environment and those changes are well understood.

This section contains the following topics:

To migrate Admin roles and task definitions

You can customize Identity Manager roles and tasks to meet the specific needs of your company. The customization involves creating or modifying admin roles and tasks or by using a Create or Modify task for an admin role or task.

An alternative method, though *not recommended*, is to modify roles and tasks in the roledefinition.xml file. Use this method for very limited changes because of the risk of errors in editing.

This process will only migrate administrative role and task definitions. If the roles were bound to organizations, consider migrating the entire Identity Manager environment.

Important! If you changed role or task definitions in the production environment, those changes are lost when you import role or task definitions from a development environment. Importing role and task definitions overwrites existing role and task definitions with the same names.

To export Admin role and task definitions

If changes were made directly to the roledefinition.xml file, this file can be directly imported into the production environment. Otherwise, to export the role and task definitions:

1. If you have a Policy Server cluster, check that only one Policy Server is running.
2. Stop all but one Identity Manager node.

3. Log into the Management Console.
4. Click Identity Manager environments.
5. Select the Identity Manager environment, from which to export the role and task definitions.
6. Click Roles, then click Export and supply a name for the file.
7. Follow the instructions in the next procedure to import this file.

To import Admin role and task definitions

To import the roles and task definitions into the production environment:

1. Copy the file created in the preceding procedure to the production environment.
2. Log into the Management Console in the production environment.
3. Click Identity Manager environments.
4. Select the appropriate Identity Manager environment.
5. Click Roles.
6. Click Import and specify the name of the XML file generated by the export.
7. If these steps succeeded, start any extra Policy Servers and Identity Manager nodes that you stopped.

   Note: If you still need to make changes to an Identity Manager environment, omit this step until you are done.

To verify the role and task import

To verify that the roles and tasks were imported successfully, log into Identity Manager as an administrator account that can use the following tasks:

- Modify Admin Role
- Modify Admin Task

Execute these tasks and verify that the roles and tasks reflect the newly imported role definitions.

To migrate Identity Manager skins

Identity Manager skins can be customized to give the application a specific look and feel. If you have modified skins or created new skins for a set of users, use the following steps to migrate skins from the development to the production environment.

If you are modifying a skin, you only need to copy the files that have been modified.

To migrate skins

1. Copy new and modified files from the development to the production server such as image files, style sheets, properties files, and the console page (index.jsp).
2. If multiple skins are being used, configure SiteMinder response.

   Note: For more information on using multiple skins, see the *Configuration Guide*.

To verify the migration of skins, log into the User Console and check that the skin appears correctly.

Update Identity Manager in a Production Environment

After migrating CA Identity Manager from development to production, you may need to perform incremental updates. To migrate new CA Identity Manager functionality from your development environment to your production environment, execute the following steps:

1. Migrate Identity Manager environments.
2. Copy the iam_im.ear.
3. Migrate workflow process definitions.

To migrate an Identity Manager environment

A Identity Manager Environment is created from the Management Console. It includes a set of role and task definitions, workflow definitions, custom features created with Identity Manager APIs, and a Identity Manager Directory.

To migrate an Identity Manager environment

1. If Identity Manager integrates with SiteMinder, and you have a Policy Server cluster, check that only one Policy Server is running.
2. Stop all but one Identity Manager node.
3. Export Identity Manager Environments from the Management Console in the development environment.

4. Import the exported environments in the Management Console in the production environment.
5. If Identity Manager integrates with SiteMinder, reprotect the Identity Manager realms in the Policy Server User Interface.

   The policy domain is not exported from the policy store when you export a Identity Manager Environment.
6. Restart the Policy Server and Identity Manager nodes that you stopped.

When migrating a Identity Manager Environment, the following occurs:

- The changes on the development server overwrite changes on the production server if the same object exists in both locations.
- If new objects are created on the development environment, they are added to the production server.
- If new objects are created on the production server, they are maintained.

To export an Identity Manager environment

To deploy an Identity Manager environment on a production system, you export the environment from a development or staging system and import that environment to the production system.

Note: When you import a previously exported environment, CA Identity Manager displays a log in a status window in the Management Console. To see validation and deployment information for each managed object and its attributes in this log, select the Enable Verbose Log Output field on the Environment Properties page *before* you export the environment. Be aware that selecting the Enable Verbose Log Output field can cause significant performance issues during the import.

To export an Identity Manager environment

1. Click Environments in the Management Console.

   The Identity Manager environments screen appears with a list of Identity Manager environments.
2. Select the environment that you want to export.
3. Click the Export button.

   A File Download screen appears.
4. Save the ZIP file to a location that is accessible to the production system.
5. Click Finish.

   The environment information is exported to a ZIP file that you can import into another environment.

To import an Identity Manager environment

After exporting an Identity Manager environment from a development system, you can import it into a production system.

To import an Identity Manager environment

1. Click Environments in the Management Console.

   The Identity Manager environments screen appears with a list of Identity Manager Environments.

2. Click the Import button.

   The Import Environment screen appears.

3. Browse for the ZIP file required to import an environment.

4. Click Finish.

The environment is imported into CA Identity Manager.

To verify the Identity Manager environment migration

To verify that the Identity Manager environment was migrated correctly, confirm that the Identity Manager Environment appears in the Policy Server User Interface for the Policy Server in the production environment.

In the Policy Server User Interface, verify the following:

- The Identity Manager user directory settings are accurate
- The new Identity Manager domain exists
- The correct authentication schemes protect the Identity Manager realms

Also, verify that when you log into the Management Console, the Identity Manager Environment appears when you select Environments.

Migrate the iam_im.ear for JBoss

Redeploy the iam_im.ear each time functionality is migrated from the development environment to the production environment. By migrating the entire EAR, you ensure that your production environment is identical to your development environment.

To migrate the IdentityMinder EAR on JBoss Application Servers

1. Copy the iam_im.ear from your development environment to a location accessible to your production environment.
2. In the copy of the iam_im.ear, edit the Policy Server connection information, so that it reflects the production environment.

   To achieve this change, copy the *jboss_home*/server/default/iam_im.ear/policyserver_rar/META-INF/ra.xml from your production environment into the iam_im.ear.
3. Replace the installed iam_im.ear with the copy of the iam_im.ear from your development environment from Step as follows:
   a. On the production server, delete the iam_im.ear:

      cluster_node_jboss_home\server\default\deploy\iam_im.ear

   b. Replace the file you deleted with the edited copy of the iam_im.ear from the development environment.
4. Repeat these steps for each node in the cluster.

Migrate the iam_im.ear for WebLogic

Redeploy the iam_im.ear each time functionality is migrated from the development environment to the production environment. By migrating the entire EAR, you ensure that your production environment is identical to your development environment.

To migrate the iam_im.ear on WebLogic

1. Preserve Policy Server connection information.

   Policy server connection information is stored in the ra.xml file in the policyserver_rar/WEB-INF directory. Copy this file to another location, so that it can be replaced in the iam_im.ear before redeploying it.
2. Copy the iam_im.ear to a location available to the WebLogic Admin Server.
3. Replace the Policy Server connection information.

   In the iam_im.ear replace the policyserver_rar/WEB-INF/ra.xml file with the one preserved from Step .
4. Redeploy the iam_im.ear
   a. Log in to the WebLogic console.
   b. Go to Deployments, Application, IdentityMinder

On the Deploy Tab, select Deploy (Re-Deploy) Application.

Migrate the iam_im.ear for WebSphere

To migrate the IdentityMinder EAR on WebSphere Application Servers

1. Copy the *imsInstall.jacl* script from *was_im_tools_dir**WebSphere-tools* to the *deployment_manager_dir* *bin* directory where:
   - *was_im_tools_dir* is the directory on the development system where the Identity Manager Tools for WebSphere are installed
   - *deployment_manager_dir* is the location where the Deployment Manager is installed.
2. On the development system where you configured the Identity Manager application, copy *was_im_tools_dir* *WebSphere-tools**imsExport.bat* or *imsExport.sh* to *was_home**bin.*
3. On the command line, navigate to *was_home**bin.*
4. Make sure the WebSphere application server is running.
5. Export the deployed Identity Manager application as follows:

   For Windows, enter this command:

   `imsExport.bat "path-to-exported-ear"`

   where *path-to-exported-ear* is the full path and file name that the imsExport utility creates.

   For Windows systems, use forward slashes (/) instead of back slashes (\) when you specify the path to was_im.ear. For example:

   ```
   imsExport.bat "c:/program files/CA/CA Identity Manager/
   exported_ear/iam_im.ear"
   ```

   For UNIX, enter this command:

   `./wsadmin -f imsExport.jacl -conntype RMI -port 2809 path to exported ear`

   where *path-to-exported-ear* is the full path including the file name of the exported EAR file.
6. Copy the exported EAR file from the location on the development system where you exported it to a location on the system where the Deployment Manager is installed.
7. Replace the *was_im_tools_dir*/WebSphere-ear/iam_im.ear/policyserver_rar/META-INF/ra.xml with the one from the production environment.

   The ra.xml file contains the Policy Server connection information.

8. On the system where the Deployment Manager is installed, deploy the IdentityMinder EAR:
   a. From the command line, navigate to:

      deployment_manager_dir \bin.

   b. Make sure that the WebSphere application server is running.

   c. Run the imsInstall.jacl script as follows:

   Note: The imsInstall.jacl script may take several minutes to execute.

   Windows:

   wsadmin -f imsInstall.jacl *"path-to-copied-ear" cluster_name*

   where *path-to-copied-ear* is full path including the file name for the IdentityMinder EAR that you copied to the Deployment Manager system.

   For example:

   wsadmin -f imsInstall.jacl "c:\Program Files\CA\Identity Manager\WebSphere-tools\was_im.ear" im_cluster

   UNIX:

   ./wsadmin -f imsInstall.jacl *path-to-copied-ear cluster_name*

   where *path-to-copied-ear* is full path including the file name for the IdentityMinder EAR that you copied to the Deployment Manager system.

   For example:

   ./wsadmin -f imsInstall.jacl /opt/CA/Identity Manager/websphere-tools/was_im.ear im_cluster

9. If Identity Manager integrates with SiteMinder, verify the following:
   - The SiteMinder agents can connect to your policy store.
   - The Policy Server can connect to the user store.
   - The Identity Manager domains have been created.

Migrate Workflow Process Definitions

If you used workflow in the development environment, you need to export the workflow definitions and import them into the production environment. Then, configure workflow in each of the server nodes.

Export process definitions

On the development environment system, you export the workflow process definitions.

To export process definitions

1. Make sure the application server is running.
2. Go to *admin_tools*\Workpoint\bin\ and run Archive.bat (for Windows) or Archive.sh (for UNIX) as follows:
   a. In the Import dialog, select the root object.
   b. Click Add.
   c. Specify the name of the file to generate.
   d. Click Export.
   e. Click Go.

   admin_tools refers to the Administrative Tools, which are installed by default in one of the following locations:

   - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools
3. Follow the instructions in the next section, To import process definitions (see page 231).

Import process definitions

On the production environment system, import the workflow process definitions.

To import process definitions

1. Restart the application server.
2. Optionally, create a backup copy of your current definitions by exporting the definitions using the preceding procedure.

3. Go to *admin_tools*\Workpoint\bin\ and run the Archive script as follows:
   a. In the Import dialog, select all items to import.
   b. When you are prompted about using the new or old format, retain the old format.

      The new format is not supported by Identity Manager.
   c. Supply the name of the file generated by the export.
   d. Click Go.

   admin_tools refers to the Administrative Tools, which are installed by default in one of the following locations:

   - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools
   - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

Chapter 10: Identity Manager Logs

This section contains the following topics:

How to Track Problems in CA Identity Manager

Identity Manager includes the following methods for recording status and tracking issues:

View Submitted Tasks task

Displays the status of all events and tasks in an Identity Manager environment. Administrators use this task in the User Console.

View Submitted Tasks provides the following types of information:

- The list of events and tasks that occur in the environment
- The list of attributes associated with an event
- Successful and failed events
- Events that are in a pending or stalled state
- Rejected events, including the reason for rejection
- Account synchronization status
- Identity policy synchronization status
- Provisioning information (when provisioning is enabled)

Application Server logs

Displays information about all of the components in an Identity Manager installation, and provides details about all operations in Identity Manager.

The location and type of log file depends on which of the following types of application servers you are using:

- WebLogic—Identity Manager information is written to standard out. By default, standard out is the console window in which the server instance is running.
- JBoss—Identity Manager information is written to the console window where the server instance is running, and to *jboss_home*\server\log\server.log
- WebSphere—Identity Manager information is written to the console window where the server instance is running, and to *was_home*\AppServer\logs*server_name*\SystemOut

See the documentation for your application server for more information.

Directory Server log file

Contains information about activity that occurs in the user directory.

The type of information that is recorded and the location of the log file depend on the type of directory server that you are using. See the directory server's documentation for more information.

Policy Server log file

Displays the following information when Identity Manager integrates with SiteMinder:

- SiteMinder connection issues
- SiteMinder authentication issues
- Information about Identity Manager managed objects in the SiteMinder policy store
- Password policy evaluation

For information about configuring SiteMinder logs, see the *CA SiteMinder Web Access Manager Policy Server Administration Guide*.

Policy Server Profiler

If Identity Manager integrates with SiteMinder, allows you to trace internal Policy Server diagnostics and processing functions, including functions related to Identity Manager.

For more information, see How to Trace Components and Data Fields (see page 235).

Web Agent log files

If Identity Manager integrates with SiteMinder, the Web agents write information to the following two logs:

- Error log file—contains program and operational-level errors, for example, the Web agent not being able to communicate with Policy Server.
- Trace log file—contains warning and informational messages, such as trace messages and flow state messages. It also includes data such as header details and cookie variables.

Note: For more information about Web Agent log files, see the *CA SiteMinder Web Access Manager Web Agent Configuration Guide*.

How to Trace Components and Data Fields

When Identity Manager integrates with SiteMinder, you can use the SiteMinder Policy Server Profiler to trace components and data fields in the Identity Manager extensions for the Policy Server. The Profiler lets you configure filters for the tracing output so that only specific values for a component or data field are captured.

Note: For instructions on using the Policy Server Profiler, see the *CA SiteMinder Web Access Manager Policy Server Administration Guide*.

You can enable tracing for the following components:

Function_Begin_End

Provides low-level trace statements when certain methods in the Identity Manager extensions for the Policy Server are executed.

IM_Error

Traces runtime errors in the Identity Manager extensions for the SiteMinder Policy Server.

IM_Info

Provides general tracing information for the Identity Manager extensions.

IM_Internal

Traces general information about internal Identity Manager operations.

IM_MetaData

Provides tracing information when Identity Manager processes directory metadata.

IM_RDB_Sql

Provides tracing information for relational databases.

IM_LDAP_Provider

Provides tracing information for LDAP directories.

IM_RuleParser

Tracks the process of parsing and evaluating member, owner, and admin policies, which are defined in an XML file that gets interpreted at runtime.

IM_RuleEvaluation

Traces the evaluation of member, admin, owner, and scope rules.

IM_MemberPolicy

Traces the evaluation of member policies, including membership and scope.

IM_AdminPolicy

Traces the evaluation of admin policies.

IM_OwnerPolicy

Traces the evaluation of owner policies.

IM_RoleMembership

Traces information relating to role membership, such as the list of roles a user has and the list of members in a certain role.

IM_RoleAdmins

Traces information relating to role administration, such as the list of roles a user can administer and the list of administrators for a certain role.

IM_RoleOwners

Traces information relating to role ownership, such as the list of roles a user owns and the list of owners for a certain role.

IM_PolicyServerRules

Traces evaluatation of member rules, such as RoleMember, RoleAdmin, RoleOwner rules, which are resolved by the Policy Server, and scope rules, such as All and AccessTaskFilter rules for AccessTasks

IM_LLSDK_Command

Traces communication between the internal Identity Manager SDK and the policy server. This trace component is used by Technical Support.

IM_LLSDK_Message

Traces messages that are explicitly sent by Java code to the Policy Server from the internal Identity Manager SDK. This trace component is used by Technical Support.

IM_IdentityPolicy

Traces the evaluation and application of Identity Policies.

IM_PasswordPolicy

Traces the evaluation of password policies.

IM_Version

Provides information about the Identity Manager version.

IM_CertificationPolicy

Traces the evaluation of certification policies.

IM_InMemoryEval

Traces the processing of Identity Manager policies, including member, admin, owner, and Identity Policies. This trace component is used by Technical Support.

IM_InMemoryEvalDetail

Provides additional detail about the processing of Identity Manager policies, including member, admin, owner, and Identity Policies. This trace component is used by Technical Support.

The data fields for which you can configure tracing are listed in the *CA SiteMinder Web Access Manager Policy Server Administration Guide*.

Chapter 11: CA Identity Manager Protection

This section contains the following topics:

Management Console Security

After installing Identity Manager, you can limit access to the Management Console if Identity Manager integrates with SiteMinder.

Use SiteMinder to Secure the Management Console

To protect the Management Console initially, you can create a SiteMinder policy.

A SiteMinder policy identifies a resource that you want to protect, such as the Management Console, and grants a set of users access to that resource.

To create a SiteMinder Policy to protect the Management Console

1. Log into one of the following interfaces as an administrator with Domain privileges:
   - For CA SiteMinder r12 or higher, log into the Administrative UI
   - For CA SiteMinder 6.0 SP*x*, log into the Policy Server User Interface

   Note: For information on using these interfaces, see the documentation for the version of SiteMinder that you are using.
2. Locate the policy domain for the appropriate Identity Manager Environment.

   This domain is created automatically when Identity Manager integrates with SiteMinder. The domain name has the following format:

   *Identity Manager-environment*Domain

   In this format, *Identity Manager-environment* specifies the name of the environment you are modifying. For example, when the name is *employees*, the domain name is *employees*Domain.
3. Create a new realm with the following resource filter:

   /iam/immanage/
4. Create a new rule for the realm. Specify an asterisk (*) as the filter to protect all pages in the Management Console.

5. Create new a policy and associate it with the rule you created in the previous step.

   Be sure to associate users who can access the Management Console with the policy.

6. Restart the application server.

User Console Security

The User Console is the user interface that administrators use to manage objects such as users, groups, and organizations in a Identity Manager environment, with a set of associated roles and tasks. When an administrator logs into the User Console, that administrator can only see tasks that he can perform in that environment.

By default, Identity Manager protects access to the User Console with native authentication. Identity Manager administrators enter a valid username and password to log into a Identity Manager environment. Identity Manager authenticates the name and password against the user store that Identity Manager manages.

If Identity Manager integrates with SiteMinder, Identity Manager *automatically* uses SiteMinder basic authentication to protect the environment. No additional configuration is required to use basic authentication. You can configure advanced authentication methods using the SiteMinder Administrative User Interface.

Note: For more information, see the *CA SiteMinder Web Access Manager Policy Server Configuration Guide.*

Chapter 12: SiteMinder Integration

This section contains the following topics:

SiteMinder and CA Identity Manager

When Identity Manager integrates with CA SiteMinder, CA SiteMinder can add the following functionality to a Identity Manager environment:

Advanced Authentication

Identity Manager includes native authentication for Identity Manager Environments by default. Identity Manager administrators enter a valid username and password to log in to an Identity Managera Identity Manager Environment. Identity Manager authenticates the name and password against the user store that Identity Manager manages.

When Identity Manager integrates with CA SiteMinder, Identity Manager uses CA SiteMinder basic authentication to protect the Environment. When you create an Identity Managera Identity Manager Environment, a policy domain and an authentication scheme are created in CA SiteMinder to protect that Environment.

When Identity Manager integrates with CA SiteMinder, you can also use SiteMinder authentication to protect the Management Console.

Access Roles and Tasks

Access roles enable Identity Manager administrators to assign privileges in applications that are protected by CA SiteMinder. Access roles include access tasks, which represent a single action that a user can perform in a business application, such as generating a purchase order in a finance application.

Directory Mapping

An administrator may need to manage users whose profiles exist in a different user store from the one that is used for authenticating the administrator. In other words, when logging in to the Identity Manager Environment, the administrator must be authenticated using one directory and authorized to manage users in a second directory.

When Identity Manager integrates with CA SiteMinder, you can configure a Identity Manager Environment to use different directories for authentication and authorization.

Advanced Password Policies

Identity Manager enables you to create basic password policies that manage user passwords by enforcing rules and restrictions governing password expiration, composition, and usage.

If you configure Identity Manager to integrate with CA SiteMinder, you can create advanced password policies that enable you to define the additional rules and restrictions.

Note: For more information, see the *Administration Guide*.

Skins for Different Sets of Users

A skin changes the look of the User Console. When Identity Manager integrates with CA SiteMinder, you can enable different sets of users to see different skins. To accomplish this, you use a SiteMinder response to associate a skin with a set of users. The response is paired with a rule in a policy, which is associated with a set of users. When the rule fires, it triggers the response to pass information about the skin to Identity Manager, to build the User Console.

Note: For more information, see the *User Console Design Guide*.

Locale Preferences for a Localized Environment

When Identity Manager integrates with CA SiteMinder, you can define a user's locale preference using an imlanguage HTTP header. In the SiteMinder Policy Server, you set this header within a SiteMinder response and specify a user attribute as the header's value. This imlanguage header acts as the highest priority locale preference for a user.

Note: For more information, see the *User Console Design Guide*.

More Information:

Collect User Credentials Using a Custom Authentication Scheme (see page 273)

SiteMinder Components

When Identity Manager integrates with SiteMinder, the following components are added to the Identity Manager architecture:

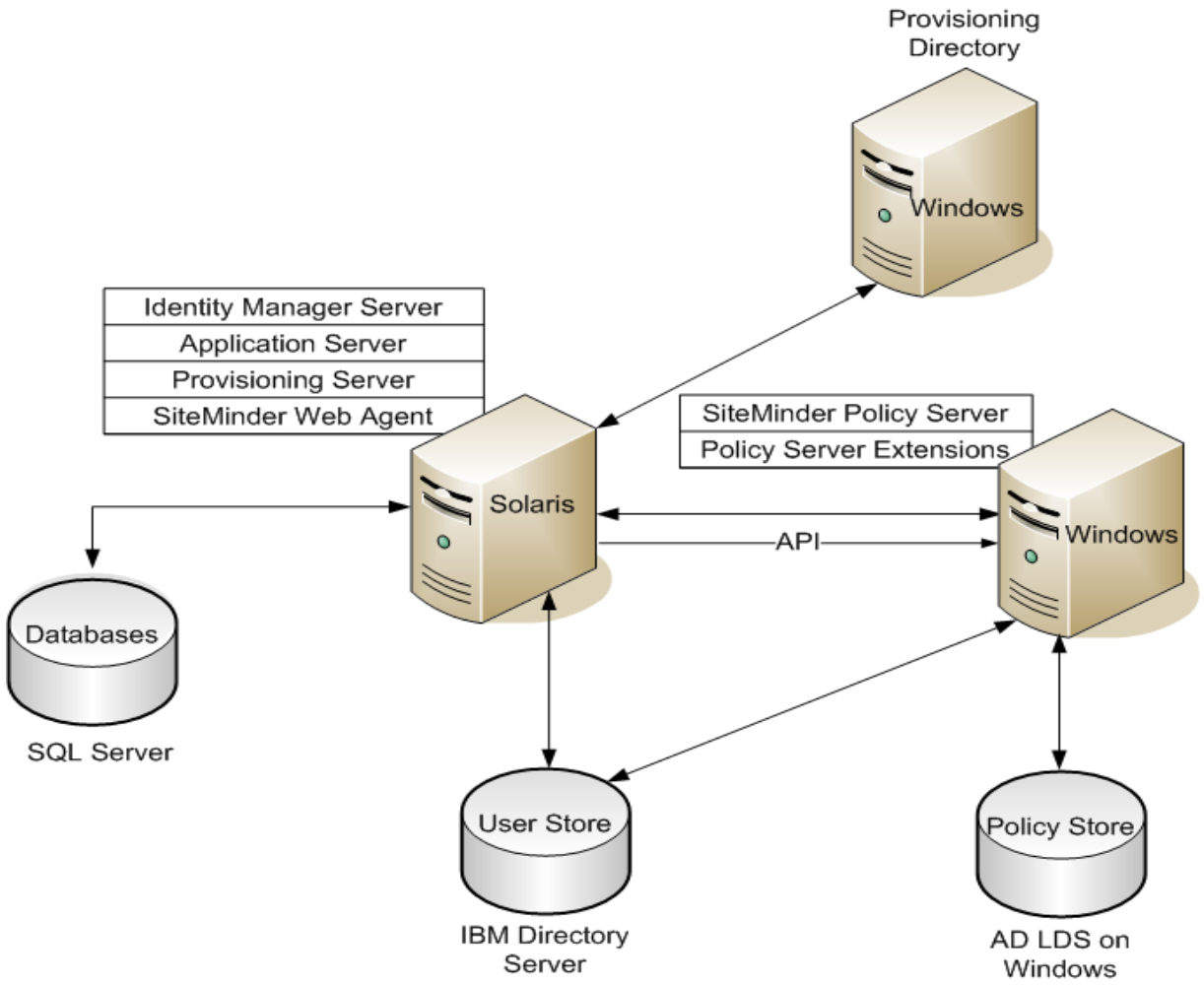
SiteMinder Web Agent

Protects the Identity Manager Server. Installed on the system with the Identity Manager Server.

SiteMinder Policy Server

Provides advanced authentication and authorization for Identity Manager, as well as other facilities such as Password Services, Single Sign-On, and so forth.

The following figure is an example of a Identity Manager installation with a SiteMinder Policy Server and Web Agent:



Note: The components are installed on different platforms as examples. However, you can choose other platforms. The Identity Manager databases are on Microsoft SQL Server and the user store is on IBM directory Server. The SiteMinder Policy Store is on AD LDS on Windows.

How Resources are Protected

Advanced authentication requires you to use a SiteMinder Policy Server in your implementation.

In many situations, the application server hosting the Identity Manager Server is on a separate system from the one with the Web Server that proxies requests to the application server. To provide forwarding services, the Web Server needs the following:

- A plug-in that is provided by the application server vendor
- A SiteMinder agent to protect the Identity Manager resources, such as the User Console, Self Registration, and the Forgotten Password feature

The Web Agent controls the access of users who request Identity Manager resources. After authenticating and authorizing users, the Web Agent allows the Web Server to process the requests.

When the Web Server receives the request, the application server plug-in forwards it to the application server hosting the Identity Manager Server.

The Web Agent protects Identity Manager resources that are exposed to users and administrators.

How to Protect CA Identity Manager with SiteMinder

The following table describes the steps involved in configuring SiteMinder to protect Identity Manager resources:

✓	Step
	1. Be sure you have installed the Identity Manager extensions on the SiteMinder Policy Server as described in the *Installation Guide*.
	2. Install a SiteMinder Web Agent to protect Identity Manager resources.
	3. Install the plug-in the Web Server uses to forward requests to the application server.
	4. Configure the SiteMinder Policy Store for use with Identity Manager.

✓	Step
	5. Start the application server and other servers in the installation.
	6. Verify that the plug-in is successfully forwarding requests to the application server.
	7. (Optional) Configure SiteMinder high availability for Identity Manager.

Install the SiteMinder Web Agent

You can use a SiteMinder Web Agent or a Web Agent Group to protect Identity Manager resources. For supported Web Agent versions, see the Identity Manager support matrix on the CA Support Site.

Note: For more information about Web Agent groups, see the *CA SiteMinder Policy Server Configuration Guide*.

Before installing the Web Agent, ensure the following requirements have been met:

- The SiteMinder Policy Server is installed and configured.
- The system that hosts the Web Agent has network access to the Policy Server.
- The Web Server that hosts the Web Agent is running.

The following table lists the steps to install and configure a SiteMinder Web Agent:

✓	Step	Refer to...
	1. Install and configure the Web Agent.	*CA SiteMinder Web Agent Installation Guide*
	2. If you installed the Web Agent on an IIS Web Server, set the DefaultAgentName and DefaultPassword parameters of your Agent Configuration Object.	*CA SiteMinder Web Agent Installation Guide*
	3. Enable the Web Agent.	*CA SiteMinder Web Agent Installation Guide*
	4. If you are using an IIS web server, ensure the SiteMinder web agent ISAPI filter appears before any other filter, including the SePlugin filter, in the IIS console.	IIS documentation

Important! Identity Manager now uses a new CA styles EAR. To support this, change the web server plug-in that is used to forward to the application server, by adding a redirection to /castylesr5.1.1 in addition to /iam in the http proxy forwarder.

To use the SiteMinder Web Agent to protect Identity Manager, select the Web Agent when you create an Environment.

Note: You do not need to create any additional SiteMinder objects to use the SiteMinder Web Agent.

To verify the Web Agent, confirm the following:

- The SiteMinder Policy Server Authentication and Authorization logs verify that the Web Agent starts properly.
- The Agent log for the Web Agent verifies that the Web Agent starts properly.

Install the Proxy Plugin

Based on which application is installed, you install the plug-in the Web Server uses to forward requests to the application server.

- WebSphere (see page 247)
- JBoss (see page 251)
- WebLogic (see page 252)

Install the Proxy Plug-In on WebSphere

Once the Web Agent authenticates and authorizes a request for a Identity Manager resource, the Web Server on which you installed the Web Agent must forward the request to the application server that hosts the Identity Manager Server. This is accomplished through a Web Server proxy plug-in provided by the application server vendor.

Use the procedures that apply:

- Configure the IBM HTTP Server (see page 247) (All web servers)
- Configure the Proxy Plug-In (see page 247) (All web servers)
- Complete the Configuration on IIS (see page 248)
- Complete the Configuration on iPlanet or Apache (see page 250)

Configure the IBM HTTP Server

For all web servers, you install the proxy plug-in and use the configurewebserver command.

Follow these steps:

1. Install the proxy plug-in from the WebSphere Launch Pad.
2. Add the Web Server to the WebSphere cell by running the configurewebserver1.bat command as follows:
   a. Edit *websphere_home*\Plugins\bin\configurewebserver1.bat/,sh in a text editor.
   b. Add a user name and password to after wsadmin.bat/.sh as follows:
   `wsadmin.bat -user wsadmin -password password -f configureWebserverDefinition.jacl`
   c. Run configurewebserver1.bat/.sh.

   Note: See the IBM WebSphere documentation for more information about the configurewebserver command.
3. Continue with the procedure to Configure the Proxy Plug-In (see page 247).

Configure the Proxy Plug-In

For all web servers, you update the plug-in using WebSphere's GenPluginCfg command:

Follow these steps:

1. Log in to the system where WebSphere is installed.
2. From the command line, navigate to *websphere_home*\bin, where *websphere_home* is the installed location of WebSphere.

   For example:

   - **Windows:**

     C:\Program Files\WebSphere\AppServer\profile\AppSrv01\bin

   - **UNIX:**

     /*home_dir*/WebSphere/AppServer/profile/AppSrv01/bin
3. Run the GenPluginCfg.bat or GenPluginCfg.sh command.

   Running this command generates a plugin-cfg.xml file in the following location:

   websphere_home\AppServer\profiles\AppSrv01\config\cells
4. Continue with one of the following procedures:
   - Complete the Configuration on IIS (see page 248)
   - Complete the Configuration on iPlanet or Apache (see page 250)

Complete the Configuration on IIS

After you have configured the IBM HTTP server and the proxy plug-in, you make sure the proxy plugin-cfg.xml is in the right location and perform steps to configure an additional plugin file.

Follow these steps:

1. Copy the plugin-cfg.xml as follows:
   a. Log into the system where the web agent is installed.
   b. Create a folder with no spaces under the C: drive. For example: C:\plugin.
   c. Copy the plugin-cfg.xml file to C:\plugin.
2. Create a file called plugin-cfg.loc in the C:\plugin folder and add the following line to it:

   C:\plugin\plugin-cfg.xml
3. Download the Websphere Plugin installer from www.ibm.com to the system where WebSphere is installed.
4. In a command prompt, go to the location of the Websphere Plugin installer.
5. Generate the iisWASPlugin_http.dll file by using this command:

   ```
   install is:javahome "c:\IBM\WebSphere\AppServer\Java
   ```

   Respond to the questions presented based on your configuration.

   When the wizard ends, the iisWASPlugin_http.dll file is saved in the C:\IBM\WebSphere\Plugs\bin folder. Look for a 32bit of 64bit subfolder.
6. Copy the iisWASPlugin_http.dll file to the C:\plugin folder on the system with the web agent.
7. Create a virtual directory as follows:
   a. Open the IIS Manager.
   b. Right click Default web sites.
   c. Click New virtual directory and supply these values:

      Alias = sePlugins (Note that it is case sensitive.)

      Path = c:\plugin

      Permission = Read + Execute (ISAPI or CGI)

8. Add an ISAPI filter as follows:
   a. Right click Default web site.
   b. Click properties.
   c. On the ISAPI filter tab, click Add.
   d. Supply these values:

      Filter name = sePlugins

      Executable = c:\plugin\ iisWASPlugin_http.dll

9. Create a web service extension as follows:
   a. In IIS6 Manager, expand the computer name.
   b. Create a new Web Service Extension and set it to allowed.

      Extension name = WASPlugin

      Path = C:\plugin\ iisWASPlugin_http.dll

   c. Right click each Web Service Extension to change it to Allowed Status.
10. Restart the IIS Web server.

    In the master WWW service, ensure that the WebSphere plug-in (sePlugin) appears after the SiteMinder Web Agent plug-in and that the WebSphere plug-in started successfully.

Complete the Configuration on iPlanet or Apache

After you have configured the IBM HTTP server and the proxy plug-in, you make sure the proxy plugin-cfg.xml is in the right location and restart the web server.

Follow these steps:

1. If the application server and the Web server are on different systems, copy the plugin-cfg.xml to the system where you installed the proxy plug-in. Place the copy in this location:

   websphere_home\AppServer\profiles*server_name*\config\cells*websphere_cell*\nodes\webserver1_node\servers\webserver1\

2. Restart the web server.

   - iPlanet Web Servers: Ensure that the WebSphere plug-in (libns41_http.so) is loaded after the SiteMinder Web Agent plug-in (NSAPIWebAgent.so)

     For iPlanet 6.0 Web Servers, check the order of plug-ins in *iplanet_home*/https-*instance*/config/magnus.conf.

     For iPlanet 5.x Web Servers, copy the following lines from *iplanet_home*/https-*instance*/config/magnus.conf to *iplanet_home*/https-*instance*/config/obj.conf

     ```
     Init fn="load-modules" funcs="as_init,as_handler,as_term"
     shlib="/export/WebSphere/AppServer/bin/libns41_http.so"

     Init fn="as_init"
     bootstrap.properties="/export/WebSphere/AppServer/config/cells/plugin-cfg.xml"
     ```

     Add the following code after AuthTrans fn="SiteMinderAgent" in the obj.conf file:

     ```
     Service fn="as_handler"
     ```

   - Apache Web Servers: In the Dynamic Shared Object (DSO) Support section of *apache_home*/config/httpd.conf, be sure that the SiteMinder Web Agent plug-in (mod2_sm.so) is loaded before the WebSphere plug-in (mod_ibm_app_server_http.so).

Install the Proxy Plug-In for JBoss

Once the Web Agent authenticates and authorizes a request for a Identity Manager resource, the Web Server on which you installed the Web Agent must forward the request to the application server that hosts the Identity Manager Server. This is accomplished through a Web Server proxy plug-in provided by the application server vendor.

To forward these requests, install and configure a JK Connector on the system where the SiteMinder Web Agent installed. See the following Jakarta Project web site for more information about the JK Connector:

http://community.jboss.org/wiki/usingmodjk12withjboss

The Identity Manager Administrative Tools include sample configuration files that you can use to configure the JK Connector. For instructions, see the readme.txt file in the directory noted in the following table.

Platform	Location
IIS Web server on a Windows system	C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\samples\ ConnectorConfiguration\windows\IIS_JBoss*
Sun Java System Web server on a Solaris system	/opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools/samples/ ConnectorConfiguration/solaris/Iplanet_JBoss*
Apache Web server on a Solaris system	/opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools/samples/ ConnectorConfiguration/solaris/apache_JBoss*

Install the Proxy Plug-In on WebLogic

Once the Web Agent authenticates and authorizes a request for a Identity Manager resource, the Web Server on which you installed the Web Agent must forward the request to the application server that hosts the Identity Manager Server. This is accomplished through a Web Server proxy plug-in provided by the application server vendor.

1. Install the WebLogic proxy plug-in for your Web Server as described in the WebLogic documentation.

   Note: For IIS users, when you install the proxy plug-in, be sure to configure proxying by file extension and by path. When you configure proxying by file extension, add an application mapping in the App Mapping tab with the following properties:
   Executable: IISProxy.dll
   Extension: .wlforward

2. Configure the proxy plug-in for Identity Manager as described in one of the following sections:

   - IIS Proxy Plug-in (see page 253)
   - iPlanet Proxy Plug-in (see page 254)
   - Apache Proxy Plug-in (see page 257)

Configure the IIS Proxy Plug-in

The proxy plug-in for IIS Web Servers requires the following steps for WebLogic.

Follow these steps:

1. Create a folder on the system where the web agent is installed. For example: c:\weblogic_proxy.
2. Log into the system where the Identity Manager server is running.
3. Go to this folder: *Weblogic_Home*\wlserver_11\server\plugin
4. Copy the following files to weblogic proxy folder that you created in step 1.
   - iisforward.dll
   - iisproxy.dll
5. Create a file called iisproxy.ini in the same folder and include the following content:

   ```
   # This file contains initialization name/value pairs
   # for the IIS/WebLogic plug-in.
   WebLogicHost=host-name
   WebLogicPort=7001
   ConnectTimeoutSecs=20
   ConnectRetrySecs=2
   WlForwardPath=/castylesr5.1.1,/iam,/im
   WLLogFile= c:\weblogic_proxy \proxy.log
   DebugConfigInfo=ON
   ```

   Replace *host-name* with the actual host name.
6. Start IIS Manager.
7. Expand Web Sites
8. Right-click Default Web Site.
9. Select Properties.
10. Add a filter as follows:
    a. Click ISAPI Filters.
    b. Click Add and complete the dialog as follows:

       For Filter Name: WebLogic

       For Executable: Path of the iisforward.dll
11. Provide the location of the iisproxy.dll file as follows:
    a. Click Home Directory.
    b. Click Configuration.
    c. Click on Add.
    d. Enter the path of the iisproxy.dll file.

e. Enter .jsp in the Extension field.

f. Clear the Verify that file exists option.

12. Repeat step 11 for the .do and .wlforward extensions.
13. Add a web service extension for wlforward (in all lower case) pointing to the location of iisforward.dll.

    Set the extension status to Allowed.
14. Right click each Web Service Extension to change it to Allowed Status.
15. Restart the IIS web server.

Configure the iPlanet Proxy Plug-in

To configure the plug-in, modify the following iPlanet configuration files:

- magnus.conf
- obj.conf

The iPlanet configuration files have strict rules about the placement of text. To avoid problems, note the following:

- Eliminate extraneous leading and trailing white space. Extra white space can cause your iPlanet server to fail.
- If you must enter more characters than you can fit on one line, place a backslash (\) at the end of that line and continue typing on the following line. The backslash directly appends the end of the first line to the beginning of the following line. If a space is necessary between the words that end the first line and begin the second line, be certain to use one space, either at the end of the first line (before the backslash), or at the beginning of the second line.
- Do not split attributes across multiple lines.

The iPlanet configuration files for your iPlanet instance are found in the following location:

iplanet_home/https-*instance_name*/config/

where *iplanet_home* is the root directory of the iPlanet installation, and *instance_name* is the particular server configuration that you are using.

To install the proxy plug-in on an iPlanet Web Server

1. From the *weblogic_home*/server/lib directory, copy the libproxy.so file that corresponds to your version of your iPlanet Web Server to the file system where you installed iPlanet.
2. In a text editor, modify the iPlanet magnus.conf file.

   To instruct iPlanet to load the libproxy.so file as an iPlanet module, add the following lines to the beginning of the magnus.conf file:

   ```
   Init fn="load-modules" funcs="wl_proxy,wl_init"\
   shlib=path in file system from step 1/libproxy.so
   Init fn="wl_init"
   ```

   For example:

   ```
   Init fn="load-modules" funcs="wl_proxy,wl_init"\
   shlib=/usr/local/netscape/plugins/libproxy.so
   Init fn="wl_init"
   ```

   The function load-modules tags the shared library for loading when iPlanet starts up. The values wl_proxy and wl_init identify the functions that the plug-in executes.

3. In a text editor, modify the iPlanet obj.conf file as follows:

   a. After the last line that begins with the following:

      NameTrans fn=....

      Add the following Service directive to the Object name="default" section:

      ```
      Service method="(GET|HEAD|POST|PUT)" type=text/jsp fn="wl-proxy"
      ```

      Note: You may add this directive in a line following existing Service directives.

   b. Add the following to the end of the file:

      ```
      <Object name="idm" ppath="*/iam/*">">
      Service fn="wl-proxy" WebLogicHost="hostname" WebLogicPort="portnumber"
      PathTrim="/weblogic"
      </Object>
      <Object name="weblogic1" ppath="*/console*">
      Service fn="wl-proxy" WebLogicHost="hostname" WebLogicPort="portnumber"
      PathTrim="/weblogic"
      </Object>
      ```

      where *hostname* is the server name and domain of the system where you installed WebLogic, and *portnumber* is the WebLogic port (default is 7001).

      You may have more than one Object entry.

      For example:

      ```
      <Object name="idm" ppath="*/iam/*">">
      Service fn="wl-proxy" WebLogicHost="MyServer.MyCompany.com"
      WebLogicPort="7001" PathTrim="/weblogic"
      <Object name="weblogic1" ppath="*/console*">
      Service fn="wl-proxy" WebLogicHost="MyServer.MyCompany.com"
      WebLogicPort="7001" PathTrim="/weblogic"
      </Object>
      ```

4. Save your iPlanet configuration file.

5. Restart your Web Server instance.

Configure the Apache Proxy Plug-in

1. After installing a Web Agent on Solaris, stop the Apache web server and copy the mod_wl_20.so file from the following location:

   weblogic_home/server/lib/solaris

   to

   apache_home/modules

2. Edit the http.conf file (located in *apache_home*/conf) and make the following changes:

   a. Under the load module section, add the following:
   ```
   LoadModule weblogic_module      modules/mod_wl_20.so
   ```

   b. Edit the server name with the name of the Apache server system.

   c. Add an If block at the end of the file as follows:
   ```
   <IfModule mod_weblogic.c>
     WebLogicHost weblogic_server.com
     WebLogicPort 7001
     MatchExpression /iam
     MatchExpression /castylesr5.1.1
   </IfModule>
   ```

3. Save the http.conf file.

4. Restart the Apache web server.

For more information about the http.conf file, see Oracle WebLogic 11 Documentation.

Configure the Policy Store for CA Identity Manager

Once you install the Identity Manager Extensions for SiteMinder on the system with the Policy Store, extend the policy store schema for Identity Manager.

To extend the schema to the policy store, use the Identity Manager Administrative Tools. Install the tools using the Identity Manager installation program, without installing the Identity Manager Server.

Configure a Relational Database

To configure a relational database policy store

1. Configure the database as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Run one of the following scripts for Identity Manager on the Policy Store database:

   - **SQL:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas\MicrosoftSQLServer\ims8_mssql_ps.sql
   - **Oracle:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools/policystore-schemas/OracleRDBMS/ims8_oracle_ps.sql

   The preceding are default installation locations. The location for your installation may be different.

Configure Sun Java Systems Directory Server or IBM Directory Server

To configure a Sun Java Systems Directory or IBM Directory policy store

1. Configure the directory as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Add the appropriate LDIF schema file from the following table to the directory. The default Windows location for the LDIF files is C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas.

   Adding the following schema files for your directory:

   - **IBM Directory Server:**

     IBMDirectoryServer\V3.identityminder8

   - **Sun Java Systems Directory Server (iPlanet):**

     SunJavaSystemDirectoryServer\sundirectory_ims8.ldif

Configure Microsoft Active Directory

To configure a Microsoft Active Directory policy store, you apply the activedirectory_ims8.ldif script.

To configure an Active Directory policy store

1. Configure the directory as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Modify the activedirectory_ims8.ldif schema file as follows:

   a. In a text editor, open the activedirectory_ims8.ldif file. The default Windows location is:

      C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas\MicrosoftActiveDirectory

   b. Replace all instances of {root} with the root organization for the directory.

      The root organization must match the root organization that you specified when you configured the policy store in the Policy Server Management Console.

      For example, if the root is dc=myorg,dc=com, replace dn: CN=imdomainid6,CN=Schema,CN=Configuration,{root} with dn: CN=imdomainid6,CN=Schema,CN=Configuration,dc=myorg,dc=com

   c. Save the file.

3. Add the schema file as described in the documentation for your directory.

Configure Microsoft ADAM

To configure a Microsoft ADAM policy store, you apply the adam_ims8.ldif script.

To configure a Microsoft ADAM policy store

1. Configure the directory as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Modify the adam_ims8.ldif schema file as follows:

   a. In a text editor, open the adam_ims8.ldif\.ldif file. The default Windows location is:

      C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas\MicrosoftActiveDirectory

   b. Replace every cn={guid} reference with the string you found when you configured the SiteMinder policy store in Step 1 of this procedure.

      For example, if the guid string is CN={39BC711D-7F27-4311-B6C0-68FDEE2917B8}, then replace every cn={guid} reference with CN={39BC711D-7F27-4311-B6C0-68FDEE2917B8}.

   c. Save the file.

3. Add the schema file as described in the documentation for your directory.

Configure CA Directory Server

To configure a CA Directory policy store

1. Configure the directory as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Copy etrust_ims8.dxc to *dxserver_home*\config\schema

   where *dxserver_home* is the directory where CA Directory is installed. The default source location for this file on Windows is C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas\eTrustDirectory.

3. Create a custom schema configuration file as follows:

   a. Copy the *dxserver_home*\config\schema\default.dxg to *dxserver_home*\config\schema*company_name*-schema.dxg.

   b. Edit the *dxserver_home*\config\schema*company_name*-schema.dxg file by adding the following lines to the bottom of the file:

   ```
   # Identity Manager Schema
   source "etrust_ims8.dxc";
   ```

4. Edit the *dxserver_home*\bin\schema.txt file by adding the contents of etrust_ims_schema.txt to the end of the file. The default source location for this file on Windows is C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas\eTrustDirectory.

5. Create a custom limits configuration file as follows:

   a. Copy the *dxserver_home*\config\limits\default.dxc to *dxserver_home*\config\limits*company_name*-limits.dxc.

   b. Increase the default size limit to 5000 in the *dxserver_home*\config\limits*company_name*-limits.dxc file as follows:

   ```
   set max-op-size=5000
   ```

   Note: If you upgrade CA Directory, the limits.dxc file is overwritten, therefore you must reset max-op-size to 5000 after the upgrade is completed.

6. Edit the *dxserver_home*\config\servers*dsa_name*.dxi as follows:

   ```
   # schema
   source "company_name-schema.dxg";

   #service limits
   source "company_name-limits.dxc";
   ```

   where *dsa_name* is the name of the DSA using the customized configuration files.

7. Run the dxsyntax command.

   This utility reports any errors with the directory configuration. If this utility runs with no errors, continue to Step 8.

8. Stop and restart the DSA as the dsa user to make the schema changes take effect, as follows:

   ```
   dxserver stop dsa_name
   dxserver start dsa_name
   ```

Configure Novell eDirectory Server

To configure an Novell eDirectory Server policy store, you apply the novell_ims8.ldif script.

To configure an Novell eDirectory policy store

1. Configure the directory as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Find the DN of the NCPServer for your Novell eDirectory Server by entering the following information in a command window on the system where the Policy Server is installed:

   ```
   ldapsearch -h hostname -p port -b container -s sub
   -D admin_login -w password objectClass=ncpServer dn
   ```

   For example:

   ```
   ldapsearch -h 192.168.1.47 -p 389 -b "o=nwqa47container" -s sub -D
   "cn=admin,o=nwqa47container" -w password objectclass=ncpServer dn
   ```

3. Open the novell_ims8.ldif file.

4. Replace every NCPServer variable with the value you found in Step 2.

   The default location for novell_ims8.ldif on Windows is:

   C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\policystore-schemas\NovelleDirectory

   For example, if the DN value is cn=servername,o=servercontainer, you would replace every instance of *NCPServer* with cn=servername,o=servercontainer.

5. Update the eDirectory Server with the novell_ims8.ldif file.

   See the Novell eDirectory documentation for instructions.

Configure Oracle Internet Directory (OID)

To configure an Oracle Internet Directory policy store

1. Configure the directory as a supported SiteMinder Policy Store.

   Note: Be sure that SiteMinder is pointing to this policy store. For configuration instructions, see the *CA SiteMinder Policy Server Installation Guide.*

2. Update the Oracle Internet Directory Server with the oracleoid_ims8.ldif file. The default installation location for this file on Window is:

   C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\policystore-schemas\OracleOID\

   See the Oracle Internet Directory documentation for instructions.

3. Start the Policy Server services as follows:

   a. Open the Policy Server Management Console.

   b. Click the Update button in the console and verify that the services started successfully.

Note: If you experience a timeout when searching for Admin roles using the wildcard (*) character, create a SearchTimeout string value in the LdapPolicy key in the registry. Set the value to a number greater than 20 seconds, which is the default search timeout, then restart the Policy Server services.

To access the registry on Windows, open Start, Run. Enter REGEDT32 in the Run window. On Solaris, open *policy_server_home*/registry/sm.registry.

The LdapPolicy key is located in:

HKEY_LOCAL_MACHINE\SOFTWARE\Netegrity\SiteMinder\CurrentVersion\Ds\

Verify the Policy Store

To verify the policy store, confirm the following:

- Your Policy Server log does not contain a section of warnings that begins with the following:

  ```
  *** IMS NO SCHEMA BEGIN
  ```

  Note: For SiteMinder r6.x, check smps.log.

  This warning appears only if you have installed the Extensions for the SiteMinder Policy Server, but you have not extended the Policy Store schema.

- The Identity Manager objects exist in the policy store database or directory. The Identity Manager objects begin with an ims prefix.

Start the Servers

After you have configured the Policy Store, you start the application server and other servers in the installation.

- WebSphere (see page 263)
- JBoss (see page 264)
- WebLogic (see page 264)

Start the Servers for WebSphere

Once all configuration is complete, start the servers in the correct order.

To start the servers

1. Start one of the SiteMinder Policy Servers that supports Identity Manager.

   Note: If you have a Policy Server cluster, only one Policy Server should be running while you create Identity Manager directories, create or modify Identity Manager environments, or change WorkPoint settings.

2. Run the Deployment Manager if you have a WebSphere cluster.

   If have only a single node installation, skip to Step 7.

3. On the first managed node, complete the following steps:

   a. Navigate to *was_home*\WebSphere\AppServer\bin.

   b. Execute the startNode.bat\.sh command.

      The first managed node starts.

4. Repeat Step 3 on each node in the cluster.

5. Start each cluster member in Servers, Clusters, *cluster name*, Cluster Members in the WebSphere Administrative Console on the Deployment Manager.

6. Be sure that the messaging engine for the cluster is running in Service integration, Buses, iam_im-IMSBus, Messaging Engines in the WebSphere Admin Console on the Deployment Manager.

7. Start the Web Server where you installed the SiteMinder Web Agent and the application server proxy plug-in.

Start the Servers for JBoss

Once all configuration is complete, start the servers in the correct order.

To start the servers for JBoss

1. Start one of the SiteMinder Policy Servers that supports Identity Manager.

   Note: If you have a Policy Server cluster, only one Policy Server should be running while you create Identity Manager directories, create or modify Identity Manager environments, or change WorkPoint settings.

2. From a command line, navigate to:

   jboss_home/bin

3. Enter the following to start JBoss:

   - For Windows, single node installation:

     run.bat

   - For Windows, cluster installation:

     run.bat -c all

   - For UNIX:

     ./run.sh

   - For UNIX cluster installation:

     ./run.sh -c all

4. Start the Web Server where you installed the SiteMinder Web Agent and the application server proxy plug-in.

Start the Servers for WebLogic

Once all configuration is complete, start the servers in the correct order.

To start the servers

1. Start one of the SiteMinder Policy Servers that supports Identity Manager.

   Note: If you have a Policy Server cluster, only one Policy Server should be running while you create Identity Manager directories, create or modify Identity Manager environments, or change WorkPoint settings.

2. If neccessary, start the WebLogic Administration Server:

   a. Change to the domain directory you created for the cluster.

   b. Start WebLogic.

3. Start the clustered server instances by running the following command on each of the nodes you created:

   `startManagedWeblogic.cmd` *`ServerName AdminServerAddress:port`*

   Note: Before using the startManagedWebLogic.cmd file to start each node in the WebLogic cluster, update the paths in the file to point to the deployed iam_im.ear.ear on the managed server node. If these paths are not set correctly, errors occur when the cluster tries to start.

4. Use the WebLogic Node Manager to start the clustered Managed Server nodes from the Admin Server. This requires that the Node Manager is installed and running on each of the physical systems that hosts the clustered servers.

5. Start the Web Server where you installed the SiteMinder Web Agent and the application server proxy plug-in.

Verify SiteMinder Configuration

The Identity Manager Server installation contains a JSP page that you can use to verify that the application server connector is successfully forwarding requests to the application server.

The JSP pages installed with the Identity Manager Server are in this location:

admin_tools\samples\admin

The folder contains a readme.txt file with instructions for using the JSP pages.

In a browser, enter the following URL:

http://*web_server*/iam/im/ui/ping.jsp

For example:

http://MyServer.MyCompany.com/iam/im/ui/ping.jsp

If your application server connector is functioning, you receive a JSP page with an initial heading of Request Information. This page provides details about the processing of the request for the JSP page.

If the Web Agent you created is functioning correctly, information similar to the following appears under Request Headers in the page displayed in your browser:

```
SM_AUTHTYPE = Not Protected
SM_DOMAIN = domain
SMTRANSACTIONID = system-generated_id
```

For example:

```
SM_AUTHTYPE = Not Protected
SM_DOMAIN = .MyCompany.com
SMTRANSACTIONID = 41041aac-04ec-3edbc669-0a70-012d19d9
```

How to Configure Identity Manager Agent Settings

When Identity Manager integrates with SiteMinder, Identity Manager uses a built-in Identity Manager agent to communicate with the SiteMinder Policy Server. To tune the performance, configure the following connection settings for the Identity Manager agent.

1. Complete one of the following steps:
   - If Identity Manager is running on a WebLogic or WebSphere application server, edit the resource adapter in the policyserver_rar connector descriptor in the application server's console.
   - If Identity Manager is running on a JBoss application server, open policyserver-service.xml from <JBoss_home>\jboss-4.0.5\server\default\deploy\iam_im.ear\policyserver_rar\META-INF.
2. Configure the settings as follows:

   ConnectionMax

   Sets the maximum number of connections to the policy server, for example, 20.

   ConnectionMin

   Sets the minimum number of connections to the policy server, for example, 2.

   ConnectionStep

   Sets the number of additional connections to open when all the agent connections are in use.

   ConnectionTimeout

   Specifies the amount of time in seconds that the agent should wait to connect to SiteMinder before timing out.
3. Restart the application server.

Configure SiteMinder High Availability

If you have created a SiteMinder Policy Server cluster, you can configure an application server cluster to use it for load balancing and failover.

To configure SiteMinder high availability for a cluster

1. Edit the ra.xml file in this location:

   WebSphere:
   WAS_PROFILE/config/cells/*CELL_NAME*/applications/iam_im.ear/deployments/IdentityMinder/policyserver_rar/META-INF
   Jboss:*jboss_home*/server/all/farm/iam_im.ear/policyserver_rar/META-INF
   WebLogic: *wl_domain*/applications/iam_im.ear/policyserver_rar/META-INF

2. Modify these items, which are explained in the sections that follow:
   - Connection settings for the Policy Server
   - The number of Policy Servers
   - The selection of load balancing or failover for the cluster.
3. Repeat these steps for each Identity Manager server in the cluster.
4. Restart the application server for changes to take effect.

Note: When you are creating a Identity Manager directory or an environment or modifying directory or environment settings, set SiteMinder Failover and FailoverServers to false. Otherwise, the directory object could be created but not replicated in time to be used. For example, you create a directory in Server 1. Then, you create an attribute using the object ID of that directory on Server 2, but the second directory does not exist yet. You receive an Object not Found error.

Modify Policy Server Connection Settings

The Policy Server connection information should reflect the primary server for the production environment. This information consists of the ConnectionURL, the user name and password for the SiteMinder Admin account, and the name and shared secret for the Agent.

In the following example, the values to edit appear in CAPITAL LETTERS.

```
<config-property>
        <config-property-name>ConnectionURL</config-property-name>
   <config-property-type>java.lang.String</config-property-type>
        <config-property-value>DEVELOPMENT.SEVERCOMPANY.COM,VALUE,VALUE,VALUE</co
nfig-
                property-value>
</config-property>
```

```
<config-property>
        <config-property-name>UserName</config-property-name>
   <config-property-type>java.lang.String</config-property-type>
        <config-property-value>SITEMINDER-ADMIN-NAME</config-property-
                value>
</config-property>

<config-property>
        <config-property-name>AdminSecret</config-property-name>
        <config-property-type>java.lang.String</config-property-type>
        <config-property-value>ENCRYPTED-PASSWORD</config-
                property-value>
</config-property>
<config-property>
        <config-property-name>AgentName</config-property-name>
        <config-property-type>java.lang.String</config-property-type>
        <config-property-value>DEVELOPMENT-AGENT-NAME</config-property-
                value>
</config-property>

<config-property>
        <config-property-name>AgentSecret</config-property-name>
        <config-property-type>java.lang.String</config-property-type>
        <config-property-value>ENCRYPTED-AGENT-SECRET</config-
                property-value>
</config-property>
```

Note: For the values that require encrypted text, use the Identity Manager password tool. For more information, see the *Configuration Guide*.

Add More Policy Servers

To add more Policy Servers to the Identity Manager installation instance, edit the FailoverServers entry in the ra.xml file.

Note: Include the primary Policy Server and all failover servers in the FailoverServers entry.

For each Policy Server, enter an IP address followed by port numbers for authentication, authorization, and accounting services. Use a semi-colon to separate entries as shown here:

```
<config-property>
        <config-property-name>FailoverServers</config-property-name>
        <config-property-type>java.lang.String</config-property-type>
        <config-property-value>
                172.123.123.123,44441,44442,44443;172.123.123.124,33331,
                33332,33333
        </config-property-value>
</config-property>
```

Select Load Balancing or Fail Over

The default behavior of Identity Manager is to use round-robin load balancing using the servers identified by the ConnectionURL and FailoverServers. Load balancing occurs if you leave FailOver set to false.

To select failover, set FailOver to true:

```
<config-property>
        <config-property-name>FailOver</config-property-name>
        <config-property-type>java.lang.String</config-property-type>
        <config-property-value>true</config-property-value>
</config-property>
```

Adding SiteMinder to an Existing CA Identity Manager Deployment

This section provides detailed instructions for adding CA SiteMinder to an existing Identity Manager environment (after Identity Manager has been installed). Before you begin, ensure that you have access to the following documents for reference:

- *CA SiteMinder Policy Server Installation Guide*
- *CA SiteMinder Web Agent Installation Guide*

To add CA SiteMinder to an existing Identity Manager environment

Important! All existing password policy configurations will be lost. Password policies are not portable when moving from an environment without SiteMinder to an environment with SiteMinder.

1. Be sure you have a Web Server.
2. Install and configure a Web Server to the application server proxy forwarder.
3. Install and configure a SiteMinder Policy Server and Web Agent for this Web Server.

   Note: For more information, see the *CA SiteMinder Policy Server Installation Guide* and the *CA SiteMinder Web Agent Installation Guide*.
4. Import the Identity Manager policy store schema to the policy store.

5. Run the Identity Manager installer on the machine where the SiteMinder Policy Server is installed.

   Select *only* the Extensions for SiteMinder option when you run the installer.

6. In the Management Console, export the Identity Manager directories and environments.

7. Delete all directories and environments after the export completes.

8. Edit the ra.xml file located in \iam_im.ear\policyserver.rar\META-INF, as follows:

   a. Set Enabled = true.

   b. In the ConnectionURL property, fill in the IP or hostname of the SiteMinder Policy Server.

   c. In the UserName property, fill in the name of the SiteMinder administrator.

   d. Encrypt the SiteMinder administrator's password using the Identity Manager Password Tool and put it in the AdminSecret property. The Password Tool can be found in:

      admin_tools\PasswordTool\pwdtools.bat.

      admin_tools

         The installed location of the Administrative Tools, which are installed in one of the following locations:

         Windows: C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools

         UNIX: /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools

   e. In the AgentName property, fill in the name of the Agent.

   f. Encrypt the Agent's password using the Identity Manager Password Tool and put it in the AgentSecret property.

9. Edit the web.xml file located in iam_im.ear\ user_console.war\WEB-INF, and set the FrameworkAuthFilter property to Enabled = false.

   Note: For WebSphere, the web.xml is located in *WebSphere_home*/AppServer/profiles/*Profile_Name*/config/cells/*Cell_name*/applications/iIam_im.ear/deployments/IdentityMinder/user_console.war/WEB-INF

10. (WebSphere Only) Update the policyServer object in the Administrative Console with same values as in the ra.xml file.

11. Restart the application server.

12. For an RDB user store only, do the following:

    a. Configure a data source that SiteMinder will use to connect to the user directory.

       Note: For more information on configuring the data source, see the *CA SiteMinder Policy Server Installation Guide*.

    b. Add the SiteMinder data source information to the directory by editing the directory.xml file. In the directory.xml file, locate the line containing the <JDBC datasource="jdbc/userstore"/> tag and add the following line after it, with your user name and encrypted password:

       ```
       <Credentials
       user="<your-user>">{PBES}:gSex2/BhDGzEKWvFmzca4w==</Credentials>
       <DSN name="<name of the data source you created>"/>
       ```

13. Enable the Web Agent by modifying the webagent.conf file in the Web Agent folder and setting it to Enabled = yes.

    In order to test the Web Agent configuration, go to the Management Console by using the Web Server port instead of the application server port.

14. Import the directory.xml from Step 6 to create a new Identity Manager directory.

15. Repeat Step 14 for all directories.

16. In the environment ZIP file created in Step 6, edit the environment.xml file and add the SiteMinder Agent, as follows:

    ```
    agent="SiteMinder_agent_name"
    ```

17. Import the ZIP file to recreate the Identity Manager environment.

    Note: Be sure that you re-establish all of your connection objects, such as JDBC or reporting connections, after recreating the environment.

18. Repeat Step 16 and Step 17 for all environments.

19. Restart the application server.

Removing SiteMinder from an Existing CA Identity Manager Deployment

This section provides detailed instructions for removing CA SiteMinder from an existing Identity Manager environment.

To remove CA SiteMinder from an existing Identity Manager environment

Important! Some password policy functionality will be lost when you remove SiteMinder from your environment. Also, any password history information will not be accessible after the migration.

1. Stop the application server.
2. Disable the Policy Server in the ra.xml file located in \iam_im.ear\policyserver.rar\META-INF by setting Enabled = false.
3. Edit the web.xml file located in \iam_im.ear\User_console.war/WEB-INF and set the FrameworkAuthFilter property to Enabled = true.

   Note: For WebSphere, the web.xml file is located in *WebSphere_home*/AppServer/profiles/*Profile_name*/config/cells/*Cell_name*/applications/iam_im.ear/deployments/IdentityMinder/user_console.war/WEB-INF.
4. Start the application server.
5. (WebSphere only) Update the policyServer object in the Administrative Console with same values as in the ra.xml file.

SiteMinder Operations

The following sections discuss how to modify SiteMinder features, including policy domains and authentication schemes, to support Identity Manager:

Collect User Credentials Using a Custom Authentication Scheme (see page 273)

Changes the method that Identity Manager uses to collect credentials for users who try to access a Identity Manager Environment.

Configure Access Roles (see page 274)

Provides access to functions in an application.

Configure the LogOff URL (see page 288)

Prevents unauthorized access to a Identity Manager Environment by enforcing a full logout.

Update an Alias in SiteMinder Realms (see page 289)

Updates the realms that protect a Identity Manager Environment when you change the Environment's alias.

SiteMinder Passwords **(see page 291)**

Lets you to change the password for the administrator account that Identity Manager uses to communicate with SiteMinder, and the shared secret for the SiteMinder agent that protects a Identity Manager Environment.

Configure Identity Manager Agent Settings **(see page 266)**

Tunes the performance of the Identity Manager agent that communicates with the SiteMinder Policy Server.

Use Different Directories for Authentication and Authorization **(see page 292)**

Enables administrators who have profiles in one directory to manage users in a different directory.

Improve the Performance of LDAP Directory Operations

Increases the throughput of Identity Manager requests to the user store by configuring SiteMinder to open multiple connections to the same directory.

Collect User Credentials Using a Custom Authentication Scheme

SiteMinder uses an authentication scheme to collect user credentials and determine a user's identity at login time. Once a user is identified, Identity Manager generates a personalized User Console based on the user's privileges.

You can implement any SiteMinder authentication scheme to protect an Identity Manager Environment.

For example, you can implement an HTML Forms Authentication Scheme, which collects credentials in an HTML form. Using an HTML form lets you create a login page that may include branding elements, such as a company logo, and links to the self-registration and forgotten password pages.

Note: For information about authentication schemes, see the *CA SiteMinder Policy Server Configuration Guide*.

To collect user credentials using a custom authentication scheme

1. Log into one of the following interfaces:
   - For CA SiteMinder Web Access Manager r12 or higher, log in to the Administrative UI
   - For CA eTrust SiteMinder 6.0 SP5, log in to the Policy Server User Interface

   Note: For information about using these interfaces, see the documentation for the version of SiteMinder that you are using.
2. Create an authentication scheme as described in the *CA SiteMinder Policy Server Configuration Guide*.
3. Modify the realm that protects the appropriate Identity Manager Environment to use the authentication scheme you created in Step 1.

   The realm name has the following format:

   *Identity Manager-environment*_ims_realm

   Note: If you configured support for public tasks, you see an additional realm, *Identity Manager-environment*_pub_realm. This realm uses an anonymous authentication scheme to enable unknown users to use the self-registration and forgotten password features without supplying credentials. Do not modify the authentication schemes for these realms.

How to Configure Access Roles

Access roles enable centralized management of user privileges in external applications secured by SiteMinder. Identity Manager administrators can create and assign roles in the Identity Manager User Console that determine users' access to applications outside of CA Identity Manager. For example, a Role Administrator may create roles in the User Console that control access to a finance application, and grant the ability to assign the roles to the Help Desk administrator. The Help Desk administrator can assign or revoke that role through the User Console.

Access roles are enabled through integration with SiteMinder. SiteMinder associates roles with policies to determine which users can access a protected resource and to deliver user-specific role and task information to protected resources.

Access roles require configuration in Identity Manager and SiteMinder. Two administrators are involved:

- The Identity Manager administrator creates access roles and tasks in Identity Manager. The default System Manager and Access Role Manager roles include these tasks.
- The SiteMinder administrator manages System and Domain objects in CA SiteMinder. The SiteMinder administrator must have System scope.

  Note: For more information, see the *Policy Server Configuration Guide*.

The following procedure outlines the steps to create an access role. Review these steps *before* configuring access roles for use with SiteMinder.

1. An Identity Manager administrator completes the following tasks:
   a. Enables access roles and tasks for use with SiteMinder.
   b. Creates access tasks.
   c. Creates an access role.
   d. Communicates role and task information to the SiteMinder administrator for the purpose of creating Siteminder role-based access control policies.
2. A SiteMinder administrator creates a role-based access control policy by completing the following steps:
   a. Assigning a user directory that is associated with one or more Identity Manager environments to a Policy Domain.
   b. Associating one or more Identity Manager environments with the Policy Domain in step 1.
   c. Creating realms and rules in the Policy Domain (if they do not already exist). The realms and rules should correspond to the resources to which the access roles will grant access.
   d. Creating policies and binding them to roles from the Identity Manager environment.
   e. (optional) Specifying responses which deliver entitlement information to the protected resources.

   Note: For detailed instructions on these steps, see the *Policy Server Configuration Guide*.

More information:

Enable Access Roles for Use with SiteMinder (see page 276)

Enable Access Roles for Use with SiteMinder

To use access roles with CA SiteMinder, CA Identity Manager mirrors all objects in the Identity Manager object store related to those access roles in the SiteMinder policy store. To enable this to occur, you configure a property in the Identity Manager Management Console.

To enable access roles for use with SiteMinder

1. Open the Management Console.
2. Select Environment, *Your Environment*, Advanced Settings, Miscellaneous.
3. Add a new property by providing the following information:
   - In the Property field, enter the following:

     EnableSMRBAC
   - In the Value field, enter the following:

     true
4. Click Add. Then, click Save.

   A message indicating that the environment needs to restart appears.
5. Click Restart Environment.

   CA Identity Manager now supports access roles and tasks for use with CA SiteMinder.

Once you enable access roles for use with CA SiteMinder, note the following:

- If you used access roles in CA Identity Manager r8x, you need to perform an additional migration step to manage those access roles in the current version of CA Identity Manager. For more information, see the *Upgrade Guide.*
- To disable support for access roles in SiteMinder, delete the Identity Manager access role and task objects from the SiteMinder policy store. Then, remove the “EnableSMRBAC” Property from the Miscellaneous Properties list and restart the Environment.

Create an Access Task

An access task is a single action that a user can perform in a business application, such as generating a purchase order in a finance application. Users can perform that action when they are assigned an access role that includes the access task.

To create an access task

1. Select Roles and Tasks, Access Tasks, Create Access Task.
2. Select one of the following options:
   - Create a new access task
   - Create a copy of an access task
3. Complete these fields:

   Name

   A unique name you assign to the task, such as Generate Purchase Order.

   Tag

   A unique tag for the task. The tag must start with a letter or an underscore character and contain letters, numbers, or underscores only.

   Description

   An optional note about the purpose of the task.

   Application ID

   An identifier for an application, such as the application name, associated with the task. The application ID cannot contain any spaces or non-alphanumeric characters.

   Make note of this ID; you need it when you enable the role in SiteMinder.
4. To complete the access task, click Submit.

How to Create an Access Role

An access role contains access tasks, which provide access to functions in an application. For example, a role may contain tasks that enable role members to place an order in a purchasing application and update quantities in an inventory control application.

You complete the following steps to create an access role:

1. Begin access role creation. (see page 278)
2. Define basic properties for the access role in the Profile tab. (see page 278)
3. Select access tasks for the role. (see page 278)
4. Define member policies for the role. (see page 279)
5. Define admin policies for the role. (see page 280)
6. Define owner rules for the role. (see page 281)

Begin Access Role Creation

1. Log into an Identity Manager account with a role that includes a task for creating access roles.
2. Click Access Roles, Create Access Role.

   Choose the option to create a new role or a copy of role. If you select Copy, search for the role.
3. Continue with next section, Define the Profile of an Access Role.

Define the Profile of an Access Role

To define the profile of an access role

1. Enter a name, description, and complete any custom attributes defined for the role.

   Note: You can specify custom attributes on the Profile tab that specify additional information about access roles. You can use this additional information to facilitate role searches in environments that include a significant number of roles.
2. Select Enabled if you are ready to make the role available for use as soon as you create it.
3. Continue with the next section, Define Member Policies for an Access Role.

Select Access Tasks for the Role

On the Tasks tab:

1. Select the tasks to include in this role. First, select the applications, then the task. You can include tasks from different applications:

   Note: If another role has the tasks you need, click Copy Tasks from another role. You can edit the list that appears.

In creating a role or task, you see icons for adding, editing and removing items:

Go forward or select the current item to view or edit it.

If JavaScript is disabled, press the forward button to select from a drop down list.

Go back or undo a previous selection.

Insert an element, such as a task or rule.

Delete the current task or, in a rule, the expression that follows.

Move the current item up in the list.

Move the current item down in the list.

2. Continue with the next section, Define Admin Policies for an Access Role.

Define Member Policies for an Access Role

A member policy defines a member rule and scope rules for a role. You can define several member policies for one role. For each policy, if a user meets the condition in the member rule, that user has the scope for using the role that is defined in the policy.

To define member policies for access roles

1. Select the Members tab.
2. Select Add to define the member policies.
3. (Optional) On the Member Policy page, optionally define a member rule for who should be able to use this role.

   This automatically assigns the role to users who match the criteria in the member policy.

   Note: Define member policies that use only directory attributes, for example: title=Manager.If you define member policies that include references to objects that are not stored in the user directory, such as admin roles, SiteMinder will not be able to resolve the reference.

4. Verify that the Member Policy appears on the Members tab.

   To edit a policy, click the arrow symbol on the left. To remove it, click the minus sign icon.

5. On the Members tab, enable the Administrators can add and remove members of this role check box.

   Once you enable this feature, you define the Add Action and Remove Action. These actions define what happens when a user is added or removed as a member of the role.

Define Admin Policies for an Access Role

An admin policy defines admin rules, scope rules, and administrator privileges for a role. You can define several admin policies for a role. Each policy indicates that if an administrator meets the condition in the admin rule, that administrator has the scope and administrator privileges defined for the policy.

To define admin policies for access roles

1. Select the Administrators tab for the access role.
2. If you want to make the Manage Administrators option available, enable the Administrators can add and remove administrators of this role check box.

   Once you enable this feature, define the actions for when a user is added or removed as an administrator of the role.

3. On the Administrators tab, add admin policies that include admin and scope rules and administrator privileges. Each policy needs at least one privilege (Manage Members or Manage Administrators).

   You can add several admin policies with different rules and different privileges for administrators who meet the rule.

   Note: Define admin policies that use only directory attributes, for example: title=Manager.If you define admin policies that include references to objects that are not stored in the user directory, such as admin roles, SiteMinder will not be able to resolve the reference.

4. To edit a policy, click the arrow symbol on the left. To remove it, click the minus sign icon.
5. Continue with the next section, Define Owner Rules for an Access Role.

Define Owner Rules for an Access Role

An owner rule defines who can modify a role. You can define several owner rules for a role.

To define an owner rule

1. Select the Owners tab for the access role.
2. Define owner rules, which determine which users can modify the role.

   Note: Define owner rules that use only directory attributes, for example: title=Manager.If you define owner rules that include references to objects that are not stored in the user directory, such as admin roles, SiteMinder will not be able to resolve the reference.
3. Click Submit.

   A message appears to indicate that the task has been submitted. A momentary delay may occur before a user can use the role.

Access Roles in SiteMinder

To configure roles-based access control to protected resources, a SiteMinder administrator associates an Identity Manager Environment with a Policy Domain in the Policy Server User Interface. The administrator creates a policy to protect an application and associates a role or roles with that policy. Users who have an associated role can access the protected application.

A SiteMinder administrator binds roles to security policies that define how users interact with resources. Policies may link the following objects:

- Users and User Groups

  Identify a set of users affected by a policy.
- Roles

  Identify users who have been assigned a set of privileges in Identity Manager.
- Rules

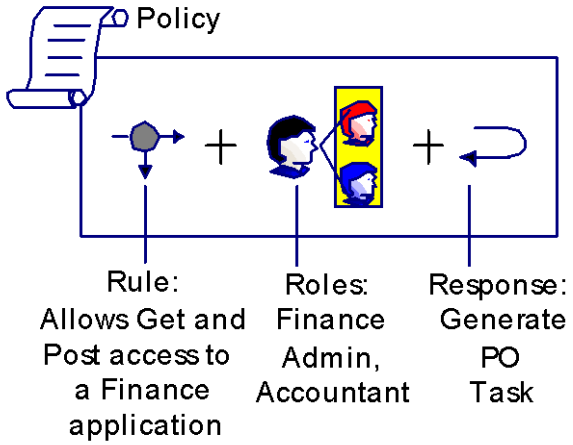
  Identify a resource and the actions that are allowed or denied for the resource. The resource is typically a URL, application, or script.
- Responses

  Determine a reaction to a rule. When a rule fires, responses are returned to a SiteMinder Agent.

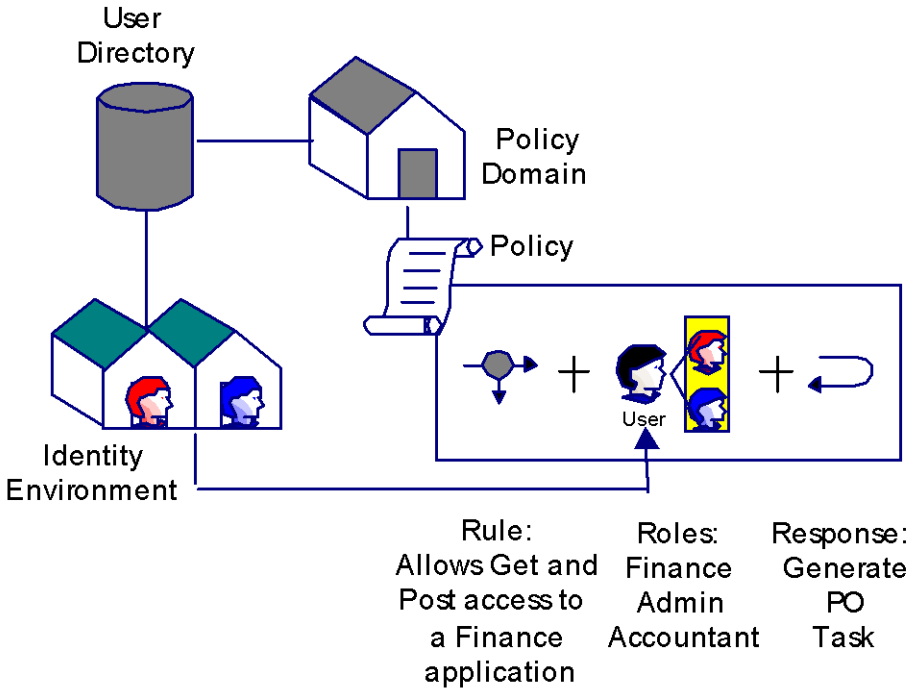
  Identity Manager uses SiteMinder responses to deliver specific task and role information to a protected resource.

You can bind SiteMinder policies to users, or to roles, or to users *and* roles. When a user or role member attempts to access a protected resource, SiteMinder uses information in the policy to determine whether to grant access, and to trigger responses.

The following figure illustrates the relationship of policy objects in a role-based policy.



SiteMinder policies are created in policy domains, which logically tie user directories to protected resources. The following figure illustrates the relationship of policy objects in a role-based policy.



To supply user entitlements to a protected application, a SiteMinder administrator pairs a rule in the application's policy with a response. The response contains a SiteMinder-generated response attribute that retrieves entitlement information from Identity Manager.

When SiteMinder authorizes a role member for a protected resource, the following events take place:

1. The policy's rule executes in SiteMinder, triggering the paired response.
2. The Policy Server obtains entitlement information from Identity Manager to include in a response.
3. The Policy Server passes the response attribute to the Web Agent.
4. The Web Agent makes the entitlement information available to the application as an HTTP header variable or a cookie.

SiteMinder-Generated Response Attributes

Identity Manager passes entitlement information to applications through SiteMinder Web Agent responses. These responses contain HTTP header variables in response attributes, which can be used by the application to determine a user's access privileges. Responses are included in SiteMinder policies, which determine how users interact with a protected resource.

SiteMinder administrators can configure a response that includes two types of response attributes to pass information to an application:

- SM_USER_APPLICATION_ROLES[:*application id*]--Returns a list of roles assigned to a user
- SM_USER_APPLICATION_TASKS[:*application id*]--Returns a list of tasks a user can perform based on roles assigned to him

The application ID limits the requested set of roles and tasks to a specific application. For example, if you create the following response attribute:

SM_USER_APPLICATION_ROLES:Finance_application

SiteMinder returns the roles that have tasks in the Finance application to the Web Agent, which then passes the information to the Finance application.

Note: The *application id* you supply should match an *application id* you supplied when you used Create Access Task in Identity Manager. If you have not yet created the task, the application ID can be any name that you choose, but it cannot contain any spaces or non-alphanumeric characters.

You can specify multiple application IDs in a comma-delimited list to return the set of roles and tasks from multiple applications in a single response attribute. For example, to return the list of roles that a user has in the Finance and Purchasing applications specify the following:

SM_USER_APPLICATION_ROLES:Finance, Purchasing

How to Enable Access Roles in SiteMinder

The following steps assume that SiteMinder already protects the application to which the access role grants access. If you are creating an access role for an application that SiteMinder does not protect yet, see one of the following guides in the SiteMinder bookshelf:

- For SiteMinder 6.0 SP5, see the *Policy Design Guide*
- For SiteMinder 12.0 SP2, see the *Policy Server Configuration Guide*

Note: To configure access roles in SiteMinder, use the Policy Server User Interface, an applet–based application, instead of the SiteMinder Administrative UI. In SiteMinder 12, this applet is named the SiteMinder Federation Security Services Administrative UI (FSS Administrative UI). You can install the FSS Administrative UI using the Policy Server installer.

To enable access roles in SiteMinder, you complete the following high-level steps:

1. In the Policy Server User Interface, associate a user directory and an Identity Manager environment with a Policy Domain (see page 285).
2. In the Policy Domain, create realms and rules (if they do not exist) that correspond to the resources to which the access role grants access.

   Note: For information about creating realms and rules, see one of the following guides in the SiteMinder bookshelf:

   - For SiteMinder 6.0 SP5, see the *Policy Design Guide*
   - For SiteMinder 12.0 SP2, see the *Policy Server Configuration Guide*
3. Create a response (see page 286) to pass entitlement information to the resource.
4. Create a policy and associate it with the following objects:

   - The access role (see page 287)
   - The realms and rules you created in step 2.
   - The responses you created in step 3.

   Note: For information on creating policies, see the *Policy Design Guide* (for SiteMinder 6.0 SP5) or the *Policy Server Configuration Guide* (for SiteMinder 12.0 SP2).

Add Identity Manager Environments to a Policy Domain

To enable SiteMinder to support access roles, you associate an Identity Manager environment with a user directory and a policy domain in SiteMinder.

Note: Add the user store associated with the Identity Manager environment to the policy domain *before* you can add the Identity Manager environment to the policy domain.

To add an Identity Manager Environment to a policy domain

1. In the Policy Domain dialog in the Policy Server User Interface, add the user store associated with the Identity Manager environment with a policy domain as follows:

   a. Select the User Directories tab.

   b. From the drop-down list box at the bottom of the tab, select the user directory to include in the policy domain.

c. Click the Add button.

The Policy Server User Interface adds the directory to the list displayed in the User Directories tab.

d. Click Apply.

2. Add the Identity Manager environment to the policy domain as follows:

a. Select the Identity Manager Environments tab.

b. Select the Identity Manager Environment that you want to associate with the policy domain from the drop-down list at the bottom of the tab.

c. Click Add.

The Policy Server User Interface adds your selection to the list of Identity Manager environments at the top of the tab.

3. Click OK to save your selections and close the dialog.

The Identity Manager environments that you selected are available when you create policies.

Create a SiteMinder Response

1. Log into the Policy Server User Interface.
2. Depending on your administrative privileges, do one of the following:
   - If you have the Manage System and Domain Objects privilege:
     a. In the Object pane, click on the Domains tab.
     b. Select the policy domain to which you want to add a response.
   - If you have the Manage Domain Objects privilege, select the policy domain to which you want to add a response in the Object pane.
3. From the menu bar, select Edit, <domain name>, Create Response.

   The SiteMinder Response dialog opens (see Response Dialog).
4. Enter a name and description for the new response.
5. In the Agent Type group box, select the SiteMinder radio button.
6. Select the Web Agent option from the drop-down list in the Agent Type group box and click Apply to save your changes.
7. Click Create.

   The SiteMinder Response Attribute Editor dialog opens.
8. From the Attribute drop down list, select the WebAgent-HTTP-Header-Variable response attribute.
9. In the Attribute Setup tab, select the User Attribute radio button.

10. In the Variable field, enter the name of the variable that will be passed to the application.

    For example, if you specify the variable TASKS, the following header is returned to the application:

    HTTP_TASKS

11. In the Attribute Name field, specify the response attribute as follows:

    - SM_USER_APPLICATION_ROLES[:*application id1, application_id2, ...application_idn*]--Returns a list of roles assigned to a user
    - SM_USER_APPLICATION_TASKS[:*application id1, application_id2, ...application_idn*]

    SiteMinder-Generated Response Attributes (see page 284) provides more information.

12. Click OK to save your changes and return to the SiteMinder Administration window.

Add Roles to a SiteMinder Policy

When a user who has been assigned the appropriate access role tries to access a protected resource, the SiteMinder Policy Server verifies that the user has been assigned the access role, and then fires the rules included in the policy to see if the user is allowed to access the resource.

To add access roles to a SiteMinder policy

1. In the SiteMinder Policy dialog, click the Users tab.

   The Users tab contains tabs for each user directory and Identity Manager environment included in the policy domain.

2. Select the Identity Manager Environment that contains the roles you want to add to the policy.

3. Click the Add/Remove button.

   The SiteMinder Policy Identity Manager Role dialog opens.

4. To add roles to the policy, select an entry from the Available Members list and move it to the Current Members list.

5. Click OK to save your changes and return to the SiteMinder Policy dialog.

Exclude Roles in a Policy

In addition to using access roles to grant access to applications, you can also use access roles to prevent members of access roles from accessing an application. To prevent access role members from accessing an application, you exclude the roles from SiteMinder policies. When a user who has been assigned the excluded access role in Identity Manager tries to access a protected resource, the Policy Server verifies that the user has been assigned the excluded Identity Manager role, and blocks access to the resource.

To exclude Identity Manager roles from a policy

1. In the SiteMinder Policy dialog, click the Users tab.

   The Users tab contains tabs for each user directory and Identity Manager Environment included in the policy domain.

2. Click the Identity Manager Environment that contains the roles you want to exclude from your policy.

3. Click the Add/Remove button.

   The SiteMinder Policy Identity Manager Role dialog opens.

4. To add roles to the policy, select an entry from the Available Members list and click on the Left Arrow button, which points to the Current Members list.

   The opposite procedure removes roles from the Current Members list.

5. In the Current Members list, select the roles you want to exclude, and click the Exclude button located under the list.

   A red circle with a slash appears to the left of the excluded roles.

6. Click OK to save your changes and return to the SiteMinder Policy dialog.

Configure the LogOff URI

To protect an Identity Manager environment, configure the SiteMinder Web Agent that protects the environment to terminate a user session after the user logs off Identity Manager.

The Web Agent terminates a user session by deleting the SiteMinder session and authentication cookies from the Web browser and instructing the Policy Server to remove any session information.

To terminate the SiteMinder session, configure logout functionality in the LogOffURI field in the Agent Configuration Object for the SiteMinder agent that protects the Identity Manager environment.

Notes:

- A SiteMinder agent has one LogOff URI. All applications protected by the agent use the same logout page.
- When you configure custom logout pages in the Management Console as described in Configure Custom Logout Pages, Identity Manager sends the logout request to the custom logout page *and* the LogOff URI. However, Identity Manager displays only the custom logout page to the user.

To configure the LogOff URI

1. Log into one of the following interfaces:
   - For CA SiteMinder r12 or higher, log into the Administrative UI
   - For CA eTrust SiteMinder 6.0 SP5, log into the Policy Server User Interface

   Note: For information on using these interfaces, see the documentation for the version of SiteMinder that you are using.
2. Modify the #LogOffUri property in the Agent Configuration Object for the agent that protects the Identity Manager environment as follows:
   - Remove the pound sign (#)
   - In the Value field, specify the following URI:

     /iam/im/logout.jsp

   Note: You select an Agent Configuration Object when you install the Web Agent. For more information, see the *CA SiteMinder Web Access Manager Policy Server Installation Guide*.
3. Save the changes.
4. Restart the Web server.

Aliases in SiteMinder Realms

An *alias* is a unique string that is added to the URL for accessing an Identity Manager environment. For example, when an environment's alias is *employees*, the URL for accessing that environment is as follows:

`http://myserver.mycompany.org/iam/im/employees`

myserver.mycompany.org

Defines the fully qualified domain name of the server where Identity Manager is installed.

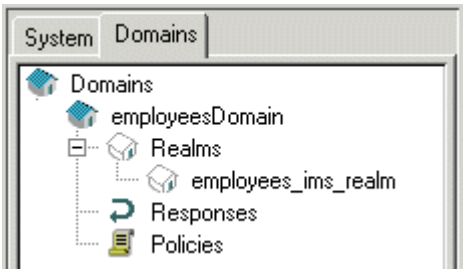
You specify at least one alias when you create an Identity Manager environment in the Management Console. (You may also specify a public alias.)

SiteMinder uses the environment name to name the objects that protect the environment. For example, when you specify the name *employees*, SiteMinder creates objects named *employeesobject_type*.

object_type

Defines the SiteMinder object, such as employees_ims_realm.

The following illustration shows two of the objects that SiteMinder creates:



Update an Alias in SiteMinder Realms

If you modify the protected or public alias in the Management Console, CA Identity Manager tries to update the alias names in the Policy Server. If CA Identity Manager cannot update the names, you must manually update them in one of the following interfaces:

- For CA SiteMinder Web Access Manager r12 or higher, use the Administrative UI
- For CA eTrust SiteMinder 6.0 SP5, use the Policy Server User Interface

To update the SiteMinder realm in the policy domain

1. Locate the realms for the Identity Manager Environment.

   These realms are created automatically (along with other required SiteMinder objects) when CA Identity Manager integrates with SiteMinder.

   The realms use the following naming convention:

   - *Identity Manager-environment*_ims_realm—Protects the User Console.
   - *Identity Manager-environment*_pub_realm—Enables support for public tasks, such as self-registration and forgotten password tasks. This realm appears only if you have configured a public alias.

     Note: If you are using the Policy Server User Interface to modify the realm, locate the policy domain (*Identity Manager-environment*Domain) for the Identity Manager environment first. The realms are located under the domain.

2. Modify the resource for the realm as follows:

   /iam/im/*new_alias*

   Do not remove the /iam/im/ that precedes the alias in the resource filter.

3. Save the changes.

Note: Modify Identity Manager Environment Properties provides instructions on changing the alias in the Management Console.

Modify a SiteMinder Password or Shared Secret

When you install the Identity Manager Extensions to the Policy Server, you supply the password for the SiteMinder administrator account that Identity Manager uses to communicate with the Policy Server

You can change the password; however, the password must be encrypted. To encrypt a password, use the password tool provided with Identity Manager.

Note: Before changing a SiteMinder password, be sure the JAVA_HOME variable is defined for your environment.

To modify a password

1. Encrypt the password as follows:

   a. From the command line, navigate to *admin_tools*\PasswordTool, where *admin_tools* is the installed location of the Administrative Tools, as in the following examples:

      - **Windows:** C:\Program Files\CA\Identity Manager\IAM Suite\Identity Manager\tools\PasswordTool
      - **UNIX:** /opt/CA/IdentityManager/IAM_Suite/Identity_Manager//tools/PasswordTool

   b. Type the following command:

      pwdtools *new_password*

      In this command, *new_password* is the password to encrypt.

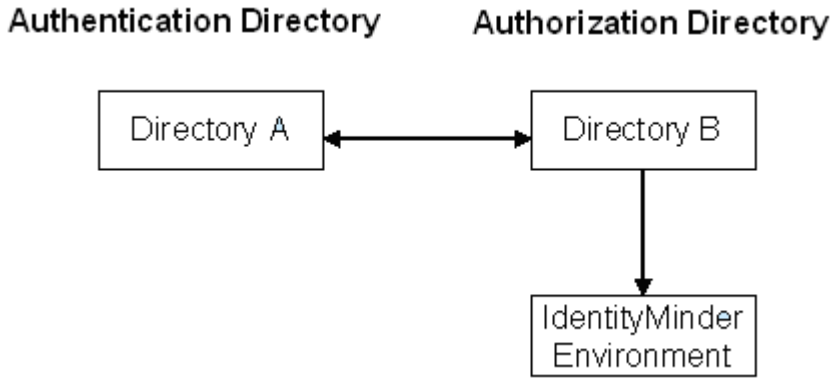
      The password tool generates the encrypted password.

   c. Copy the encrypted password.

2. Complete the relevant step as follows:
   - If Identity Manager is running on a WebLogic application server, do the following:
     a. In the WebLogic console, edit the WebLogic resource adapter in the policyserver_rar connector descriptor.
     b. Add the encrypted password as the value of the Password property.
   - If Identity Manager is running on a JBoss application server, do the following:
     a. Open ra.xml from *JBoss_home*\server\default\deploy\iam_im.ear\policyserver_rar\META-INF.
     b. Add the encrypted password as the value of the Password config-property.
   - If Identity Manager is running on a WebSphere application server, do the following:
     a. In the WebSphere console, open ra.xml.
     b. Add the encrypted password as the value of the Password config-property.
3. Restart the application server.

Configure an Identity Manager Environment to Use Different Directories for Authentication and Authorization

An administrator may need to manage users whose profiles exist in a different user store from the one that is used for authenticating the administrator. In other words, when logging in to the Identity Manager Environment, the administrator must be authenticated using one directory and authorized to manage users in a second directory, as shown in the following illustration:



To configure an Identity Manager Environment to use different directories for authentication and authorization

1. Log into one of the following interfaces:
   - For CA SiteMinder Web Access Manager r12 or higher, log into the Administrative UI
   - For CA eTrust SiteMinder 6.0 SP5, log into the Policy Server User Interface

   Note: For information on using these interfaces, see the documentation for the version of SiteMinder that you are using.
2. Create two user directories.

   One directory references the authentication data (administrator profiles); the other directory references the authorization data (user profiles).
3. In the Management Console, create an Identity Manager Environment.

   Select the authorization directory as the Identity Manager directory.
4. In the interface for the version of SiteMinder that you are using, add the authentication directory to the domain for the Identity Manager Environment that you created in the previous step.

   The domain and other objects required by SiteMinder are created automatically when you create an Environment and SiteMinder integrates with CA Identity Manager.

   The domain uses the following naming convention:

   *Identity Manager-environment*Domain
5. Make sure that this directory appears first in the list of directories associated with the domain.
6. Locate the *Identity Manager-environment*_ims_realm.
7. Map the authorization directory to the authentication directory in the Advanced section of the realm definition.
8. Locate the following *Identity Manager-environment*response_ims response
9. Add response attributes to the responses as follows:

Field	Value
Attribute	Web-Agent-HTTP-Header-Variable
Attribute Kind	user attribute
Variable Name	sm_userdn
Attribute Name	SM_USERNAME

10. Save the changes.

    CA Identity Manager will now use different directories for authentication and authorization.

Appendix A: FIPS 140-2 Compliance

This section contains the following topics:

FIPS Overview

The Federal Information Processing Standards (FIPS) 140-2 publication is a security standard for the cryptographic libraries and algorithms a product should use for encryption. FIPS 140-2 encryption affects the communication of all sensitive data between components of CA products and between CA products and third-party products. FIPS 140-2 specifies the requirements for using cryptographic algorithms within a security system protecting sensitive, unclassified data.

CA Identity Manager uses the Advanced Encryption Standard (AES) adapted by the US government. CA Identity Manager incorporates the RSA Crypto-J v3.5 and Crypto-C ME v2.0 cryptographic libraries, which have been validated as meeting the FIPS 140-2 Security Requirements for Cryptographic Modules.

Communications

FIPS encryption covers all data communications between Identity Manager and the following components:

- Identity Manager Server
- Provisioning Server
- Provisioning Manager and Clients
- C++ Connector Servers
- C++ Connector Server endpoints (if supported by endpoint)
- Java Connector Servers

- Java Connector Server endpoints (if supported by endpoint)
- Connector Xpress (if supported by endpoint)
- Windows Password Synchronization Agents
- Java Identity and Access Management (JIAM)
- Service Provisioning Markup Language (SPML)

Installation

The Identity Manager installer allows you to configure CA Identity Manager to comply with FIPS 140-2.

All components in an Identity Manager environment must be FIPS 140-2 enabled for CA Identity Manager to support FIPS 140-2. You need a FIPS encryption key to enable FIPS 140-2 during installation. To generate a FIPS encryption key, run the Password Tool (pwdtools.bat/pwdtools.sh) from where you unpacked the install package. The Password Tool is available in the following locations:

- Windows: *package root*\PasswordTool\bin\pwdtools.bat
- UNIX: *package root*/PasswordTool/bin/pwdtools.sh

Note: The Password Tool is also installed in the following location:

```
C:\Program Files\CA\Identity Manager\IAM Suite\Identity
Manager\PasswordTool\pwdtools.bat
```

Important! Use the same FIPS 140-2 encryption key in all installations, and be sure to safeguard the key file generated by the Password Tool.

Connecting to SiteMinder

When connecting to CA SiteMinder during Identity Manager installation, be aware that FIPS mode and product version configurations are supported only as listed in the following table:

Identity Manager r12	SiteMinder	SiteMinder Version
FIPS-only mode	FIPS-only mode	r12
FIPS-only mode	FIPS-compatible mode	r12
Non-FIPS mode	FIPS-compatible mode	r12

Identity Manager r12	SiteMinder	SiteMinder Version
Non-FIPS mode	Non-FIPS mode	r6

Key File Storage

CA Identity Manager uses the file system for FIPS encryption key storage. The Identity Manager administrator is responsible for protecting files from unauthorized access by setting the directory access permissions for specific group or user types, such as the user who is authorized to run CA Identity Manager.

The following table lists the location of the FIPS key files for each Identity Manager component.

Component	Installed Location
Identity Manager Server	*iam_im.ear*\config\com\netegrity\config\keys\FIPSkey.dat *iam_im.ear* is the installed location of CA Identity Manager on the application server.
Provisioning Server	*Provisioning Server install*\data\tls\keymgmt\imps_datakey
C++ Connector Server	*Provisioning Server install*\data\tls\keymgmt\imps_datakey
Password Synchronization Agent	*Provisioning Server install*\data\tls\keymgmt\imps_datakey

The Password Tool

The FIPS-compliant password tool utility, pwdtools.bat (or pwdtools.sh), can generate the encryption key during CA Identity Manager installation, from the command line.

Before using the password tool, edit the pwdtools.bat/pwdtools.sh file and set the JAVA_HOME variable as required.

Important! Because CA Identity Manager does not support data migration or re-encryption, you should not change encryption keys after installation.

This command has the following syntax:

```
pwdtools -[FIPSKEY|JSAFE|FIPS] -p [plain text] -k [key file location]
```

JSAFE

Encrypt a plain text value using non-FIPS algorithm.

Example:

```
pwdtools -JSAFE –p mypassword
```

FIPSKEY

Create a FIPS key file required by the installer. You generate the key before installing CA Identity Manager.

Example:

```
pwdtools -FIPSKEY –k C:\keypath\FIPSkey.dat
```

Where *keypath* is the full path to the location where you want the FIPS key to be stored.

The password tool creates the FIPS key in the location specified. During installation, you provide the location of the FIPS key file to the installer.

Note: Be sure to secure the key by setting the directory access permissions for specific group or user types, such as the user who is authorized to run CA Identity Manager.

FIPS

Encrypt a plain text value using a FIPS key file. This uses the existing FIPS key file.

Example:

```
pwdtools -FIPS –p firewall -k C:\keypath\FIPSkey.dat
```

Where *keypath* is the full path to the FIPS key directory.

Note: Use the same FIPS key file that you specified during installation.

Important! Because Identity Manager uses the FIPS key file to check whether the application is to start in FIPS mode or non-FIPS mode, the key file must be named FIPSKey.dat with the following application server deployment path:

```
iam_im.ear\config\com\netegrity\config\keys\FIPSkey.dat
```

where iam_im.ear is in the application server deployment directory, for example:

```
jboss_home\server\default\deploy
```

FIPS Mode Detection

To determine whether or not CA Identity Manager is operating in FIPS mode or non-FIPS mode, use the Identity Manager Environment status page.

To view the status page, enter the following URL in a browser:

`http://server_name/iam/im/status.jsp`

server_name

Determines the fully qualified domain name of the server where CA Identity Manager is installed, for example, myserver.mycompany.com. In this example, the complete URL is:

http://myserver.mycompany.com/iam/im/status.jsp

The FIPS status is displayed at the bottom of the page.

Note: You can also check if CA Identity Manager is operating in FIPS mode by locating the following key file:

`/config/com/netegrity/config/keys/FIPSkey.dat`

If this file exists, CA Identity Manager is operating in FIPS mode.

The FIPSkey.dat key file is created by the password tool utility, pwdtools.bat (or pwdtools.sh), during Identity Manager installation.

More Information:

The Password Tool (see page 297)

Encrypted Text Formats

The algorithm name is added to the encrypted text as a prefix. This informs Identity Manager which algorithm was used for encryption.

In FIPS mode, the prefix is {AES}. For example, if you encrypt the text "password", the encrypted text is similar to this:

{AES}:eolQCTq1CGPyg6qe++0asg==

In non-FIPS mode (or JSAFE mode), the prefix is {PBES}. For example, if you encrypt the text "password", the encrypted text is similar to this:

{PBES}:gSex2/BhDGzEKWvFmzca4w==

Encrypted Information

The following Identity Manager information is encrypted:

- Passwords in the datasource configuration for Jboss
- Forgotten password recovery information
- Provisioning Server callback secret
- Workflow session information
- Policy Server connection information

CA Identity Manager uses JSafe libraries to encrypt and decrypt data. To ensure that the libraries are not tampered with, CA Identity Manager uses CryptoJ self-test code during startup.

After the self-tests run, CryptoJ messages, which report the status of the test, appear in the application server log. The log will contain one of the following messages:

```
[ims.default] * CryptoJ was initialized properly.
```

```
[ims.default] !!! CryptoJ was not initialized properly. !!!
```

FIPS Mode Logging

The following CA Identity Manager components indicate in log files whether FIPS mode is enabled:

- Identity Manager Server
- Provisioning Server
- C++ Connector Server
- Java Connector Server
- Provisioning Manager
- Password Synchronization Agent

In all cases, the log entry indicating that FIPS mode is enabled ends with the following string:

FIPS 140-2 MODE: ON

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