# CA Identity Governance

## Installation Guide

12.6.02a

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# CA Technologies Product References

- This document references the following CA Technologies products:
- CA Identity Governance
- CA Identity Manager
- CA Single Sign On
- CA User Activity Reporting
- CA Service Desk Manager
- CA IAM Connector Server

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# Contents

Chapter 1: Installation Overview 9

Product Overview ... 9
Product Components ... 10
JBoss Cluster Implementation ... 12

Chapter 2: System Requirements 13

Database Requirements ... 13
    Increase Oracle Database Sessions and Process Parameters-A ... 15
Server Hardware Requirements ... 15
Client Tools Server Hardware Requirements ... 16
JBoss Port Requirements ... 17

Chapter 3: Installation Prerequisites 19

Verify Available Ports ... 19
Create a Database ... 20
Prepare the Installation Package ... 20
IBM WebSphere on Red Hat Enterprise Linux 6.2 Requirements ... 21
Install Workpoint Server on a Separate System ... 22
View CA Identity Governance Installer Debugging Information ... 23

Chapter 4: Install CA Identity Governance on JBoss 25

How to Install CA Identity Governance on a JBoss Cluster ... 25
Create a Reference Installation ... 26
Configure the Cluster Nodes ... 27
    Verify Cluster Prerequisites ... 27
    Prepare Initial Node for Cluster Configuration ... 28
    Configure Additional Nodes for Cluster Configuration ... 30
Verify Successful Installation ... 32
Configure the CA IAM Connector Server Connector Server for a Cluster ... 32
Import Workpoint Processes ... 33

## Chapter 5: Post Cluster Installation Information 35

## Chapter 6: How to Install CA Identity Governance on an IBM WebSphere Cluster 37

Review Requirements ........38
Install CA Identity Governance on IBM WebSphere 7........39
Configure Hazelcast........41
Create Database Users ........42
Install JDBC Drivers and Data Sources on the Workpoint Cluster ........43
    Install Microsoft SQL Server JDBC Drivers and Data Sources on the Workpoint Cluster ........43
    Install Oracle JDBC Drivers and Data Sources on the Workpoint Cluster ........45
Review Python File Parameters........46
Set Up CA Identity Governance and Workpoint Clusters ........47
Configure the CA Identity Governance Folder ........47
Verify a Successful Installation ........48
Configuring the CA IAM Connector Server for a Cluster ........49
Import Workpoint Processes........49

## Chapter 7: SSL-Encrypted Communication 51

Configure for SSL Communication........52
    Verify Prerequisites........52
    Add Your Digital Certificate to the Keystore ........53
    Activate SSL Communication in JBoss ........54
    Set Secure Server Properties........55
    (Optional) Activate SSL on Cluster Nodes ........56
Obtain a Digital Certificate ........56

## Chapter 8: Installing Additional Components 59

Install Oracle Client Components........59
Install Client Tools ........60
    Configure Client Tools After Installation ........61
    Coordinate the Client Connection to the Database with CA Identity Governance Server........62
    Configure Direct Client Connection to Databases........62
Install Workpoint Designer........64
    Install Workpoint Designer on JBoss ........64
    Install Workpoint Designer to Work with WebSphere........65

## Appendix A: Installation Worksheets 67

JBoss/Windows Installation Worksheet........67

JBoss/Linux Installation Worksheet ........................................................................................................ 69
Microsoft SQL Server Worksheet ........................................................................................................ 70
Oracle Database Worksheet ........................................................................................................ 71

## Appendix B: Configure JBoss as a Windows Service 75

JBoss Windows Service Fails to Start........................................................................................................ 76

## Appendix C: Configure JBoss as a Linux Daemon 77

## Appendix D: Installing CA Identity Governance and Oracle RAC 81

How to Install CA Identity Governance and Oracle RAC ........................................................................ 81
Review  CA Identity Governance and Oracle RAC Prerequisites ........................................................ 82
Configure CA Identity Governance with Oracle RAC Databases ........................................................ 82
Configure Java Database Connectivity (JDBC) ........................................................................ 86
Verify a Successful Installation ........................................................................ 87
Verify Oracle TNS Identifies Database Cluster ........................................................................ 88
Integrate CA Identity Governance Discovery and Audit with Oracle RAC Databases ........................ 89
(Optional) Restore CA Identity Governance-Oracle RAC Databases Connection ........................ 91

# Chapter 1: Installation Overview

This section contains the following topics:

Product Overview (see page 9)
Product Components (see page 10)
JBoss Cluster Implementation (see page 12)

## Product Overview

CA Identity Governance complements CA Identity Lifecycle Management products with analytical and client tools for Role-Based Access Control (RBAC).

In RBAC, predefined roles codify common resource usage patterns. Often these roles bundle access rights related to specific business tasks and responsibilities. Users are assigned one or more of these roles based on their current duties, allowing access to only the resources they need.

CA Identity Governance supports implementation of RBAC in the enterprise in several ways:

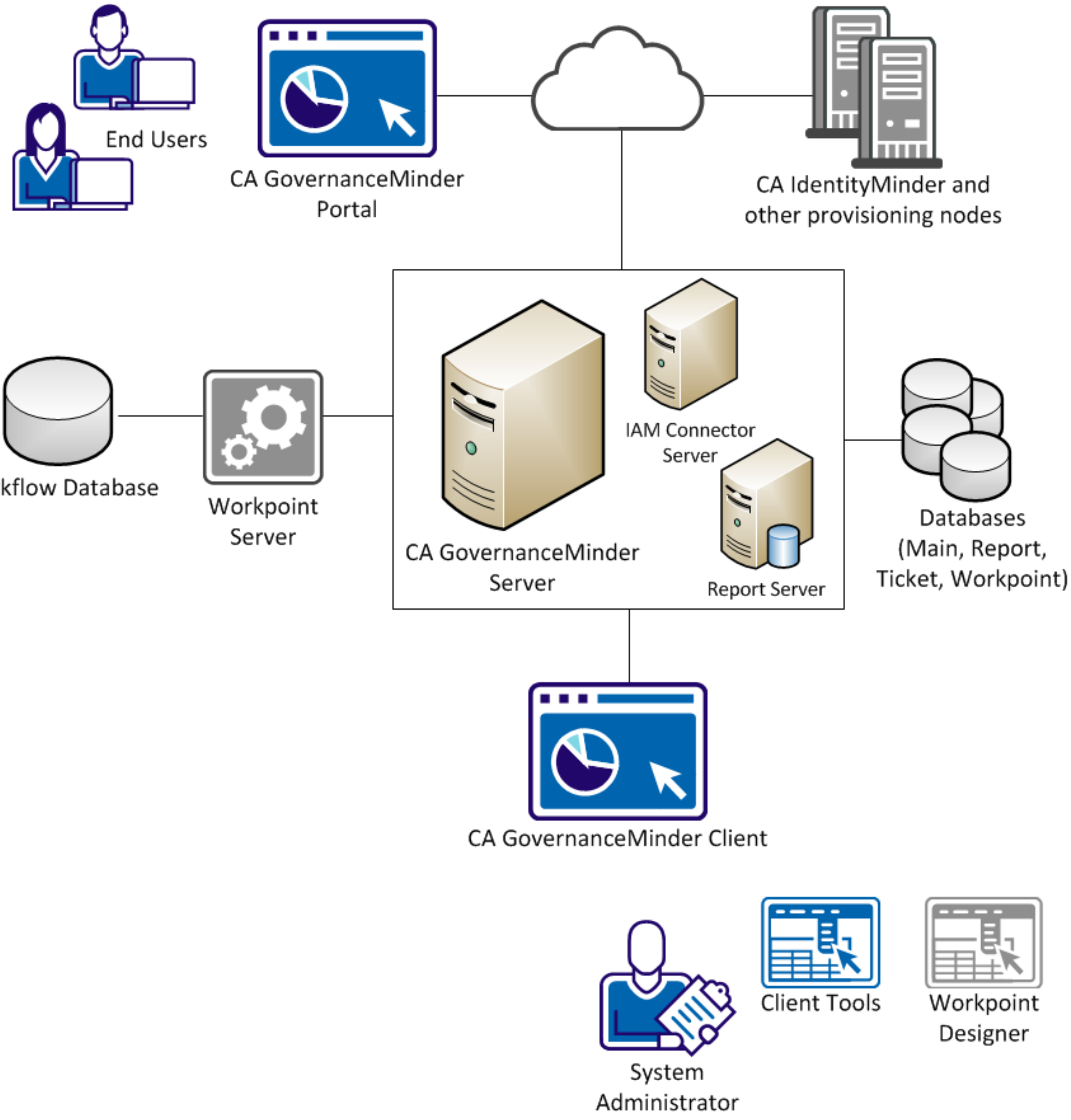
- **Role Discovery:** CA Identity Governance imports data from CA Identity Manager and other provisioning nodes throughout the enterprise. Based on this data, CA Identity Governance provides powerful analytical tools that efficiently discover common usage patterns and construct an optimized role hierarchy that provides most users the resource access they need. The database and role hierarchy are constantly updated based on user, resource, and provisioning information from across the network.
- **Certification:** periodically, managers throughout the enterprise certify their workers' access privileges - by reviewing the roles assigned to them. Similarly, resource owners periodically review the users and roles that link to their resource. In some jurisdictions, these certifications are mandated by law. CA Identity Governance implements these certifications with a workflow.
- **Real-Time Provisioning Support:** provisioning nodes can query CA Identity Governance in real time using a set of web services. These web services suggest role profiles for users, and answer "what if" questions. In addition, CA Identity Governance can export changes to these nodes, creating account templates and other provisioning tools that reflect the best practices of the role hierarchy. In this way, the role hierarchy proactively controls the privileges assigned to users - realizing the promise of role-based access control.

# Product Components

Every CA Identity Governance implementation includes the following functional components:

- The CA Identity Governance server supports data import, certifications, and the CA Identity Governance web portal and web services.
- CA Identity Governance client tools - let administrators manage data and develop the role hierarchy.
- The Workpoint server application and the Workpoint Designer client support certifications and other CA Identity Governance business processes that are implemented using Workpoint workflows.
- Databases - CA Identity Governance user, role, and resource databases, Workpoint processes, inbox data, and a reporting database.

The following diagram shows the interaction between these components.


End Users
CA GovernanceMinder Portal
CA IdentityMinder and other provisioning nodes
Workflow Database
Workpoint Server
IAM Connector Server
CA GovernanceMinder Server
Report Server
Databases (Main, Report, Ticket, Workpoint)
CA GovernanceMinder Client
Client Tools
Workpoint Designer
System Administrator

The CA Identity Governance server application is the focal point of any CA Identity Governance implementation. It handles various functions and queries, including:

- Automatically importing data from CA Identity Manager and other nodes, and support for web service calls
- Hosting the CA Identity Governance Web Portal
- Conducting certifications and other work flows through the CA Identity Governance Portal, using Workpoint processes and a management system

The Workpoint server application processes workflows such as certifications. Typically a dedicated instance of Workpoint server is installed together with the CA Identity Governance server, but an existing instance can be used.

The role engineer who administers CA Identity Governance uses a set of applications:

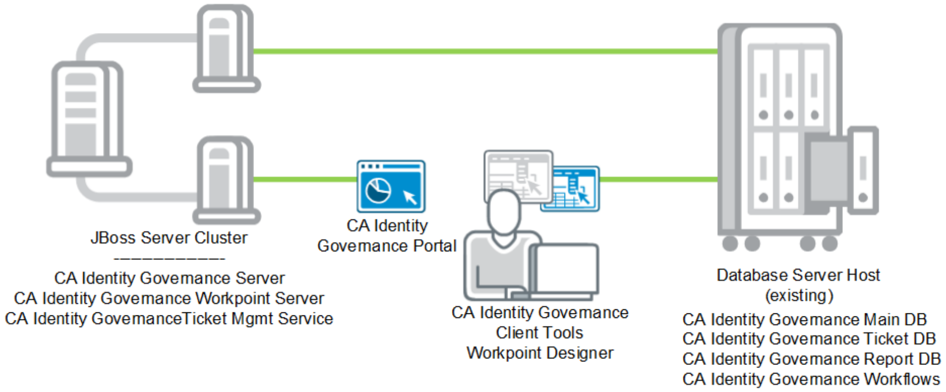
- The CA Identity Governance Client Tools manages data import and to define the role-based permissions hierarchy.
- The Workpoint Designer client loads and modifies Workpoint work flows.
- Additional management and configuration functions are exposed to administrators through the CA Identity Governance Portal.

# JBoss Cluster Implementation

To help ensure availability and accommodate higher volumes of traffic, the CA Identity Governance and Workpoint server applications can be installed on a load-balanced JBoss server cluster of 64-bit Windows computers.

An existing database server hosts the CA Identity Governance databases.

You install the CA Identity Governance Client Tools and Workpoint Designer application on a separate Windows computer running a supported operating system, as shown in the following diagram:


JBoss Server Cluster
-----------
CA Identity Governance Server
CA Identity Governance Workpoint Server
CA Identity GovernanceTicket Mgmt Service
CA Identity Governance Portal
CA Identity Governance
Client Tools
Workpoint Designer
Database Server Host
(existing)
CA Identity Governance Main DB
CA Identity Governance Ticket DB
CA Identity Governance Report DB
CA Identity Governance Workflows

**More information:**

JBoss/Windows Installation Worksheet (see page 67)

# Chapter 2: System Requirements

This section contains the following topics:

Database Requirements (see page 13)
Server Hardware Requirements (see page 15)
Client Tools Server Hardware Requirements (see page 16)
JBoss Port Requirements (see page 17)

## Database Requirements

CA Identity Governance creates database instances for user, role, and resource information, and Workflow data (for the Workpoint database). You can implement a database in the following two ways:

- A dedicated local RDBMS installed on the CA Identity Governance server.
- An existing RDBMS in the network.

**Note**: We recommend using Microsoft SQL Server for CA Identity Governance databases. During testing in CA Technologies labs, SQL Server provided the best performance.

For a list of supported databases, see the Platform Support Matrix available at CA Technologies Support Online. For information about system requirements for your RDBMS, see the documentation for your product.

Disk Space

To help ensure the best performance, the system that hosts the database must have sufficient disk space. Use the following guideline for determining the required disk space:

Set the disk space to 4 GB for every 100,000 links in a certification.

For example, if you have a certification that consists of 200,000 links, set the disk space to 8 GB.

**Case Sensitive Requirements**

The following case-sensitive states are applied to these databases:

- **eurekify_sdb**—case-sensitive
- **eurekify_ticket**—case-sensitive
- **WPDS (Workpoint)**—case-insensitive
- **Data Warehouse**—case-sensitive

Microsoft SQL Server

The following privileges and settings are required for Microsoft SQL Server:

- **User Account**—The CA Identity Governance database user must have the following privileges:
  - System Admin (SA)—Required during install if the installer is creating the database.
  - Dbo—Required during install if the database administrator manually created the database before install.
  - Datareader, Datawriter, BulkAdmin, DDLAdmin—minimum required privileges after installation.
- **Server Authentication mode**—"Mixed Authentication mode" only
- **Communications protocols**—TCP/IP and Named Pipes protocols enabled

**Oracle Database**

The following privileges and settings are required for Oracle Database:

- **Database**—The database must be defined either in a local tnsnames.ora file (under the Oracle Client installation), or in an Oracle directory server.
- **Encoding**—CA Identity Governance databases must use UTF-8 (AL32UTF8) encoding.
- **Database Sessions and Processes**—When an Oracle database server hosts CA Identity Governance databases, allot a minimum of 250 sessions and processes for CA Identity Governance activity on the database server.
- **Schemas**—Empty, separate, schemas for SDB, ticketdb, and Workpoint (wpds), whose owners have the following roles and privileges:
  - Roles: CONNECT and RESOURCE. The CONNECT role provides the create session permission. The RESOURCE role provides several create system privileges, and provides for previous Oracle database compatibility releases.
  - System privileges:ALTER SESSION, CREATE CLUSTER, CREATE DATABASE LINK, CREATE SEQUENCE, CREATE SESSION, CREATE SYNONYM, CREATE TABLE, CREATE VIEW, CREATE CLUSTER, CREATE INDEXTYPE, CREATE OPERATOR, CREATE PROCEDURE, CREATE SEQUENCE, CREATE TABLE, CREATE TRIGGER, CREATE TYPE, SELECT ANY DICTIONARY.

**Note:** We recommend that your database administrator creates the empty schemas for you before you install CA Identity Governance. If you do not prepare empty schemas for the CA Identity Governance databases, the installation requires the credentials of an Oracle Database user with DBA privileges. The installation program then creates the schemas using the information you provide.

**For more information:**

Increase Oracle Database Sessions and Process Parameters-A (see page 15)

## Increase Oracle Database Sessions and Process Parameters-A

Increase database sessions and process parameters from the default settings to reduce exceptions.

**Follow these steps:**

a. Connect to the database with the system account.

b. Run the following commands:

```
alter system set sessions=400 scope=spfile;
```

```
alter system set processes=400 scope=spfile;
```

c. Restart the entire database (all cluster instances).

Database sessions and process parameters are increased.

# Server Hardware Requirements

The following minimum hardware and software prerequisites apply to the production platforms that host the CA Identity Governance server and Workpoint server.

- **Processor**—Intel multicore processors with minimum 2.4 GHz. Four processors are required, configured as two dual-core processors or a single quad-core processor.
- **Memory**—8-GB RAM
- **Available disk space**—80 GB
- **Central database (RDBMS)**—For a list of supported databases, see the Platform Support Matrix available at CA Technologies Support Online.

  **Note:** You do not need to install this central database on the same computer as CA Identity Governance. For information about system prerequisites for your RDBMS, see the documentation for your product.

In addition, the CA Identity Governance server must have the following software installed:

- (Optional) **Active Directory**—An enterprise user store that is used to manage access to the CA Identity Governance portal

  If you are not using an enterprise user store, CA Identity Governance uses its own user store (the users database).

  **Note:** You do not need to install this user store on the same computer as CA Identity Governance. For information about system prerequisites, see the Active Directory product documentation. For supported versions, see the Platform Support Matrix available at CA Technologies Support Online.

- **Java Development Kit (JDK)**—CA Identity Governance 12.6.1 requires Oracle Java SE Development Kit 6u45 (1.6_45) as a prerequisite for the JBoss 5.1 application server that is installed with the product. For a list of supported JDKs, see the Platform Support Matrix available at CA Technologies Support Online.

  Add the pathname of this JDK instance to the JAVA_HOME and PATH variables in the System variables area in the Environment Variables window. If necessary, create the JAVA_HOME variable there.

  **Note**: When using a 64-bit JDK, and available memory is greater than 1400M (default), set the JVM maximum setting at 4 GB.

# Client Tools Server Hardware Requirements

The following minimum requirements apply to the computer that hosts the CA Identity Governance Client Tools:

**Note:** Typically, you install the Client Tools on the same computer as the Workpoint Designer application. We recommend selecting a computer that satisfies the requirements of both packages.

- **Processor**—Intel Core2 Duo 2.4 GHz
- **Memory**—2-4 GB RAM
- **Central database (RDBMS)**—For a list of supported databases, see the Platform Support Matrix available at CA Technologies Support Online.

  **Note:** You do not need to install this central database on the same computer as the client tools. For information about system requirements for your RDBMS, see the documentation for your product.

In addition, the following software must be installed:

- **Supported web browser**—For a list of supported web browsers, see the Platform Support Matrix available at CA Technologies Support Online.
- **.NET Framework**—Version 1.1 or 2.0

- **Microsoft XML**—Version 6
- **Microsoft Visual C++ 2005 SP1 Redistributable Package**—x86 or x64 version, depending on the target computer.

  Install this package after you install the .NET framework. On 64-bit computers, run the assembly registration utility (regasm.exe) after you install the package.
- (Optional) **Microsoft SQL Native Client 2005**—Only required if you reference a remote SQL Server instance *or* if you have a local Microsoft SQL 2008 database.
- (Optional) **Oracle Client**—Only required if you reference a remote Oracle Database instance. CA Identity Governance uses the following Oracle Client components: Oracle Database Utilities, SQL *Plus, Oracle Objects for OLE, and Oracle Provider for OLE DB.
- (Optional) **Java Virtual Machine**—Version 1.6_23 (minimum)

  Only required if you are installing the Workpoint Designer client on the same computer as the client tools.

  **Note:** For detailed information about Workpoint software installation and requirements, see the Workpoint documentation at the following location:

  *gm_install*\Server\eurekify-jboss\Workpoint\WorkPointDesigner\docs
- **Java Development Kit (JDK)**—For a list of supported JDKs, see the Platform Support Matrix available at CA Technologies Support Online.

  This software and pathname configuration is required for the connector.

  On a Windows computer, add the pathname of this JDK instance to the PATH and JAVA_HOME environment variables. If necessary, create the JAVA_HOME variable.

# JBoss Port Requirements

The JBoss Application Server that is installed with the CA Identity Governance server uses the following ports:

- 1098
- 1099
- 1577
- 4026
- 4444
- 4445
- 4446
- 5001
- 8009

- 8080
- 8083
- 8093
- 8094
- 9092

# Chapter 3: Installation Prerequisites

Before you can install CA Identity Governance, verify that the preliminary requirements are met and that you have the necessary information available.

**This section contains the following topics:**

Verify Available Ports (see page 19)
Create a Database (see page 20)
Prepare the Installation Package (see page 20)
IBM WebSphere on Red Hat Enterprise Linux 6.2 Requirements (see page 21)
Install Workpoint Server on a Separate System (see page 22)
View CA Identity Governance Installer Debugging Information (see page 23)

## Verify Available Ports

This procedure describes how to verify that the required network communications ports for the product are available.

**Follow these steps:**

1. On the target server, issue the following command:

   ```
   netstat -a -o | findstr "1098 1099 1577 4026 4444 4445 4446 5001 8009 8080 8083
   8093 8094 9092"
   ```

   The command checks for any activity on the listed ports. If no activity is found, the ports are available to CA Identity Governance.

2. If the command shows activity on one or more ports, issue the following command to identify the application using each port:

   ```
   netstat -a -o -b
   ```

3. Redirect traffic from other applications to free the ports for CA Identity Governance.

   You have verified that the required network communications ports for the product are available.

# Create a Database

When you are installing CA Identity Governance, you may not want to provide database credentials during installation. Instead, manually create the database and then run the installer and provide the database information when prompted. To manually create a database, use the DBUtil tool.

**Follow these steps:**

1. Verify that a local instance of Microsoft SQL Server or Oracle is available.
2. Copy the CA-RCM-12.6.01-Core.zip file from the CA Identity Governance installation package to a temporary location, and extract the file.
3. Navigate to the DBUtil tool in a Command Prompt window.

   The DBUtil tool is located in the following directory where you extracted the installation package:

   \CA-RCM-12.6.01-Core\Utils&Conf\DB Utility
4. Enter one of the following commands:
   - Microsoft SQL Server: dbutil.bat -c_i2 -d  alpha_rdb  -h localhost -u sa -p capassword
   - Oracle: dbutil.bat  -c_i2  -d db1  -h  localhost -u i2db -p eurekify -su system -sp eurekify -ven oracle

   The CA Identity Governance database is created on the database server.

# Prepare the Installation Package

The CA Identity Governance software is available as a zipped installation package. After you download the installation package, prepare the installation files before you install. Use this procedure to create the installation files from the installation package.

**Note:** In the following procedure, *RN* is the current release number for the product.

**Follow these steps:**

1. Create a temporary directory in a location that is accessible from the target system.
2. Download the installation package files to the temporary directory, and extract them.

3. Extract the following compressed files to yield the installation programs:

   - Extract the CA-RCM-*RN*-Installer.zip file to the current directory to yield the InstCARCM.exe installation program.

     Use this installation program to install the CA Identity Governance server components.

   - Extract the client tools ZIP file to yield the installation program. Select the client tools package appropriate to the processor of the target system, as follows:

     - For a 64-bit system, extract CA-RCM-*RN*-Client-Tools-x64.zip
     - For a 32-bit system, extract CA-RCM-*RN*-Client-Tools-x86.zip

     Use the appropriate installation program to install the CA Identity Governance client tools on the target system.

## IBM WebSphere on Red Hat Enterprise Linux 6.2 Requirements

When you install the product on IBM WebSphere on Red Hat Enterprise Linux (RHEL) 6.2, consider the following prerequisites.

- **IBM WebSphere 7.0 Network Deployment Application Server**—Install the IBM WebSphere 7.0 Network Deployment Application Server.

  **Important!** When running the setup script, select the Cell (deployment manager and a managed node) option.

- **Java Development Kit (JDK)**—CA Identity Governance 12.6.1 requires Oracle Java SE Development Kit 6u45 (1.6_45) as a prerequisite for the JBoss 5.1 application server that is installed with the product. For a list of supported JDKs, see the Platform Support Matrix available at CA Technologies Support Online.

  Add the pathname of this JDK instance to the JAVA_HOME and PATH variables in the System variables area in the Environment Variables window. If necessary, create the JAVA_HOME variable there.

  **Note**: When using a 64-bit JDK, and available memory is greater than 1400M (default), set the JVM maximum setting at 4 GB.

- **RHEL 6.2**—Install RHEL 6.2 with these packages in this order:

  - glibc-2.12-1.25.el6.i686.rpm
  - libX11-1.3-2.el6.i686.rpm
  - libxcb-1.5-1.el6.i686.rpm
  - libXtst-1.0.99.2-3.el6.i686.rpm
  - libXau-1.0.5-1.el6.i686.rpm
  - libXi-1.3-3.el6.i686.rpm

  - libXext-1.1-3.el6.i686.rpm
  - nss-softokn-freebl-3.12.9-3.el6.i686.rpm
  - dos2unix-3.1-37.el6.x86_64.rpm
- **Run Commands**—Run the following command to improve performance (Entropy):
  `rm /dev/random && mknod -m 644 /dev/random c 1 9`
- **Java Virtual Machine (JVM) 1.6.0**—Install JVM 1.6.0, and set the following java environment variables:
  - JAVA_HOME=/usr/java/jdk1.6.0_20/
  - PATH=$PATH:/usr/java/jdk1.6.0_20/bin

## Install Workpoint Server on a Separate System

If you want to install a CA Identity Governance server on a system that references a Workpoint server on another system, run the installer twice. First run the installer on one server to install Workpoint. Then you install the CA Identity Governance server on a separate system and configure the server to reference the Workpoint server.

The installer also installs the CA Identity Governance server. However, this instance of the CA Identity Governance server is not used.

**Follow these steps:**

1. Verify that the database server which hosts CA Identity Governance databases is running.
2. Run *one* of the following installation programs:
   - **Windows:** InstCARCM.exe
   - **Linux:** InstCARCM.bin

   These installation programs are available in the installation package (see page 20) that you downloaded.

   The CA Identity Governance installer opens.
3. Select the language that you want for the CA Identity Governance Portal, which is a web-based interface for CA Identity Governance.

   **Note:** The language you that select affects only the Portal interface and not the installation or any other component. This selection does not affect this installation.
4. Complete the installer by providing the necessary information.
5. Review your installation choices, and click Install.

   The installer runs the customized installation package.
6. Click Done to close the installer.

7. Remove CA Identity Governance server files, as follows:

   a. Navigate to this directory:

      *gm_install*\Server\eurekify-jboss\server\eurekify\deploy

      **Note:** *gm_install* is the CA Identity Governance installation directory.

   b. Delete the following files:

      - eurekify.war folder and its entire content
      - viewer.war
      - reportdb-ds.xml

   The Workpoint server is installed and you can continue with the CA Identity Governance server installation.

**More information:**

Prepare the Installation Package (see page 20)
JBoss/Windows Installation Worksheet (see page 67)

# View CA Identity Governance Installer Debugging Information

When CA Identity Governance installs from the installer, you can view CA Identity Governance installer debugging information in a console window.

To invoke the console window, hold down the CTRL key when launching the CA Identity Governance installer. A console window appears and displays CA Identity Governance installation information in parallel to the installer.

# Chapter 4: Install CA Identity Governance on JBoss

This scenario describes how you install CA Identity Governance with JBoss 5.1 on Windows or Linux.

The target audience for this scenario is as follows:

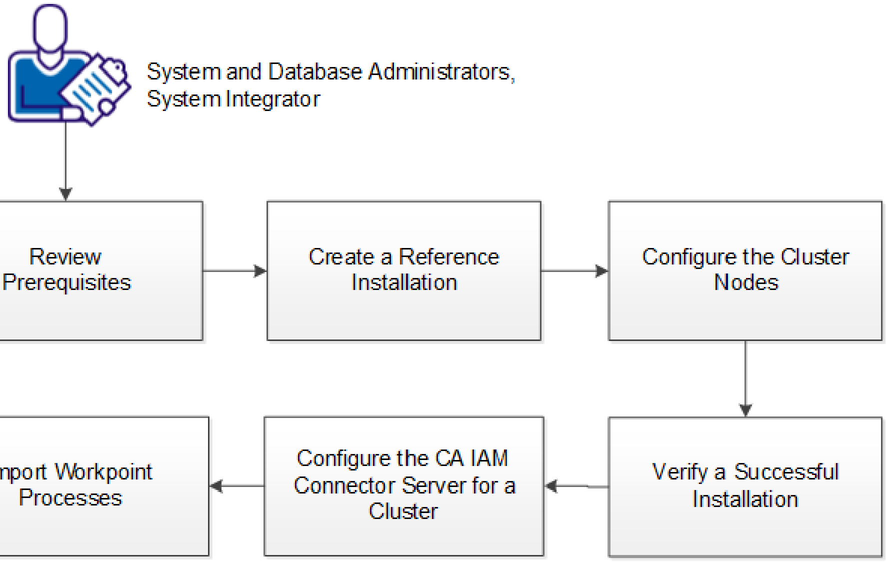
- System and database administrators
- System integrators

This section contains the following topics:

How to Install CA Identity Governance on a JBoss Cluster (see page 25)
Create a Reference Installation (see page 26)
Configure the Cluster Nodes (see page 27)
Verify Successful Installation (see page 32)
Configure the CA IAM Connector Server Connector Server for a Cluster (see page 32)
Import Workpoint Processes (see page 33)

## How to Install CA Identity Governance on a JBoss Cluster

Run the installer on a single node to create a reference installation, then copy CA Identity Governance server components to other cluster nodes.


System and Database Administrators,
System Integrator
Review Prerequisites
Create a Reference Installation
Configure the Cluster Nodes
Verify a Successful Installation
Configure the CA IAM Connector Server for a Cluster
Import Workpoint Processes

**Follow these steps:**

1. Review installation prerequisites. (see page 19)
2. Run the installer to create a reference installation (see page 26).
3. Configure the cluster nodes (see page 27).
4. Verify successful installation (see page 32).
5. Configure the CA IAM Connector Server for a cluster (see page 32).
6. Import Workpoint processes (see page 33).

# Create a Reference Installation

Run the installer to create a reference installation on a single node.

**Note:** The installation worksheets (see page 67) list information that you provide during installation. To avoid errors, use the worksheets during installation.

**Follow these steps:**

1. Verify that the designated CA Identity Governance database server host is running.

   **Note:** Host the database on a different computer than the cluster nodes.

2. Run one of the following installation programs:

   - Windows: InstCARCM.exe
   - Linux: InstCARCM.bin

   These installation programs are available in the installation package (see page 20) that you downloaded.

   The CA Identity Governance installer opens.

3. Select the language you want for the Portal, which is a web-based interface for CA Identity Governance.

   **Note:** The language you that select affects only the Portal interface and not the installation or any other component. This selection does not affect this installation.

4. Complete the installer by providing the necessary information.
5. Review your installation choices and click Install.

   The installer runs the customized installation package.

6. Click Done to close the installer.

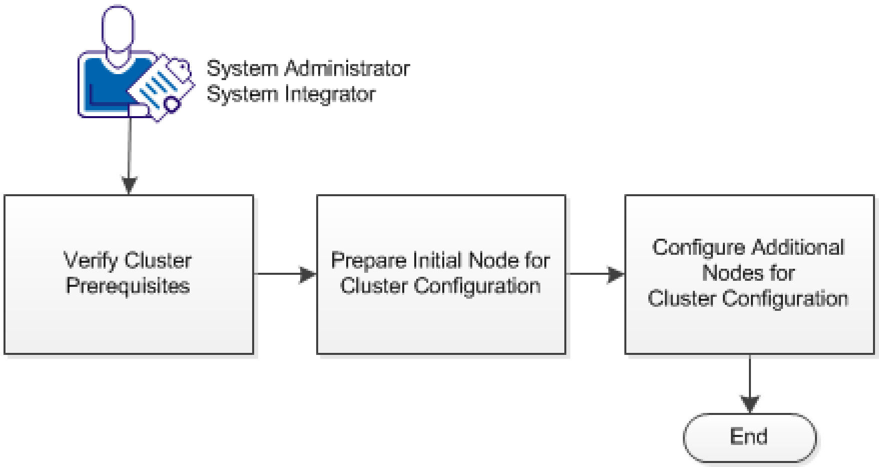
Next, you configure the cluster nodes.

**More information:**

Prepare the Installation Package (see page 20)

# Configure the Cluster Nodes

The following diagram illustrates how to prepare and configure cluster nodes using the provided cluster script:


System Administrator
System Integrator
Verify Cluster Prerequisites
Prepare Initial Node for Cluster Configuration
Configure Additional Nodes for Cluster Configuration
End

Follow these steps to prepare and configure CA Identity Governance cluster nodes:

1. Verify Cluster Prerequisites (see page 27).
2. Prepare initial node for cluster configuration (see page 28).
3. Configure additional nodes for cluster configuration (see page 30).

## Verify Cluster Prerequisites

This section lists cluster script software prerequisites.

Verify that all the prerequisites are installed before processing cluster components. Verify that they start with no errors and then stop them.

The software prerequisites are as follows:

- CA Identity Governance on Node 1
- Windows or Linux operating system
- JBoss 5.1 GA (5.1.0)

- CA Identity Governance cluster script (extracted into a temporary work folder on Node 1)

  **Note:** The script is in the Core.zip file at the following location:

  ```
  CA-RCM-12.6.00-Core\Utils&Conf\Jboss Cluster
  ```

- Apache Ant 1.7 or higher
- An ANT_HOME environment variable on the installation server.

  Set the ANT_HOME environment variable value to the ANT installation directory.

  **Example:**

  ANT_HOME="C:\ant 1.7.1"

## Prepare Initial Node for Cluster Configuration

You prepare the initial cluster node by defining system components, permissions, and folders to work in a cluster configuration.

**Follow these steps:**

1. In the temporary folder where you extracted the cluster script, open the prepareCluster.properties file and set the following parameters:

   - CA Identity Governance installation directory

     **Example:** CA Identity Governance home (Windows)

     ```
     rcm.installation.home=C:/Program Files/CA/RCM/Server
     ```

   - JBoss 5.1 root directory

     **Example:** JBoss 5.1 root

     ```
     jboss.5.1.home=C:/jboss-5.1.0.GA
     ```

   - CA Identity Governance JBoss cluster operating system

     Set for Windows or Linux

     **Example:** For Linux

     ```
     os.provider=linux
     ```

   - CA Identity Governance database. Set for MSSQL or Oracle

     **Example:** For MSSQL

     ```
     db.provider=mssql
     ```

   - JBoss messaging database server name

     **Example:**

     ```
     db.server.name=your database computer name
     ```

- JBoss messaging database user login

  **Example:**

  ```
  db.login.user=CA_GM_administrator
  ```

- JBoss messaging database password login

  **Example:**

  ```
  db.login.password=your database password
  ```

- Database port

  Limits: 1433 MSSQL, port 1521 Oracle

  **Example:**

  ```
  db.port=1433
  ```

- Temporary files work folder

  **Example:**

  ```
  work.dir=C:/temp/work
  ```

- Cluster node names — a list of comma-separated host names and IP addresses

  **Example:**

  ```
  cluster.nodes=nodeA, nodeB, 3.33.333.255
  ```

- (Oracle) Oracle server service name

  **Example:**

  ```
  oracle.service=ORCL
  ```

2. Save and close the prepareCluster.properties file.
3. On the server where the Portal is installed, open a Command Prompt window and run the following file:

   **Windows:** prepareCluster.bat

   **Linux:** prepareCluster.sh

   This file prepares the downloaded JBoss 5.1 files to run in the cluster as Node 1.

4. Create a database and name it jboss_messaging.

   The nodes are prepared for cluster configuration. Repeat Steps 1-4 for preparing additional initial cluster nodes.

# Configure Additional Nodes for Cluster Configuration

After configuring the initial node, you configure additional nodes for CA Identity Governance cluster configuration.

Configure additional CA Identity Governance cluster nodes using automatic or manual mode.

- Manual (see page 31)
- Automatic (see page 30)

## Automatic Cluster Node Configuration

Automatically configure the CA Identity Governance cluster node. This mode configures multiple nodes using default parameters.

**Follow these steps:**

1. Locate and open the prepareCluster.properties file in the temporary work folder.
2. Locate the line containing the cluster.node.id=1 parameter, and set the cluster node property for this node.

   **Example:**

   For Node 4,

   ```
   cluster.node.id=4
   ```

   **Note:** The default node ID value is 1.
3. Open a Command Prompt window, and run the following file from the CA Identity Governance cluster work folder:

   **Windows:** prepareCluster.bat configure

   **Linux:** prepareCluster.sh configure

   This file configures JBoss 5.1 files to run as the designated node in the cluster.
4. Copy the JBoss 5.1 Home directory and all the contents from Node 1 to the next server in the cluster.
5. Repeat Steps 1-4 for each subsequent node in the cluster.

   You have automatically configured the CA Identity Governance cluster node.

## Manual Cluster Node Configuration

Manually configure the CA Identity Governance cluster node. This mode is suggested for custom configurations.

**Follow these steps:**

1. Copy the JBoss 5.1 Home folder and all the contents from Node 1 to Node N, this server.
2. Locate and open for editing the following file in the JBoss home folder:

   **Windows:** eurikify.bat

   **Linux:** eurikify.sh
3. Assign the node to the following parameters:

   **- jboss.messaging.ServerPeerID**

   Defines the unique value (Node N) of this node in the cluster.

   **- g**

   Defines the unique cluster name.

   **Example:** Set the JBoss messaging peer ID and the network cluster name.

   From (default)

   ```
   run.bat -c %SERVER_NAME% -b %JBOSS_BIND_ADDRESS% -g CA_GM_Cluster -u 233.3.4.4
   -Djboss.messaging.ServerPeerID=1  %*
   ```

   To (assigned node number)

   ```
   run.bat -c %SERVER_NAME% -b %JBOSS_BIND_ADDRESS% -g CA_GM_Cluster -u 233.3.4.4
   -Djboss.messaging.ServerPeerID=2  %*
   ```
4. Save and close the file.
5. Open the server.xml file located in the following folder:

   ```
   JBoss 5.1 Home/server/all/deploy/jbossweb.sar/
   ```

   a. Locate and replace the following text:

   ```
   <Engine name="jboss.web" defaultHost="localhost">
   ```

   With

   ```
   <Engine name="jboss.web" defaultHost="localhost"
   jvmRoute="worker-node-name">
   ```

   **Note:** "*worker-node-name*" is the load balancer worker node name.

   b. Save and close the server.xml file.

   You have manually configured the CA Identity Governance cluster node.

# Verify Successful Installation

When the installation is successful, you can access the CA Identity Governance Portal.

**Follow these steps:**

1. Open a Command Prompt window on Node 1, navigate to the JBoss home folder and run the following file:

   **Windows:** eurikify.bat

   **Linux:** eurikify.sh

   The CA Identity Governance and JBoss servers on Node 1 starts.

2. Review the logs and ensure Node 1 starts with no error messages.

   The CA Identity Governance cluster node log folder is:

   ```
   jboss.5.1home\server\all\log
   ```

   **Note:** *jboss.5.1home* is the CA Identity Governance cluster node home directory.

3. Log in using the default administration credentials:

   - **Username:** AD1\EAdmin
   - **Password:** eurekify

   **Note:** The password can be any password. It must be at least one character. The field must not be blank.

4. Stop the CA Identity Governance and JBoss servers on Node 1.

   You have verified the CA Identity Governance installation.

Next, you configure the CA IAM Connector Server for a cluster.

# Configure the CA IAM Connector Server Connector Server for a Cluster

When installing the CA IAM Connector Server in a cluster environment, install the CA IAM Connector Server on one of the nodes, or on a dedicated node.

After installation, edit the following properties to reflect the location of the CA IAM Connector Server:

- jcs.ui.url=*IAMCS_hostname*

  The CA IAM Connector Serverhostname of the machine where the CA IAM Connector Server is installed.

- jcs.ui.enabled=true

- jcs.ui.username=*username*

  **Default:** admin

- jcs.ui.password=*IAMCS_password*

  The CA IAM Connector Server password is the one provided during installation.

Next, you import workpoint processes.

## Import Workpoint Processes

To enable certifications and other business processes, import predefined workflow definitions into Workpoint.

**Follow these steps:**

1. Verify that the CA Identity Governance databases are running.
2. Log in to the Portal as an administrator.

   Your Portal home page appears.

3. Go to Administration, Settings.
4. Click Workpoint DB Administration.

   The Workpoint DB Administration screen appears.

5. Under Update Workpoint Processes, verify the CA Identity Governance Server Host Name, Port, and HTTPS setting.

   **Note:** In a clustered environment, enter the load balancer hostname instead of the server hostname, or localhost when no load balancer exists.

6. Click Update.

   The product populates the Workpoint database with Workpoint processes and related data.

# Chapter 5: Post Cluster Installation Information

This post cluster information specifies settings that point cluster load balancer:

- buildingBlockService.url
- campaignService.url
- reportsService.url
- sageBrowsingService.url
- statisticalService.url

In the Properties settings:

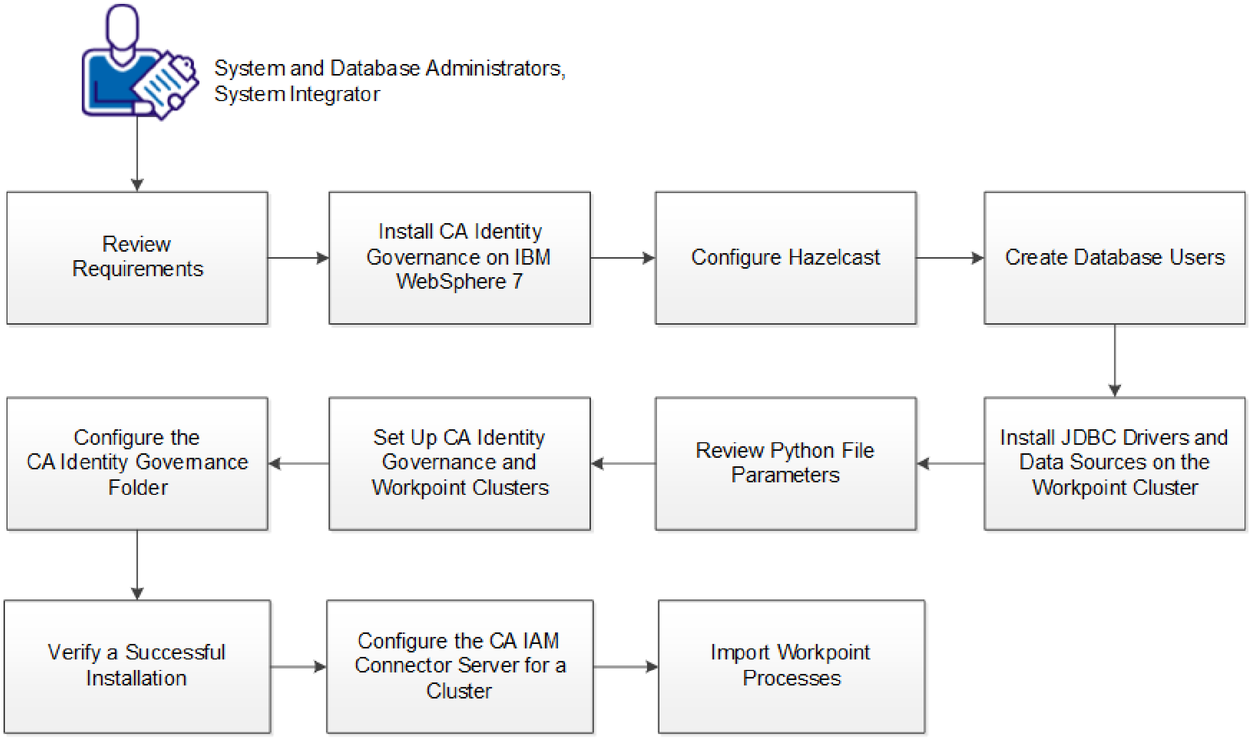
- integration.unicenter.servicedesk.webservice.url
- portalExternalLink.ticketQueueUrl
- reports.baseUrl
- sage.sageBaseUrl
- tms.workflow.url

# Chapter 6: How to Install CA Identity Governance on an IBM WebSphere Cluster

As a system database administrator or system integrator, you install CA Identity Governance with IBM WebSphere Application Server (WAS) 7 on Red Hat Enterprise Linux (RHEL) 6.2.

The supplied script installs CA Identity Governance and WebSphere by automating various installation tasks. WebSphere is an application server that provides application delivery with operational efficiency, reliability, security, and control. Clustering increases computer processing power, load balancing, and provides application high availability.

The following diagram illustrates how to install CA Identity Governance and WebSphere with the supplied script:


System and Database Administrators, System Integrator
Review Requirements
Install CA Identity Governance on IBM WebSphere 7
Configure Hazelcast
Create Database Users
Install JDBC Drivers and Data Sources on the Workpoint Cluster
Review Python File Parameters
Set Up CA Identity Governance and Workpoint Clusters
Configure the CA Identity Governance Folder
Verify a Successful Installation
Configure the CA IAM Connector Server for a Cluster
Import Workpoint Processes

**Follow these steps:**

1. Review requirements (see page 38).
2. Install CA Identity Governance on IBM WebSphere 7 (see page 39).
3. Configure Hazelcast (see page 41).

4. Create database users (see page 42).
5. Install JDBC drivers and data sources on the Workpoint cluster (see page 43).
6. Review Python file parameters (see page 46).
7. Set up CA Identity Governance and Workpoint clusters (see page 47).
8. Configure the CA Identity Governance folder (see page 47).
9. Verify a successful installation (see page 48).
10. Configure the CA IAM Connector Server for a cluster (see page 49).
11. Import Workpoint processes (see page 49).

## Review Requirements

When you install the product on IBM WebSphere on Red Hat Enterprise Linux (RHEL) 6.2, consider the following requirements.

- **IBM WebSphere 7.0 Network Deployment Application Server**—Install the IBM WebSphere 7.0 Network Deployment Application Server.

  **Important!** When running the setup script, select the Cell (deployment manager and a managed node) option.

- **Java Development Kit (JDK)**—CA Identity Governance 12.6.1 requires Oracle Java SE Development Kit 6u45 (1.6_45). For a list of supported JDKs, see the Platform Support Matrix available at CA Technologies Support Online.

  **Note:** When using a 64-bit JDK, and available memory is greater than 1400M (default), set the JVM maximum setting at 4 GB

- **Verify that the following packages exist in this order:**
  - glibc-2.12-1.25.el6.i686.rpm
  - libX11-1.3-2.el6.i686.rpm
  - libxcb-1.5-1.el6.i686.rpm
  - libXtst-1.0.99.2-3.el6.i686.rpm
  - libXau-1.0.5-1.el6.i686.rpm
  - libXi-1.3-3.el6.i686.rpm

  - libXext-1.1-3.el6.i686.rpm
  - nss-softokn-freebl-3.12.9-3.el6.i686.rpm
  - dos2unix-3.1-37.el6.x86_64.rpm
- **Run Commands**—Run the following command to improve performance (Entropy):

  ```
  rm /dev/random && mknod -m 644 /dev/random c 1 9
  ```

- **Java Virtual Machine (JVM) 1.6.0**—Install JVM 1.6.0, and set the following java environment variables:
  - JAVA_HOME=/usr/java/jdk1.6.0_20/
  - PATH=$PATH:/usr/java/jdk1.6.0_20/bin

**Note:** For more information about installation prerequisites, see the *Installation Guide*.

## Install CA Identity Governance on IBM WebSphere 7

This procedure describes how you install the CA Identity Governance server in a WebSphere environment. You must install the product as a root user on the same system where you have installed IBM WebSphere Network Deployment. The installer also installs and configures CA Identity Governance databases and data tables on a specified SQL or Oracle database server.

**Follow these steps:**

1. Verify that the SQL or Oracle server that is determined to host your databases is running.
2. Do the following:

   a. Download and install the latest Oracle JDK 1.6.X from the Oracle website.

      **Note:** We recommend that you download any Oracle JDK version above 1.6.23.

   b. Configure the Red Hat Enterprise Linux 6.2 Java alternatives.

      For example, run the following commands from the command prompt:

      ```
      /usr/sbin/alternatives --install  /usr/bin/java java
      /usr/java/jdk1.6.0_45/bin/java 1500
      ```

      ```
      /usr/sbin/alternatives --config java
      ```

      **Note:** In this example, the JDK installation root is as follows:

      ```
       /usr/java/jdk1.6.0_45
      ```

   c. Verify that the default Java command is now the Oracle JDK 6.45.

      From the command prompt, enter in the following command:

      ```
      java -version
      ```

      The Java version displays the following information:

      ```
      java version "1.6.0_45"
      ```

   d. Set the following java environment variables to the CA Identity Governance and IBM WebSphere cluster node installation:

      ```
      JAVA_HOME=JDK_6_install_root
      ```

      For example, add the following lines to the /root/.bashrc file:

      ```
      JAVA_HOME=/usr/java/jdk1.6.0_45
      ```

      ```
      export JAVA_HOME
      ```

      **Note:** You only set the environment variables on the node where you install CA Identity Governance, and not every node.

   You have configured Red Hat E Enterprise Linux 6.2 Java alternatives, verified default commands, and set Java environment variables.

3. Run the InstCARCM.bin installation program from the installation files.

   The CA Identity Governance installer opens.

4. Select the language that you want for the Portal, and click OK.

   **Note:** The language that you select affects the Portal interface only and not the installation or any other component.

5. Complete the installer by providing the necessary information. The following options are not self-explanatory:

   **Application Server**

   Specifies WebSphere: Prepare '.ear' installation files.

   **Workpoint Server Host**

   Specify *one* of the following server options:

   - This server - You install the Workpoint server on the CA Identity Governance server.
   - Remote server - Specify a remote Workpoint server.

6. Review your installation choices, and click Install.

   The installer runs the customized installation package.

7. When the installation completes, click Done to close the installer.

   You have installed CA Identity Governance and selected WebSphere as the application server in the Application Server step.

Next, you configure Hazelcast.

## Configure Hazelcast

This procedure describes how to configure Hazelcast. Hazelcast is an open source clustering and highly scalable Java data distribution operating environment that CA Identity Governance uses.

For the CA Identity Governance cluster integration, edit the hazelcast.xml file to adjust the Hazelcast lock mechanism. The Hazelcast.xml file is located in the eurekify.war file.

**Follow these steps:**

1. Locate the hazelcast.xml file in the following folder:

   ```
   eurekify.ear/eurekify.war/WEB-INF/classes
   ```

   **Note:** Extract the eurekify.ear file before deploying to the cluster.

2. Open the hazelcast.xml file in an editor and locate the following group element:

   ```
   < group>
      <name>dev_RCM_WAS</name>
      <password>dev-pass</password>
   </group>
   ```

3. To match a unique name for your CA Identity Governance cluster, edit this element.

4. Locate the following element:
   ```
   <tcp-ip enabled="true">
     <interface>127.0.0.1</interface>
   </tcp-ip>
   ```

5. Add all your cluster member host names to the element as in Step 4.

   For example, the element would read as follows:
   ```
   <tcp-ip enabled="true">
      <interface>Server1</interface>
      <interface>Server2</interface>
      <interface>Server3</interface>
      <interface>Server4</interface>
   </tcp-ip>
   ```

6. Save the changes to the hazelcast.xml file and exit.

   You have configured the hazelcast.xml file to adjust the Hazelcast lock.

Next, you create database users to synchronize Java Messaging Service (JMS) topics.

## Create Database Users

This procedure describes how to create database users to synchronize Java Messaging Service (JMS) topics.

**Follow these steps:**

1. Create the following database users:
   - gvmBus
   - wpBus
2. (Oracle only) Verify that the databases have the appropriate permissions by running the following SQL commands as user sys:
   ```
   grant select on pending_trans$ to WPDS;
   grant select on dba_2pc_pending to WPDS;
   grant select on dba_pending_transactions to WPDS;
   ```
   - (if using an Oracle JDBC 10.2.0.3 or lower driver):
     ```
     grant execute on dbms_system to WPDS;
     ```
   - (if using an Oracle JDBC 10.2.0.4 or higher driver):
     ```
     grant execute on dbms_xa to WPDS;
     ```
3. (Oracle only) Restart the Oracle server.

   You have created database users to synchronize Java Messaging Service (JMS) topics.

Next, you install Server JDBC drivers and data sources on the Workpoint cluster.

# Install JDBC Drivers and Data Sources on the Workpoint Cluster

This procedure describes how to install JDBC API support server cluster connections to the Microsoft and Oracle SQL database.

- **Microsoft:** (http://www.microsoft.com/en-us/download/default.aspx) XA data sources with Microsoft Distributed Transaction Coordinator (MS DTC) manage distributed transactions. To enable a specific user to participate in distributed transactions with the JDBC driver, assign the SqlJDBCXAUser role on the master database to the user that you create for the WDPDS database.
- **Oracle:** (http://www.oracle.com/technetwork/indexes/downloads/index.html) When an Oracle database server hosts CA Identity Governance databases, install JDBC drivers on the WebSphere Application Server. XA data sources manage distributed transactions. To enable a specific user to participate in distributed transactions with the JDBC driver, assign the SqlJDBCXAUser role on the master database to the user that you create for the WDPDS database.

Next, you review Python file parameters.

## Install Microsoft SQL Server JDBC Drivers and Data Sources on the Workpoint Cluster

**Valid on Microsoft SQL Server.**

This procedure describes how you install Microsoft SQL Server JDBC drivers and data sources on the Workpoint cluster.

Java applications use the JDBC XA driver to establish concurrent connections to multiple databases through their associated resource managers.

Install the JDBC XA drivers on all SQL servers, and on the WebSphere application server.

**Note the following:**

- With a 32-bit SQL server, use the sqljdbc_xa.dll file in the x86 folder, even if the SQL server is installed on an x64 processor.
- With a 64-bit SQL server on the x64 processor, use the sqljdbc_xa.dll file in the x64 folder.
- With a 64-bit SQL server on an IA-64 processor, use the sqljdbc_xa.dll file in the IA64 folder.

**Follow these steps:**

1. Install the Microsoft SQL JDBC installer on the SQL server.

   Download the installer, Microsoft JDBC Driver for SQL (sqljdbc_4.0.2206.100_enu.exe), from the Microsoft Download Center.

2. Enable the XA transactions on the SQL server as follows:

   a. In the computer where you install the SQL server, browse to the Control Panel.

   b. Click Administrative Tools, Component Services.

   c. Right-click My Computer and click Properties.

   d. Click the MSDTC tab and click Security Configuration.

   e. Select Enable XA Transactions.

   f. Save the changes and restart the SQL server.

3. Copy and install drivers on other SQL cluster servers as follows:

   a. Locate the JDBC distributed transaction components under the \xa folder of the JDBC driver installation directory.

   b. Copy the file sqljdbc_xa.dll.

   c. Paste this file in the following directory of every SQL server computer that participates in distributed transactions:

      ```
      %SQL_SERVER_INSTALL%\Binn
      ```

   d. Execute the database script xa_install.sql on every SQL server instance that participates in distributed transactions. This script installs sqljdbc_xa.dll as an extended stored procedure.

      **Note:** When you run this script, log in as an administrator for the SQL Server instance.

4. Install the drivers on WebSphere as follows.

   a. In the original JDBC installation folder on the SQL server, locate the sqldbc.jar file in the following directory:

      ```
      Microsoft SQL Server 2005 JDBC Driver\sqljdbc_1.2\enu
      ```

   b. Copy this file to the WebSphere application server under the following directory:

      *WAS_install_root*/essentials/JDBC/

      **Note:** *WAS_install_root* is the WebSphere Application Server installation directory.

5. To implement the new data source definitions, restart the WebSphere Application Server or the Deployment Manager service as required in your WebSphere environment.

   You have installed the Microsoft SQL Server JDBC drivers and data sources on the Workpoint cluster.

## Install Oracle JDBC Drivers and Data Sources on the Workpoint Cluster

**Valid on Oracle database.**

This procedure describes how you install Oracle JDBC drivers and data sources on the Workpoint cluster.

**Follow these steps:**

1. Download the ojdbc14.jar file from the Oracle Download Center to the WebSphere application server, and place the file under the following directory:

   *WAS_install_root*/essentials/JDBC/

   **Note:** *WAS_install_root* is the WebSphere application server installation directory.

2. In the WebSphere administration console, click Resources, JDBC, JDBC Providers and create a JDBC provider with the following settings:

   - The server provider:

     **Name:** ServerProvider

     **Provider Type:** Oracle JDBC Driver

     **Implementation Type:** data source

- The server XA provider:

  **Name:** ServerXAProvider

  **Provider Type:** Oracle JDBC Driver (XA)

  **Implementation Type:** XA data source

- Apply the following settings to both JDBC providers:

  **Scope** – Workpoint_cluster

  **Database type** – Oracle

  **Class path** – *WAS_install_root*/essentials/JDBC/ojdbc14.jar

3. Restart the WebSphere Application Server or the Deployment Manager service as required in your WebSphere environment.

   The new data source definitions are implemented.

   You have installed the Oracle JDBC drivers and data sources on the Workpoint cluster.

# Review Python File Parameters

This procedure describes how you review the Python file to verify correct CA Identity Governance installation paths and data sources, and retain reusable memory. You download this file with the CA Identity Governance installation files. This file contains classes that can be used as reusable data sources and can construct dictionaries from other mappings or sequences of pairs.

**Follow these steps:**

1. Locate and open the dataSources.py file in the following folder:

   ```
   gm_install/rcm-websphere/WAS-Scripts
   ```

2. Change the passwords for the gvmBus and the wpBus users to the passwords set during the creation.
3. Save the dataSources.py file.

   You have reviewed the Python file.

Next, you set up the CA Identity Governance and Workpoint clusters.

## Set Up CA Identity Governance and Workpoint Clusters

This procedure describes how you set up CA Identity Governance and Workpoint clusters on WebSphere.

**Follow these steps:**

1. Navigate to the following directory:

   ```
   gm_install\rcm-websphere\WAS-Scripts
   ```

2. Open a Command Prompt and enter the following command:

   ```
   ./DeployGVM.sh /opt/IBM/WebSphere/AppServer/bin
   ```

   This command instructs the installation script where to place the installation files.

   You have set up CA Identity Governance and the Workpoint clusters on WebSphere.

Next, you configure the CA Identity Governance folder to configure and copy essential files to the cluster nodes.

## Configure the CA Identity Governance Folder

This procedure describes how you configure the CA Identity Governance installation folder to set up and copy essential files to the cluster nodes.

**Follow these steps:**

1. Locate and copy the *GM_Install_Dir* folder to the WebSphere clustered node server.
2. Change the directory as follows:

   ```
   GM_Install_Dir\rcm-websphere\WAS-Scripts
   ```

3. Locate and run the setupEssentials.py file from the following folder:

   ```
   WAS_HOME\profiles\NODE_NAME\bin\wsadmin.bat -lang jython -f  setupEssentials.py
   ```

4. Repeat Steps 1, 2 and 3 for each cluster node.

   You have configured the CA Identity Governance installation folder to configure and copy essential files to the cluster nodes.

Next, verify a successful installation.

# Verify a Successful Installation

This procedure describes how you verify a successful installation after you complete installing the product. When the CA Identity Governance installation is successful, you can access the CA Identity Governance Portal.

**Follow these steps:**

1. Select and start one server from the CA Identity Governance cluster, CA Identity Governance, and installed applications, including reports.
2. Review the started server logs and verify that no log errors exist.
3. Start all other servers in the CA Identity Governance cluster.
4. Review all the product cluster logs and verify that no errors exist in the logs.

   You can access the Portal after a successful installation.
5. Open a browser and enter the following URL:

   `http://serverhost:port/eurekify/portal/login`

   **Note:** *serverhost:port* is the network address and communications port of the CA Identity Governance server or load balancer. The WebSphere/AIX server default port is 9080.

   The CA Identity Governance Portal login page appears.
6. Log in using the following default administration credentials:
   - **Username:** AD1\EAdmin
   - **Password:** eurekify

   The Portal home page appears.
7. Set your Properties and Common properties URL setting under Administration, Settings.
8. Navigate to Reports, Configuration Reports, and select Configuration Properties.
9. Select ConfigWithRoles to verify that the report application is working.

   You have verified a successful installation.
10. (Upgrade only) Clear the browser cache or refresh the web page to replace old graphical elements.

Next, configure the CA IAM Connector Server for a cluster.

# Configuring the CA IAM Connector Server for a Cluster

You configure the CA IAM Connector Server for a cluster after the installation completes. When you install the CA IAM Connector Server in a cluster environment, install the CA IAM Connector Server on one of the nodes, or on a dedicated node.

After the installation, edit the following properties to reflect the location of the CA IAM Connector Server:

- jcs.ui.url=*IAMCS_hostname*

  This name is the CA IAM Connector Serverhostname of the computer where the CA IAM Connector Server is installed.

- jcs.ui.enabled=true
- jcs.ui.username=*username*

  **Default:** admin

- jcs.ui.password=*IAMCS_password*

  The CA IAM Connector Server password is the one provided during the installation.

Next, you import the Workpoint processes to enable certification campaigns and other business processes.

# Import Workpoint Processes

This procedure explains how to import Workpoint processes to enable certification campaigns and other business processes.

**Follow these steps:**

1. Verify that the CA Identity Governance cluster is running.
2. Log in to the Portal as an administrator.
3. Go to Administration, Settings, and click Workpoint DB Administration.
4. Under Update Workpoint Processes, verify the CA Identity Governance Server Host Name, Port, and HTTPS setting.

   **Note:** In a clustered environment, enter the CA Identity Governance (load balancer) name instead of the server hostname.

5. Click Update.

   The product populates the Workpoint database with predefined Workpoint processes and related data.

   You have imported Workpoint processes.

# Chapter 7: SSL-Encrypted Communication

The Portal is a web-based application that is available to client computers through supported application servers. To configure SSL for the HTTPS transport of the application server, you first create an SSL key file (which defines the security policy). You then configure the application server to use the file. Property settings and common properties must be edited for the secure server.

### Example: Create a Self-Signed Certificate

### Example: How to Configure CA Identity Governance for SSL Communication

By default, JBoss is not installed with SSL support. This means that all communication between the application server and the Portal client is not encrypted. This example shows you how to configure JBoss version 5.1.0 to use a certificate to secure communication.

**Notes:**

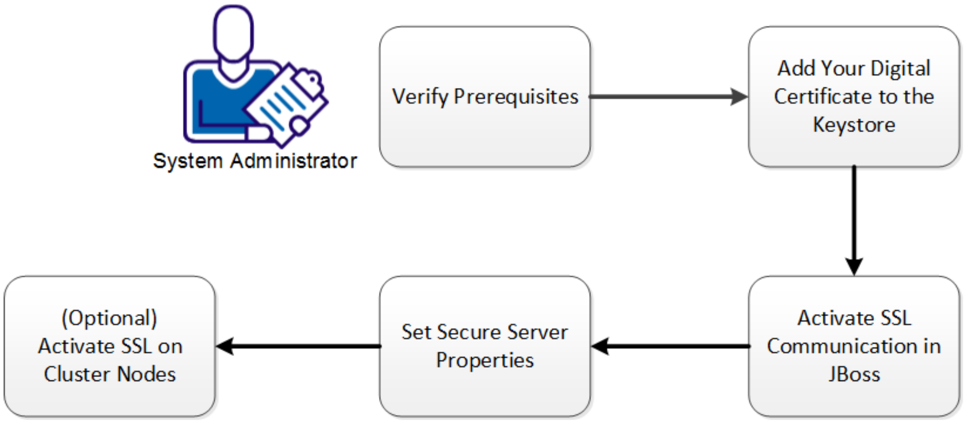
- The examples in this section are for Windows.
- For more information about configuring JBoss for SSL, see the JBoss Community Documentation Library.

# Configure for SSL Communication

As a system administrator, you ensure that CA Identity Governance Portal users communicate securely with the CA Identity Governance server. Secure Sockets Layer (SSL) is a protocol that uses a digital certificate and a private key stored in that certificate to provide confidential and authenticated communication between client and server.

Use this scenario to guide you through the process.

**Note:** When you install the CA Identity Governance server and Client Tools application on separate servers, install the root and server certificates where you install the Client Tools application.


System Administrator
Verify Prerequisites
Add Your Digital Certificate to the Keystore
Activate SSL Communication in JBoss
Set Secure Server Properties
(Optional) Activate SSL on Cluster Nodes

1. Verify Prerequisites (see page 52).
2. Add Your Digital Certificate to the Keystore (see page 53).
3. Activate SSL Communication in JBoss (see page 54).
4. Set Secure Server Properties (see page 55).
5. (Optional) Activate SSL on Cluster Nodes (see page 56).

## Verify Prerequisites

Verify that your system meets the following prerequisites:

- CA Identity Governance is installed.
- Your organization has a digital certificate that was generated by a Certificate Authority. For the purposes of this scenario, we use a certificate file named *example.cer*.
- The JDK version corresponds with your CA Identity Governance installation.
- The JAVA_HOME environmental variable is set in your environment.

## Add Your Digital Certificate to the Keystore

To enable CA Identity Governance to use SSL communication, export the digital certificate from the CA Identity Governance server and import this certificate into the keystore.

For information about how to create a self-signed certificate, see Create a Self-Signed Certificate in the *CA Identity Governance Installation Guide*.

**Important:** In a production environment, use a certificate that was issued by a trusted Certificate Authority, and not a self-signed certificate.

**Follow these steps:**

1. Stop JBoss if it is running.
2. Open a Command Prompt window on a system where the Portal is installed and navigate to the following directory:

   ```
   C:\Program Files\Java\jdk1.6_23\bin
   ```

3. Export the digital certificate from the server to JBoss with the following command:

   ```
   "%JAVA_HOME%\bin\keytool" -v -export -alias serverkeys -keystore "C:\Program
   Files\CA\RCM\Server\eurekify-jboss\server\eurekify\conf\server.keystore"
   -storepass password -file example.cer
   ```

   You have exported the digital certificate.

4. Import the digital certificate to the keystore with the following command:

   ```
   "%JAVA_HOME%\bin\keytool" -v -import -keystore
   "%JAVA_HOME%\jre\lib\security\cacerts"-storepass password -file example.cer
   ```

   You have imported the digital certificate to the keystore.

5. Copy the *example.cer* file to the following JDK security folder:

   ```
   C:\Program Files\Java\jdk1.6_23\jre\lib\security
   ```

6. Add the certificate to the local certificate store.

   a. Locate and double-click the *example.cer* file.

      A Certificate window opens.

   b. On the General tab, click Install Certificate.

      The Certificate Import Wizard opens.

   c. Complete the prompts as required, click Finish, and click OK when the confirmation dialog opens.

You have added the digital certificate to the keystore.

## Activate SSL Communication in JBoss

To activate SSL communication in JBoss, first block the default port and then edit the server.xml file to include the certificate path and password.

**Follow these steps:**

1. Stop JBoss if it is running.
2. Locate the server.xml file in the following .sar folder and open it for editing:

   ```
   gm_install\Server\eurekify-jboss\server\eurekify\deploy\jboss-web.sar
   ```

   **Note:** *gm_install* is the directory where the product is installed, for example, C:\Program Files\CA\RCM.
3. Block default port 8080. Locate and comment out the following code section:

   ```
   <Connector protocol="HTTP/1.1" URIEncoding="UTF-8" port="8080"
   address=${jboss.bind.address}"
   connectionTimeout="20000" redirectPort="8443" />
   ```

   You have blocked default port 8080.
4. Edit the JBoss server.xml file to enable SSL and to include the certificate path and password.

   a. Locate the following section:

   ```
   <Connector protocol="AJP/1.3" port="8009"
   address="${jboss.bind.address}"redirectPort="8443" />
   ```

   b. Add a line directly below and paste the following code:

   ```
   <Connector protocol="HTTP/1.1" port="8443" SSLEnabled="true"
   maxThreads="150" scheme="https" secure="true"
   clientAuth="false" sslProtocol="TLS"
   keystoreFile="${jboss.server.home.dir}/conf/server.keystore"
   keystorePass="password"
   />
   ```

   c. Replace *password* with the keystore password.
5. Save and close the server.xml file.
6. Start JBoss.

   You have activated SSL communication in JBoss.

## Set Secure Server Properties

Configure the CA Identity Governance Portal to use secure server properties. Edit common properties and property settings in the CA Identity Governance Portal to enable the secure URL (HTTPS) and delete the default port setting 8080.

**Follow these steps:**

1. Log in to the CA Identity Governance Portal as an administrator.
2. Go to Administration, Settings, Common Property Settings.
3. Open the common property statisticalService.url, and perform the following steps:
    a. In the Property Value field, make the URL secure by replacing **http** with **https** and delete the default port setting by removing **:8080**.

       The property now has the following value:

       ```
       https://localhost/eurekify/services/sageStatisticalService
       ```

    b. In the Type field select Database Property, and click Save.
4. Repeat Step 3 for each of the following common properties:
    - flowCampaignService.url
    - buildingBlockService.url
    - reportsService.url
    - campaignService.url
    - sageBrowsingService.url

    The common property settings are set for the secure server.
5. Go to Administration, Settings, Property Settings.
6. Repeat Step 3 for each of the following property settings:
    - integration.unicenter.servicedesk.webservice.url
    - portalExternalLink.certificationUrl
    - portalExternalLink.homeUrl
    - logout.landingPageUrl
    - resource.image.url
    - reports.baseUrl
    - tms.workflow.url
    - portalExternalLink.ticketQueueUrl
    - sage.sageBaseUrl

- role.image.url
- sso.sajcsui.url

The property settings are set for the secure server.

## (Optional) Activate SSL on Cluster Nodes

If you have a cluster deployment, enable each node in your JBoss cluster to use SSL communication. To activate SSL on cluster nodes, copy your digital certificate to each node and import the certificate to the keystore of that node.

**Follow these steps:**

1. On the computer where your reference installation is located, browse to the following directory:
   `%JAVA_HOME%\jre\lib\security\cacerts`
2. Copy the *example.cer* file to a node in your JBoss cluster.
3. On the node, double-click the *example.cer* file to import the certificate, and follow the steps in the wizard that opens.
4. On the node, set the keystore path to the following path:
   `C:\jboss-5.1.0GA\server\all\conf\server`
5. Repeat steps 1–4 for each node on your JBoss cluster.

   You have exported the certificate to each cluster node.

SSL communication is now active in your CA Identity Governance cluster deployment.

# Obtain a Digital Certificate

A digital certificate (also called a public key certificate) is an electronic document that is used to verify identity in electronic communication. A digital certificate is issued by a Certificate Authority (CA). You obtain a digital certificate from one of the following sources:

**Internal CA**

An internal CA enables you to issue and use your own digital certificates. Windows Server 2003/2008/2012 has a built-in CA that you can install and use. For information about how to use the Windows Server CA, see the Microsoft support website.

**Trusted Third-Party**

A TTP (trusted third-party) is a CA that issues a digital certificate for a commercial fee. The certificate is signed with a private key and the corresponding public key is widely distributed.

**Self-Signed Certificate**

A self-signed certificate is a certificate that is signed using the private key of the issuer of the certificate. That is, the certificate is signed by the same entity whose identity it certifies.

**Note:** Trusting the issuer of a self-signed certificate is problematic. In a production environment, we recommend that you use a certificate issued by a trusted Certificate Authority. For testing in a non-production environment, a self-signed certificate is acceptable.

### Example: Create a Self-Signed Certificate

To enable SSL encryption in your CA Identity Governance Portal, create a self-signed certificate.

**Follow these steps:**

1. Open a Command Prompt window.
2. Enter the following command:

   ```
   keytool -genkey -alias name -keyalg RSA -keystore server.keystore
   ```

   **-alias**

   Defines the alias to use for adding an entry to the keystore.

   **-keyalg**

   Specifies the algorithm to use to generate the key pair.

   The keytool utility starts.
3. Complete the prompts as required and click Enter.
4. Place your certificate in the following folder:

   ```
   gm_directory\eurekify-jboss\server\eurekify\conf
   ```

   A server.keystore file is created and placed in the specified folder.

# Chapter 8: Installing Additional Components

This section contains the following topics:

Install Oracle Client Components (see page 59)
Install Client Tools (see page 60)
Install Workpoint Designer (see page 64)

## Install Oracle Client Components

When an Oracle server hosts CA Identity Governance databases, you install Oracle Client components on computers that run CA Identity Governance Client Tools. These components support client interaction with databases on the Oracle server.

**To install Oracle Client components**

1. Download an Oracle Client installation package that is compatible with the target Oracle server from the Oracle website (_ http://www.oracle.com/technology/software/products/database/index.html) to the computer that hosts CA Identity Governance Client Tools.
2. Run the Oracle Client installer and install the following components:
   - Oracle Database Utilities
   - SQL*Plus
   - Oracle Windows Interfaces components:

     Oracle Objects for OLE

     Oracle Provider for OLE DB
3. Unzip the Oracle Client installer.

4. Create a tnsnames.ora file that defines the connection to the main CA Identity Governance database on the Oracle server.

   For example, the following code defines a TCP link to the rcm_sdb database on the XE database server.

   ```
   XE =
   (DESCRIPTION =
   (ADDRESS = (PROTOCOL = TCP)(HOST = ORAC01.com)(PORT = 1521))
   (CONNECT_DATA = (SERVER = DEDICATED)(SERVICE_NAME =rcm_sdb))
   )
   ```

5. Copy the tnsnames.ora file to the following directory:

   *Oracle_home*\network\admin

   **Note:** *Oracle_home* is the root directory for the Oracle Client package.

## Install Client Tools

Use the Client Tools to import and modify data, and analyze, construct and administer the role hierarchy. Install the Client Tools on a Windows computer that can communicate with the CA Identity Governance server and the database server.

**Follow these steps:**

1. On a Windows computer, run the .msi file you prepared earlier:

   - On a 64-bit computer, run CA-RCM-*rel#*-Client-Tools-x64.msi
   - On a 32-bit computer, run CA-RCM-*rel#*-Client-Tools-x86.msi

   The Client Tools installation wizard opens.

2. Complete the installer following the wizard prompts.

   If you selected to install additional components, the installation prompts you for the required files:

   - To install the UUID and IM Connector tools, locate the CA-RCM-*rel#*-Client-Tools-Open-Source.zip file.
   - To install the Online Help, locate the CA-RCM-*rel#*-Language-Files.zip file.

   The installer runs and installs the CA Identity Governance client tools on the computer.

3. (64-bit computers only) Run the Microsoft Assembly Registration Utility:

   a. Open a command line window and navigate to the following folder:

      ```
      C:\WINDOWS\Microsoft.NET\Framework64\v2.0.50727
      ```

   b. Enter the following commands:

      ```
      regasm.exe "C:\Program Files\CA\RCM\Client
      Tools\Software\Microsoft.Web.Services3.dll"
      regasm.exe "C:\Program Files\CA\RCM\Client Tools\Software\SageSOAP.dll"
      ```

   You have installed the Client Tools on a Windows computer that can communicate with the CA Identity Governance server and the database server.

**More information:**

Prepare the Installation Package (see page 20)

## Configure Client Tools After Installation

After you install the Client Tools, configure them to connect to the CA Identity Governance database.

**Follow these steps:**

1. Verify that the database server is running.
2. If your installation also includes a CA Identity Governance server, verify that it too is running.
3. Run the Client Tools.
4. Click File, General Settings.

   The Settings dialog opens.
5. Close the dialog.
6. Do *one* of the following:

   ■ When your implementation includes a CA Identity Governance server, coordinate database interactions with CA Identity Governance server (see page 62).

   ■ When there is no CA Identity Governance server, configure a direct connection to the database server (see page 62).

   The Client Tools are configured and ready for use.

## Coordinate the Client Connection to the Database with CA Identity Governance Server

When your implementation includes a CA Identity Governance server, configure the Client Tools to coordinate database interactions with the CA Identity Governance server. This coordination ensures data synchronization between the client and server interfaces.

**Follow these steps:**

1. Verify that the database server and CA Identity Governance server are running.
2. Run the client tools.

   The Enter Server Credentials dialog appears.
3. Click Cancel. Then click File, General Settings from the main menu.

   The Settings dialog appears.
4. Click the SQL Connectivity tab.
5. Select the Request SQL Credentials from a Server option.
6. Complete the address of the CA Identity Governance server URL, and click Apply.

   The Enter Server Credentials dialog appears.
7. In the SQL Server area, specify the user name and password that is defined for the CA Identity Governance database on the database server.
8. In the Web Server area, specify the user name and password of an administrator account on the CA Identity Governance portal.
9. Click OK.

   A message confirming SQL connectivity appears after a while. Changes that you make to databases using the client tools are synchronized with the CA Identity Governance portal.
10. Close the dialog.

    You have configured the Client Tools to coordinate database interactions with the CA Identity Governance server.

## Configure Direct Client Connection to Databases

In implementations that **do not** include a CA Identity Governance server, configure your client applications to work directly with the database server.

**Follow these steps:**

1. Verify that the database server is running.

2. Run the Data Management application.

   The Enter Server Credentials dialog appears.

3. Click Cancel. Then click File, General Settings from the main menu.

   The Data Management Settings dialog appears.

4. Click the SQL Connectivity tab.

5. Select the Use Static SQL Credentials option.

6. Configure the following fields and options:

   **SQL Server Type**

   Specifies whether a Microsoft SQL Server or Oracle Server hosts CA Identity Governance databases.

   **Server**

   Defines the target on the database server:

   - For a Microsoft SQL Server, this field specifies the host name of the database server instance.
   - For an Oracle database server, this field specifies the Oracle service name, as defined in the tnsnames.ora file in the Oracle service directory.

   **Database**

   (Microsoft SQL Server only) Defines the main CA Identity Governance database.

   **Username, Password**

   Define the login credentials of the database user or schema owner.

   **Windows Authentication**

   (Microsoft SQL Server only) When the database user is mapped to a general Windows user account in the environment, specifies whether the Windows user is used to log in to the database server.

7. Click Apply.

   A message confirming SQL connectivity appears. The application is now connected to the database.

8. Close the dialog.

9. Repeat this procedure in the DNA application.

   The client applications are configured and ready for use.

# Install Workpoint Designer

CA Identity Governance uses the Workpoint Business Process Management (BPM) solution to implement CA Identity Governance business workflows. For example, certifications are modeled as Workpoint processes, and the CA Identity Governance server is implemented as Workpoint jobs.

You can use the Workpoint Designer application to import and customize process workflows.

**Note:** We recommend that you use the workflow administration tools of the Portal to load and update Workpoint processes. Only experienced administrators should use Workpoint Designer to customize workflow behaviors.

The CA Identity Governance installer places a precompiled, customized Workpoint Designer package in the CA Identity Governance server installation directory. You can copy this package to run Workpoint Designer on another server.

This section describes how to install and configure Workpoint Designer to work with a CA Identity Governance server installation.

**This section contains the following topics:**

Install Workpoint Designer on JBoss (see page 64)
Install Workpoint Designer to Work with WebSphere (see page 65)

## Install Workpoint Designer on JBoss

This procedure describes how to install and configure Workpoint Designer to work with a CA Identity Governance server on JBoss.

**Follow these steps:**

1. Locate the following directory on the server where you ran the CA Identity Governance installer:

   *gm_install*\Server\eurekify-jboss\Workpoint

   *gm_install* is the CA Identity Governance installation directory.

2. Copy the Workpoint Designer directory to a system that runs a supported version of Windows or Linux. Continue this procedure on that system.

3. (Remote) Define an ODBC Data Source that points to the CA Identity Governance Workpoint database.

4. Configure the Workpoint Designer as follows:

   a. In the Workpoint Designer directory, locate the workpoint-client.properties file in the following folder:

      \conf

   b. Locate and edit the following property:

      **java.naming.provider.url**—The host name and port information for the Workpoint server or the Workpoint cluster load balancer. For a JBoss cluster, the default port on the load balancer is 1100.

      **Note:** Edit the instance of this property that is under the JBOSS SETTINGS section of the file. Specify the full URL and port string. Do not specify a DNS hostname.

   c. Save and close the **workpoint-client.properties** file.

5. Verify the Workpoint Designer installation.

   Workpoint Designer is installed and configured to work with a JBoss installation.

**Note:** For detailed information about Workpoint Designer, see the Workpoint documentation at the following location:
*gm_install*\Server\eurekify-jboss\Workpoint\WorkPointDesigner\docs

## Install Workpoint Designer to Work with WebSphere

This procedure describes how to install and configure Workpoint Designer to work with a CA Identity Governance server on WebSphere.

**Follow these steps:**

1. On the system where IBM WebSphere 7 is installed, navigate to the following folder:

   *WAS_home*/opt/IBM/WebSphere/AppServer/essentials/Workpoint/

2. Copy and paste the following properties files:

   - Archive
   - GeneralMonitor
   - IdCheck
   - workpoint-client
   - workpoint-server

   in the following folder:

   *WAS_home*/opt/IBM/WebSphere/AppServer/essentials/Workpoint/WorkPointDesigner/conf

3. (Remote) Download and install the IBM Application Client for WebSphere Application Server.
4. (Remote) Define an ODBC Data Source that points to the CA Identity Governance Workpoint database.
5. Configure the Workpoint Designer as follows:
   a. In the Workpoint Designer directory, locate the workpoint-client.properties in the following folder:

      \conf

   b. Open the workpoint-client.properties file and make the following changes:
      - Under the J2EE Client Configuration header, change all lines in the JBoss SETTINGS section into remarks by adding the # character.
      - Remove the # character from all lines of the IBM WEBSPHERE SETTINGS section to make these lines active.
      - Save and exit.

   c. Locate the init.bat or initi.sh file located in the following directory:

      \bin

   d. Edit the **init.bat** or **init.sh** file by doing the following steps:
      - Add the *rem* keyword to all lines in the USE WITH JBoss section.
      - Remove the *rem* keyword from all lines in the USE WITH IBM WEBSPHERE section.
      - Set the JAVA_HOME and WAS_HOME properties to the WebSphere Application Server client application. Typically the values are as follows:

        Windows:

        ```
        SET JAVA_HOME=C:\PROGRA~1\IBM\WebSphere\AppClient\java\jre
        SET WAS_HOME=C:\PROGRA~1\IBM\WebSphere\AppClient
        ```

        Linux:

        ```
        SET JAVA_HOME=/opt/IBM/WebSphere/AppServer/java/jre
        SET WAS_HOME=/opt/IBM/WebSphere/AppServer
        ```

      - Save and exit.
6. Run Workpoint Designer.

   Workpoint Designer is installed and configured to work with a WebSphere installation.

# Appendix A: Installation Worksheets

The CA Identity Governance installation program requests information about previously installed software and the software that you are installing. Use the following worksheets to collect information about your system before installing CA Identity Governance. After you complete the worksheets, you can use them as you work through the installation prompts. You can print and complete the worksheets to record your selections.

**This section contains the following topics:**

JBoss/Windows Installation Worksheet (see page 67)
JBoss/Linux Installation Worksheet (see page 69)
Microsoft SQL Server Worksheet (see page 70)
Oracle Database Worksheet (see page 71)

## JBoss/Windows Installation Worksheet

In a single Windows server installation, the CA Identity Governance server installation also installs a customized version of the JBoss Application Server. For clustered installations, a supported application server must already be configured and working. Record the following application server information you need during installation:

| Field | Description | Your Response |
|---|---|---|
| Select SQL Options | Specifies the server host and supported database server type you want to install CA Identity Governance against. Can be either:<br>■ Microsoft SQL Server<br>■ Oracle<br>**Note:** Verify that you complete the appropriate worksheet for your database server. | |
| Select the Application Server Environment | Specifies the supported application server where you want to install the CA Identity Governance server. | JBoss |
| Select the WorkPoint Server Host | Specifies the host name or IP address of the Workpoint server computer.<br>**Default:** This server—the computer you are installing on. | |

| Field | Description | Your Response |
|---|---|---|
| Select a Destination Folder | Defines the location where the CA Identity Governance software files are installed.<br>**Default:** C:\Program Files\CA\RCM\Server | |
| Select a Shortcut Folder | Defines the location where the CA Identity Governance installer creates product shortcuts.<br>**Default:** Other—The Start menu of the user that executed the installer. | |
| Provisioning Options | Specifies which provisioning feature to install.<br>Select from:<br>■ Standalone Connector Server<br>■ Connector Server Management UI<br>**Note:** Provisioning option is **not** required. | |

**More information:**

Microsoft SQL Server Worksheet (see page 70)
Oracle Database Worksheet (see page 71)

# JBoss/Linux Installation Worksheet

In a single Linux server installation, the CA Identity Governance server installation also installs a customized version of the JBoss Application Server. For clustered installations, a supported application server must already be configured and working. Record the following application server information you need during installation:

| Field | Description | Your Response |
|---|---|---|
| Select the SQL Server Type | Specifies the supported database server type you want to install CA Identity Governance against. Can be either:<br>■ Microsoft SQL Server<br>■ Oracle<br>**Note:** Verify that you complete the appropriate worksheet for your database server. | |
| Select the Application Server Environment | Specifies the supported application server you want to install the CA Identity Governance server on. | JBoss |
| Select the WorkPoint Host | Specifies the host name or IP address of the Workpoint server computer.<br>**Default:** This computer—the computer you are installing on. | |
| Where Would You Like to Install | Defines the location where the CA Identity Governance software files are installed.<br>**Default:** /user home/CA/RCM/Server | |
| Where Would You Like to Create Product Icons | Defines the location where the CA Identity Governance installer creates product shortcuts.<br>**Default:** Other—The Start menu of the user that executed the installer. | |

**More information:**

Microsoft SQL Server Worksheet (see page 70)
Oracle Database Worksheet (see page 71)

# Microsoft SQL Server Worksheet

A database server must already be configured and working with a supported RDBMS. Record the following database information you need during installation against an existing Microsoft SQL Server:

| Field | Description | Your Response |
|---|---|---|
| Microsoft SQL Server Host | Defines the host name or IP address of the database server computer or cluster. | |
| Select Microsoft SQL Server Instance | Specifies a target SQL Server instance, by name or communications port.<br>**Default:** Use default instance—uses an unnamed default instance and the standard port 1433. | |
| SQL Server Username | Defines the user ID of an SQL Server user with the system administrator privileges.<br>**Note:** You can only use SQL login names to authenticate against the SQL Server. | |
| SQL Server Password | Defines the password of the SQL Server user with system administrator privileges. | |

**Important!** We recommend that you use the default database names. CA Identity Governance database names cannot contain the hyphen (-) character.

| | | |
|---|---|---|
| RCM Database Name | Defines the name of the database that holds imported user, role, and resource information, CA Identity Governance portal settings, and other data.<br>**Default:** eurekify_sdb | |
| RCM Ticket Database Schema Name | Defines the name of the schema for business processes data such as review and approval campaigns.<br>User must have CONNECT and RESOURCE roles.<br>**Default:** eurekify_ticketdb | |
| Workpoint Database | Defines the name of the database that holds the Workpoint work flows.<br>**Default:** WPDS | |
| Report Database Name | (Optional) Defines the name of the database that holds the reporting information.<br>**Default:** eurekify_reportdb | |

**Note:** When you install CA Identity Governance on an AIX/WebSphere application server, you create two additional databases for CA Identity Governance and Workpoint cluster bus queues. For instructions, see the AIX installation notes in the CA Identity Governance support Knowledge Base section.

## Oracle Database Worksheet

A database server must already be configured and working with a supported RDBMS. Record the following database information you need during installation against an existing Oracle Database Server:

| Field | Description | Your Response |
|---|---|---|
| Oracle Server Host | Defines the host name or IP address of the database server computer or cluster. | |
| Select Service Name | Specifies the name that identifies your RDBMS on the system.<br>**Default:** ORCL—the default service name for Oracle Database 10*g* or 11*g*. | |
| Specify Oracle Server port | Specifies the port used by the RDBMS you specified.<br>**Default:** 1521—the default port for Oracle Database. | |
| | **Important!** We recommend that you use the default database names. CA Identity Governance database names cannot contain the hyphen (-) character. | |
| RCM Database Schema Name | Defines the name of the schema for imported user, role, and resource information, CA Identity Governance portal settings, and other data.<br>User must have CONNECT and RESOURCE roles.<br>**Default:** eurekify_sdb | |
| RCM Database Schema Password | Defines the password of the CA Identity Governance schema user. | |

| Field | Description | Your Response |
|---|---|---|
| RCM Ticket Database Schema Name | Defines the name of the schema for business processes data such as review and approval campaigns.<br>User must have CONNECT and RESOURCE roles.<br>**Default:** eurekify_ticketdb | |
| RCM Ticket Database Schema Password | Defines the password of the CA Identity Governance ticket schema user. | |
| Workpoint Database Schema Name | Defines the name of the schema for the Workpoint work flows.<br>User must have CONNECT and RESOURCE roles.<br>**Default:** WPDS | |
| Workpoint Database Schema Password | Defines the password of the Workpoint schema user. | |
| **Note:** We recommend that your database administrator creates the empty schemas for you before you install CA Identity Governance. If you do not prepare empty schemas for the CA Identity Governance databases, the installation requires the credentials of an Oracle Database user with DBA privileges. The installation program then creates the schemas using the information you provide. | | |
| **Note:** When you install CA Identity Governance on an AIX/WebSphere application server, you create these additional databases for CA Identity Governance and Workpoint cluster bus queues. See the AIX installation notes in the CA Identity Governance support Knowledge Base section. | | |
| Oracle DBA username | Defines the name of a DBA user you want to use to create the required CA Identity Governance schemas you supplied.<br>**Note:** If you prepare the CA Identity Governance schemas in advance of running the installation program, you do not need to supply Oracle DBA credentials.<br>**Default:** system | |
| Password | Defines the password of a DBA user you want to use to create the required CA Identity Governance schemas you supplied. | |

**Note:** When you install CA Identity Governance on an AIX/WebSphere application server, you can work with either an Oracle 10*g* Database or an Oracle 11*g*R2 Database, but the installed driver is for the Oracle Database 10*g* Database.

# Appendix B: Configure JBoss as a Windows Service

When you configure the JBoss application server as a web service, it automatically runs when the computer starts.

**Follow these steps:**

1. Browse to the JBoss community download website and download the jboss-native-2.0.9-windows-x86-ssl.zip file.

2. Copy and decompress the jboss-native-2.0.9-windows-x86-ssl.zip file to the following directory:

   ```
   gm_install\eurekify-jboss
   ```

   **Note:** *gm_install* is the CA Identity Governance installation directory.

   New directories and files are created.

3. Create a backup of the **service.bat** file in the following subdirectory:

   ```
   gm_install\eurekify-jboss
   ```

4. Edit the **service.bat** file in the *gm_install*\eurekify-jboss\bin subdirectory as follows:

   a. Search the file and replace the string **run.bat** with the string **eurekify.bat**.

   b. Locate and delete the following strings in the file:

      - > run.log
      - >> run.log
      - > shutdown.log
      - >> shutdown.log
      - 2>&1

   c. Save changes to the file.

5. Open a command line window from the Start menu and navigate to this directory:

   ```
   ...\jboss-native-2.0.9-windows-x86-ssl\bin
   ```

6. Enter **service install**.

   A confirmation message appears after the JBoss web application service is installed.

7. Open the Windows Control Panel, and double-click Administrative Tools, Services.

   The Services application window appears.

8. Locate and right-click the JBoss Application Server entry, and select Properties.

9. Change the Startup Type to Automatic, click OK and exit the Services application.
10. Restart the computer.
11. Verify CA Identity Governance log files to verify that the JBoss Application Server starts.

    The JBoss application server is configured as a Windows service.

This section contains the following topics:

JBoss Windows Service Fails to Start (see page 76)

# JBoss Windows Service Fails to Start

When you implement JBoss as a Windows service, the JBoss service may not start when you restart Windows. There may be a conflict between existing DLL files and the new files you installed to implement the JBoss service. You can disable unnecessary DLLs.

**Follow these steps:**

1. Browse to the following directory:

   ```
   gm_install\eurekify-jboss\bin
   ```

   **Note:** *gm_install* is the CA Identity Governance installation directory.
2. Rename the **\native** subdirectory to **\native_bak**.
3. Restart the computer.
4. Verify CA Identity Governance log files to verify that the JBoss Application Server starts.

# Appendix C: Configure JBoss as a Linux Daemon

When you configure the JBoss application daemon as a web service, it automatically launches when you restart the computer.

**Follow these steps:**

1. Copy the jboss_linux_service.sh file from the CA Identity Governance installation package, located in this directory;

   ```
   gm_install/eurekify-jboss/bin/
   ```

   To the following directory:

   ```
   /etc/init.d
   ```

   **Note:** *gm_install* is the CA Identity Governance installation directory.

2. Rename the file JBoss.
3. Open the jboss_linux_service.sh file for editing, and replace all instances of gm_install with the actual installation path.
4. Verify the file permissions.

### Example: Configure JBoss as a Linux Daemon Script

This example shows you how to create a script to configure JBoss as a Linux daemon.

1. Copy and paste the following script in this directory:

   ```
   /etc/rc.d/init.d
   ```

2. As root (su - root) type vi /etc/rc.d/init.d/jboss and paste as follows:

   ```
   #! /bin/sh

       start(){
               echo "Starting jboss.."
               su -l root -c ' gm_install/eurekify-jboss/bin/eurekify.sh  >
       /dev/null 2> /dev/null &'
       }

       stop(){
               echo "Stopping jboss.."
               su -l root -c ' gm_install/eurekify-jboss/bin/shutdown.sh -S &'
       }
       restart(){
               stop
       # give stuff some time to stop before we restart
               sleep 60
       # protect against any services that cannot stop before we restart (warning
       this kills all Java instances running as 'jboss' user)
               su -l root -c 'killall java'
               start
       }

       case "$1" in
         start)
               start
               ;;
         stop)
               stop
               ;;
         restart)
               restart
               ;;
         *)
               echo "Usage: jboss {start|stop|restart}"
               exit 1
       esac
       exit 0
   ```

3. Change the permissions of the file with the following command:

   ```
   chmod 0755 /etc/init.d/jboss
   ```

4. Create links that you use to identify JBoss start and stop run levels.

   For example, (create as root):

   ```
   ln -s /etc/rc.d/init.d/jboss /etc/rc3.d/S84jboss

   ln -s /etc/rc.d/init.d/jboss /etc/rc5.d/S84jboss

   ln -s /etc/rc.d/init.d/jboss /etc/rc4.d/S84jboss

   ln -s /etc/rc.d/init.d/jboss /etc/rc6.d/K15jboss

   ln -s /etc/rc.d/init.d/jboss /etc/rc0.d/K15jboss

   ln -s /etc/rc.d/init.d/jboss /etc/rc1.d/K15jboss

   ln -s /etc/rc.d/init.d/jboss /etc/rc2.d/K15jboss
   ```

5. Test the script by running it with the following commands:

   ```
   Run JBoss:

   /etc/init.d/jboss start
   ```

   The CA Identity Governance server becomes available in a few moments.

   ```
   Stop JBoss:

   /etc/init.d/jboss stop
   ```

   You have configured the JBoss application daemon as a web service, and it automatically launches when you restart the computer.

# Appendix D: Installing CA Identity Governance and Oracle RAC

This scenario describes how to install CA Identity Governance with Oracle Real Application Clusters (RAC).

This scenario targets the following CA Identity Governance users:

- System and database administrators
- System integrators

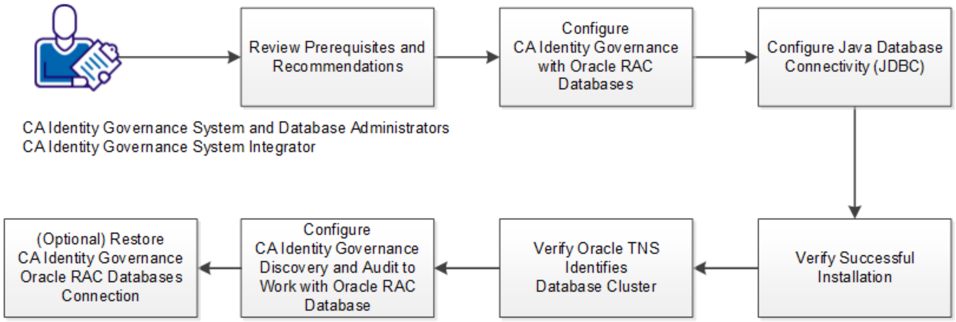
This section contains the following topics:

How to Install CA Identity Governance and Oracle RAC (see page 81)
Review  CA Identity Governance and Oracle RAC Prerequisites (see page 82)
Configure CA Identity Governance with Oracle RAC Databases (see page 82)
Configure Java Database Connectivity (JDBC) (see page 86)
Verify a Successful Installation (see page 87)
Verify Oracle TNS Identifies Database Cluster (see page 88)
Integrate CA Identity Governance Discovery and Audit with Oracle RAC Databases (see page 89)
(Optional) Restore CA Identity Governance-Oracle RAC Databases Connection (see page 91)

## How to Install CA Identity Governance and Oracle RAC

You configure CA Identity Governance to function in an Oracle RAC environment. Oracle RAC provides clustering and high availability software for Oracle database environments.

The following diagram illustrates how to install CA Identity Governance with Oracle RAC databases:



Review Prerequisites and Recommendations
Configure CA Identity Governance with Oracle RAC Databases
Configure Java Database Connectivity (JDBC)
CA Identity Governance System and Database Administrators
CA Identity Governance System Integrator
Verify Successful Installation
Verify Oracle TNS Identifies Database Cluster
Configure CA Identity Governance Discovery and Audit to Work with Oracle RAC Database
(Optional) Restore CA Identity Governance Oracle RAC Databases Connection

Follow these steps to install CA Identity Governance with Oracle RAC databases:

1. Review prerequisites and recommendations.
2. Configure CA Identity Governance with Oracle RAC databases.
3. Configure Java Database Connectivity (JDBC).
4. Verify successful installation.
5. Verify Oracle TNS Identifies Database Cluster.
6. Integrate CA Identity Governance Discovery and Audit with Oracle RAC databases.
7. (Optional) Restore CA Identity Governance Oracle RAC databases connection.

## Review  CA Identity Governance and Oracle RAC Prerequisites

This section lists CA Identity Governance and Oracle RAC prerequisites.

- CA Identity Governance databases must use UTF-8 (AL32UTF8) encoding.
- We recommend enabling 400 connections for each CA Identity Governance server that is connected to the same database, even if they are connected to different schemas.
- We recommend that you expand the CA Identity Governance cache memory limits to support considerable CA Identity Governance configurations. The default setting limits the memory cache to 500,000 elements. We recommend that you reset the CA Identity Governance cache limits to 900,000 elements.

## Configure CA Identity Governance with Oracle RAC Databases

You configure CA Identity Governance with Oracle RAC databases by adding roles, establishing communication, and defining parameters.

**Follow these steps:**

1. Create a CA Identity Governance database user (schema). This user must have the following permissions and settings:
   - Roles: CONNECT, RESOURCE
   - System Privileges: ALTER SESSION, CREATE CLUSTER, CREATE DATABASE LINK, CREATE SEQUENCE, CREATE SESSION, CREATE SYNONYM, CREATE TABLE, CREATE VIEW, CREATE CLUSTER, CREATE INDEXTYPE, CREATE OPERATOR, CREATE PROCEDURE, CREATE SEQUENCE, CREATE TABLE, CREATE TRIGGER, CREATE TYPE, SELECT ANY DICTIONARY

   The CONNECT role provides the create session permission. The RESOURCE role provides several create system privileges, and provides for previous Oracle database compatibility releases.

2. Edit the tnsnames.ora file for the database cluster from the database server.

   You modify the tnsnames.ora file by adding your cluster address and port. The Oracle client uses the tnsnames.ora file to connect to the Oracle server. Do the following:

   a. Locate the tnsnames.ora file in the Oracle home directory. The tnsnames.ora file is located in the following folder:
      *Oracle_home*/NETWORK/ADMIN

   b. Locate the instances that define your clustered service and add your cluster address and port.

      **Example:**

      ```
      RCMDB1 =

         (DESCRIPTION =

           (ADDRESS = (PROTOCOL = TCP)(HOST = oraclusternode1-vip)(PORT = 1521))

           (ADDRESS = (PROTOCOL = TCP)(HOST = oraclusternode2-vip)(PORT = 1521))

           (LOAD_BALANCE = yes)

           (CONNECT_DATA =

            (SERVER = DEDICATED)

            (SERVICE_NAME = RCMDB1

         )

      )
      ```

      In this example, your Oracle RAC cluster and port have been defined.

   c. Save and close the file.

      The tnsnames.ora file is edited.

3. Update the hosts file to define current cluster nodes.

   You define the IP addresses and the Oracle RAC host names. Do the following:

   a. Locate the hosts file in the following folder:

      *gm_install*/Windows/System32/drivers/etc

   b. Define the IP addresses and the Oracle RAC host names.

   c. Save and close the file.

      You have updated the hosts file to define the current cluster nodes.

      **Example:** In this example, in the # RAC VIRTUAL INTERFACES section, IP address 10.0.0.82 is defined as rac1-vip.localdomain, and IP address 10.0.0.83 is defined as rac2-vip.localdomain.

```
###########################################
# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1       localhost.localdomain localhost
10.0.0.39       ca_gm_linux46.localdomain   ca_gm_linux46
# RAC VIRTUAL INTERFACES
10.0.0.82       rac1-vip.localdomain    rac1-vip
10.0.0.83       rac2-vip.localdomain    rac2-vip
# RAC PUBLIC INTERFACES
10.0.0.182      rac1.localdomain        rac1
10.0.0.183      rac2.localdomain        rac2
###########################################
```

4. Edit the eurekify.properties file to define the database host name as the CA Identity Governance SDB database. The SDB contains CA Identity Governance Master and Model data.

   **Important!** When you upgrade from CA Identity Governance 12.5 SPx with Oracle RAC, edit this property file after the upgrade process completes.

   a. Locate the eurekify.properties file in the following folder:

      *gm_install*/Program Files/CA/RCM/Server/eurekify-jboss/conf/

      **Note:** *gm_install* is the CA Identity Governance installation directory.

b. Add the following property:

   ```
   sdb.host=RCMDB1
   ```

   **Note:** *RCMDB1* is the Oracle RAC database service name as defined above.

c. Save and close the file.

   You have edited the eurekify.properties file to define the database host name as the CA Identity Governance SDB database.

   **Note:** Update this property file in each node when you configure CA Identity Governance to work in a cluster.

5. Run the CA Identity Governance installer, and in the database parameters section, define the following database parameters:

   - **Oracle Server Host** - The IP address of one of the cluster nodes.
   - **Oracle Service name** - Cluster Database service name (not the nodes).

     **Example:**

     ```
     Specify Oracle SQL Server Information

     Oracle Server Host (DEFAULT: rcmlinux46.localdomain): rac1

     Oracle Service Name (DEFAULT: ORCL): RCMDB1

     Specify Oracle Server port (DEFAULT: 1521):1521
     ```

   **Note:** For more information, refer to the *CA Identity Governance Installation Guide*.

6. Increase the database sessions and processes parameters from the default setting to reduce exceptions.

   a. Connect to the database with the system account.

   b. Run the following commands:

      ```
      alter system set sessions=400 scope=spfile;

      alter system set processes=400 scope=spfile;
      ```

   c. Restart the entire database (all cluster instances).

      Database sessions and process parameters are increased.

   You have configured CA Identity Governance with Oracle RAC databases. You now configure JDBC connectivity.

# Configure Java Database Connectivity (JDBC)

You configure the JDBC to connect to a database and increase default cache settings. JDBC, an API for the Java programming language, defines how a client accesses a database by providing querying methods and updating database data.

**Follow these steps:**

1. Backup the eurekify-ds.xml and wp-ds.xml files from the following folder:

   ```
   gm_install/CA/RCM/Server/eurekify-jboss/server/eurekify/deploy/
   ```

2. Update JDBC URL values to define Oracle RAC database cluster rac1-vip and rac2-vip. Do the following:

   a. Locate the following elements in both files:

      ```
      <connection-url>jdbc:oracle:thin:@rac:1521/RCMDB1</connection-url>
      ```

   b. Replace with the following text that defines the JDBC URL to Oracle RAC cluster rac1-vip and rac2-vip databases:

      ```
      <connection-url>jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
      (ADDRESS=(PROTOCOL=TCP)(HOST=rac1-vip.localdomain) (PORT=1521))
      (ADDRESS=(PROTOCOL=TCP)(HOST=rac2-vip.localdomain) (PORT=1521))
      (CONNECT_DATA=(SERVICE_NAME=RCMDB1)))</connection-url>
      ```

   c. Save and close the files.

      The JDBC URL values define Oracle RAC database cluster rac1-vip and rac2-vip.

3. Reset the CA Identity Governance cache limits, as follows:

   a. Edit the **ehcache-sageDal.xml** file on the CA Identity Governance server:

      - For JBoss, this file is found in the following location:

      ```
      jboss_install\server\all\farm\eurekfiy.war\WEB-INF\classes\
      ```

      - For WebSphere, this file is located in the eurekify.ear file found in the following location:

      ```
      /eurekify.war/WEB-INF/classes
      ```

   b. In the **defaultCache** entry, change the following attribute:

      **maxElementsInMemory**

      Defines the maximum number of elements stored in cache memory.

      We recommend that you set this field using the following formula:

      maxElementsInMemory = total number of entities * 3

      For example, if you have one universe with 500,000 users and 500,000 roles, set maxElementsInMemory to 3,000,000 elements.

      If you have two universes, each with 500,000 users and 500,000 roles, set maxElementsInMemory to 6,000,000 elements.

   c. Save and close the file.

      The CA Identity Governance cache limits are reset.

      You have configured the JDBC. You now verify a successful CA Identity Governance installation.

# Verify a Successful Installation

Verify a successful CA Identity Governance Windows or Linux installation.

You can access the CA Identity Governance portal when you have successfully installed CA Identity Governance on a JBoss cluster.

**Follow these steps:**

1. Select one server from the CA Identity Governance cluster and start it.
2. Review the started server logs and verify no log errors exist.
3. Start all other servers in the CA Identity Governance cluster.
4. Review all CA Identity Governance cluster logs and verify that no errors exist in the logs.

   When the installation is successful, you can access the CA Identity Governance portal.

5. Open a browser and enter the following URL:

   `http://`*`serverhost`*`:`*`port`*`/eurekify/portal/login`

   **Note:** *serverhost:port* is the network address and communications port of the CA Identity Governance server or load balancer. The JBoss/Windows server default port is 8080.

6. Log in using the default administration credentials:

   - **Username:** AD1\EAdmin
   - **Password:** eurekify

   **Note:** The password can be any password. It must be at least one character. The field must not be blank.

7. Set your Property and Common Property URL settings under Administration, Settings.

8. (Linux only) Update Workpoint DB administration to the load balancer server.

9. Navigate to Reports, Configuration Reports, select Configuration Properties and select ConfigWithRoles. This action verifies that the report application is working.

10. (Upgrade only) Clear the browser cache or refresh the web page to replace old graphical elements.

# Verify Oracle TNS Identifies Database Cluster

You verify that the Oracle TNS entries in the tnsnames.ora file identify your Oracle RAC database structure. Oracle Transparent Network Substrate (TNS) provides a network platform of different protocols to function as a homogeneous network. The tnsnames.ora file is a configuration file that defines database addresses by establishing connections to them.

**Follow these steps:**

1. Locate the tnsnames.ora file on the computer hosting the CA Identity Governance Discovery and Audit tool.

   The tnsnames.ora file is located in the following folder:

   *`Oracle_home`*`/NETWORK/ADMIN`

2. Open the tnsnames.ora file and verify that the existence of TNS entries identifies your database cluster.

   **Example:**

   ```
   RCMDB1 =
     (DESCRIPTION =
       (ADDRESS = (PROTOCOL = TCP)(HOST = rac1-vip.localdomain)(PORT = 1521))
       (ADDRESS = (PROTOCOL = TCP)(HOST = rac2-vip.localdomain)(PORT = 1521))
       (LOAD_BALANCE = yes)
       (CONNECT_DATA =
         (SERVER = DEDICATED)
         (SERVICE_NAME = RCMDB1)
       )
     )
   ```

3. Save and close the file.

   You have verified that the Oracle TNS entries in the tnsnames.ora file identify your Oracle RAC database structure. You now install and configure CA Identity Governance Discovery and Audit tools to work with Oracle RAC databases.

## Integrate CA Identity Governance Discovery and Audit with Oracle RAC Databases

You integrate the CA Identity Governance Discovery and Audit tool with Oracle RAC databases to import and modify data, analyze, construct and administer the role hierarchy.

**Follow these steps:**

1. Run the CA Identity Governance Client Tools installer and open the application.

   The CA Identity Governance Client Tools installer, CA-RCM-*RN*-Client-Tools-x86.zip, is located in the folder where you downloaded the installation package files when you installed CA Identity Governance.

   **Note:** *RN* is the current release number for the product.

   The CA Role and Compliance Manager - Discover and Audit window appears.

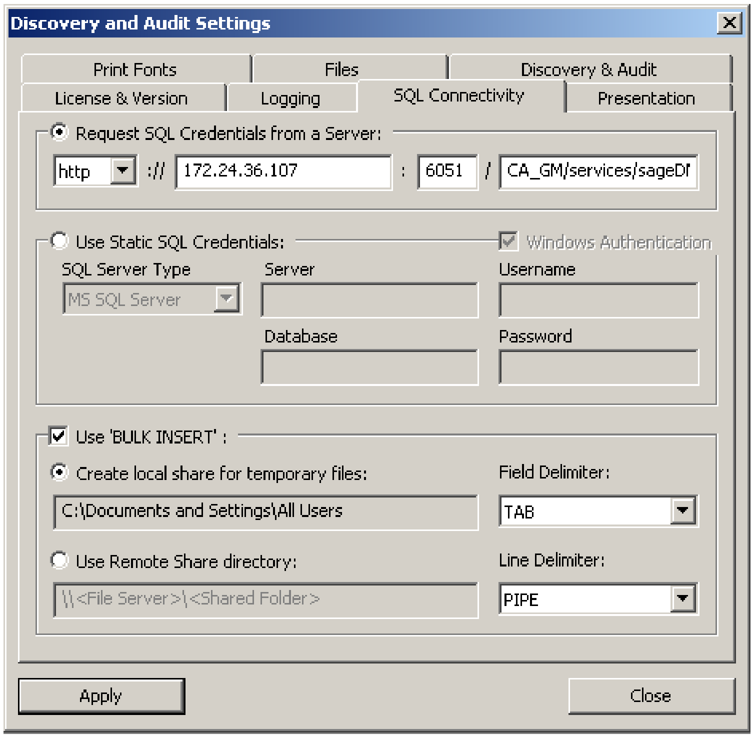
2. Navigate to File, General Settings.

   The Discovery and Audit Settings window appears.

3. In the SQL Connectivity tab, select Request SQL Credentials from a Server.

   This option connects the SQL database through the CA Identity Governance server.

   The following graphic displays the Request SQL Credentials from a Server option that is selected with an example server host IP address and port number displayed:



Discovery and Audit Settings

● Request SQL Credentials from a Server:

http ://172.24.36.107 : 6051 / CA_GM/services/sageDI

○ Use Static SQL Credentials:

☑ Windows Authentication

SQL Server Type: MS SQL Server

Server:

Username:

Database:

Password:

☑ Use 'BULK INSERT' :

● Create local share for temporary files: C:\Documents and Settings\All Users

Field Delimiter: TAB

○ Use Remote Share directory: \\<File Server>\<Shared Folder>

Line Delimiter: PIPE

4. Enter in the CA Identity Governance server host name and the CA Identity Governance Server port number and click Apply.

   The Enter Server Credentials window appears.

5. In the SQL Server section, enter in the user name and password.

6. In the Web Server section, enter in the CA Identity Governance Portal administrator and password, and click OK.

7. In the Discovery and Audit Settings window, click Close.

   The CA Identity Governance Discovery and Audit tool is integrated to connect with Oracle RAC databases to manage data.

# (Optional) Restore CA Identity Governance-Oracle RAC Databases Connection

You restore the connection between CA Identity Governance and Oracle RAC databases after a failure. Connection failures can occur when you connect to the SQL database through the CA Identity Governance server.

**Follow these steps:**

1. Edit the tnsnames.ora file for the database cluster from the database server. Do the following:

   a. Locate the tnsnames.ora file in the Oracle home directory.

   b. Locate the instances that represent your clustered service and verify your cluster address and port.

      **Example:**

      ```
      RCMDB1 =
         (DESCRIPTION =
           (ADDRESS = (PROTOCOL = TCP)(HOST = oraclusternode1-vip)(PORT = 1521))
           (ADDRESS = (PROTOCOL = TCP)(HOST = oraclusternode2-vip)(PORT = 1521))
           (LOAD_BALANCE = yes)
           (CONNECT_DATA =
            (SERVER = DEDICATED)
            (SERVICE_NAME = RCMDB1
         )
      )
      ```

   c. Save and close the file.

      The tnsnames.ora file is edited, and the Oracle client-server connection is restored.

2. Edit the eurekify.properties file to define the database host name as the CA Identity Governance SDB database. The SDB contains CA Identity Governance Master and Model data.

   Do the following:

   a. Locate the eurekify.properties file in the following folder:

      `gm_install/Program Files/CA\RCM/Server/eurekify-jboss/conf`

   b. Add the following property to define the database host name as the CA Identity Governance SDB database:

      `sdb.host=RCMDB1`

      **Note:** *RCMDB1* is the Oracle RAC database host name.

   c. Save and close the file.

      The eurekify.properties file is edited to define the database host name as the CA Identity Governance SDB database.

3. On the CA Identity Governance installation computer, open Oracle SQL Developer or similar program for working with SQL in Oracle databases.

4. Connect to the eurekify_sdb database, and insert the following text:

   ```
   insert into SAGE_PREFERENCES

   (LoginID, PrefGroup, Name, Value)

   values

   ('eurekify.properties', 'eurekify.properties.dynamic', 'sdb.host', 'RCMDB1');
   ```

5. In the Query menu, select Execute to run the SQL query.

   The CA Identity Governance and Oracle RAC databases connection is restored.